

Innovaatiot kasvun moottoriksi II
IPR-talous ja aineeton pääoma - luovien
alojen tuotannolla Suomi nousuun
19.1.2016
Kauppakorkeakoulu

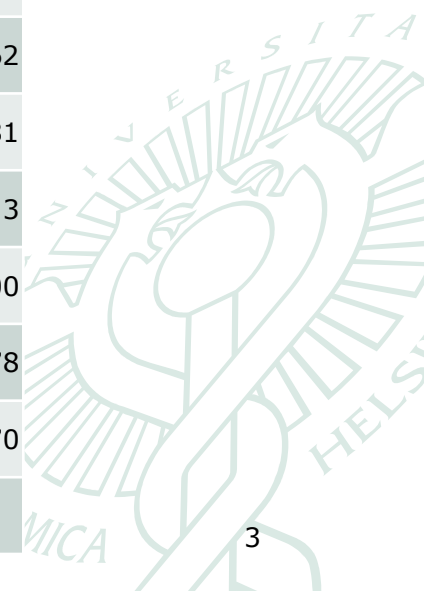
Professor Arto Lahti
Aalto University

Arto Lahti

- Professor Arto Lahti, Aalto University is a man of action, worked in practice e.g. in Kone, and been a presidential candidate for Finland.
- He has been a board member in 30 SMEs and a specialist for e.g. Ministry of Finance, Council of Nordic Governments, and tens of cities; for OKO Bank, Electrolux and TeliaSonera; and for 300 growth firms in 10 EU-nations.
- He has written 50 books of e.g. IO, strategic marketing, growth firms, globalization, public governance, and firm valuation.
- He has been chairman for Finland's Federation of Scholarly Association of Management and for many others and Ambassador of Malik Institute (leading institute of complex, global decision-making).
- The book just published:
- Innovation competition in global markets and Schumpeter's entrepreneur, LAP LAMBERT Academic Publishing GmbH & Co.
- German Hidden Champions: The EU's best option in global B2B markets!, LAP LAMBERT Academic Publishing GmbH & Co.
- 10 in Elisa book kirja and 5 more coming

Top economies in 2013. Sources: IMF World Economic Outlook,

2013 RANKING	COUNTRY	GDP BASED ON VALUATION \$BILLION PPP	EXPORTS OF COMMODITIES \$BILLION	TRADE BALANCE \$BILLION
1	United States	16,768	1,575	-688
2	China	16,149	2,210	+226
3	India	6,776	313	-152
4	Japan	4,667	697	-117
5	Germany	3,512	1,493	+262
6	Russia	3,491	515	+181
7	Brazil	3,012	244	+3
8	France	2,534	578	-100
9	Indonesia	2,389	178	178
10	United Kingdom	2,320	813	-170
	World	74,699	17,974	



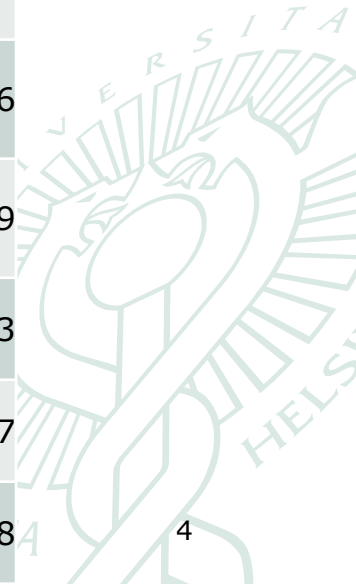
Leading EU countries in commodity exports

HSE

Ranking	Good/ commodity \$Billion 2014	Germany	FRANCE	ENGLAND	ITALY
1	Vehicles other than railway, tramway	267	47	54	38
2	Machinery, nuclear reactors, boilers	262	66	71	107
3	Electrical, electronic equipment	147	44	32	29
4	Pharmaceutical products	79	35	33	25
5	Plastics and articles thereof	70	23	13	21
6.	Optical, photo, technical, medical	68	17	19	12
7	Aircraft, spacecraft, and parts thereof	47	57	17	6
8	Mineral fuels, oils, distillation products	47	21	56	19
9	Articles of iron and steel + iron/ steel	63	25	17	33
10	Organic chemicals	33	13	12	7
	All products	1,508	582	472	528



Accredited by Association of MBAs

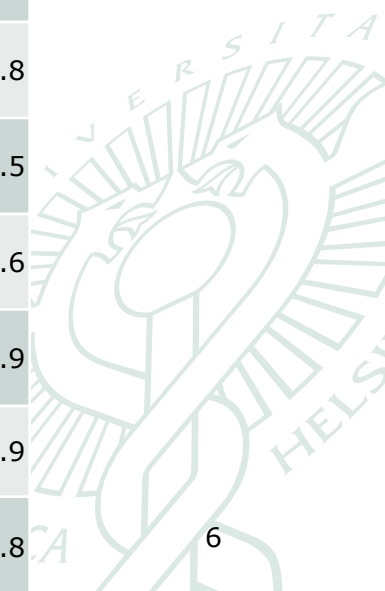


Nordic countries in commodity exports

Ranking	Good/ commodity \$Billion 2014	SWEDEN	DENMARK	FINLAND	NORWAY
1	Machinery, nuclear reactors, boilers, et	25.4	14.9	9.8	7.6
2	Electrical, electronic equipment	17.5	10.3	6.4	3.4
3	Vehicles other than railway, tramway	16.0	2.6	3.4	0.8
4	Mineral fuels, oils, distillation products	13.2	7.7	8.0	94.1
5	Paper, board, pulp, cellulose, wood	17.6	2.9	11.5	1.1
6.	Pharmaceutical products	7.5	12.1	1.1	0.9
7	Articles of iron and steel + iron/steel	9.7	4.8	6.3	2.7
8	Plastics and articles thereof	5.8	2.6	2.7	0.5
9	Optical, photo, technical, medical	4.4	4.2	2.9	2.3
10	All food	3.7	14.6	0.7	10.8
	All products	164.3	109.7	74.1	146.1

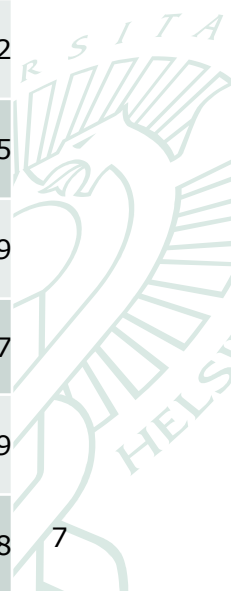
Leading service exporters

2014 Ranking	Country \$billion	2005	2008	2011	2014
1	United States	377.3	535.6	619.1	709.3
2	United Kingdom	207.6	208.9	296.3	333.9
3	Germany	163.3	255.8	273.7	272.3
4	France	122.3	165.3	235.4	268.4
5	China	74.4	147.1	176.4	223.4
6	Holland	92.3	125.8	138.2	188.8
7	Japan	77.5	148.3	145.5	162.5
8	India	52.5	107.1	138.7	154.6
9	Spain	94.3	143.0	143.2	135.9
10	Ireland	59.9	99.5	113.2	133.9
	World (WTO)	2 529.2	3 845,4	4 283.0	4 775.8



Leading service exporters in EU

Rank	\$Billion 2014	THE US	Germany	France	England	Holland
1	Business services	127.6	76.8	84.0	93.0	43.9
2	Transport	89.8	57.9	51.5	39.2	32.7
3	Travel	177.4	43.1	56.2	46.3	15.5
4	Telecommunication	34.2	29.3	18.3	20.9	1.8
5	Financial services	87.2	20.5	14.3	75.7	0.7
6.	Insurance and pension	16.4	9.7	6.8	33.6	3.2
7	Communications cultural services (year 2013)	0.7	1.5	4.1	4.0	6.5
8	Maintenance, manufacturing construction	22.2	7.9	12.5	5.0	11.9
9	Government goods	21.8	5.2	1.2	4.3	0.7
10	Intellectual property	131.6	13.5	12.3	14.9	34.9
	All services	709.4	271.4	268.4	341.5	188.8



Leading countries in service exports

\$Billion	value 2010	value 2011	value 2012	value 2013	value 2014
Travel	947	1,058	1,096	1,165	1,063
Business services	981	1,125	1,160	1,157	933
Transport	799	869	879	887	846
Financial services	278	314	306	330	410
Telecommunication services	71	80	80	72	365
Intellectual property	255	289	292	285	309
Insurance and pension	96	104	103	100	121
Manufacturing and construction	96	103	104	96	213
Government goods	67	74	74	68	65
Communications cultural services	126	141	146	149	147
	2,222	2,252	2,142	2,225	2,222

Leading countries in service exports

Ranking	Good/ commodity \$Billion 2014	Sweden	Denmark	Finland	Norway
1	Other business services	20.1	9.5	4.3	13.8
2	Transport	10.9	43.4	3.5	22.0
3	Travel	12.9	7.2	4.0	5.6
4	Telecommunication	16.1	3.2	5.8	2.5
5	Financial services	4.7	0.9	0.3	3.1
6.	Insurance and pension	0.9	0.3	0.2	0.3
7	Communications and cultural services (year 2013)	0.4	0.5	0.1	0.4
8	Maintenance, manufacturing and construction	1.0	4.0	3.8	1.2
9	Government goods	0.4	0.3	0.1	0.1
10	Intellectual property	8.8	2.5	3.2	0.3
	All services	77.0	72.3	27.5	49.5

Internet Usage in Europe

Country	Internet users 2014 Million	Penetration (% Population)	Facebook -2012 Million
Russia	87,4	61.4	7.9
Germany	71.7	88.6	25.3
United Kingdom	57.2	89.8	32.9
France	55.2	83.3	25.6
Turkey	46.2	56.7	32.1
Italy	36.0	58.5	23.2
Spain	35.7	74.8	17.5
Poland	25.6	66.9	9.8
Ukraine	18.5	41.8	2.3
Netherlands	16.1	95.7	7.5
Sweden	9.2	94.8	4.9
Belgium	9.4	90.4	4.9
Hungary	7.3	74.5	4.6
Switzerland	7.1	89.1	3.0
Austria	7.1	86.8	2.9
Greece	6.4	59.9	3.8
Finland	5.1	97.1	2.8



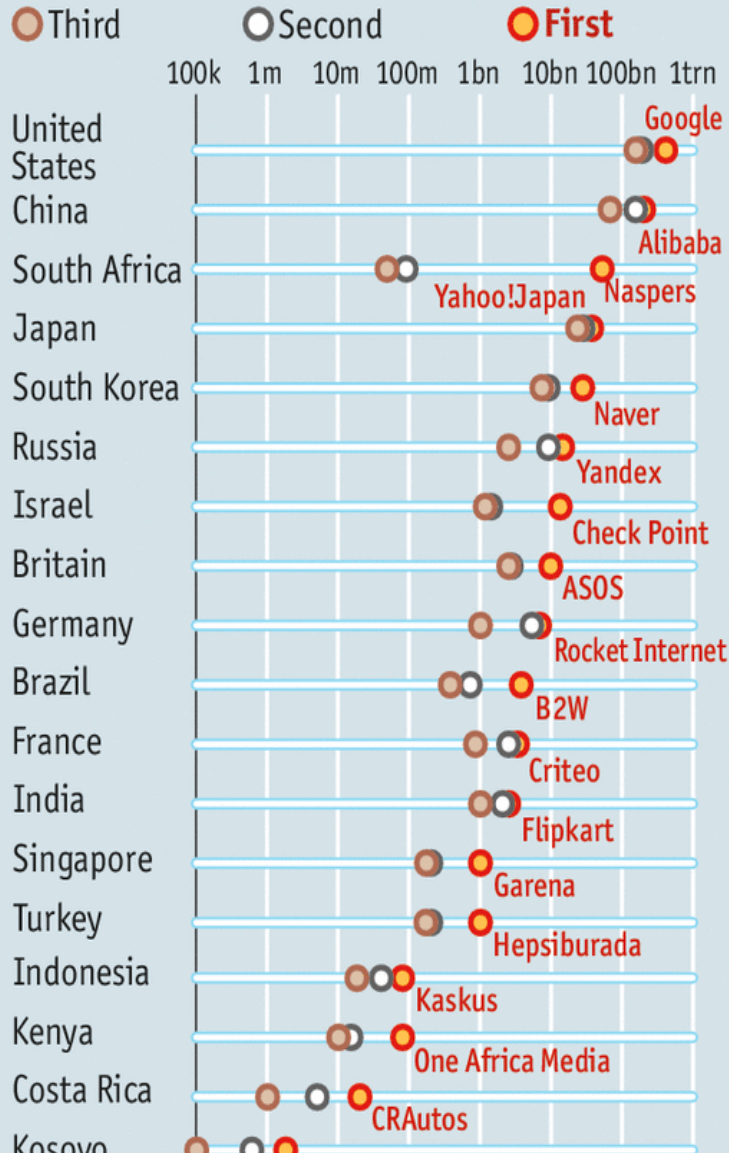
HSE Internet Usage Globally

World Regions	Internet users 2014 Million	Penetration (% Population)	Growth 2000-2014
Africa	297,885,898	26.5	7.9
Asia	1,386,188,112	34.7	25.3
Europe	582,441,059	70.5	32.9
Middle East	3,284,800	48.3	25.6
North America	310,322,257	87.7	32.1
Latin America	320,312,562	52.3	23.2
Oc./ Australia	26,789,942	72.9	17.5
WORLD TOTAL	3,035,749,340	42.3	2.3

Leading Internet companies

Three biggest internet firms in each country

Peak market valuation, selected countries, log scale, \$



Leading brands

Brand	Country	Industry	Value \$m
1. Apple	United States	Technology	98,316
2. Google	United States	Technology	93,291
3. Coca-Cola	United States	Beverages	78,808
4. IBM	United States	Business Services	78,808
5. Microsoft	United States	Technology	59,546
6. GE	United States	Diversified	46,947
7. McDonald's	United States	Restaurants	41,992
8. Samsung	South Korea	Technology	39,610
9. Intel	United States	Technology	37,257
10. Toyota	Japan	Automotive	35,346
11. Mercedes-Benz	Germany	Automotive	31,904
12. BMW	Germany	Automotive	31,839
13. Cisco	United States	Technology	29,053
14. Disney	United States	Media	28,147
15. HP	United States	Technology	25,843
16. Gillette	United States	FMCG	25,105
17. Louis Vuitton	France	Luxury	24,893
18. Oracle	United States	Technology	24,088

Revolution in mobile phones

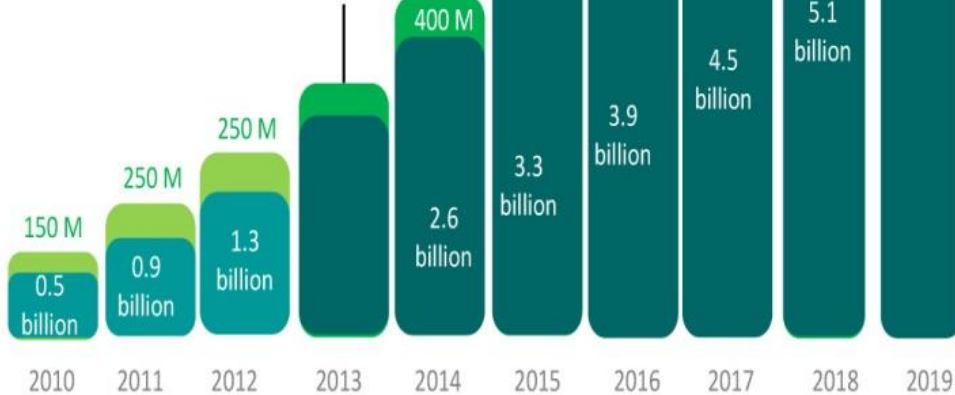
Smartphones, mobile PCs, tablets and mobile routers with cellular connection

800 million mobile PCs, tablets and mobile router subscriptions

300 million mobile PCs, tablets and mobile router subscriptions

1.9 billion smartphone subscriptions

5.6 BILLION smartphone subscriptions by the end of 2019



Mobile PCs, tablets and mobile router subscriptions

Smartphone subscriptions

Biggest IT companies

Yrityksen nimi	Pääkonttori	Liikevaihto (mrd. dollaria)	Työntekijät tuhansia
1. Apple Inc.	Cupertino, CA, USA	233	215
2. Samsung	Suwon, South Korea	189	326
3. Foxconn	New Taipei City, Taiwan	132	1.290
4. HP	Palo Alto, CA, USA	111	317
5. IBM	Armonk, NY, USA	92	379
6. Amazon.com	Seattle, WA, USA	88	154
7. Microsoft	Redmond, WA, USA	86	128
8. Sony	Tokyo, Japan	72	140
9. Google	Mountain View, CA, USA	66	53
10. Panasonic	Osaka, Japan	64	271
11. Dell	Austin, TX, USA	56	108
12. Intel	Santa Clara, CA, USA	55	106
13. LG Electronics	Seoul, South Korea	54	38
14. Toshiba	Tokyo, Japan	54	201

Biggest Internet companies

Yrityksen nimi	Pääkonttori	Liike-vaihto mrd. dollaria	Työn- tekijät tuhansia	Markkina- arvo mrd. dollaria
1. Amazon.com	Seattle, USA	88	154	175
2. Google	Mountain View, USA	66	53	502
3. JD.com	Beijing, China	18	62	39
4. eBay	San Jose, USA	17	34	69
5. Tencent	Shenzhen, China	12	25	144
6. Facebook	Menlo Park, USA	12	9	222
7. Alibaba	Hangzhou, China	8	26	246
8. Priceline Group	Norwalk, USA	8	12	63
9. Expedia, Inc.	Bellevue, USA	5	10	11
10. Rakuten	Tokyo, Japan	5	10	13
11. Netflix	Los Gatos, USA	5	2	33
12. Baidu	Beijing, China	5	34	78
13. Yahoo	Sunnyvale, USA	4	12	41
14. Salesforce.com	San Francisco, USA	4	13	39
15. Groupon	Chicago, USA	3	10	5
16. LinkedIn	Mountain View, USA	2	6	32
17. NetEase	Guangzhou, China	2	7	13
18. Twitter	San Francisco, USA	1	3	31
19. ASOS.com	London, UK	1	7	4
20. Trip Advisor	Newton, USA	1	2	12
US yhtiöt yht.		217	320	1.374
muut yht.		51	170	547

Biggest software companies

Yrityksen nimi	Pääkonttori	Liikevaihto (mrd. dollaria) 2014	Markkina-arvo (mrd. dollaria) 2014
Microsoft	Redmond, WA, USA	86	385
Oracle	Redwood, CA, USA	38	85
SAP	Walldorf, Germany	23	85
Symantec	Mountain View, USA	6	17
VMware	Palo Alto, USA	6	35
Fiserv	Brookfield, USA	4	17
CA Technologies	Islandia, USA	4	13
Intuit	Mountain View, USA	4	26
Salesforce.com	San Francisco, USA	4	37
Amadeus IT	Madrid, Spain	4	17

Biggest tele-companies in Nordic countries

Yrityksen nimi	Pääkonttori	Liikevaihto milj. euroa	Työntekijät	Voitto milj. euroa
1. Telenor ASA	Norja	11 774	35 000	2 152
2. TeliaSonera AB	Ruotsi	10 620	24 951	2 113
3. TDC A/S	Tanska	3 135	6 396	479
4 Tele2 AB	Ruotsi	2 727	5 484	367
5 Telenor Norge AS	Norja	2 497	5 484	793
6. Elisa Oyj	Suomi	1 535	4 138	277
7. Eltel AB	Ruotsi	1 242	8 439	7
8. Telenor Sverige AB	Ruotsi	1 211	1 874	320
9. DNA Oy	Suomi	649	1 296	19
10. Relacom Management AB	Ruotsi	500	3 833	
11. Com Hem Holding AB	Ruotsi	500	1 015	
12. HI3G Denmark ApS	Tanska	412	660	48
13. Teracom Boxer Group AB	Ruotsi	401	741	53
14. TDC Sverige AB	Ruotsi	318	791	9
15. Canal Digital Kabel Tv AS	Norja	301	141	43
16. Get AS	Norja	286	909	81
17. Canal Digital Norge AS	Norja	252	103	
18. Broadnet Topholding AS	Norja	249	450	
19. Broadnet Midholding AS	Norja	249	450	
20. Telenor Global Services AS	Norja	204	68	8

Biggest softa-companies in Nordic countries

Yrityksen nimi	Pääkonttori	Liike-vaihto milj. euroa	Työntekijät	Voitto milj. euroa
1. Microsoft Mobile Oy	Suomi	5 245	22 309	2 152
2. Tieto Oyj	Suomi	1 545	24 951	2 113
3. TDC A/S	Tanska	1 522	6 396	479
4. Every ASA	Norja	1 411	5 484	367
5. Atea Sverige AB	Ruotsi	1 041	5 484	793
6. Evry Norge AS	Norja	800	4 138	277
7. Mhwirth AS	Norja	795	8 439	7
8. Visma AS	Norja	786	1 874	320
9. CGI Suomi Oy	Suomi	615	1 296	19
10. Tieto Sweden AB	Ruotsi	495	3 833	
11. eWork Scandinavia AB	Ruotsi	495	1 015	
11. CGI Suomi Oy	Suomi	407	660	48
13. Fujitsu Finland Oy	Suomi	405	741	53
14. Madasplayer AB	Ruotsi	358	791	9
15. Forenede A/S	Tanska	324	141	43
16. IFS AB	Ruotsi	318	909	81
17. IBM Oy	Suomi	279	103	
18. Fujitsu Sweden AB	Ruotsi	277	450	
19. Capgemini Sverige AB	Ruotsi	270	450	
20. Evry Nordic Sverige AB	Ruotsi	251	68	8

Biggest Internet content providers in Nordic countries

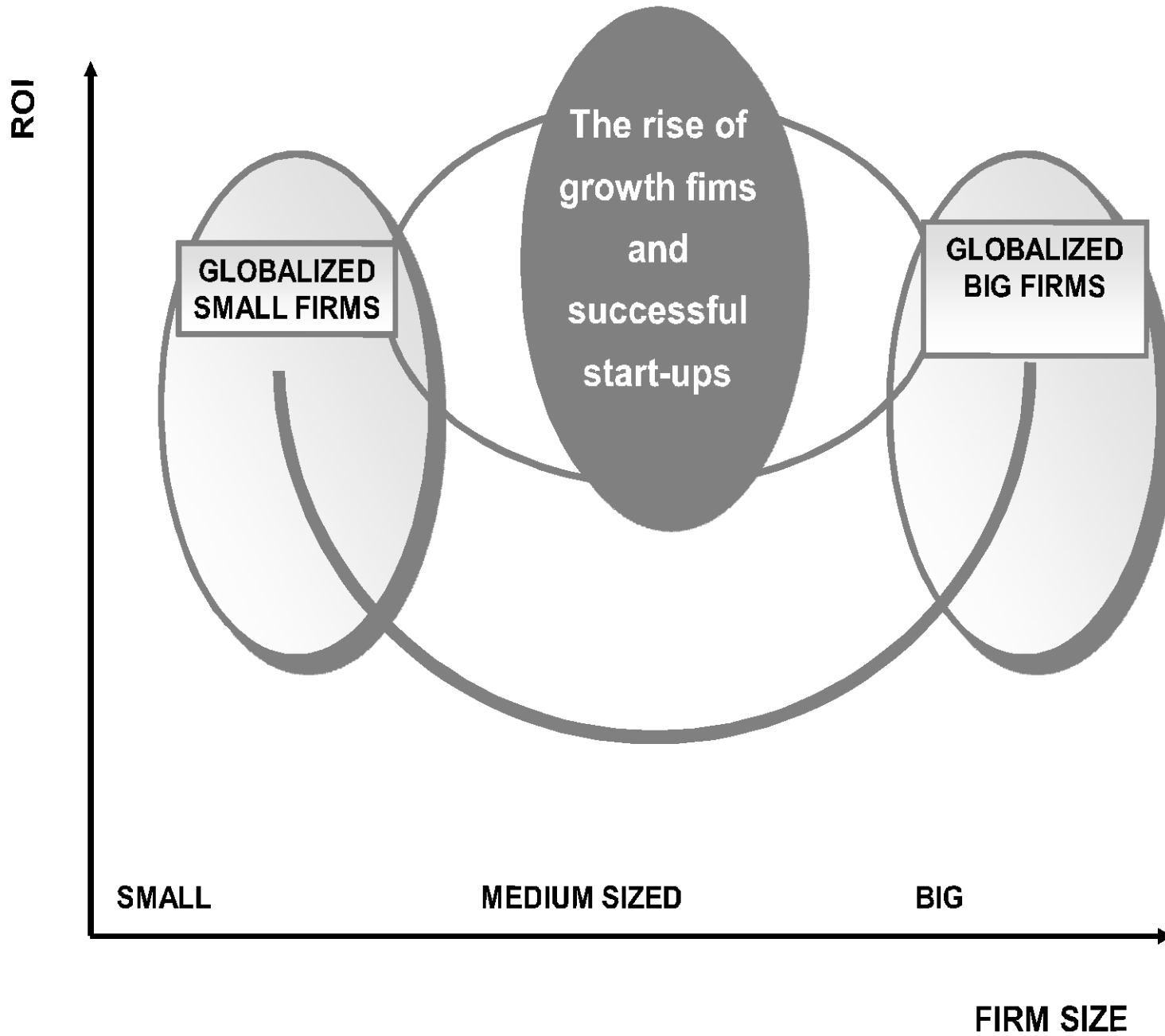
Yrityksen nimi	Pääkonttori	Liikevaihto milj. euroa
1. Spotify AB	Ruotsi	580
2. Eniro AB	Ruotsi	315
3. IBM Ab Oy	Suomi	279
4. Capgemini Sverige AB	Ruotsi	251
5. Evry AB	Ruotsi	167
6. Nordic Processor AB	Tanska	147
7. Pinnacle Sweden AB	Ruotsi	99
8. Spotify Norway AS	Norja	84
9. Eniro Norge AS	Ruotsi	84
10. Unit4 AB	Ruotsi	70
11. Telecomputing Norway AS	Norja	69
12. TT Nyhetsbyrån AB	Ruotsi	69
13. Bluegarden A/S	Tanska	65
14. Bisnode Sverige AB	Ruotsi	52
15. Cegal Blueback AS	Norja	51
16. Forsikringens Datacenter A/S	Tanska	47
17. Thomson Reuters (Markets) Norge AS	Norja	46
18. Cegal AS	Norja	43
19. Arek Oy	Suomi	41
20. Dolphin Group ASA	Norja	40
21. Enfo Zender Oy	Tanska	37
22. Silkeborg Data A/S	Tanska	36
23. Thomson Reuters (Markets) Sverige AB	Ruotsi	35
24. Förlagssystem Jal, AB	Ruotsi	34
25. Interoute Managed Services AB	Ruotsi	33

Biggest logistical service providers for companies in Nordic countries

Yrityksen nimi	Pääkonttori	Liikevaihto milj. euroa
1. Stora Enso Logistics AB	Ruotsi	632
2. DSV Road AB	Ruotsi	512
3. Ikea of Sweden AB	Ruotsi	418
4. Harding Trading AS	Norja	162
5. Brodviik AB	Ruotsi	99
6. Hummel Holding A/S	Tanska	94
7. Reaxcer AB	Ruotsi	92
8. XR Logistik AB	Ruotsi	90
9. TT Nyhetsbyrån AB	Ruotsi	69
10. Vita Huset i Nyköping AB	Ruotsi	68
11. Vob & T Holding AB	Ruotsi	66
12. Active Brands AS	Norja	55
13. Tengbomgruppen ab	Ruotsi	50
14. Panorama Gruppen AS	Norja	49
15. Borgstena Group Sweden AB	Ruotsi	48
16. Enegia Consulting Oy	Suomi	45
17. 07 Media AS	Norja	44
18. Viafin Oy	Suomi	42
19. BM Agri Holding AB	Suomi	41
20. Riis Retail A/S	Tanska	38
21. Norbeam AS	Norja	34
22. Ess Hotell AB	Ruotsi	31
23. Melker Andersson AB	Ruotsi	31
24. Vallila Interior Ab, Oy	Suomi	31
25. Eezy Osk	Suomi	30

Biggest tv-companies in Nordic countries

Yrityksen nimi	Pääkonttori	Liikevaihto milj. euroa
1. Modern Times Group MTG AB	Ruotsi	1 654
2. Norsk Rikskringkasting AS	Norja	633
3. DR	Tanska	518
4. Yleisradio Oy	Suomi	472
5. Sveriges Television AB	Ruotsi	456
6. Tv 2 AS	Norja	390
7. Viasat AB	Ruotsi	296
8. Sveriges Radio AB	Ruotsi	271
9. MTV Sisällöt Oy	Suomi	237
10. Discovery Networks Norway AS	Norja	169
11. TV 2 Networks A/S	Ruotsi	132
12. Boxer TV A/S	Tanska	83
13. Canal Digital Danmark A/S	Ruotsi	71
14. Viasat Satellite Services AB	Ruotsi	56
15. Bauer Media Group AB	Ruotsi	44
16. MTG TV AB	Ruotsi	27
17. HBO Nordic AB	Ruotsi	23
18. Bauer Media AS	Norja	20
19. BM Agri Holding AB	Ruotsi	41
20. Ob-Team AS	Norja	18
21. Bauer Media Oy	Suomi	15
22. Radiotjänst i Kiruna AB	Ruotsi	15
23. MTG TV A/S	Tanska	15
24. Warner Bros. Sverige AB	Ruotsi	12



Kondratieff's long-waves

	Description	Period	Key Factors of Technological Change
	First Kondratieff	1780s–1840s	Industrial Revolution: factory production for textiles
	Second Kondratieff	1840s–1890s	Invention of steam power and its application in railways
	Third Kondratieff	1890s–1940s	Invention of electricity, steel, etc. and their applications in the process industry
	Fourth Kondratieff	1940s–1980s	Mass production of automotive and synthetic materials, especially petroleum
	Fifth Kondratieff	1980s–2010s	Digital information techniques, the internet and micro-electronics
	Sixth Kondratieff	2010s-?	Nano engineering and manufacturing/ revolution in material technologies



Global R&D (Billion US dollars) Spending, Forecast PPP, Purchasing Power Parity, GERD (Gross Expenditures on R&D) Source: Battelle, R&D Magazine 2012, 2014

Country/ Region/ Year	2011	2012	2013	2014
US	412	418	423	465
Brazil	27	29	31	33
Canada	27	28	30	30
America (21 countries)	485	494	507	504
Japan	156	159	161	163
China	177	197	220	258
India	38	40	45	42
Korea	53	55	57	61
Asia (20 countries)	487	518	554	633
Germany	89	90	91	92
France	49	50	50	52
England	41	42	42	44
Russia	35	37	38	40
Italy	24	24	24	23
Spain	20	20	19	22
Sweden	14	14	14	14
Netherlands	13	13	13	15
Finland	7	7	7	7
Europe (34 countries)	342	346	349	351
Wold total	1.394	1469	1.496	1.618

Total patent applications by field of technology (top ones) in 2010 Source: WIPO Statistics Database, April 2010

Technology field	Patent applications
Electrical engineering	
Computer technology	145,282
Electrical machinery, apparatus, energy	120,547
Instruments	
Optics	81,770
Medical technology	80,678
Chemistry	
Pharmaceuticals	69,638
Basic materials chemistry	42,191
Mechanical engineering	
Transport	79,659
Mechanical elements	53,063
Other fields	
Furniture, games	53,663
Civil engineering	62,844

Published PCT international applications by top applicants – 16 best Source: WIPO

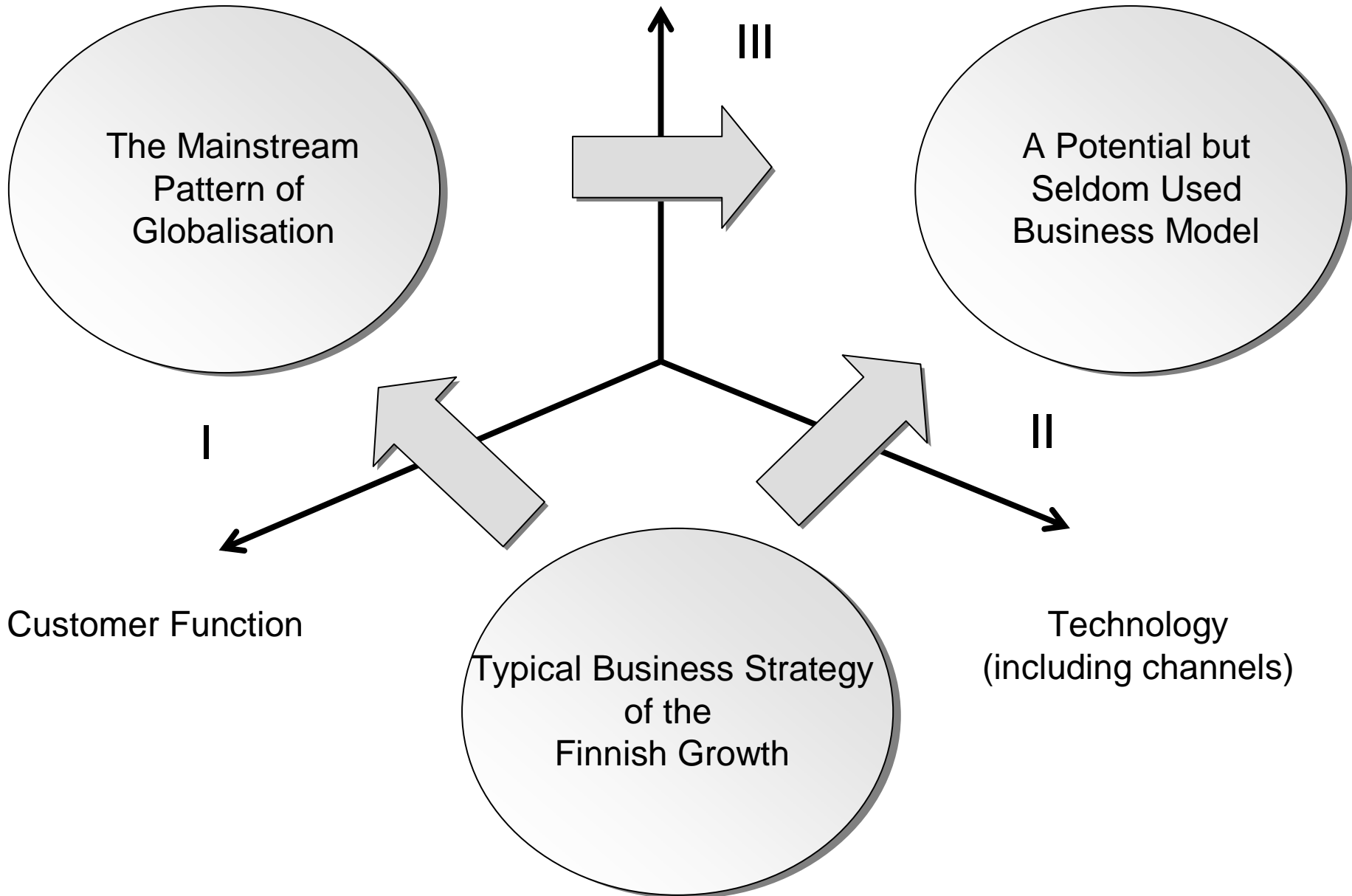
2011 RANKING	APPLICANT'S NAME	COUNTRY	APPLICATIONS
1	ZTE CORPORATION	China	2'826
2	PANASONIC CORPORATION	Japan	2'463
3	HUAWEI TECHNOLOGIES	China	1'831
4	SHARP KABUSHIKI KAISHA	Japan	1'755
5	ROBERT BOSCH	Germany	1'518
6	QUALCOMM	US	1'494
7	TOYOTA	Japan	1'417
8	LG ELECTRONICS	Korea	1'336
9	PHILIPS ELECTRONICS	Holland	1'148
10	ERICSSON	Sweden	1'116
11	NEC CORPORATION	Japan	1'056
12	SIEMENS	Germany	1'039
13	MITSUBISHI ELECTRIC	Japan	834



Market-related strategies	Industry supply characteristics	Characteristics of firms
<p>Patents-related de jure or a de facto standard constitutes market-related mobility barriers that can be very powerful stimulants for firms in leadership game as the case 'Apple vs. Nokia' implies.</p> <p>Multinationals and top universities may have high licensing fees of science based patents that can be an entry barrier for growth companies.</p>	<p>Large total scope and/ or number of patent claims in the industry as a whole or in a particular strategic group may constitute powerful industry-related mobility barriers for growth companies.</p> <p>Rules of game of cross-licensing of multinationals and top universities can be discriminating against SMEs and private inventors.</p>	<p>Aggressiveness of IPR strategy of big science based multinationals and top universities. Patent portfolio theory is a new strategic weapon in the global environment.</p> <p>Patent litigations are complex and costly. The patent trolls are powerful players in markets constituting firm-related barriers.</p>



Customer Needs



The Mainstream
Pattern of
Globalisation

A Potential but
Seldom Used
Business Model

Typical Business Strategy
of the
Finnish Growth

Customer Function

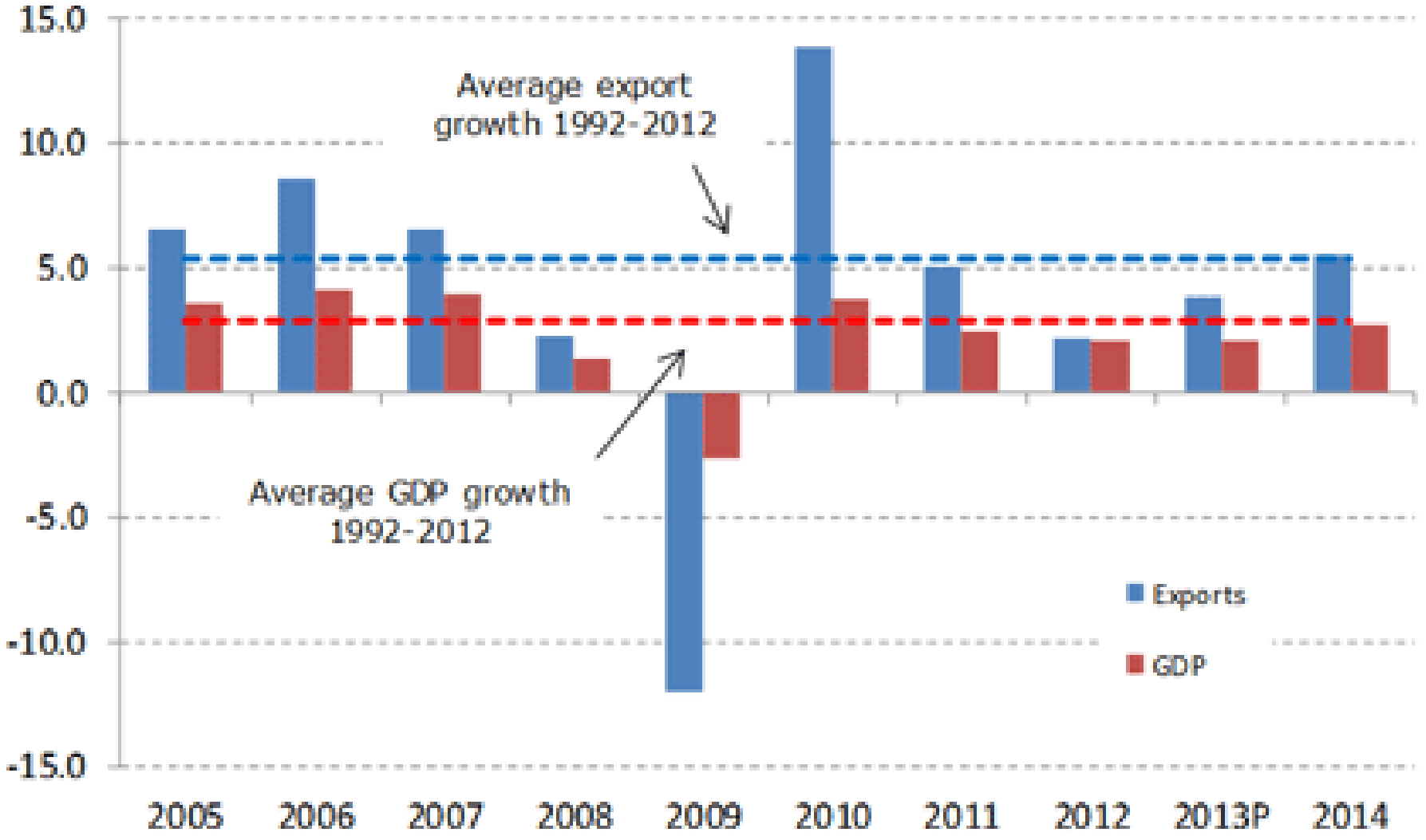
Technology
(including channels)

I

II

III

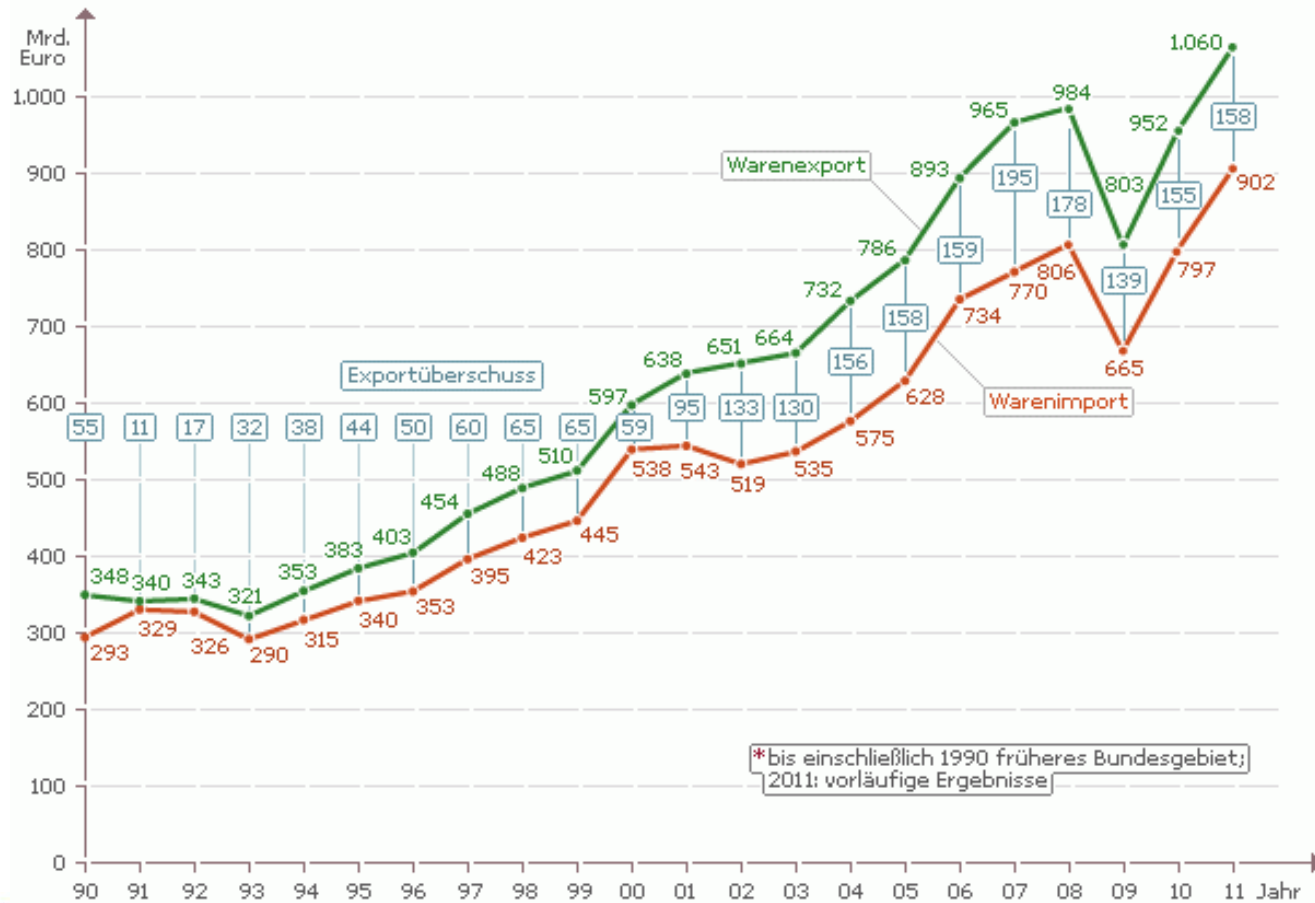
WTO: The global economy is trade-driven. Global GDP and export growth rates in 2005–2014.



Germany has been the winner during the two decades of globalization

Entwicklung des deutschen Außenhandels

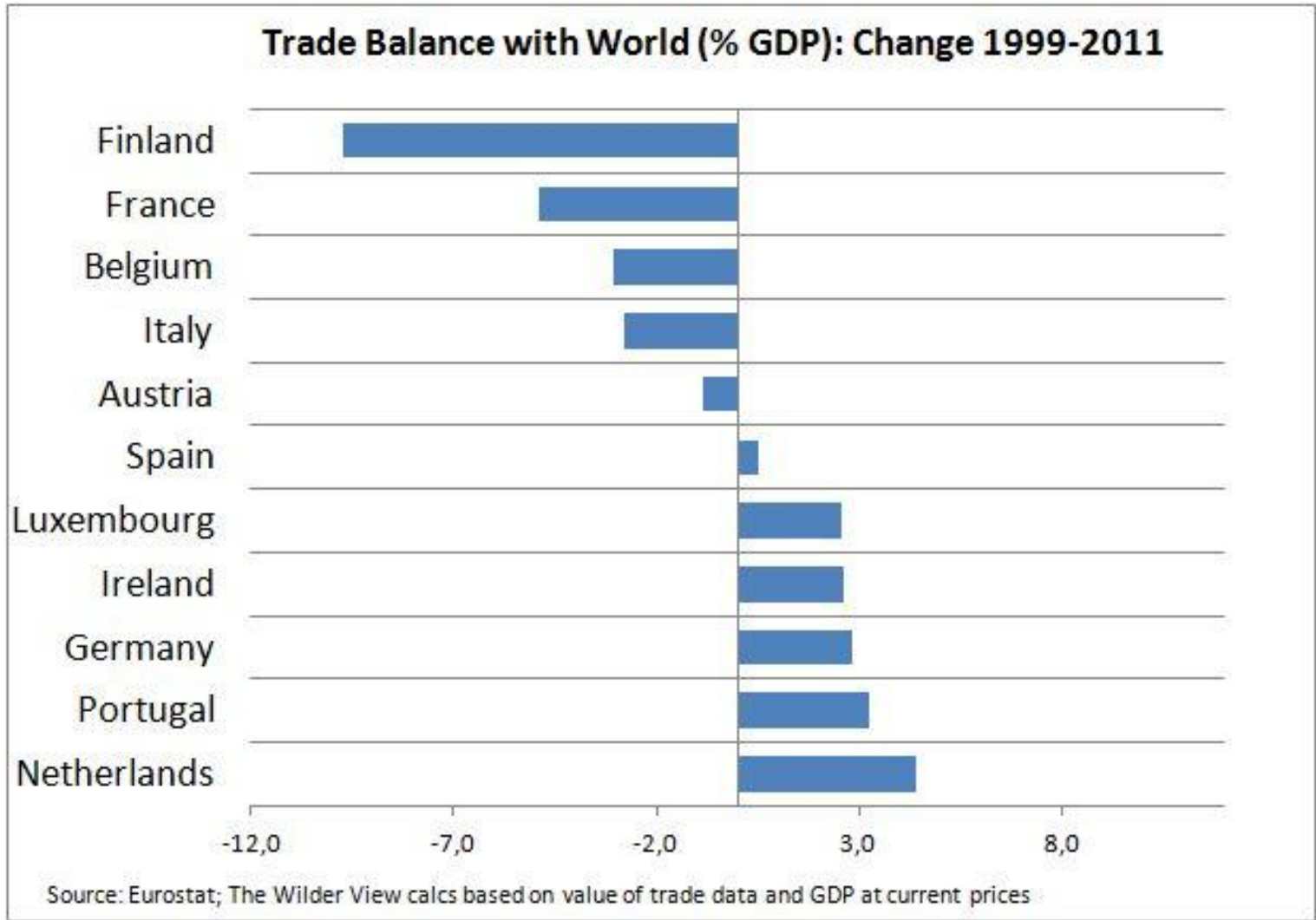
Import, Export und Exportüberschuss in absoluten Zahlen, 1990 bis 2011*



*bis einschließlich 1990 früheres Bundesgebiet; 2011: vorläufige Ergebnisse



Finland has lost its export position during the past decade decades of globalization



The US and the Asian success model (China, Japan, India and Korea) is based on MNCs

- In 2012 there were about 100,000 multinationals in the world and 900,000 foreign affiliates with total assets value about 57,000 billion dollars and sales 33,000 billion dollars. MNCs account for 25% of world GDP, and 80% of international trade.
- In the U.S. the majority of firms are domestic-market firms; the US universities dominate the international trade literature.
- Germany: near 400.000 internationalized SMEs (Mittelstand) and about 100.000 of them have FDI-operations.
- Finland: only some hundreds internationalized SMEs.
- In spite of the unique success story, only some of German writers of international trade are well known globally.
- Transnationality Index (share of foreign operations in sales, personnel and assets) is for ABB/ Linde 85% and for GE 52% and GM 48%. In the U.S. only some SMEs are international.

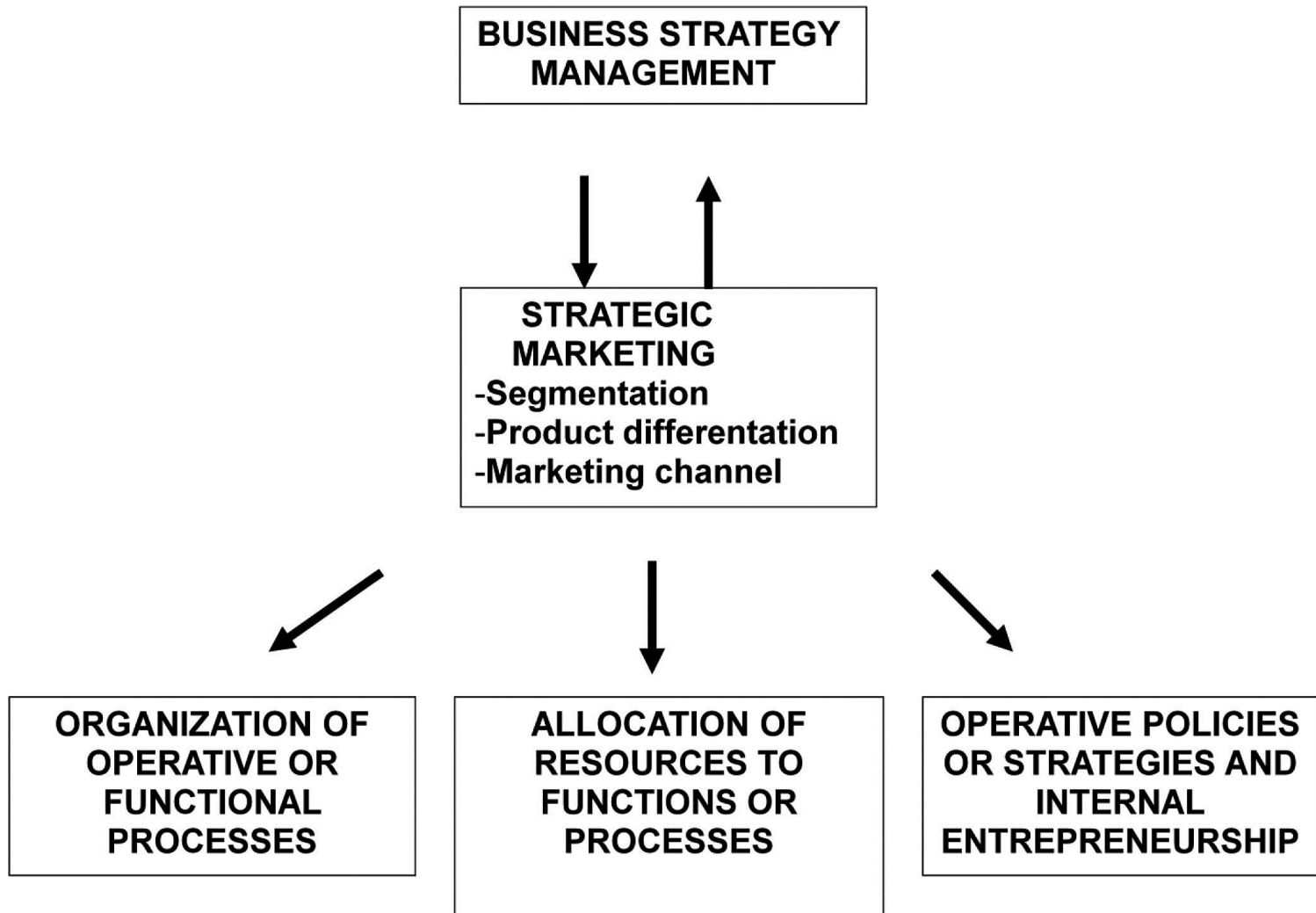
Germany's global success is based on innovative products, KIBS services and reliable technologies by Hidden Champions

- Germany's few giant, highly visible firms like Volkswagen, Siemens, BASF, Bosch, etc. that are not different from other MNCs like GE, DuPont or IBM. Germany's export strength is not determined by MNCs so there must be a large number of mid-sized firms who are strong exporters.
- Hidden Champions are normally known only in their own area, by customers and suppliers, but not to the wider public. They are concealed behind a curtain of invisibility, and business secrets. Often, but not always, they are family owned. Their values are often conservative: hard work, strict selection, high performance, and high employee loyalty. Leadership style is authoritarian on strategic issues but otherwise participative.
- **Because they are often locating in small towns, their deficit might be competition of young talents worldwide.**

Hidden Champions (HCs) have proved to be real champions in international marketing

- HCs have a strategic vision guiding marketing: To be the market leaders in global market. HCs are humble to construct their marketing action plans so that they are responsive to key customers. HCs have attained a high customer loyalty with their technological superiority and customer working methods.
- Germany has commercialized its reliability, credibility and authenticity. For Finland the same kinds of qualities means a handicap. Finland has excellent NMCs as German NMCs. The major difference is SMEs. Finnish SMEs in B2B technology industries are in crisis and only some SMEs in global digital businesses (e.g. Rovio) are success stories.
- German HCs have excellent marketing skills. Gutenberg's genius monopolistic scope (monopolistische bereich) concept advice German marketers to avoid oligopolistic power games that have been devastating even such a big firm as Nokia.

The strategic management model reflecting the German HCs way of acting

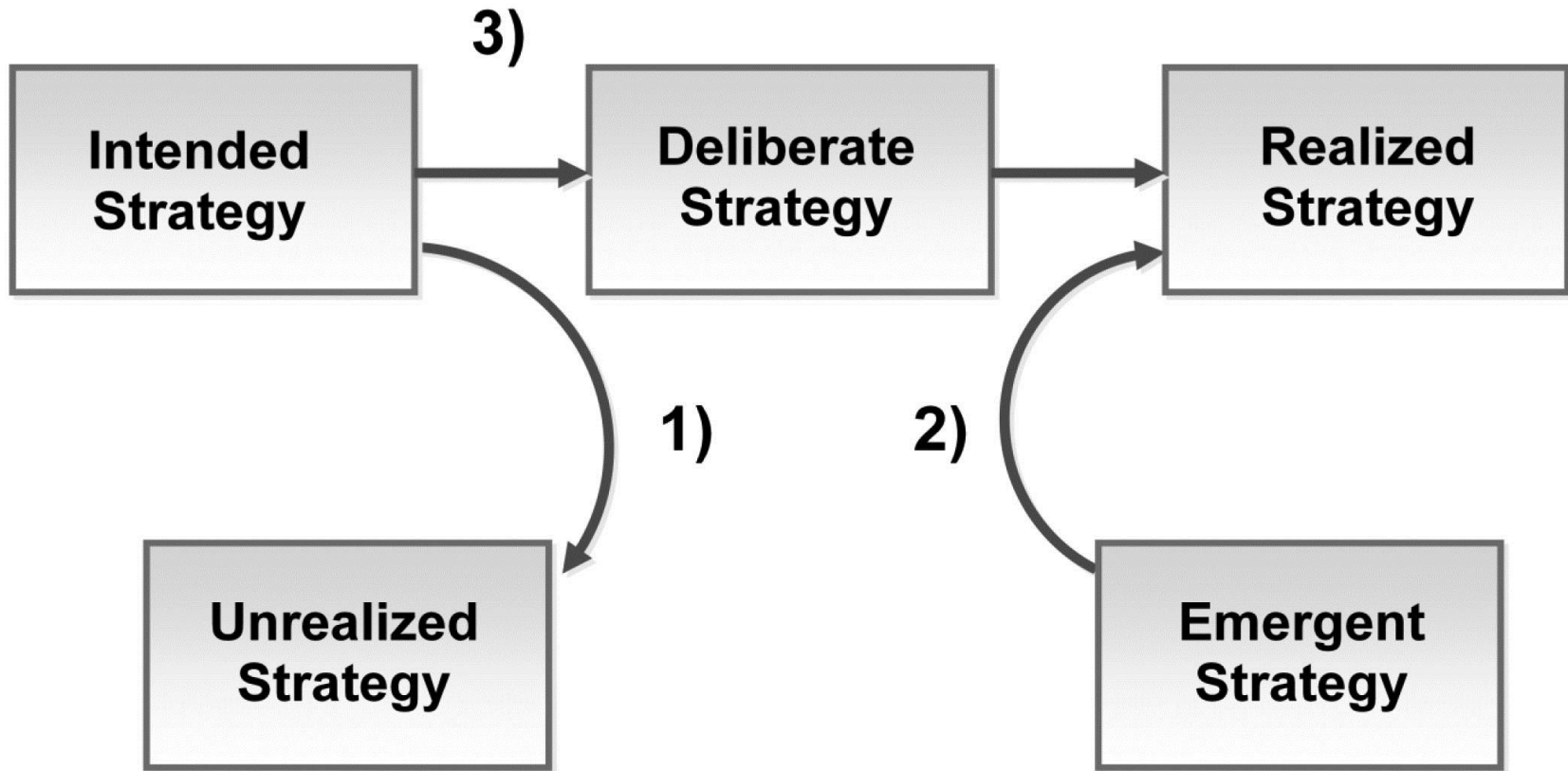


German HCs accept the high market risk in global markets

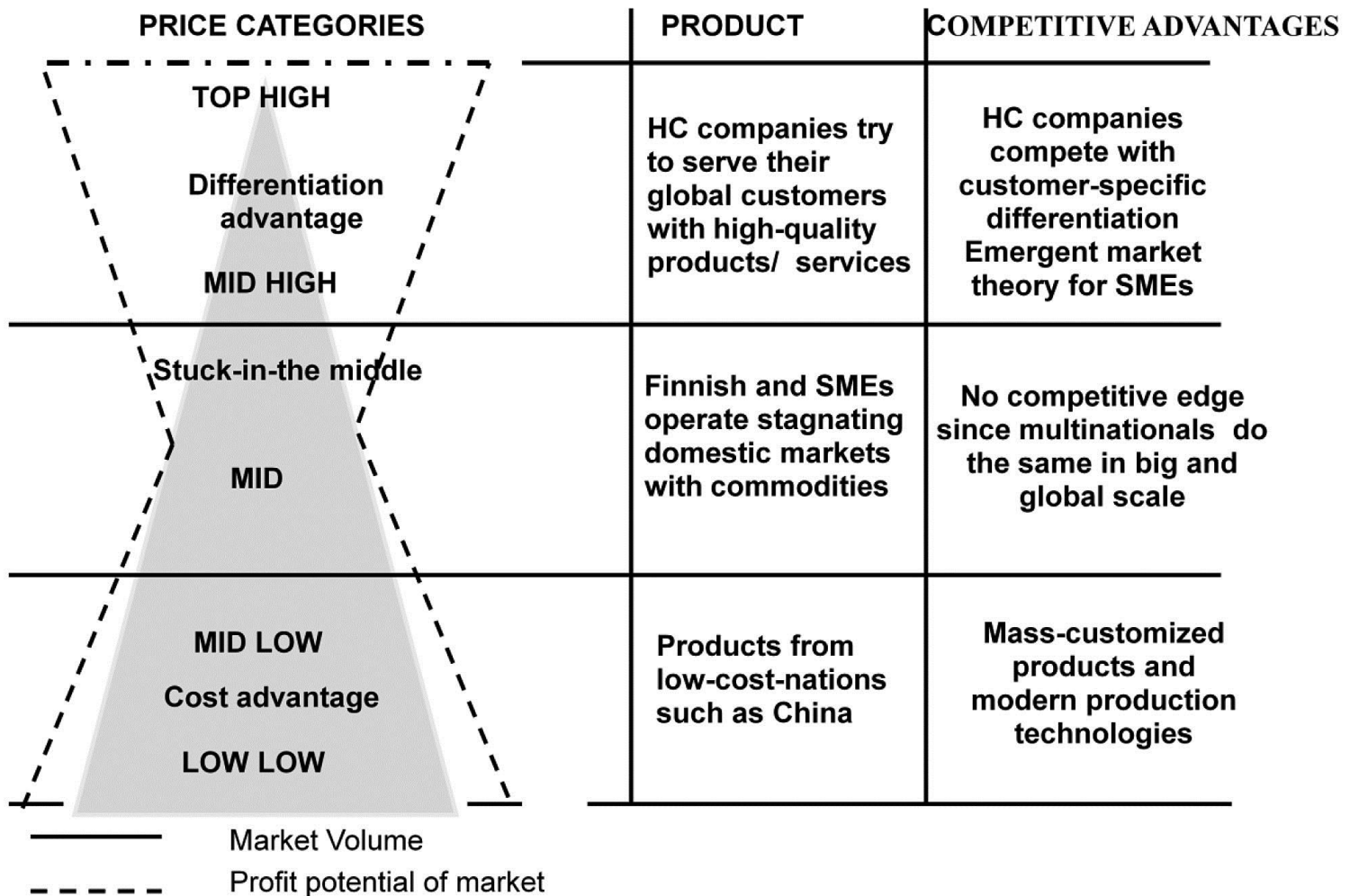
		Market Risk	
		LOW	HIGH
Competition Risk	LOW		Transnational Niche Strategy for Hidden Champions
	HIGH	Global Allocation Strategy for Multinationals	



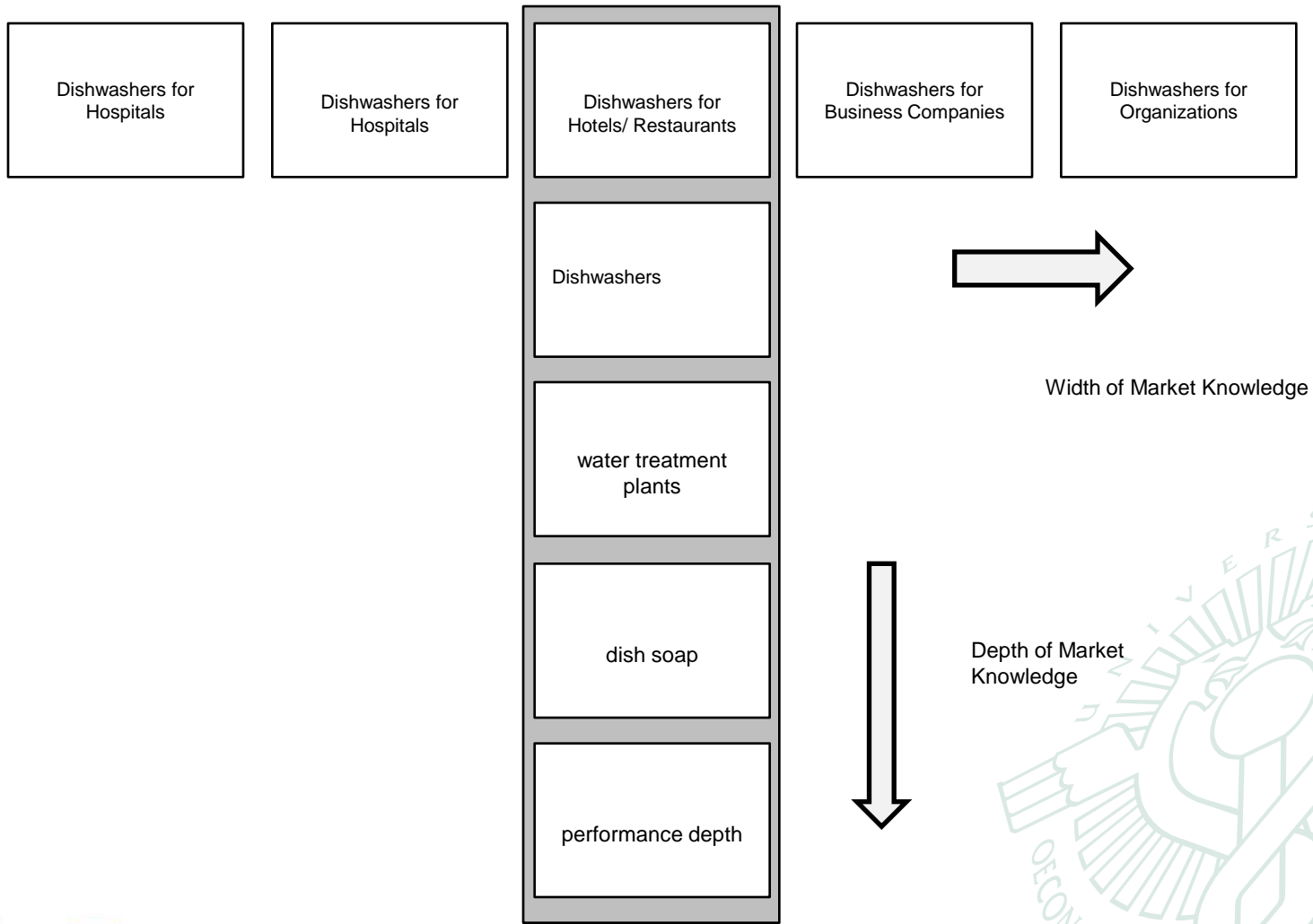
The German HCs utilize “Emergent Strategy”



Market positioning is the main success model element of the German HCs



The strategic management model reflecting the German HCs way of acting



Kaupungit, niiden asukasluku, talousalue (Agglomeraatio) ja metropolialue

Kaupunki	as.luku	Aggl.	Metrop.
	2010	2012	
(1) Köln	1,02	1,90	11,69
(1) Düsseldorf	0,59	1,22	11,69
(1) Dortmund	0,58	4,70	11,69
(1) Essen	0,57	4,70	11,69
(2) Berlin	3,51	4,30	5,95
(3) Frankfurt am Main	0,70	1,93	5,52
(4) Stuttgart	0,60	1,80	5,29
(5) München	1,38	2,00	5,20
(6) Hamburg	1,80	2,60	4,27
(7) Hannover	0,53	1,13	3,88
(8) Nürnberg	0,51	1,20	3,50
(9) Bremen	0,55	0,85	2,73
(10) Leipzig	0,53	1,21	2,40
(10) Dresden	0,53	0,75	2,40



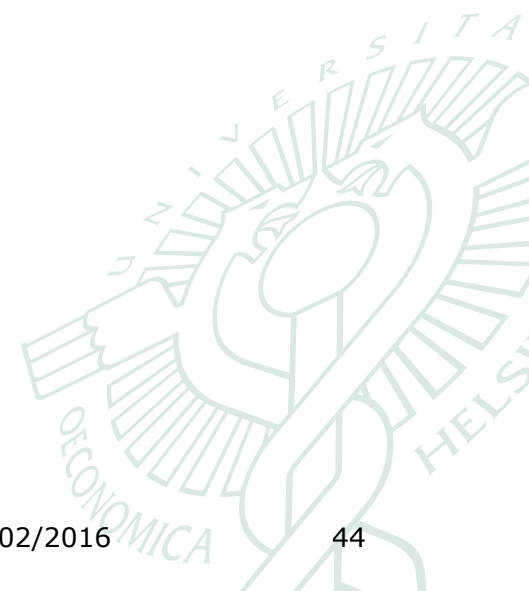
Ulkomaiset investoinnit (FDI, Inwards): Yhdysvallat on ylivoimainen investointikohde

Maa	2000	2011
Englanti	897.845	1.198.870
Ranska	390.953	963.792
Belgia	195.219	957.836
Saksa	271.613	713.706
Sveitsi	86.804	583.455
Espanja	129.194	634.532
Hollanti	243.733	589.051
Ruotsi	93.995	338.484
Italia	122.533	322.664
Irlanti	127.089	243.484
Puola	34.227	197.538
Norja	30.265	171.524
Tanska	73.574	152.847
Itävalta	31.165	148.799
Suomi	24.273	82.962
Kiina	193.348	711.802
Hong Kong	455.468	1.138.365
Japani	50.322	225.787
Australia	118.858	499.663
Venäjä	32.204	457.474
Yhdysvallat	2.783.235	3.509.359
Kanada	212.716	595.002
Brasilia	122.250	669.670

HSE Saksassa toimii 55.000 ulkomaista yritystä, jotka työllistävät yli 3 milj. työntekijää.

- Vuosina 2007–11 Saksassa oli noin 800 FDI-projektia, joissa oli mukana noin 3.000 yritystä (USA 24% ja Englanti 8%). Kiina on valinnut Saksan greenfield-investointien kohteeksi Euroopassa. Myynti, markkinointi ja tukipalvelut ovat keskeinen syy (38 %) investoida Saksaa, mihin liittyy liike-elämän palvelut (15 %). Valmistus on harvoin pääsyy (14 %). Saksassa FDI-investoinnit suuntautuvat 39 sektorille, joista keskeiset ovat:

1. ICT ja ohjelmistot 18 %:ia
2. Business- ja rahoituspalvelut 15 %:ia
3. Autot, teollisuuskoneet ja -laitteet 15 %:ia
4. Kemia, muovi, paperi 8 %:ia
5. Elektroniikka ja puolijohteet 7 %:ia
6. Kulutustavarat 7 %:ia
7. Tekstiilit 7 %:ia
8. Energia, mineraalit ja metallit 6 %:ia
9. Kuljetus, varastoinnit ja logistiikka 6 %:ia
10. Terveys, lääkkeet ja bioteknologia 5 %:ia
11. Hotellit, turismi ja viihde 2 %:ia



Ulkomaiset investoinnit (FDI, Outwards): Yhdysvallat on ylivoimainen investoija

Maa	2000	2011
Englanti	897.485	1.731.095
Ranska	925.925	1.372.676
Belgia	179.773	944.056
Saksa	541.866	1.441.611
Sveitsi	232.161	991.996
Espanja	129.194	640.312
Hollanti	305.461	943.086
Italia	169.957	512.201
Ruotsi	123.256	358.886
Irlanti	27.925	324.226
Puola	1.018	50.044
Norja	34.026	207.469
Tanska	73.100	231.325
Itävalta	24.821	199.261
Suomi	52.109	138.843
Kiina	27.768	365.981
Hong Kong	388.380	1.045.920
Japani	278.422	962.790
Australia	95.979	385.470
Venäjä	20.141	362.101
Yhdysvallat	2.694.014	4.449.962
Kanada	237.639	670.417
Brasilia	51.946	202.586

Saksan yrityksissä yrittäjistä suuryrityksiin keksinnöllisyys on vallitseva kulttuuri.

- Saksalaisilla suuryrityksillä on R&D-keskuksia ja tuotantoyksiköitä Aasian kasvavissa maissa samaan tapaan kuin European Fortune 1000 suuryrityksillä. Ero on siinä, että Saksan suuryritykset (kuten Siemens tai Bosch) hankkivat pääosan teknologiasta kotimaasta. Yrityssektori kykenee tuottamaan ratkaisuja eri toimialojen tuotteiden ja prosessien tehostamiseen.
- Saksassa tutkimusintensiivisten alojen osuus oli 12,4 %:ia tuotannonarvosta (gross value added) vuonna 2009 (high-tech 9,5 %:ia ja cutting-edge technology 2,9 %:ia). Japanissa tutkimusintensiivisten alojen osuus oli 9,4 %:ia (high-tech 6,5 %:ia ja cutting-edge technology 3,3 %:ia) ja Yhdysvalloissa 6,9 %:ia tuotannonarvosta (high-tech 3,6 %:ia ja cutting-edge technology 3,4 %:ia)

R&D (Gross Expenditures on R&D) mrd. dollaria maittain vuosina 2011-2013

Maa/alue	R&D 2011	R&D 2012	R&D 2013
Yhdysvallat	412,4	418,6	423,7
Brasilia	27,9	29,5	31,9
Kanada	27,6	28,8	30,9
Amerikka (21 maata)	485,4	494,9	507,6
Japani	156,0	159,9	161,8
Kiina	177,3	197,3	220,2
Intia	38,4	40,3	45,2
Korea	53,5	55,8	57,8
Aasia (20 maata)	487,1	518,6	554,6
Eurooppa (34 maata)	342,9	346,9	349,5
Saksa	89,5	90,9	91,1
Ranska	49,6	50,4	50,6
Englanti	41,4	42,0	42,4
Venäjä	35,7	37,0	38,5
Italia	24,3	24,1	24,0
Espanja	20,0	20,0	19,8
Ruotsi	14,0	14,2	14,5
Hollanti	13,3	13,5	13,5
Suomi	7,6	7,5	7,5
Maailma yhteensä	1.394,3	1469,0	1.496,1

WIPO:n tietokannan mukaan 50 johtavan PCT-hakijan joukossa on vuosina 1978–2011 hakijoita kolmesta johtavasta maasta

- **17 yhdysvaltalaisista** (PCT-hakemusten yhteismäärä vuosina 1978–2011): Protect & Gamble 10.133; Qualcomm 9.417; Motorola 9.124; Dupont 7.871; 3M 7.051; Intel 5.589; University of California 5.147; IBM 5.088; Kodak 4.233; Honeywell 4.232; GE 4.075; Microsoft 4.066; HP 4.032; Minnesota Mining & Manufacturing 3.064; Medtronic 2.883; Applied Materials 2.582 ja Merck & Co 2.499.
- **12 japanilaista** (PCT-hakemusten yhteismäärä vuosina 1978–2011): Panasonic 20.621; Toyota 7.328; Sharp 6.922; Fujitsu 6.668; Mitsubishi 6.345; Sony 6.117; NEC 5.883; Daikin 3.008; Hitachi 2.753; Cannon 2.580, Kabushiki 2.518 ja Pioneer 2.414.
- **8 saksalaista** (PCT-hakemusten yhteismäärä vuosina 1978–2011): Siemens 19.719; Bosch 17.197; BASF 9.985; Henkel 5.073; Fraunhofer-Gesellschaft 3.555; Daimler 3.259; Infineon 3.138; Bosch-Siemens 2.987 ja Bayer 2.371.

Saksa on kolmas PCT-patenttihakijana maailmassa Yhdysvaltojen ja Japanin jälkeen

- Saksan kolme monikansallista yritystä ovat 7 johtavan PCT-hakijan joukossa: Siemens, Bosch ja BASF. Markkinajohtaja on hollantilainen Philips, jolla oli 24.966 PCT-hakemusta. Kiina nojaa vahvoihin yrityksiin: Huawei (9.272) ja ZTE (6.117). Ericsson on Pohjoismaiden pioneeri ja sijalla 5 (11.937). Nokia on sijalla 11 (8.609). Korea on vahvan patenttoija mutta vain Samsung on mukana (4.970). Ranskaa edustaa vain kaksi yritystä: Thompson (3.911) ja Commissariat (2.708) ja Sveitsiä Novartis (3.072). Englanti ei ole edes mukana.
- Vahva näyttö Saksan teknologiasta on Fraunhofer-Gesellschaft, joka on toinen tiedeyhteisö Yhdysvaltojen yliopiston (University of California) jälkeen. Saksan kansainvälisen patentoinnin painopiste on Itä-Aasia ja Yhdysvallat. Saksan EU-patentointia hallitsee EPO (European Patent Office).

Osavaltio	Patentihakemukset	Patentihakemukset	Per capita
	2011	2012	2012
Bayer	13,722	14,340	114
Baden-Württemberg	14,593	14,225	132
Nordrhein-Westfalen	7,099	6,758	38
Niedersachsen	2,985	2,952	37
Hessen	2,373	2,293	38
Rheinland-Pfalz	1,183	1,122	28
Sachsen	1,049	1,056	26
Berlin	812	855	24
Hamburg	1,013	758	42
Thüringen	567	590	27
Schleswig-Holstein	486	516	18
Brandenburg	352	296	13
Saarland	251	296	25
Sachsen-Anhalt	310	246	11
Mecklenburg-Vorpommern	167	180	11
Bremen	153	150	23
Saksa yhteensä	47,115	46,586	57

Baden-Württemberg ja Bayer ovat osavaltiosta vahvoja patentoijia

- Baden-Württemberg on osavaltiosta vahvin patentoija. Siellä patenttihakemuksia tehtiin vuonna 2012 132 per asukas, mikä ei ole yllättävää, koska osavaltio on Saksan ja Euroopan kansainvälisen teollisuuskeskus. Bayer on toinen vahva osavaltio. Siellä patenttihakemuksia tehtiin vuonna 2012 114 per asukas. Muut osavaltiot jäävät jälkeen.
- Taulukossa on tilastoitu ne hakemukset, jotka on tehty Saksan kansalliseen patentti- ja tavaramerkkitoimistoon (Deutsches Patent- und Markenamt). Tämä ei anna täyttä kuvaa, koska Saksan vahvaa kansainvälistymistä kuvaa se, että Euroopan patenttitoimisto (EPO) on kasvattanut suosiotaan ja suuri osa Saksan kansainvälisistä patentoijista toimii myös suoraan EPO:n kanssa, jonka pääkonttori on Saksassa (München).

25 suurinta patentoijaa (2012) Saksassa (Deutsches Patent- und Markenamt)/ DPMA

2012 RANKING	APPLICANT'S NAME	COUNTRY OF ORIGIN	APPLICATIONS 2012
1	ROBERT BOSCH	Germany	3,972
2	DAIMLER	Germany	1,991
3	SIEMENS	Germany	1,921
4	SCHAEFFLER TECHNOLOGIES	Germany	1,854
5	GM GLOBAL TECHNOLOGIES	US	1,565
6	BAYERISCHE MOTOREN	Germany	829
7	WOLKSWAGEN	Germany	805
8	AUDI	Germany	787
9	ZF FRIEDRICHSHAFEN	Germany	740
10	BOSCH SIEMENS HAUSGERÄTE	Germany	719
11	HYUNDAI MOTORS	Korea	533
12	FORD GLOBAL TECHNOLOGIES	US	504
13	CONTINENTAL AUTOMOTIVE	Germany	435
14	DENSO CORPORATION	Germany	428
15	FRAUNHOFER-GESELLSCHAFT	Germany	424
16	PORSCHE	Germany	413
17	INFINEON TECHNOLOGIES	Germany	311
18	OSRAM GESELLSCHAFT	Germany	310
19	CONTINENTAL TEVES	Germany	306
20	GENERAL ELECTRIC	US	304
21	HENKEL	Germany	276
22	IBM	US	267
23	KRONES	Germany	248
24	VOITH PATENTI	Germany	230
25	DEUTCHES ZENTRUM	Germany-	03/02/2016 226

Hamburg ja Berlin ovat vahvoja uusien tavaramerkkien rekisteröijänä

- Nordrhein-Westfalen on Saksassa vahvin uusien tavaramerkkien rekisteröijänä. Suhteessa vahvin on Hamburg, jossa vuonna 2012 rekisteröitiin 173 merkkiä per asukas. Berlin ei jää paljoa jälkeen ja siellä vuonna 2012 rekisteröitiin 126 merkkiä per asukas. Kaksi suurinta kaupunkia on siis johtavia, mikä kuvaa hyvin sitä, että luovat alat keskittyvät kaupunkikeskuksiin.
- Saksan teolliset osavaltiot ovat tässäkin suhteessa vahvoja. Niissä uusien tavaramerkkien rekisteröinti on tasolla 70–80 per asukas.
- Sen sijaan maaseutu-Saksan osavaltiot (Brandenburg, Mecklenburg-Vorpommern ja Sachsen-Anhalt) ja jäävät merkittävästi jälkeen tässäkin mittarissa, joka mittaa talouden aktiivisuutta.

Saksan asema kolmessa ylikansainvälisessä järjestelmässä on ylivoimainen Euroopassa

Year	PCT System	Rank	Madrid System	Rank	Hague System	Rank
1998	9,403	2	5,663	1		
1999	10,514	2	5,920	1		
2000	12,580	2	6,321	1	1,315	1
2001	14,035	2	5,808	1	1,231	1
2002	14,323	2	5,126	1	1,225	1
2003	14,658	3	5,559	1	599	1
2004	15,218	3	5,395	1	355	2
2005	15,991	3	5,804	1	334	2
2006	16,737	3	5,663	1	256	2
2007	17,821	3	6,101	1	380	1
2008	18,855	3	6,214	1	406	2
2009	16,797	3	4,793	1	408	2
2010	17,568	3	5,006	1	531	2
2011	18,851	3	5,000	2	584	2
2012	18,758	3	4,408	3	663	1

Münchenissä on tähtitieteen tutkimuskeskus, joka on yksi 80 Max Planck instituutista ja Euroopan observatoriokeskus.

- München toteuttaa samaa mallia kuin Saksan muut metropolit. Siellä tiede yhdistyy taiteeseen, kulttuuriin ja luonnonarvoihin.
- München on taloudellisesti menestynyt, mitä kuvaa se, että siellä on kuuden DAX-yrityksen (Allianz, BMW, Linde, Man, Münchener Rück ja Siemens) pääkonttorit. Nämä edustavat laajasti monia eri aloja, joskin painopisteenä on auto-, kone-, sähköteollisuus ja pankki- ja vakuutuspalvelut. Linde on myös merkittävä, koska kyseessä on maailman suurin kaasuyhtiö.
- Jo 1800-luvulla kaupungissa työskenteli tiedemiehiä ja taiteilijoita, kuten Rudolf Diesel, Wilhelm Röntgen, Alois Alzheimer, Richard Wagner ja Richard Strauss. 1900-luvun alussa siellä asui yli 3.000 taiteilijaa. Münchenin väkiluku nousi jo 1900-luvun alussa puoleen miljoonaan asukkaaseen, mikä teki kaupungista yhden Saksan metropolikeskuksista.

Berlin = State (Bundesland)
Kassel = Cities
Salzgitter AG = Companies

Headquarters of the DAX companies





Table 9: Filing growth rate by technology

Source: WIPO Statistics Database, April 2010

Technology	Average Annual Growth Rate (%)			
	1972-82	1983-90	1991-94	1995-07
Digital communication	4.9	9.3	4.0	15.2
Pharmaceuticals	7.8	5.3	4.8	10.7
Computer technology	6.0	10.4	-5.7	9.2
Medical technology	4.9	6.4	5.9	8.1
Semiconductors	8.7	8.4	-7.6	7.7
Telecommunications	4.1	8.6	0.5	7.2
Biotechnology	5.7	9.0	7.3	5.8
Electrical machinery, apparatus, energy	1.2	1.1	0.5	5.6
Measurement	2.2	2.5	-5.1	5.5
Organic fine chemistry	-1.9	0.9	1.1	4.7
Audio-visual technology	5.7	6.2	-3.2	4.5
Transport	-0.6	3.2	3.4	4.2
Optics	3.4	7.6	-2.3	3.8
Civil engineering	0.0	1.9	4.4	2.3
Handling	-0.9	1.2	2.9	2.2
Other special machines	-0.6	2.9	-0.7	2.0

2010 RANKING	APPLICANT'S NAME	COUNTRY OF ORIGIN	PCT 2010	INCREASED OVER 2009
38	UNIVERSITY OF CALIFORNIA	USA	306	-15
103	MASSACHUSETTS INSTITUTE	USA	145	0
115	UNIVERSITY OF TEXAS	USA	130	4
144	UNIVERSITY OF FLORIDA	USA	107	-4
145	THE UNIVERSITY OF TOKYO	Japan	105	11
168	COLUMBIA UNIVERSITY	USA	91	-19
168	HARVARD COLLEGE	USA	91	-18
176	THE JOHNS HOPKINS	USA	89	2
183	SNU R&DB FOUNDATION	Korea	86	63
202	ARIZONA	USA	80	25
206	UNIVERSITY OF MICHIGAN	USA	79	18
218	UNIVERSITY OF PENNSYLVANIA	USA	75	-5
242	CORNELL UNIVERSITY	USA	71	22
287	OSAKA UNIVERSITY	Japan	60	22
291	UNIVERSITY OF UTAH	USA	59	-7
291	UNIVERSITY OF ILLINOIS	USA	59	7
302	WASHINGTON UNIVERSITY	USA	57	-15
327	STANFORD UNIVERSITY	USA	54	-13
342	INSTITUTE OF SCIENCE	Korea	52	9
349	CALIFORNIA INSTITUTE	USA	50	-2
349	PURDUE FOUNDATION	USA	50	5
357	DUKE UNIVERSITY	USA	49	11
368	WISCONSIN FOUNDATION	USA	48	-16

376	SOUTHERN CALIFORNIA	USA	47	-13
376	KYOTO UNIVERSITY	Japan	47	2
376	HANYANG UNIVERSITY	Korea	47	20
386	ISIS INNOVATION LIMITED	UK	46	1
414	UNIVERSITY OF JERUSALEM	Israel	43	10
430	TOHOKU UNIVERSITY	Japan	41	2
430	NORTH CAROLINA	USA	41	4
443	TECHNISCHE HOCHSCHULE	Switzerland	40	4
448	UNIVERSITY OF MASSACHUSETTS	USA	39	-2
462	YONSEI UNIVERSITY	Korea	38	-13
462	TEL AVIV UNIVERSITY LTD.	Israel	38	-9
462	KEIO UNIVERSITY	Japan	38	4
462	NORTHWESTERN	USA	38	6
462	HOKKAIDO UNIVERSITY	Japan	38	8
486	IMPERIAL COLLEGE	UK	37	-5
486	INDIANA UNIVERSITY	USA	37	13
497	UNIVERSITY OF MIAMI	USA	36	6
497	OKAYAMA UNIVERSITY	Japan	36	12
526	UNIVERSITY OF COLORADO	USA	34	-4
526	UNIVERSITY OF QUEENSLAND	Australia	34	5
526	NAGOYA UNIVERSITY	Japan	34	7
526	EMORY UNIVERSITY	USA	34	10
559	OHIO STATE UNIVERSITY	USA	32	-11
559	STATE UNIVERSITY OF NEW YORK	USA	32	-6
580	POSTECH FOUNDATION	Korea	31	-8
580	NIHON UNIVERSITY	Japan	31	9
593	UNIVERSITY OF MARYLAND	USA	30	3
593	HIROSHIMA UNIVERSITY	Japan	30	10

The global technology and innovation markets are regulated by two important intergovernmental organizations:

- The World Intellectual Property Organization (WIPO) was created in 1967. Since 1974 the WIPO has been an UN agency. The WIPO Convention was signed at Stockholm in 1967 and as amended in 1979). According to the Article 3, the WIPO seeks to "promote the protection of intellectual property throughout the world. Today, the WIPO in Geneva, Switzerland has 184 member states, and administers 23 treaties. Much of the work is done by committees.
- The WIPO treaties facilitate international harmonization, but not protection for IPRs. The WTO's Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement that came into effect on 1 January 1995 establishes standards of protection and rules on enforcement, and brought them into the jurisdiction of the new dispute settlement system of the WTO. The TRIPS shifts the emphasis on procedural uniformity, as promoted by the WIPO, to minimum standards of substantive protection.

The TRIPS is the catalyst for evolution of the global the knowledge economy.

- Scientific knowledge as a commercial commodity is a profound characteristic of globalization. Universities all over the world produce commercial knowledge for firms, following the role model of the University of California. Large firms are actively involved with the universities and research labs to get access to the up-to-date scientific knowledge at a global scale. In the early 1980, the U.S. federal government adopted policies to promote the commercialization of research conducted with federal funding as a means to speed the development of benefits to the public good.
- The principal argument for patenting public financed scientific inventions is the fact that post-invention development costs far exceed pre-invention R&D costs, and firms are unable to make these investments without protection from competition (Schumpeter's argument). A series of laws referred as the Bayh-Dole Act, DBA (1980) allowed the US universities to become active in patenting. In many field of science, e.g. molecular biology, universities patent discoveries or upstream patents.

Bayh-Dole Act, DBA (1980) allowed the US universities to become active in patenting

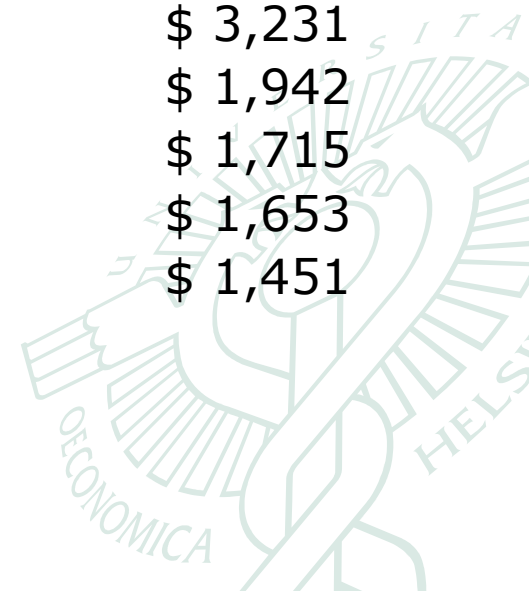
- The DBA provides universities the first-right to commercialize patents, and, if they fail, the Federal agencies retain the ownership of patents and then can grant non-exclusive licenses to interested third parties. Prior to the enactment of the Act, the U.S. government had in its possession about 30,000 patents of which only about 5% were commercially licensed (Siepmann, 2011).
- Besides the BDA the Federal antitrust laws were liberalized (The Stevenson-Wydler Technology Innovation Act of 1980) which enables the National Institutes of Health (NIH) and other federal agencies to enter into license agreements with commercial entities that promote the development of technologies developed by universities and research labs.
- As a result, thousands of science-based firms have sprung up around universities as patents facilitated an efficient transfer of science-based technologies to the private sector by providing exclusive rights.

UC 2007 Licensing Revenues

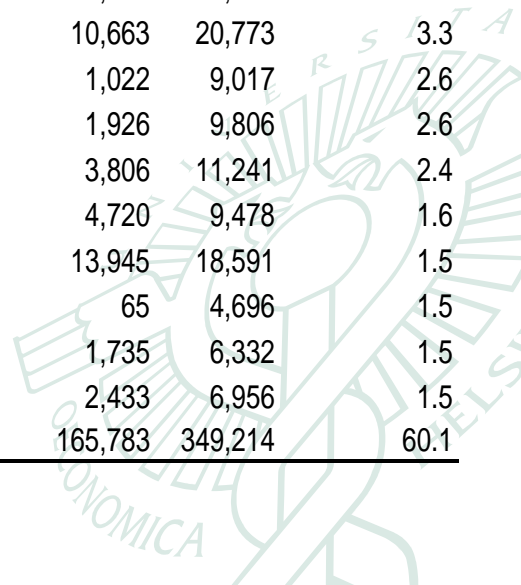
UC TOP-EARNING INVENTIONS

www.law.berkeley.edu/institutes/bclt/patent-valuation/presentations/obrien.pdf

- Hepatitis-B Vaccine (SF, 1979 and 1981) \$ 14,656
- Treatment of Intracranial Aneurysms (LA, 1989) \$ 11,122
- Egf Receptor Antibodies (SD, 1983) \$ 8,700
- Interstitial Cystitis Therapy (SD, 1980) \$ 7,160
- Bovine Growth Hormone (SF, 1980) \$ 6,083
- Biodegradable Implant Coils (LA, 1998) \$ 4,071
- Dynamic Skin Cooling Device (IR, 1993) \$ 3,231
- Camarosa Strawberry (DA, 1992) \$ 1,942
- Chromosome Painting (LLNL, 1985) \$ 1,715
- Nicotine Patch (LA, 1984) \$ 1,653
- Energy Transfer Primers (BK, 1994) \$ 1,451



Origin - Destination	First Surge Period			Second Surge Period			
	1983	1990	Contribution to Growth	Origin - Destination	1995	2007	Contribution to Growth
Total	233,465	305,947	31.0	Total	305,441	751,901	146.2
Germany -Japan	5,490	18,558	5.6	Japan -USA	28,567	62,680	11.2
Japan -USA	10,724	21,548	4.6	Japan -China	5,395	32,979	9.0
Japan -EPO	4,219	12,742	3.7	USA -China	4,858	29,161	8.0
USA -EPO	9,413	17,237	3.4	Germany -EPO	14,097	34,004	6.5
Germany -EPO	6,781	14,260	3.2	Republic of Korea -USA	2,128	18,810	5.5
USA -Japan	12,287	16,751	1.9	USA -Japan	10,337	25,346	4.9
Germany -German Democratic Republic	831	5,006	1.8	USA -Republic of Korea	1,476	16,414	4.9
Russian Federation -Soviet Union	1,410	5,532	1.8	Japan -Republic of Korea	4,490	19,217	4.8
Japan -Republic of Korea	1,331	4,921	1.5	USA -EPO	18,589	32,885	4.7
Germany -USA	5,361	7,799	1.0	Germany -USA	8,376	21,049	4.1
USA -Australia	3,366	5,457	0.9	USA -Mexico	1,030	13,252	4.0
France -EPO	2,821	4,816	0.9	Japan -EPO	10,663	20,773	3.3
USA -Canada	11,290	13,207	0.8	Republic of Korea -China	1,022	9,017	2.6
Japan -Canada	2,124	3,894	0.8	Germany -China	1,926	9,806	2.6
Italy -EPO	803	2,373	0.7	USA -Australia	3,806	11,241	2.4
USA -Republic of Korea	970	2,519	0.7	France -EPO	4,720	9,478	1.6
France -USA	2,036	2,976	0.4	USA -Canada	13,945	18,591	1.5
Germany -Republic of Korea	157	984	0.4	China -USA	65	4,696	1.5
Switzerland -EPO	1,378	2,183	0.3	Republic of Korea -Japan	1,735	6,332	1.5
Germany -Canada	1,394	2,181	0.3	Canada -USA	2,433	6,956	1.5
Others - Others	149,279	141,003	-3.5	Others - Others	165,783	349,214	60.1



Top 25 patent assignees (direct) at DPMA in 2012 – Germany fully dominates

2012 RANKING	APPLICANT'S NAME	COUNTRY OF ORIGIN	APPLICATIONS 2012
1	ROBERT BOSCH	Germany	3,972
2	DAIMLER	Germany	1,991
3	SIEMENS	Germany	1,921
4	SCHAEFFLER TECHNOLOGIES	Germany	1,854
5	GM GLOBAL TECHNOLOGIES	US	1,565
6	BAYERISCHE MOTOREN	Germany	829
7	WOLKSWAGEN	Germany	805
8	AUDI	Germany	787
9	ZF FRIEDRICHSHAFEN	Germany	740
10	BOSCH SIEMENS HAUSGERÄTE	Germany	719
11	HYUNDAI MOTORS	Korea	533
12	FORD GLOBAL TECHNOLOGIES	US	504
13	CONTINENTAL AUTOMOTIVE	Germany	435
14	DENSO CORPORATION	Germany	428
15	FRAUNHOFER-GESELLSCHAFT	Germany	424
16	PORSCHE	Germany	413
17	INFINEON TECHNOLOGIES	Germany	311
18	OSRAM GESELLSCHAFT	Germany	310
19	CONTINENTAL TEVES	Germany	306
20	GENERAL ELECTRIC	US	304
21	HENKEL	Germany	276
22	IBM	US	267
23	KRONES	Germany	248
24	VOITH PATENTI	Germany	230
25	DEUTCHES ZENTRUM	Germany	226

Top 6 patent filing countries of internal combustion engine (Verbrennungsmotor) at DPMA in 2012

<u>YEAR</u>	2006	2007	2008	2009	2010	2011	2012
<u>Country</u>							
Germany	1,751	1,654	1,570	1,888	1,907	1,874	2,070
US	449	452	594	631	515	694	696
Japan	864	969	899	992	771	690	758
Korea	16	8	25	49	41	56	91
France	144	139	152	162	136	83	107
China	4	5	9	7	3	4	10
TOTAL	3,459	3,468	3,497	3,987	3,633	3,646	4,038

Top 6 patent filing countries of hybrid drives (Hybridantriebe) at DPMA in 2012

<u>YEAR</u>	2006	2007	2008	2009	2010	2011	2012
<u>Country</u>							
Germany	131	219	337	537	692	805	915
US	101	110	193	324	238	331	414
Japan	213	203	304	346	354	367	594
Korea	11	20	16	23	29	149	142
France	7	8	11	37	23	22	32
China	0	3	3	5	13	8	11
TOTAL	474	562	887	1,298	1,398	1,727	2,246

Patent filing in energy technologies (German vs. foreign) at DPMA in 2006-12

YEAR	2006	2007	2008	2009	2010	2011	2012
Technology							
Solar	103	157	143	240	290	330	280
Wind	92	93	123	192	233	273	312
Wasser/ Welle	11	13	19	20	40	51	34
Terminal/ Bio	26	61	78	86	72	77	76
TOTAL	485	643	825	1,286	1,563	2,005	2,205

YEAR	2006	2007	2008	2009	2010	2011	2012
Technology							
Solar	109	134	231	350	485	646	753
Wind	103	134	165	292	342	453	603
Water/ Wave	24	27	31	55	57	88	71
Terminal/ Bio	17	24	35	51	44	87	76
TOTAL	485	643	825	1,286	1,563	2,005	2,205

The DBA is the most inspired piece of legislation enacted in the US over the past half-century

- The BDA was passed to promote research in cancer and other diseases by providing institutions and researchers with a commercial incentive, even though major part of costs are funded by the federal agencies, such as the NIH (Ransom, 2008). In 2006, the U.S. universities and hospitals earned \$1.85 billion from patents and technology licenses, and received \$43.86 billion from federal, state and industry funders (Loewenberg, 2009). In the case of biomedical research, the investment yields of medical advances include a 10% increase in longevity of U.S. citizens which will realize a \$240 billion return on public investment (The U.S. Congressional Joint Economic Committee). The DBA is said to be "the most inspired piece of legislation to be enacted in America over the past half-century" (Innovation's Golden Goose), allowing universities to earn Schumpeterian monopoly profits from licensing and royalty payments. In contrast to most of EU countries, the U.S. has no price control measures in place to control the amount of money private industry can charge on e.g. prescription drugs which lead to Schumpeterian monopoly profits, and, thereby stimulate investments in the private sector (European Union Prep. Acts).

An innovation based on property claims as structural building bricks

