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CREATECH connect
» idea to market

From Idea to Market in Chile:

Applying the Best Practices of Evaluation and Commercialization of Innovations

"Transforming Science and Technology Opportunities into Business: Experiences from the Finnish innovation system"

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FACTS ABOUT FINLAND

Capital: Helsinki

Total Area: 338,145 sq km

Population: 5.3 million

Languages: Finnish 92% (official), Swedish 5.6% (official), other 2.4% (2003)

Literacy: *definition:* age 15 and over can read and write, *total population:* 100% (2000 est.)

Religions: Lutheran National Church 84.2%, Greek Orthodox in Finland 1.1%, other Christian 1.1% other 0.1%, none 13.5% (2003)

Life Expectancy: *total population:* 78.35 years, *male:* 74.82 years, *female:* 82.02 years (2005 est.)

Government Type: republic

GDP (per capita) of Finland: purchasing power parity - $29,000 (2004 est.)

Exports: $61.04 billion f.o.b. (2004 est.)

Imports: $45.17 billion f.o.b. (2004 est.)

Natural Resources: timber, iron ore, copper, lead, zinc, chromite, nickel, gold, silver, limestone

Telephones (mobile cellular): 4.7 million (2003)

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FAVOURABLE INFRASTRUCTURE AND DRIVERS TO GET IDEAS AND INNOVATIONS FROM RESEARCH AND DEVELOP THEM TO MARKETS...

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HIGH PERFORMING EDUCATION SYSTEM

Top-performer Finland Improves Further in PISA Survey as Gap Between Countries Widens

"Finland once again came out top in the OECD's latest PISA study of learning skills among 15-year-olds, with high performances in mathematics and science matching those of top-ranking Asian school systems in Hong Kong-China, Japan and Korea."

Extensive (state) university network

- free (the students are actually paid)
- high proportion of age class enter universities
-

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HIGH PRIVATE AND PUBLIC SPENDING ON R&D

R&D expenditure by sector and GDP share of R&D expenditure in 2000-2005

Year	Business enterprises		Public sector*		University sector		Total	GDP share of R&D expenditure **
	milj. €	%	milj. €	%	milj. €	%	milj. €	%
2000	3,135	70.9	497.4	11.2	789.3	17.8	4,422	3.34
2001	3,284	71.1	500.9	10.8	834.1	18.1	4,619	3.30
2002	3,375	69.9	529.7	11.0	925.6	19.2	4,830	3.35
2003	3,527	70.5	515.4	10.3	961.7	19.2	5,005	3.43
2004	3,683	70.1	530.1	10.1	1,039.8	19.8	5,253	3.46
2005	3,876	70.8	554.7	10.1	1,042.1	19.0	5,473	3.48 ***)**

* incl. PNP (private non-profit sector)
** GDP 2004 and 2005 preliminary data of Statistics Finland

***) second highest in EU**

Source: Research and Development, Statistics Finland

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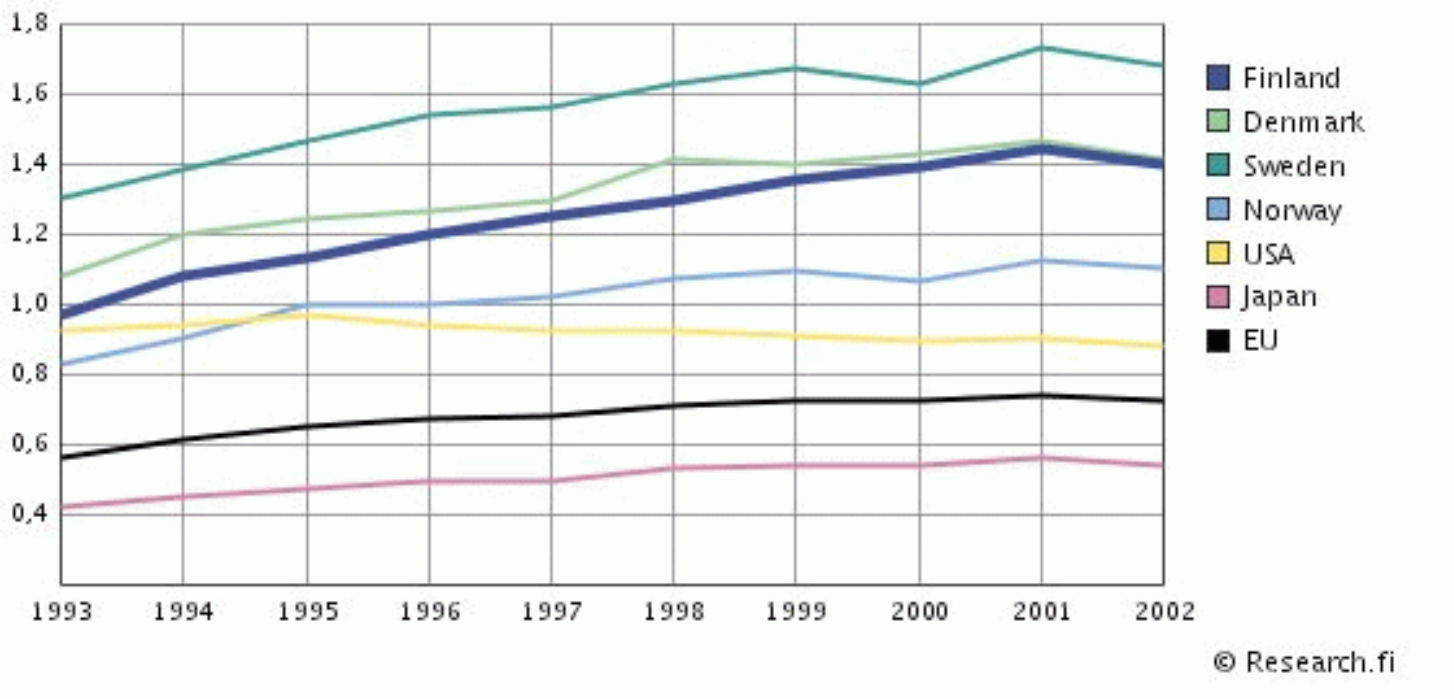
HIGH SCIENTIFIC OUTPUT AND LEVEL

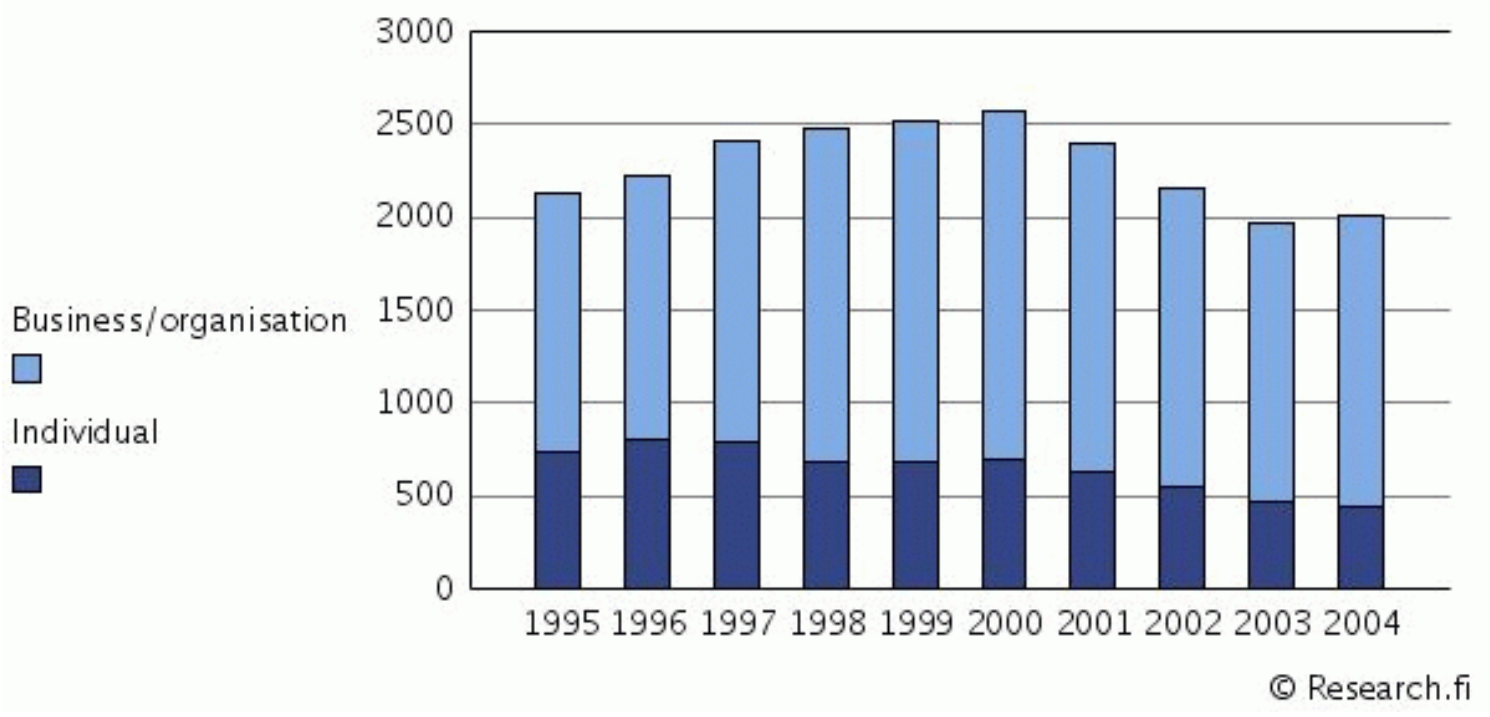
Publications/thousand inhabitants



Source: Academy of Finland 9/2003, Institute for Scientific Information, NSIOD, OECD 2003/2

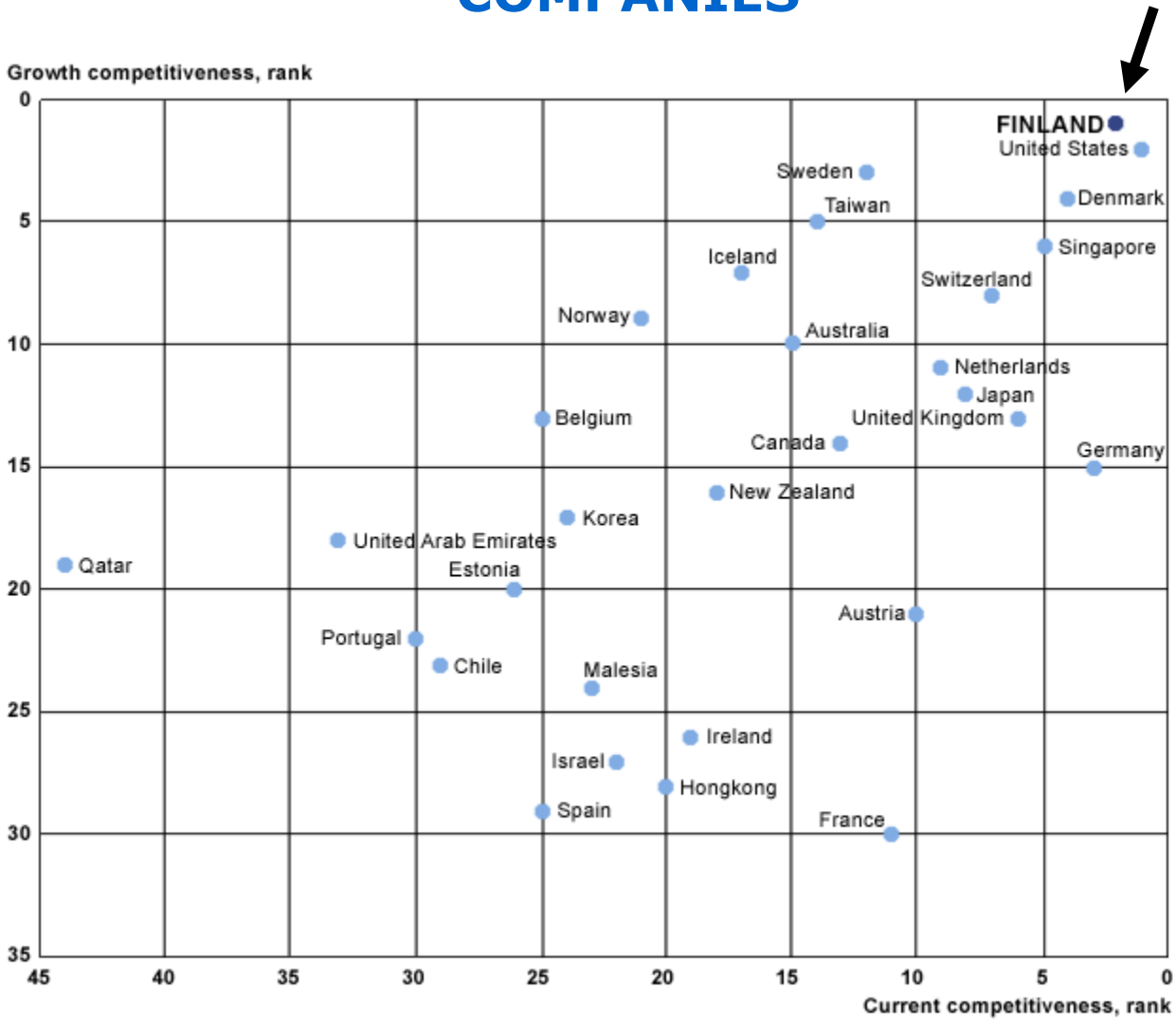
HIGH PER CAPITA PATENTING ACTIVITY – DECLINING THOUGH

Finnish patent applications



Source: Statistics Finland, Science and Technology Statistics

FAVOURABLE ENVIRONMENT FOR COMPANIES



Source: World Economic Forum (WEF)

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WORLD CLASS COMPANIES IN CERTAIN FIELDS

- Mobile communications (Nokia 1st)
- Pulp and Paper (UPM-Kymmene, Stora Enso top 5)
- Paper Chemicals (Kemira 1st)
- Water Treatment Chemicals (Kemira 1st)
- Lifts and Elevators (Kone 2nd)
- Paper Machinery (Metso 1st)
- Mining Technology and Products (Outokumpu, Rautaruukki)
- Fertilisers (Kemira 2nd in Europe)
- Waisala (1st) – environmental sond and sensors
- Shipbuilding (cruisers, ice breakers, oil rifts)

BUT ONLY SMALL COMPANIES IN E.G. PHARMACEUTICALS/BIOTECHNOLOGY

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INNOVATION SYSTEM: PLAYERS AND FINANCING

- **BASIC RESEARCH-** universities (University budget, Academy of Finland, EU, Foundation for Finnish Inventions)
- **EARLY DEVELOPMENT OF IDEAS** (Tekes, Foundation for Finnish Inventions) – **A GAP!**
- **APPLIED RESEARCH** –universities, research institutes as Technical Research Centre of Finland (Tekes, companies)
- **PRODUCT DEVELOPMENT** (Tekes, companies)
- **MANY SUPPORTING PLAYERS** (Science Parks, Local State Agencies etc.)
- The chain is far from perfect

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TEKES –Finnish Funding Agency for Technology and Innovation

- annual support for R&D 430 million €
- supports applied university research
- supports cooperative research between companies and universities
- Finances high risk research in companies – mainly SMEs but even Nokia is eligible
- Creates technology programmes for pre-competitive research – universities and companies work jointly
- considered to have had major impact in taking new ideas and innovations to the market for 20 years
- Chain of financing: 10.000Euro to assess the idea, 35.000Euro to prepare a business plan, founding loan, R&D subsidies (grants and loans)

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UNIVERSITY INNOVATIONS IN FINLAND

- individual scientists own the inventions unless the project has been financed by industry, Tekes or EU
- universities own only few patents
- very little experience of licensing for real money
- but relatively high number of companies established in ict (software) and biotech sectors
- strong tradition in many field of transferring technology for r&d money into Finnish industry
- only few real TTO:s in the universities
- each university have since late 1990’s 1-3 innovation managers – main task to identify and push forward ideas

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TAKING UNIVERSITY IDEAS, KNOWHOW AND INNOVATIONS TO THE MARKET – OFTEN DIRECT LINK TO LOCAL INDUSTRY

- strong intimate cooperation (including exchange of staff) between industry and universities/research institutes in the field of telecommunication, machinery industry, paper industry etc.
- ideas and innovations ”flow” into the companies
- universities (especially technical universities) get major research funding from the companies in return for research and knowhow
- Tekes acts as a catalyst in many cases

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TAKING UNIVERSITY IDEAS, KNOWHOW AND INNOVATIONS TO THE MARKET (2)

But problems exist and arise:

- the universities are paid for research, not for the inventions
- the companies can shelf the inventions
- solutions:

  1) the companies should pay bigger share of the total cost of the joint project in order to get rights to license the inventions

  2) the companies should pay ample compensations for the IPR
- change is difficult because the companies have strong bargaining position

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LICENTIA LTD

- established in 2001 as a merger of Helsinki University TT company and TT company of Helsinki University of Technology and Technical Research Centre of Finland
- operates throughout the country mainly in the life science sector
- main business commercializing inventions made in the public sector in cases where there is not ”natural” Finnish company to take the idea to the market
- Licentia can finance patenting
- staff 9: most with business experience
- financing: own cash flow, equity

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LICENTIA LTD (2)

- no exclusive arrangement with any universities (ownership)
- Licentia collects actively strategic patent clusters from different sources
- Licentia owned by University of Helsinki and other public parties
- about 100 patent families in the portfolio – more than 50 commercialized
- so far some 70 license/option agreements and 5 new companies established based on the patents
- in most cases a sponsored research contract is linked to option/license agreements
- license agreement mainly with foreign companies (USA, EU, Japan)
- in public sector with success fee principle (33 %)
- partnership e.g. with Foresight, Inc, (technology consulting, commercialization in US)

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EXPERIENCES

- ideas are in very early phase – funding for proof of concept phase is still lacking in the system (no man´s land!) – Tekes is developing solutions
- Finnish venture capital community small and Finland is ”remote” from ”core” EU and US – new funds being established by e.g. University of Helsinki and pension funds
- Angel investor are emerging in ICT and also biotech field
- direct relations to companies are essential to get licensing deals
- valuable patents are infringed – until Licentia the public sector was not defending patents at all – so far 11 cases: 7 favourable resolved with ”soft” means the rest will be handled with a Licentia partner (sued already e.g. Nokia and Amazon.com)

CASES (1) -THERMOWOOD

- invention by Technical Research Centre of Finland
- the timper is treated in high temperature with steam
- physical properties including rot resistance improved – the product will partially replace chemically treated wood
- Finnish timber industry created an association to promote the new product and create standards
- Licentia has the rights to the invention and has licensed the technology to association members
- international interest has also been hot: recently licensees in Japan, EU and Canada

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VEGENICS, LTD (AUSTRALIA)

- researchers at Helsinki University and Ludwig Institute for Cancer Research (700 scientists in U.K., Australia, US, Brazil..,) have made outstanding inventions which can be applied in treatment of cancer
- patents are co-owned by Licentia and Ludwig Institute
- new company was established with Australian VC funding in Melbourne in July 2006 with Licentia and Ludwig as major owners
- active development program started
- listing in stock exchange expected in spring 2007

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SPARKLIKE LTD (FINLAND)

- double glazed windows are filled with argon to improve the insulation properties
- argon may leak – measurement has been difficult and invasive
- scientist in Helsinki University developed a new innovative method – Licentia patented it
- new company Sparklike was established, got license from Licentia and is now world leader
- no VC involved