The Innovation Ecosystem

A simplified overview
Barriers to tech transfer

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* Please take note that these views are not necessarily carried by either one of my affiliations

WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

A short word on TNO

Key characteristics and figures

- Established in 1933 by TNO Act as the Netherlands Organisation for **Applied** Scientific Research
- Independent and impartial from industry and state
- Not-For-Profit (all revenues ploughed back in R&D)
- >3.500 highly skilled employees including ~65 university lecturers and professors
- Highly integrated/co-located with universities

Funding and budget:

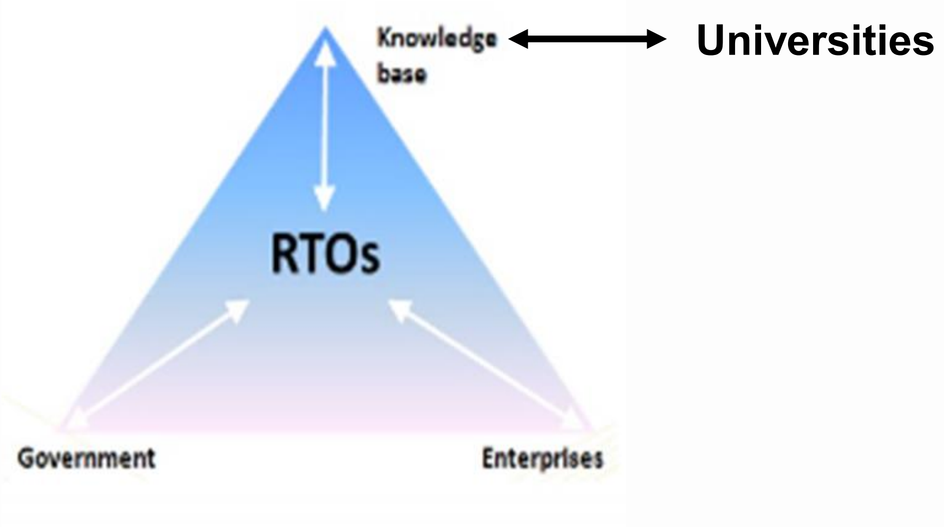
Gov blockfunding | **Corporations** | **EU & Gov grants**

What is an RTO ?

European association of research and technology organisations

Role of RTOs in the Innovation Ecosystem

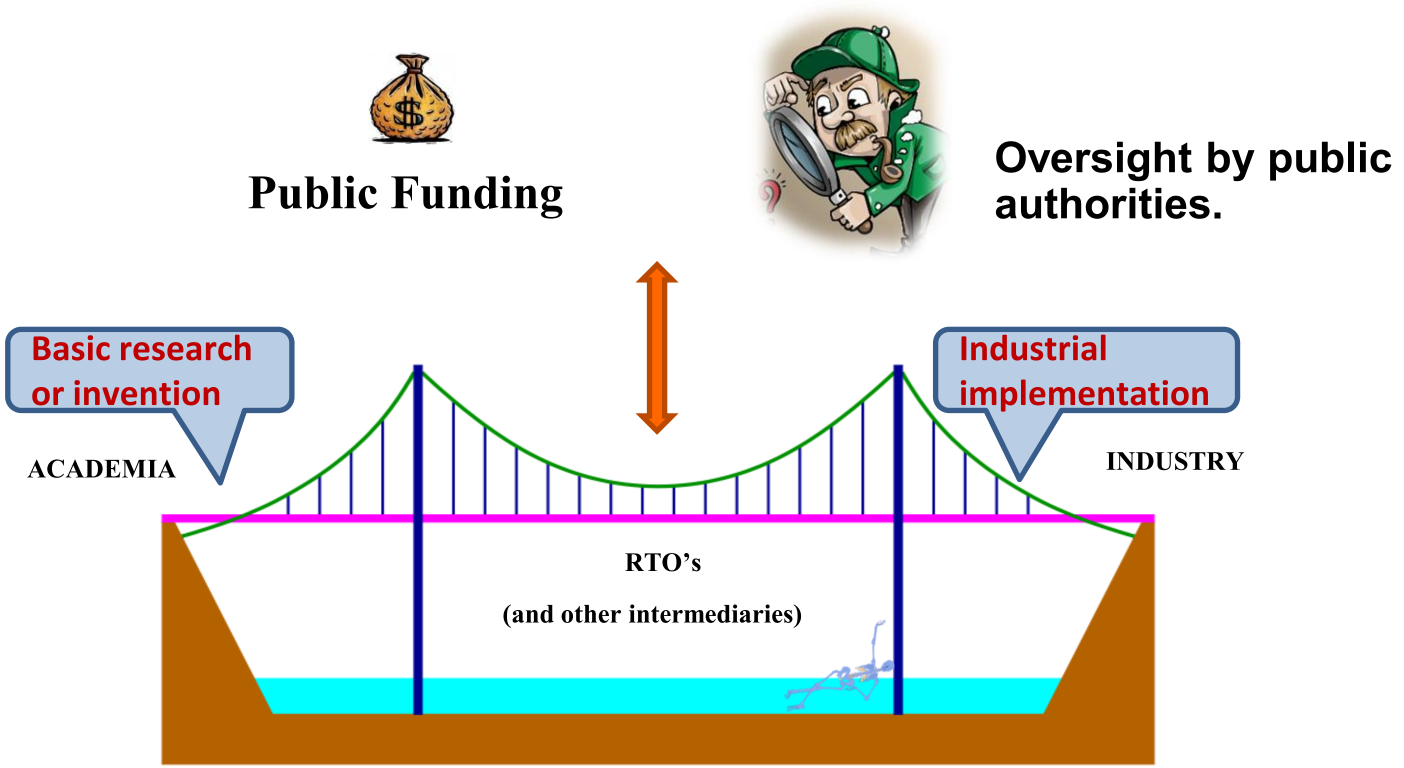
- Bridging the innovation gap / market failure
- RTOs take up fundamental knowledge
- Translation to applied knowledge
- In close collaboration with market
- Initiate new entrepreneurial activities (TNO~10 spinoffs/yr)
- EARTO is Brussels based branch organisation with 350 direct and indirect members



"Triple helix"

continuous interplay between these factors

The University-RTO-Industry interface



"Valley of Death":

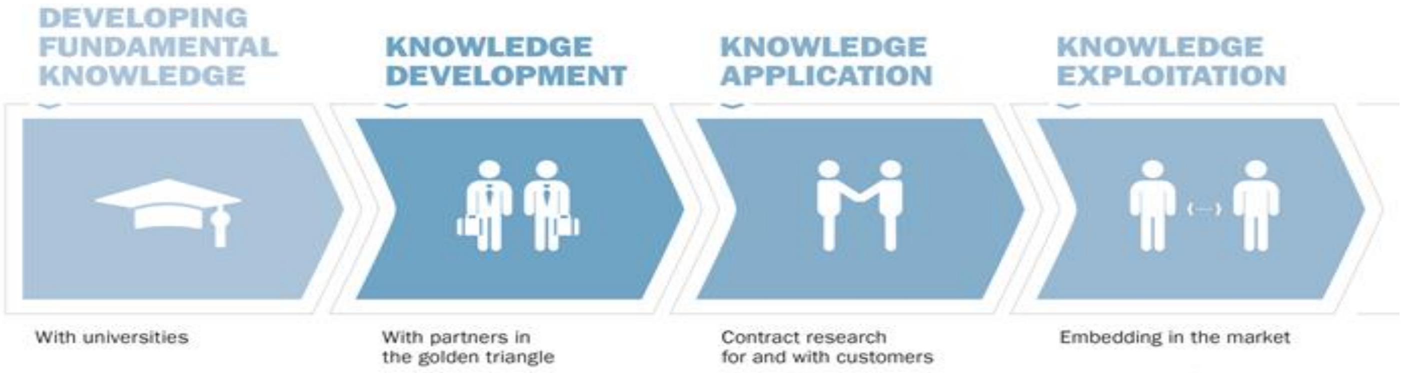
- High Risk
- High Cost
- Long timescale
- No direct shareholder value
- Industry reluctant to invest
- Uni's cannot invest, but have TTO's

➔ **Market failure !**

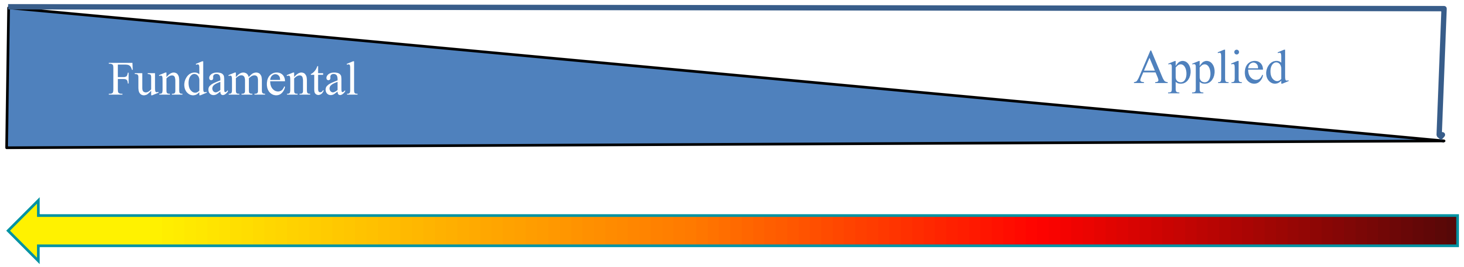
(do read "The Entrepreneurial State" by Mariana Mazzucato !)

MIND THE GAP

RTO’s Open Innovation Paradigm



TRL-level (NB: research is not a linear process !)



Not-For-Profit: Revenues ploughed back into new research

Modes of tech transfer (examples)

Informal modes → societal benefits

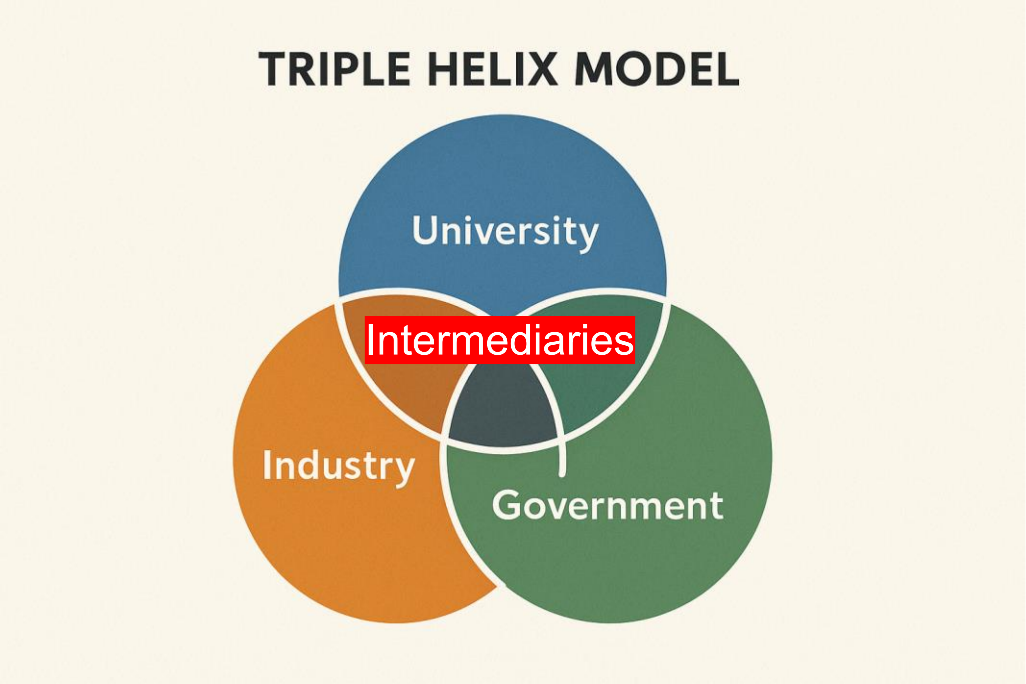
- Exchange of students and personnel
- Open source/open content publications
- Co-locations, competence centres
- Making research infrastructures available to other players
- Education and public outreach
- Tech assessment & policy studies

Grey zone

Formal modes → monetization

- University and RTO Spin-offs
- Joint ventures with industry
- Contract research and collaborative R&D
- Shared research programs
- IP licensing and transfer
- Transfer of explicit knowledge (knowhow)

Regulatory framework & blocking factors



Dual role for governments & public authorities

- Funding and stimulation
- Regulation →

  - ➢ Balance required
  - ➢ Risk of overreach
  - ➢ Disruptive technologies!

REGULATORY & LEGAL BARRIERS

Complexity of TTBER

The Technology Transfer Block Exemption Regulation sets strict thresholds and excludes patent pools, complicating compliance.

Legal Unpredictability

Evolving guidelines under EU competition law create unpredictability, delaying licensing negotiations and strategic planning.

Antitrust Risks

Licensing agreements carry antitrust risks that further complicate technology transfer and collaboration processes.

Impact on Innovation

Regulatory barriers discourage innovation and collaboration, especially for smaller entities lacking legal resources.

FRAGMENTED INNOVATION ECOSYSTEM

Fragmented Policies and Coordination

Divergent policies and lack of coordination across EU regions hinder effective cross-border technology transfer.

Overlapping Initiative Challenges

Overlapping mandates of initiatives like Horizon Europe create inefficiencies and siloed innovation efforts.

Digital Divide Impact

The digital divide among member states limits infrastructure and resource access, reducing participation in technology transfer.

Need for Integration

Strategic coordination and harmonized policies are essential to create a cohesive environment for innovation exchange.

Need for venture capital

Due to market fragmentation not sufficient capital is available for high tech/high risk scale ups.

IP & DATA LICENSING COMPLEXITIES

Low Patent Filing Rates

Europe has low patent filings in emerging technologies, limiting innovation protection and commercialization.

Ambiguity in Licensing Framework

Unclear licensing rules under TTBER create legal uncertainty, discouraging technology transfer participation.

Regulatory Gaps for Data Technologies

TTBER does not fully cover data-driven technologies, leaving gaps in regulation and enforcement.

Need for Updated Guidelines

New guidelines are essential to address digital innovation and clarify licensing and data sharing pathways.

TECHNICAL MATURITY GAPS

Digital Maturity Challenges

European countries show varying digital maturity levels, complicating technology transfer and innovation.

Impact on Collaboration

Uneven digital readiness causes unequal involvement in projects and limits technology exchange efficiency.

Digital Literacy and Workforce

Shortages in digital skills hinder adoption and implementation of new technologies across regions.

Solutions for Inclusion

Targeted investments in infrastructure and education are critical to bridge digital maturity gaps.

GEOPOLITICAL & TRADE CONTROLS / SANCTIONS

Export Restrictions Impact

Export controls in key sectors like semiconductors limit technology transfers and complicate international collaboration.

EU Strategic Autonomy

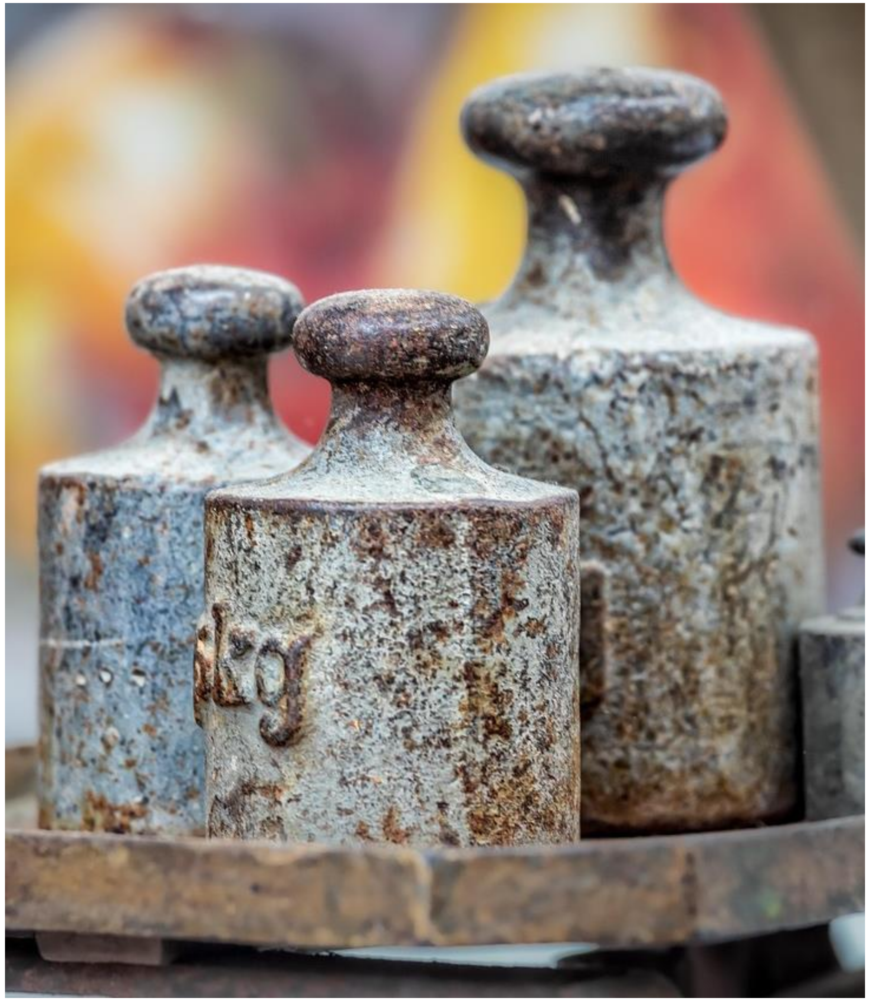
The EU's policies on foreign investment and local production add complexity to licensing and deter foreign participation.

Global Power Dynamics

International and regional rivalries may influence trade controls aimed at protecting industries but risks reducing access to innovation networks.

Balancing Security and Collaboration

Finding equilibrium between economic security and open innovation is crucial to maintaining global technology transfer.



MARKET POWER ASYMMETRIES

Power Imbalance Challenges

Large corporations hold significant market power that creates barriers for smaller entities in technology transfer negotiations.

Limitations of Smaller Entities

SMEs and research institutions often lack legal resources and IP expertise to negotiate favorable licensing terms.

Need for Supportive Policies

Empowering SMEs with capacity building, legal support and promoting equitable partnerships fosters innovation and technology exchange.