Creative Switzerland?

Joint Study of the Swiss–American Chamber of Commerce
and The Boston Consulting Group
Zurich, December 2008

Fostering an Innovation Powerhouse!

Swiss-American Chamber of Commerce

BCG
The Boston Consulting Group

Note to the Reader

This study concludes our three-year series on multinational companies in Switzerland. Our first study drew attention to foreign companies as an important and fast-growing sector within the Swiss economy. Our second study shed light on Switzerland's success in attracting multinational companies but also on the vulnerability of the Swiss economy should they relocate elsewhere. Our third study looks at how Switzerland can maintain its attractiveness to multinational companies and sustain its competitive position as the best place for innovation.

Multinational companies – large and small, Swiss and foreign – represent a vital part of the Swiss economy, contributing 34 percent of the Swiss GDP. Yet these companies are highly mobile: on average they reevaluate their geographic setup every five years, constantly putting a large share of Swiss GDP at risk.

In light of the increasing mobility of multinational companies, and escalating competitiveness to attract those companies, Switzerland needs to promote its most important advantage – a creative environment for innovation – in order to continue to attract and retain these companies. This study calls for action that will enable Switzerland to do just that and thereby sustain its competitive advantage in the global economy. Clearly, a multinational company with significant innovation activities in Switzerland, which creates above average value for the Swiss economy, is less likely to relocate than a management holding company.

Switzerland has long been an excellent place for innovation. It is not surprising, therefore, that innovative industries contribute more than a third of Swiss GDP and, over the past ten years, grew more than twice as fast as other industries in Switzerland. Multinational companies play a vital role in these innovative industries. Because of their significance to the Swiss economy and because of the global race to attract these companies to locations around the world, it is essential that Switzerland takes the necessary political action to increase its competitiveness in promoting itself as the best place for innovation. This study describes five critical initiatives for doing so.

We hope you enjoy reading our study. Your comments and feedback would be highly appreciated. Please do not hesitate to contact us:

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01
Executive Summary

Switzerland has long been an excellent place for innovation and for conducting business

Switzerland's heritage includes a strong pioneering spirit and creativeness. Pioneers like Henri Nestlé, Johann Rudolf Geigy, Alfred Escher, Johann Jakob Sulzer, and Charles E.L. Brown laid the foundation for the highly competitive and innovative environment that enables Switzerland to achieve top rankings in international benchmarking studies across the board today. It is Switzerland's exceptional productivity in creating intellectual property, its outstanding universities and research institutes, the high quality and productivity of its work force, and its extremely high standard of living that stand out and make it an excellent place for innovation.

Switzerland' s wealth is heavily dependent on multinationals in highly innovative industries

To this day, innovation has continued to play a vital role in Switzerland. Switzerland's wealth is created mainly by multinational companies[1] in highly innovative industries.[2] These industries – which we call Switzerland's economic *pillars of wealth* – contribute 35 percent of the Swiss GDP. In the ten years from 1997 through 2006, they grew more than twice as fast as other industries (excluding public services), generated 74 percent higher value added per employee, and created over 140,000 jobs in Switzerland. But while growing faster, being more productive and creating many jobs, the pillars of wealth are also much more exposed to competition in the global markets. And global competition ultimately drives a need for both innovation and globalization. Consequently, 75 percent of these industries are highly innovative – and multinationals account for three-quarters of the GDP generated by Switzerland's pillars of wealth.

Armed with immense budgets, many countries boost their attractiveness as places for innovation

While the large percentage of multinational companies within the pillars of wealth reflects Switzerland's current competitiveness, it also represents an often-neglected risk for the Swiss economy. Since multinationals reevaluate their geographic setup every five years on average – as we learned in the joint study we conducted last year, *Multinational Companies on the Move: How Switzerland Will Win the Battle!* – a large part of the fastest growing and most productive segment of the Swiss economy is constantly at risk of erosion. This risk is further heightened by the recent rise of many challengers to Switzerland's position as a top-ranking place for innovation.

Armed with immense budgets, these competitors aim to advance their research capabilities and boost their attractiveness as locations for innovation and creative activities. Thus Switzerland, which has traditionally been one of the global strongholds in these areas, is being challenged today on its core strengths. More than 60 percent of all respondents to a survey conducted for this study reported plans to significantly increase their R&D investments outside Switzerland, while less than 40 percent plan to do so within Switzerland. The beneficiary of this trend will most likely be Asia, which is regarded by many respondents as the primary region in which to expand innovation activities, and where countries such as Singapore are prominent forerunners in taking a greenfield approach to building an attractive research and innovation environment.

1 For the purposes of this study, we define multinational companies (MNCs) as all foreign companies in Switzerland, as well as Swiss companies – large or small – with a large export share (more than 25 percent of total revenue) and significant foreign direct investments (measured as more than 25 percent of employees abroad).
2 See Methodology for a description of the method used in this study to evaluate the innovation intensity of industries.

If Switzerland does not act now, it will be putting its future wealth at risk

In the past, Switzerland has not leveraged its creative environment to its full potential. As a result, it has had very low real GDP growth over the past 25 years. And with the robust progress of competitors in the global economy, even this low GDP growth is now threatened. If competing countries get just 2 percent points[1] of the multinational companies in Switzerland to relocate abroad each year, the result would be devastating for Switzerland. If, on the other hand, Switzerland makes the changes required to fully leverage its creative environment to attract an additional 2 percent points of multinational companies each year, this will add an additional 40 percent to the GDP of 2030. And if Switzerland could match Finland's growth, it would achieve more than 80 percent additional GDP by 2030 – a difference worth more than half a trillion Swiss francs.

Five initiatives for creating the best place for innovation

We call upon the political bodies of Switzerland to implement a five-point program to create the best place for innovation on earth:

1. *Strengthen the homegrown work force in science, engineering, and technology:* A qualified work force is the single most important factor for successful innovation. But Switzerland currently has a shortage of roughly 3,000 engineers and scientists, and we estimate that this number could double by 2016. The current economic crisis might dampen the current demand and lack of, engineers and scientists, but it will not change the medium- and long-term imbalance of demand and supply of such qualified professionals. Only one out of four Swiss university graduates earns a degree in science or engineering, and engineering and technology is also the only major professional area in which apprenticeships offered by industry by far outnumber interested and qualified young people. To strengthen the Swiss work force in science, engineering, and technology, Swiss schools must significantly increase the class time devoted to – and the acknowledged importance of – these disciplines; industry and universities must increase their involvement in early education to foster interest in careers in these areas; and, finally, efforts must be made to promote greater awareness of the importance of science, engineering, and technology to Switzerland's future role in the global economy.

2. *Facilitate immigration of highly qualified professionals:* The domestic work force alone cannot satisfy the growing demand for skilled professionals in the Swiss economy, and an increasing dependence on qualified professionals from abroad has become evident. The recent implementation of the Free Movement of Persons Agreement simplified immigration from EFTA and 17 EU countries considerably. At the same time however, it impedes immigration from non-EU/EFTA countries. Thus, despite the immense advancements in Swiss immigration policy, many companies still report increasing difficulties in filling vacancies with highly qualified employees. To efficiently tap the worldwide talent pool, Switzerland must make every effort to attract the best young talent from around the world to study – and remain to work – in Switzerland, it must significantly ease the immigration process for highly qualified professionals from non-EU/EFTA countries, and it must take steps to make Switzerland an even more appealing place to work for foreign professionals – such as ensuring that there are sufficient international schools for their children.

1 About one-quarter of the companies reevaluating business location each year.

3. *Create a culture and environment that encourages entrepreneurship:* While Switzerland's performance in intellectual property creation is unbeaten in Europe, it clearly underperforms in transforming its abundant ideas into successful businesses. A culture where failing is not an option, with limited venture capital, and overly laborious and time-consuming administrative processes for doing business drive many of the most talented individuals to pursue careers in large corporations instead of facing the risks of entrepreneurship. To better leverage Swiss excellence in intellectual property creation, Switzerland must strongly promote an entrepreneurial culture with the freedom to fail and try again. Moreover, it must foster a dynamic venture capital landscape, considerably reduce administrative hurdles for doing business, and further strengthen existing tools for transferring technology and supporting start-ups (particularly the Innovation Promotion Agency of the Swiss government, CTI).

4. *Provide a regulatory environment that supports innovation in established companies:* Transforming ideas into marketable products is challenging not only for start-ups but also for established companies. To foster innovation in these companies, Switzerland must provide an open-minded and stable regulatory environment that adapts quickly to new developments and that gives multinationals the freedom to explore new grounds. It must continue to provide strong protection for intellectual property, and it must monitor – and probably react to – the rapidly increasing government funding of business R&D in countries around the world.

5. *Foster national efforts to promote Switzerland as the best place for business and innovation:* Many of Switzerland's strengths result from the inherent competition between cantons that is fostered by the Swiss political system. Still, many perceive Switzerland today as a collection of competing cantons that often do not act in the best interest of the country as a whole. In light of increasing global competition, a national effort would be beneficial to nurturing and coordinating Switzerland's business strengths and to facilitating the establishment of multinational companies in Switzerland. Moreover, Switzerland must create and implement a focused national marketing strategy to promote Switzerland as a premier business and innovation location.

Considering the rapid development of Switzerland's challengers and the globalization of innovation activities, it is clear that Switzerland must spare no effort to implement these five initiatives to create the best place for innovation on earth – for that is the source of sustainable future wealth for Switzerland's next generations.

"The best path for Switzerland to remain competitive in the world is innovation. And for innovation we need the best brains and lots of brains – from Switzerland and from abroad."

Jacques Aigrain
Chief Executive Officer, Swiss Re

02
Creativity – Switzerland's Ace in the Global Economy

02.1

Switzerland's Heritage Includes a Strong Pioneering Spirit and a History of Innovation

Most of the largest Swiss corporations listed on the Swiss Stock Exchange – as for example ABB, Credit Suisse, Nestlé, Novartis, Roche, Swiss Re, UBS, and Zurich Financial Services – have their roots in the eighteenth or nineteenth century. It was then that pioneers like Henri Nestlé, Johann Rudolf Geigy, Alfred Escher, Johann Jakob Sulzer, and Charles E.L. Brown chose Switzerland as the place to turn their often revolutionary ideas into successful businesses that still carry enormous weight in today's global markets. (See Figure 2.1.)

With their pioneering spirit and creativeness, these champions of the Swiss economy laid the foundation for the highly competitive and innovative environment that enables Switzerland to achieve top rankings across the board in international benchmarking studies. (See Figure 2.2.)

Switzerland's strength as a place for innovation stands out in the following four key areas:

1. Switzerland is exceptionally productive in creating intellectual property – filing considerably more patents per capita than any other country except Japan.
2. Switzerland is home to some of the world's best universities and research institutes, which produce highly qualified experts and perform cutting-edge research.
3. The quality and productivity of the Swiss work force is very high, with a deep-rooted proclivity for lifelong development.
4. Switzerland is a pleasant and convenient place to live – consistently ranking as a top location in terms of quality of life and transportation infrastructure.

It is not surprising, given this environment, that many companies conduct a considerable portion of their creative activities in Switzerland. This is reflected in the impressive percentage of employees working in research and development (R&D) in Switzerland, as reported by both domestic and foreign respondents to our broad survey of more than 50 global companies in Switzerland. While worldwide, 10 percent of the employees of the responding companies work in R&D, this share is 50 percent higher in Switzerland – illustrating that these companies conduct above-average R&D in Switzerland. (See Figure 2.3.)

Figure 2.1

Switzerland looks back on a strong heritage of pioneering spirit, innovation, and wealth creation

Figure 2.2

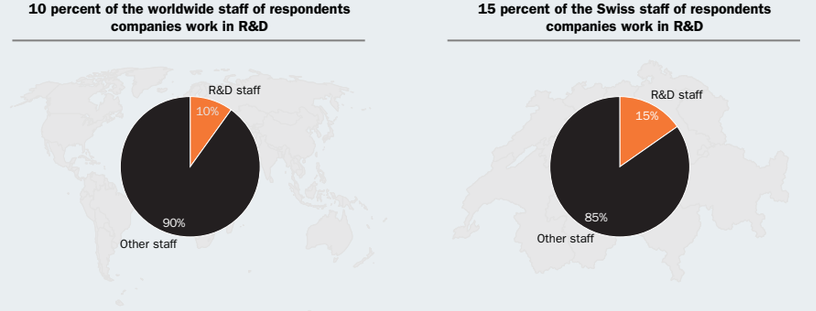
Switzerland Ranks Among the Top Countries for Innovation

Pro Inno Europe's European Innovation Scoreboard	World Economic Forum's GCR Innovation Index	Economist Intelligence Unit's Innovation Index	INSEAD's Global Innovation Index
1. Sweden	1. USA	1. Japan	1. USA
2. Switzerland	**2. Switzerland**	**2. Switzerland**	2. Germany
3. Finland	3. Finland	3. USA	3. UK
4. Israel	4. Japan	4. Sweden	4. Japan
5. Denmark	5. Israel	5. Finland	5. France
6. Japan	6. Sweden	6. Germany	**6. Switzerland**

Source: Pro Inno Europe (2007), WEF (2008), EIU (2007), INSEAD (2007)

Figure 2.3

Companies Conduct a High Percentage of R&D in Switzerland



Source: Joint survey of The Swiss American Chamber of Commerce and The Boston Consulting Group (2008)

02.2

In Switzerland Today, the Wealth Generators Are Mostly Multinationals in Highly Innovative Industries

The multinational companies including a large number of SME attracted by Switzerland's innovation-friendly environment have contributed significantly to Switzerland's wealth in the past and still play a key role in Switzerland's economy today. An analysis of the Swiss economy, which can be broadly categorized into three parts, makes this clear: while public services make up the ground level, and various private (often infrastructure-related) sectors serve as the foundation on which Switzerland's economy builds, it is the export-oriented service and production industries – *the pillars of wealth* – that drive economic growth, productivity, and job creation. (See Figure 2.4.) These pillars of wealth contribute 35 percent of the Swiss GDP. Between 1997 and 2006, they grew more than twice as fast as the industries constituting Switzerland's economic foundation, generated 74 percent higher value added per employee, and created over 140,000 jobs. (See Figure 2.5.)

But while growing faster, generating higher value added, and creating many jobs, the pillars of wealth are also much more exposed to competition in the global markets. And global competition ultimately drives a need for both innovation and globalization. Consequently, 75 percent of these industries are highly innovative. And multinational companies account for three-quarters of the GDP generated by Switzerland's pillars of wealth.

The Many Faces of Innovation

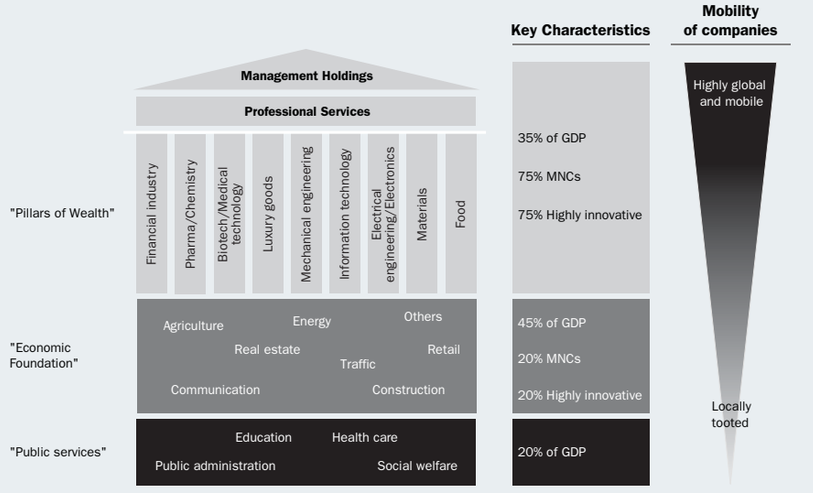
Innovation has many faces and is encountered at various places in the business environment. Most business innovation can be classified into four broad categories:

- Product and service innovation consists of newly introduced or significantly improved goods or services, such as digital cameras or single-trip car insurance.
- Process innovation involves the implementation of new or significantly improved production or delivery methods, such as radio-frequency identification (RFID) product tracking or Global Positioning System (GPS)-based taxi fleet management.
- Business model innovation encompasses significant changes in the value proposition, value chain, or income model of a business. Typical examples include selling production capacity instead of machinery and selling directly to end customers over the Internet.
- Marketing innovation includes significant changes in product placement, promotion, or pricing, or the introduction of new marketing tools, such as loyalty programs.

While most of the companies in Switzerland that participated in our survey considered product, service, and process innovation to be very important for their company in the long term, only about two-thirds considered business model and marketing innovation to be equally important.

Figure 2.4

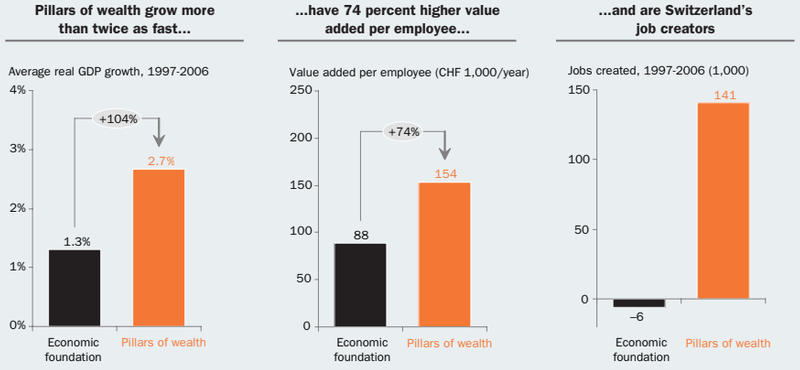
The Pillars of Wealth of the Swiss Economy Are Highly Innovative, International, and Mobile Industries



Source: BCG analysis

Figure 2.5

The pillars of wealth are the growth and productivity drivers and the job creators of the Swiss economy



Source: Bundesamt für Statistik, BCG analysis

03
The Realities of Increasing Competitiveness

03.1

Do Not Get Comfortable – The Situation Can Change Quickly

While the large percentage of multinational companies within the pillars of wealth reflects Switzerland's current competitiveness, it also represents an often-neglected risk for the Swiss economy. Multinational companies are generally highly global and mobile, and they reevaluate their geographic setup every five years on average.[3] Hence, a large part of the fastest-growing and most productive segment of the Swiss economy is constantly at risk of erosion – a risk heightened by the recent rise of many challengers to Switzerland's position as a top-ranking place for innovation. In fact, while Switzerland has thus far successfully managed to sustain its competitive position, its competitors are rapidly closing in and positioning themselves as alternative locations for conducting innovation activities.

This is a direct consequence of the changing environment in the past ten years: oil-producing countries in the Middle East, realizing the finiteness of their resources, are investing large sums to extend the breadth of their local economy; many of the Asian "Tiger" countries have managed to move their economy into areas of higher value added, away from the workbench to innovation activities; the entry of the BRIC (Brazil, Russia, India, and China) countries and the Eastern European countries into the global economy has intensified globalization and economic competition; and breakthroughs in communication have enabled collaboration on a global scale.

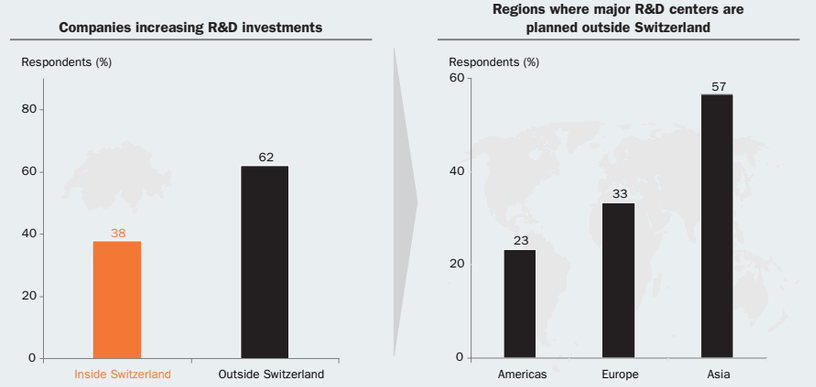
Companies quickly seize these opportunities: more than 60 percent of all survey respondents reported plans to considerably increase their R&D investments outside Switzerland, while less than 40 percent plan do so within Switzerland. Similarly, our analysis of business R&D spending over the past decade reveals that Swiss companies' R&D spending abroad grew 1.4 times faster than their domestic spending on R&D. In fact, the current total R&D spending abroad by Swiss companies is 40 percent higher than all business R&D expenditures by Swiss and foreign companies within Switzerland. And since the biggest Swiss R&D-intensive companies generate approximately 95 percent of their revenue abroad, this difference is expected to increase in the future.

The beneficiary of this trend will most likely be Asia, which is regarded by many as the primary region in which to expand innovation activities. More than half of our survey respondents whose companies intend to increase R&D investments abroad plan a major expansion in Asia, whereas only one-third plan expansions in Europe and less than one-quarter plan expansions in the Americas. (See Figure 3.1.) The Asian countries named most frequently were India, China, and Japan.

3 *Multinational Companies on the Move: How Switzerland Will Win the Battle!* A Joint Study of the Swiss-American Chamber of Commerce and The Boston Consulting Group, Zurich, 2007.

Figure 3.1

Sixty-Two Percent of Survey Respondents Plan to Increase R&D Investments Outside Switzerland – More Than Half of Those Plan to Expand in Asia



Note: Forty percent of respondents planning R&D centers outside Switzerland did not provide additional information on their plan.
Source: Joint survey of The Swiss American Chamber of Commerce and The Boston Consulting Group (2008)

A disquieting trend revealed in another global study is that companies are relocating product development and product customization to large rapidly developing markets.[4] This is a result of a globalizing world, in which breakthrough advances in communication and transportation infrastructure allow many businesses to move these activities closer to their customers in the biggest and most promising markets – usually away from Switzerland.

Another trend is even more alarming for Switzerland. Armed with immense budgets, Switzerland's competitors aim to advance their research capabilities and boost their attractiveness as locations for early activities in the innovation value chain – for example, in idea generation and basic research. (See Figure 3.2.) Thus Switzerland, which has traditionally been one of the global strongholds in these areas, is being challenged on its core strengths.

Singapore is one of the most prominent forerunners in taking a greenfield approach to building an attractive research and innovation environment. With a yearly budget of roughly 5 billion Swiss francs, the National Research Foundation of Singapore dwarfs its Swiss counterpart, the Swiss National Foundation, which has only 10 percent of this sum at its disposal. And with a five-year budget of 4.4 billion Swiss francs, Singapore's Biopolis is well on its way to becoming one of the leading biotechnology centers of the world. (See the exerpt "Biopolis: How Singapore Has Become Asia's Leading Biotechnology Center.") Many other locations have equally high ambitions, although they have not yet made as much progress. To name just two examples, Saudi Arabia plans to spend 13 billion Swiss francs to build a leading university in science and technology in Jeddah (KAUST, the King Abdullah University of Science and Technology), and Abu Dhabi's Masdar Initiative, with a total budget of 24 billion Swiss francs, is intended to build up a leading industry in the area of renewable and sustainable energy in the United Arab Emirates. (See the exerpt "The Masdar Initiative: Securing the United Arab Emirates a Leading Position in Renewable and Sustainable Energy.")

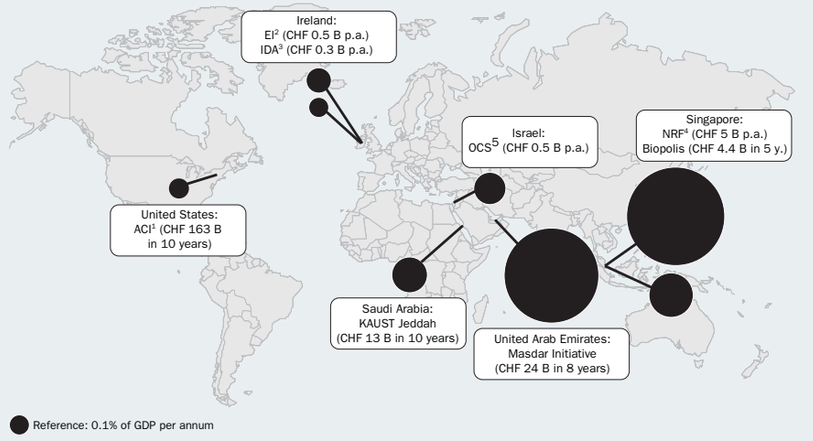
"Our wealth is our biggest enemy."

Branco Weiss
Entrepreneur

4 *Innovation 2007: A BCG Senior Management Survey*, BCG Report, August 2007.

Figure 3.2

New Challengers Are Investing Heavily to Attract Global Companies For Innovation Activities A Few, Selected Examples



1 American Competitiveness Initiative
2 Enterprise Ireland
3 Ireland Development Agency,
4 National Research Foundation Singapore, 5. Office of the Chief Scientist
Note: These are selected examples of public investments intended to attract innovation activities
Source: KAUST, The White House, Biopolis Singapore, NRF Singapore,
Masdar Initiative, OCS Israel, Enterprise Ireland, IDA

Biopolis: How Singapore Has Become Asia's Leading Biotechnology Center

The idea for Biopolis was born in 2000. It consisted of building a biotechnology cluster in Singapore to attract the production, research, clinical development, and regional headquarters of international biomedical companies, with the goal of becoming Asia's leading biotechnology center.

In 2002, only two years later, the first Biopolis campus was opened, and in 2004 the last of the originally planned buildings was completed. Today, Biopolis is home to seven government research institutes and accommodates 2,000 researchers, while an equally large space for another 2,000 researchers is under construction to support Biopolis's dramatic growth.

From the beginning, Singapore realized that the most critical factor for Biopolis's success would be to attract the best talent. To achieve this goal, Singapore offers state-of-the-art laboratory technology, high salaries, more liberal regulations than in Europe or in the United States (especially in the area of stem cell research), and plenty of research funding. With 4 billion Swiss francs in research funding for its first five years, Biopolis had at its disposal an average 800 million Swiss francs each year, considerably more than the combined annual budgets of the SNF and CTI during the same years. Singapore's standard of living, strong patent laws, and simple immigration laws further increase the attractiveness of Biopolis.

To date, Singapore's Biopolis has attracted many corporate research centers – most notably, from a Swiss point of view, Novartis. Novartis opened its Institute for Tropical Diseases (NITD) at Biopolis in 2002, as a public-private partnership between Novartis and Singapore. The NITD now employs more than 100 researchers and staff who investigate infectious tropical diseases.

A weakness in Biopolis is that 75 percent of its researchers are of foreign origin. While Singapore's goal is to reduce the number of foreign researchers at Biopolis to 50 percent, it is well aware that it will take 10 to 15 years to develop its own academic offspring.

Biopolis is only one of three pillars in the first phase of Singapore's master plan to develop a 200-hectare area called *one-north* into a knowledge hub. The development of *one-north* is expected to take place over the next 20 years. And while many Western experts were at first skeptical about Singapore's outstanding ambitions at Biopolis, they are impressed today by its achievements – and only a few doubt its further successful development.

The Masdar Initiative: Securing the United Arab Emirates a Leading Position in Renewable and Sustainable Energy

With its Masdar Initiative, Abu Dhabi aims to push commercialization and adoption of technologies in sustainable energy, carbon management, and water utilization. The initiative should drive the economic diversification of Abu Dhabi, expand its position in the global energy markets, and position it as a global technology developer.

The core of the initiative is Masdar City, a green city that will accommodate 50,000 residents by 2016. It is designed to be carbon dioxide (CO_2) neutral, to be powered exclusively by renewable energies, and to generate 98 percent less waste than other cities of comparable size. Compliance with these specifications will be verified by the World Wide Fund for Nature (WWF). Masdar City serves as both a feasibility study and a field test for the new technologies, as well as a showcase for the initiative.

In addition to Masdar City, the initiative also includes the Masdar Institute of Science and Technology, a graduate-level scientific engineering institution focused on education and research in sustainable energy and technology, as well as the Masdar Clean Tech Fund, the Sustainable Technologies and Advanced Research (STAR) program, and the Masdar Business Incubator, all aiming to attract companies, researchers, and talent, and assist in commercialization of early-stage to near-commercial technology. Moreover, a Special Projects Unit will support the development of large-scale capital-intensive energy and technology projects, and a Special Free Zone will provide infrastructure and incentives for up to 1,500 companies, offering one-stop government services, tax exemption, intellectual property protection, and permission for full foreign ownership.

The initial budget for building the infrastructure of Masdar City is estimated at 4 billion Swiss francs, and the budget for the entire Masdar Initiative is expected to be 24 billion Swiss francs. It is anticipated that a large part of this budget will be financed by the trading of Masdar City's carbon emission savings.

Abu Dhabi has attracted some powerful partners: MIT, Imperial College London, RWTH Aachen, DLR, and Credit Suisse, to name just a few. Nevertheless, it remains to be seen whether Abu Dhabi's Masdar Initiative can match Singapore's success with Biopolis.

“When it comes to technical and scientific output, our labs in India and China are absolutely on a par with us.”

Matthias Kaiserswerth
Director, IBM Zurich Research Laboratory

“The recipe for Switzerland’s past success is not a secret.”

Mauro Dell’Ambrogio
State Secretary for Education and Research

“If basic research moves away from Switzerland, we will have a big problem!”

Fritz Schiesser
President, ETH Board

03.2

Switzerland Has One Major Opportunity: Creating the Best Place for Innovation

The Swiss are among the richest people worldwide today. Measured in terms of the number of millionaire households and also in terms of gross national income per capita, Switzerland consistently scores among the best.[5] But Switzerland needs to take steps now to sustain its prosperity in the long term – for the next generation.

All the richest and most successful economies in the global markets either own natural resources, have substantial available cheap labor, contain large domestic markets, or offer a superior creative environment. It is obvious that Switzerland cannot compete on the first three of these dimensions. (See Figure 3.3.) But with its heritage of a pioneering spirit, history of innovation, and innovation-friendly environment, Switzerland is well positioned to succeed on the fourth dimension.

In the past, Switzerland did not sufficiently leverage its creative environment. As a result, it has had very low real GDP growth over the past 25 years. And with the robust progress of competitors in the global economy, even this low GDP growth is now threatened. As noted above, 20 percent of the multinational companies in Switzerland reassess their geographic setup each year. If each year, one out of every ten of these multinationals decided to move to another country, the result would be devastating for Switzerland. (See Figure 3.4.)

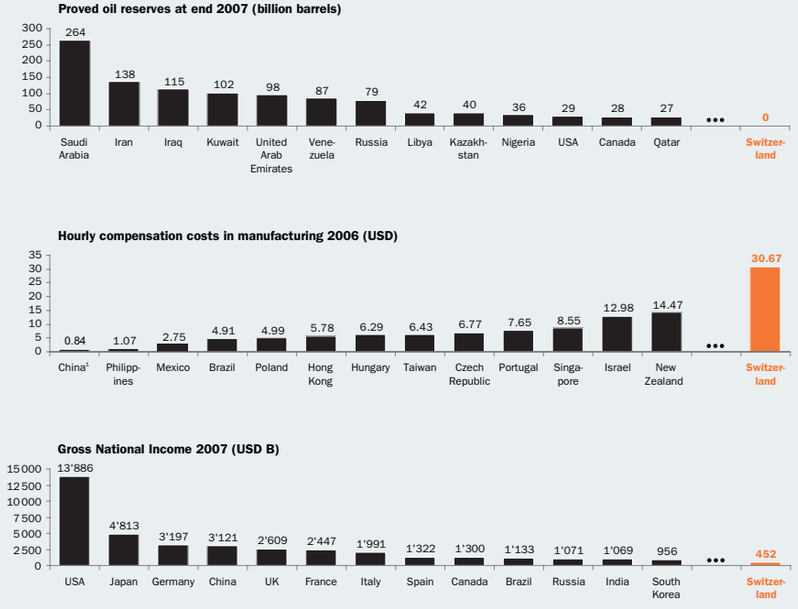
If, on the other hand, Switzerland further improves and fully leverages its creative environment to attract new multinational companies and to nurture domestic companies, it could secure its wealth for the next generation. If Switzerland could attract an additional 2 percent of multinational companies every year, as compared with losing 2 percent of the multinational companies currently operating in Switzerland, the difference between these scenarios would mean more than 260 billion Swiss francs – or an additional 40 percent – to the Swiss GDP by 2030. And if Switzerland could match Finland’s growth, it would achieve more than 80 percent additional GDP by 2030 – a difference worth more than half a trillion Swiss francs.

Considering the rapid development of Switzerland’s challengers and the globalization of innovation activities, it is clear that Switzerland must spare no effort to create the best place for innovation on earth – for that is the source of sustainable future wealth for Switzerland’s next generation.

5 *Global Wealth 2008: A Wealth of Opportunities in Turbulent Times*, BCG Report, September 2008.

Figure 3.3

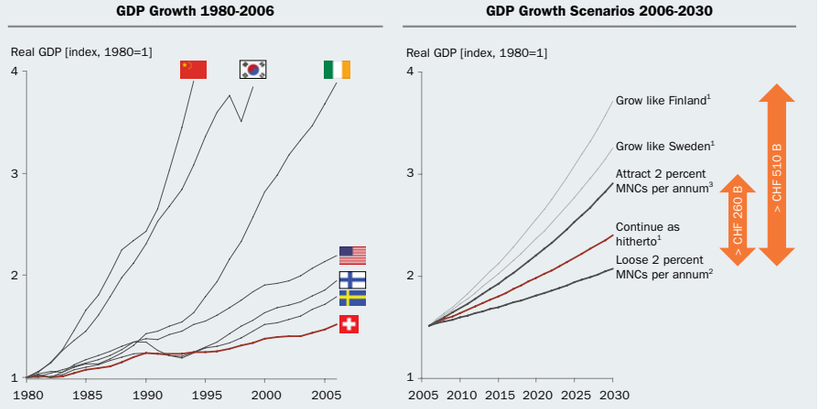
Switzerland Is Not a Competitor When It Comes to Natural Resources, Cheap Labor, or the Size of Its Home Market



1 Estimate based on 2002-2004 numbers
Note: Symbol height proportional to value
Source: BP (2008); US Department of Labor (2007); World Bank (2008)

Figure 3.4

Switzerland Must Increase Its Attractiveness to MNCs as the Best Place for Innovation – Failure to Do So Will Be Costly



1 Average yearly growth, 1997–2006 extrapolated
2 Ten percent of MNCs that consider relocation leave Switzerland every year
3 Attract an additional 2 percent of MNCs every year
Source: OECD (2008), BCG analysis

“Switzerland is a very good location for innovation – but its potential is even greater.”

Beat Wittmann
Chief Executive Officer Investments Products, Julius Bär (at time of study)

04
A Call for Action to Sustain Competitive Advantage

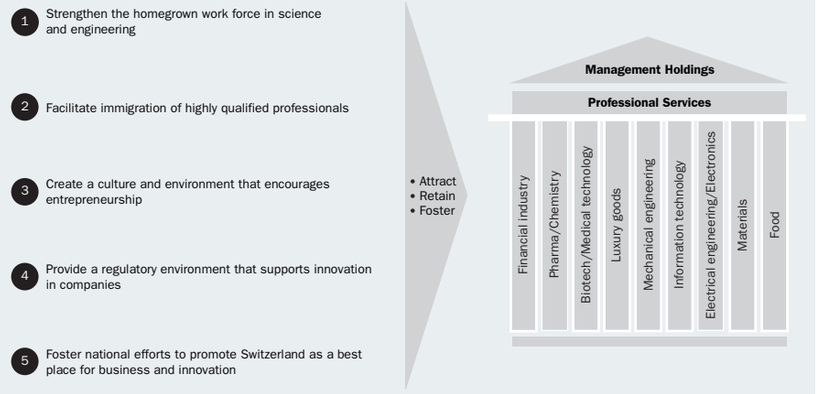
On the basis of the many interviews that we conducted with senior executives, our broad survey on innovation in Switzerland, and a detailed analysis of various benchmark studies and original sources, we call upon the political bodies of Switzerland to implement a five-point program to make Switzerland the best place for innovation on earth. (See Figure 4.1) It is imperative that Switzerland act now to sustain its competitive advantage in the global economy:

1. Strengthen the homegrown work force in science, engineering, and technology
2. Facilitate immigration of highly qualified professionals
3. Create a culture and environment that encourages entrepreneurship
4. Provide a regulatory environment that supports innovation in established companies
5. Foster national efforts to promote Switzerland as the best place for business and innovation

On the pages that follow, we highlight the critical need for action in these areas and propose a detailed plan of action.

Figure 4.1

Switzerland Needs to Take Action Now to Sustain Its Competitive Advantage in the Global Economy



Source: BCG analysis

04.1

Strengthen the Homegrown Work Force in Science, Engineering, and Technology

A qualified work force is probably the single most important factor for successful innovation. The Swiss elementary and secondary education system, combined with apprenticeships, higher professional education, and universities, ensures Switzerland a work force with an adequate mix of people who have practical experience and people who possess theoretical knowledge. This investment in preparing young people for work differentiates Switzerland from many of its competitors, as very few countries provide such a highly developed system of professional training. Consequently, Switzerland always achieves a high ranking in international benchmarks when it comes to a qualified work force.

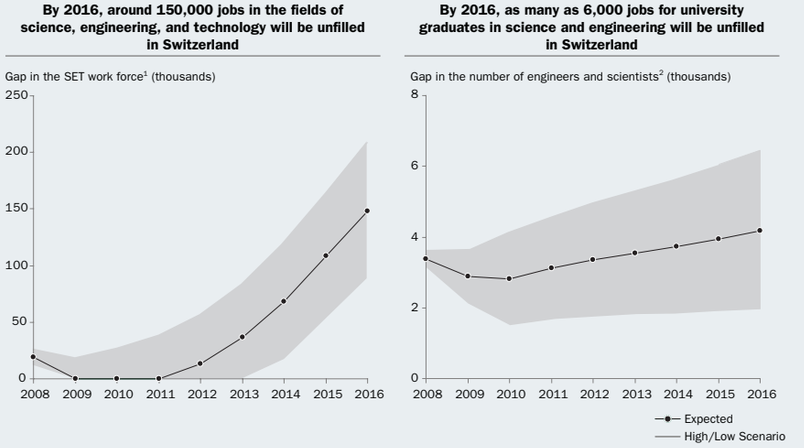
Switzerland's challenge, however, is not only to maintain the quality of its work force but also to ensure its availability. Today, there is a shortage of engineers and scientists in Switzerland; roughly 3,000 more engineers and scientists are needed than are available, and we estimate this gap could double, growing to 6,000, by 2016. (See Figure 4.2.) The same trend is evident for the overall work force in the areas of science, engineering, and technology. By 2016, we estimate that one out of ten jobs in these fields will be unfilled or will have been moved to a location outside Switzerland. To a large extent, this expected gap in supply will be caused by demographic changes in Switzerland, which we expect will lead to a decrease in the total work force in Switzerland starting in 2012. But the lack of appeal of science and engineering to Swiss students and apprentices is also definitely a contributing factor.

In 2004, only one out of four Swiss university graduates earned a degree in science or engineering – considerably less than in Sweden, Germany, or Finland, and far less than in Asian countries such as China or Korea. (See Figure 4.3.) And even though this number is expected to grow, it is not expected to grow sufficiently to ease the current and anticipated shortage of engineers and scientists in Switzerland, as we learned during this study.

There is also a lack of interest in science and engineering among apprentices in Switzerland. In 2008, the overall area of engineering and technology was one of the few professional areas in which apprenticeships offered by industry by far outnumbered interested young people. (See Figure 4.4.) Only one out of five new apprentices undertook professional education in engineering, technology, or applied computer science. And even though this ratio is expected to remain stable over the next few years, it is estimated that by 2016, the absolute number of new apprentices in these areas will have shrunk by 13 percent, as a result of the decreasing attractiveness of apprenticeships overall – a phenomenon that has been ongoing for more than two decades.

Figure 4.2

A Significant Shortage Is Expected in the Science, Engineering, and Technology Work Force – At All Levels



1 The overall work force in the fields of science, engineering, and technology
2 Engineers and scientists with university degree working in the fields of science, engineering, and technology
Source: BCG analysis

Among many others, the following companies contributed to this study:

ABB Switzerland Ltd
Actelion
Amgen (Europe) GmbH
Ascom Holding AG
Bentley Systems AG
Bobst Group
Bucher Industries
Cablecom
Cargill International SA
Ciba
Cilag
Credit Suisse
Du Pont
Freescale Semiconductor
Georg Fischer AG
Glaxo Smith Kline
Heidrick & Struggles AG
Holcim
IBM
INFICON Holding AG
IWC
Johnson & Johnson
Kaba Group
Lindt & Sprüngli
Merck Serono
NAIE SA
Nestlé
OC Oerlikon Corp.
Pfizer
Rieter Textile Systems
Speedel
Starrag Heckert
Studer Professional Audio GmbH
Sulzer
Swisscom
Syngenta
Tecan AG
WICOR Group

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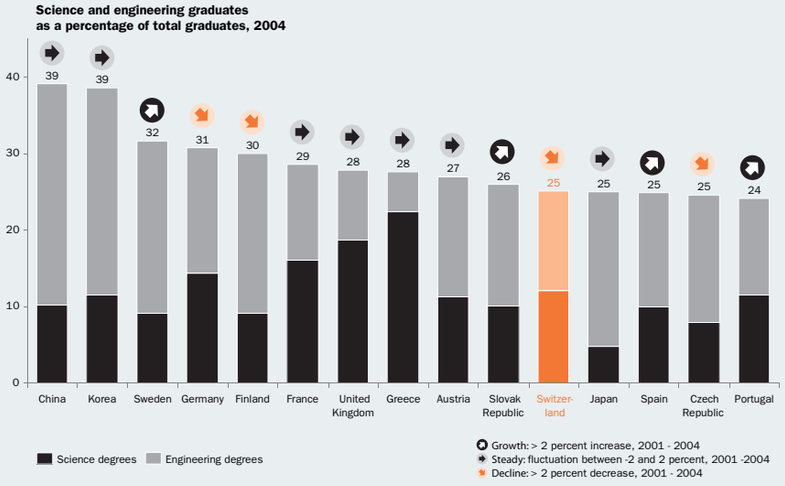
The Swiss Federal Statistical Office
The Swiss Federal Customs Administration
The Federal Office for Migration
The State Secretariat for Education and Research
The Federal Office for Professional Education and Technology
The Swiss National Bank
economiesuisse
Avenir Suisse
osec

We extend thanks to all the contributors for their ideas, their time, and their willingness to share their innovative ideas with us.

Figure 4.3

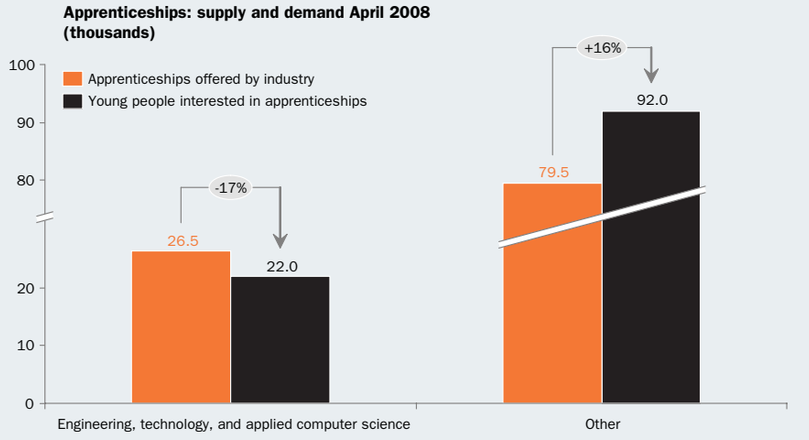
Swiss Students Show Less Interest in Science and Engineering than Students in Other European and OECD Countries Do



Note: In the United States, science and engineering graduates made up 15 percent of the total graduates in 2004
Source: OECD, BCG analysis

Figure 4.4

The Number of Young People Interested in Apprenticeships in Engineering and Technology Is Much Smaller than the Number of Apprenticeships Offered



Note: Other includes construction, office, service, art, health, agriculture, manufacturing, and retail. With the exception of construction and manufacturing, all other areas have a greater number of students interested in apprenticeships than there are apprenticeships offered
Source: Bundesamt für Berufsbildung und Technologie (2008), BCG analysis

The reasons for the lack of interest in science and engineering among young people are manifold. One important factor is that a career in science or engineering is neither as prestigious nor as remunerative as a career in many other occupational areas. Another more tangible reason is the inadequate emphasis on science and technology in primary and secondary education, which denies many young people the opportunity to become interested in these fields.

We have identified specific actions, across three dimensions, that Switzerland must take in order to ensure the future availability of a highly qualified work force in the areas of science, engineering, and technology. The successful implementation of these actions is essential to Switzerland's future attractiveness as a location for innovation.

Increase attention to the study of science and technology in Swiss schools
According to a 2006 study by the OECD Programme for International Student Assessment (PISA), the average 15-year-old student in Switzerland has 2.36 hours of science instruction per week – roughly half of what fellow students in the United Kingdom receive. And there is little instruction in information technology (IT), which encompasses basic computer training and computer science training (algorithms, data structures, programming, and so forth). The time devoted to IT instruction by far underestimates the importance of IT in almost all modern industries. The prevailing attitude is that students learn IT skills at home anyway. But this attitude does not take into account the complexity of IT today. Consequently, the majority of students in Switzerland feel insufficiently prepared in this important area.[6] Swiss schools must significantly increase the number of hours per week dedicated to the disciplines of science and technology.

In parallel with increasing the class time devoted to science and technology in Swiss schools, the national and cantonal governments must ensure that teachers are adequately prepared to educate their students in these vital subjects. This is essential not only for high school teachers but also for primary school teachers and even kindergarten teachers. A kindergarten teacher who is well educated in science and technology, and who shows interest in these subjects, can be an important role model for students – and arouse their interest in science and technology at an early age.

In addition, the national and cantonal governments should explore initiating a new course on applied science and technology in Swiss secondary schools to provide students with a broad overview of the applications of science and technology in modern society.

Increase the involvement of industry and universities in early Swiss education
The responsibility for educating young students in science, engineering, and technology should not be left entirely to the schools. Swiss industry and universities should also get increasingly involved in meeting this challenge. The possibilities for participation are manifold and include providing teaching materials and project ideas to teachers, class trips to companies, children's universities, and visits from scientists and engineers to young students in their classrooms.

6 Staatssekretariat für Bildung und Forschung SBF, *Der Übergang ins Studium II*, 2006.

Many not-for-profit organizations, universities, and companies are already setting good examples of how to promote the education of young people in the areas of science and technology. For example, EducETH, an initiative from ETH Zurich, provides complete teaching materials in science and technology to secondary schools in Switzerland. Siemens supplies so-called "Forscherkisten" (researchers' boxes) with age-appropriate experiments to Swiss kindergartens. The Paul Scherrer Institute has a special children's lab that enables Swiss school classes to participate in hands-on experiments.

Not-for-profit organizations, universities, and companies should increase their involvement in, and support for, educating young people in science and technology by fostering additional initiatives. And those in charge of the school curricula must ensure that these initiatives are put in place – both to improve the education of Swiss students and to promote Swiss students' interest in pursuing careers in science and technology.

Promote awareness of the importance of science and technology
Finally, the government, not-for-profit organizations, and innovative companies in Switzerland should take responsibility for promoting greater awareness of the importance of science and technology to Switzerland's future role in the global economy. While increasing the emphasis on science and technology within the Swiss school system is a vital part of this effort, relevant not-for-profit organizations and the Swiss government must also play a significant role in building appreciation of the importance of science and technology among Swiss people of all ages.

"Although the educational system of Switzerland enjoys an excellent international reputation, the quantity and quality of information technology related topics in school does not match the demand of our know-how and service driven economy."

Claude Honegger
Chief Information Officer Switzerland, Credit Suisse

“The pyramid of apprenticeships, higher professional education, and top universities provides a huge advantage for Switzerland.”

Markus Akermann
Chief Executive Officer, Holcim

“We don’t only need PhDs – we also need a lot of qualified apprentices.”

Ulf Berg
President, Sulzer

“Qualified precision mechanics are very scarce in Switzerland today – even though many key Swiss industries, such as watchmaking, medical technology, and mechanical engineering, are highly dependent on these specialists.”

Christian Klever
Chief Financial Officer, IWC

“Companies should be involved in education – starting as early as kindergarten!”

Olivier Carnal
Head of Technology Development, Georg Fischer

04.2

Facilitate Immigration of Highly Qualified Professionals

While it is vital to increase the attractiveness of careers in science, engineering, and technology to young people in Switzerland, it is not sufficient. Because of the normal course of demographic changes, even a dramatic increase in the number of young people entering the fields of science, engineering, and technology will not provide a sufficiently large qualified work force in these areas. Thus Switzerland cannot fill the anticipated gap between positions available and people ready to fill them with its domestic work force. As a result, Switzerland's economy will become increasingly dependent on highly qualified professionals from other countries.

This trend toward dependence on skilled professionals from other countries has been evident in Switzerland for some years, and it has been particularly pronounced in innovation-intensive industries. For example, highly skilled personnel who immigrated to Switzerland in 2007 accounted for almost 7 percent of the total work force in the most innovation-intensive industries, which include pharmaceuticals, chemistry, biotechnology, IT, electronics, instruments, and mechanical engineering. In these industries, the share of the work force made up of newly immigrated personnel had more than tripled, from 2.3 percent in 2004. And a similar, though less intense, growth of highly qualified professionals from other countries is visible in other industries as well. (See Figure 4.5.)

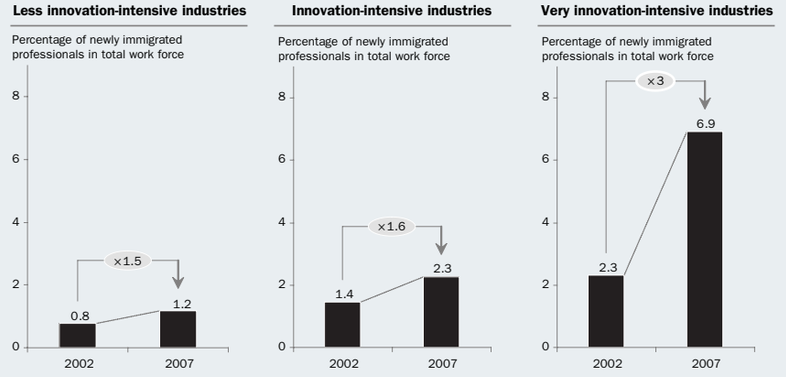
Meeting the large demand for highly qualified professionals would not have been possible without the recent advancements in Switzerland's immigration policy for citizens from member countries of the European Union (EU) and the European Free Trade Association (EFTA). The Free Movement of Persons Agreement completely opened the Swiss labor market to all citizens from the EU-17 and EFTA countries,[7] and in April 2006, new protocols simplified immigration for citizens of eight new member countries,[8] with a complete easing of immigration restrictions for these countries planned for 2011.

But while the Free Movement of Persons Agreement simplifies immigration for citizens of countries that are members of the EU and EFTA, it appears to impede immigration for citizens of non-EU/EFTA countries, as many of the senior executives we interviewed told us that they have observed firsthand in their companies. Their observations are supported by data on recent changes in Switzerland's work force. Since the Free Movement of Persons Agreement was first introduced in 2001, the number of people who left EU-17 and EFTA countries to work in Switzerland grew by 131 percent, to more than 62,000 in 2007, and the number of those who left the eight new member countries to work in Switzerland nearly tripled, reaching almost 3,000 in 2007. At the same time, however, there was a 22 percent decrease in immigration of people from North America choosing to work in Switzerland – and immigration of those from Asia dropped by almost half. (See Figure 4.6.)

7 Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom.
8 Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia.

Figure 4.5

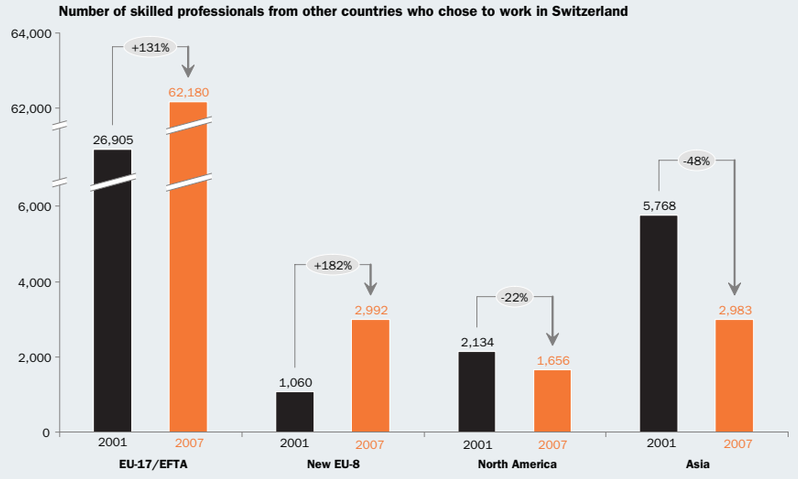
Innovative industries in Switzerland Are Highly Dependent on Skilled Individuals from Other Countries – And This Dependence Has Increased Dramatically



Note: See "Methodology" for how the innovation-intensity of Swiss industry segments was evaluated
Source: Bundesamt für Migration (2008), BCG analysis

Figure 4.6

There Has Been a Steep Decrease in the Number of Skilled Professionals from Non-EU/EFTA Countries Who Chose to Work in Switzerland



Source: Bundesamt für Migration (2008), BCG analysis

The main obstacle for skilled professionals from non-EU/EFTA countries who want to work in Switzerland is the paperwork and time required to obtain a work permit – on the part of the hiring company and (especially) the candidate. There is no doubt that the arduous paperwork requirements discourage some of the best talent from coming to Switzerland. These skilled professionals are often sought after for jobs and have offers from companies in other countries, so the burdens of paperwork and time required to obtain a work permit can deter highly qualified and needed personnel from coming to work in Switzerland.

In addition, many EU/EFTA countries suffer the same shortage as Switzerland when it comes to a qualified work force in science, engineering, and technology. In Germany alone, the Association of German Engineers estimates a current shortage of some 95,000 engineers. Thus, despite the Free Movement of Persons Agreement and the resulting increase in workers who have moved to Switzerland from EU and EFTA countries in recent years, many companies in Switzerland are reporting increasing difficulties in filling staff vacancies with highly educated employees. (See Figure 4.7.)

It is clear that further improvement is required in Swiss immigration policies in order to attract skilled professionals from non-EU/EFTA countries. We have identified actions, along three dimensions, that Switzerland needs to undertake to attract, develop, and retain the world's best young talent and highly qualified professionals.

Attract and develop the world's best young talent

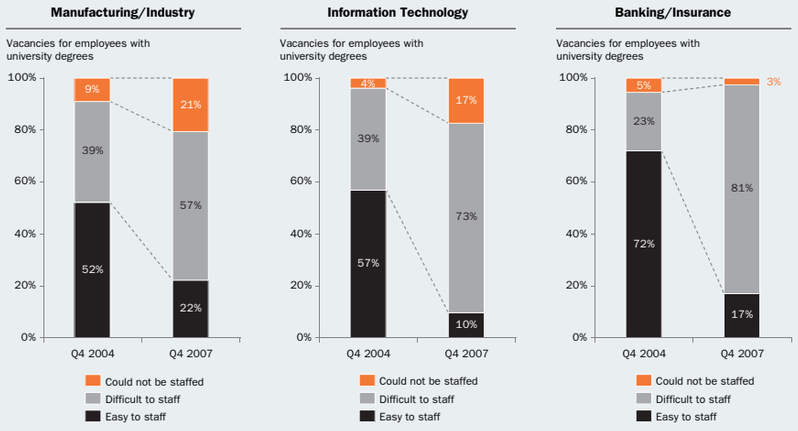
It is essential that Switzerland make every effort to attract and develop the best young talent from around the world. In order to do this, the national government and universities must increase their worldwide marketing of Switzerland – both as a great place to work and as a place to study at top universities. With implementation of the Bologna process, which defines and promotes the standardization of academic degrees across European countries, and the consequent internationalization of higher education in Europe and Switzerland, Switzerland has a solid foundation for attracting the best master's degree candidates to study at Swiss universities. Two changes, however, are required to fully leverage this opportunity. First and foremost, all master's degree studies in Switzerland must be conducted in English, which is not the case yet for all master's programs. Second, to be competitive with top U.S. universities, top Swiss universities must offer full scholarships to the best international applicants.

In order to retain talent attracted to Switzerland through academic study, the best foreign graduate students to complete their master's degrees and PhDs in science or engineering at a Swiss university should automatically be given a Swiss work permit for a limited period of time. This would bring Switzerland on a par with many other countries (for example, the United States or Canada), and would encourage top talent to stay in Switzerland and apply the skills they acquired at Swiss universities to building the Swiss economy.

Finally, new initiatives should be explored for attracting graduates of top universities throughout the world to come and work in Switzerland. One option would be to offer automatic work permits to the best graduates of selected foreign universities.

Figure 4.7

Despite the Easing of Immigration Restrictions on Those from EU/EFTA Countries, There Is Still A Shortage of Highly Educated Professionals in the Work Force in Switzerland



Source: Bundesamt für Statistik, Beschäftigungsstatistik (2008)
Note: Similar changes are observable for all quarters of the years shown, as well as for employees with higher professional education.

Ease the immigration process for highly qualified professionals from non-EU/EFTA countries

In addition to attracting and developing the best young talents, Switzerland must also ease immigration for highly qualified professionals – especially those from non-EU/EFTA countries. The Swiss government should offer an accelerated immigration process to these highly qualified professionals – which should significantly reduce the paperwork and speed up the process. The Swiss government should also consider introducing a unique visa for highly qualified professionals to ease common disadvantages that L-visa holders currently face in Switzerland (for example, when applying for housing, telephone service, or credit cards).

The simplified immigration process for highly qualified professionals must be accompanied by an equally simple immigration process for their families. In addition, the partners of highly qualified professionals should be given automatic work permits for Switzerland. This is particularly important because, increasingly, partners have their own independent careers and, in many cases, if they are not able to obtain a work permit this can put an end to the opportunity for the whole family.

Make Switzerland an even more appealing work destination for highly qualified professionals

With its excellent standard of living, Switzerland is a very attractive location to highly qualified professionals. Still, steps should be taken to make Switzerland even more appealing as a location for skilled professionals from other countries to come and work. First and foremost, it is essential to ensure that a sufficient number of international schools are available for the children of skilled professionals from other countries, which will require both increasing the size of current international schools and creating new ones. Moreover, Switzerland must continue to be competitive with other locations when it comes to the specific concerns of professionals who choose to work outside their own countries – for example, personal tax considerations or ease of international travel.

"To attract the best students from around the world, we need to tell them they can stay after the studies. Today this is impossible."

Patrick Aebischer
President, EPF Lausanne

“There are many more researchers outside Switzerland than inside, so the question is how can Switzerland exploit what the world offers. We must become the world leader in attracting and retaining the best talent on earth.”

Paul Polman
Executive Vice President, Nestlé (at time of interview; now CEO of Unilever Inc.)

“With the Free Movement of Persons Agreement we opened one door, but we also closed another. Taking additional steps to simplify immigration also from non-EU/EFTA countries would give Switzerland an incredible competitive advantage in Europe.”

Matthias Kaiserswerth
Director, IBM Zurich Research Laboratory

“Availibiliy of internationals schools is a real problem in Switzerland. If it does not get solved, companies evaluating Switzerland as a business location will go elsewhere, and those companies already here will start rethinking their location.”

James H. White
President Europe, Middle East and Africa Sector, Ecolab

04.3

Create a Culture and Environment That Encourages Entrepreneurship

The big difference between an idea and an innovation is cash.[9] In other words, innovation requires more than creative people with excellent ideas. It also requires entrepreneurs who can turn those ideas into successful marketable products. It is entrepreneurship that is often lacking in Switzerland. While its performance in intellectual property creation is unbeaten in Europe, Switzerland clearly underperforms in transforming its abundant ideas into successful businesses. (See Figure 4.8.)

This underperformance can be traced, first and foremost, to the Swiss culture. Entrepreneurship is a risky business – something that many of the most successful entrepreneurs in the world have learned the hard way. Entrepreneurs often first fail with business ideas before finally succeeding. But the freedom to fail and start over again hardly exists in Switzerland, where failing entrepreneurs often lose their reputations and do not get a second chance. At the same time, thriving entrepreneurs are envied and huge rewards from entrepreneurial success are frowned upon. In such a culture, it is not surprising that many of the most talented individuals pursue careers in large corporations instead of facing the risks of entrepreneurship. As a result, there are many fewer new business enterprises in Switzerland – and many fewer business failures – than in other countries. (See Figure 4.9.)

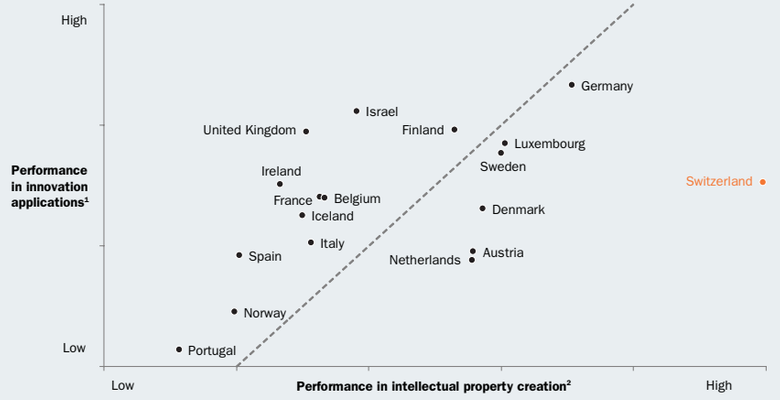
For those who are willing to face the risks of entrepreneurship and launch a new business venture, the first challenge is raising funds. The availability of venture capital in Switzerland still lags behind many countries. (See Figure 4.10.) Consequently, entrepreneurs need to spend much of their time and effort raising funds instead of developing their business ideas.

The next hurdle entrepreneurs face is dealing with Swiss administrative processes, which, according to a recent World Bank study, are more time-consuming than those in other locations.[10] The World Bank investigated the ease of doing business in various places around the world, on the basis of concrete case studies, and found that administrative processes in Switzerland are consistently more time-consuming than, for example, those in Singapore or the Scandinavian countries. (See Figure 4.11.) Most striking is the three years it takes, as the case study shows, to close a business in Switzerland – much longer than in other locations. We are also aware, from our interviews with senior executives, of a case in Switzerland in which formally closing a small solvent business without any employees took more than one and a half years. The excessively time-consuming administrative effort required to close a business – be it solvent or insolvent – underscores the lack of acceptance of business failure in the Swiss culture.

9 See James P. Andrew and Harold L. Sirkin, *Payback: Reaping the Rewards of Innovation* (Boston: Harvard Business School Press, 2007).
10 The World Bank, *Doing Business 2009*.

Figure 4.8

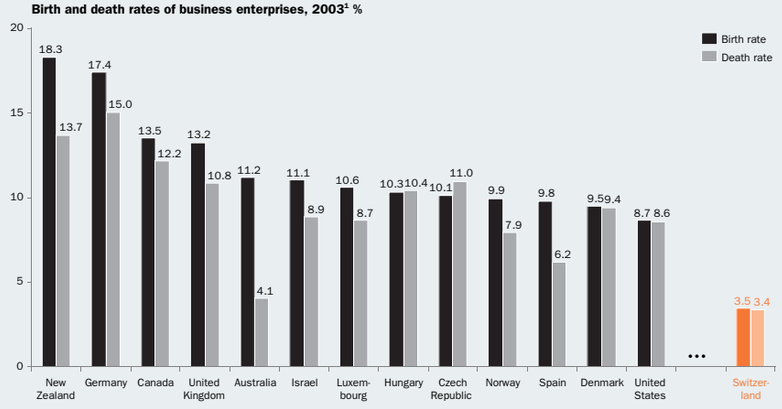
Switzerland Is Underperforming in Turning Its Large Number of Inventions (Intellectual Property) into Innovations (Applications)



1 The innovation applications score is based on employment in high-tech services, exports of high-tech products, sales of new-to-market products, sales of new-to-firm products, and employment in medium-high and high-tech manufacturing
2 The intellectual property score is based on EPO patents, USPTO patents, triad patents, community trademarks, and community industrial designs
Source: European Innovation Scoreboard 2007

Figure 4.9

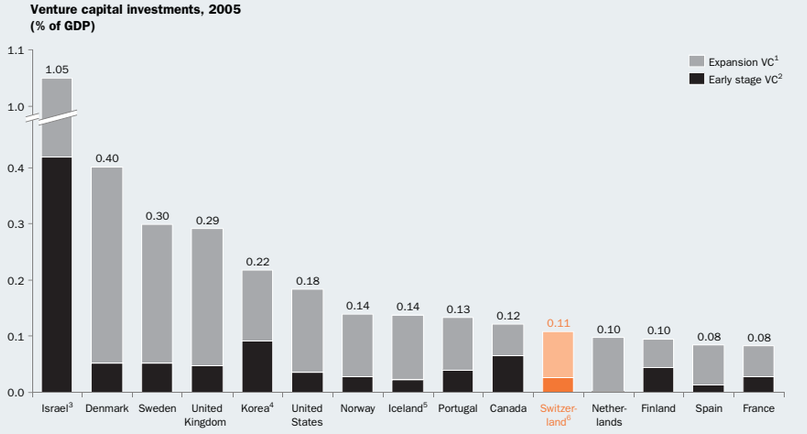
In Switzerland, There Is a Low Number of New Business Enterprises and Failed Business Enterprises



1 Data for Israel is for 2006; data for Switzerland is for 2004
Sources: OECD, Bundeßsamt für Statistik, Central Bureau of Statistics Israel

Figure 4.10

Switzerland Lags Far Behind Other Countries in Venture Capital Investments



1 Expansion and replacement capital
2 Seed and start-up capital
3 Split early versus expansion VC estimated based on 2008 numbers
4 2001 data
5 2002 data
6 Corresponds to 500 million Swiss francs
Source: OECD, Israel Venture Capital Research Center

Figure 4.11

Administrative Processes Take Much Longer in Switzerland than in Other Locations

Note: Ranking among 34 locations consisting of 24 high-income OECD locations, BRIC (Brazil, Russia, India, and China), Singapore, Hong Kong, Taiwan, Israel, Saudi Arabia, and United Arab Emirates
Source: World Bank, Doing Business 2008

Despite these hurdles, the entrepreneurial environment in Switzerland has improved in recent years. One of the most prominent enablers of improvement is the Innovation Promotion Agency of the Swiss government (CTI), which in recent years introduced several initiatives to foster entrepreneurship and support start-ups. Still, while these initiatives are promising, there are two major areas in which CTI could make further advances: First and foremost, CTI could be less risk averse in selecting which start-ups to support – excessive caution is clearly indicated by the average business death rate of only 2.7 percent between 2003 and 2007. (See Figure 4.12.) Second, as indicated by several of the senior executives we interviewed, CTI could take steps to reduce extremely time-consuming administrative processes for entrepreneurs.

We have identified three major areas in which improvements are needed in Switzerland to foster entrepreneurship and to transform ideas into successful products. While cultural change, in particular, will not come quickly, it promises to increase Switzerland's attractiveness as a location for innovation.

Promote an entrepreneurial culture

Young people often can afford to take the risks that accompany entrepreneurship. Therefore, it is vital that students and young professionals be encouraged to pursue entrepreneurship. It is also essential that entrepreneurs be given the freedom to make mistakes and to fail: It must become easier to close a business. And the financial consequences of a failed venture must not overwhelm an unsuccessful entrepreneur and prevent him or her from trying again. Moreover, the enormous experience gained from entrepreneurship – successful and unsuccessful – should be recognized, not only by the population in general but also by prospective employers.

Reduce administrative hurdles for doing business

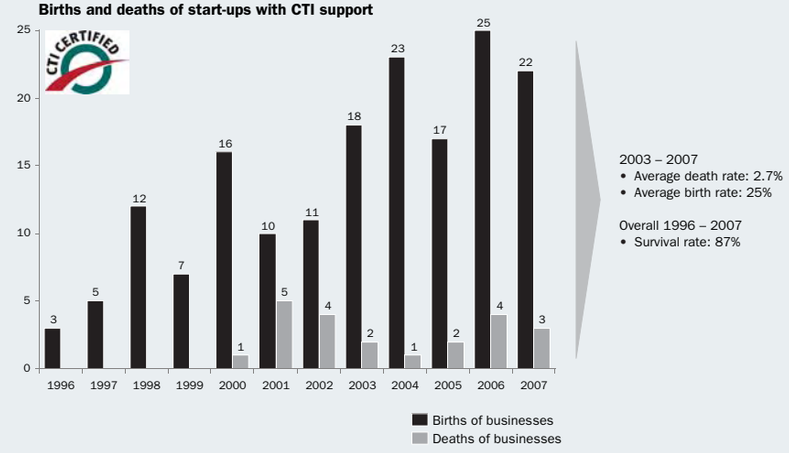
Switzerland must simplify and speed up all the administrative processes required for doing business – specifically, reducing the number of documents and steps required, shortening waiting periods prescribed by law, and increasing the speed at which public authorities handle administrative issues. In addition, administrative requirements for conducting a business should be synchronized across cantons. Finally every canton should introduce one-stop shops that provide entrepreneurs and businesses with help on various administrative issues.

Strengthen existing tools for technology transfer

In CTI, Switzerland has an excellent tool for transferring technology from the academic world of research to business. But this tool requires further strengthening. First, CTI must become more independent from the government, must focus less on administrative matters, and must be allowed to take considerably greater risks in supporting research and start-ups. In parallel, CTI's budget must be increased substantially – especially when it comes to fostering entrepreneurship and supporting start-ups. Finally, the national government should integrate CTI with the high-performing Swiss National Science Foundation (SNF) into one powerful nonbureaucratic agency to promote science and innovation.

Figure 4.12

The Low Death Rate of Start-Ups Supported By CTI Indicates That CTI Is Risk-Averse in Selecting Companies to Support



Source: CTI Start-up (2008)

“Considering the risk involved, it is not very appealing to become an entrepreneur in Switzerland.”

Ruedi Noser
Entrepreneur and member of the Swiss National Council

“When you start a business in the United States, you are only risking your time – in Switzerland, you are also risking your reputation.”

Ralph Müller
Entrepreneur and professor for biomechanics at ETH Zurich

“The National Fonds works extremely well due to its operational independence from daily politics. CTI needs the same independence to become effective.”

Patrick Aebischer
President, EPF Lausanne

“Build a new business. Get rich. Be successful. It’s fun!”

Mark Bürki
Chief Executive Officer, Swissquote

04.4

Provide a Regulatory Environment That Supports Innovation in Established Companies

Transforming ideas into marketable products is challenging not only for start-ups but also for established companies. The main regulatory drivers that foster innovation in these companies are strong intellectual property laws, an excellent tax environment, and a regulatory environment that adapts quickly to new technological developments (such as e-commerce or genetic engineering). Switzerland still often plays a passive role, especially when it comes to the regulatory environment – waiting for the EU to establish regulations that are then adopted, over time, in Switzerland.

We have identified specific actions, across three dimensions, that Switzerland should take to make Switzerland attractive to multinational companies as a place in which to nurture innovation.

Provide an excellent regulatory environment for innovation
Switzerland must provide an open-minded and stable regulatory environment that adapts quickly to new developments and that gives multinational companies the freedom to explore new ground. While it is important that Switzerland’s regulatory environment be in line with that of the EU, Switzerland should also try to ensure that regulations keep up with new scientific developments – in order to remain attractive to multinational companies conducting cutting-edge research.

Continue to provide strong protection for intellectual property
For many innovative companies, protecting intellectual property is paramount – especially because of the often immense expenditures required to develop new products. To ensure that developing new products in Switzerland remains attractive to these companies, Switzerland must provide and enforce strong and effective intellectual property laws. It must fiercely abate piracy and protect the internationally valued Swiss brand.

Investigate the introduction of government funding of business R&D
An additional area in which improvements can be made is government funding for business R&D – either through direct financial support or through the introduction of R&D tax subsidies. There are few developed countries around the world that offer less when it comes to tax incentives for business R&D investments. At the same time, Switzerland’s direct financial support of business R&D expenditures is lower than in almost any other developed country. While Switzerland is clearly underperforming in this area, we heard dynamically differing opinions from the senior executives we interviewed on the importance and economic justification for such government incentives. We do not think that government funding of business R&D should become a major deal-breaker when it comes to choosing Switzerland as a business location, but, nonetheless, it might be a pragmatic necessity for Switzerland to introduce tax incentives or increase direct financial support, to reduce the gap at least partially with the many competing locations that are increasingly investing in this area to attract multinational companies.

“Innovation requires a culture based on openness and mutual respect. Innovation should not be limited to a few designated areas or time frames – it must be pursued constantly.”

Peter Goerke
Group Head of Human Resources, Zurich Financial Services

“Switzerland should not only be a source of inspiration – it should also profit from its ideas.”

Walter Steinlin
Head of Innovations, Swisscom

“Donations and endowments to universities need to be tax deductible. This would be a fair treatment of donations which enhance the Swiss scientific platform.”

Patrick Aebischer
President, EPF Lausanne

“Innovation is based on great ideas, an open environment and significant rewards. Those countries that are able to foster the spirit of start-ups, ease the financing, reduce the regulatory/administrative effort to a minimum and allow innovation leaders to capture proceeds from their efforts will see more innovation happening.”

Andreas Schönenberger
Chief Executive Offiers, Google Switzerland

04.5

Foster National Efforts to Promote Switzerland as the Best Place for Business and Innovation

Federalism combined with the regional authority of Swiss cantons defines Switzerland's political system and spirit. The inherent competition between cantons that results is the source of many of Switzerland's strengths and has often helped to advance the Swiss economy and promote Switzerland's standing in the global economy. But it has also led to very limited consolidation of strengths and a lack of coordination at the national level. In an ever more globalizing economy, in which an increasing number of countries have started to compete as the best places to do business, this lack of coordination can easily turn into a disadvantage.

For example, when large multinational companies plan to move their international headquarters or a production site to Switzerland, they are often overwhelmed by the complexity of the Swiss political system and the multiple contact persons from municipal, cantonal, and national political bodies – each with different responsibilities. This puts Switzerland at a disadvantage compared with some other countries, in which fully professionalized organizations that exist on a national level serve as single points of contact and support the settlement of multinationals.

Another example of how this lack of coordination puts Switzerland at a disadvantage is the national marketing of Switzerland as a best place to do business. While the tourism sector has built up an impressive national marketing arm in "Swiss Tourism," which had a budget of more than 76 million Swiss francs to promote "Heidi Land" in 2007, its counterpart, "LOCATION Switzerland," which promotes Switzerland as a best place to do business and is now being integrated into Osec, had less than 5 percent of this budget at its disposal. (See Figure 4.13.) Instead of a strong national effort, cantons and various regions pay for their own individual campaigns. While some coordination efforts are under way, these are still relative timid efforts.

Many of the senior executives whom we interviewed perceive Switzerland today as a collection of competing cantons that often do not act in the best interest of the country as a whole. They strongly believe that in certain areas a more coordinated effort on a national level is necessary for Switzerland to sustain its competitive position as a best place to do business.

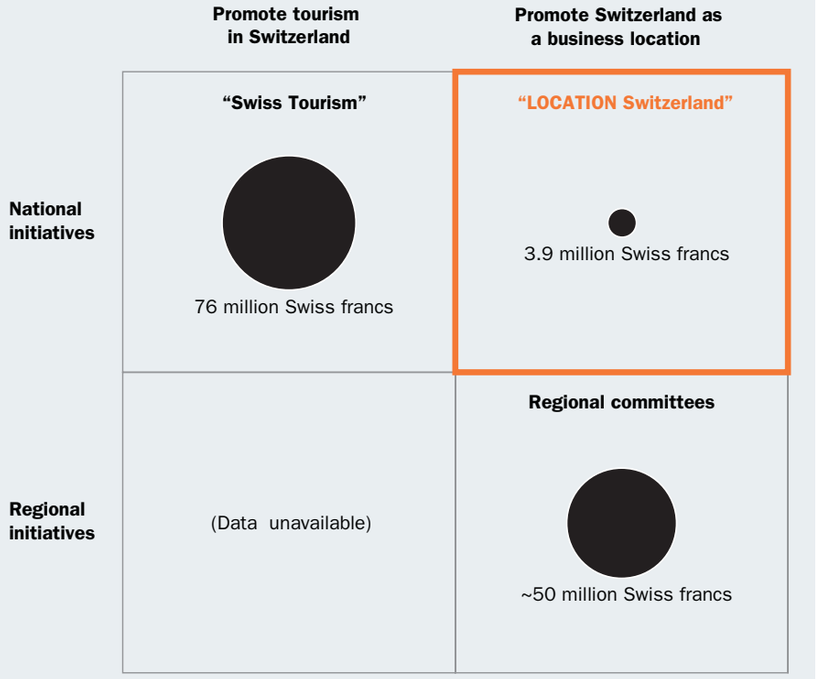
We have identified three main areas in which a national approach to promoting Switzerland as a best place for business and innovation would considerably improve Switzerland's success in the global economy. It is important to note that we do not call for a purely national approach; we are advocating a balanced approach that calls for community, cantonal, regional, and national efforts – with a shift toward national coordination of these efforts.

Foster and coordinate Switzerland's business strengths

Globalization and mobility increasingly drive resources – money as well as personnel – to attractive locations. The most attractive places become more and more specialized and significantly enhance their global reach, ultimately achieving high levels of innovation and prosperity.

Figure 4.13

The Major National Initiative to Promote "Heidi Land" Dwarfs Coordinated Efforts to Promote Switzerland As a Best Place to Conduct Business



Source: Switzerland Tourism (Annual Report 2007), LOCATION Switzerland, Swiss American Chamber of Commerce

Switzerland already possesses some centers of excellence – for example, the pharmacy and biotechnology center in Basel or the medical technology center in the Berne/Biel area. The basis for creating several other centers of excellence in Switzerland is already in place. (See exerpt "Regional Patent Registrations in Switzerland.") If Switzerland actively pursues these opportunities through a coordinated national effort, new significant international centers of excellence could flourish in Switzerland.

Similarly, in order to foster Switzerland's business strengths, federal interests must take a back seat to national interests when it comes to the specialization of universities and the establishment of new centers of innovation. Innovation centers are often invaluable sources of new business strength, and every effort should be made to promote them.

One very promising initiative in this direction is the Swiss Innovation Park promoted by the Stiftung Forschung Schweiz, which aims at establishing at least one large national research-and-innovation park with international vibrancy and attractiveness. The Swiss Innovation Park is proposed to be built on the soon-to-be-vacant site of the current military airport in Dübendorf. This would definitely be a very thoughtful and sustainable utilization of this large area, and it would benefit all of Switzerland.

Facilitate the establishment of multinational companies in Switzerland
Switzerland must establish a national first point of contact for multinational companies that plan to settle in Switzerland or that want to expand their activities within Switzerland. This center could also serve as a national center of excellence to support cantons and municipalities in negotiating and working with multinational companies.

Create and implement a focused national marketing strategy to promote Switzerland as a premier business location
Switzerland has much to offer to innovative companies, and it needs to communicate the advantages it provides on a global scale. In order to accomplish this, Switzerland must define a clear marketing strategy, and the national government must be put in charge of coordinating national, regional, and cantonal efforts to promote Switzerland as a great place to be innovative, to do business, and to establish R&D centers and university satellites. It is imperative that adequate resources be allocated to this effort on the national level.

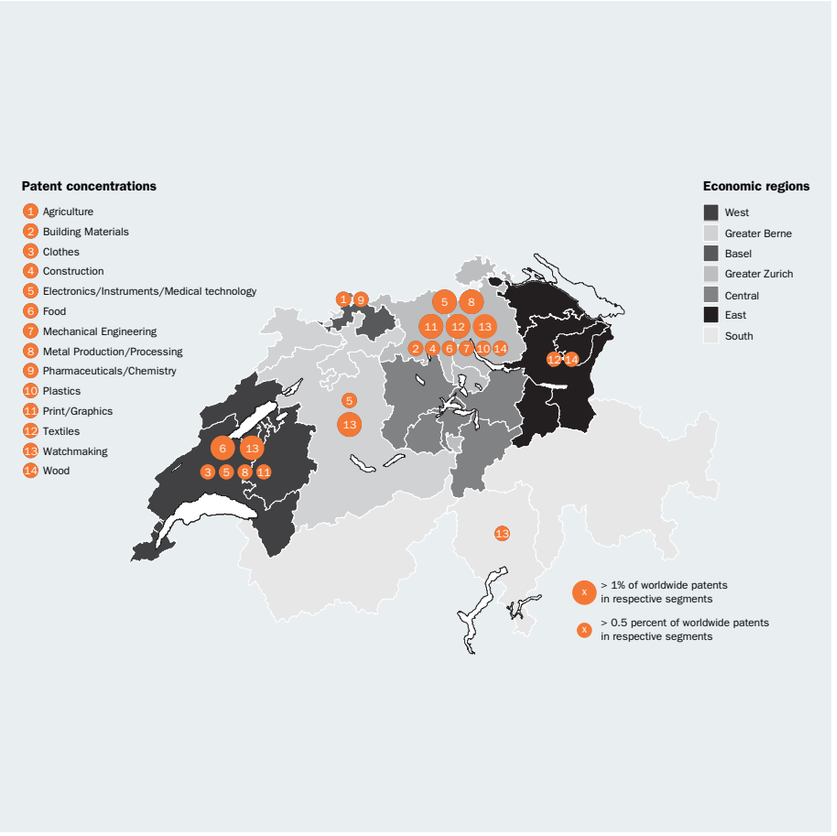
"Switzerland needs a basic marketing strategy. Decide where to focus and then begin marketing!"

Thomas Dittrich
Chief Financial Officer, Amgen (Europe)

Regional Patent Registrations in Switzerland

Even though innovation is certainly not limited to traditional R&D, the number of patents filed remains one of the best measurable indicators for the strength of innovation in any geographical area – at least for industries in which patents are relevant. An analysis of patent registrations, by region, in different industries in Switzerland shows 23 regional clusters of intellectual property across 14 industries. Between 2003 and 2006, each of these clusters filed more than 0.5 percent of the global patents in its relevant industry.

There Are 23 Strong Regional Patent Concentrations in 14 Different Segments Observable in Switzerland



05
Methodology

Just as in the past two years, we followed a three-step methodology to obtain the facts and acquire the knowledge presented in this study.

First, we did analytical research that forms the backbone of the study. We collected a wide range of data, both through our own research and with the help of several institutions. These data served as the basis of our analyses.

Second, we conducted a broad survey of multinational companies in Switzerland. More than 50 global companies that are active in Switzerland completed our survey questionnaire and contributed to our statistical analysis. The participating companies that agreed to let us publish their contributions are listed on pages 42/43.

Third, we conducted in-depth interviews with two dozen CEOs and senior managers of leading innovative companies in Switzerland and with representatives from academia and the government. These discussions enabled us to gain deeper insight into the needs of innovative companies in Switzerland.

We evaluated the innovation intensity of Swiss industries using six distinct measures: R&D expenditures, innovation expenditures, patents, average product life cycles, the sales share of innovative products, and the sales share of exports. Using these six measures, we calculated an innovation-intensity index between zero and ten for each industry, with the most innovation-intensive industry (chemicals and pharmaceuticals) achieving a score of seven. We categorized all industries with a score higher than three as highly innovative, and with a score higher than six as extremely innovative. Highly and extremely innovative industries combined make up 35 percent of the Swiss GDP, while extremely innovative industries alone make up 10 percent of the Swiss GDP.

06
Publishers of This Study

The Swiss-American Chamber of Commerce
The Swiss-American Chamber of Commerce is a 2,500-member, privately funded not-for-profit organization. The Chamber addresses issues impeding the free flow of goods, services, investments and people between Switzerland and the USA. In addition, the Chamber – as the largest association of Multinational Companies (MNCs) in Switzerland (large and small, foreign and Swiss) – addresses issues to facilitate the business of the MNCs in the business location Switzerland and at the same time helping to strengthen the business location in the competition for companies interested in relocating parts of their operations. With both goals, the Chamber strives to make a contribution for the healthy growth of its members and of the Swiss economy.

We encourage initiatives from our members and combine our resources with theirs in order to achieve what individual businesses cannot do alone. The Swiss-American Chamber of Commerce takes the lead in furthering its members' business interests in Switzerland, the United States, and internationally, through information, creation of business networks, public relations efforts, and direct government contacts. For more information, please visit www.amcham.ch.

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