

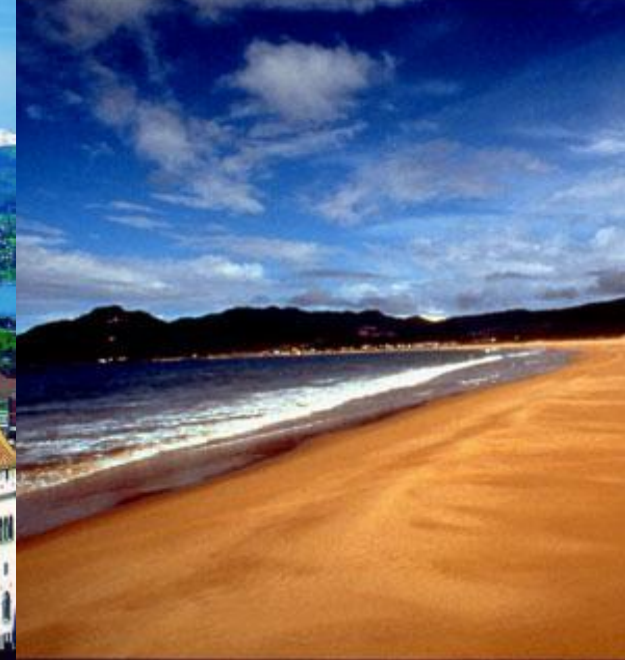
Would you rather be in Zurich, Cupertino or Shenzhen than in Taipei?

Thoughts about a creative future for Taiwan

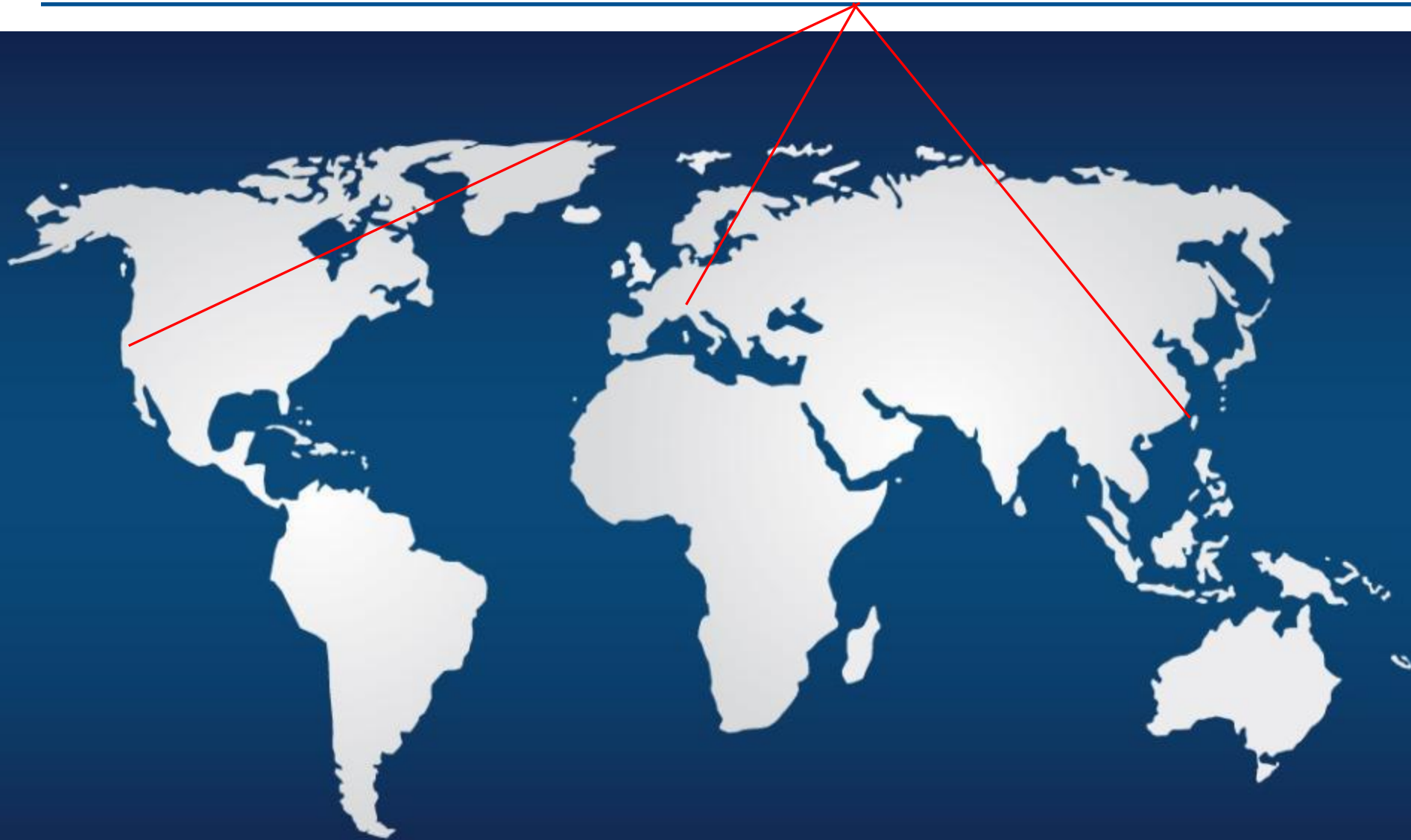
Wilhelm Gruissem
Professor, ETH Zurich



Natural and architectural beauty are important assets to spur growth in a competitive global economy



In a global economy, innovation, investments and returns are key to success





The iPad is a brilliant example of how strategic investment and production outsourcing maximize economic return



Economics 101 also teaches you many reasons why you want to be in Taipei or Zurich rather than in Shenzhen...

Cupertino

 zürich
downtown switzerland



Taipei



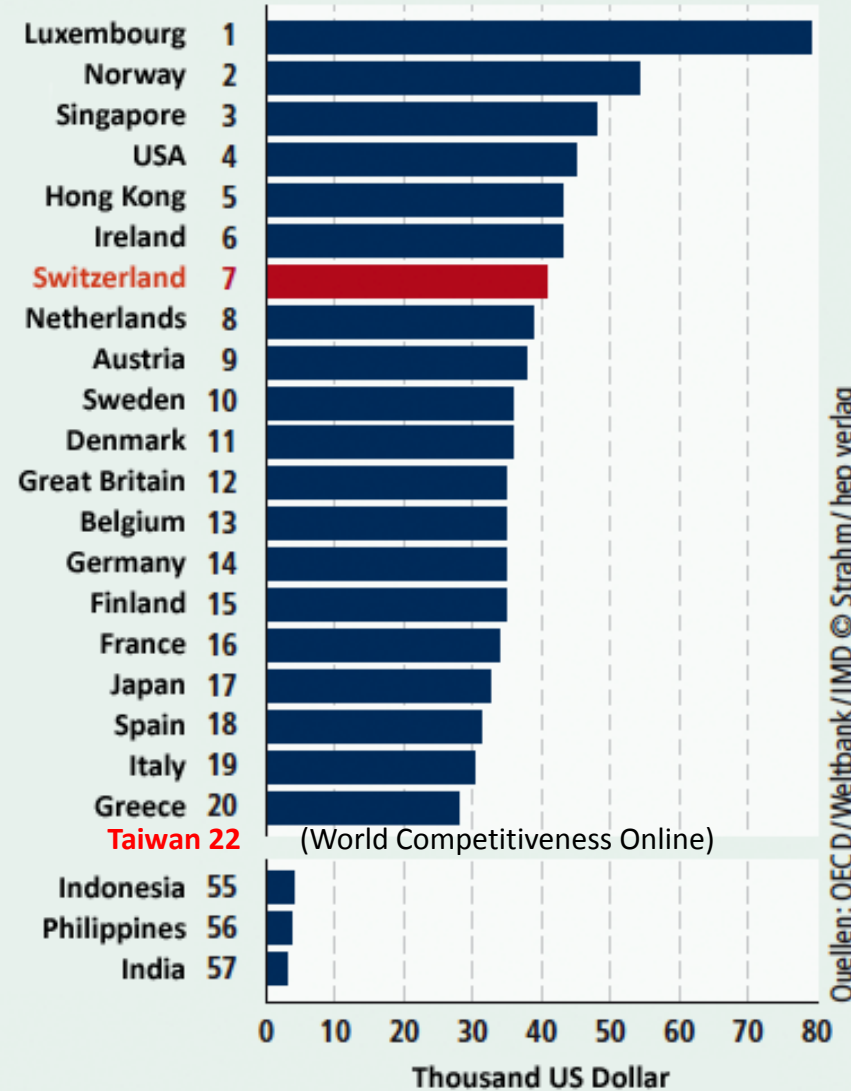
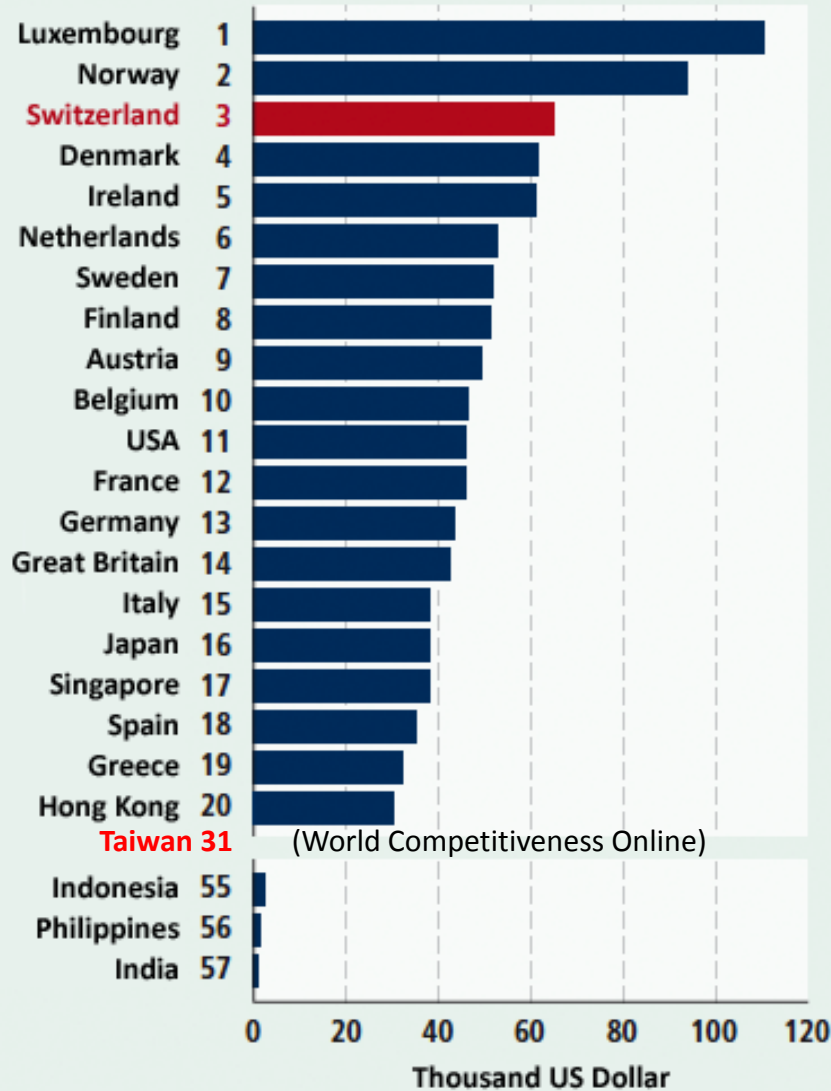
**...but are they good enough for innovation,
investments and economic growth?**

Key factors for investment and innovation



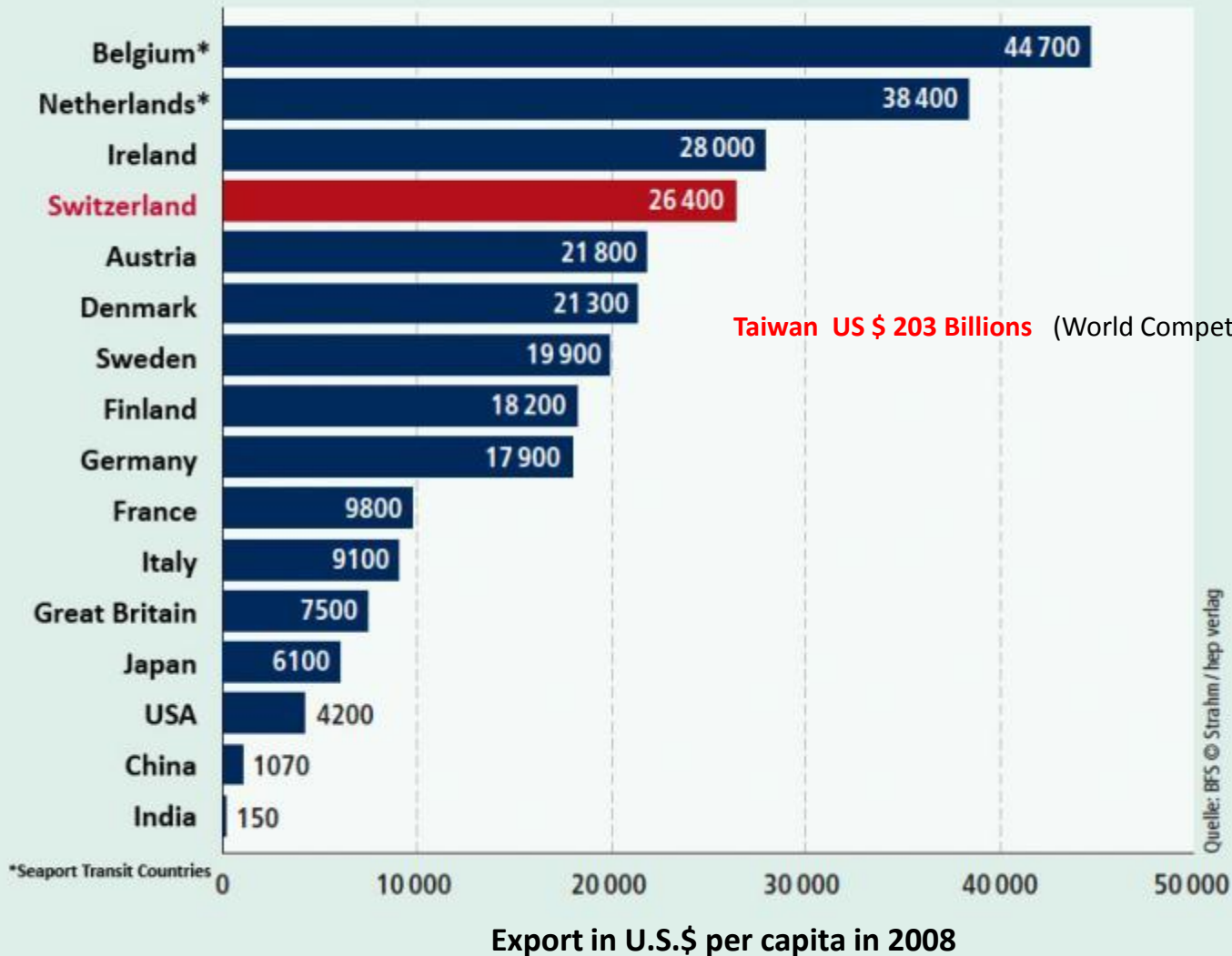
- High living standard and quality
- Excellent infrastructure
- Central location and connectivity
- Political stability
- Top educational system
- Business-friendly environment
- Attractive investment opportunities
- Innovation incentives
- Transparent legal framework
- Predictable tax system
- Customer-oriented government

In 2008, Switzerland was among the top nations based on GDP (left) and buying power (right) per capita

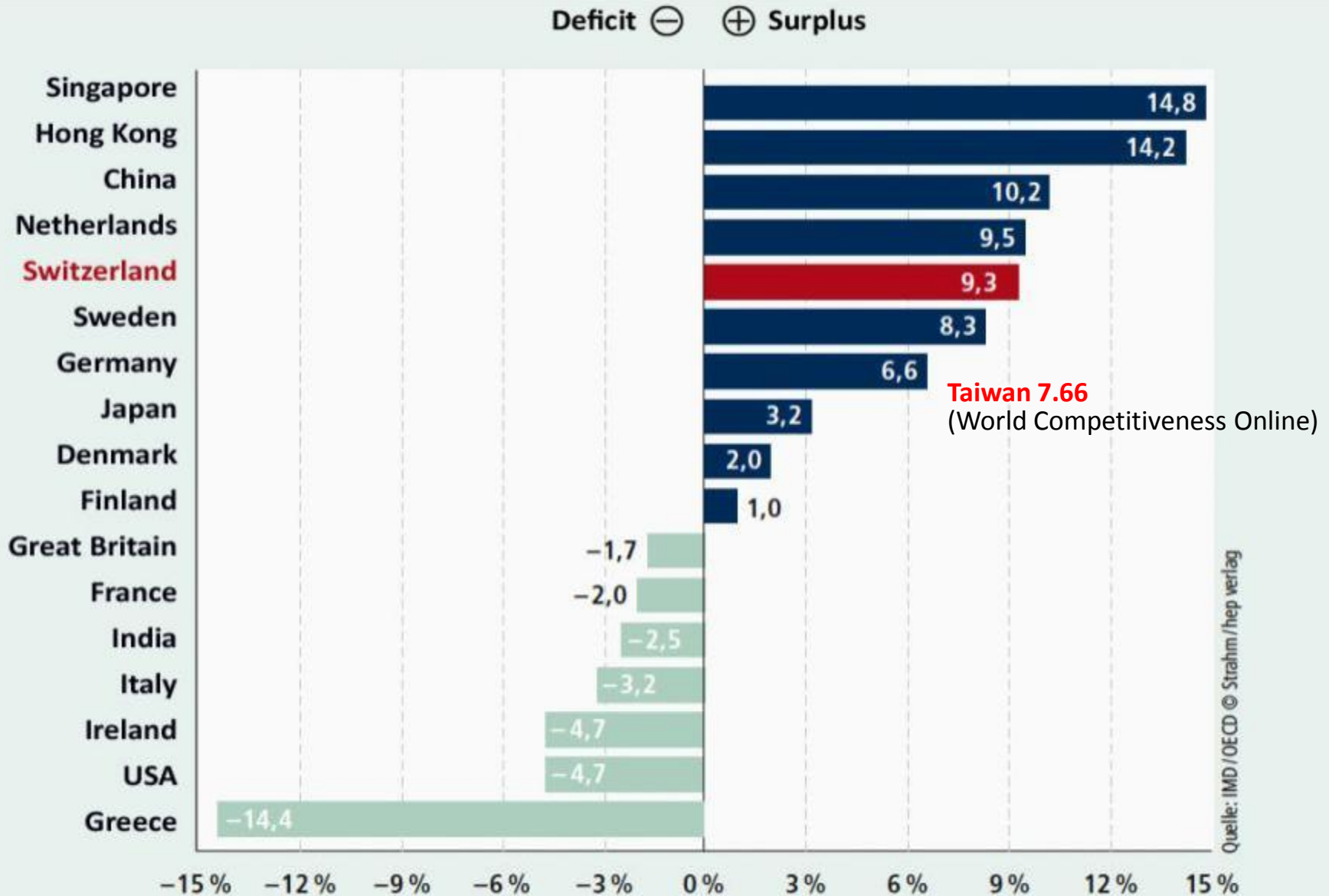


Quellen: OECD / Weltbank / IMD © Strahm / hep verlag

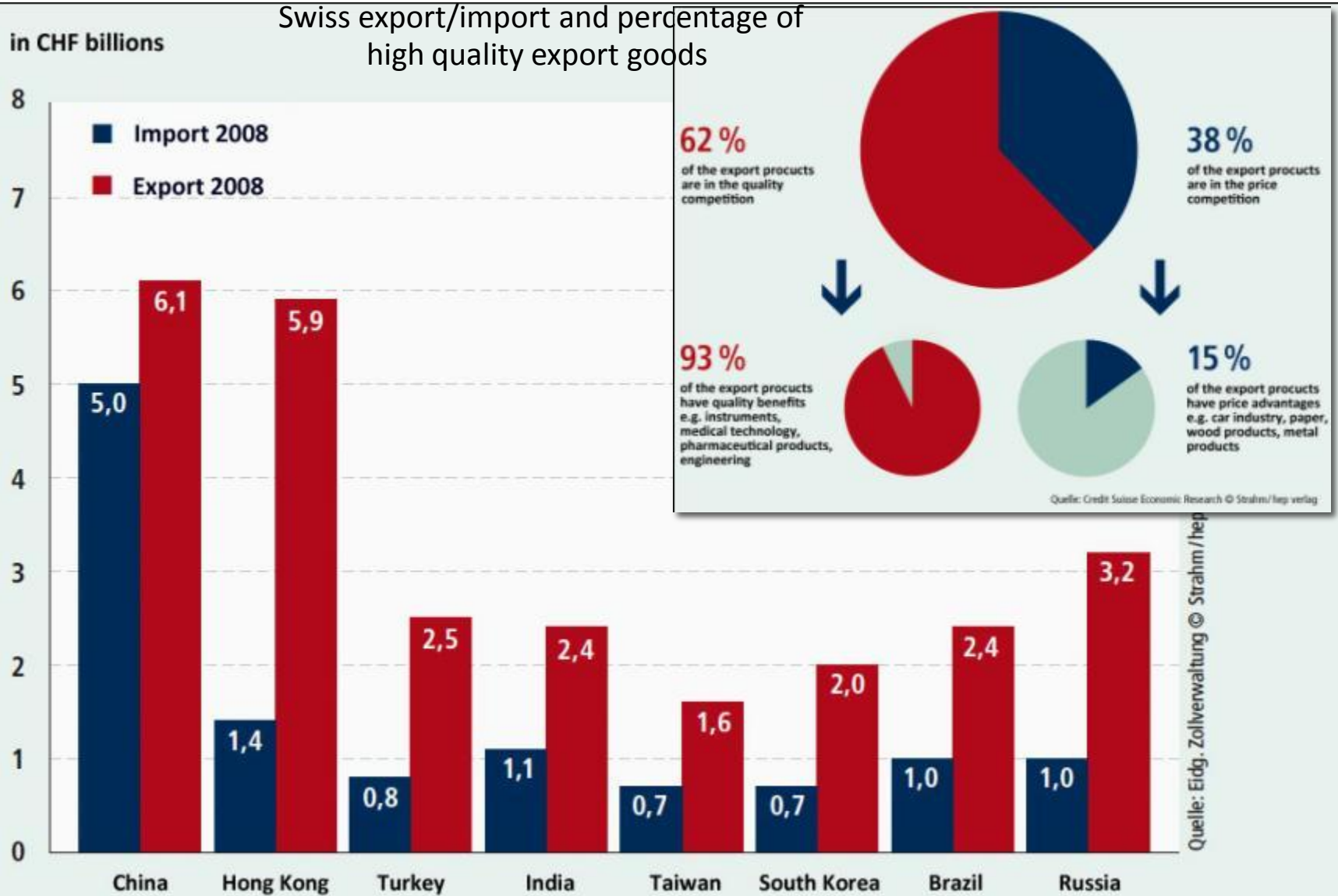
Switzerland and Taiwan are among the top global export nations



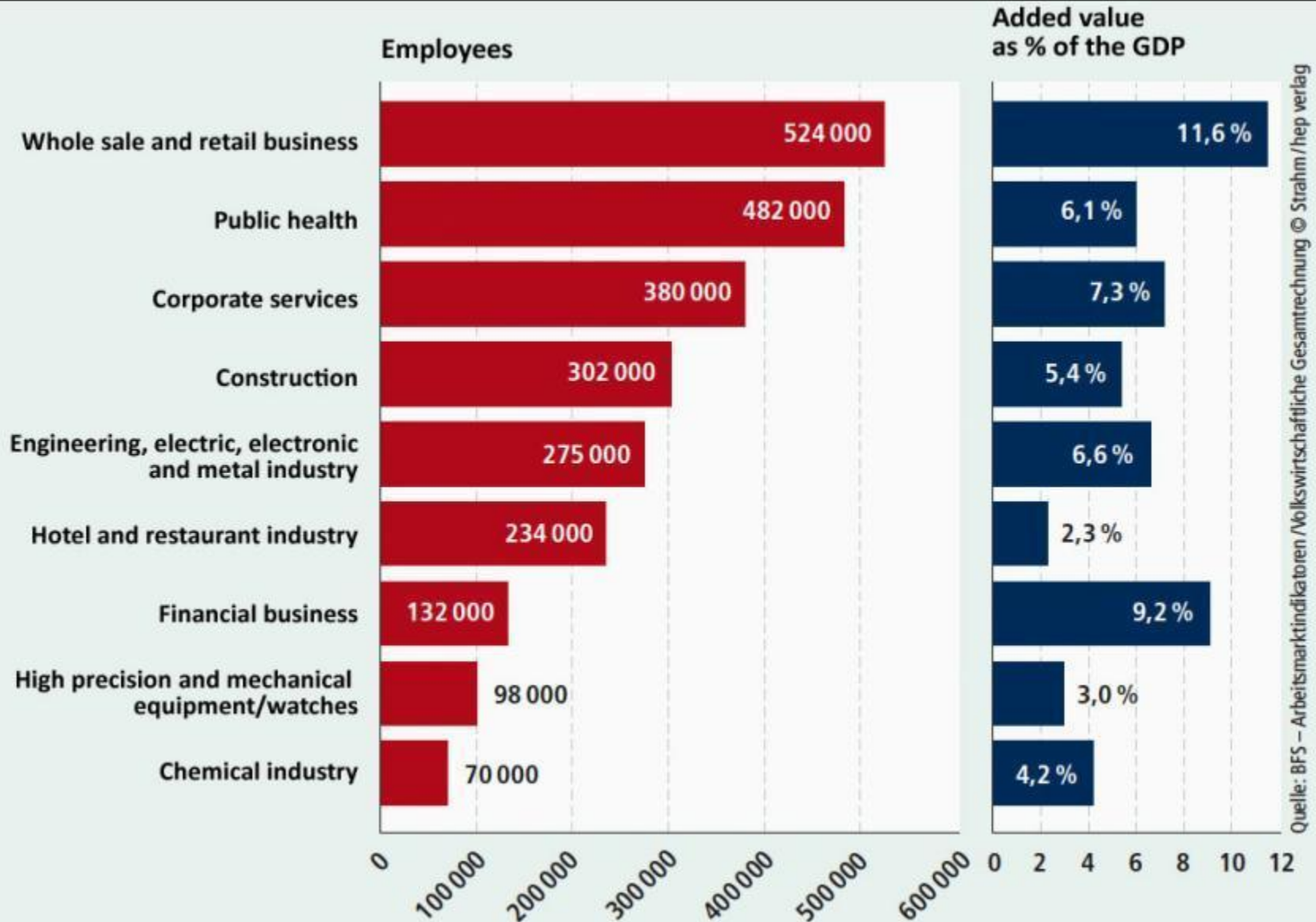
Many small nations have a positive export/import balance, which is a strong indicator for an internationally competitive position



High production cost countries can be successful in a global market by exporting high quality goods



Diversification is key to economic growth— Swiss banking does not produce the largest share of GDP

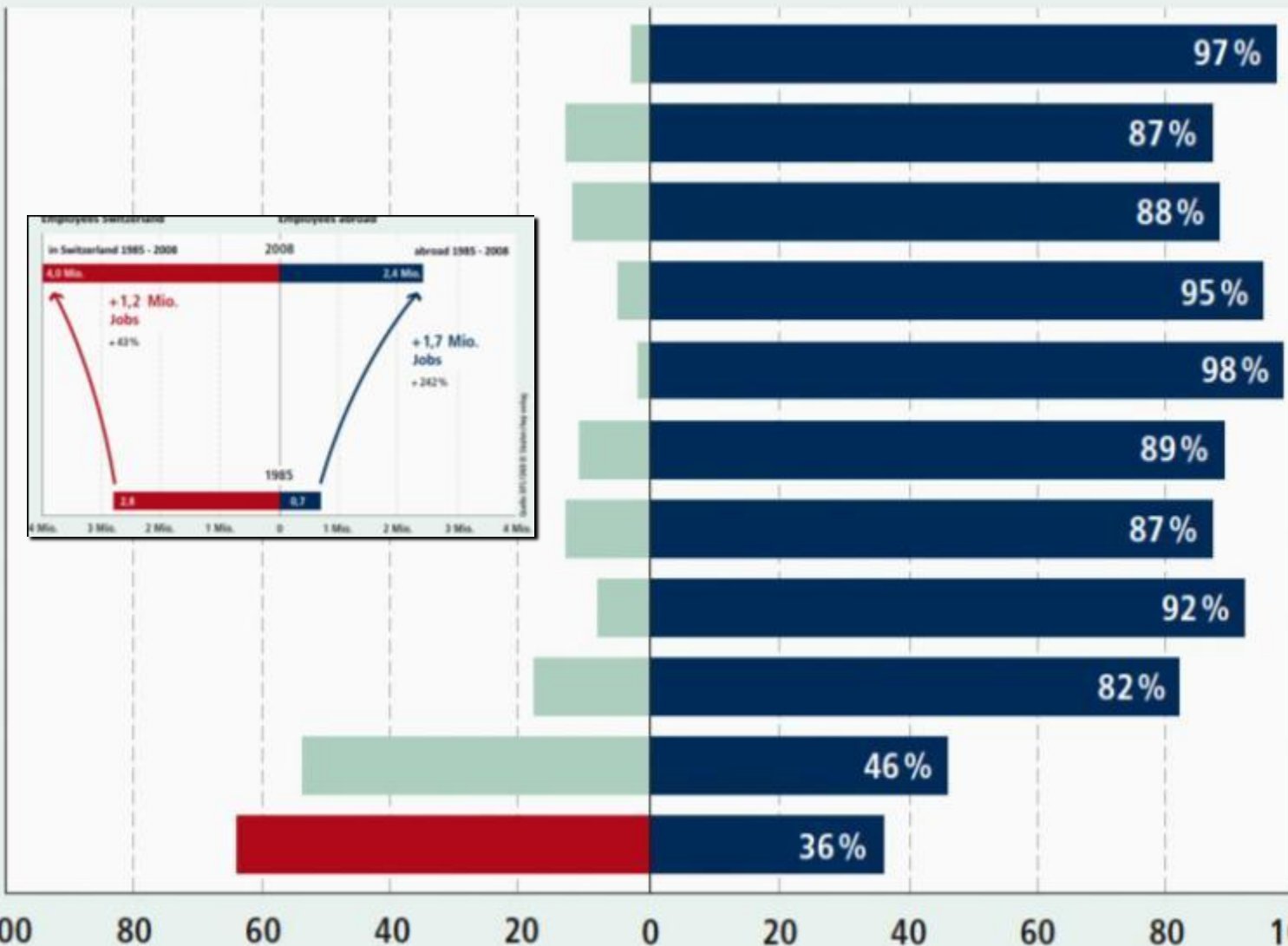


Sustained economic growth does not necessarily equate to an expansion of the national job market only

Employees Switzerland

Employees abroad

1. Nestlé
 2. Novartis
 3. Roche
 4. ABB
 5. Holcim
 6. Schindler
 7. Syngenta
 8. Clariant
 9. Ciba SC
 10. Swatch
- Total CH economy**



Quelle: Handelszeitung © Strahm/hep verlag

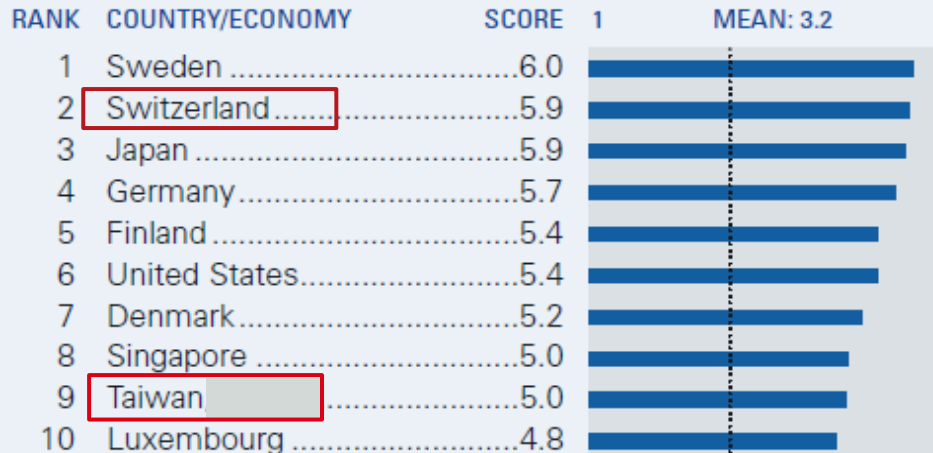
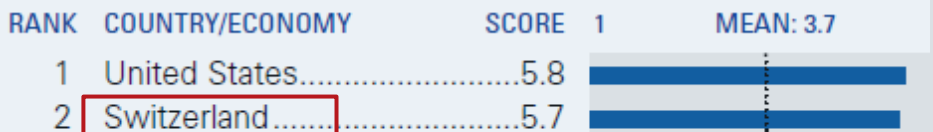
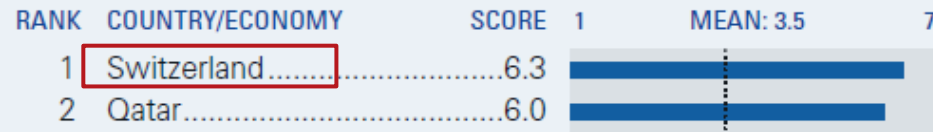
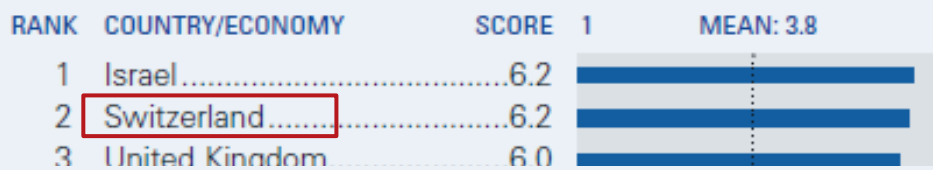
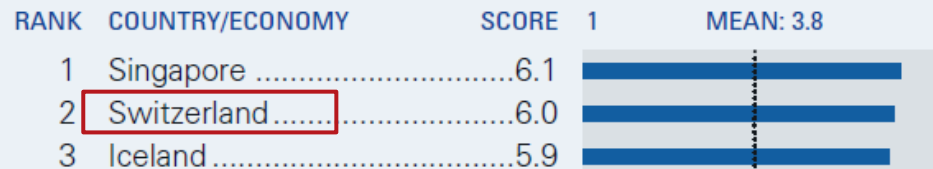
Small nations rank high in leading surveys of global competitiveness

The Global Competitiveness Report 2010-2011
© 2010 World Economic Forum

Country/Economy	GCI 2010–2011		GCI 2010– 2011 rank among 2009 countries	GCI 2009–2010 rank *	2000
	Rank	Score			
Switzerland	1	5.63	1	1	
Sweden	2	5.56	2	4	Finland 1
Singapore	3	5.48	3	3	United States 2
United States	4	5.43	4	2	Germany 3
Germany	5	5.39	5	7	Netherlands 4
Japan	6	5.37	6	8	Switzerland 5
Finland	7	5.37	7	6	Denmark 6
Netherlands	8	5.33	8	10	Sweden 7
Denmark	9	5.32	9	5	United Kingdom 8
Canada	10	5.30	10	9	Singapore 9
Taiwan	13	5.21	13	12	Australia 10

Several factors influence the national sustainability of economic growth potential and future investment opportunities

- **Quality of the educational system** **2**
Taiwan **17**
- **Quality of scientific research institutions** **2**
Taiwan **17**
- **Brain Drain** **1**
Taiwan **25**
- **University-industry collaboration in R&D** **2**
Taiwan **12**
- **Company spending on R&D** **2**
Taiwan **9**



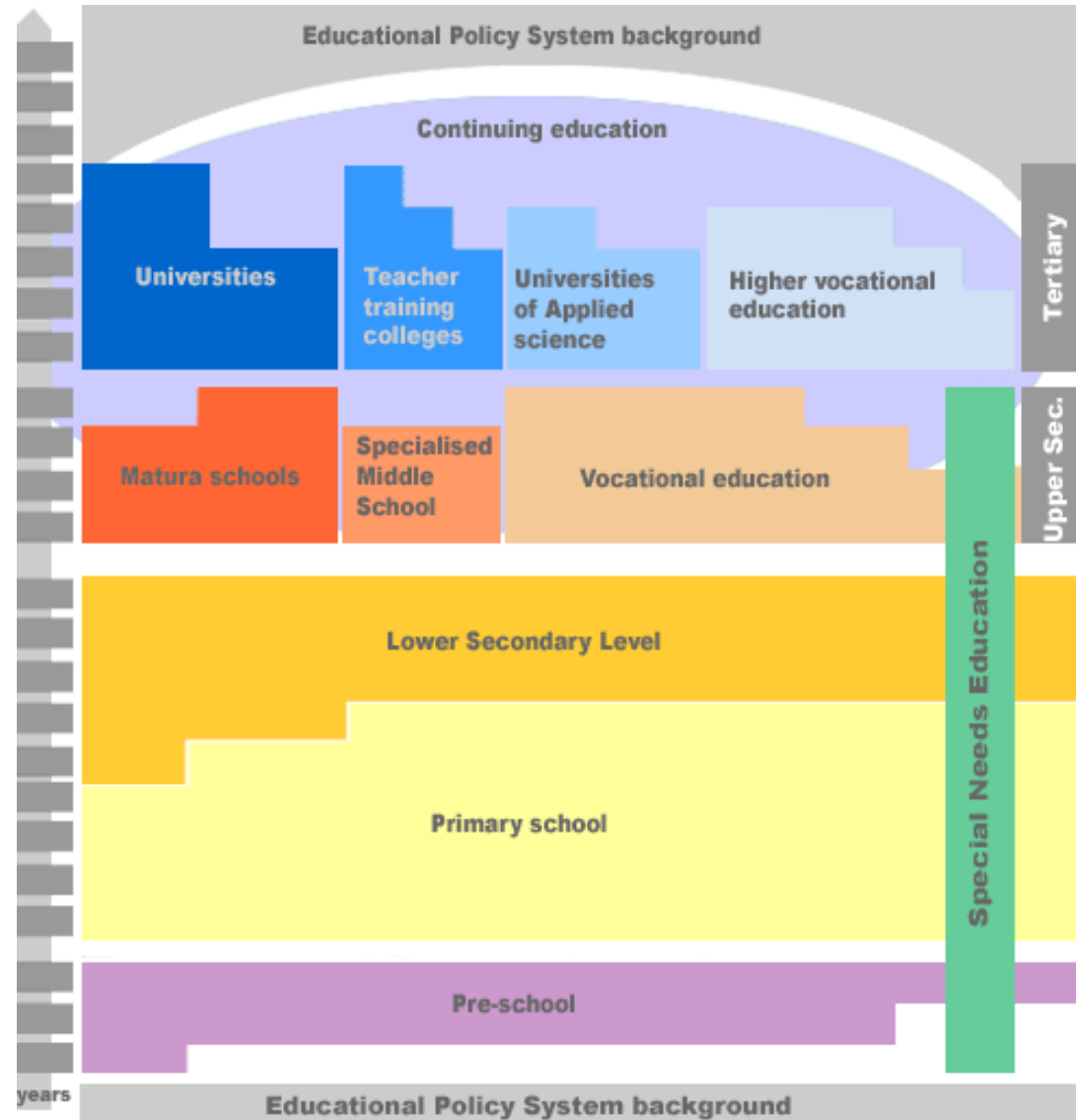
The Global Competitiveness Report 2010-2011
© 2010 World Economic Forum

The Swiss education system is unique— it strongly emphasizes vocational education and training

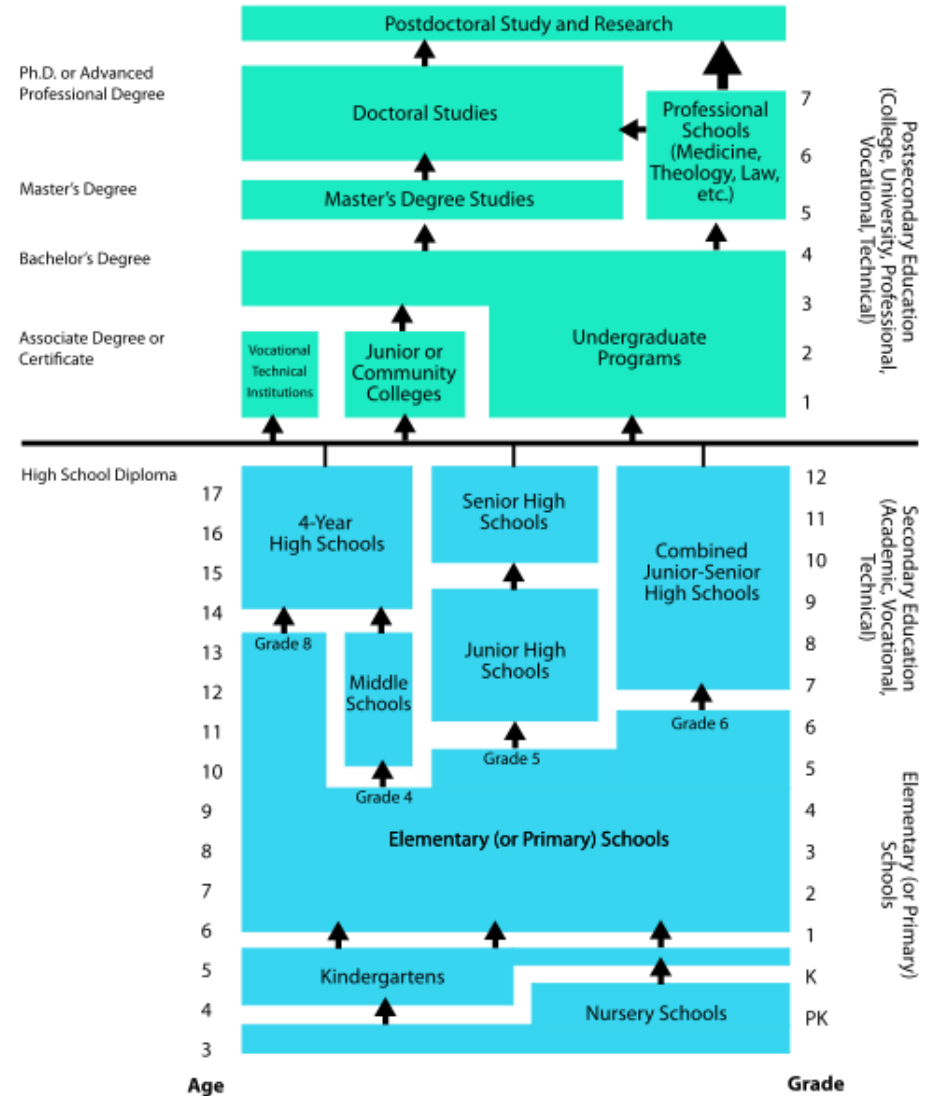
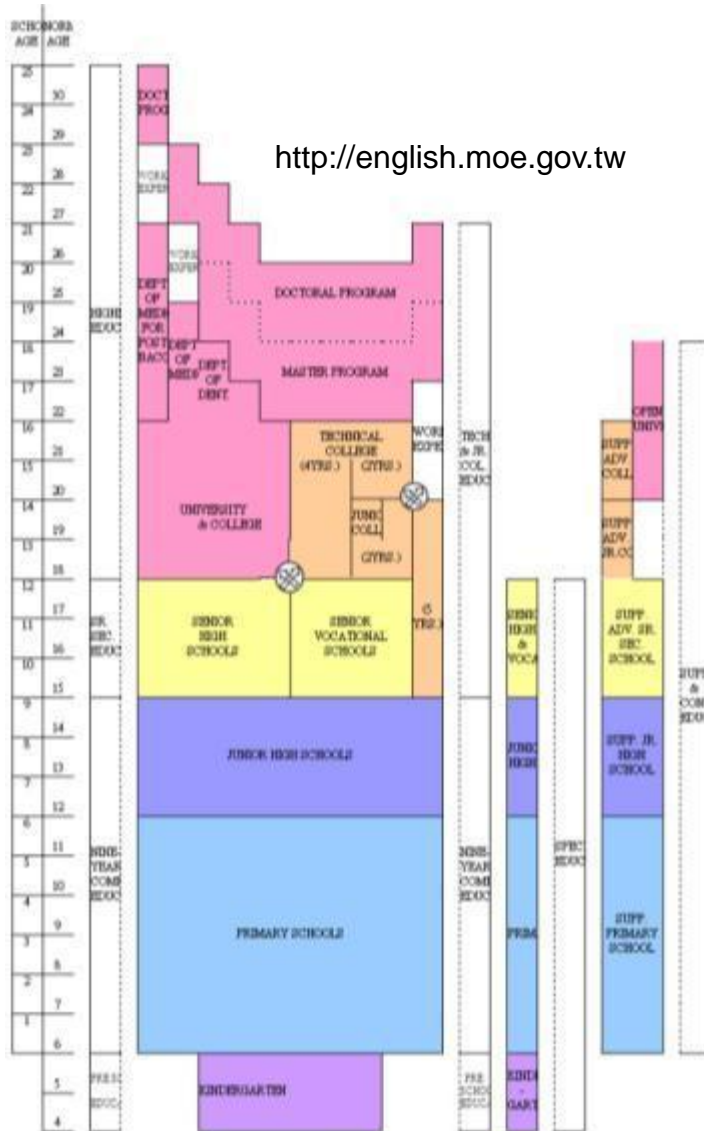
SWITZERLAND



EUROPE



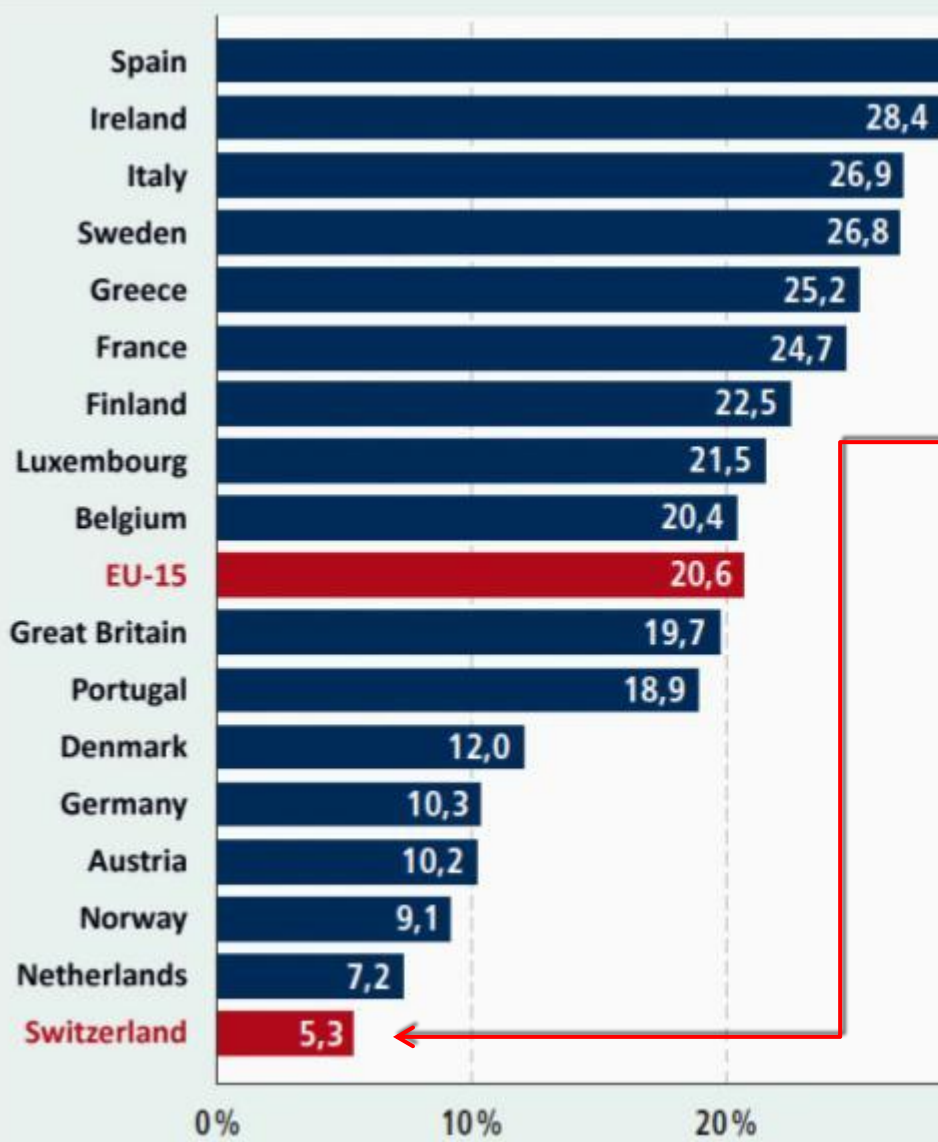
Similar to Switzerland, Taiwan emphasizes vocational training, while the U.S. educational system focuses on postsecondary education



« While Switzerland demonstrates many competitive strengths, the **university enrollment rate of 49.4 percent** continues to lag behind many other high-innovation countries, placing it 48th on this indicator. »

« **With an eye to the future, efforts should be made to boost higher education attainment to ensure sufficient national talent to continue contributing to productivity improvements.** »

Countries with strong vocational education and training have low youth unemployment rates



TAIPEI 台北時報 TIMES

Youth unemployment is the norm

By Kuo Nai-fong and Hsieh Hsiu-Yi 郭迺鋒, 謝秀宜

July 31, 2010

The Directorate-General of Budget, Accounting and Statistics just released the unemployment figures for last month. With new graduates inflating the figures, the monthly rate increased to 5.16 percent. Now many new graduates are thinking about what they should do next. There is a saying in Taiwan that goes "higher levels of education lead to higher levels of unemployment." Why has higher education taken on such a negative connotation, especially when applied to new graduates at the beginning of their professional careers?

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

Economic News Release

Employment and Unemployment Among Youth Summary

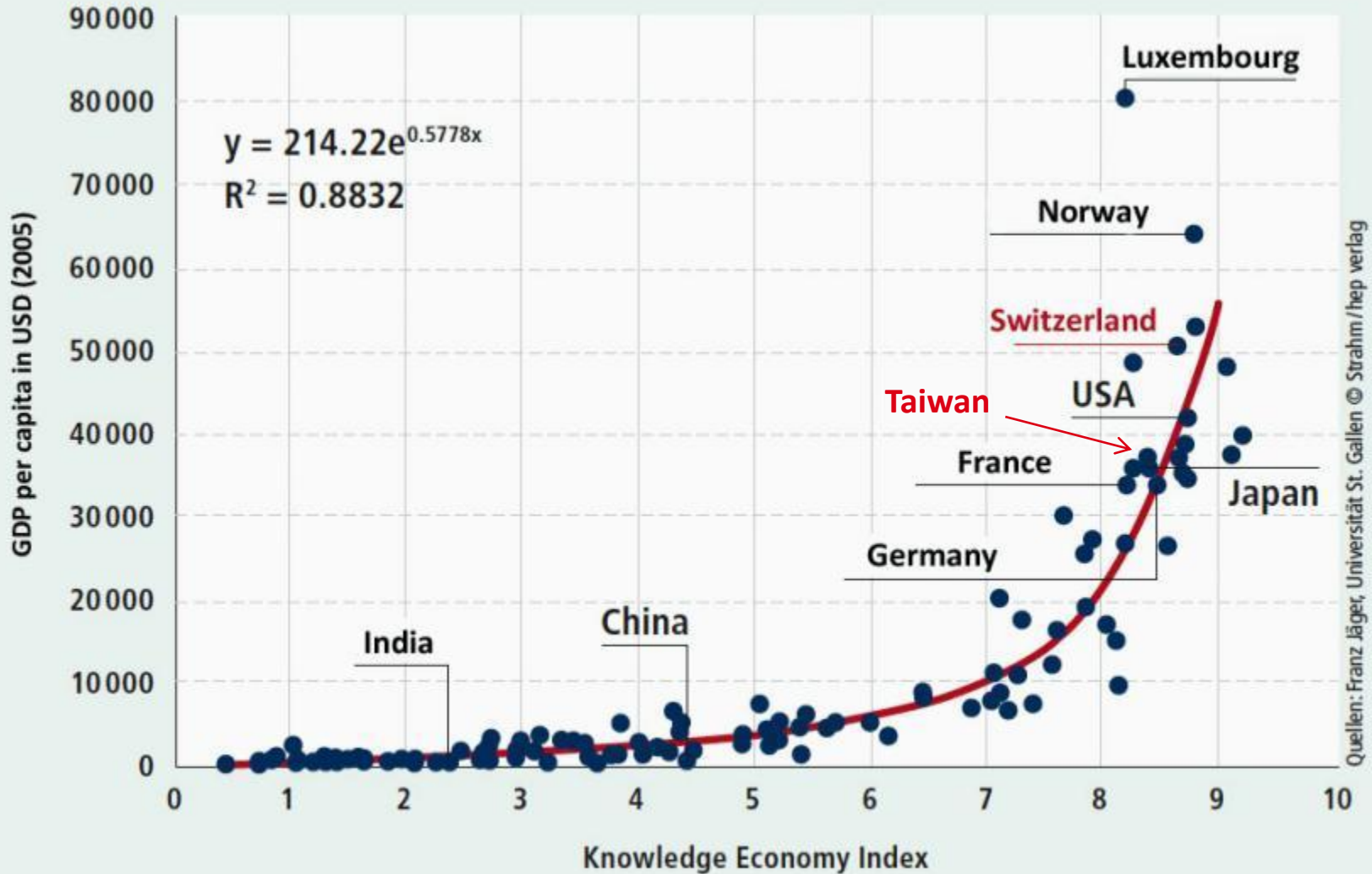
For release 10:00 a.m. (EDT) Friday, August 27, 2010 USDL-10-1

Technical information: (202) 691-6378 * cpsinfo@bls.gov * www.bls.gov/cps
Media contact: (202) 691-5902 * PressOffice@bls.gov

EMPLOYMENT AND UNEMPLOYMENT AMONG YOUTH - SUMMER 2010

From April to July 2010, the number of employed youth 16 to 24 years old rose by 1.8 million to 18.6 million, the U.S. Bureau of Labor Statistics reported today. This year, the share of young people who were employed in July was 48.9 percent, the lowest July rate on record for the series, which began in 1948. (The month

Strong investment in education and research is key to sustained economic growth and prosperity



Quellen: Franz Jäger, Universität St. Gallen © Strahm/hep verlag

- Bachelor
 - Strong foundation in physics, mathematics and other basic sciences
 - Fundamentals of discipline

- Master
 - Enhancing the disciplinary knowledge
 - Education at the cutting edge of research and technology

- Pioneering Spirit
 - Project Based Learning
 - Entrepreneurial endeavor as team project
 - Strong involvement in research projects
 - Success Stories



- **ETH was founded in 1855**
The “Federal Polytechnical School” is the driving force of industrialization in Switzerland
- **Flagship of national science**
In the 21th century ETH represents a successful combination of theoretically formulated and experimentally tested knowledge
- **ETH is an international university**
Today, a place of study, research and employment for over 20'000 people from 80 different countries

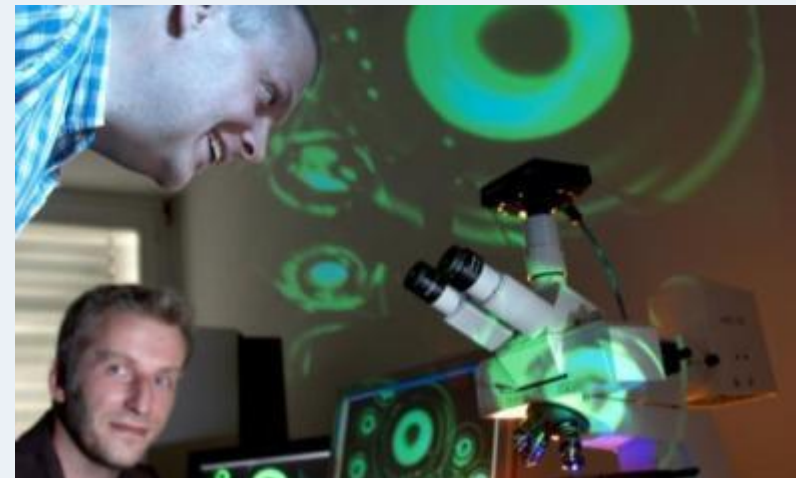


ETH campus in Zurich center



Science City, ETH campus Hönggerberg

- Top infrastructure
- International faculty: the best from all over the world
- Ground-breaking fundamental research
- Freedom to take an unconventional approach
- Applying research results for the good of society
- Many international co-operations with industry and research institutions



- ETH is the top university in continental Europe
 - Times Higher Education: “THE World University Ranking”
2010: no. 15 in the world (UCB: no. 8, NTHU: no. 107, NTU: no. 115)
 - Quacquarelli Symonds Ltd: “QS World University Ranking”
2010: no. 18 in the world
 - Shanghai Jiao Tong University: “Academic Ranking of World Universities”
2010: no. 23 in the world (UCB: no. 2, NTU: no. 108)
- 21 Nobel Laureates, for example:



Leopold Ruzicka
Chemistry, 1939



Wolfgang Pauli
Physics 1945



Vladimir Prelog
Chemistry, 1975



Richard Ernst
Chemistry, 1991

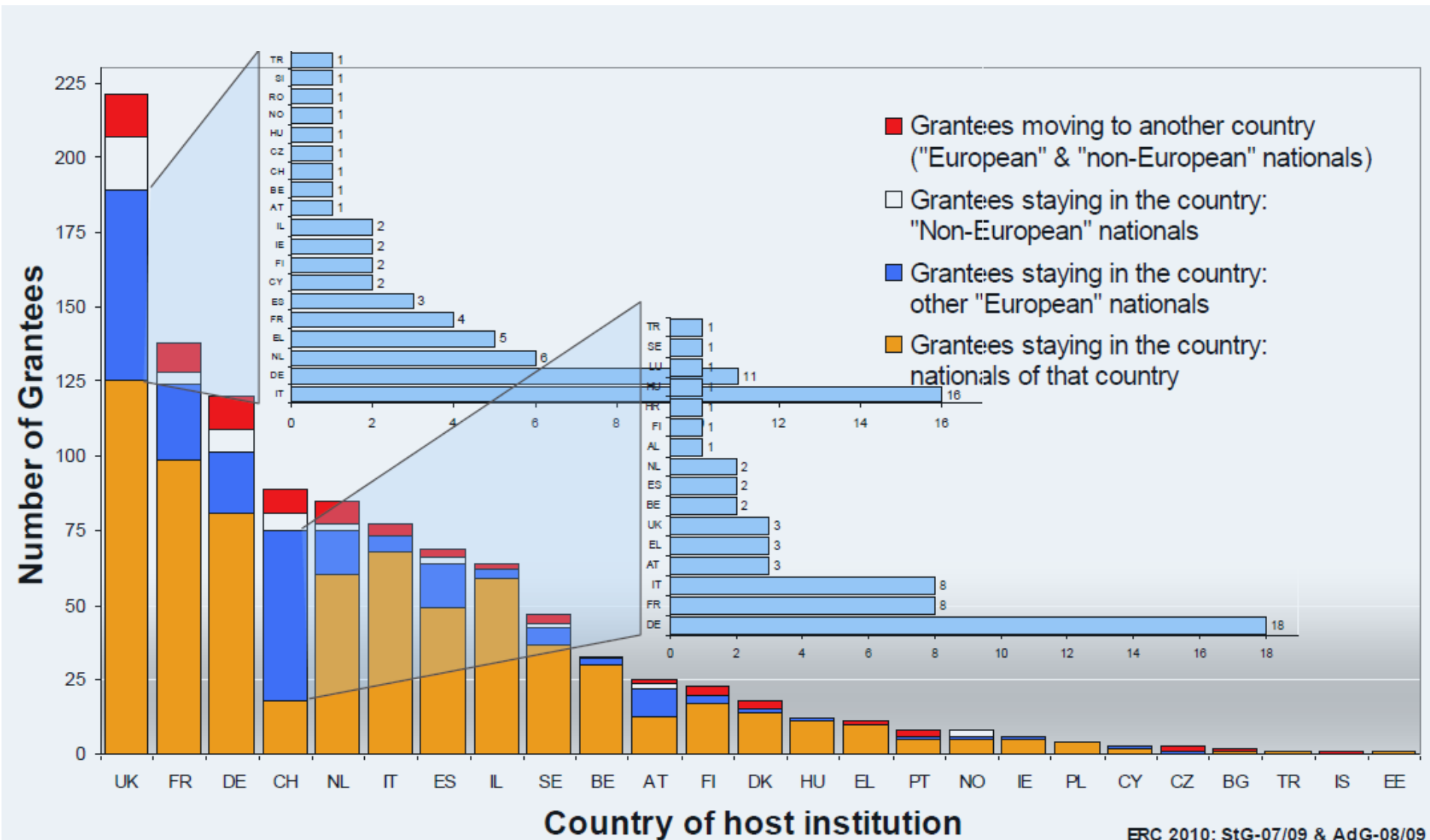


Kurt Wüthrich
Chemistry, 2002

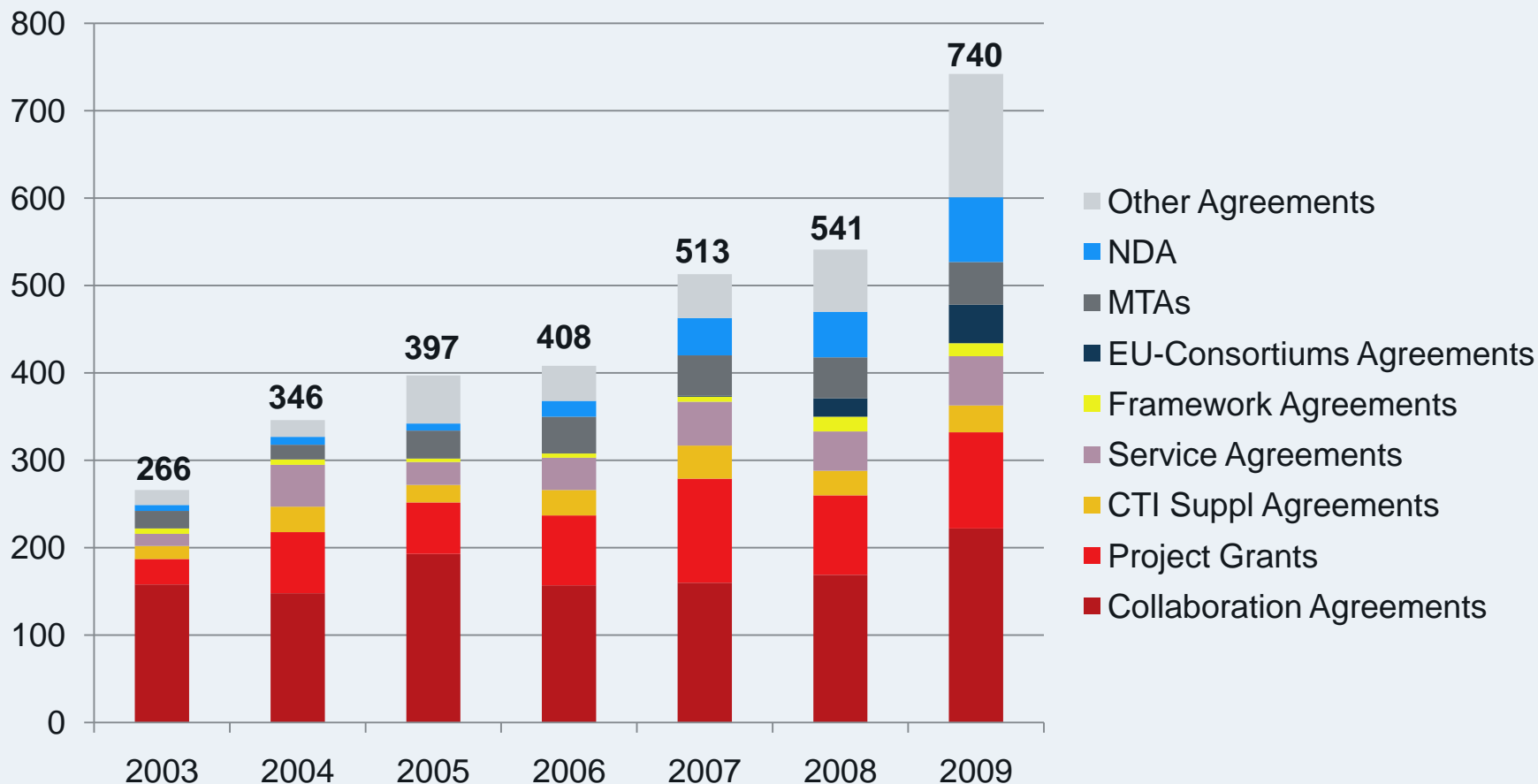
ETH is globally networked with other leading universities— a key factor for success



Within the EU, Switzerland is successfully attracting highly competitive European Research Council grants



From inventions to economic growth requires effective transfer of knowledge and technologies to industry partners



Research Agreements handled by ETH transfer

Examples of ETH Industry Partnerships

Research Program

Company commits to substantial research program covering several projects over several years

Examples



Ciba



Microsoft

Endowed Chair plus Research Program

Company sponsors a Chair in a field of interest and in addition commits to a substantial research program covering several projects over several years.

Examples

SIEMENS

syngenta

GLOBAL

Customized Partnership

Company and ETH collaborate in a particular way and substantially contribute to a collaboration for the mutual benefit of both parties

Examples

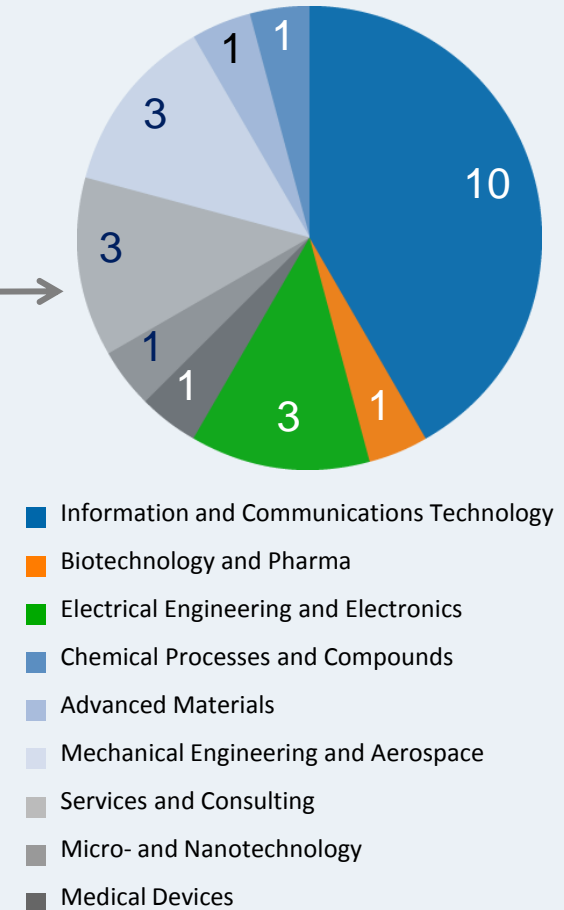
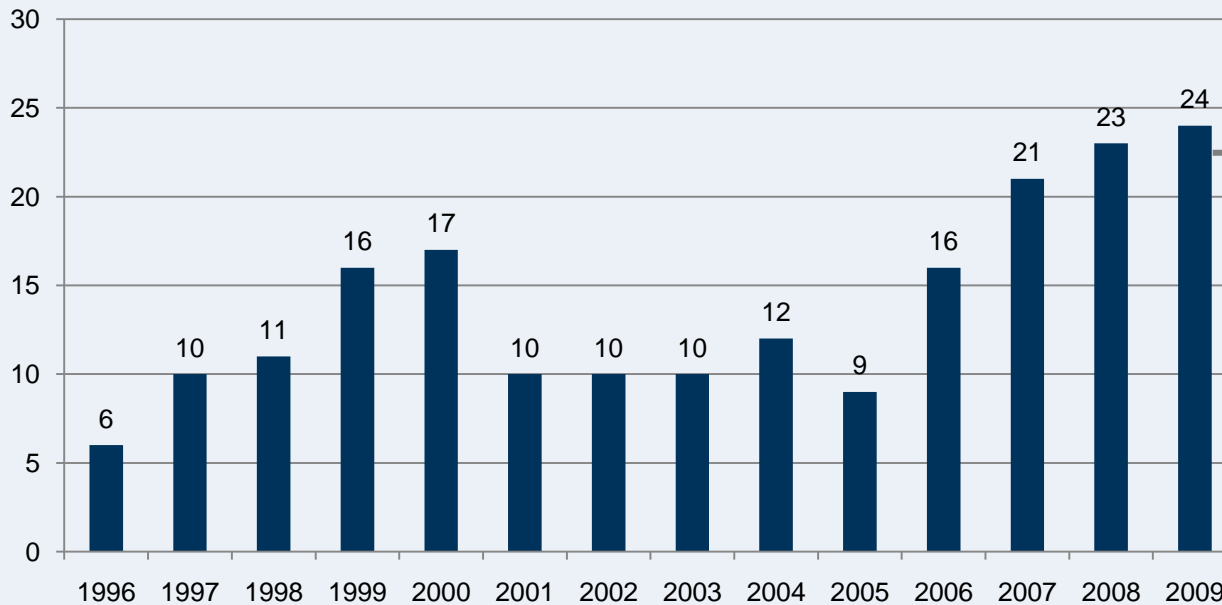


Nanoscale Exploratory Technology Laboratory (NETL) ETH Partnership with IBM

- Built by IBM until 2011 for CHF 60 Mio in Rüschlikon (Zurich).
- Jointly equipped by IBM und ETH for CHF 30 Mio.
- Leasing Agreement with ETH for 10 years.
- Joint and individual research projects possible for IBM and ETH.
- Additional industrial and academic partners are welcome in the NETL.

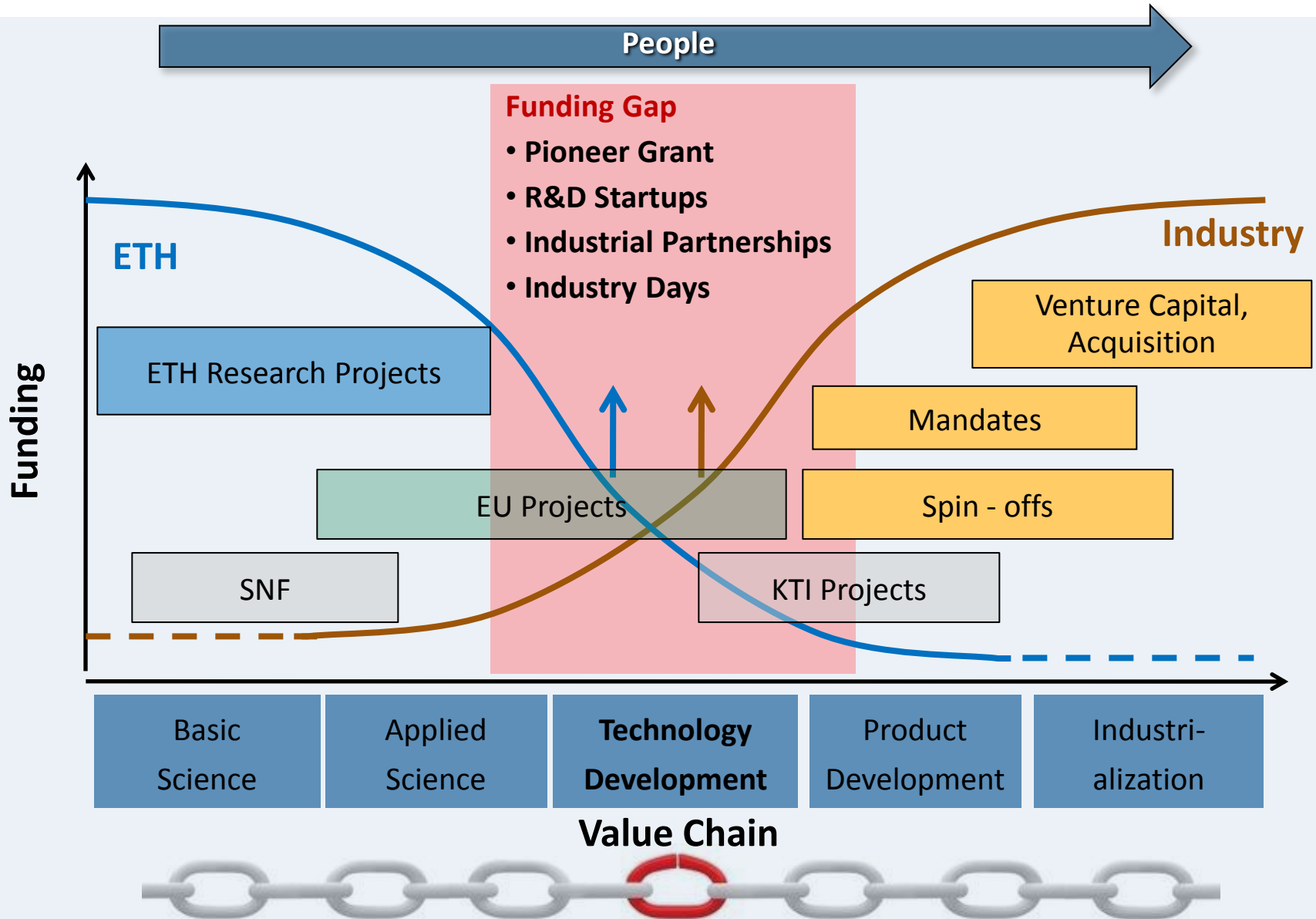


195 ETH Spin-offs started between 1996 and 2009



- ➔ 90% survival rate after five years
- ➔ Comparable number of spin-off companies per year as MIT

From research to application needs skilled people and innovative mechanisms to bridge the gap





Demographic change

We cannot afford the rising health care cost!



Urbanization

We cannot afford a crumbling urban infrastructure!



Climate change

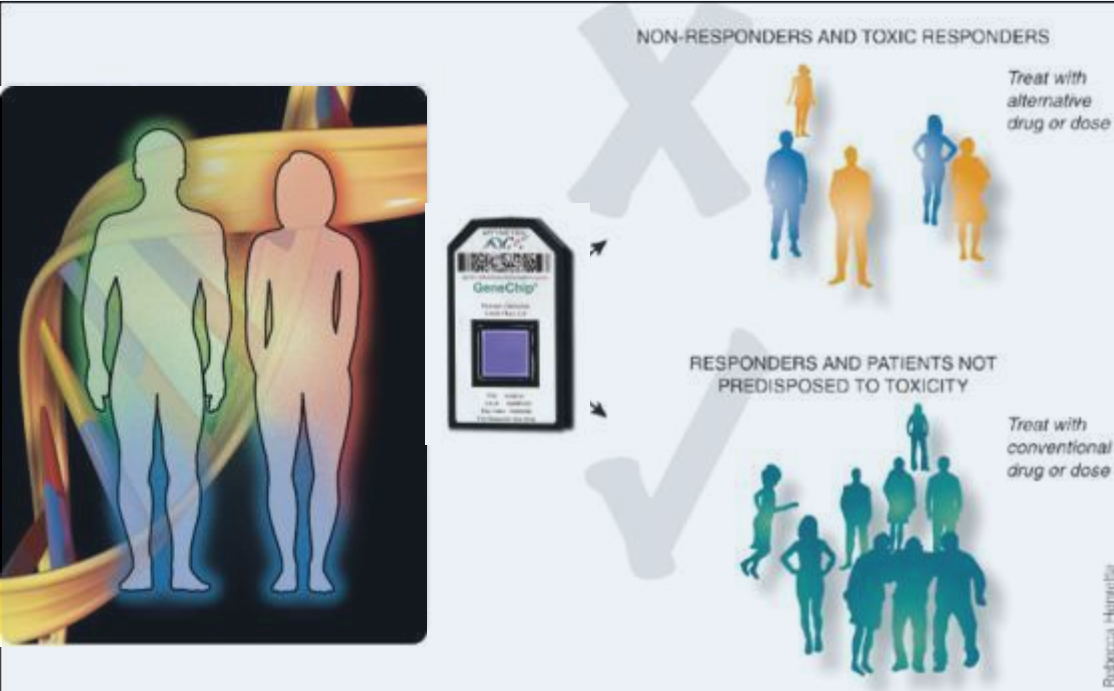
We cannot afford climate change!



Natural resources

We must look for sustainable renewable resources!

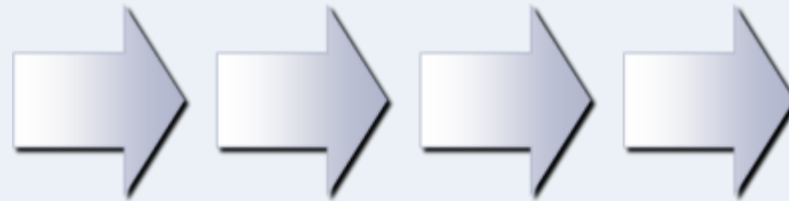
Personalized medicine will significantly improve medical therapies and create economic “win-win” benefits



Future economies must increasingly invest in the development of novel bio-based products and non-food crops

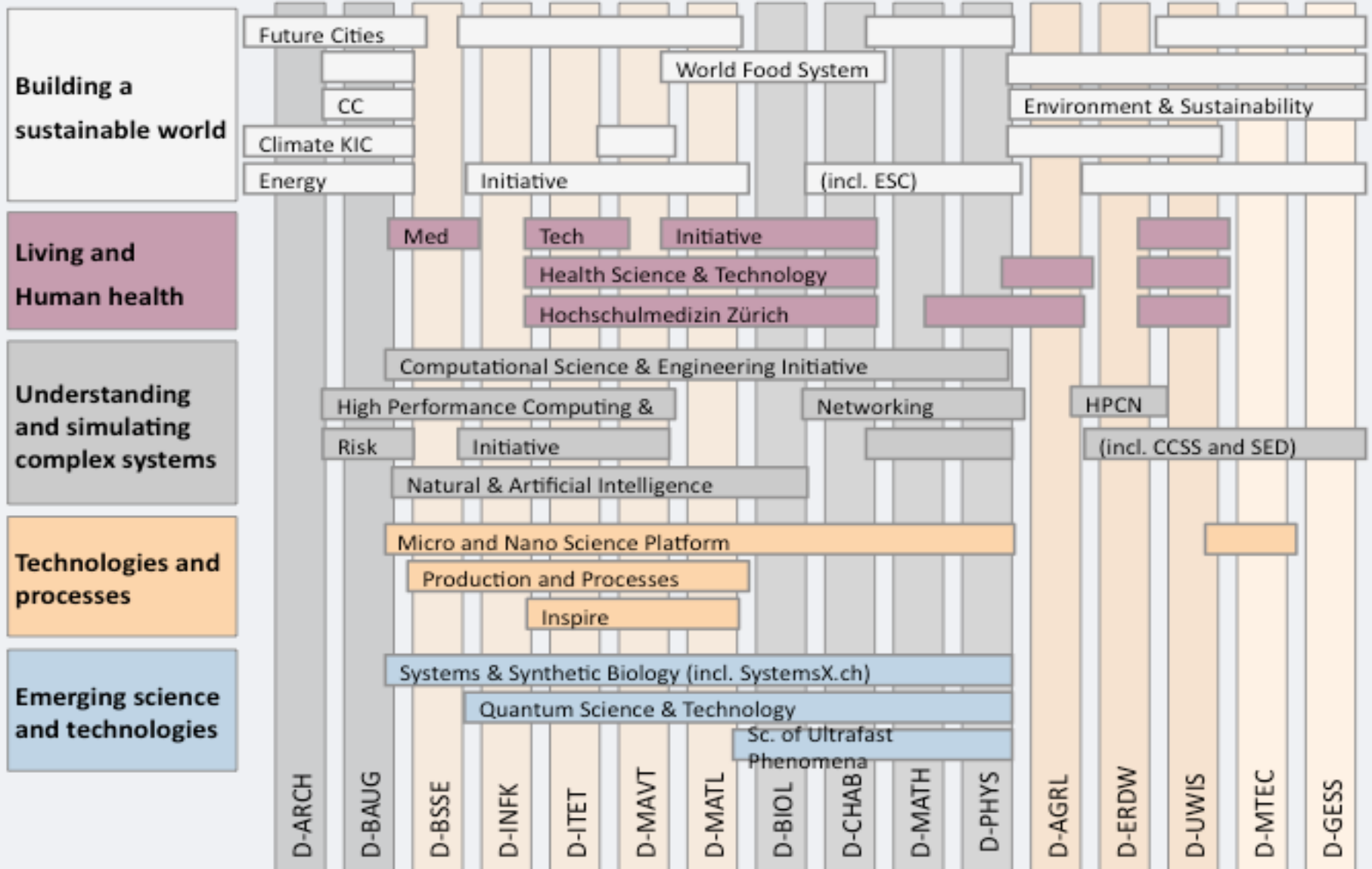



- increased yield
- bulk chemicals
- energy
- higher utility
- improved processing



Close working relationship between the research community, the growers, and the users of the bio-based feedstocks

The big challenges of the future— R&D across ETH departments to address future challenges



- 
- **Think globally**
 - **Identify future challenges**
 - **Invest locally to maximize global returns**
 - **Value education and research**
 - **Build strategic partnerships**
 - **Create opportunities**



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Economic Performance - Domestic Economy

GDP per capita

US\$ per capita

2009

1	Luxembourg	105758.38
2	Norway	79782.38
3	Switzerland	63693.09
4	Qatar	59983.64
5	Denmark	56239.44
6	Ireland	50922.46
7	Netherlands	47783.53
8	USA	46436.40
9	Austria	45979.28
10	Australia	44542.55
11	Finland	44486.11
12	Belgium	43488.05
13	Sweden	42744.16
14	France	41215.89
15	Germany	40882.93
16	Japan	39798.61
17	Canada	39588.52
18	Iceland	38050.83
19	Singapore	35514.74
20	Italy	35360.86



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21	United Kingdom		35225.68
22	Spain		31239.61
23	Hong Kong		30087.57
24	Greece		29300.90
25	New Zealand		26457.59
26	Israel		25945.55
27	Slovenia		23739.86
28	Portugal		21455.62
29	Czech Republic		18203.52
30	Korea		17037.36
31	Taiwan		16391.65
32	Slovak Republic		16218.47
33	Croatia		14241.52
34	Estonia		14237.96
35	Hungary		12857.95
36	Poland		11268.63
37	Lithuania		11173.66
38	Chile		9668.01
39	Venezuela		9007.92
40	Turkey		8741.38



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Economic Performance - Domestic Economy

GDP (PPP) per capita

Estimates; US\$ per capita at purchasing power parity

2009

1	Luxembourg	75565.81
2	Qatar	58237.07
3	Norway	57462.56
4	Singapore	46862.80
5	USA	46368.16
6	Hong Kong	42579.23
7	Switzerland	41288.38
8	Netherlands	39008.86
9	Ireland	38525.63
10	Australia	38169.57
11	Canada	37485.76
12	Austria	36419.09
13	Denmark	34951.56
14	Sweden	34663.82
15	Iceland	34331.45
16	Belgium	33954.18
17	Germany	33732.63
18	United Kingdom	33517.90
19	Finland	33209.78
20	Japan	32456.25

GDP (PPP) per capita (續)



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21	France		32088.18
22	Taiwan		31833.78
23	Italy		29746.45
24	Spain		29744.53
25	Greece		28720.31
26	Korea		27633.65
27	Israel		27350.90
28	New Zealand		26641.09
29	Slovenia		25431.76
30	Czech Republic		23422.53
31	Portugal		22648.47
32	Slovak Republic		21026.04
33	Hungary		18557.44
34	Estonia		17748.24
35	Poland		17549.40
36	Croatia		16657.61
37	Lithuania		15229.38
38	Russia		14658.64
39	Argentina		14323.21
40	Chile		14099.42

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Economic Performance - International Trade

Exports of goods

US\$ billions

2009

1	China Mainland		1201.53
2	Germany		1120.93
3	USA		1056.90
4	Japan		580.84
5	Netherlands		498.65
6	France		474.97
7	Italy		404.65
8	Belgium		369.76
9	United Kingdom		350.73
10	Taiwan		203.70
11	Switzerland		172.74
12	India		155.25
13	Austria		137.22
14	Sweden		130.74
15	Ireland		114.66
16	Denmark		93.10
17	Finland		62.59



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Economic Performance - International Trade

Exports of commercial services

US\$ billions

2009

1	USA		470.22
2	United Kingdom		239.71
3	Germany		214.80
4	France		140.38
5	China Mainland		128.70
6	Japan		124.32
7	Italy		100.95
8	Ireland		94.64
9	Netherlands		91.82
10	India		86.26
11	Belgium		74.60
12	Switzerland		68.21
13	Sweden		60.23
14	Denmark		54.64
15	Austria		53.19
16	Taiwan		30.92
17	Finland		25.04



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Economic Performance - International Trade

Balance of trade

US\$ billions (minus sign = deficit)



2009

1	China Mainland	195.85
2	Germany	189.49
3	Netherlands	52.85
4	Ireland	52.79
5	Japan	30.17
6	Taiwan	29.04
7	Singapore	24.05
8	Switzerland	17.15
9	Sweden	11.98
10	Denmark	10.21
11	Finland	2.55
12	Italy	-5.73
13	Hong Kong	-22.95
14	Greece	-39.51
15	France	-76.12
16	India	-88.39
17	United Kingdom	-129.16
18	USA	-546.87

Balance of trade (% of GDP)

Additional information



WORLD COMPETITIVENESS ONLINE

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Economic Performance - International Trade

Balance of trade

Percentage of GDP



2009

1	Ireland	23.25
2	Singapore	13.58
3	Taiwan	7.66
4	Netherlands	6.67
5	Germany	5.67
6	China Mainland	3.99
7	Switzerland	3.48
8	Denmark	3.29
9	Sweden	3.00
10	Finland	1.07
11	Japan	0.59
12	Italy	-0.27
13	France	-2.86
14	USA	-3.84
15	United Kingdom	-5.93
16	India	-7.39
17	Hong Kong	-10.89
18	Greece	-11.98

Global Competitiveness (2000)



Additional information

Table 2. Current Competitiveness Index Ranking

	Current Competitiveness Index Ranking 2000	Current Competitiveness Index Ranking 1999
Finland	1	2
United States	2	1
Germany	3	6
Netherlands	4	3
Switzerland	5	5
Denmark	6	7
Sweden	7	4
United Kingdom	8	10
Singapore	9	12
Australia	10	13
Canada	11	8
Belgium	12	15
Austria	13	11
Japan	14	14
France	15	9
Hong Kong	16	21
Iceland	17	22
Israel	18	20
New Zealand	19	16
Norway	20	18
Taiwan	21	19

Source: WEF Forum, 2000

參考資料

Switzerland					
 					
Economic Performance					
Macro-economic evaluation of the domestic economy					
Ranks	24	14	9	13	10
	2006	2007	2008	2009	2010
Sub-factors					
>> Domestic Economy	17	17	11	8	7
>> International Trade	28	19	14	25	8
>> International Investment	21	21	6	8	5
>> Employment	13	9	6	7	9
>> Prices	45	42	44	45	51
Total number of countries: 51 2005, 53 in 2006, 55 in 2007/2008, 57 in 2009, 58 in 2010					
© IMD WORLD COMPETITIVENESS ONLINE 1995-2010					

Switzerland - Overall Performance



» Overall Competitiveness

	2006	2007	2008	2009	2010
Rank	8	6	4	4	4

» Economic Performance

	2006	2007	2008	2009	2010
Rank	24	14	9	13	10

» Government Efficiency

	2006	2007	2008	2009	2010
Rank	8	3	3	3	3

» Business Efficiency

	2006	2007	2008	2009	2010
Rank	11	9	7	3	7

Basic Facts

	Value	Year
Population (million)	7.74	2009
Land area (km ² '000)	41.3	2008
GDP (\$ billion)	493.1	2009
GDP (PPP) per capita (\$)	41,288	2009
Real GDP growth (%)	-1.5	2009
Consumer price inflation (%)	-0.5	2009
Unemployment rate (%)	4.40	2009
Labor force (million)	4.73	2009
Current account balance (%)	8.34	2009

Switzerland					
Economic Performance International Trade					
	2006	2007	2008	2009	2010
Criteria (Values regularly updated)					
>> Current account balance (Background) US\$ billions (minus sign = deficit)	59.52	39.03	10.23	41.12	
>> Current account balance Percentage of GDP	15.21	8.99	2.05	8.34	
>> Balance of trade (Background) US\$ billions (minus sign = deficit)	6.46	10.90	17.14	17.15	
>> Balance of trade (Background) Percentage of GDP	1.65	2.51	3.43	3.48	
>> Balance of commercial services (Background) US\$ billions (minus sign = deficit)	26.87	32.68	40.07	34.15	
>> Balance of commercial services (Background) Percentage of GDP	6.86	7.53	8.01	6.93	

» Balance of trade (Background)	6.46	10.90	17.14	17.15
US\$ billions (minus sign = deficit)				
» Balance of trade (Background)	1.65	2.51	3.43	3.48
Percentage of GDP				
» Balance of commercial services (Background)	26.87	32.68	40.07	34.15
US\$ billions (minus sign = deficit)				
» Balance of commercial services (Background)	6.86	7.53	8.01	6.93
Percentage of GDP				
» World exports contribution				1.56
Percentage share of world exports (goods and commercial services)				
» Exports of goods	147.86	172.08	200.33	172.74
US\$ billions				
» Exports of goods	37.78	39.62	40.07	35.03
Percentage of GDP				
» Exports of goods - growth	12.93	16.38	16.42	-13.77
Percentage change based on US\$ values				
» Exports of commercial services	53.46	64.26	76.35	68.21
US\$ billions				
» Exports of commercial services	13.66	14.80	15.27	13.83
Percentage of GDP				
» Exports of commercial services - growth	10.20	20.20	18.82	-10.66
Percentage change based on US\$ values				
» Imports of goods & commercial services (Background)	167.99	192.75	219.47	189.65
US\$ billions				

Taiwan



Economic Performance

Macro-economic evaluation of the domestic economy

Ranks	25	16	21	27	16
	2006	2007	2008	2009	2010

Sub-factors

>> Domestic Economy	24	23	21	41	17
>> International Trade	30	16	28	30	10
>> International Investment	42	42	44	50	39
>> Employment	21	22	22	21	25
>> Prices	29	14	14	11	12

Total number of countries: 51 2005, 53 in 2006, 55 in 2007/2008, 57 in 2009, 58 in 2010

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Taiwan - Overall Performance



» Overall Competitiveness

	2006	2007	2008	2009	2010
Rank	17	18	13	23	8

» Economic Performance

	2006	2007	2008	2009	2010
Rank	25	16	21	27	16

» Government Efficiency

	2006	2007	2008	2009	2010
Rank	23	20	16	18	6

» Business Efficiency

	2006	2007	2008	2009	2010
Rank	13	17	10	22	3

Basic Facts

	Value	Year
Population (million)	23.12	2009
Land area (km ² '000)	36.0	2008
GDP (\$ billion)	379.0	2009
GDP (PPP) per capita (\$)	31,834	2009
Real GDP growth (%)	-1.9	2009
Consumer price inflation (%)	-0.9	2009
Unemployment rate (%)	5.85	2009
Labor force (million)	10.92	2009
Current account balance (%)	11.23	2009

Taiwan					
Economic Performance					
International Trade					
	2006	2007	2008	2009	2010
Criteria (Values regularly updated)					
>> Current account balance (Background)	26.30	32.98	25.12	42.57	
US\$ billions (minus sign = deficit)					
>> Current account balance	6.99	8.39	6.24	11.23	
Percentage of GDP					
>> Balance of trade (Background)	21.32	27.43	15.18	29.04	
US\$ billions (minus sign = deficit)					
>> Balance of trade (Background)	5.66	6.98	3.77	7.66	
Percentage of GDP					
>> Balance of commercial services (Background)	-2.89	-3.25	0.20	1.63	
US\$ billions (minus sign = deficit)					
>> Balance of commercial services (Background)	-0.77	-0.83	0.05	0.43	
Percentage of GDP					

>> Balance of trade (Background)	21.32	27.43	15.18	29.04
US\$ billions (minus sign = deficit)				
>> Balance of trade (Background)	5.66	6.98	3.77	7.66
Percentage of GDP				
>> Balance of commercial services (Background)	-2.89	-3.25	0.20	1.63
US\$ billions (minus sign = deficit)				
>> Balance of commercial services (Background)	-0.77	-0.83	0.05	0.43
Percentage of GDP				
>> World exports contribution				1.52
Percentage share of world exports (goods and commercial services)				
>> Exports of goods	224.02	246.68	255.63	203.70
US\$ billions				
>> Exports of goods	59.53	62.75	63.48	53.75
Percentage of GDP				
>> Exports of goods - growth	12.89	10.12	3.63	-20.31
Percentage change based on US\$ values				
>> Exports of commercial services	28.86	31.02	34.49	30.92
US\$ billions				
>> Exports of commercial services	7.67	7.89	8.56	8.16
Percentage of GDP				
>> Exports of commercial services - growth	12.85	7.47	11.20	-10.35
Percentage change based on US\$ values				
>> Imports of goods & commercial services (Background)	234.45	253.52	274.74	203.96
US\$ billions				
>> Imports of goods & commercial services (Background)	62.30	64.49	68.23	53.82