

# Information Technology, Inter-organizational Collaboration & Innovation Performance

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**CMI Workshop on Open Innovation**  
Cambridge, UK

May 29, 2008

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# Collaboration → Innovation

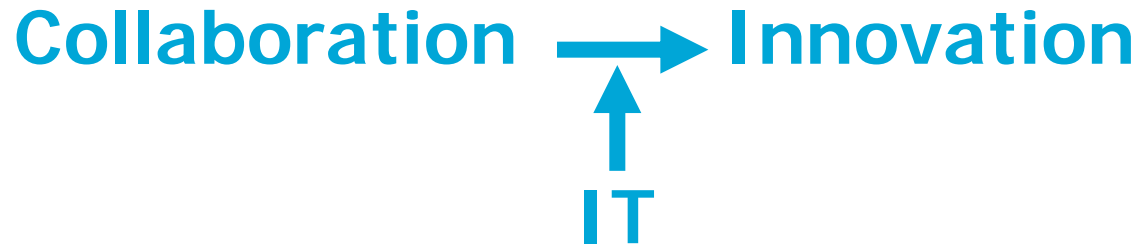
- Access to different types of knowledge/expertise
  - Technical
  - Market
  - ...
- Access to diverse resources
- Sharing costs
- Mitigating risks/uncertainties
- ...

# IT → Innovation

- CAD/CAM & PLM systems
- Knowledge Management tools
- Simulation tools
- Shorter design cycles
- Flexible designs
- Customer-oriented products
- ...

# IT → Collaboration

- Collaborative tools
- PPM systems
- Enabling role
- Facilitating role
- Real-time integration
- Enhanced coordination and communication
- ...



- How does IT moderate the relationship between collaboration and innovation?
- Can the contribution of collaboration to innovation be improved by using proper IT systems?
- Interesting but unexplored!

# Innovation Performance

- Input-based measures: *Innovation Intensity*
  1. R&D expenditure / Total turnover
  2. R&D employees / Total employees
- Throughput-based measures: *Innovation Success*
  1. Innovative sales / R&D expenditure
  2. Innovative sales / R&D employees
- Output-based measures: *Innovation Novelty*
  1. Radical sales / Innovative sales
  2. Radical sales / Total sales

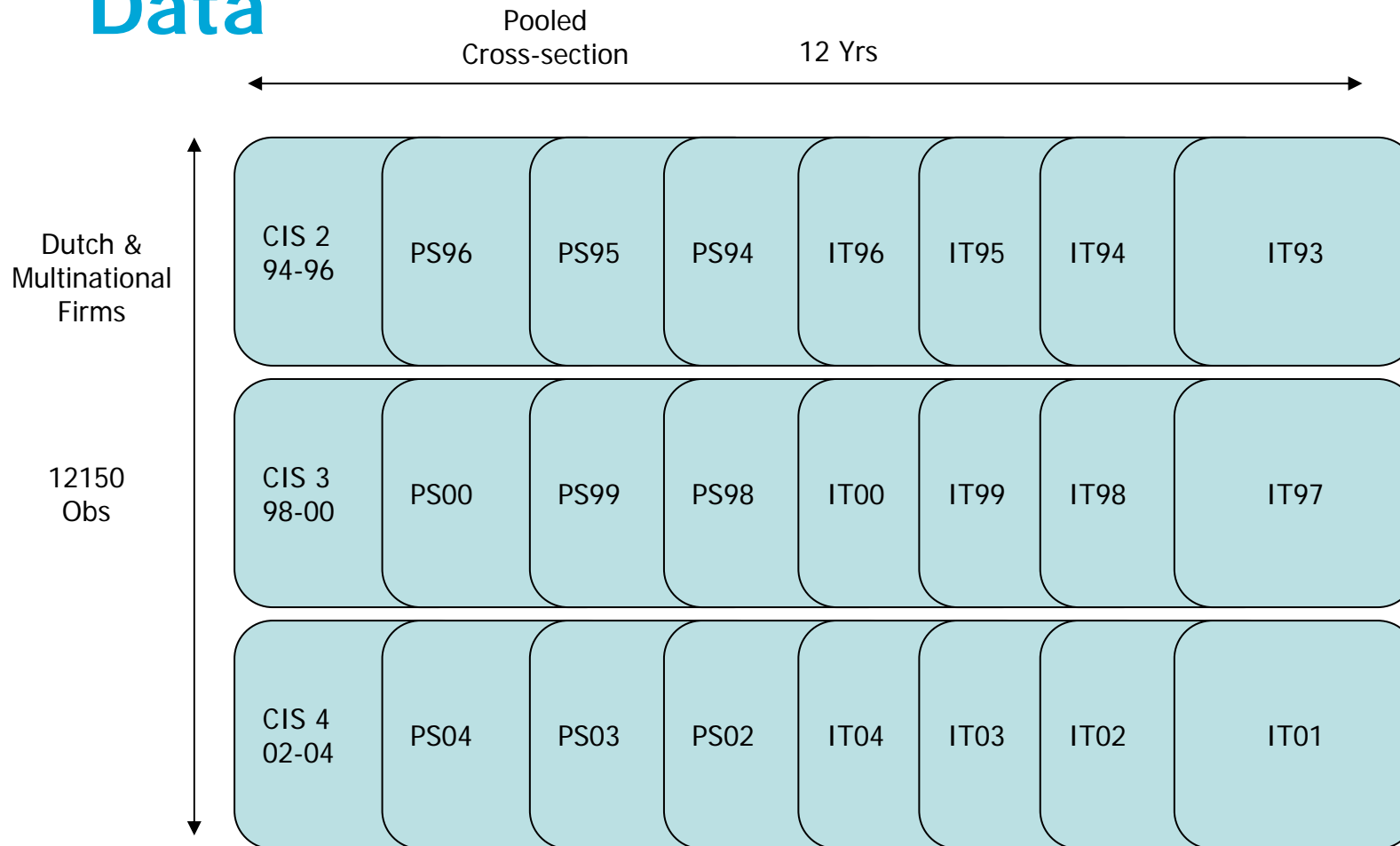
# Collaboration Partners

- Stakeholder type:
  1. Suppliers
  2. Customers
  3. Competitors
  4. Private science institutes
  5. Public science institutes
- Geographic location:
  1. NL
  2. EU
  3. US
  4. Others

# Information Technology

- Computer Density: Active computers / Total employees
- IT Orientation: Sales via IT / Total sales
- External Linkages with suppliers and/or customers
- Internal Linkage of company departments/systems
- eBusiness with suppliers and/or customers
- IT Support: IT staff / Total employees

# Data



# Exemplar Model

Innovation Novelty =  $b_0 + b_1 \text{ supp co} + b_2 \text{ cust co} + b_3 \text{ comp co} + b_4 \text{ priv sci co} + b_5 \text{ pub sci co} + b_6 \text{ proc innov} + b_7 \text{ org innov} + b_8 \text{ group} + b_9 \text{ multination} + b_{10} \text{ size} + b_{11} \text{ age} + b_{12} \text{ abs cap} + b_{13} \text{ innov behav} + \text{sector dummies} + \text{time dummies} + e$

# Results: Collaboration → Innovation

- Intensity
  1. Public science partners significantly positive
  2. EU and US partners significantly positive
- Success
  1. Customer collaboration significantly positive
  2. Supplier collaboration significantly negative
  3. No significant results for partner locations
- Novelty
  1. Customer and Supplier collaboration significantly positive
  2. NL and EU partners significantly positive

# Results: Collaboration → Innovation

- *Intensity*
  - + : coop, process innov, organization innov, innov permanence
  - : size, age
- *Success*
  - + : process innov, organization innov, age
  - : coop, group, size
- *Novelty*
  - + : coop, age, proc innov, org innov, innov permanence
  - : none

# Results: IOR Diversity → Innovation

- Intensity
  1. Stakeholder type diversity significantly positive
  2. Geographic location diversity significantly positive
- Success
  1. No significant results for diversity measures
- Novelty
  1. Stakeholder type diversity significantly positive
  2. Geographic location diversity significantly positive

# Results: Collaboration Innovation

- *Computer Density:*
  - + : innov intensity, innov novelty, coop->intensity, partner & geo div
  - : innov success
- *Internal Linkage:*
  - + : coop->intensity, internal coop, partner div, innov novelty
  - : innov intensity, coop->novelty
- *IT orientation -> Innov Success*



- *External Linkage:*
  - + : coop->intensity, innov success
  - : coop->success
- *Inbound & Outbound Linkage:*
  - No impact on supplier & customer cooperation!
- *Inbound & Outbound eBusiness:*
  - No impact on supplier & customer cooperation!
- *eBusiness Activities -> Innov Novelty*

# Future Plans

- Longitudinal analysis
- Dynamic models
- Including IT investments (SW, HW & HR)
- Including information sources
  
- And of course [your recommendations...](#)

# Discussion

Thank you very much for your time and attention.