

Topic 14

The Interface between Universities

Public Research Institutions and SMEs

Training of Trainer's Program, Teheran

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AGENDA

2

- Context
- Research and Development
- R&D and Innovation
- Internal and External R&D
- Public Private Partnerships
- PPPs challenges; advantages
- R&D funding
- Establishing partnerships

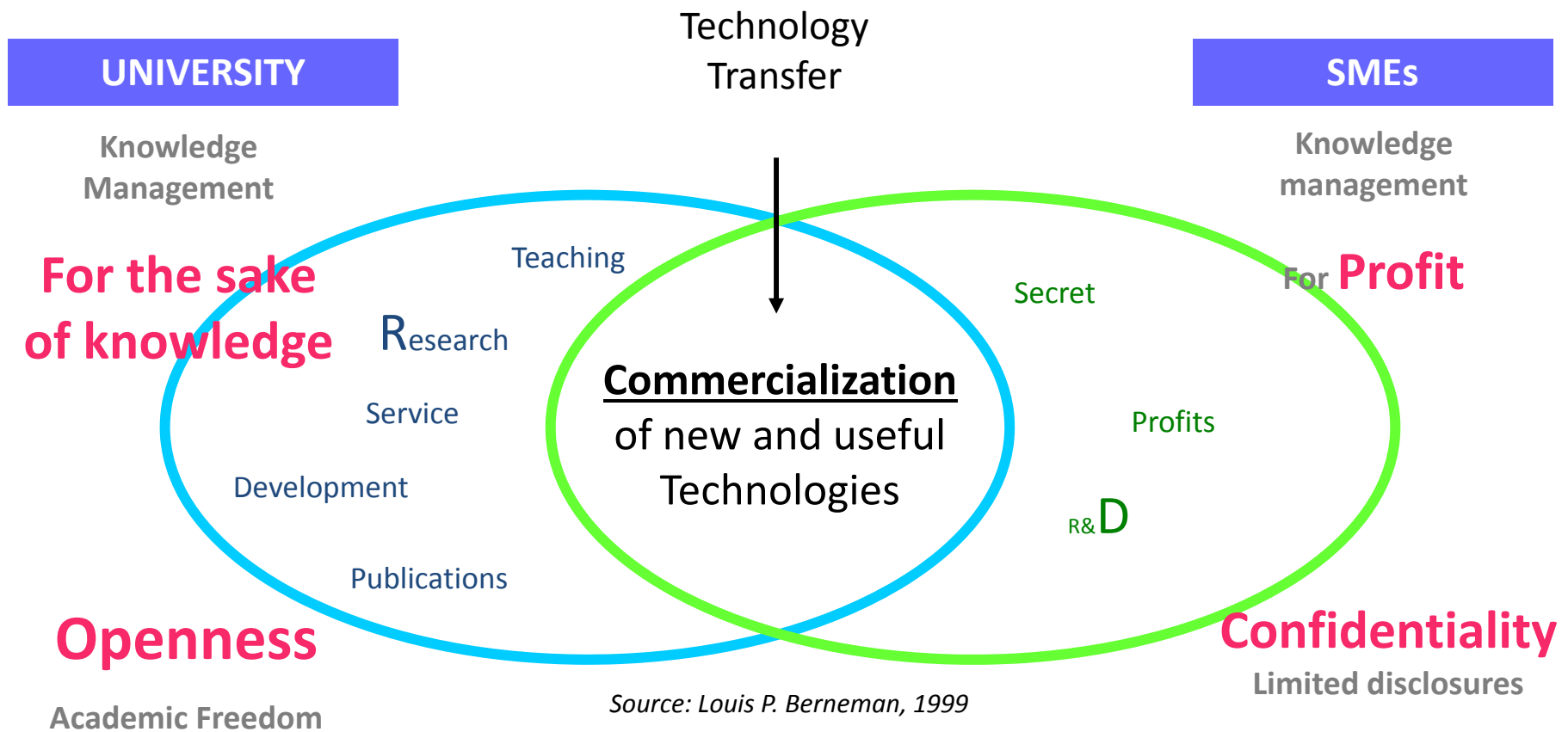


INTRODUCTION

- More and more, SMEs «outsource» R&D to University laboratories.
- University professors are more and more open to private R&D funding (depends on university and type).
- **However, often culture mismatch.**



INTRODUCTION (2)



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RESEARCH AND DEVELOPMENT

Research and Development are two different but *sometimes* related processes:

- **Research:**

Curiosity  Knowledge, Ideas (IP)

- **Development:**

Knowledge, Ideas  Products & Processes

R&D IS NOT ALWAYS THE SAME

In Academic Institutions:

R&D

Output: Knowledge, Ideas, IP

In Commercial Organizations:

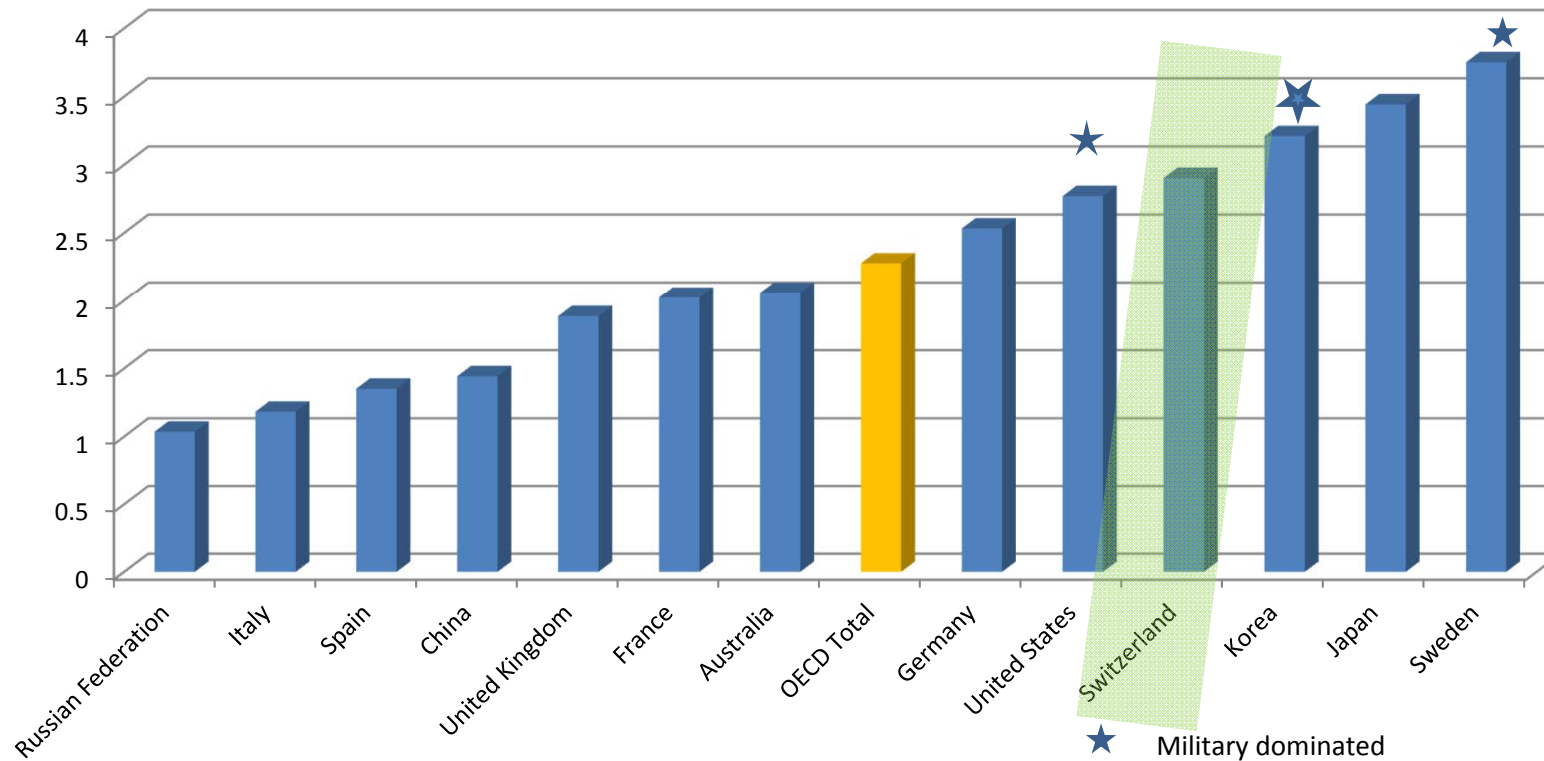
R&D

Output: Products, Processes



IMPORTANCE OF R&D BY COUNTRY

R&D as a percentage of GDP, selected nations



TOP TEN R&D COMPANIES 2009

| POSITION | COMPANY | SPENDING USD B. | INNOVATION RANK* |
|----------|-----------------------|-----------------|------------------|
| 10 | SAMSUNG CORP. | 6.0 | |
| 9 | GLAXO SMITHKLINE | 6.2 | |
| 8 | SANOFI AVENTIS | 6.3 | |
| 7 | JOHNSON & JOHNSON | 7.0 | |
| ... | ... | | |
| 3 | NOKIA | 8.2 | |
| 2 | MICROSOFT | 9.0 | |
| 1 | ROCHE HOLDINGS | 9.1 | |

* Bloomberg 50 most innovative companies



R&D SPENDING ↔ INNOVATION ?

| POSITION | COMPANY | SPENDING USD B. | INNOVATION RANK* |
|----------|-----------------------|-----------------|----------------------|
| 1 | ROCHE HOLDINGS | 9.1 | NOT in top 50 |
| 2 | MICROSOFT | 9.0 | 3 |
| 3 | NOKIA | 8.2 | 23 |
| ... | ... | | |
| 7 | JOHNSON & JOHNSON | 7.0 | NOT in top 50 |
| 8 | SANOFI AVENTIS | 6.3 | NOT in top 50 |
| 9 | GLAXO SMITHKLINE | 6.2 | NOT in top 50 |
| 10 | SAMSUNG CORP. | 6.0 | 11 |

* Bloomberg 50 most innovative companies

INTERNALIZE OR EXTERNALIZE R&D ?

- More and more companies recognize that keeping everything internal and secret slows down innovation «not invented here syndrome».
- Alternative:
 - Collaborate with customers and suppliers.
 - Collaborate with public research institutions.



INTERNALIZE OR EXTERNALIZE R&D ? (2)

Appropriate **contracts** and **good relationships decrease risks** (infringement, not respecting Confidentiality, collaborating with competitors...
Leverage patent/ IP system



PUBLIC PRIVATE PARTNERSHIPS

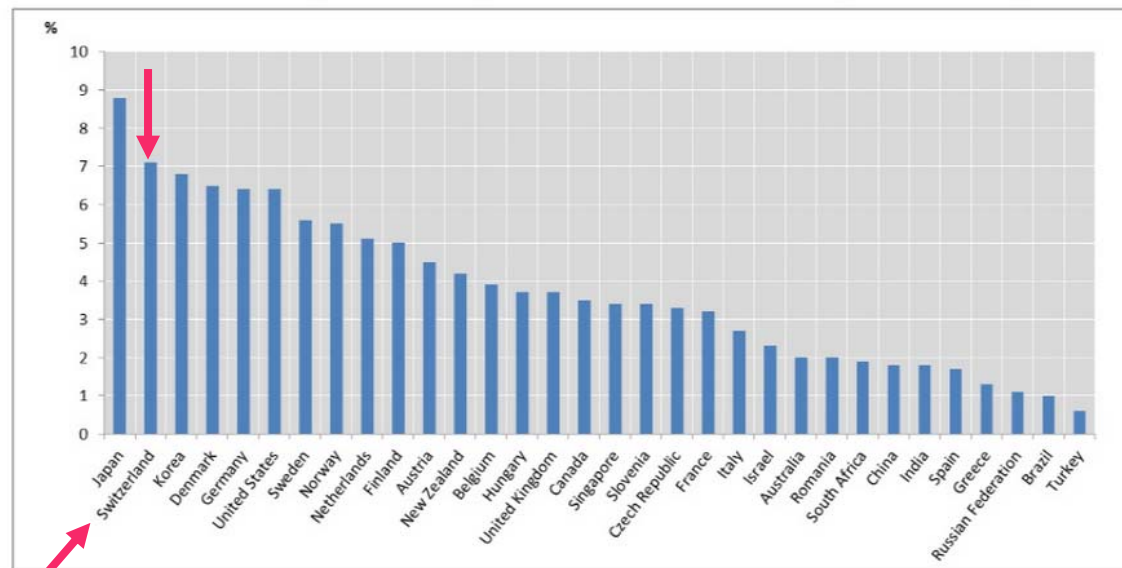
- Public Private Partnerships (PPPs) have intensified since 1980.
- Baye Dole Act, 1980, USA
 - IP stemming from publicly funded research belongs to Research Institution receiving the funds.
 - Strong increase in technology transfer activity and impact, new way to work with companies.



INTENSITY OF PPPs

Co-authored scientific publications are an indication of PPPs.

Industry-science co-publications, 2006-10
% of industry-science co-publications in total research publication output



Source: Centre for Science and Technology Studies (CWTS), Leiden University, using Web of Science (WoS) database.

PERCEIVED CHALLENGES OF PPPs

Mismatch between supply and demand: Firms not always willing (e.g. high transaction and search costs, research not relevant or of low quality) or capable of making use of public research results (e.g. lack of own absorptive capacity)

Source: Daniel Kupka/ OECD

www.oecd.org/sti/innovation

OECD: Organization for Economic Co-operation and Development



ADVANTAGES OF PPPs

- Not only IP and results.
- Also continuous source of information on latest scientific breakthroughs.
- **Transfer of personnel:** academic researcher can be hired by company. Students can be hired by company. Professors can act as scientific consultants, **spin-off** creation and **acquisition**.

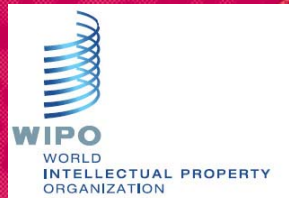


ADVANTAGES OF PPPs

- Access to latest generation scientific **equipment**.
- Access to the **open** world of scientific research.
- IP, legal and commercialization **support** of **Technology Transfer Offices** (long term relationships, trust).



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SOURCES OF RESEARCH FUNDING

- Companies.
- Research Institutions (own funding of collaborative research projects).
- Government:
 - Every country has its own system.
 - Switzerland: CTI R&D project funding.



WORLD COMPETITIVENESS

World Competitiveness rankings 2015 (IMD, CH)

| Country | Rank | | |
|-------------|------|------|--------|
| | 2014 | 2013 | Change |
| USA | 1 | 1 | — |
| Switzerland | 2 | 2 | — |
| Singapore | 3 | 5 | ↗ |
| Hong Kong | 4 | 3 | ↘ |
| Sweden | 5 | 4 | ↘ |
| Germany | 6 | 9 | ↗ |
| Canada | 7 | 7 | — |
| UAE | 8 | 8 | — |
| Denmark | 9 | 12 | ↗ |
| Norway | 10 | 6 | ↘ |

Switzerland:

Encouragement for enterprises to perform in an innovative, profitable and responsible manner

Business efficiency ↘ : strength of national currency

COLLABORATION CULTURE

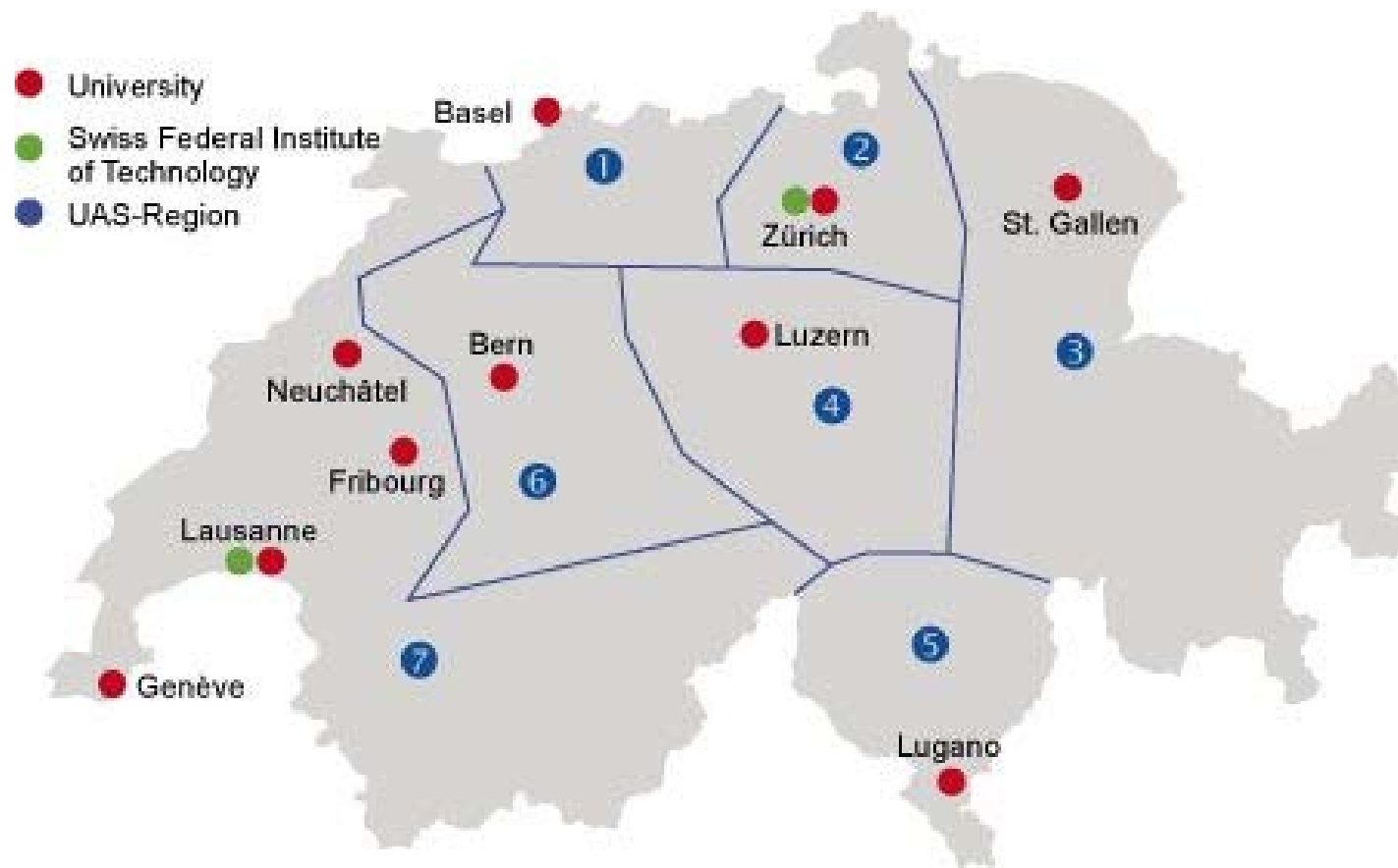
Various studies confirm the strong collaborative culture between academia and industry in **Switzerland** and the appropriate technology transfer practices of Swiss universities and other public research institutions.

Easy access to academic researchers and well defined technology transfer processes are important criteria for companies to relocate their business to Switzerland.

Source: Report 2010, Swiss Technology Transfer Association



COLLABORATION CULTURE



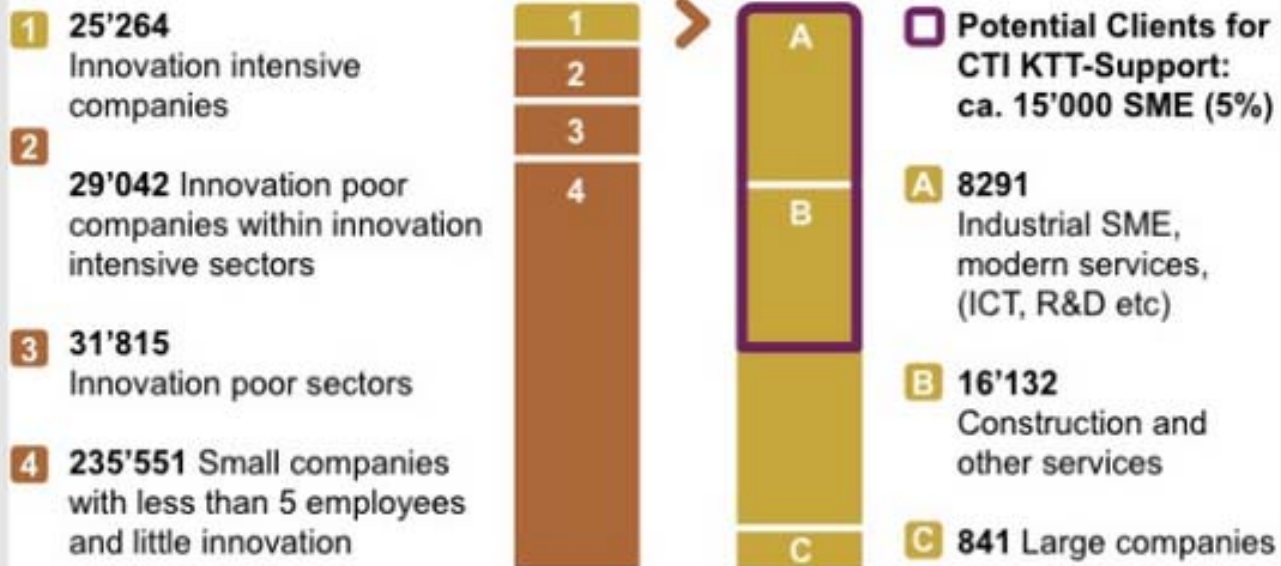
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COLLABORATION CULTURE

CTI focus on innovative companies



SwissCore

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SOURCES OF RESEARCH FUNDING (2)

- Direct government funding to SMEs.
 - Grants with no counterparty.
 - Investments (equity/ loan).
- Government funding to research institutions.
 - Grants with no counterparty.
 - Grants subject to reimbursement:
 - Linked/ conditional to success.
 - Not linked/ not conditional to success.



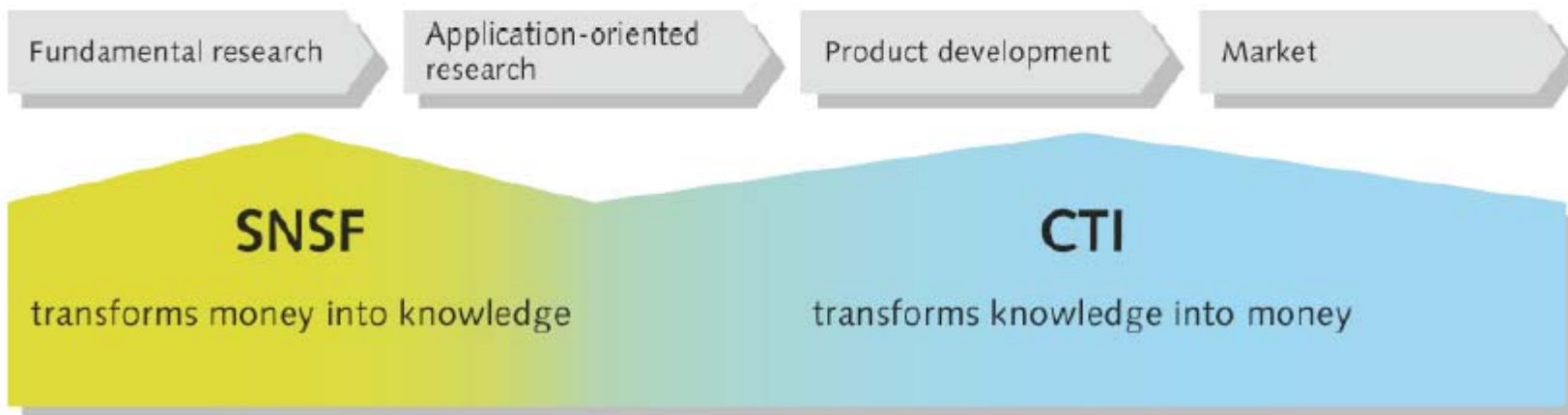
SOURCES OF RESEARCH FUNDING (3)



Science to Market

CTI in Switzerland's innovation environment

- Partners in the innovation process
- From Science to Market



SOURCES OF RESEARCH FUNDING (4)

CTI* R&D support, **Switzerland**

SMEs can get R&D funding from the government.

- Submit a project together with a public research institution.
- Fund 50% of the total project budget (existing resources/ personnel count)
- Funds from the government paid to public research institution.

* Commission for Technology and Innovation (CTI)



SOURCES OF RESEARCH FUNDING (6)

To submit an application, follow these steps:

- › Step 1: Put together a project team
- › Step 2: Find out more about your research topic
- › Step 3: Put together a project plan
- › Step 4: Submit the application
- › Step 5: Application processed
- › Step 6: Decision
- › Step 7: Statutory requirements
- › Step 8: Signing contracts

* Commission for Technology and Innovation (CTI)



SOURCES OF RESEARCH FUNDING (6)

Further Informations

Documents

Links

Project application

-  Application process CTI (PDF, 32 kB, 16.12.2014)
-  CTI funding application (DOC, 226 kB, 02.06.2015)
-  Model contract CTI project (PDF, 47 kB, 16.01.2015)
-  Research facilities allowed for contributions (PDF, 26 kB, 02.02.2015)
-  Commercial Goals (PDF, 69 kB, 16.12.2014)
-  List of experts F&E 2014 (German) (PDF, 112 kB, 16.12.2014)
-  Form animal testing (german) (DOC, 72 kB, 15.12.2014)
-  Saläransätze für Projektmitarbeitende.pdf (PDF, 103 kB, 16.12.2014)

* Commission for Technology and Innovation (CTI)



SOURCES OF RESEARCH FUNDING (7)

Your ongoing project

Once you have received a positive decision from the CTI you can get going on your innovation project. Once a project is up and running, you should nonetheless take note of the following.

- › Step 1: Report & Meeting
- › Step 2: Request changes
- › Step 3: Final reports
- › Step 4: Implementation audit

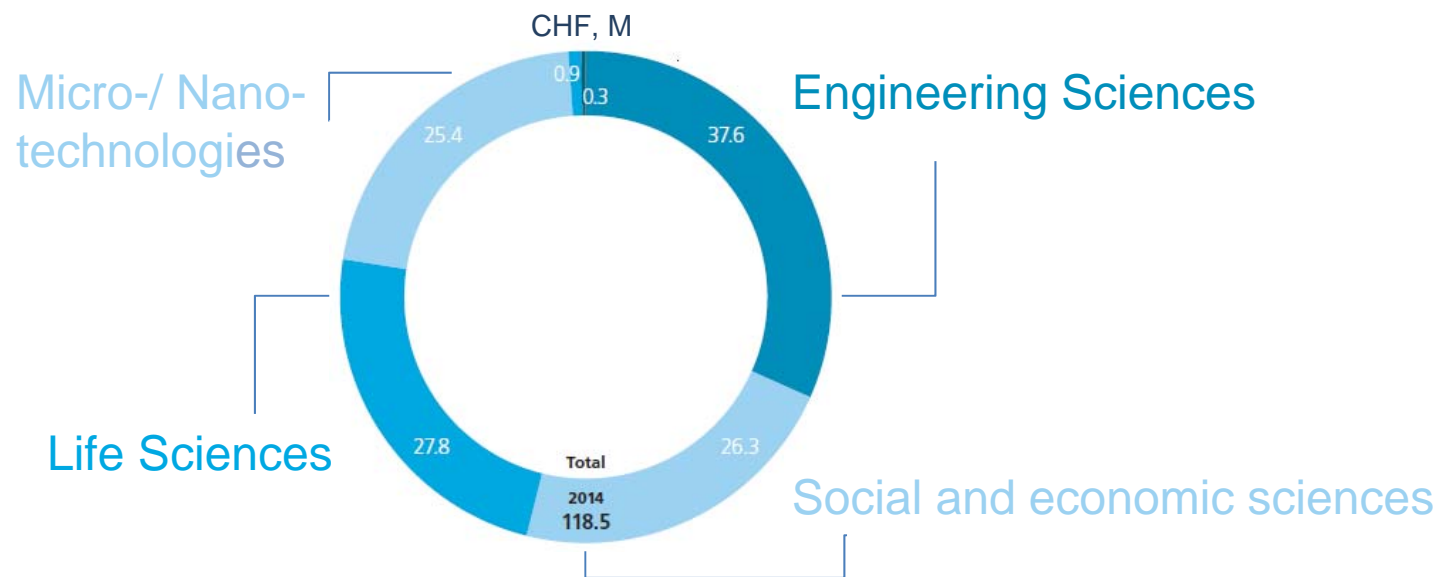
* Commission for Technology and Innovation (CTI)



SOURCES OF RESEARCH FUNDING (5)

CTI R&D support, Switzerland

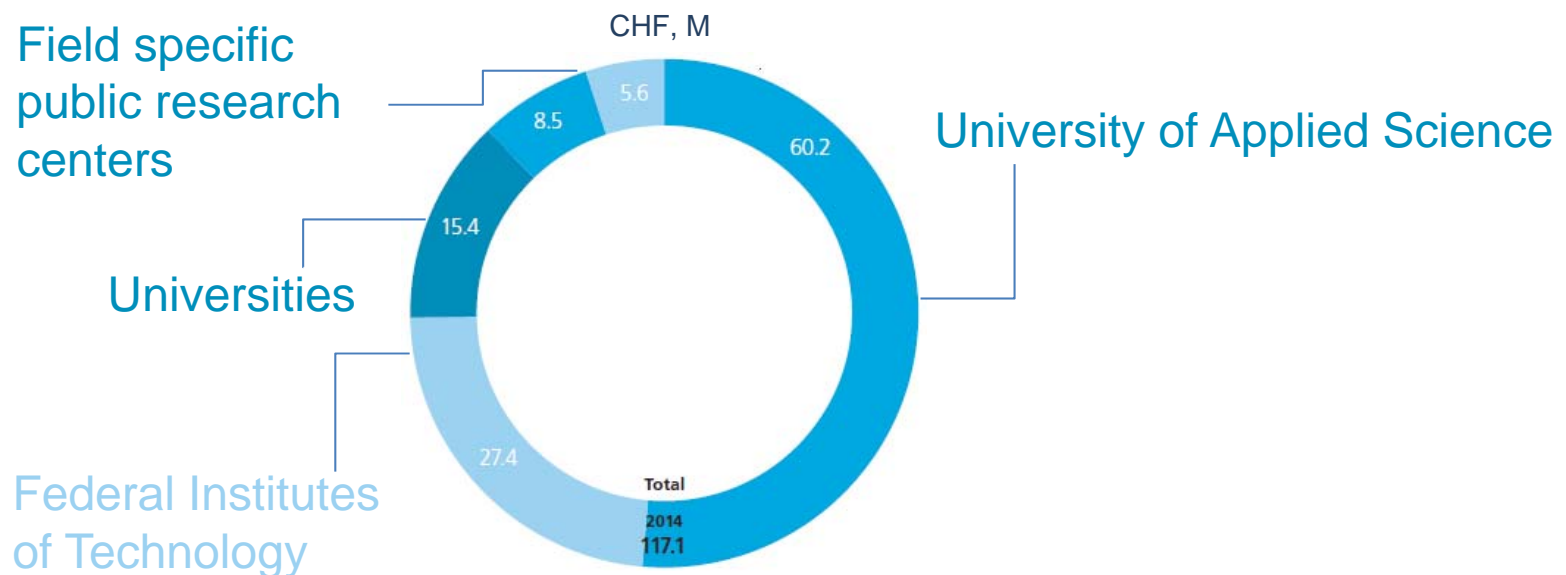
USD 126 M (2014) R&D support funding for SMEs.



SOURCES OF RESEARCH FUNDING (6)

CTI R&D support, Switzerland

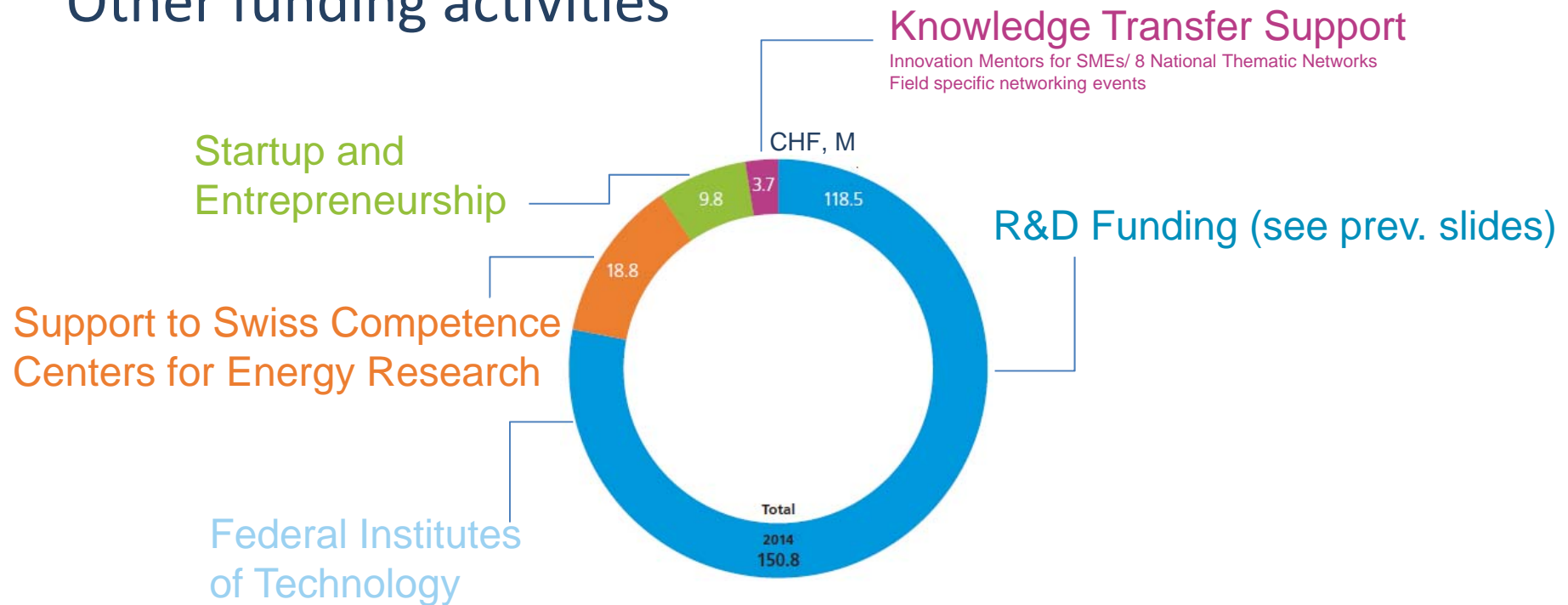
Type of research institution benefiting most:



SOURCES OF RESEARCH FUNDING (7)

CTI R&D support, Switzerland

Other funding activities



CTI STATISTICS, CASE STUDIES

CTI in numbers:

file:///C:/Users/kuhn/Downloads/Zahlen2014_en_150424_final.pdf

Annual report:

file:///C:/Users/kuhn/Downloads/Taetigkeitsbericht_2014_A4_en_150428_low_res.pdf



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STATISTICS 2013, SWITZERLAND

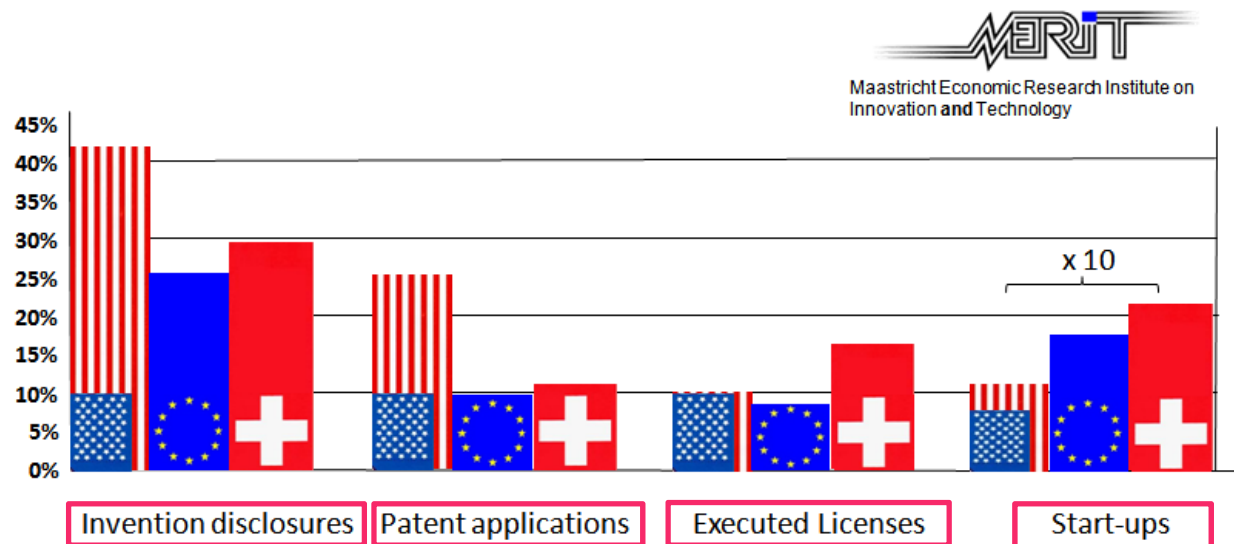
| ITEM | 2013 | 2012 |
|------------------------------------|--------|--------|
| Research Contracts | 3'934 | 3'323 |
| Invention Disclosures | 575 | 519 |
| Active Patent Cases (end of year) | 1'951 | 1'818 |
| Priority Patents Filed | 297 | 270 |
| License Agreements | 201 | 174 |
| License Revenues (KCHF) | 14'776 | 13'303 |
| New Spin-offs* | 29 | 45 |
| FTE (Academic Technology Transfer) | 86 | 81 |

Source: Report 2014, Swiss Technology Transfer Association; * with formal license.



COMPARISONS

TT Benchmarking, USA (AUTM), Europe (ASTP), Western Switzerland (Alliance)

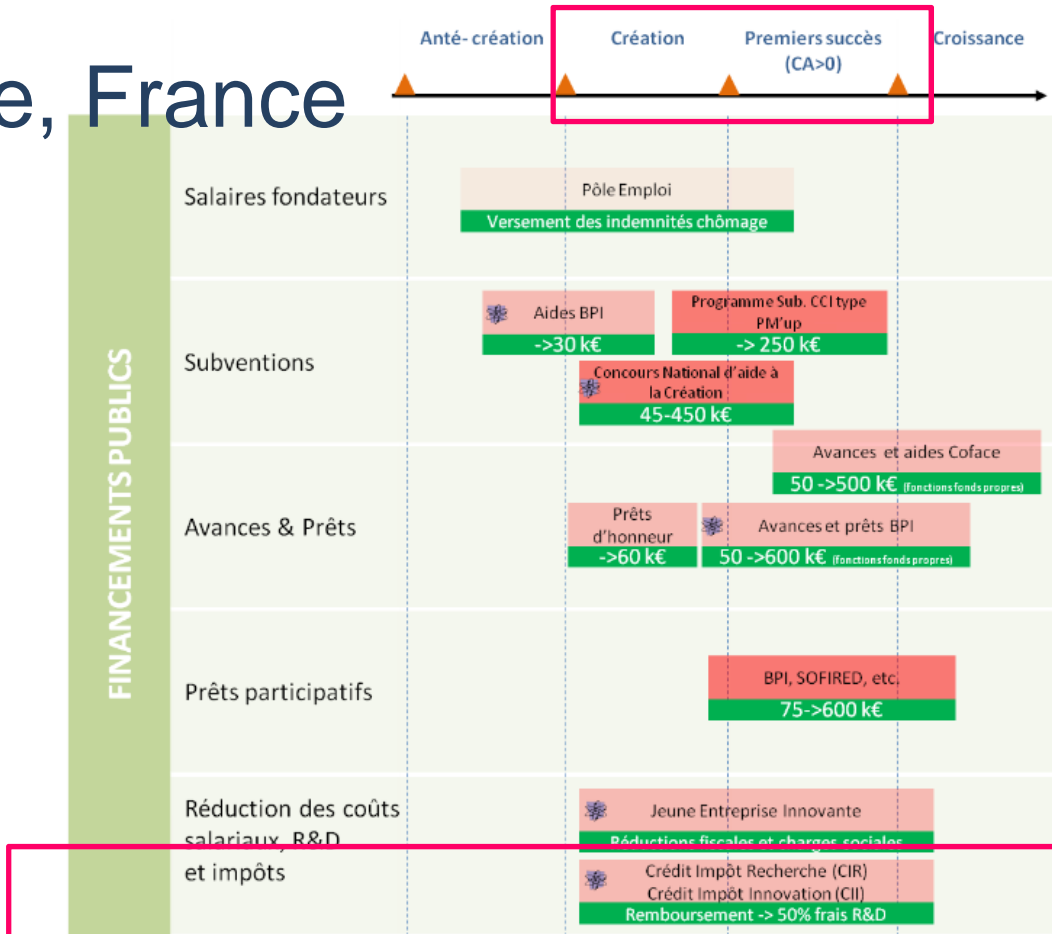


Figures are per R&D budget (mio \$): 30% = 0.3 unit for each mio \$ spent on R&D budget

Sources: AUTM (2006), ASTP (2007), Alliance (2006), OECD (PPP)

SOURCES OF RESEARCH FUNDING (4)

Funding scheme, France



Research Tax Credit for R&D expenses (up to 50%)

COLLABORATING WITH UNIVERSITIES

- Stages:
 - Identify **D**evelopment needs.
 - Build relationships.
 - Agree on a common project.
 - Agree on funding (seek government support).
 - Apply for funding.
 - Agree on Research Contract
 - Elements important to SME.
 - Elements important to University/ Public Research. Org.



COLLABORATING WITH UNIVERSITIES

- Stages (2):
 - Perform research.
 - License (?). Exploit results (SME).
 - Publish & continue generic research (University).



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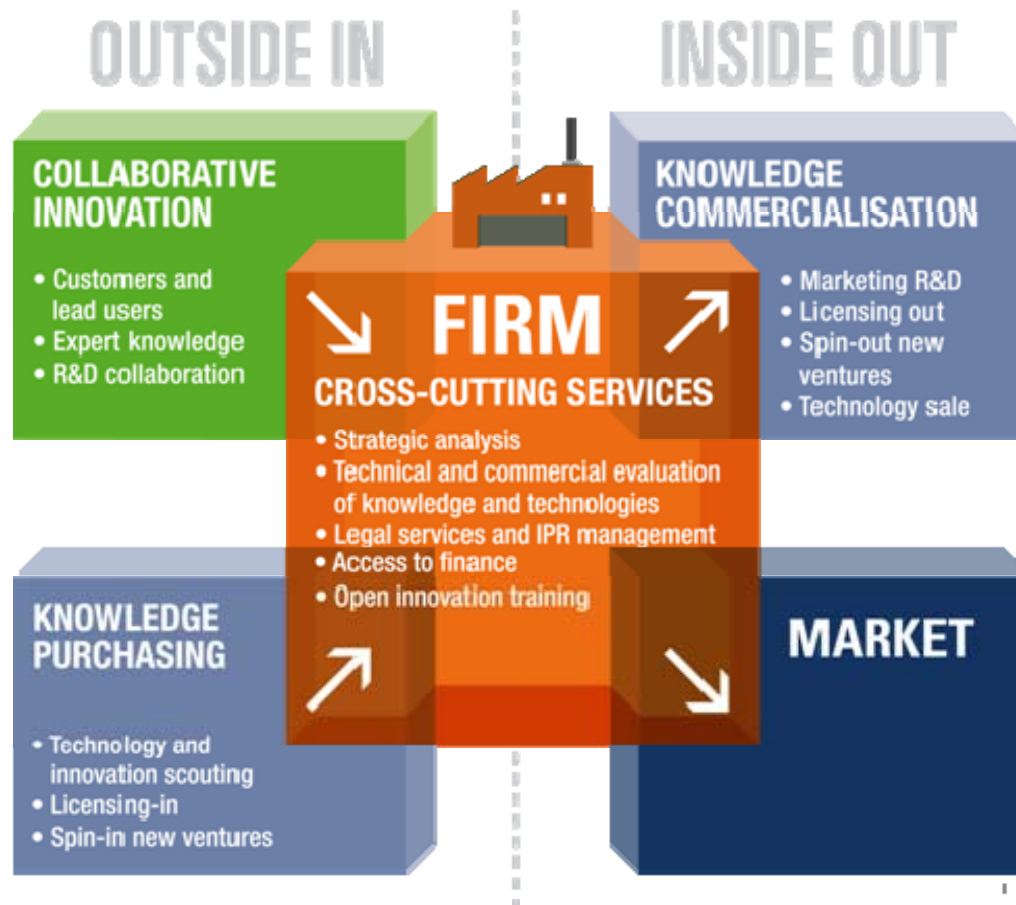
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RESEARCH CONTRACT

| IMPORTANT FOR UNIVERSITY | IMPORTANT FOR SME |
|---|----------------------------|
| Right to Publish | |
| | Right to use the Results |
| Right to own the IP | Right to own the IP |
| Results for research and education | |
| Warranties | Warranties |
| Indemnification | |
| | Confidentiality |
| | Non competition |
| Applicable Law and Jurisdiction | |
| Financial return in case of success (if exclusivity granted on the use of IP) | |

OPEN INNOVATION



OPEN INNOVATION

Firms should be open to external ideas and use them. **Sharing risks and sharing rewards**. More permeability between the inside and the outside of companies. **Diversity**.

- Idea competitions.
- Collaborative product design.
- **Customer involvement** in product development.
- **Supplier involvement** in product development.
- Innovation networks (private or public).
- R&D partnerships.



TAKE AWAY QUESTION

What is the first two stages before entering into a public private partnership ?





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