

University of Vaasa



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# Innovation Capability from Intangible Assets

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University of Vaasa & CFA in Aarhus University

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# Innovation

- Innovation can arise in marketing, organization, product development or in new digital function.
- Examples:
  - new pricing method
  - change in organizational practices
  - iPhone with better battery
  - online MBA
- So, what capabilities are needed to be innovative?

→ This paper examines ways to measure innovative capabilities (or intangible assets) at the firm level.

# Innovation Capability



Zawislak, et al. (2012, pp. 14-15) : “an overall capability encompassing the ability to *absorb*, to *adapt* and to transform a given technology into specific management, operations and transaction routines that can lead one firm to Schumpeterian profits, i.e., innovation.”

They define 4 blocks:

- 1) *technological development capability*
- 2) *operation capability*
- 3) *transaction capability*
- 4) *management capability*

- *Intangible assets can act* as an indicator for being able to innovate.
- They measure ‘knowledge stock’ or ‘innovation capability’ *in* the firm, industry or country.



# The Rise of Intangibles

Noticed in business by Brynjolfsson and Yang (1999, pp. 7-8): investments in computers (tangible assets) converted to ten times their value in the listed stock price.



# Intangibles at Macro-Level

The first one was introduced by Corrado, Hulten, Sichel (2005), henceforth CHS

- macro level measure
- three main categories: computerized information, innovation property, economic competencies
- data from many sources (like balance sheets, patent stock, national statistics)
- INTAN-invest project provides a ready data set.



# Intangibles at Firm Level

- *A micro level measure* was developed in the research projects of Innodrive, published in Görzig, Piekkola, & Riley (2010).
  - Linked employer-employee data
  - Use occupational classifications to proxy innovative competences



Research and development  
capital



Organizational capital



ICT capital  
(information communication technology)

# Measurement of Intangibles 1 / 3

- Intangible assets:

$R_{inta,t} = (1 - \delta)R_{inta,t-1} + N_{inta,t}$ ,  
where inta=rd,oc, ict

	RD	OC	ICT
Multiplier A	110%	35%	70%
Depreciation rate	15%	20%, 25% services	33%

- Investments, N:

$P_{jt}N_{inta,t} = AW_{it}$ ,      |  $W$  is the expenses on  
intangible producing  
employees

where j refers to industry, i refers to a firm

A is a multiplier approximating the use intermediates & % of  
work that is of investment nature.



# Measurement of intangibles 2/3

- Technical and mathematical work professionals
- Science and Engineering Professionals (excluding telecommunication engineering)
- Physical, engineering, and earth science professionals , architects
- Health professionals (doctors, nurses..)
- Physical and Engineering Science Technicians, Life Science Technicians and Related Associate Professionals
- R&D managers



RD work



# Measurement of Intangibles 3/3

- Managers
- Business, Finance, Administration, Sales, Marketing Professionals
- Legal, Social, Cultural and Related Associate profession
- Otherwise RD work and education field in social sciences and business

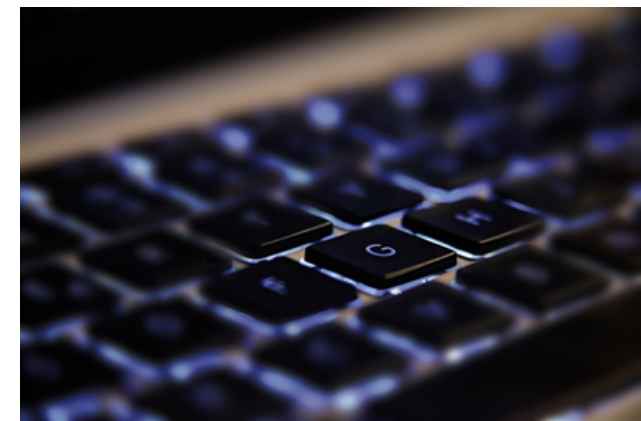


Organizational work

- ICT managers, telecommunication engineering
- ICT professionals & technicians



ICT work



A top-down view of a person's hands writing on a white notepad with a red pen. A white cup of brown liquid, likely coffee, sits on the notepad. The background is a solid yellow color. The person is wearing a dark long-sleeved shirt and a watch on their left wrist.

Comparing intangibles with innovation measures from CIS

# INTANGIBLES BY EMPIRICS

- I combined Danish community innovation survey (CIS) with intangibles from register data.
- Innovativeness of intangible intensive and non-intangible-intensive firms.
- Some correlations.



Year	Has all intangible types, %	has ICT asset, %	Has new product, %	has new to markets product, %	Importer, %	Exporter, %	Obs
<b>More intangibles than industry mean</b>							
2008	91	91	44	36	54	50	664
2009	90	90	36	27	54	52	692
2010	92	92	35	27	58	55	695
2011	95	95	35	26	59	55	686
2012	97	97	35	23	57	54	729
2013	95	95	36	26	56	54	705
<b>Less intangibles than industry mean</b>							
2008	25	25	26	19	40	37	2088
2009	25	26	22	14	37	34	2225
2010	24	25	22	14	45	41	2108
2011	26	27	21	13	45	40	2184
2012	28	28	22	13	45	42	2309
2013	27	27	21	12	45	42	2178





	<b>VA</b>	<b>sales</b>	<b>intangibles</b>	<b>RD</b>	<b>OA</b>	<b>ICT</b>	<b>Capital</b>
<b>VA</b>	1						
<b>Sales</b>	0.61	1					
<b>Intangibles</b>	0.46	0.25	1				
<b>RD</b>	0.42	0.21	0.98	1			
<b>OA</b>	0.41	0.32	0.56	0.39	1		
<b>ICT</b>	0.21	0.13	0.41	0.34	0.38	1	
<b>Capital</b>	0.07	0.07	0.05	0.05	0.04	0.03	1
<b>New Product</b>	0.12	0.12	0.14	0.13	0.12	0.11	0.05

Intangibles= RD+OA+ICT

RD=research and development

OA=organizational assets

ICT=information communication technology



	ICT	OA	RD	organazing	marketing	patents
ICT	1					
OA	0.46	1				
RD	0.33	0.27	1			
organazing	0.14	0.15	0.12	1		
marketing	0.12	0.13	0.08	0.48	1	
patents	0.11	0.08	0.17	0.15	0.14	1

Organizing: organizational changes or new methods to organize the working place, or negotiated new partnerships

RD=research and development  
OA=organizational assets  
ICT=information communication technology

Marketing: new sales channels, new media or product promotion, new pricing strategy or a new packet

Patents: has filed a patent



# Conclusion



## Intangible capital

- measures the innovation competence in firms or industries (or even countries)
- can be labelled as innovation capability indicator

## Intangible intensive firms tend to be more

- Innovative
- Internationally oriented



# Thank You

# Merci

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