

Business Models and Digital Technology in SMEs and E-ship

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Digital technologies, SMEs and E-shipping

Digital technologies are changing the way of doing business



What **happened in the past** in the industry?



IBM case → Intel and Microsoft

What is **happening today**?



Survey
Data analysis and evidence

But we know very little about the way they are changing SMEs behavior.

Business model as a (new) reference point?

- Standard paradigms in Applied & Industrial Economics only explain a minor part of the **variance of performance, i.e. profits, in economics sectors**
 - Firm effect and industry effect in Structure-Conduct-Performance model only explain 35% of total variance

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 - Resource based view
 - Knowledge based view
 - Evolutionary approach

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- **New theoretical approaches** in the last decades are still not providing convincing explanations
 - Resource based view
 - Knowledge based view
 - Evolutionary approach
- **Business models:** a promising approach, but ...
 - still not theory-grounded
 - No empirical analysis that supports inference

What we do

- We propose a statistical method to identify **clusters of firms with similar BMs**
- Apply and test
- Measure the impact on performance
- ...
- Before the data analysis, some theoretical considerations

What is a business model?

- The business model concept became prevalent with the advent of the Internet in the mid-1990s (Zott & Amit, JOM, 2011)
- **No consensus exists regarding the definition**, nature, structure, and evolution of business models
- In its mainstream definition, it is based on:
 - **Value creation**
 - **Value delivery**
 - **Value capture**
- It is mainly related to **individual firms**, but it also affects **value chains, sectors and industries**

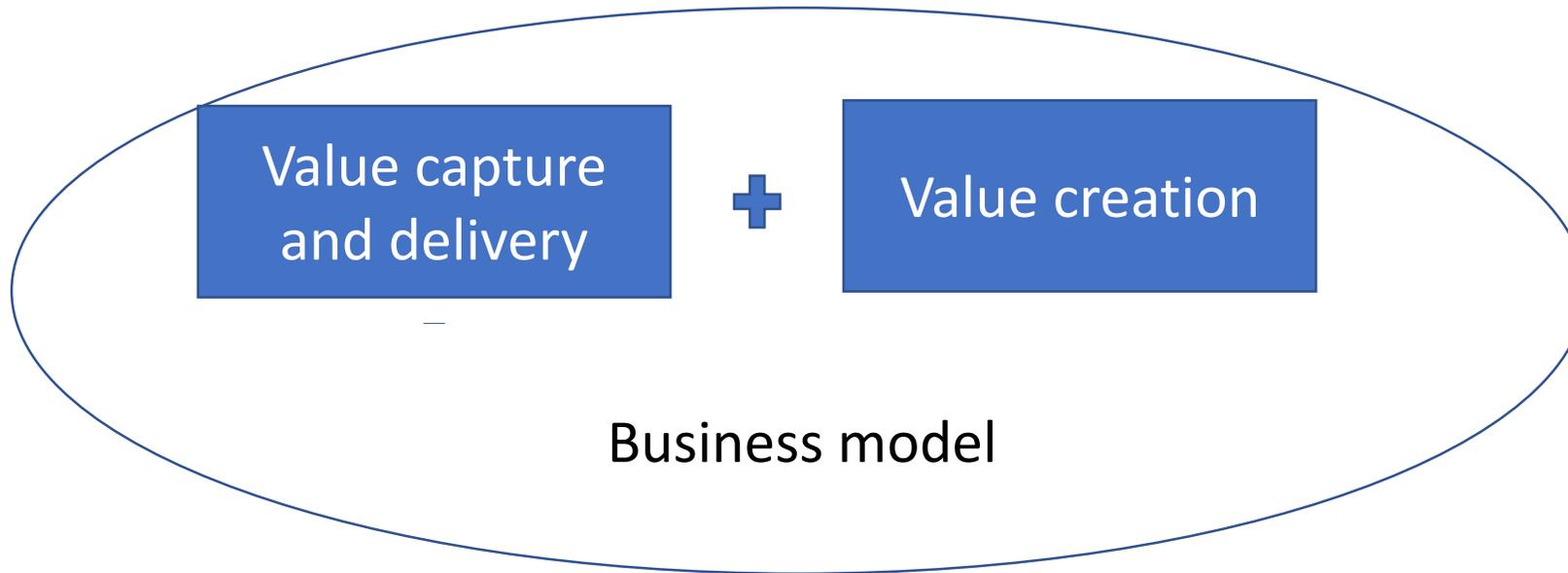
Business Model and Entrepreneurship in SMEs

Value capture
and delivery

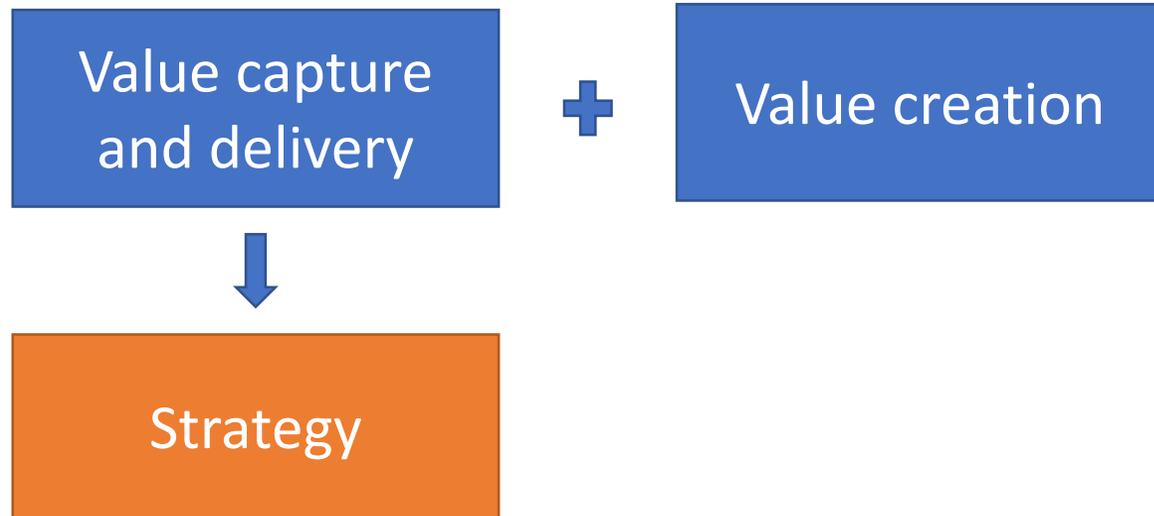


Value creation

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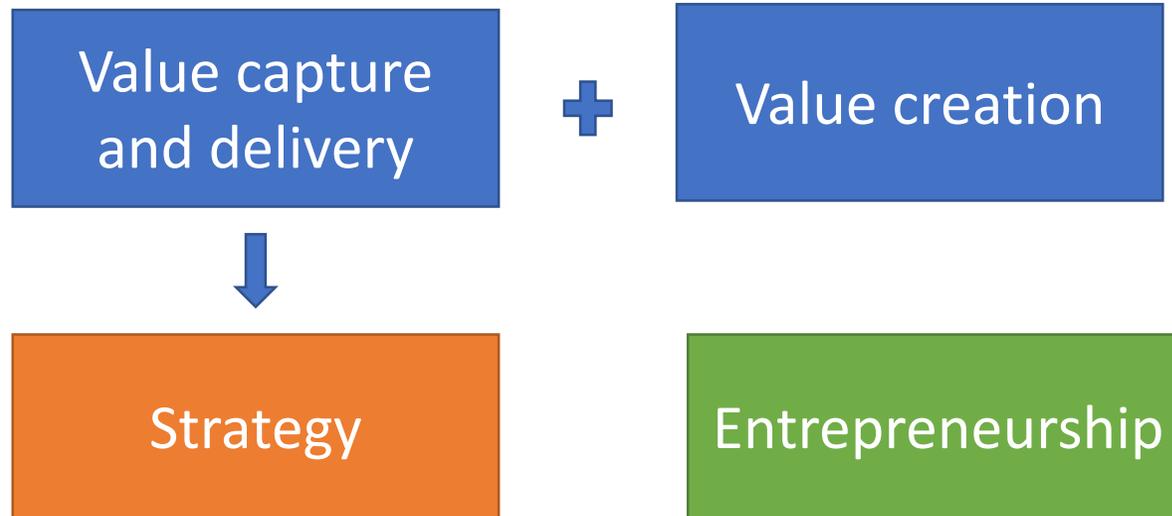
Business Model and Entrepreneurship in SMEs



**«Business as usual» in
mature sectors and
organisations**

(Casadesus-Masanell &
Ricart, 2008)

Business Model and Entrepreneurship in SMEs



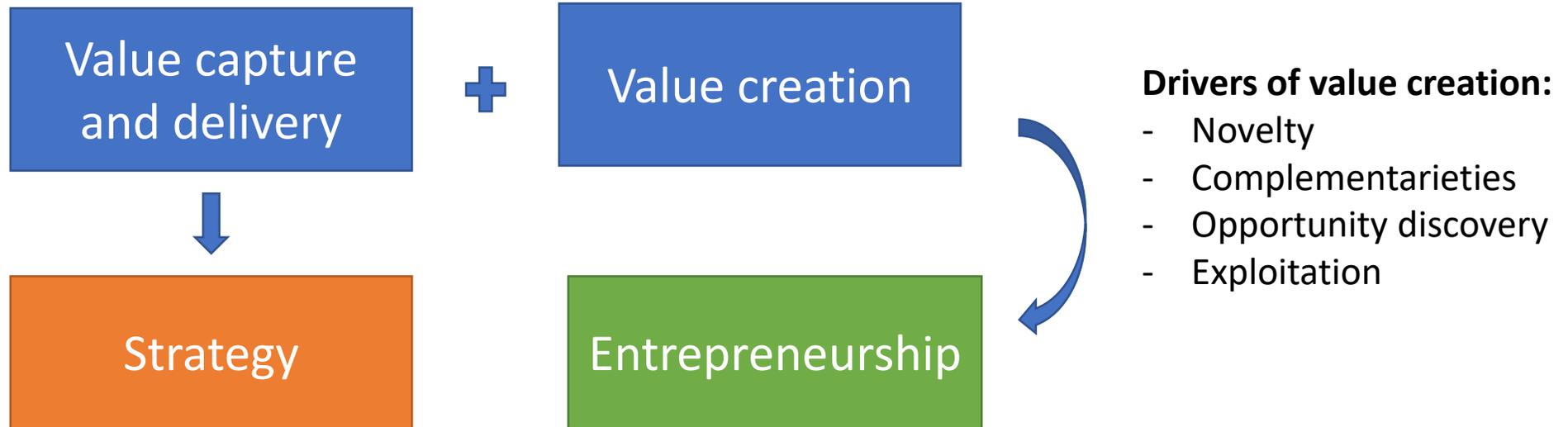
**«Business as usual» in
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**«Renewal & Renjuvenation»
through the creation,
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exploitation of opportunities**

(Demil Lecocq Ricat Zott, 2013)

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Data

- Bureau van Dijk - AIDA balance sheet data for Italian manufacturing for the period 2008-2017
 - we consider **only SMEs**, i.e. firms with sales value between **5 million and 50 million of Euros (112.000 firms x 10 years)**
 - we restrict our sample to **4-digit industries** with a significant number of firms (N>100). Very detailed sectoral structure.
 - The final preliminary sample contains 11566 firms in **9 NACE (2007) 4-digit industries**

Identification of Business Models I

We relied on 14 variables, which can be reasonably used to define business models from an E-ship perspective

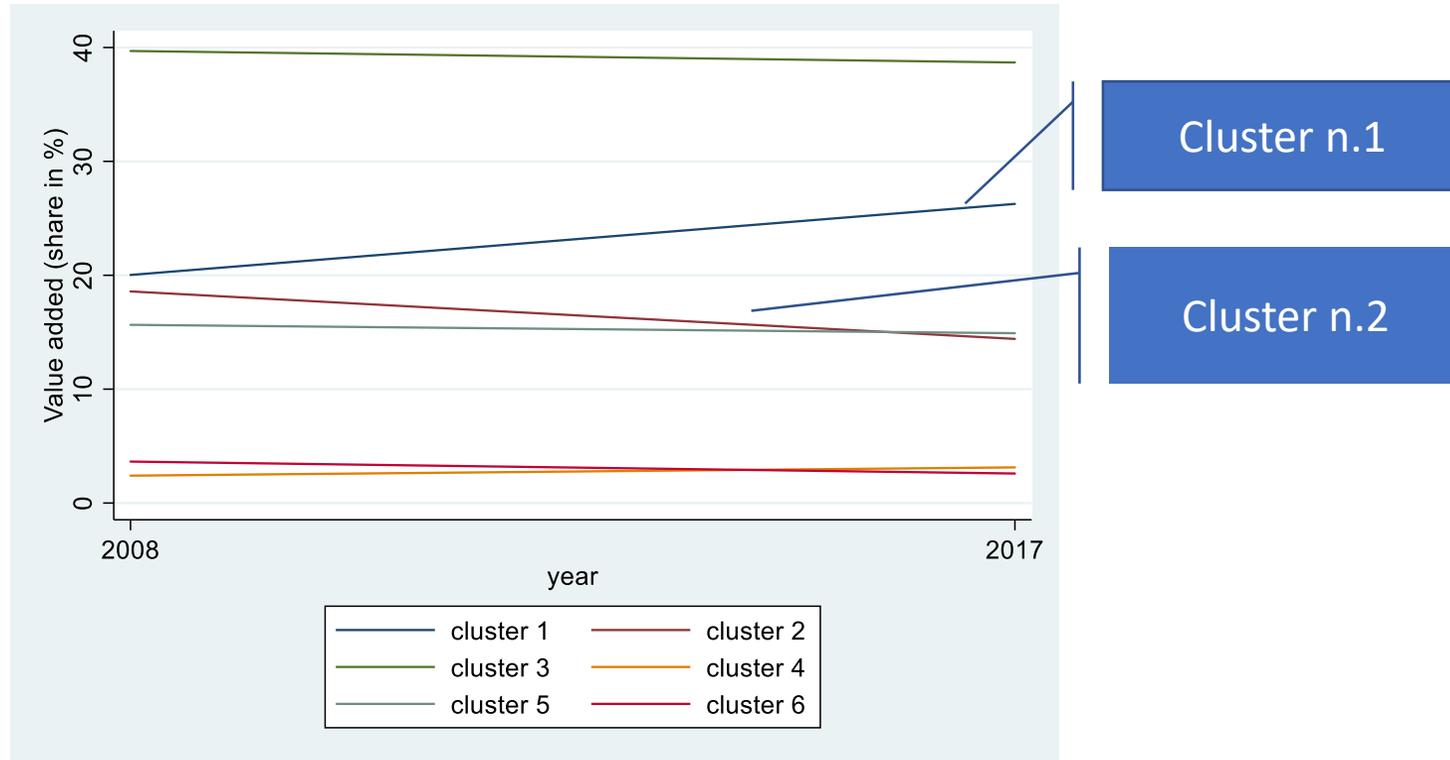
Variables	Strategy	Entrepreneurship
Vertical integration: value added / sales	X	
Labour intensity: Employees / Fixed asset	X	
Sales/employee	X	
Ebit margin	X	
Asset turnover ratio	X	
Fixed asset / total assets	X	
Financial cycle	X	
R&D / Total assets		X
Intangible assets / total assets		X
Complexity: External services / sales		X
Human capital: Wages per employee		X
Credit cycle		X

Identification of Business Models II

- **Principal Component Analysis**
- **Cluster analysis on principal components.**
 - The cluster analysis has been replicated 250 times (bootstrapping) to solve/mitigate the instability inherent in cluster methodologies
- We ended up with **65 clusters**; the number of clusters per industry ranges from **6 to 9**
- Clusters are characterised by one or more features, i.e. cluster of firms with “high” R&D expenditures, cluster of firms with both high R&D expenditures and high human capital, ...

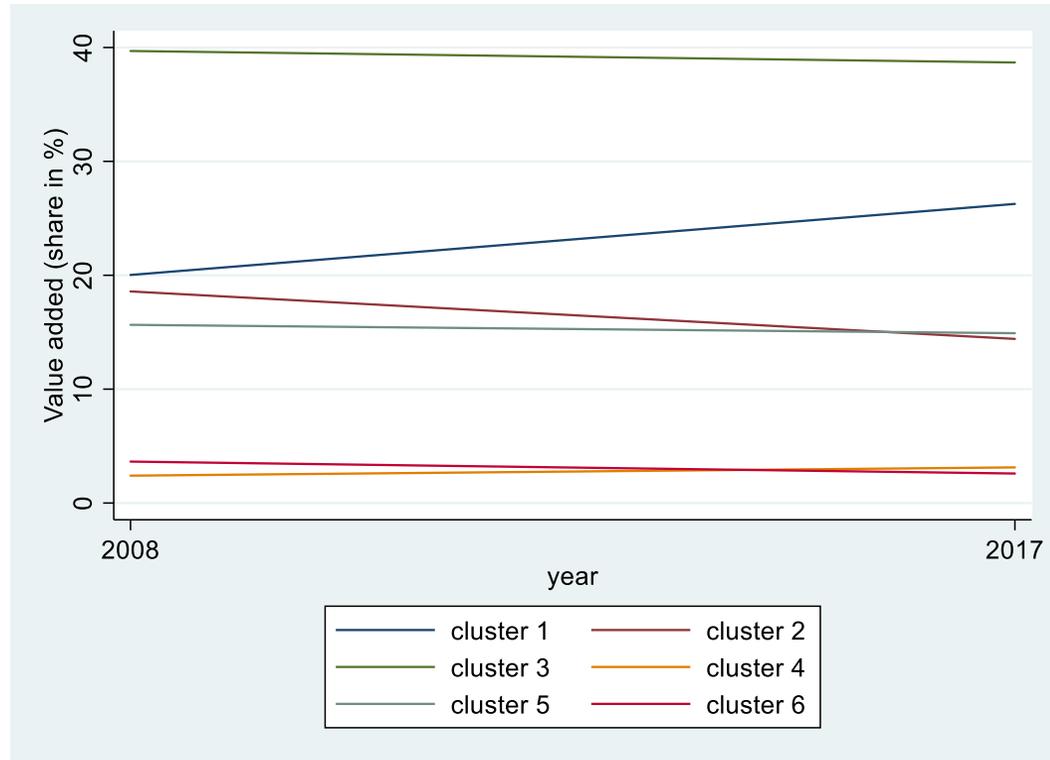
Is there evidence of relevance of business models?

NACE 1051- Milk and dairy products

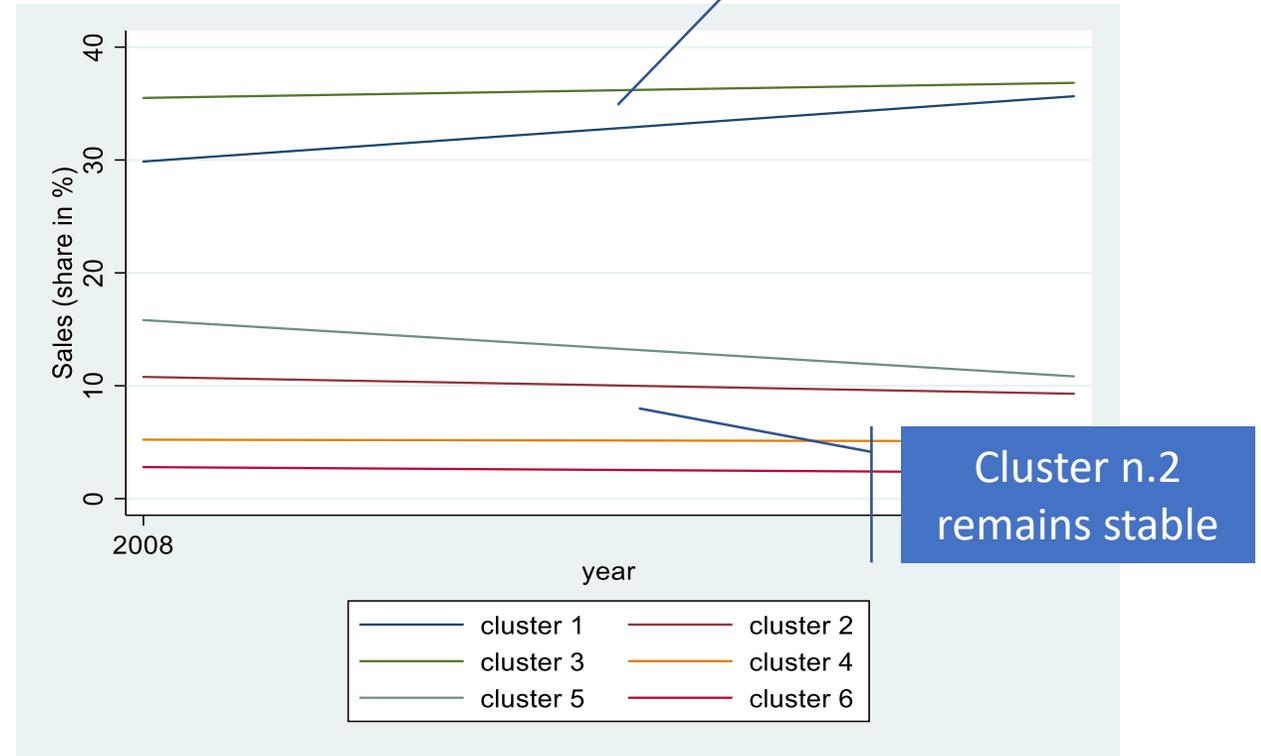


% of sector value added

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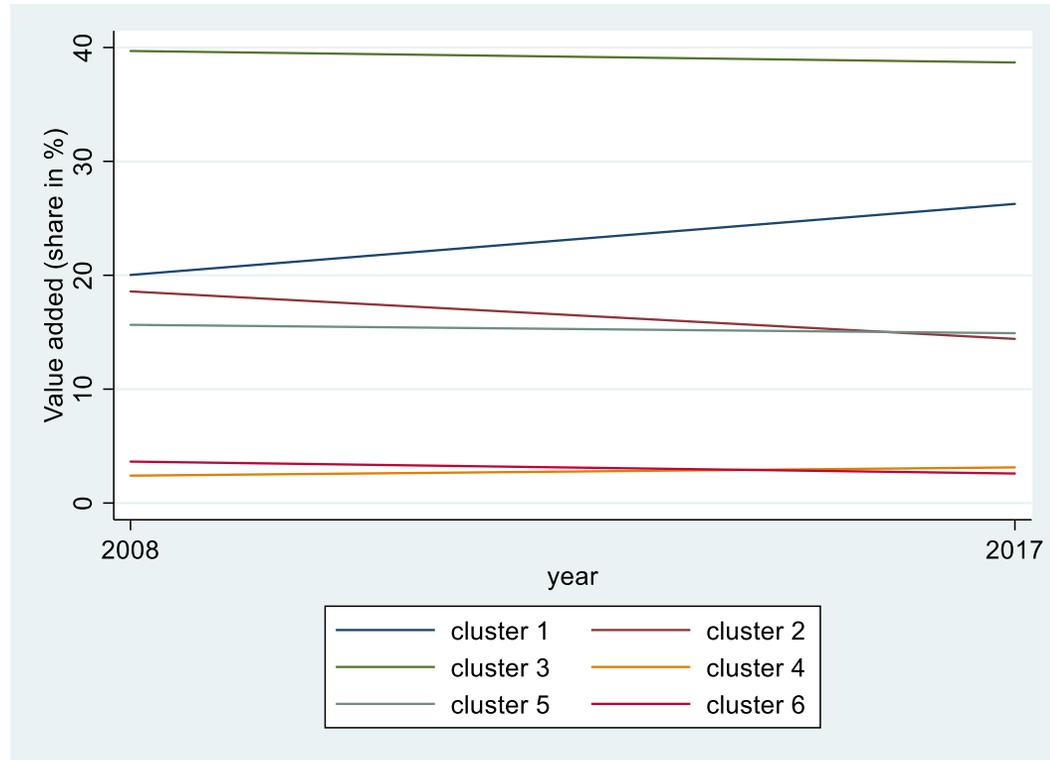


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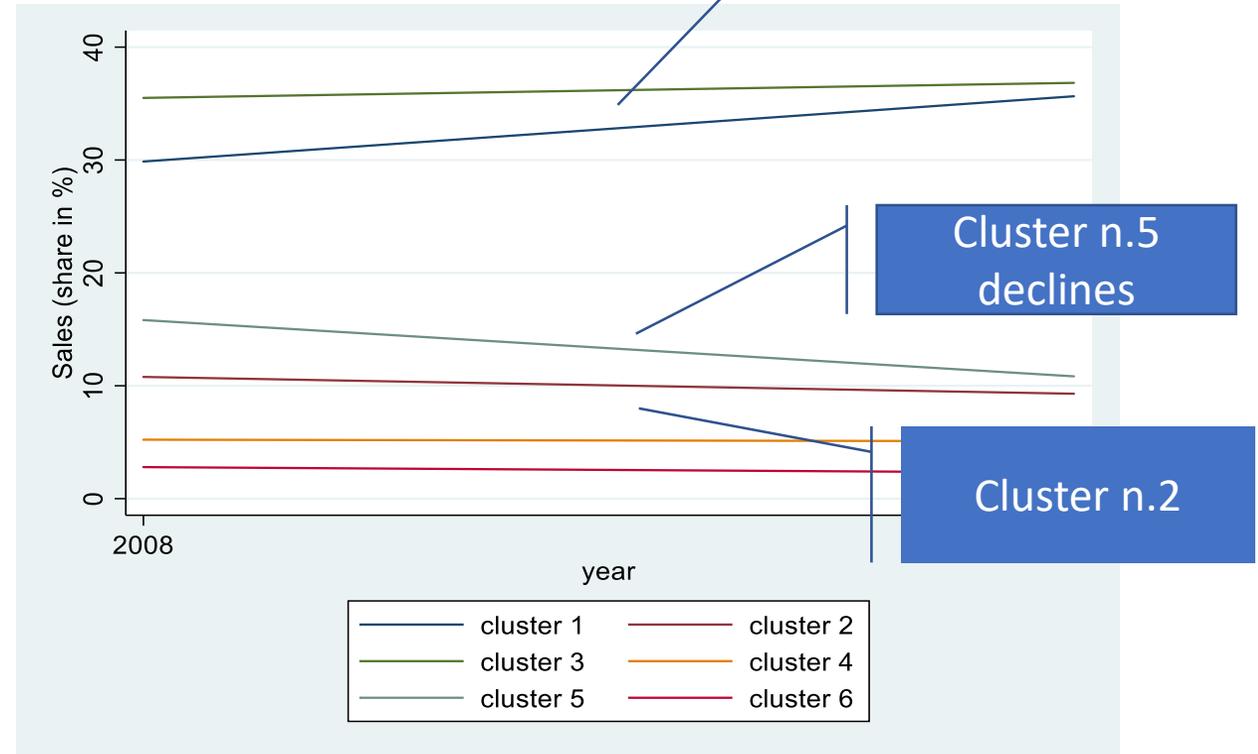


% of sector sales

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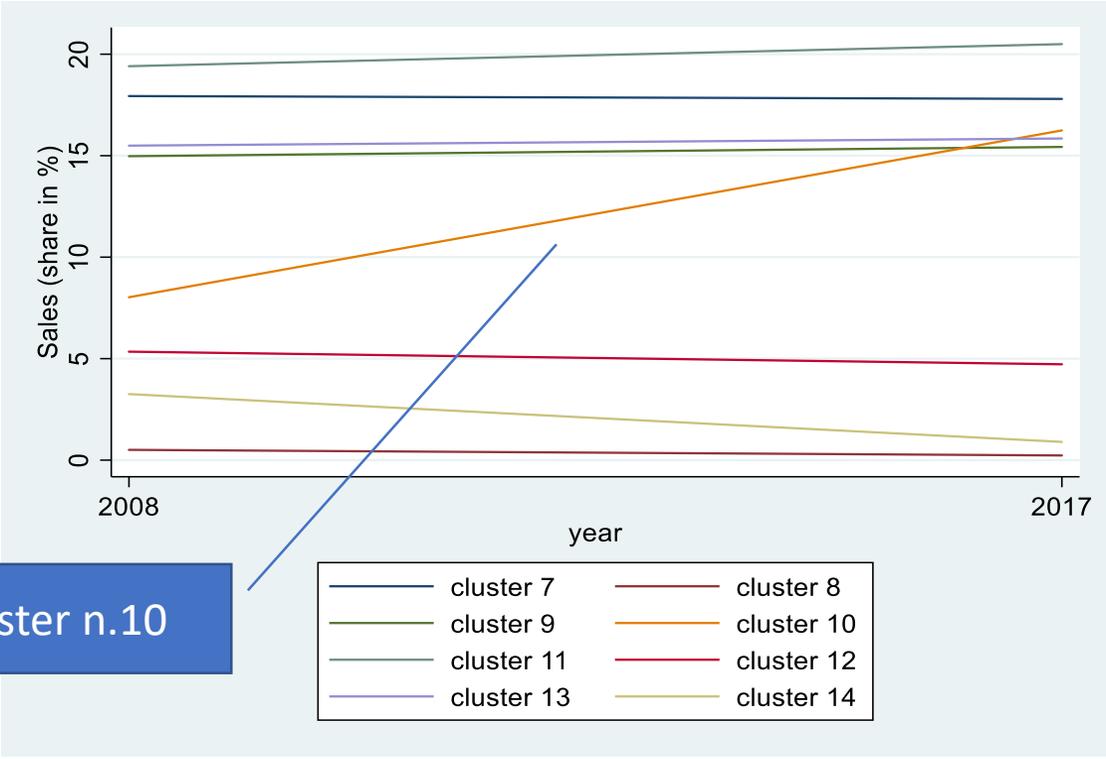
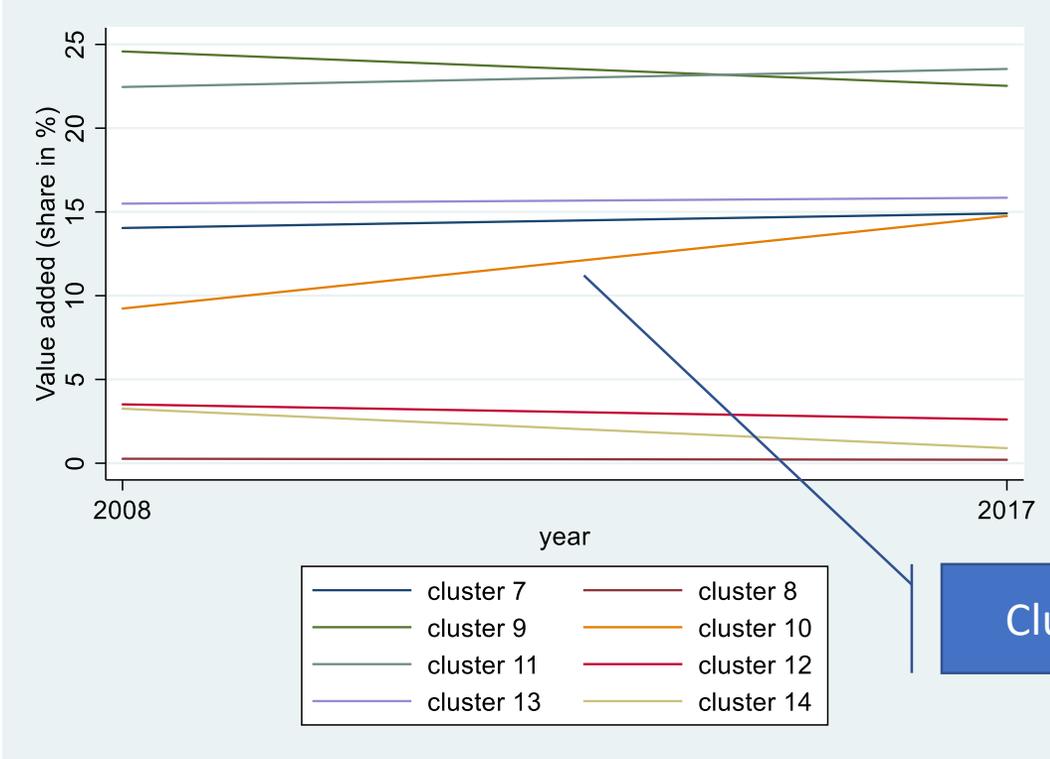


% of sector value added



% of sector sales

NACE 1520 - Footwear

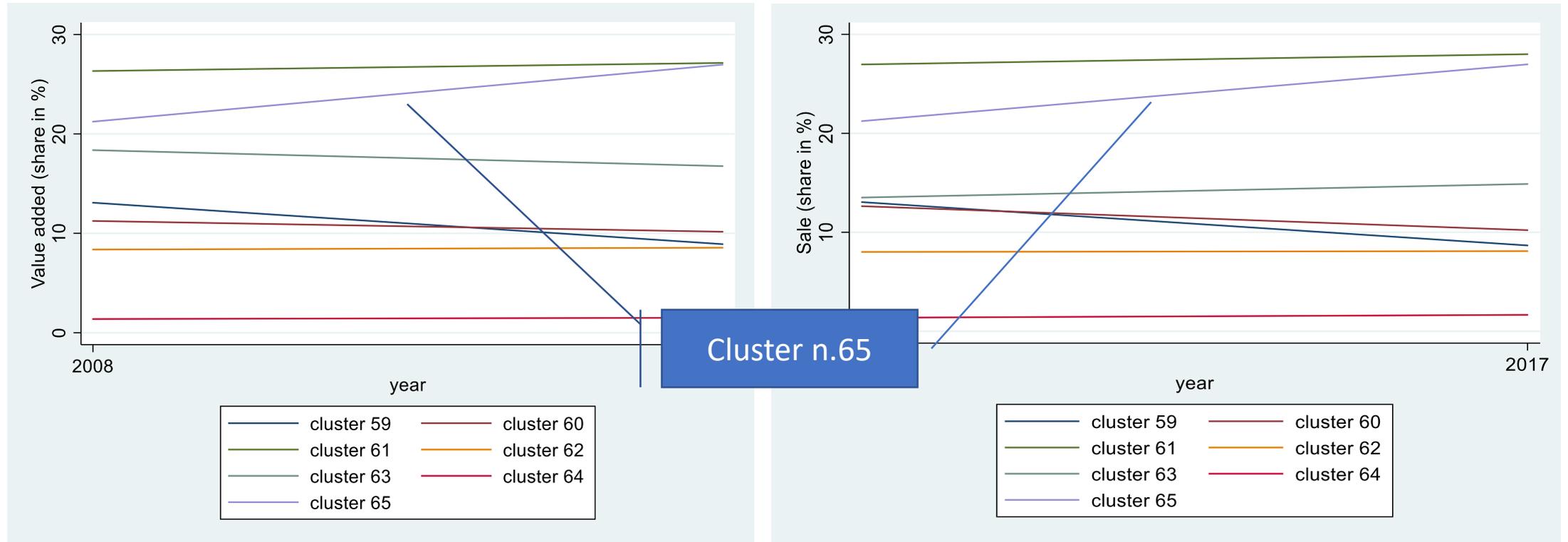


Cluster n.10

% of sector value added

% of sector sales

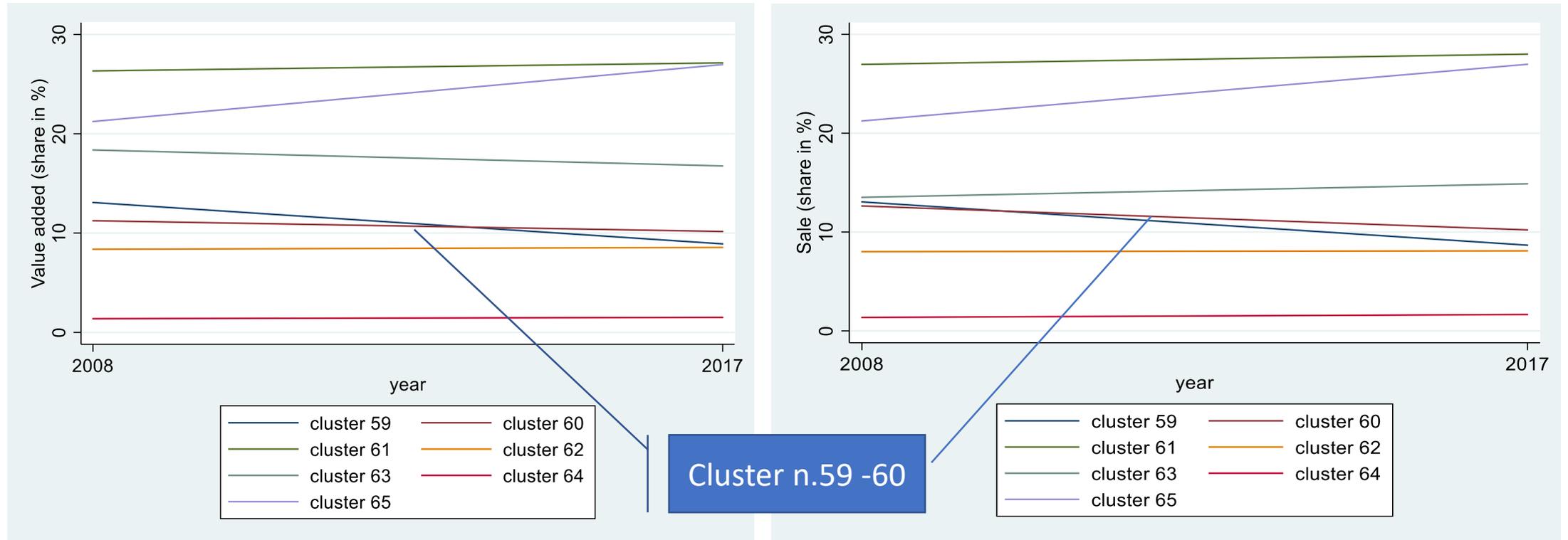
NACE 2829 – Machine tools



% of sector value added

% of sector sales

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Some preliminary conclusions

- There is **evidence of different dynamics** (growing vs declining) by BMs
- **Growth and decline are not coherent between indicators**, i.e. value added and sales. The value creation process is more complex than expected.
- The difference in response is smaller for **employment** (less reactive)
- In general, **IT-sensitive sectors** show more intense responses

Next step: Performance

We perform multilevel mixed-effects linear regressions to analyse the variability associated with each of the three levels, i.e. **firms**, **business models** and **industries**

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Variance component analysis - % of variance accounted by firm, business model and industry level

Level	All			ICT			No ICT		
	Firm	Business model	Industry	Firm	Business model	Industry	Firm	Business model	Industry
ROI	90.2	9.0	2.8	86.2	13.8	2.2	94.9	5.1	3.4
ROA	80.5	17.5	2.0	78.3	19.8	1.9	83.5	14.4	2.1
ROS	74.3	22.7	3.0	72.4	24.3	3.3	77.1	20.2	2.7
Mean values	81.7	16.4	2.6	79.0	19.3	2.5	85.2	13.2	2.7

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1. The **firm effect is the strongest**, but the **business model effect outweighs the industry effect**

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2. Business model effects range between **10% and 25%**

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Next step: Performance

3. Heterogeneity of results **between ICT and No ICT industries** might suggests complex relationships

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Business models are important also in non-ICT sectors

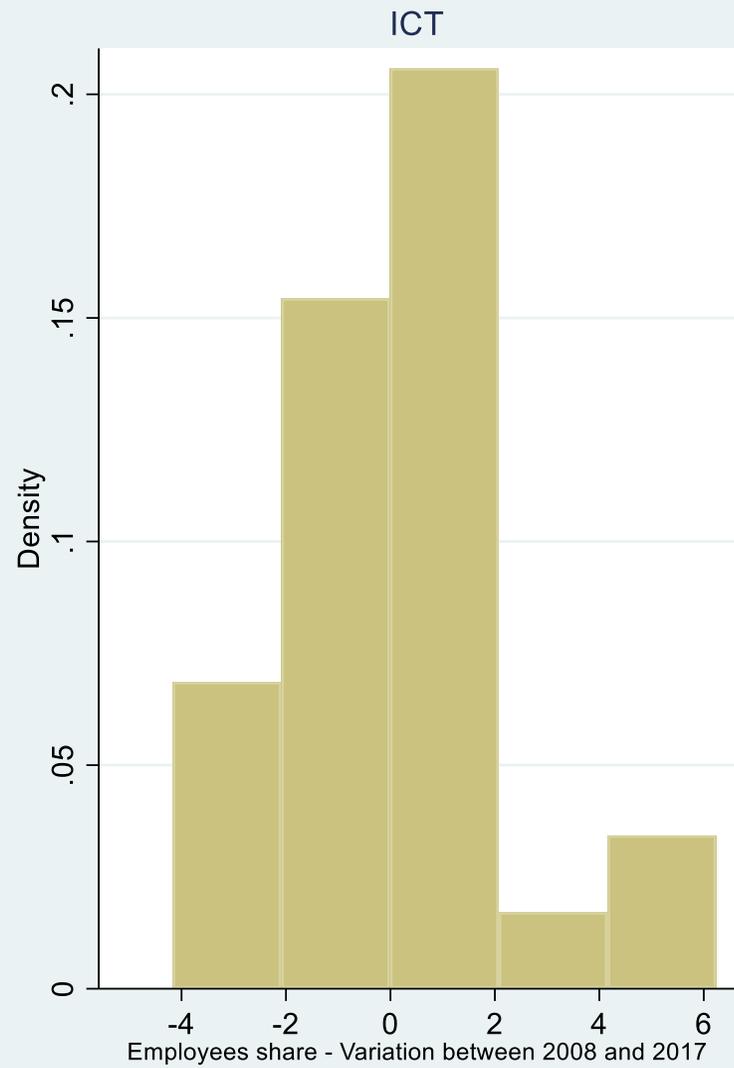
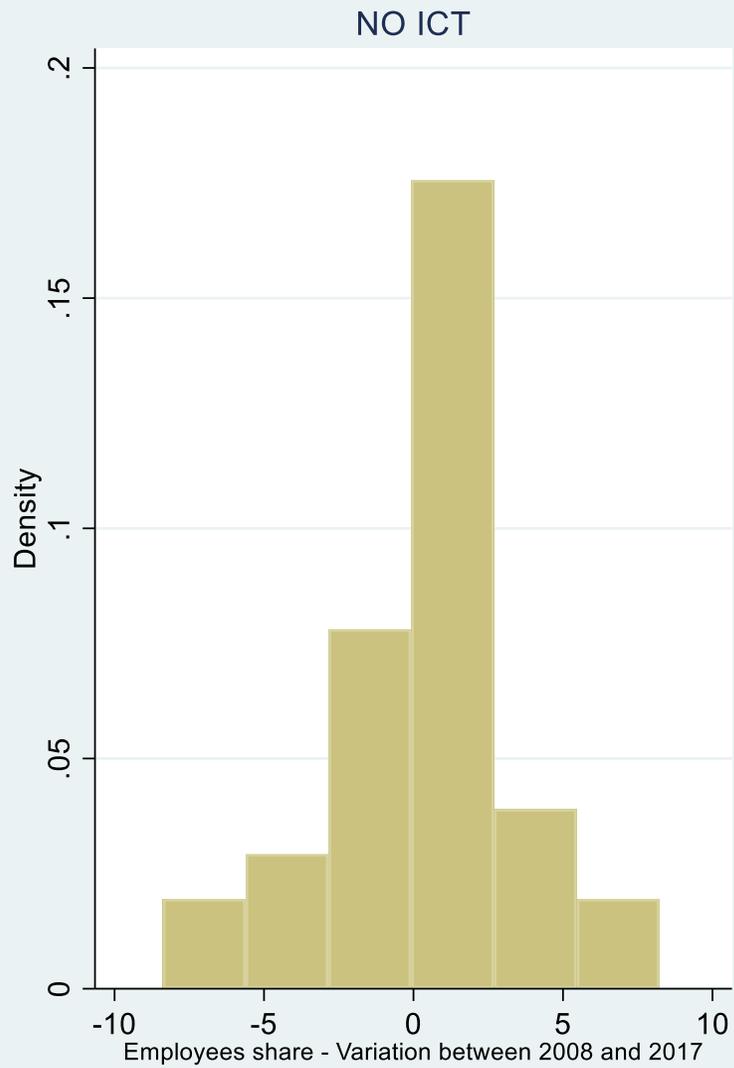
Some concluding remarks

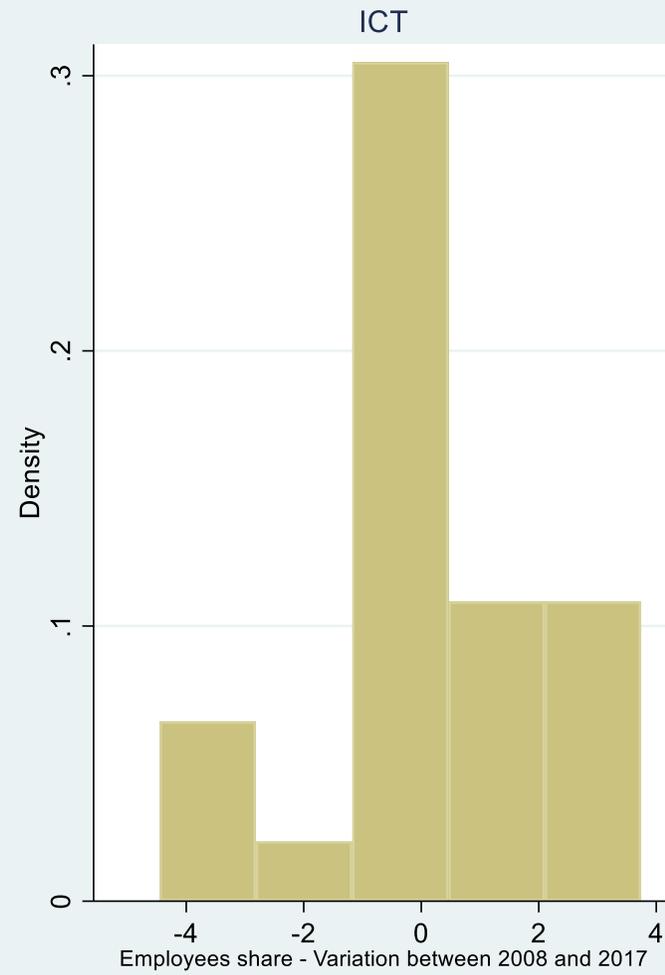
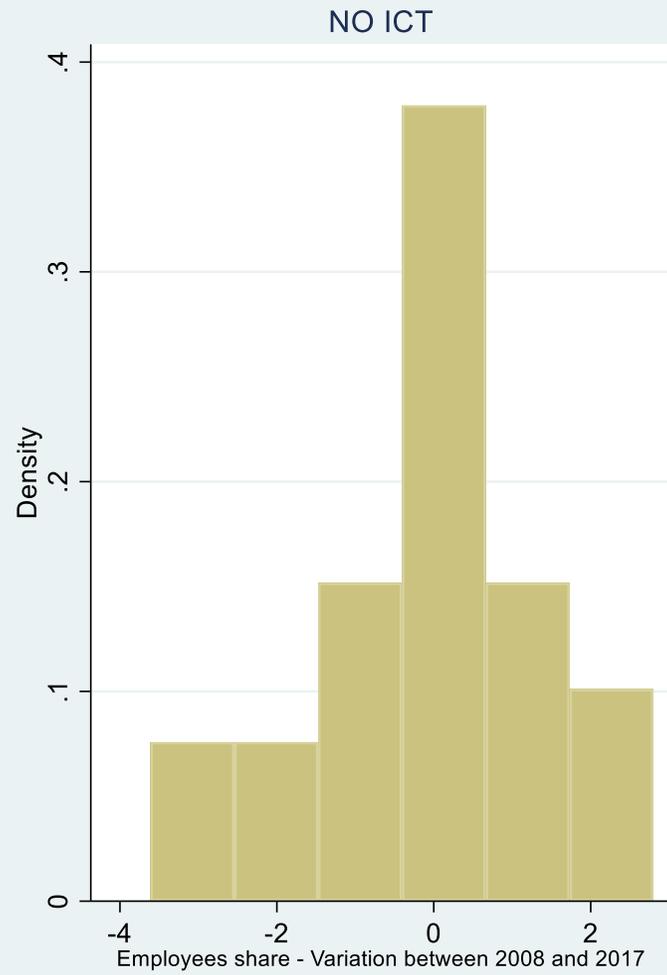
- We need to develop **new conceptual/empirical tools** to understand competitive dynamics
- Despite not well grounded, **BM's look promising** in identifying new variables behind competitiveness
- They fit well into the **logic of entrepreneurial behaviour** (how value is created)
- Despite preliminary, **empirical evidence** is supportive of the role of BM's

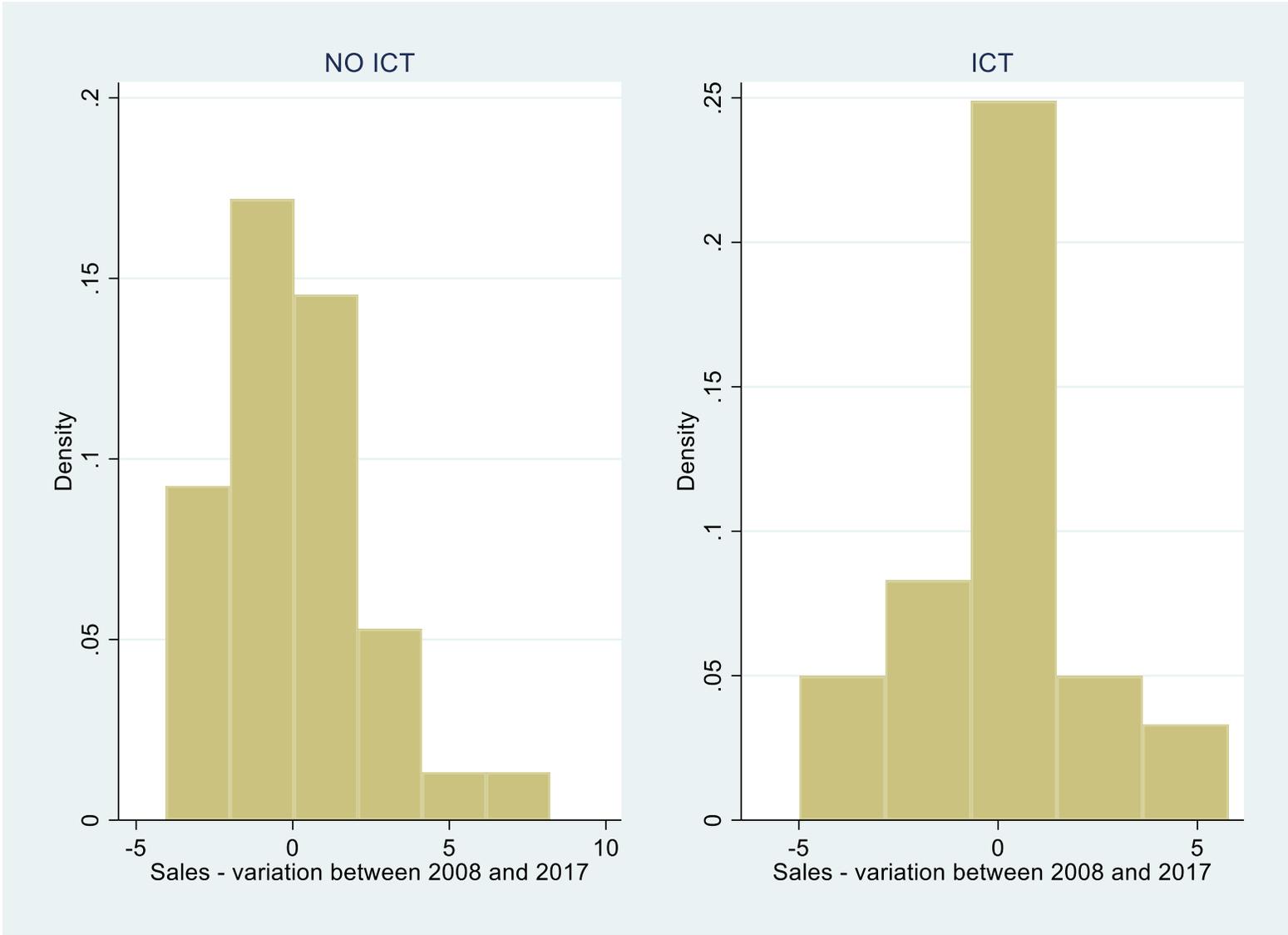
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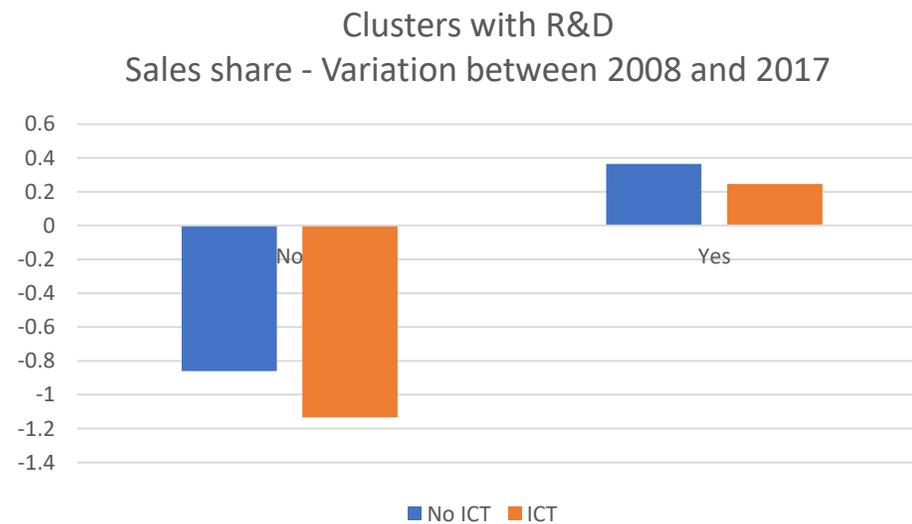
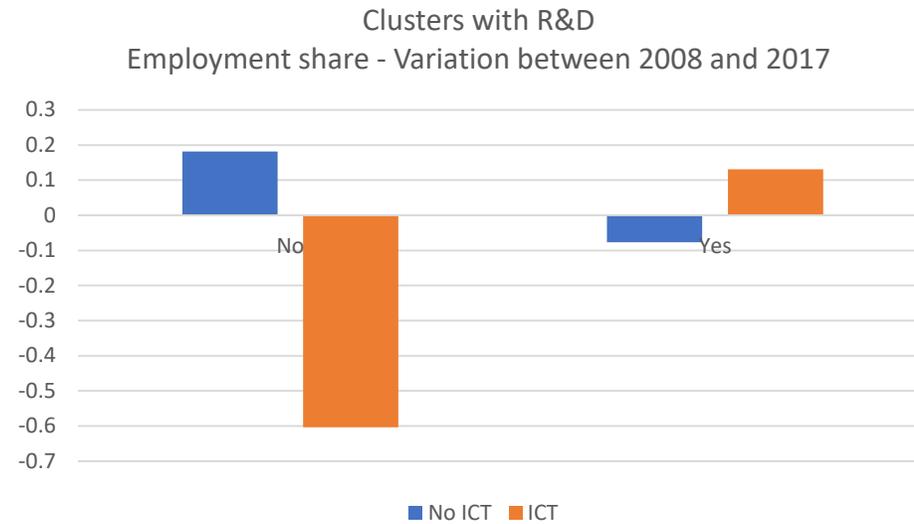
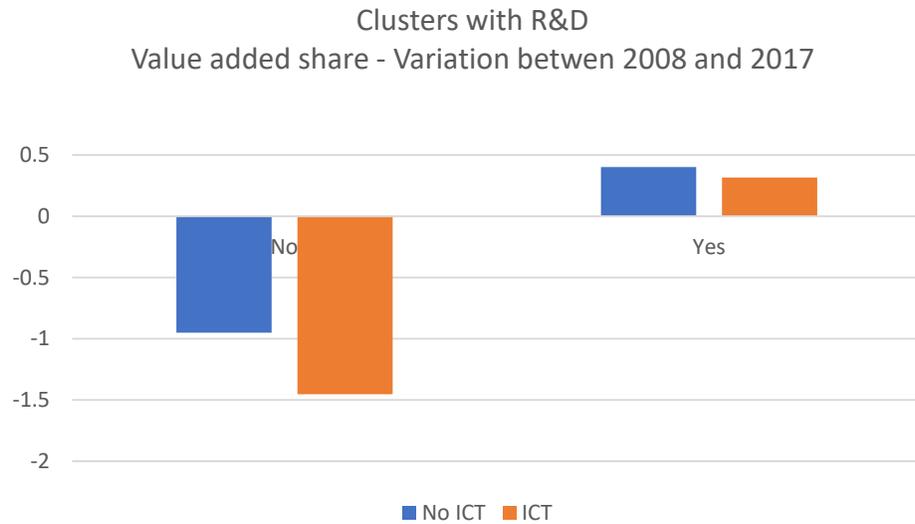
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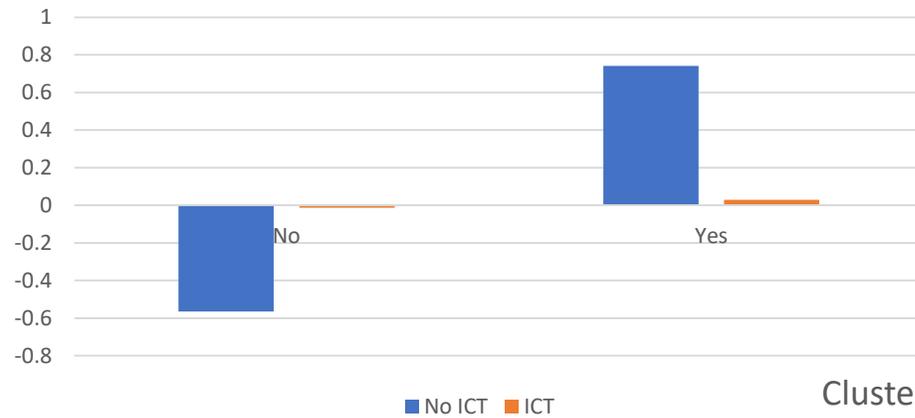


R&D

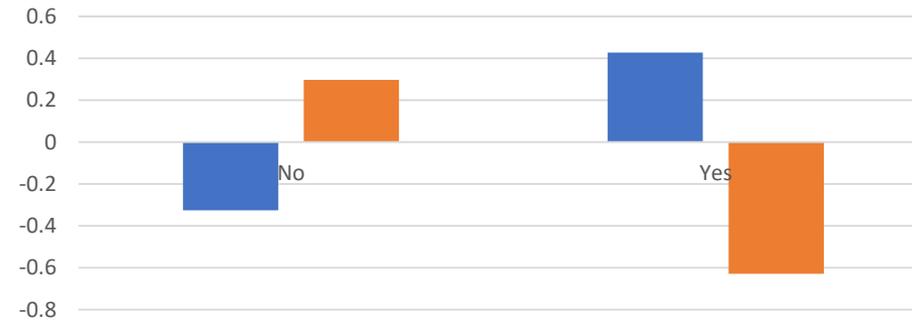


Intangibles

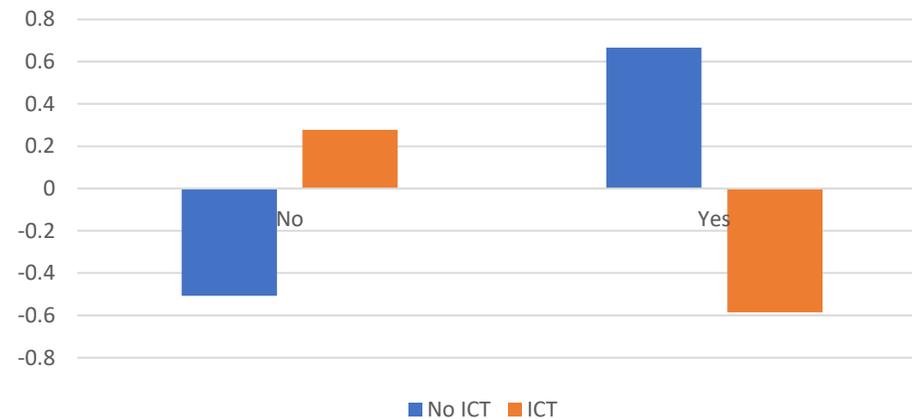
Clusters with Intangible assets
Value added variation between 2008 and 2017



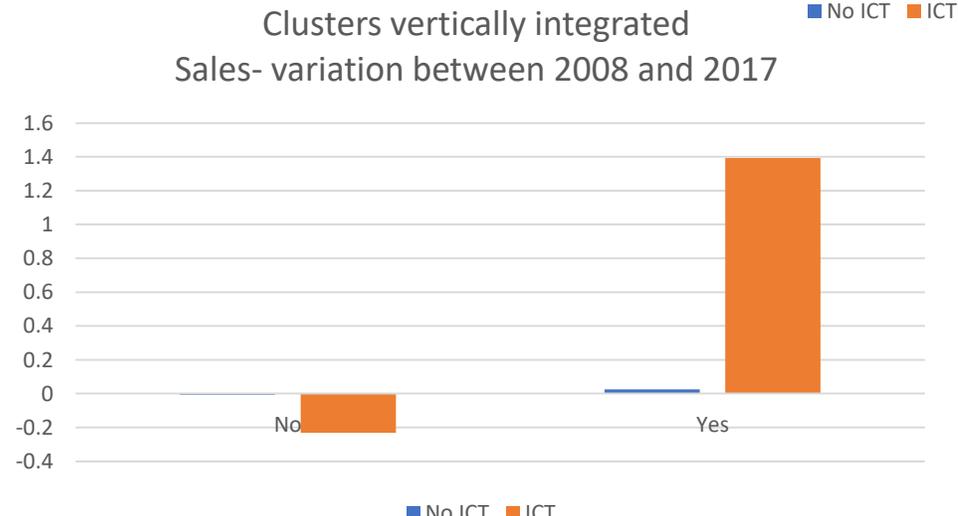
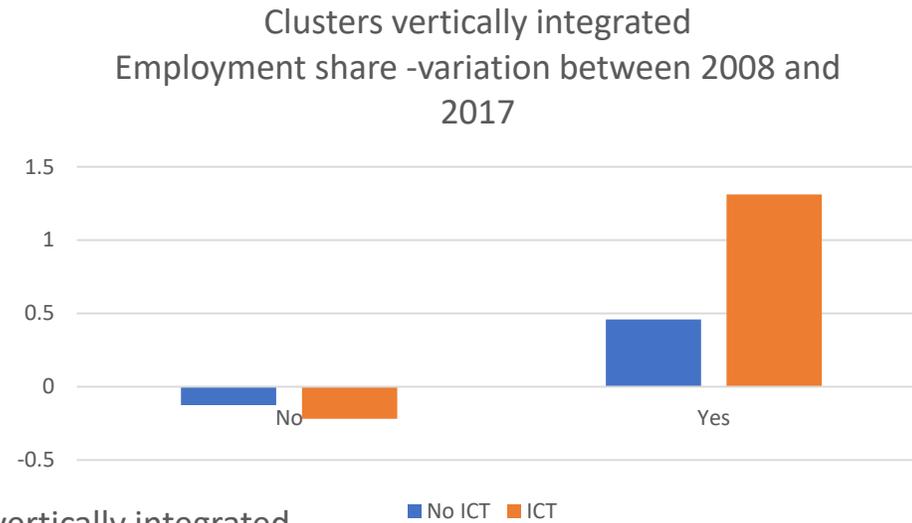
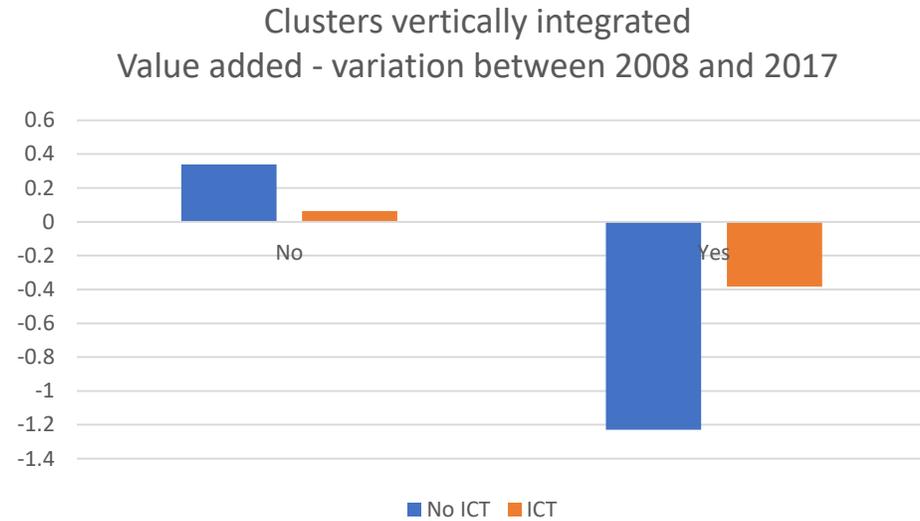
Clusters with Intangible assets
Employment share - variation between 2008 and 2017



Clusters with Intangible assets
Sales - Variation between 2008 and 2017

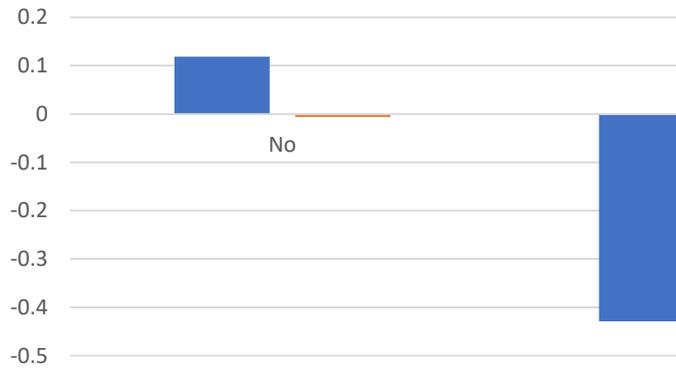


Vertical integration

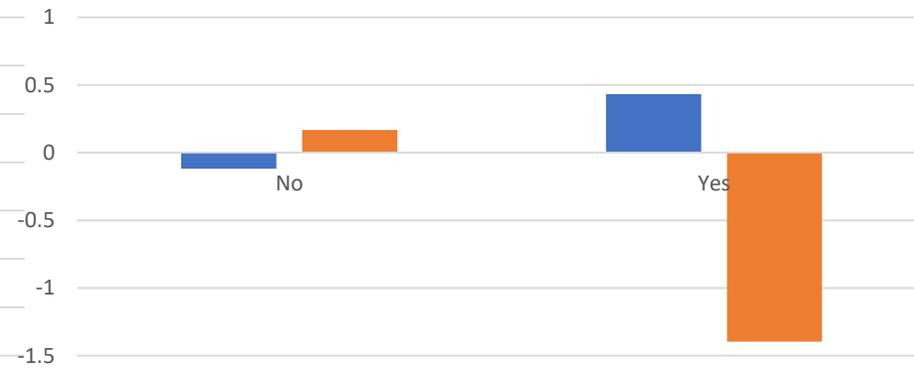


Complexity

Clusters with complexity
Value added -var 2008-2017

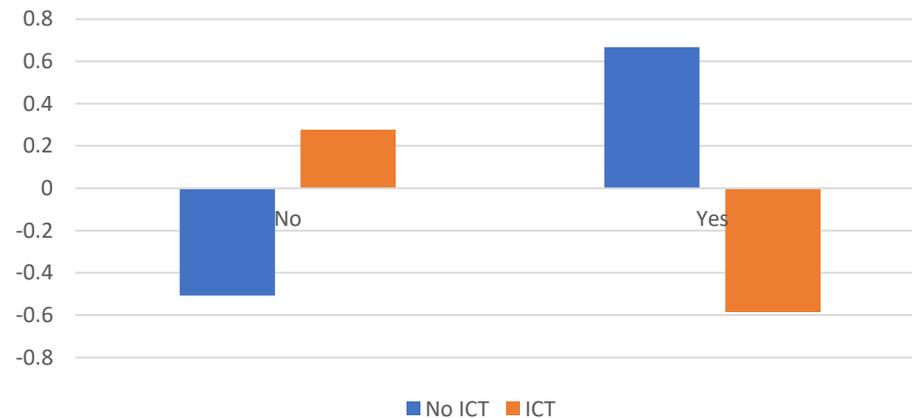


Clusters with complexity
Employment shares -var 2008-2017



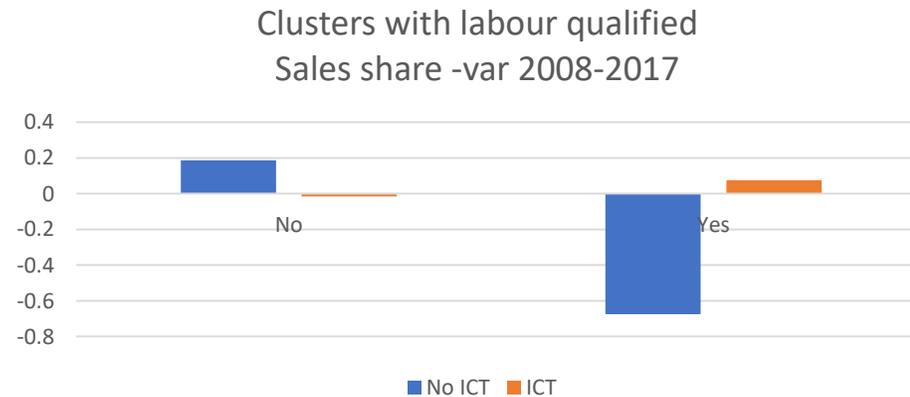
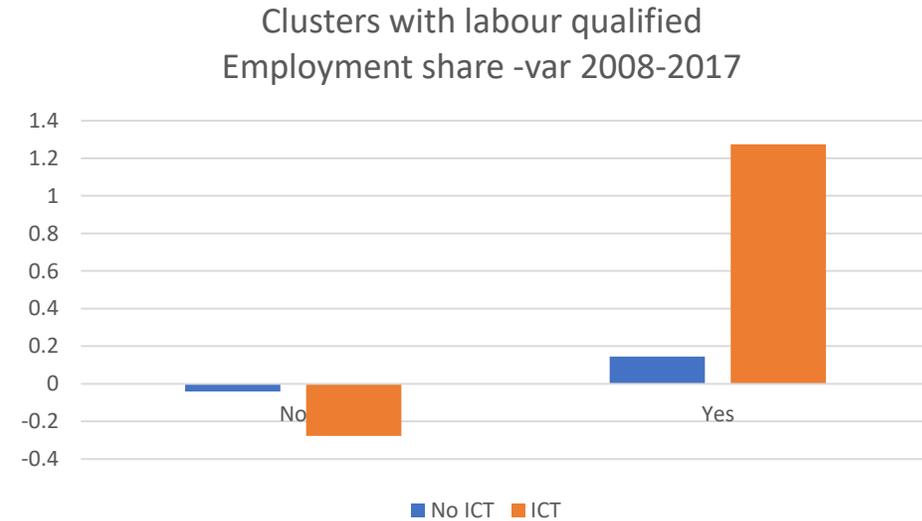
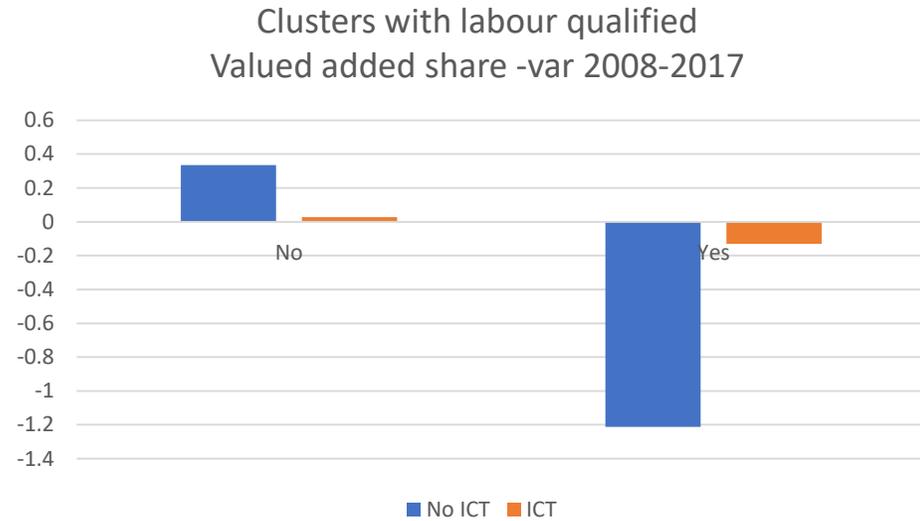
■ No ICT ■ ICT

Clusters with Intangible assets
Sales - Variation between 2008 and 2017



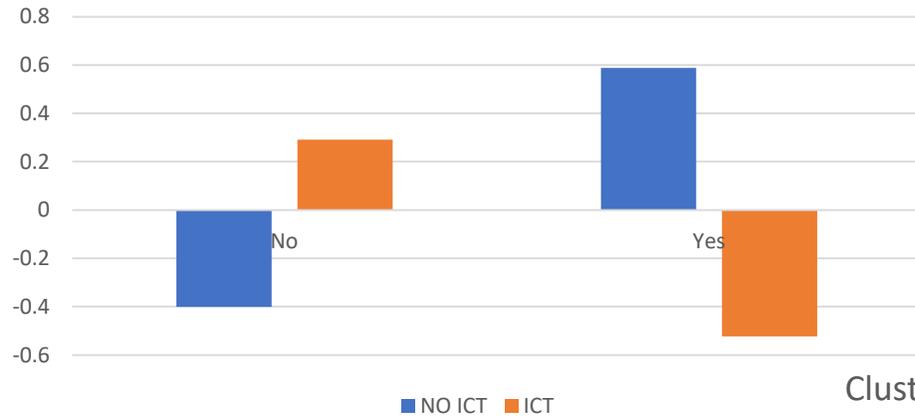
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Labour qualified

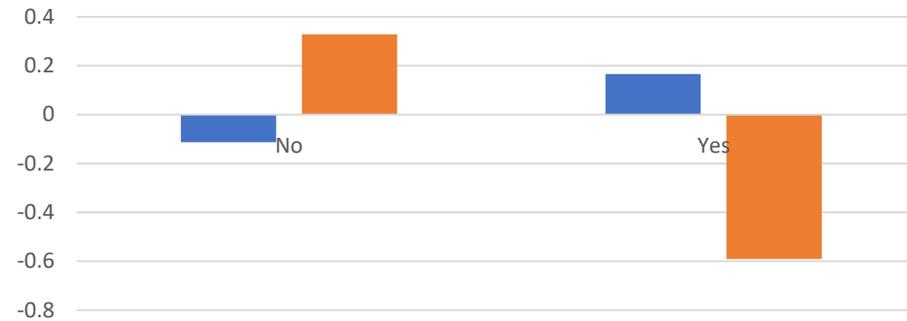


Labour intensity

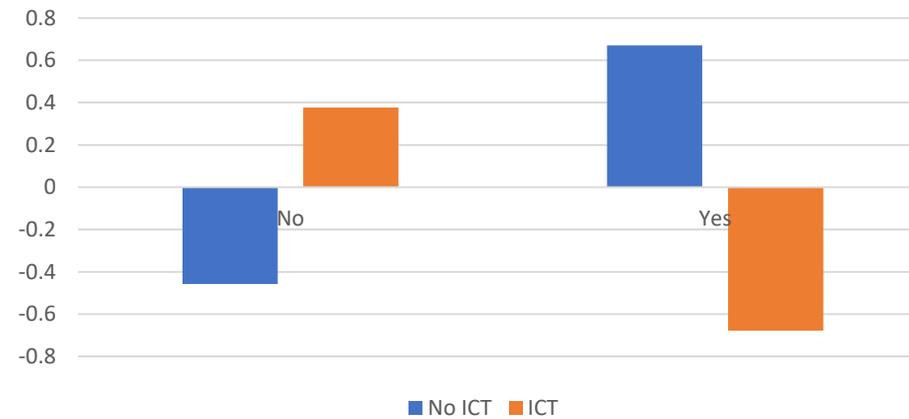
Clusters with labour intensity
Value added shares -var 2008-2017



Clusters with labour intensity
Employment share -var 2008-2017



Cluster with labour intensity
Sales -var 2008-2017



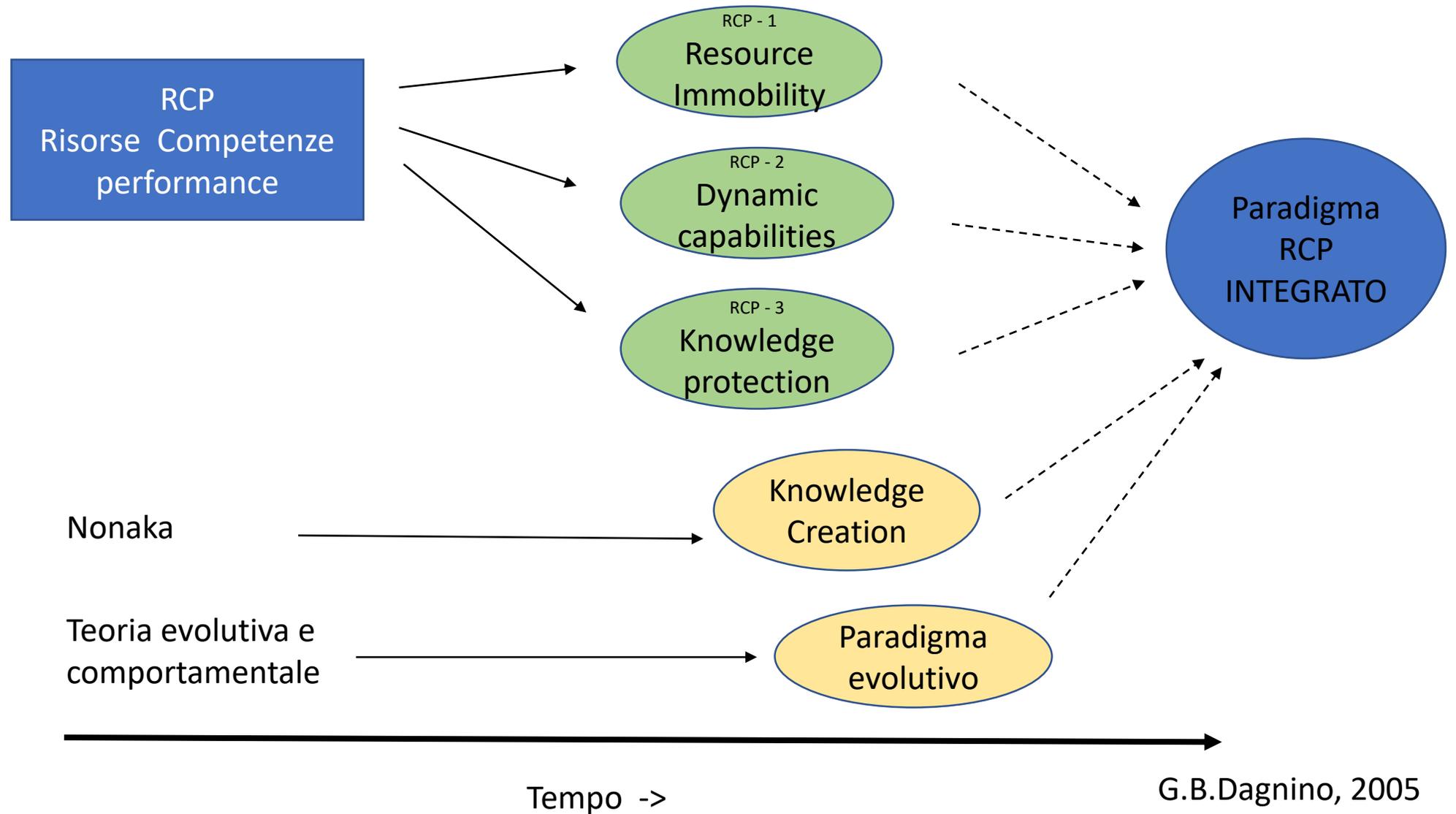
Conclusion

- For the first time (to our knowledge), we identify business models using balance-sheets data
- Business model characteristics are significantly associated with firm performance (no industry-effects, which are completely captured by BM)
- We also found that BM have varying effects in relation to different performance measures, suggesting complex relationships
- Heterogeneity is found also looking at ICT and No ICT industries
- Very preliminary results

L'ultima difesa del paradigma SCP

	Schmalensee ^a (1985)	Rumelt ^a (1991)	Mc Gahan e Porter (1997)	Hawanini <i>et al.</i> (2003)			
Base dati	FTC 1975	FTC 1974-1977	Compustat 1981-1994	Stern Stewart 1987-1996			
Misura della performance	ROA	ROA	ROA	EP e TMV ^b			
		Campione A		EP/CE	TMV/CE	ROA	Modified
Effetto di settore	19,6%	8,3%	18,7%	6,5%	11,4%	8,1%	16.0
Effetto d'impresa	0,6%	47,2%	36%	27,1%	32,5%	35,8%	16.7
<i>Errore</i>	<i>80,4%</i>	<i>36,9%</i>	<i>48,4%</i>	<i>60,3%</i>	<i>51,9%</i>	<i>52,0%</i>	

E la complessità dei paradigmi RCP/RKP



Performance I

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