KTH ROYAL INSTITUTE
OF TECHNOLOGY

From research to business in the Swedish ICT Sector

Eric Giertz

Professor, Industrial Economics and Management, KTH

Founder & Chairman, KTH Executive School

LUCAS-dagen, Lund 2016-10-20

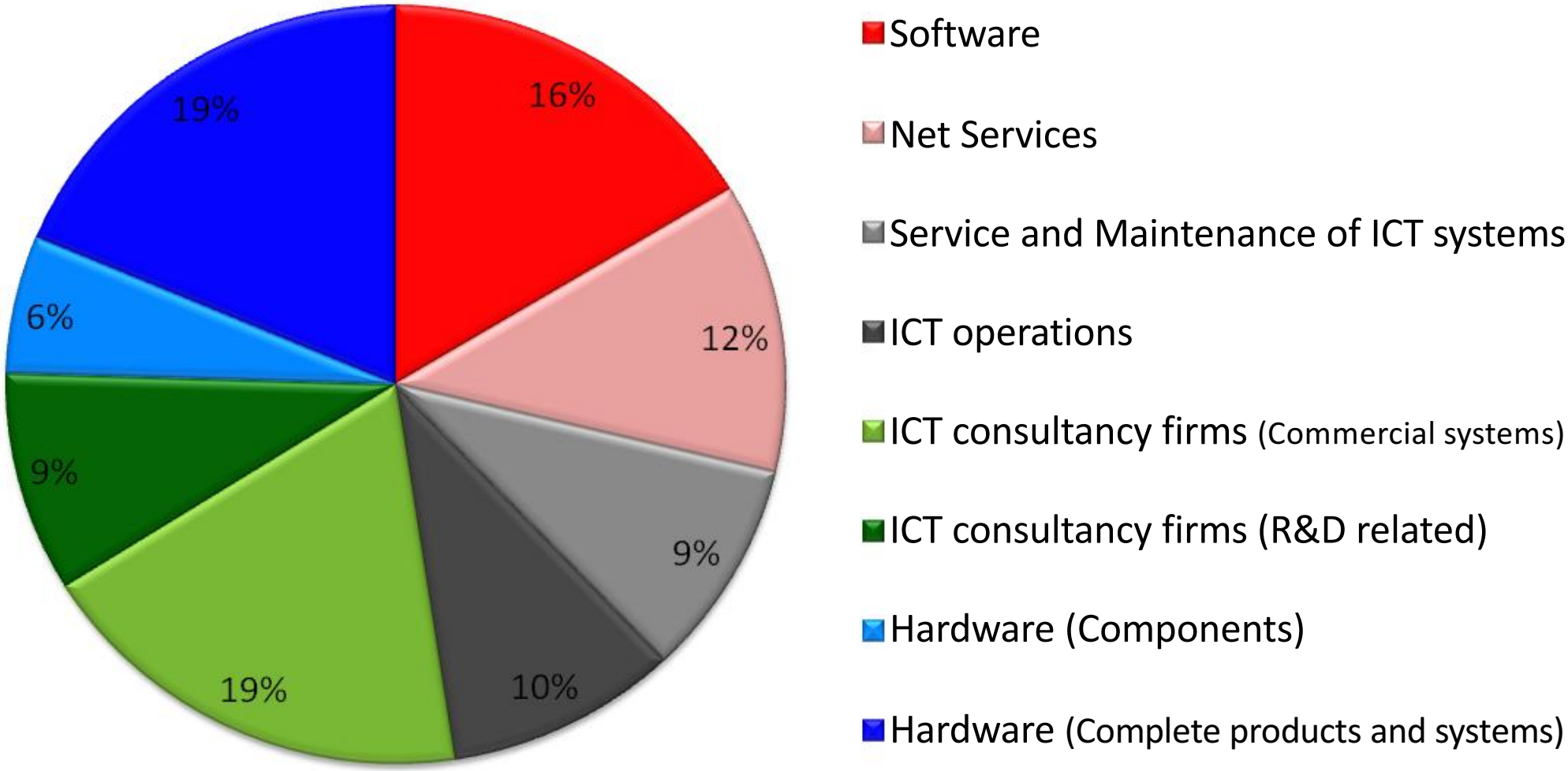
Reports

- Vinnova analys 2013:07
- Företag inom informations- och kommunikationsteknik i Sverige 2007-2011

- Vinnova analys 2015:06:
- Small and beautiful – The ICT success of Finland & Sweden

- Vinnova analys 20016:07
- Svensk konsultsektor i ny belysning

160 000 Employees in ICT companies in Sweden
in different business logics



Internet related Business models

Qbrick®

skype™

MySQL®

Spotify™

UNIBET

Kambi

td TradeDoubler
Market like you mean it

blocket.se
Sveriges största Köp & Sälj marknad

Apica

betsson™

ONGAME

A Swedish gaming industry

MASSIVE ENTERTAINMENT | A UBISOFT STUDIO

MOJANG

paradox INTERACTIVE

AVALANCHE STUDIOS

King

ICT Consultancy companies

semcon

creuna

ATEA

CGI

Logica is now part of CGI.

Prevas

kvadrat

HotSwap

T2 DATA

COMBITECH

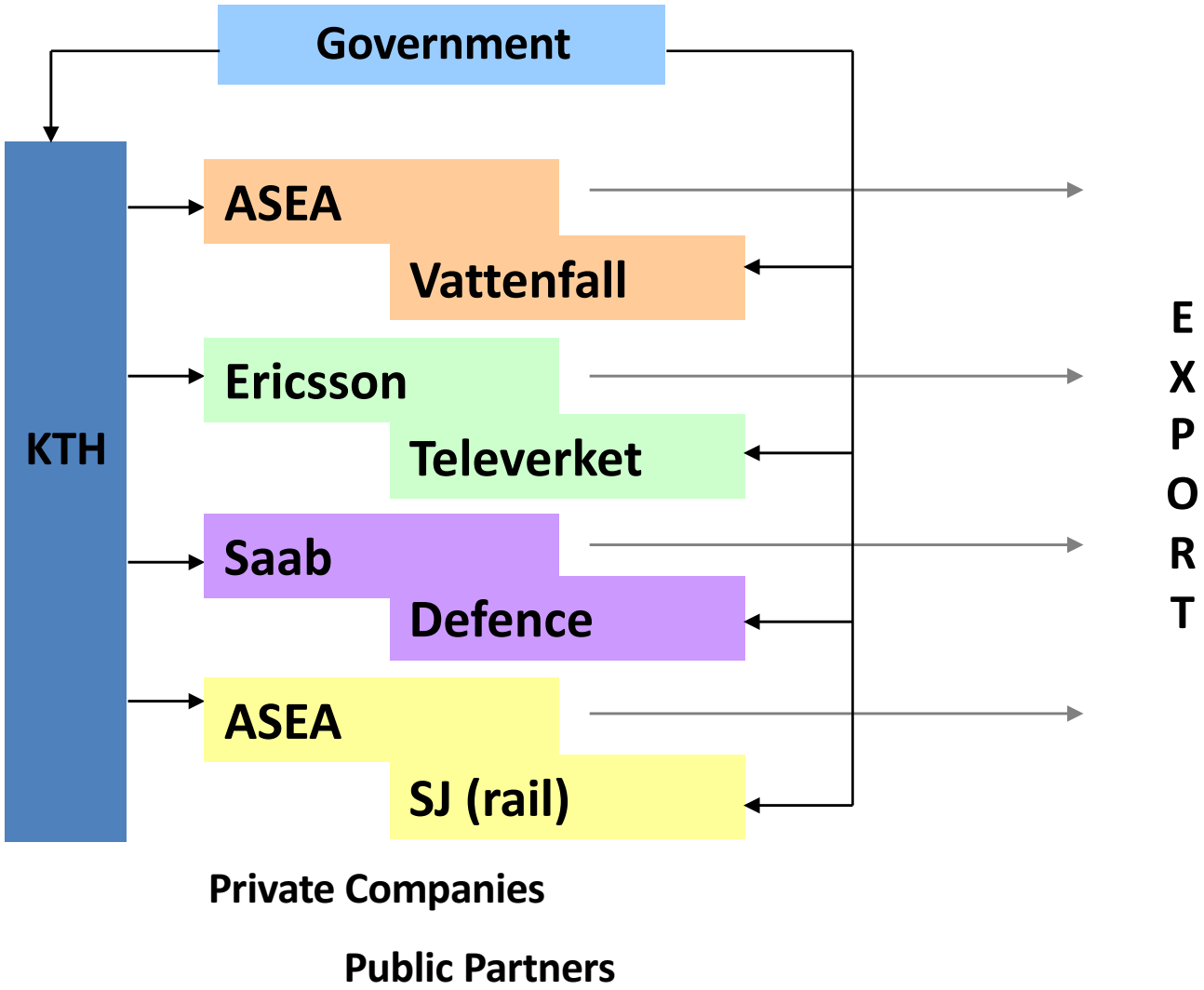
TRITECH

Understanding the Swedish saga through an historical exposé

- The foundation was build by very few strong actors!
- The turbulance around 2000 created new conditions
- Today we have an entrepreneurial and dynamic industry with many different actors!

”Developing couples”

Four parties plan from acorns to oak trees



Close Government–Industry Cooperation

A Swedish computer industry is born

- 1948 The public agency MMN is established at KTH
- BESK is completed in 1953 (the US, France, Britain and Sweden)
- SARA in 1957 (*Saab*) – D21 in 1962
- *Facit* leaves computers in 1963
- A new development couple 12,000 main frame computers (failed)

Ericsson + *Televerket* = A very tight couple

- 1970 *Ellemtel* – a joint venture is established
- Joint development of electronic and automated switching
- 1976 *Televerket* puts AXE in operation in Södertälje
- 1978 *Ellemtel* transfers AXE competence to *Ericsson*

Gov't was involved in ICT restructuring

Datasaab is established

- *Stansaab* established 1971 (SRT, *Saab Scania*, SUAB)
- *Alfaskop* is a huge success
- SRT leaves in 1973
- 1978 *Stansaab* & *Saab Scania* computer division = *Datasaab*

A state-owned PC industry is born

- January 1978 – a meeting in Linköping
- August 1978 ABC 80 is introduced
- 1979 Government takes over

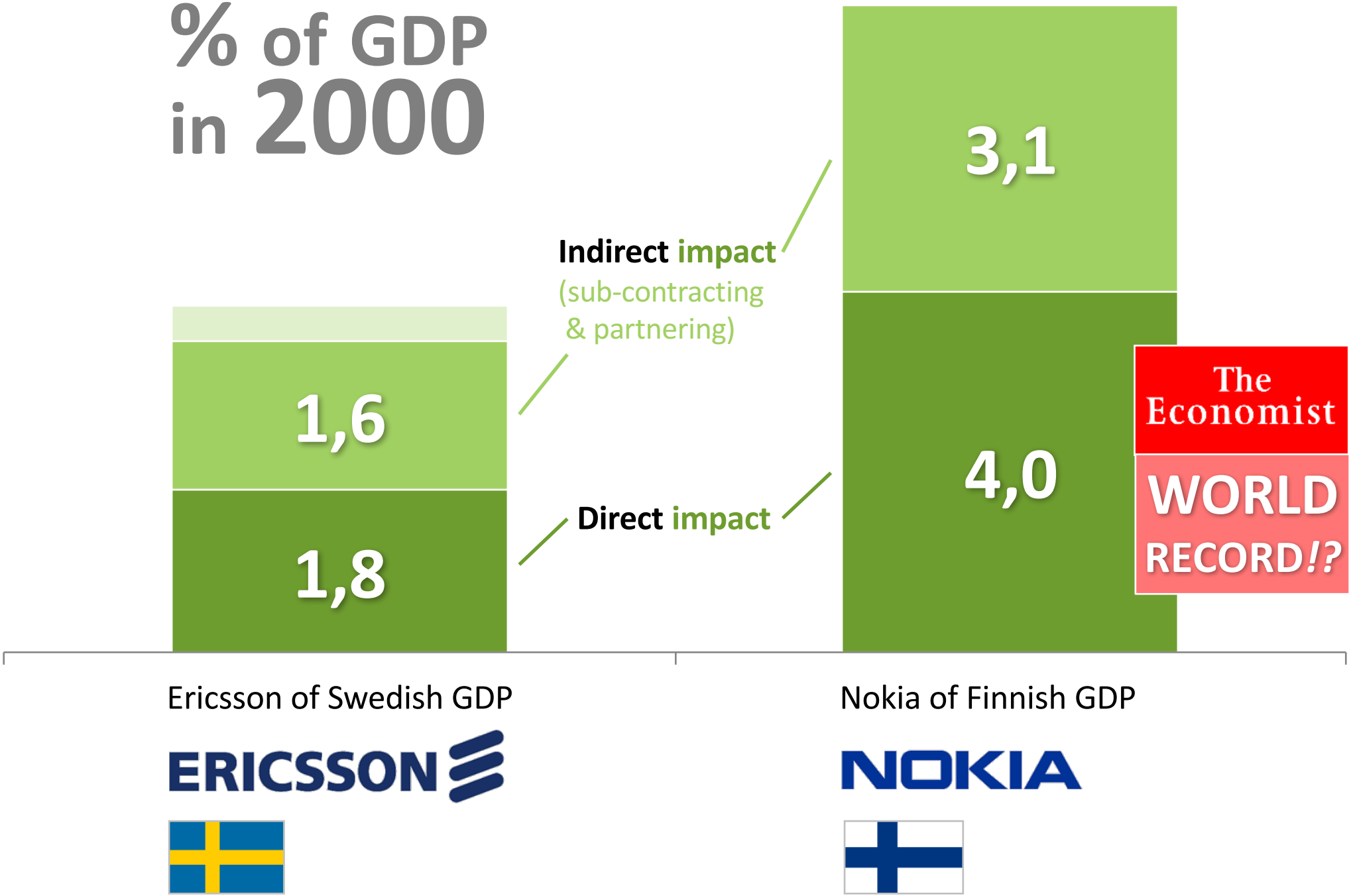
Ericsson and *Nokia* takes over

NMT & GSM opens world market for *Ericsson*

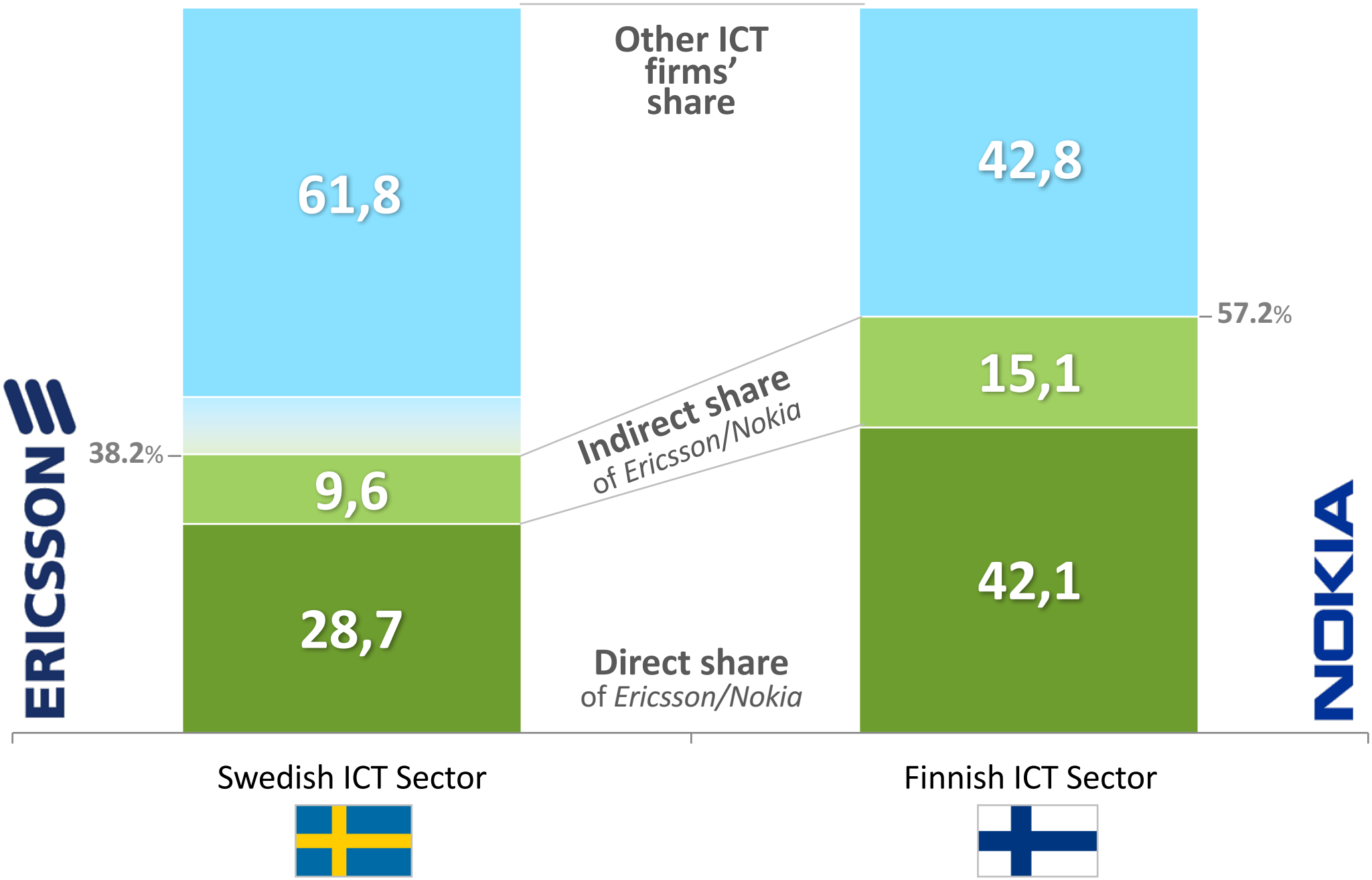
A New era starts in the 1990th

- ***Televerket* & *Ericsson* are divorced**
  - Liberalization in 1993
  - Ericsson takes over *Teli* (1994) and *Ellemtel* (1995)
  - *Telia* AB makes IPO 2000
  - *Telia* acquires *Sonera* in 2002
- ***Ericsson* ready to conquer the world!**
  - *Ericsson* outsourcing late 1990s
  - *Ericsson* on top March 2000

% of GDP in 2000

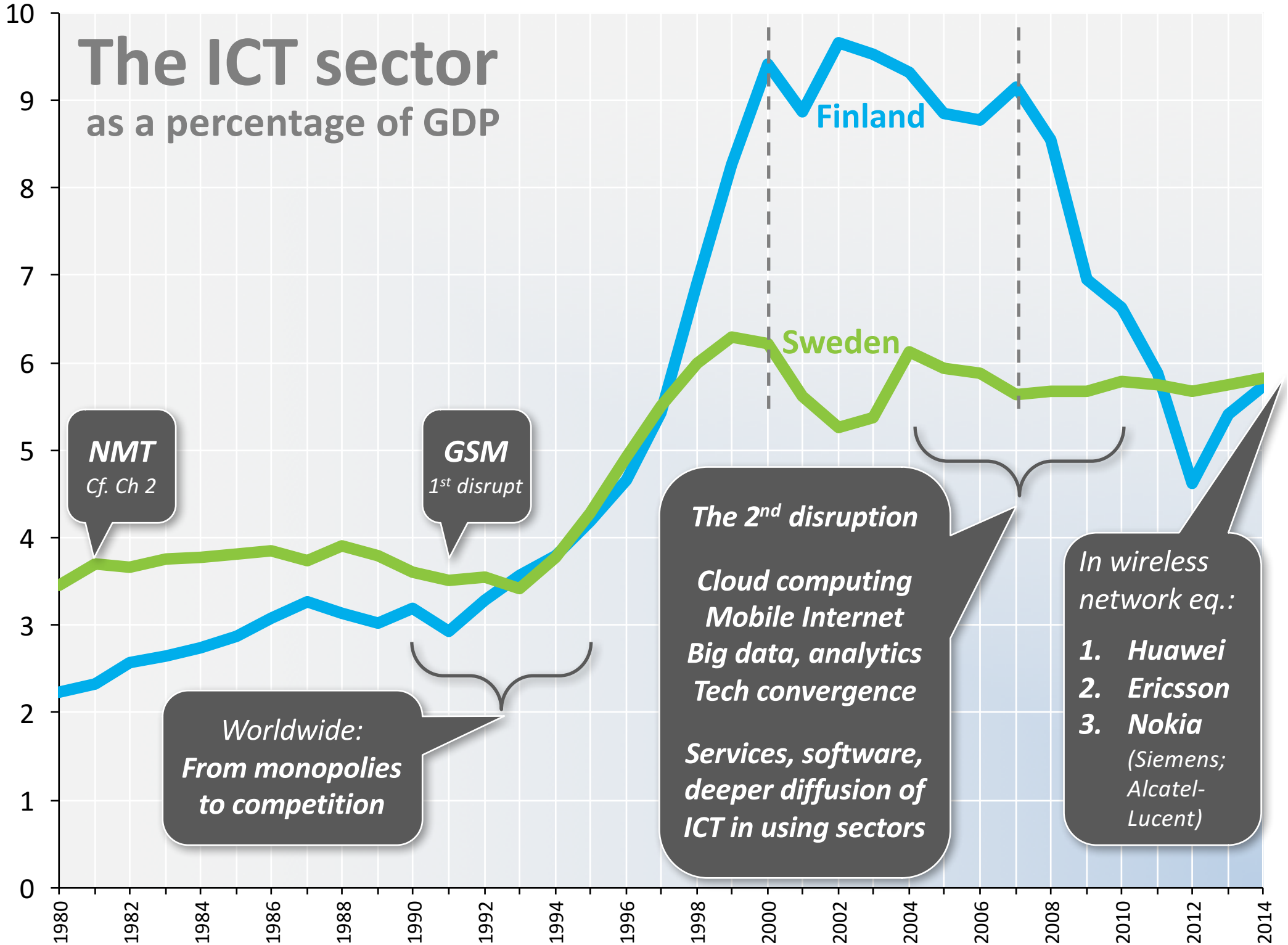


Share of ICT Sector Value Added in 2000, %

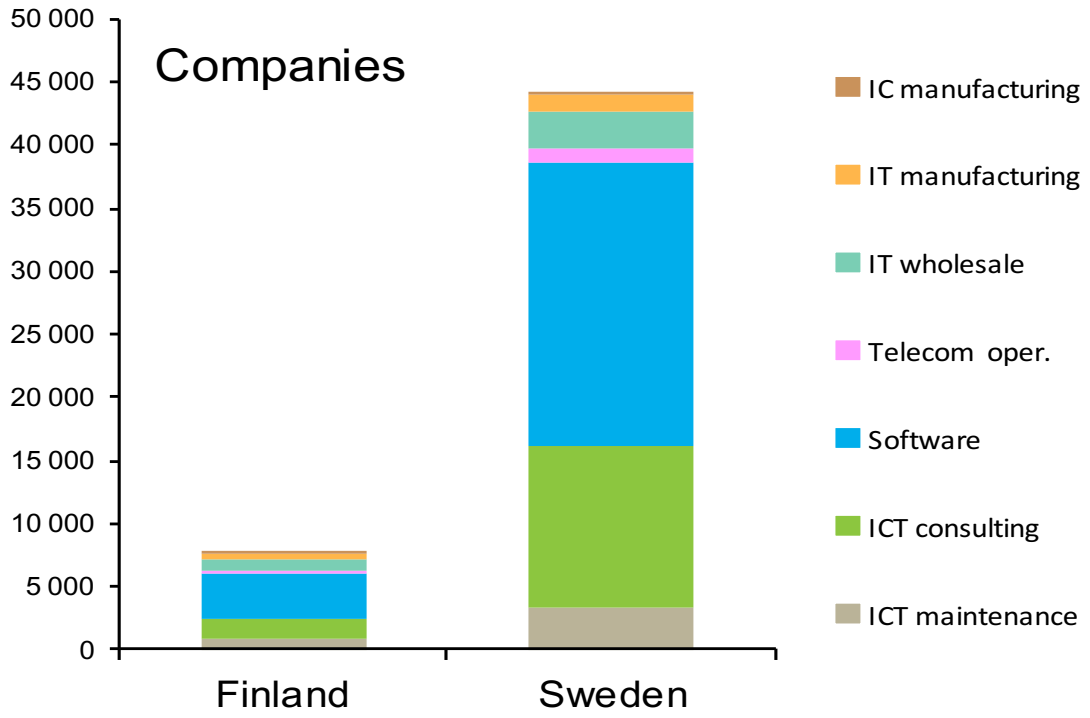


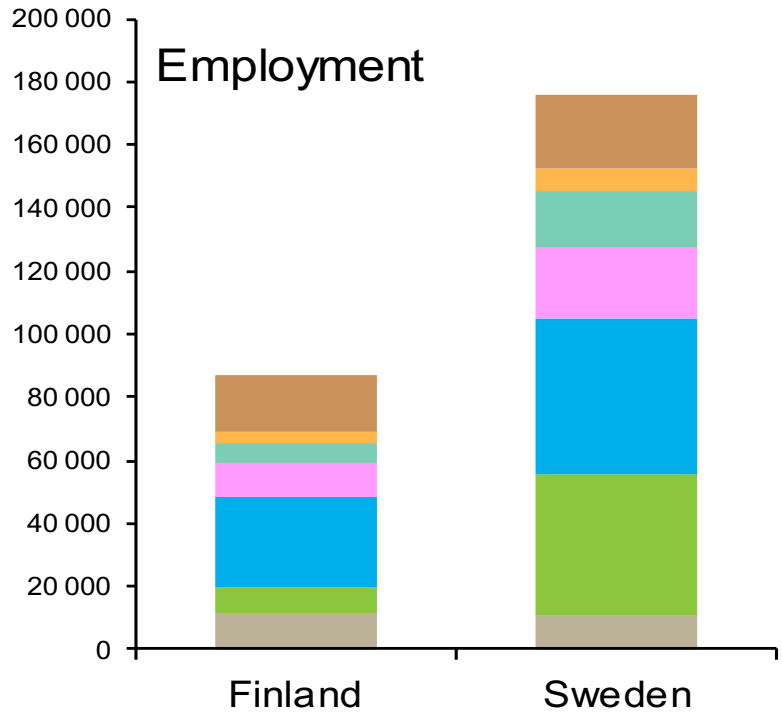
An explosion in 2001

- ***Ericsson* survived when bubble burst**
  - *Ericsson* hit by 3G licensees
  - Leaves handsets to *Sony Ericsson*
  - More than 8,000 consultants are kicked out in 2001
  - Saved by new issued shares in July 2002
  - Employment in Sweden from 43,000 to 21,000 in four years
- **A diversified ICT Sector is born**


The ICT sector
as a percentage of GDP
Finland
Sweden
NMT
Cf. Ch 2
GSM
1st disrupt
Worldwide:
From monopolies to competition
The 2nd disruption
Cloud computing
Mobile Internet
Big data, analytics
Tech convergence
Services, software, deeper diffusion of ICT in using sectors
In wireless network eq.:
1. Huawei
2. Ericsson
3. Nokia
(Siemens; Alcatel-Lucent)
0
1
2
3
4
5
6
7
8
9
10
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014

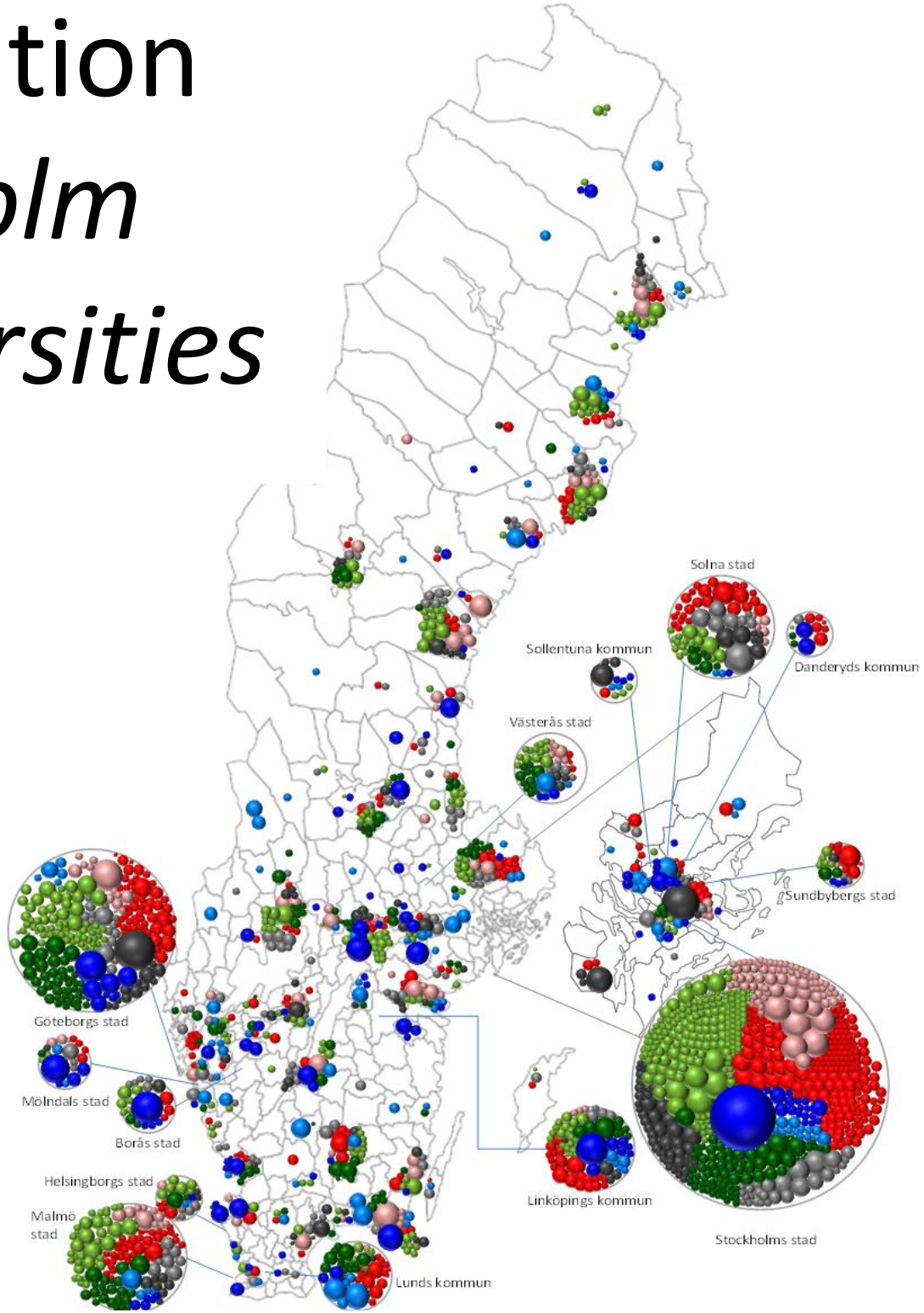
In 2012 Sweden had 6 times as many ICT-companies but only twice the number of employees





Concentration to *Stockholm and universities*

- Software
- Net Services
- Service and Maintenance of ICT systems
- ICT operations
- ICT consultancy firms (Commercial systems)
- ICT consultancy firms (R&D related)
- Hardware (Components)
- Hardware (Complete products and systems)



Internet-related business models

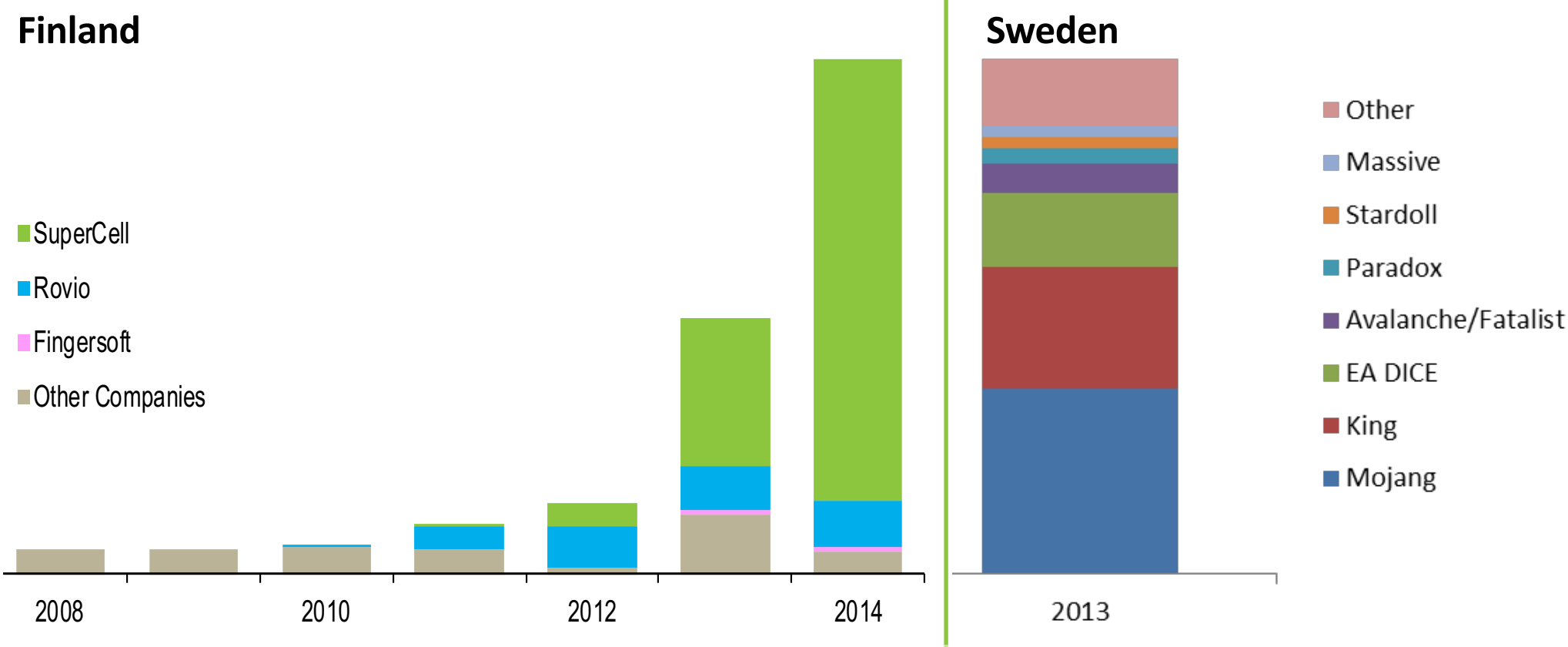
Internet-related business models

- Proof of Concepts
- Industrial exits
- Loved by Business angels & VCs

- Employ rather few people
- Great importance for the use of ICT in other sectors of industry

- Technology based B2B-companies serve many customers in consolidated industries

Finland *vs* Sweden: Part II



Finland		**Sweden**
Mobile focus	*vs*	Broad footprint
Super concentrated	*vs*	Concentrated

ICT permeates many sectors

Three aspects in focus here:

- ***ICT consultants*** as drivers of change
- ***Embedded systems*** in engineering
- ***Internet of things*** - cloud computing

The importance of R&D-related Consultancy

semcon

epsilon

CYBERCOM GROUP

SYLOG

HiQ

Prevas

T2 DATA

kvadrat

Etteplan

HotSwap

COMBITECH

TRITECH

R&D related ICT Consultancy firms

Typical customers:

Engineering Corporations making complex & assembled products

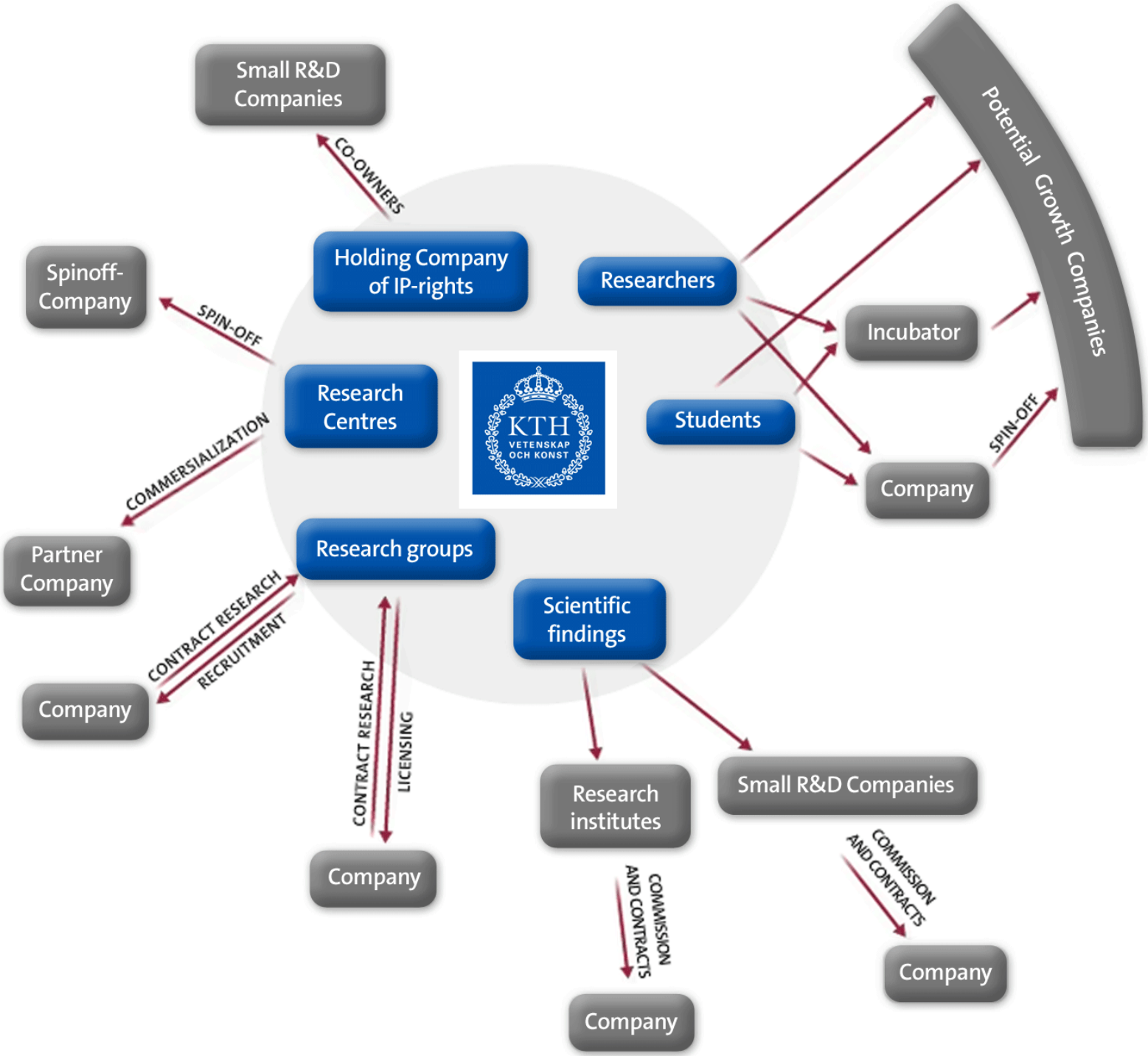
- Developing software components (embedded systems) in costumer products & systems

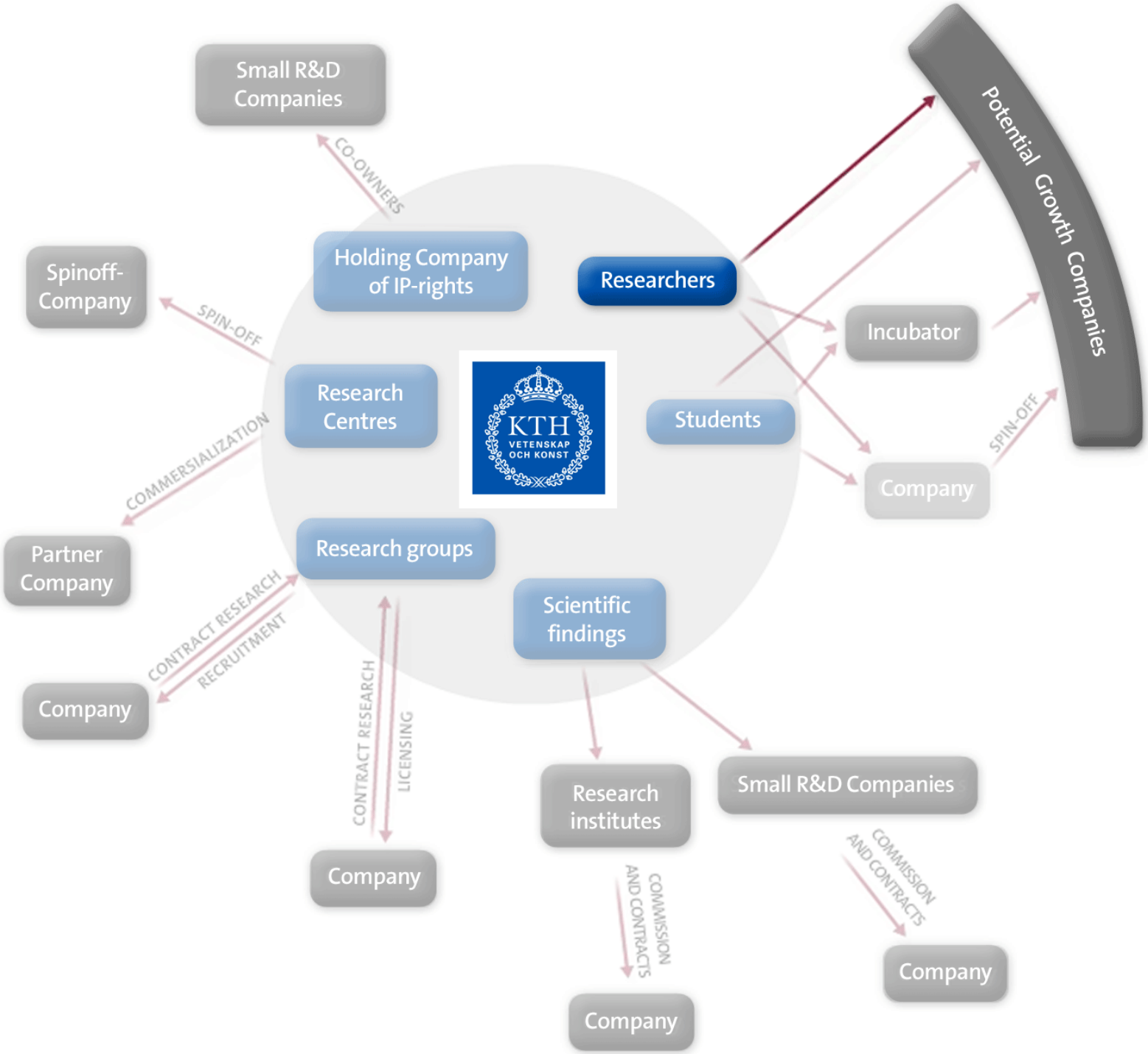
- Developing software & systems for production processes

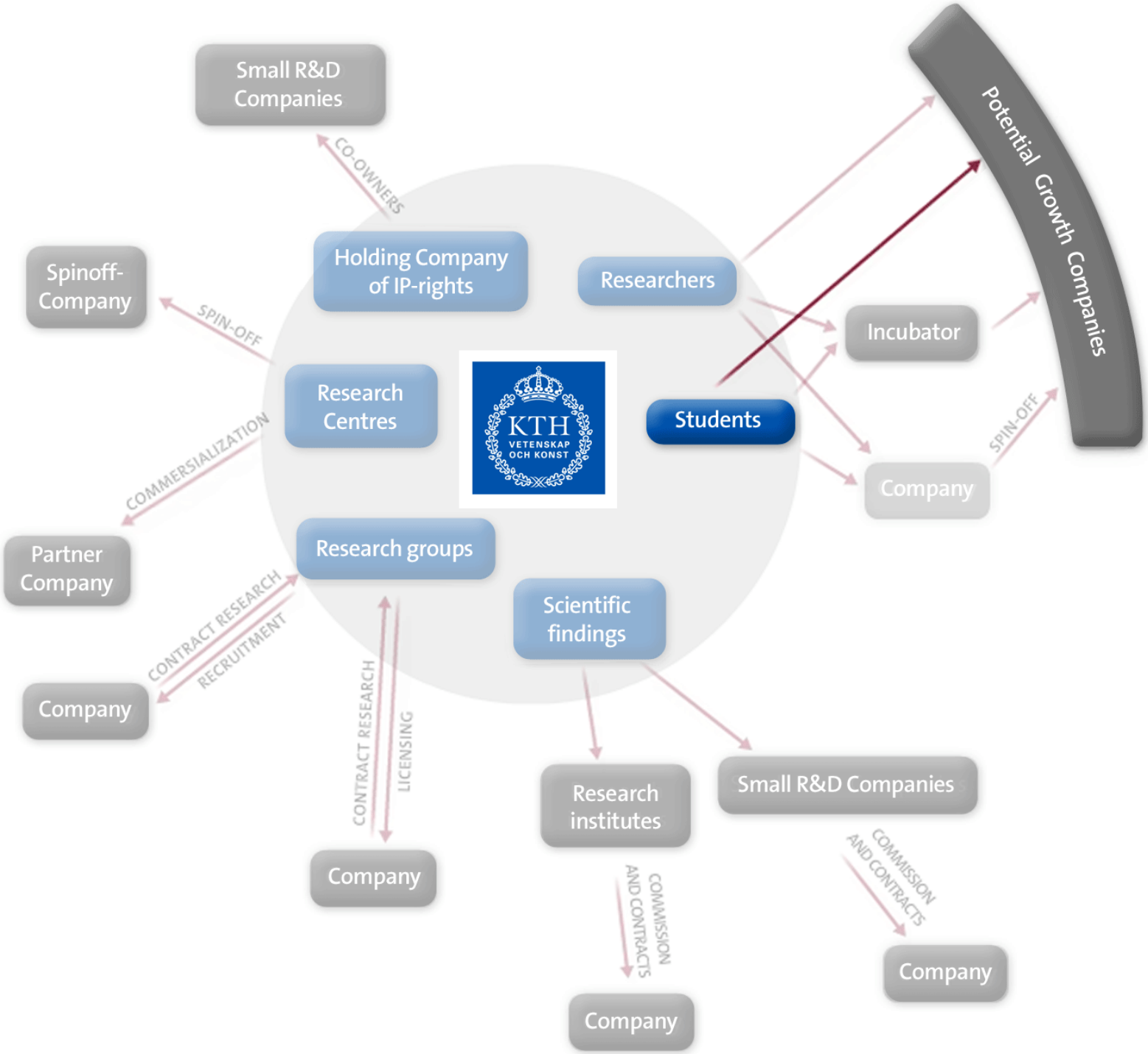

Firm XX
ABB
Ericsson
STOCKHOLM
Saab
Firm XX
Örebro
Volvo
Atlas Copco
DeLaval
Atlas Copco
Autoliv
Firm XX
Saab
Saab Automobile
Ericsson
Kapsch
Jönköping
Volvo
Husqvarna
Saab
Viking
Firm XX
Göteborg
Firm XX
Kockum
Saab
Ericsson
Växjö
Helsingborg
Firm XX
Ericsson Mobile
Hemocue
Malmö

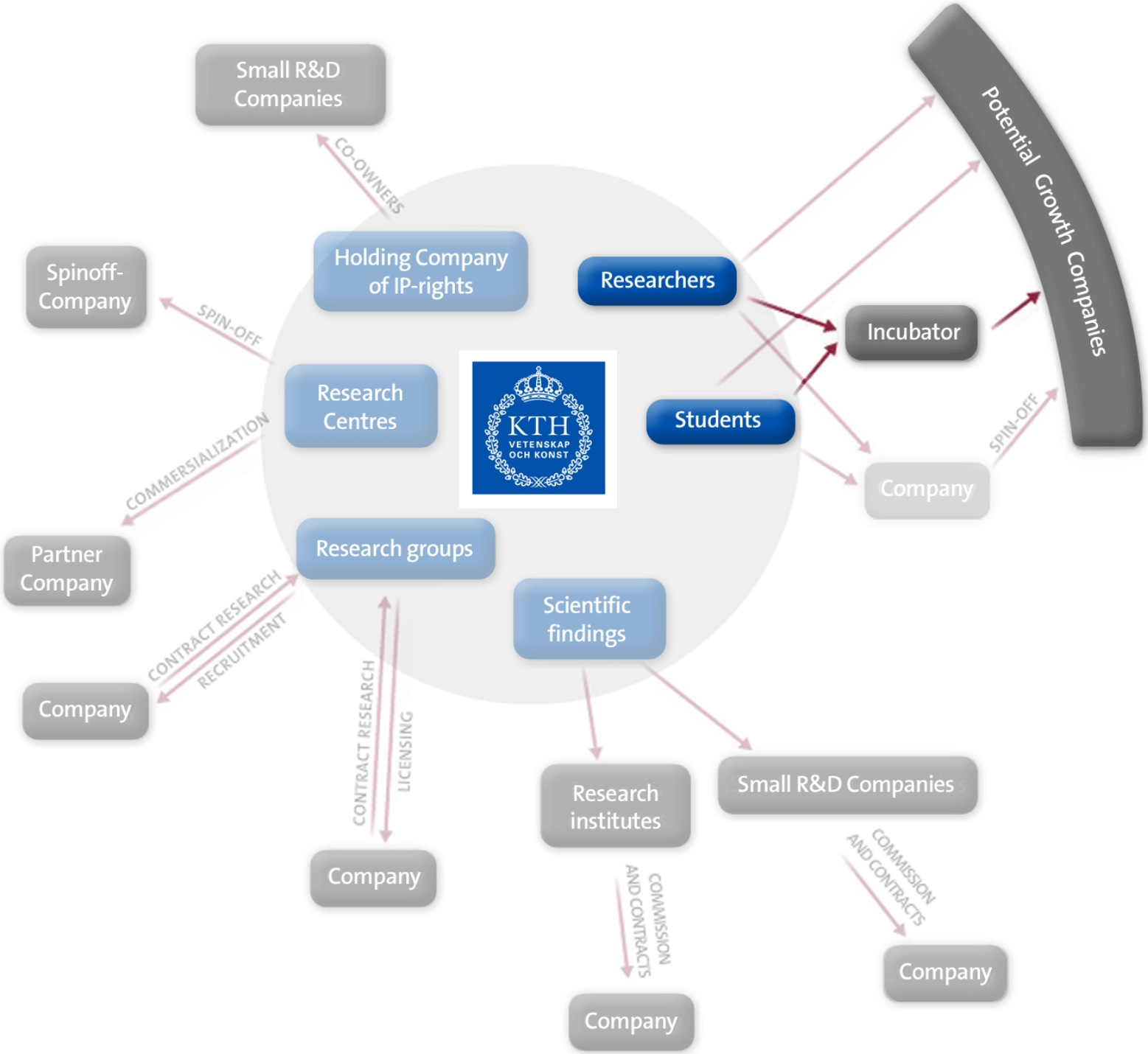
Is there a Swedish paradox?

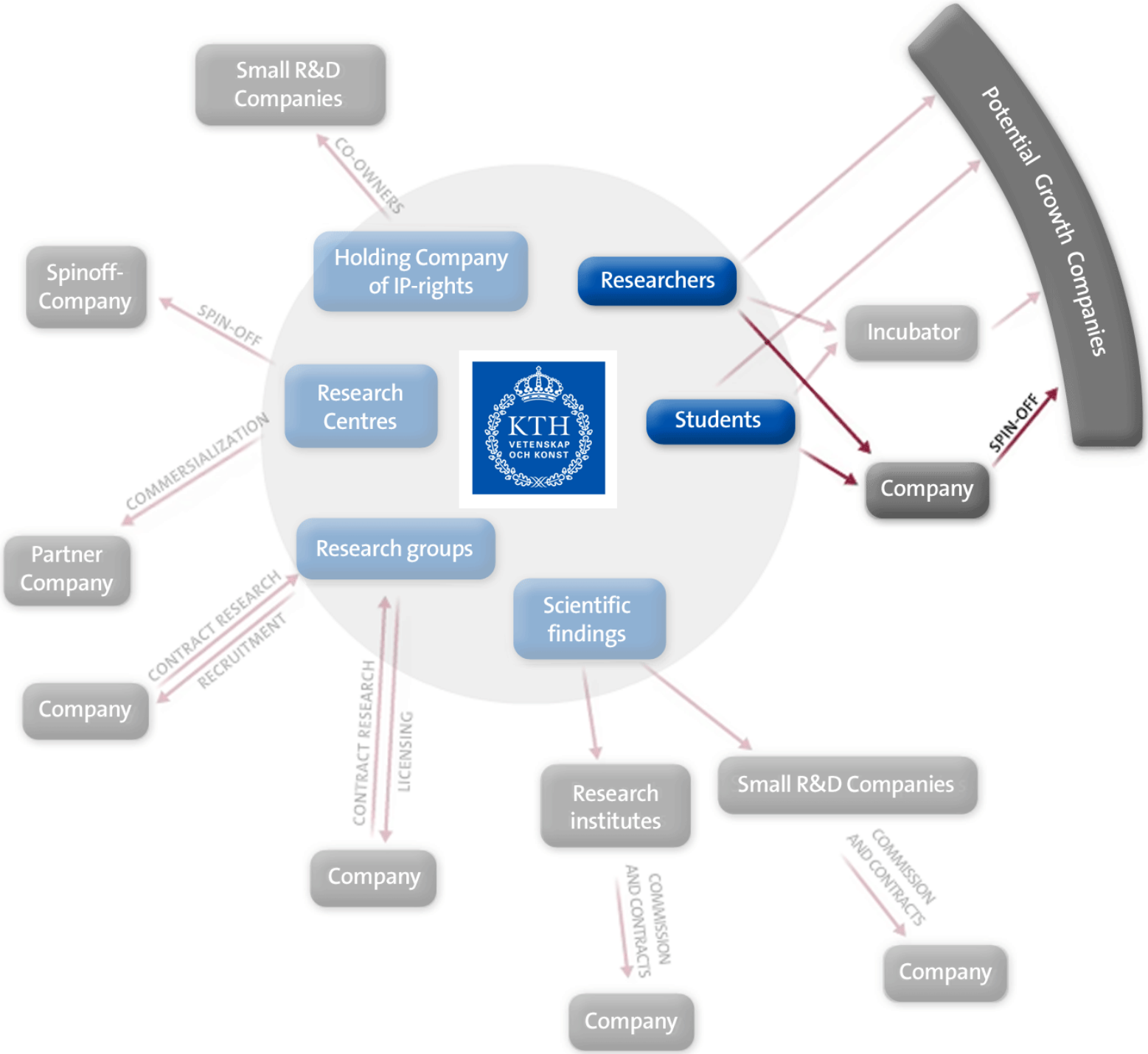
- Sweden tops European Innovation Scoreboard 2016
- Stockholm top ranked among European regions in the World Competitive Index of regions in 2014. (# 6 in the world)
- World Economic Forum ranks Sweden number 6 in Global Competitive Index 2016-2017 edition

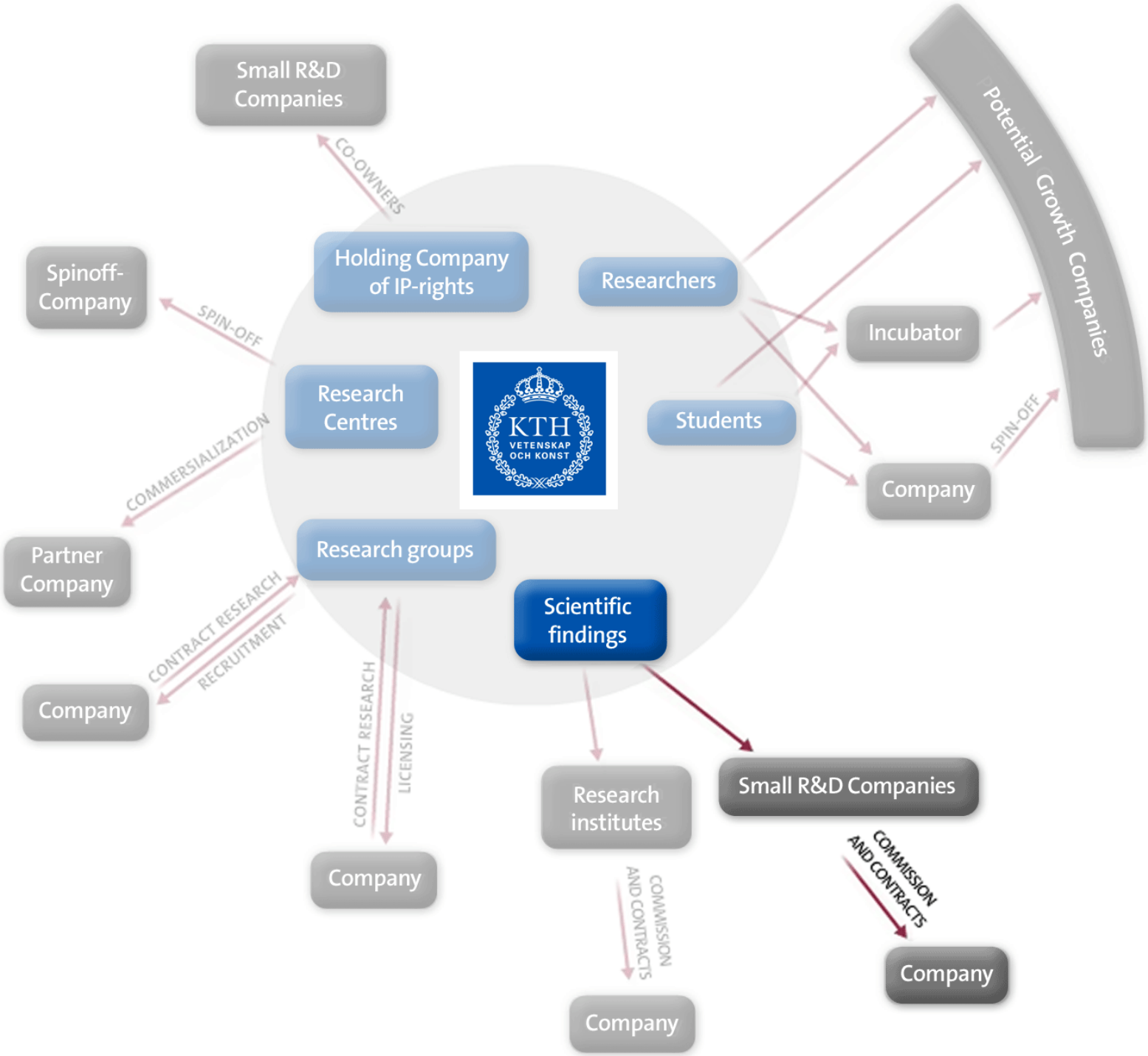

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
KTH
VETENSKAP OCH KONST
Researchers
Incubator
Students
Company
SPIN-OFF
Potential Growth Companies
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company

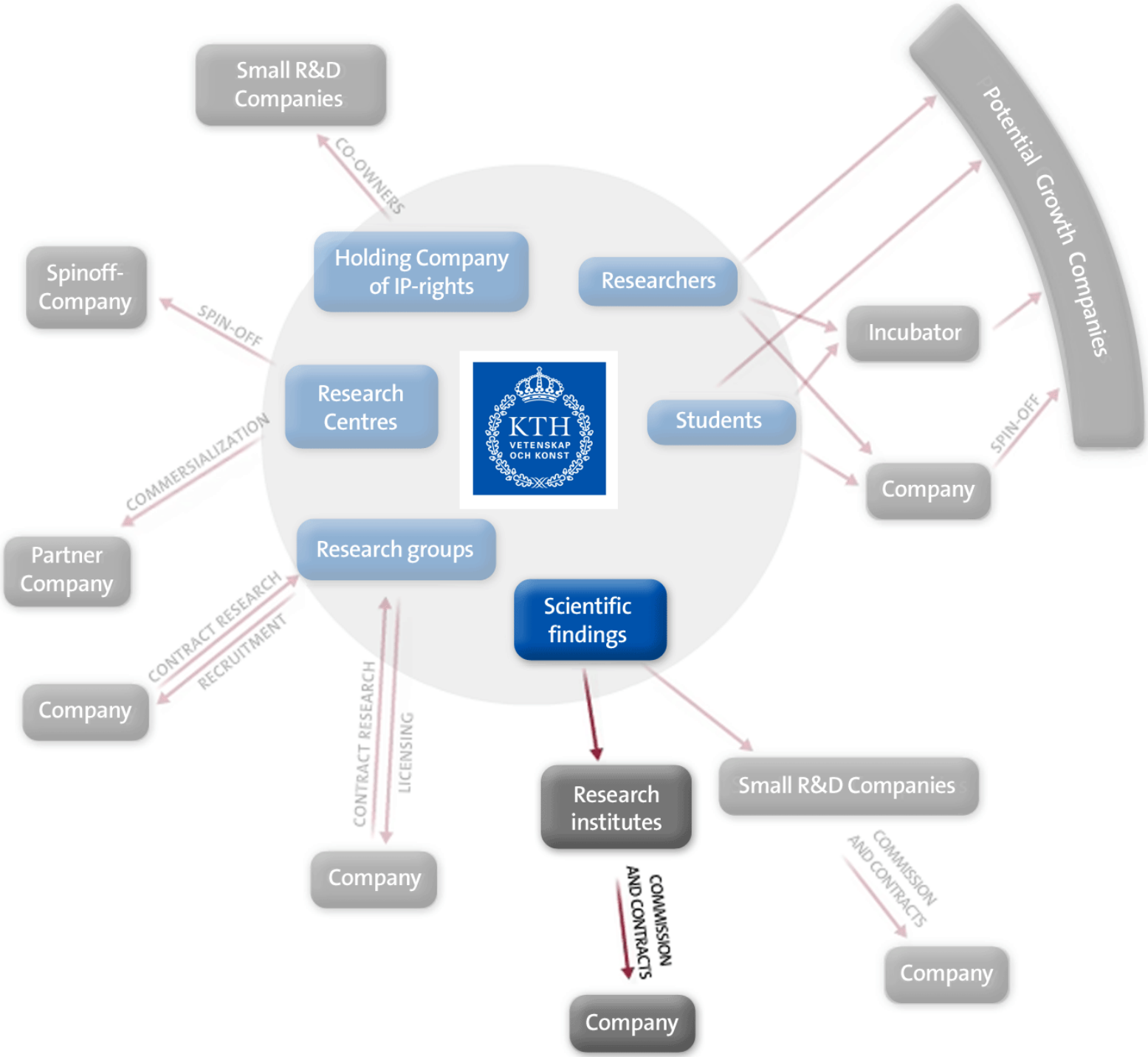

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company
Researchers
Incubator
Students
Company
SPIN-OFF
Potential Growth Companies
KTH
VETENSKAP OCH KONST

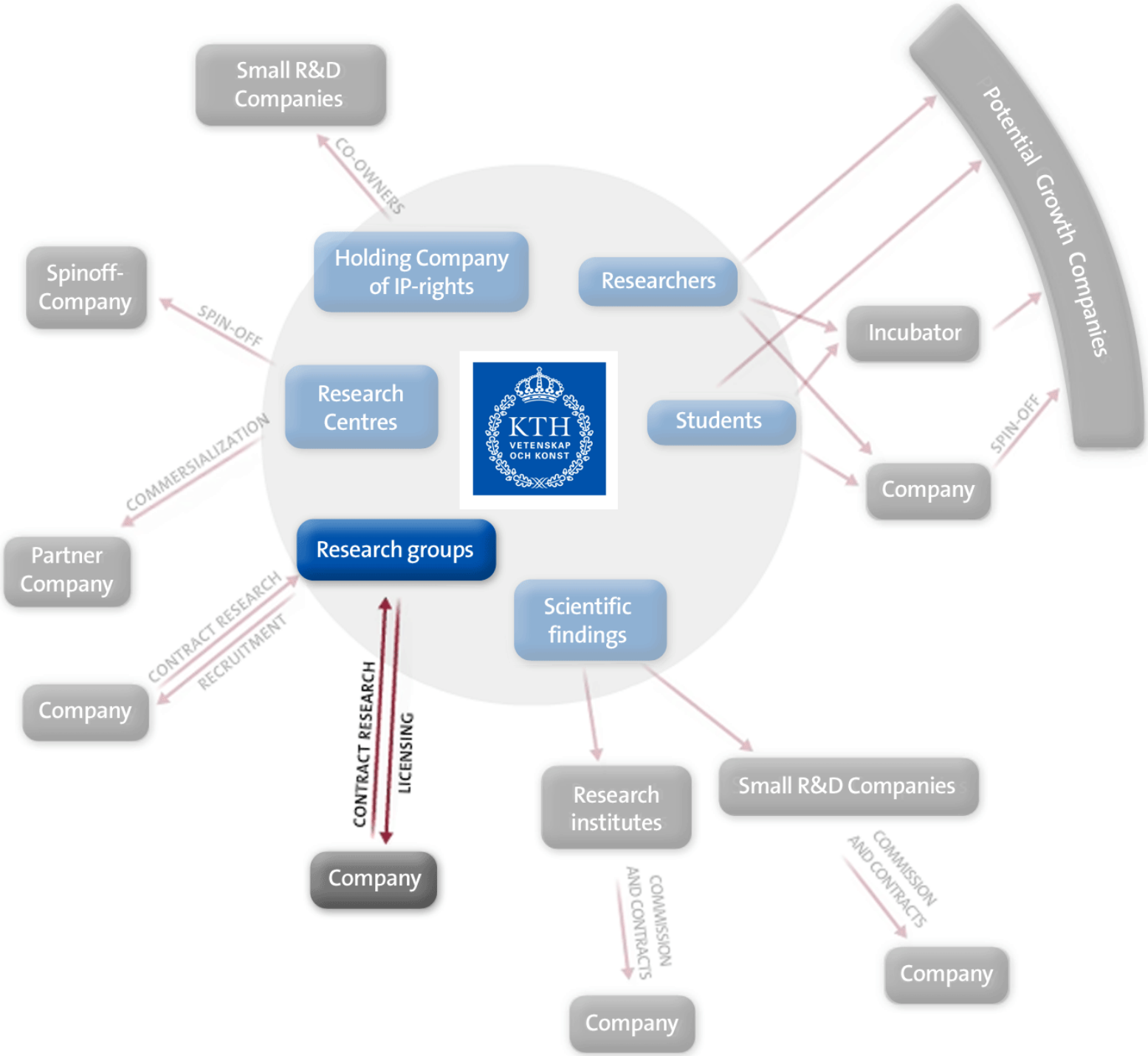

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
Company
COMMISSION AND CONTRACTS
COMMISSION AND CONTRACTS
Company
Company

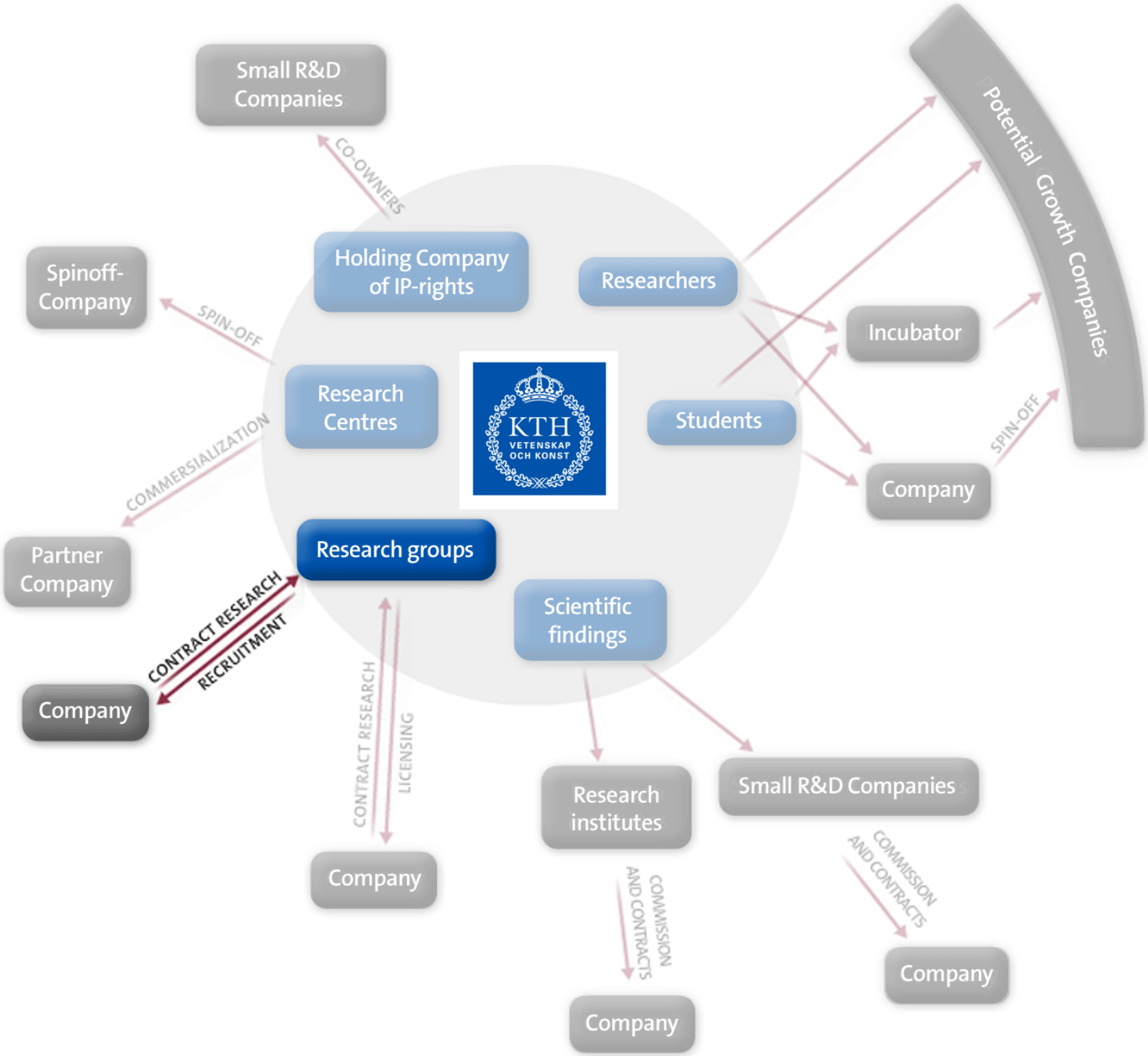

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company
Researchers
Students
Incubator
Company
SPIN-OFF
Potential Growth Companies
KTH
VETENSKAP OCH KONST

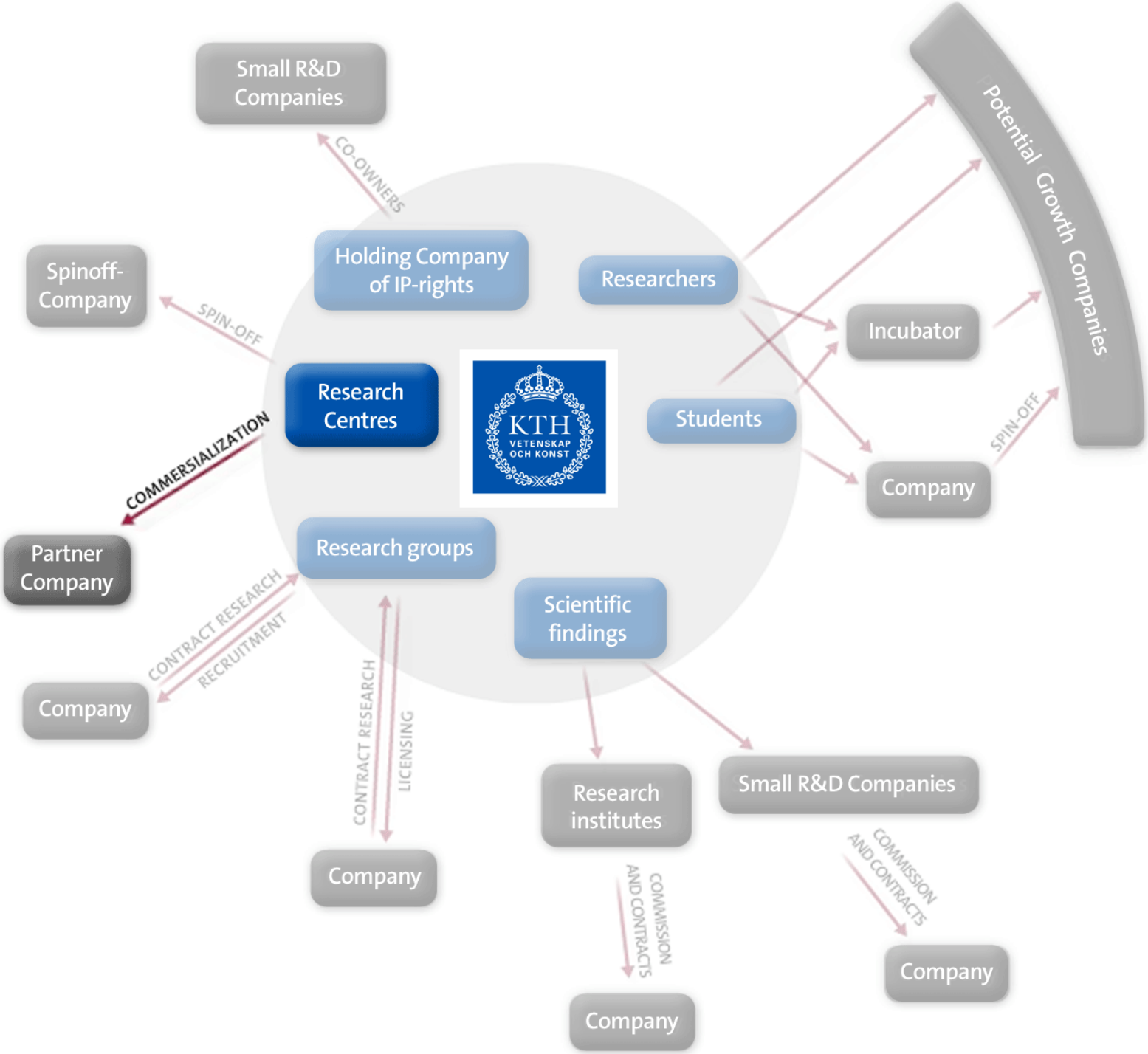

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company
Researchers
Students
Incubator
Company
SPIN-OFF
Potential Growth Companies
KTH
VETENSKAP OCH KONST

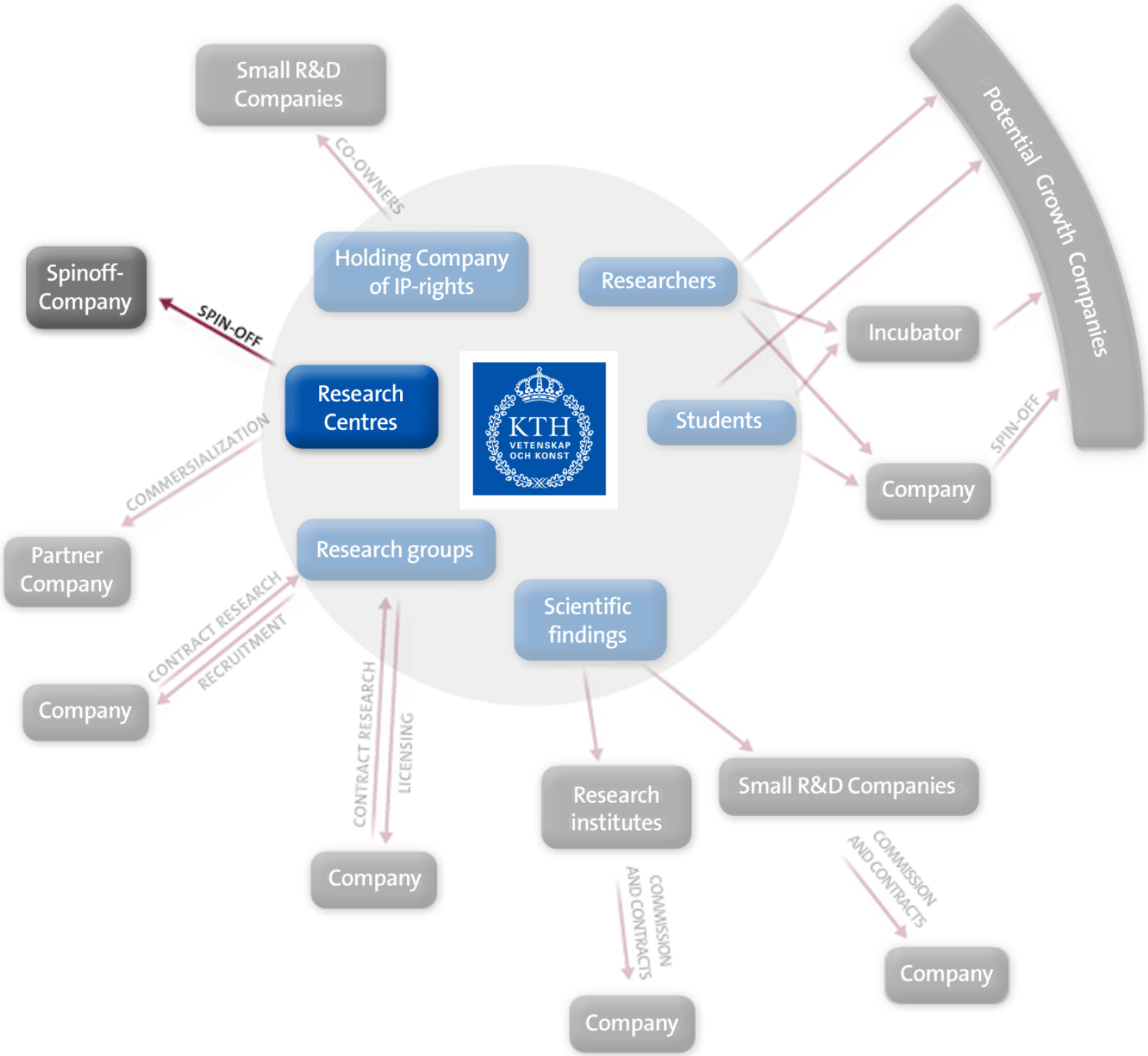

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
COMMISSION AND CONTRACTS
Company
COMMISSION AND CONTRACTS
Company

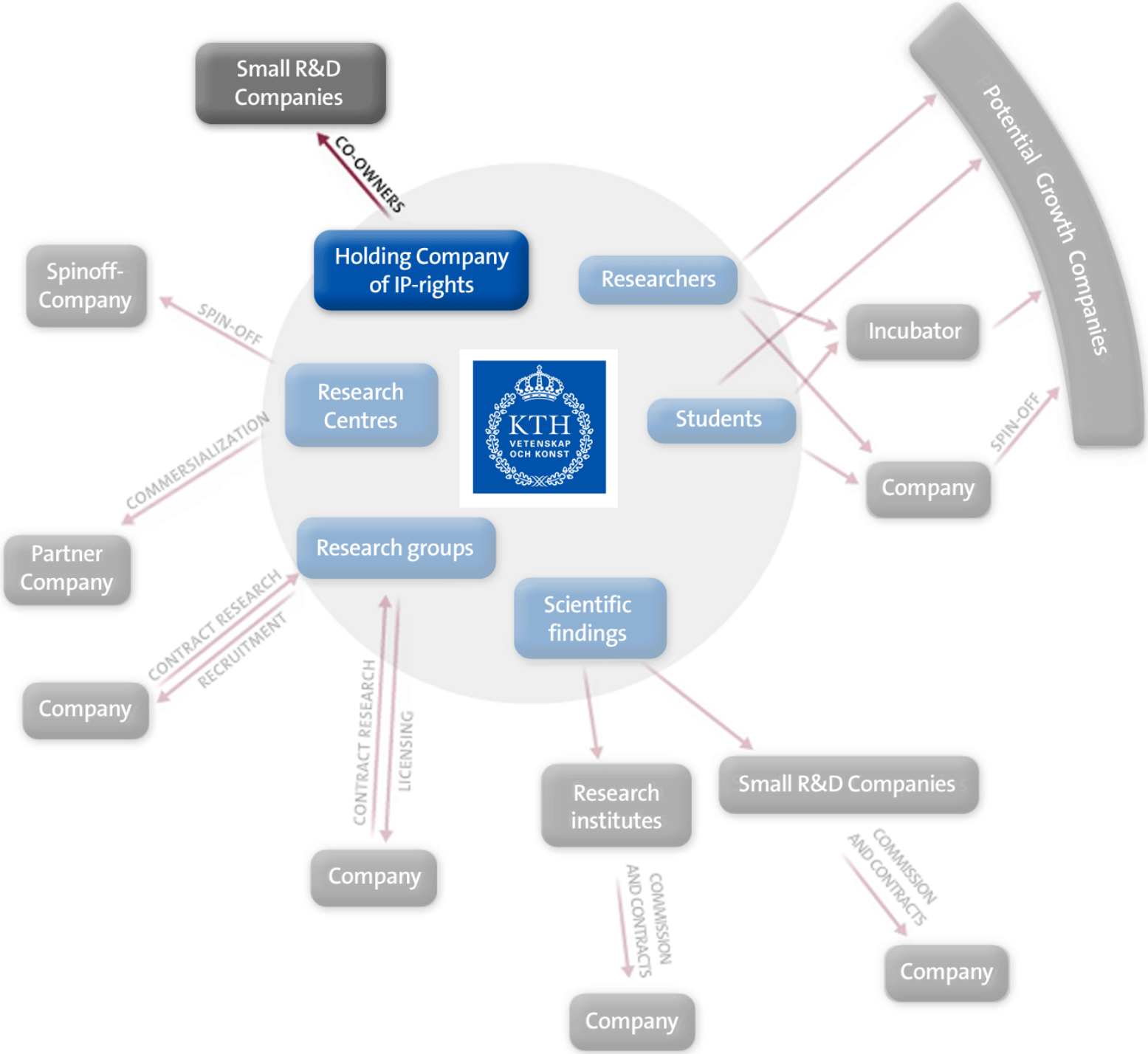

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH
VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
Company
COMMISSION AND CONTRACTS
COMMISSION AND CONTRACTS
Company
Company

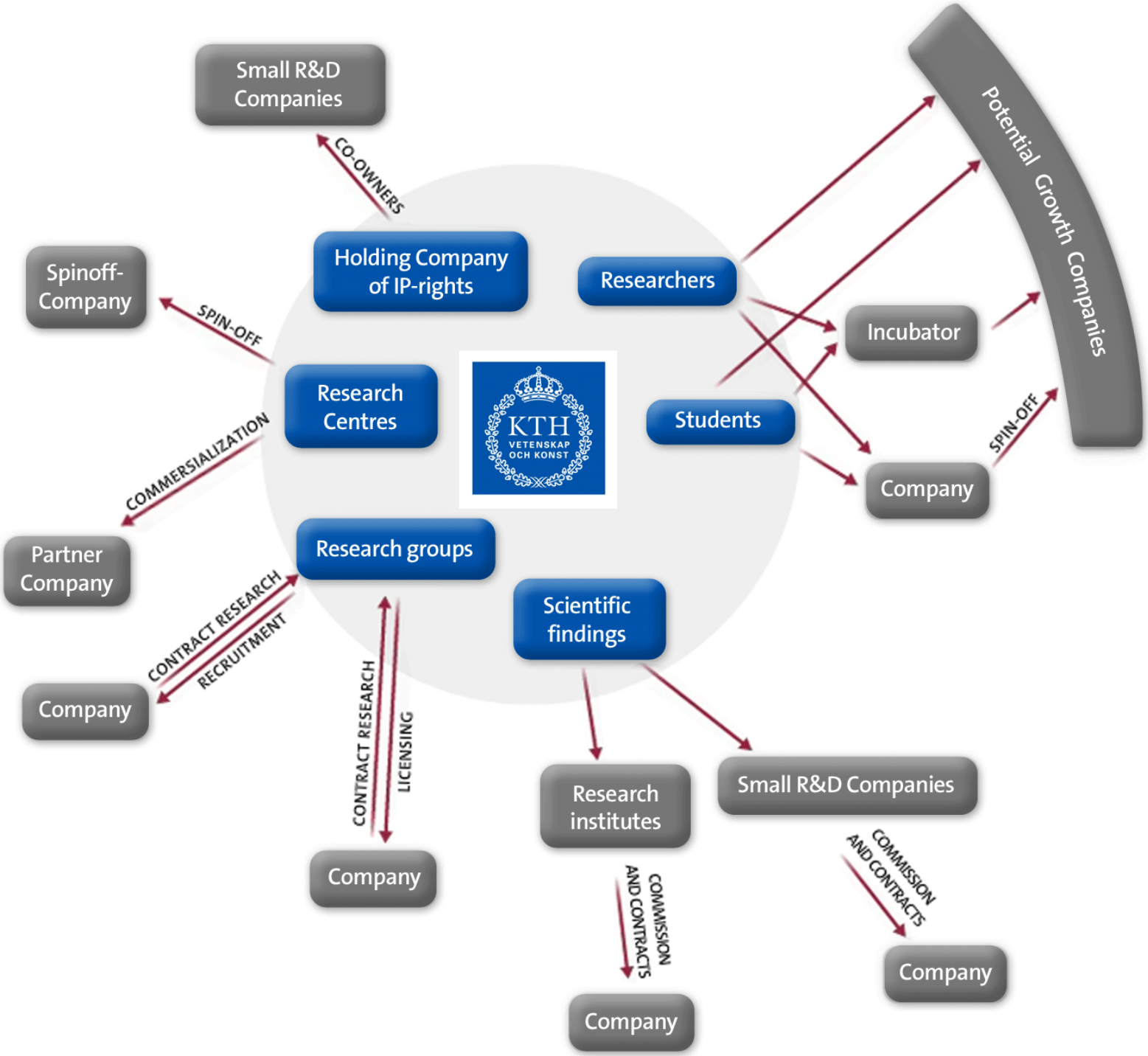

Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
Company
COMMISSION AND CONTRACTS
COMMISSION AND CONTRACTS
Company
Company


Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
Company
COMMISSION AND CONTRACTS
COMMISSION AND CONTRACTS
Company
Company


Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company
Researchers
Students
Incubator
Company
SPIN-OFF
Potential Growth Companies
KTH
VETENSKAP OCH KONST


Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Researchers
Potential Growth Companies
Spinoff-Company
SPIN-OFF
Incubator
Research Centres
KTH VETENSKAP OCH KONST
Students
SPIN-OFF
COMMERSIALIZATION
Company
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Scientific findings
Company
CONTRACT RESEARCH
LICENSING
Research institutes
Small R&D Companies
Company
COMMISSION AND CONTRACTS
COMMISSION AND CONTRACTS
Company
Company


Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
Researchers
Incubator
Students
Company
SPIN-OFF
Potential Growth Companies
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company


Small R&D Companies
CO-OWNERS
Holding Company of IP-rights
Spinoff-Company
SPIN-OFF
Research Centres
COMMERSIALIZATION
Partner Company
Research groups
CONTRACT RESEARCH
RECRUITMENT
Company
CONTRACT RESEARCH
LICENSING
Company
KTH
VETENSKAP OCH KONST
Researchers
Incubator
Students
Company
SPIN-OFF
Potential Growth Companies
Scientific findings
Research institutes
COMMISSION AND CONTRACTS
Company
Small R&D Companies
COMMISSION AND CONTRACTS
Company