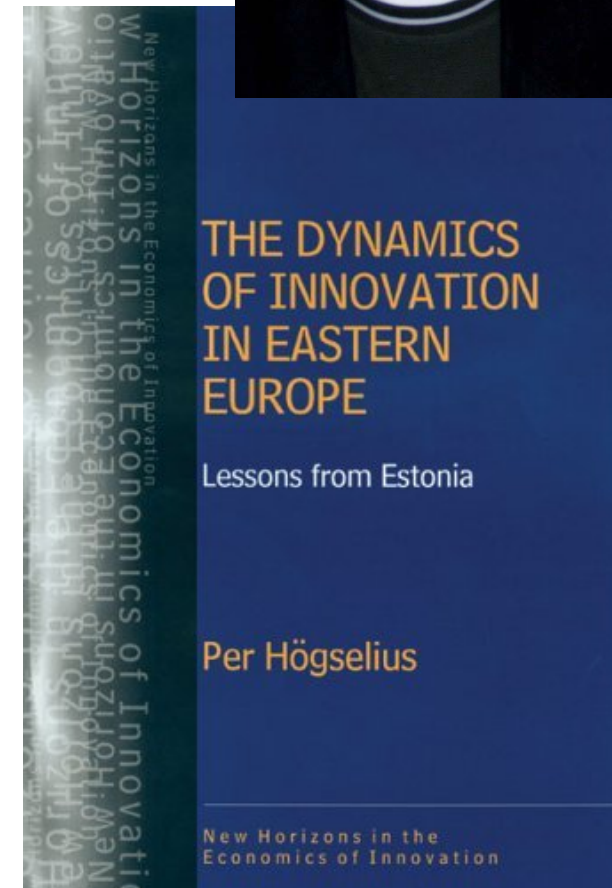


THE DYNAMICS OF INNOVATION IN EASTERN EUROPE

Lessons from Estonia

Per Högselius



The book

- How can we understand and explain innovation that occurs in post-socialist Eastern Europe?
- The post-socialist Estonian telecom sector as a "system of innovation"
- Four historical periods investigated:
 - 1855-1985: Origins of Telecommunications in Estonia
 - 1985-1993: Estonia's Reorientation towards the West
 - 1993-1998: Imitation and Experimentation
 - 1998-2004: The New Dynamism (Innovative Explosion)

Systems of innovation as a set of "activities"

- Formulation of visions (+ getting rid of old ones)
- Articulation of demand
- Creation of new knowledge (+ forgetting old knowledge)
- Competence-building (education + training)
- Formation of new firms (+ destruction of old ones)
- Adaptation of organizations
- Inter-organizational networking
- Provision of finance (+ removal of finance)
- Consultancy, advice, lobbying
- Policy-making and institution-building (+ destruction)

”Styles of innovation”

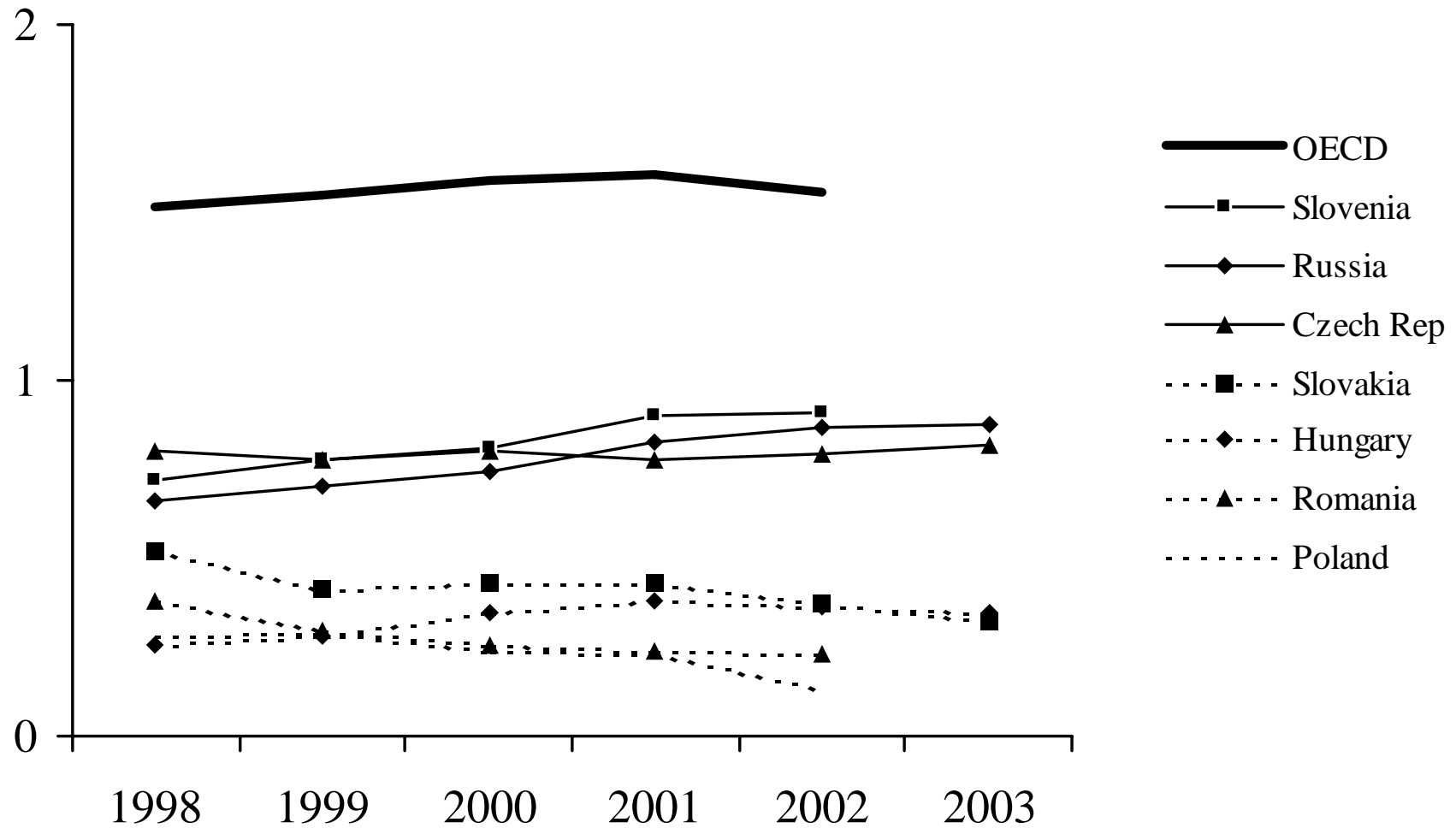
- The activities, viewed together, can be said to define a ”style of innovation”
- Question 1: Can we discern some special features of East European styles of innovation?
- Question 2: What are the underlying forces that influence and shape these East European styles of innovation?



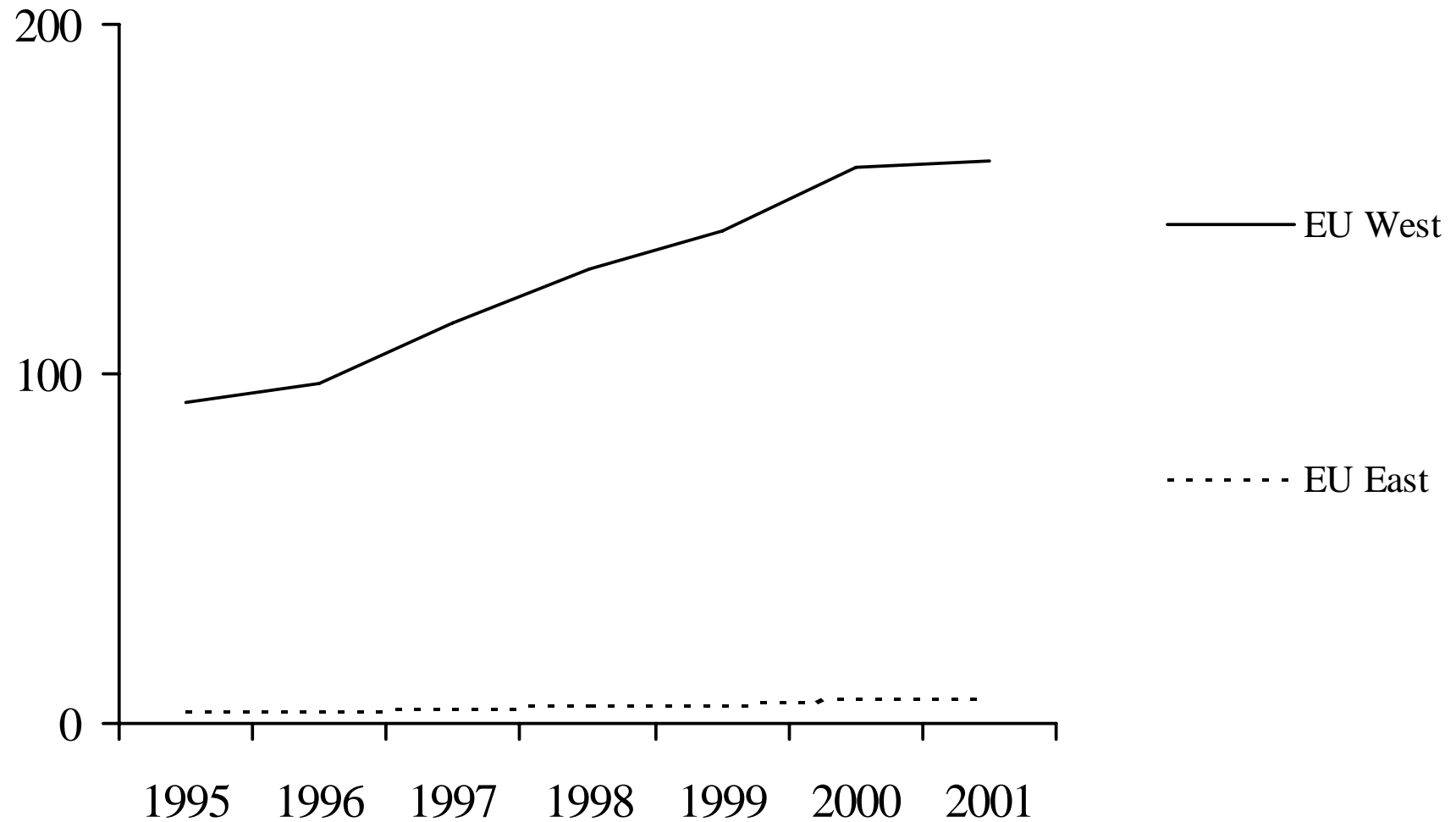
The post-communist countries of Central and Eastern Europe are...

- very poor (and very rich)
- rapidly growing
- well-integrated into global production networks
- extremely non-innovative
- better educated than Western Europe (?)
- very good at research which is unrelated to innovation

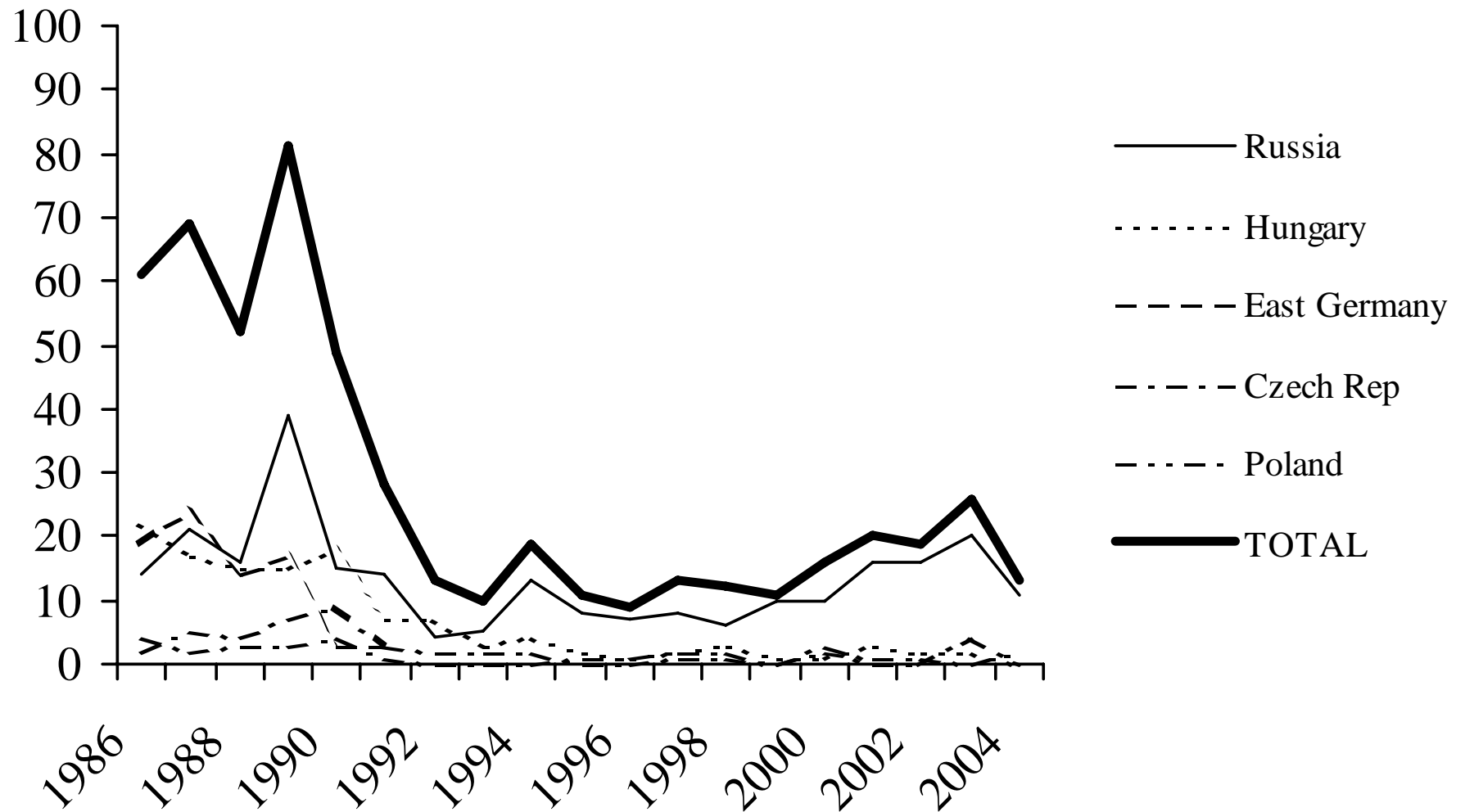
Business R&D investments (% of GDP)



EPO patents in the enlarged EU



US ICT patents granted to socialist and post-socialist countries



How can we understand
innovation which actually DOES
occur in post-communist
countries??

Estonian mobile sector in late 1998

- Economy in deep crisis since autumn
- Rapid growth in mobile penetration slows down, lies at about 15% of population
- Competition in mobile services is extremely hard
- EMT market leader
- Ritabell (Tele2) has launched prepaid card February 1998
- Radiolinja (Elisa) seeks closer collaboration with Finnish owners and with Nokia
- (Fixed) Internet boom is clearly evident

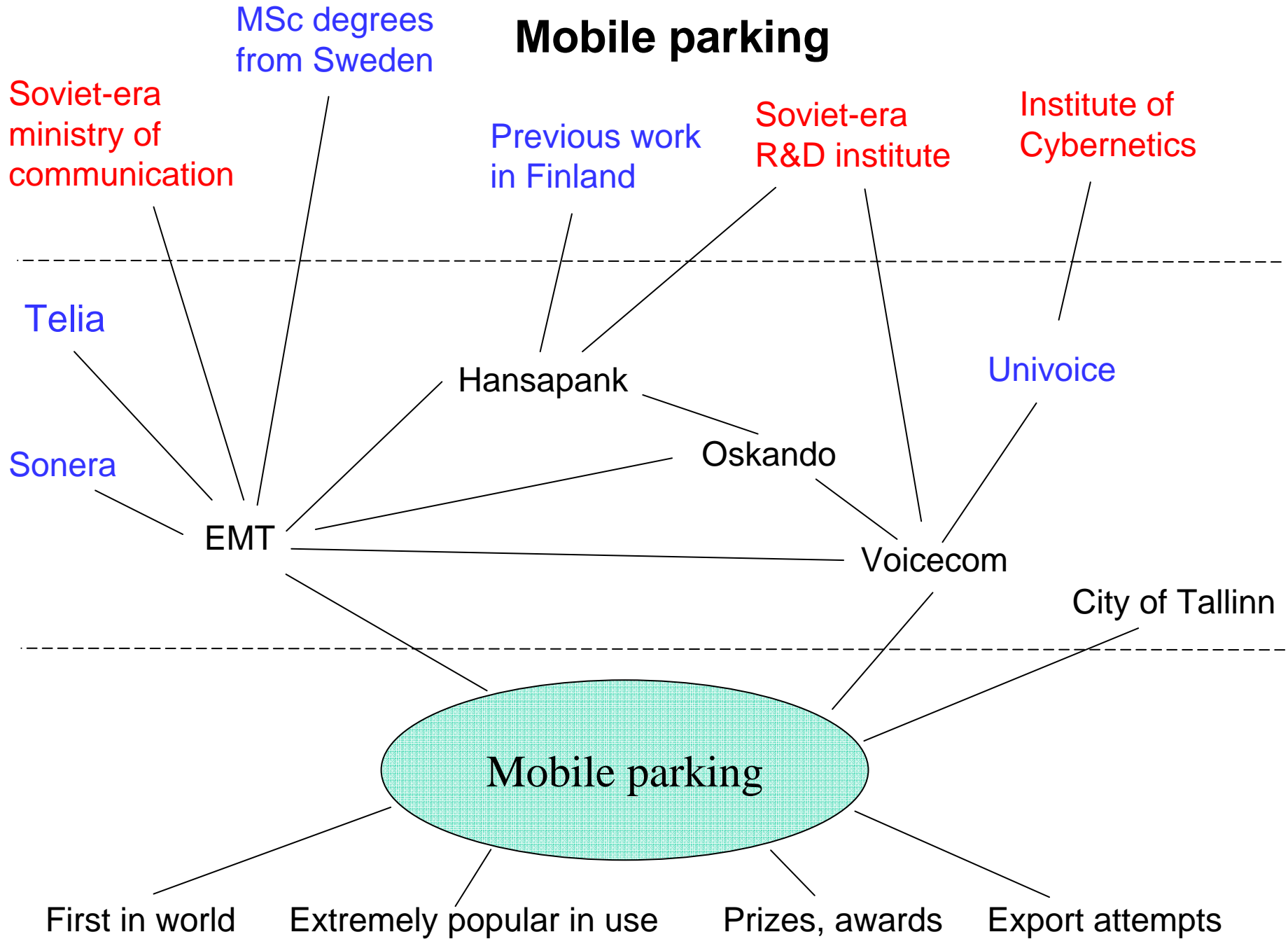
Sources of innovative opportunities for EMT

- Fantastic global developments in mobile technology and in fixed Internet
- Rapid diffusion of these technologies in Estonia = dynamic and rapidly growing market
- Highly competent, young and tech-enthusiastic staff internally + new dynamic CEO from 1999
- Basic heavy investments in GSM network have already been made + quality of *fixed* network has improved dramatically since 1991
- Good relations to Nordic firms since nearly a decade (especially Ericsson, but also Telia, Sonera = investors)
- Availability of highly competent domestic telecom-related firms (Hansapank, Oskando, Voicecom, Regio, Ericsson Eesti, etc., most of which created around 1990)
- Good relations to these domestic firms = potential partners

1999-2003: The innovative explosion

- M-commerce
- Mobile positioning
- Mobile Telematic Services
- Mobile banking
- Mobile Internet
- Various value-added services
- Etc.

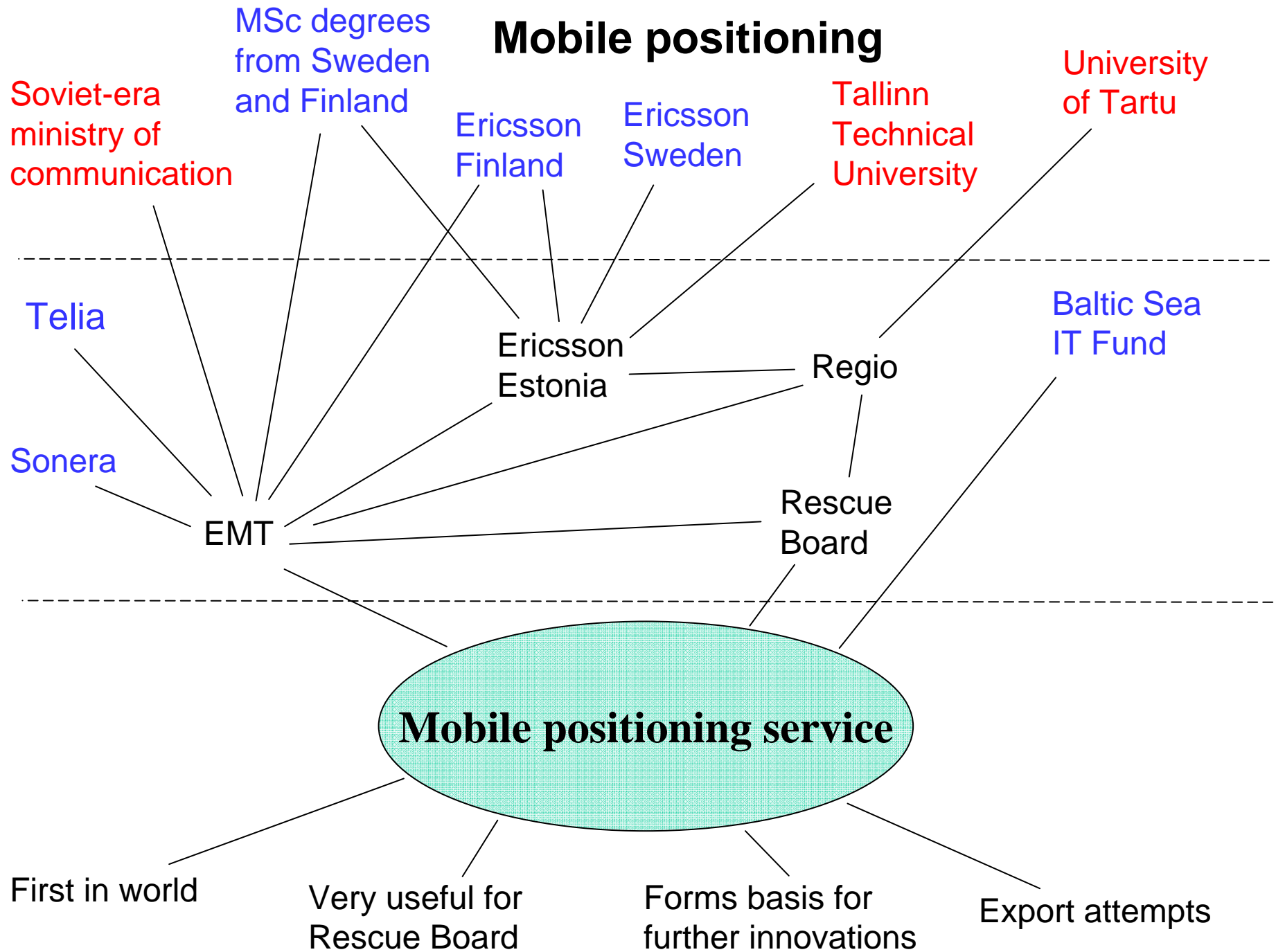
Mobile parking



Intermediate conclusion (I)

- Networks of firms are crucial for innovation to happen!
- Competencies from socialist period were exploited (through Soviet-era Ministry of Communications, Institute of Cybernetics and other R&D organizations)!
- Important but indirect input from Nordic countries – mechanisms of technology transfer much more complex than mere trade and FDI etc.!

Mobile positioning



Intermediate conclusion (II)

- Again, networks of firms are crucial for innovation to happen!
- The network consists of both domestic and foreign actors!
- Again, competencies from socialist period exploited (through Soviet-era Ministry of Communications, University of Tartu, TTÜ)!
- Again, important but indirect input from Nordic countries – mechanisms of technology transfer much more complex than mere FDI etc. (firm formation, provision of finance, Ericsson subsidiary, student exchange, etc.)!

Remember also: these innovations would probably never have occurred if...

- ... competition had been less tough
- ... telecom policy had been less liberal
- ... mobile penetration ratio had been lower
- ... Rescue Board had been less interested
- ... etc.

Estonian Internet sector in 1998

- Economy in deep crisis since autumn
- Elections coming March 1999
- Global Internet boom is clearly evident
- Rapid growth in Internet access in Estonia
- Internet banking already widespread
- Competition in Internet access provision is extremely tough

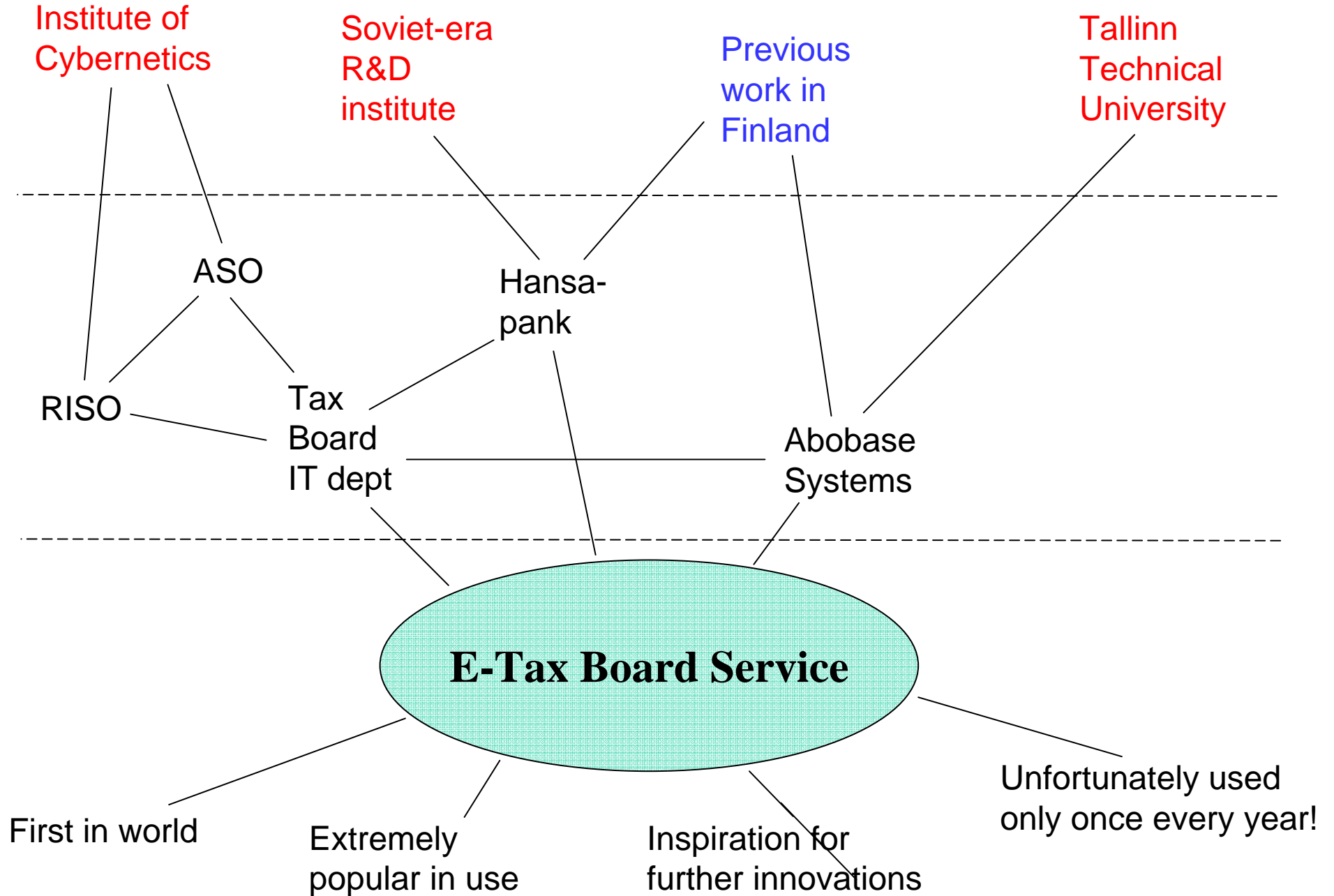
Sources of innovative opportunities in ICT for government agencies

- Basic computerisation of government agencies more or less finished
- Basic telecommunications infrastructure has improved dramatically since 1991
- Strong top-level support for further radical ICT developments in government = potential legal changes easier + funding opportunities
- Rapid growth in Internet use in population = market exists
- Internet banking already widespread = inspiration, learning
- Highly competent staff at Department of State Information Systems (RISO) and other places
- Many domestic, small, highly competent ICT firms available = potential partners in innovation

The innovative explosion in Internet services 1999-2003

- Internet banking
- E-Tax Board
- Paperless government
- X-Road
- Electronic ID Card
- IT education as a business
- Etc.

E-Tax Board



Intermediate conclusion (III)

- Again, networks of firms are crucial for innovation to happen!
- Again, competencies from socialist period exploited (through TTÜ, Institute of Cybernetics, other R&D organizations)!
- Again, indirect input from Nordic countries – mechanisms of technology transfer much more complex than mere FDI etc. (previous education and work experience in Finland etc.)!

X-Road

Tallinn
Technical
University

Institute of
Cybernetics

Cellnetwork
Sweden

Bionix
Sweden

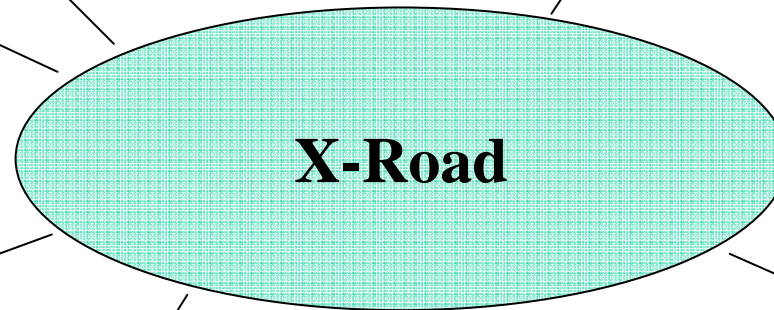
Consultations
with experts from
TTU, business

Cybernetica

Ministry of
Internal Affairs

RISO

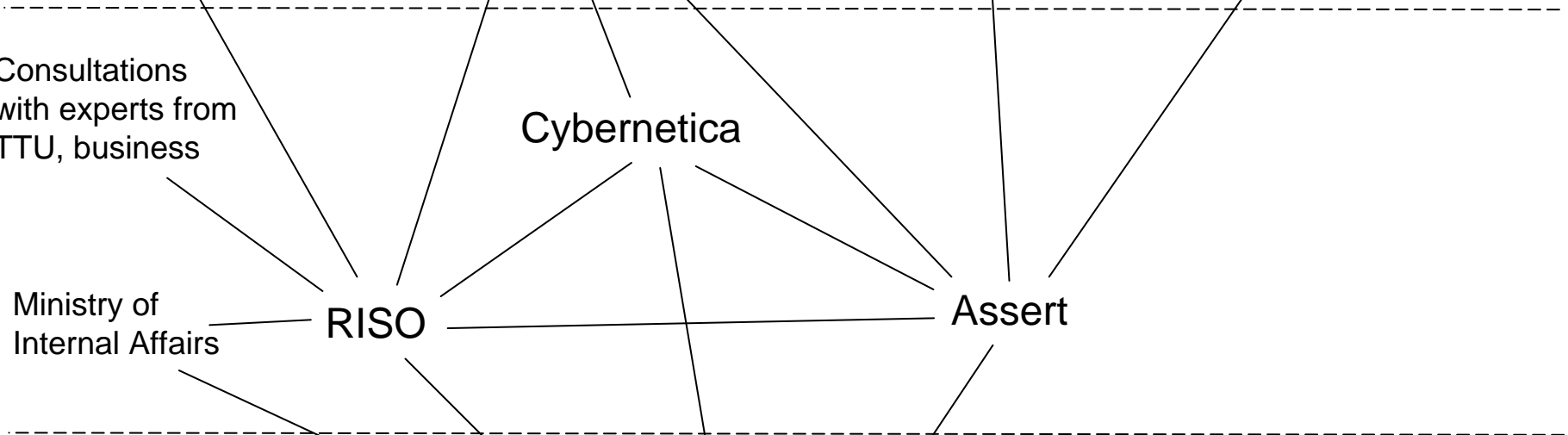
Assert



Unique in world

Enables further innovation in services

Legal problems



Intermediate conclusion (IV)

- Again, networks of firms are crucial for innovation to happen!
- The network consists of both public and private actors!
- Again, competencies from socialist period exploited (through TTÜ, Institute of Cybernetics)!
- Again, indirect input from Nordic countries – mechanisms of technology transfer much more complex than mere FDI etc. (Swedish partners play role in formation of new Estonian firms, etc.)

Exploiting inherited competencies (I)

- Competencies at the level of *organisations* have often been completely destroyed
- Notable exceptions: universities and some academic institutes
- Inherited competencies at the level of *individuals* are extremely important for post-communist innovation

Exploiting inherited competencies (II)

- Managers at innovative post-communist firms have typically a background from old socialist R&D institutes, academies, universities, ministries, etc.
- The role of secondary schools?
- Inherited cultural appreciation of science and technology?
- Pre-war experiences?

Building linkages to foreign systems of innovation (I)

- Foreign investment as vehicle for innovation in post-communism?
- In reality, foreign investment has mostly been associated with *decreasing* innovation activity
- Foreign investment has reinforced the socialist decoupling of R&D from production
- Foreign sources of innovation funding remain negligible

Building linkages to foreign systems of innovation (II)

- However, those firms that do innovate typically do have strong international connections
- ICT in Estonia: creative innovation takes place in a complex web of domestic and foreign relationships and networks
- The array of available channels of inter-system communication is much broader than usually assumed

Some channels of learning from foreign systems of innovation

- International trade
- Foreign ownership and investment
- Cross-border user-producer relationships
- Financial support (but not only for R&D)
- Consulting
- International student and research exchange
- Foreign systems of innovation as models
- Cross-border joint innovation projects

The Estonian style of innovation

- **Formulation of visions:** take advantage of post-socialist features, lack of old Western technologies + stagnating institutions, use the smallness of the country, adapt to severe financial situation, use high levels of education, proximity to Nordic countries!
- **Articulation of demand:** build on people's enthusiasm for new technologies and their preparedness to spend a lot of money on that!
- **Competence-building:** use the experiences that university professors gain in their side-activities as consultants and businessmen; transform ICT education into a business in its own right! ('E-Governance Academy' etc.)

The Estonian style of innovation

- **Knowledge creation:** develop ability to do a lot with almost no financial resources! Build low-cost solutions to compete on non-Western markets!
- **Institutional change:** use the small size and flexibility in combination with high-level technological competencies to resolve institutional bottlenecks effectively!
- **Networking:** take advantage of the 'everybody-knows-everybody' mentality to form alliances and networks for innovation + proximity to Nordic countries to involve actors from across the Baltic!
- Etc.

Instead of conclusion: a vision

- The East-West divide as an engine of progress
- The exploitation of post-communist countries' experiences in managing radical change
- The advantage of still loosely defined institutional landscapes and of lacking path-dependence
- 'The East-West corporation'
- The post-communist world as a fresh wind in the face of an increasingly stagnating Western Europe



New Horizons in the Economics of Innovation

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