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The Development of Competitiveness Clusters in Croatia: A survey-based Analysis

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MOTIVATION

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- Clusters are the key building block in **smart specialization strategies** and a **tool** used by governments to increase competitiveness and economic growth.
- The success and effectiveness of cluster initiatives are still under question.
- Croatia has **recently** adopted a smart specialization strategy and the Ministry of Economy has established 13 Croatian clusters of competitiveness (*CCCs*) associated to different sectors.
- it is important to provide a first assessment of this cluster development program, even if it is still at its early stage, because such evaluations provide more insights **for better decision-making** processes for public resources and cluster policies.

OBJECTIVE AND CONTEXT OF THE PAPER

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- The aim of our paper is to investigate the perceptions of cluster members towards:
  - The relevant objectives for the creation of clusters
  - How the setting of different objectives translate into different modes of management, governance and into different performance outcomes
- In doing so:
  - We rely upon an original dataset coming from a **survey** on 250 cluster members
  - We identify different groups of CCCs along different sets of **objectives** and investigate how these differences are reflected in the process of **management, governance**, and **performance**.

THE EMERGENCE OF CLUSTER INITIATIVES

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- **Cluster initiatives** (*CIs*): "*organised efforts to increase growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community*" (Sölvell et al., 2003).

- CIs often emerge out of a specific government project (Ketels et al., 2006; Kowalski and Marcinkowski, 2014) and may take several forms, ranging from non-profit associations to public agencies and companies

- Clusters emerge and are developed under the assumption that **agglomeration and coordination** of economic activity are beneficial for firms and for the national/regional context (Uyarra and Ramlogan, 2012; Štverková and Humlová, 2015; Maffioli et al., 2016)

  → considerable variation in structure, organisation, funding and activities across countries/regions

CLUSTER EFFECTIVENESS

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SUCCESS

- Cluster members outperform non-cluster firms (e.g. Khanna and Rivkin, 2001; Li and Geng, 2012; Francois and Nguyen, 2017): they can access capital, labour and markets less expensively than their non-group peers and have more access to political power (Khanna and Rivkin, 2001).
- Positive effects on productivity, innovation and growth, sales, wages, employment, exports, R&D investments, survival of firms (Baptista and Swan, 1998; Strøjer et al., 2003; Bell, 2005; Gilbert et al., 2008; Wennberg and Lidquist, 2008; Fontagné et al., 2010; Falck et al., 2010; Aranguren et al., 2014; Braune et al. 2016; Abdesslem and Chiappini, 2016).

FAILURE

- Governments can “pick the losers” and public subsidies might be captured by declining firms, who have higher incentives to lobby in order to obtain subsidies as compared to growing firms (Martin et al., 2011; Ketels et al., 2012; Uyarra and Ramlogan, 2012)
- Positive influence is restricted to a limited set of industries, at certain stages of development, in certain places – e.g. R&D intensive industries, and those more reliant on tacit knowledge, tend to benefit more from co-location (Beaudry and Breschi, 2003; Uyarra and Ramlogan, 2012).

CROATIAN CLUSTERS OF COMPETITIVENESS

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- CCCs are **non-profit organizations/associations** that link private, scientific-research and public institutions (**triple helix** model).
- CCCs are seen as an **instrument** to:
  - raise sectoral competitiveness
  - stimulate an efficient use of EU funds and programmes
  - lobby
  - promote a sector, also through internationalization and cross-sectoral networking
  - attract targeted investments and create new value added at the sectoral level
- There is **no obligation** to pay membership fee
- Current funding of CCCs is from **government budget;** the **Agency for Investment and Competitiveness (AIK)** gives CCCs technical and administrative support
- **13 CCCs** in different sectors

CCCs SECTOR EVOLUTION

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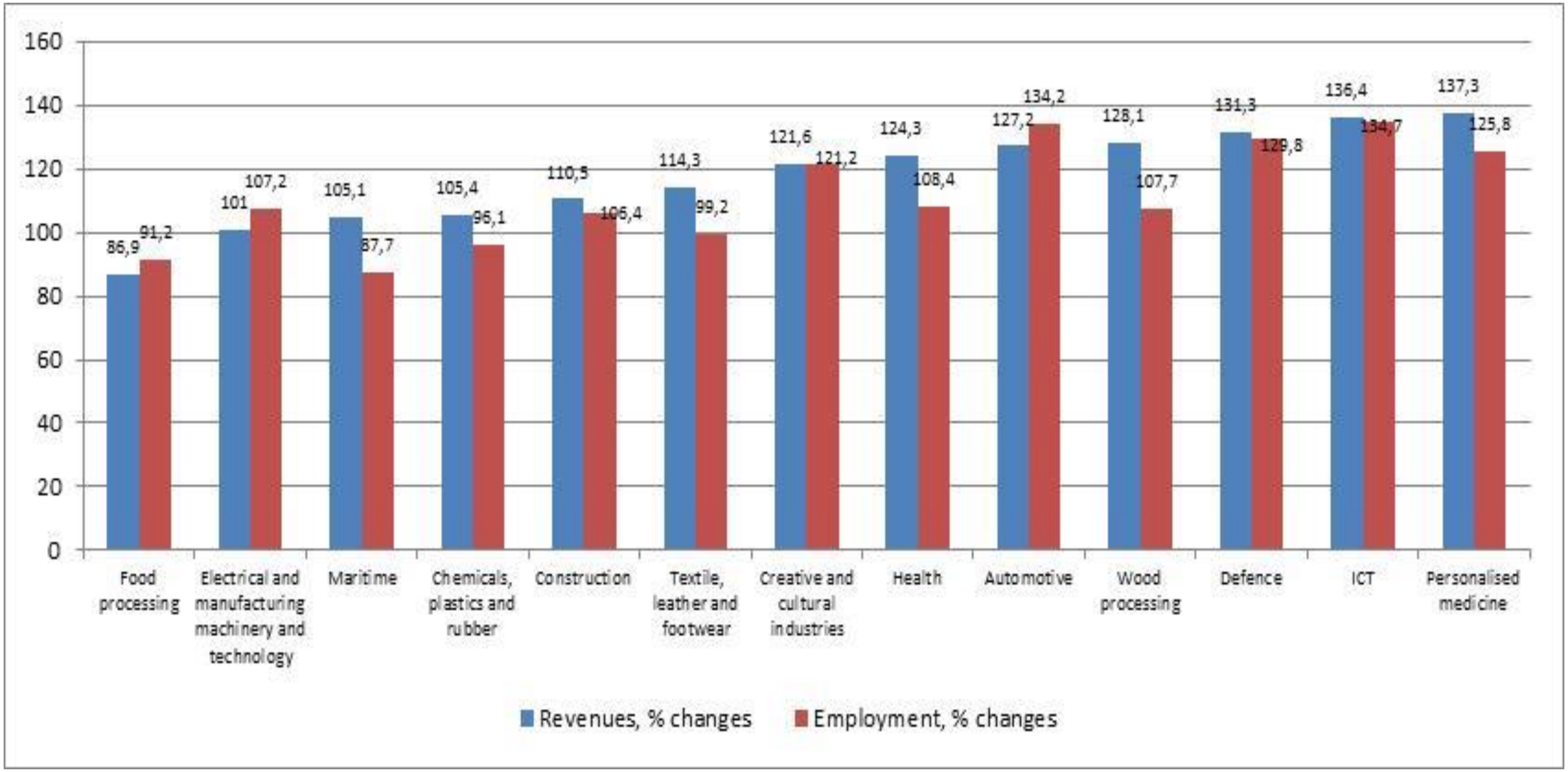
Changes in CCCs sectors' revenues and employment (2013-2016)



Source: authors' elaboration on FINA database.

METHODOLOGY (1)

- We built a **survey** with questions about CCCs' objectives, management processes, governance modes and performance (e.g. Sölvell et al., 2003; Ketels et al., 2006; Lindqvist et al., 2013).
- In particular, we asked CCCs members to:
  - rank a set of existing objectives of CCCs
  - assess the importance of objectives that CCCs should fulfil in the future
  - evaluate CCCs management and governance
  - assess the performance of CCCs
- **Computer-assisted web interviewing** (Google forms) was used to collect data during the period March-July 2017.
- Professional **interviewers** were hired and three reminders were sent out to increase response rate.

METHODOLOGY (2)

- **Target sample**: 621 **members** in 13 CCCs
- **Final sample**: 279 questionnaires (response rate of 44.9%)
  - 250 questionnaires were complete and usable
  - 28.4% governing board; 52.4% business sector; 3.2% business clusters; 10% professional organisations and associations; 17.6% education and research organisations; 16.8% regional and local government
  - The sample is representative of the CCCs composition
- **Final aim:** *clustering CCCs members* on the basis of their perceptions concerning (desired) objectives + *correlation between clusters' memership and the perception of management and governance processes as well as of CCCs performance*

A FOCUS ON RESPONDENTS FROM COMPANIES

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CCCs	Private companies	Small companies	Foreign companies	Location in Zagreb	Business performance of companies in the sample (employment change between 2013 and 2016)		
					Declining	Stable	Growing
Defence	88.89	83.33	11.11	50.00	27.78	44.44	27.78
Automotive	66.67	60.00	50.00	20.00	20.00	20.00	60.00
Wood processing	100.00	66.67	0.00	16.67	16.67	0.00	83.33
Food processing	100.00	40.00	40.00	50.00	66.67	0.00	33.33
Chemicals, plastics and rubber	100.00	33.30	33.33	16.67	33.33	0.00	66.67
Maritime	63.64	60.00	18.18	9.09	54.55	27.27	18.18
Creative and cultural industries	100.00	100.00	0.00	70.00	20.00	60.00	20.00
Construction	100.00	33.33	0.00	66.67	33.33	0.00	66.67
Health	83.33	66.67	50.00	50.00	40.00	40.00	20.00
Electrical and manufacturing machinery and technology	61.90	23.81	33.33	61.90	42.86	4.76	52.38
ICT	92.31	38.46	7.69	84.62	15.38	0.00	84.62
Textile, leather and footwear	76.92	38.46	23.08	30.77	50.00	0.00	50.00
Personalized medicine	100.00	80.00	40.00	100.00	20.00	20.00	60.00

OBJECTIVES OF CCCs

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- The most important **existing objectives** (% of members ranking that objective as the first one) are:
  - collaboration between public, private and science sectors (39.6%)
  - enhancing competitiveness and increasing the value added in the sector (31.2%)
  - efficient usage of funds and obtaining aid and new sources of financing from national Government and the EU (10.4%)

- The most important **desired/future objectives** (Likert scale 1-7) are:
  - the promotion of innovation and new technologies (5.9)
  - facilitation of higher innovativeness (5.8)
  - improvements in regulatory policies (5.7)
  - lobbying by the government for infrastructure (5.7)
  - diffusion of new technologies (5.7)

FUTURE OBJECTIVES – FACTOR ANALYSIS

SIX FACTORS emerged out of 26 proposed objectives

- Factor 1: **Lobbying** (lobby government for infrastructure, improve regulatory policy, lobby government for subsidies, and improve FDI incentives)
- Factor 2: **Innovation** (promote innovation and new technologies, facilitate higher innovativeness, diffuse the technology within the cluster/sector, attract new firms and talent to the industry, enhance production processes and create a brand for the industry)
- Factor 3: **Market and sector analyses** (assemble market intelligence, analyse technical trends, study and analyse the sector, and provide business assistance)
- Factor 4: **Infrastructure and standards** (conduct private infrastructure projects, establish technical standards and coordinate purchasing, provide incubator services)
- Factor 5: **Networks and collaborations** (foster networks among people and establish networks among firms)
- Factor 6: **Training** (the provision of technical and management training)

FUTURE OBJECTIVES – CLUSTER ANALYSIS

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	Cluster 1 Lobbying oriented (146)	Cluster 2 Networking oriented (35)	Cluster 3 Innovation oriented (69)
Lobbying	**0.23555**	-0.45462	-0.2678
Innovation	0.16939	-1.75134	**0.52994**
Market and sector analyses	-0.00772	-0.25053	**0.1434**
Infrastructure and standards	**0.56069**	-0.18239	-1.09387
Networks and collaborations	-0.05341	**0.16242**	0.03063
Training	0.1198	-0.5455	0.02322

NOTE: factors are **significantly different** across clusters of CCCs members

MANAGEMENT AND GOVERNANCE OF CCCs

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- The **most important items in CCCs management/governance** are:
  - dominance of major companies in the governance (4.3)
  - clearly formulated vision of CCCs (4.3)
  - consensus and agreement upon the activities (4.2)
  - effort taken in the model of cooperation (4.1)
- The factor analysis produced **two factors on management/governance items**
  - Long-term vision
  - Local governance

MANAGEMENT AND GOVERNANCE OF CCCs

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MANAGEMENT OF CCCs		
	Long-term vision	Local governance
We invested a lot of effort and time in presentation of our model of cooperation	**0.905**	0.082
There is an agreement on which activities will be carried out	**0.877**	0.066
The vision of CCC is formulated clearly	**0.857**	0.119
The objectives of CCC are quantified	**0.795**	0.336
Our framework of cooperation was made by following international experience	**0.785**	0.313
Framework of cooperation is a result of our own strengths of the CCC	**0.774**	0.216
Our CCC shares its own experiences with other CCs in the country	**0.688**	0.451
Our CCC shares its own experience with other CCs within the same sector abroad	**0.618**	0.464
Our CCC has its own working teams that deal with specific topics/issues	**0.588**	0.426
The process of governance of CCC is dominated by major companies	0.463	0.132
The process of governance of CCC is dominated by regional/ local government	0.074	**0.786**
Our CCC has sufficient budget for implementation of important projects	0.172	**0.707**

PERFORMANCE OF CCCs

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- The mean values of **perceived performance** ranged from 2.7 to 3.9 – very low values! Overall, respondents **negatively** assessed CCCs performance
  - The best evaluation was for the impact of CCCs on industry-academia links (3.8)
  - The worst results concern
    - the attraction of new firms to the region (2.7)
    - the attraction of FDI (2.7)
    - the employment increase (2.9)
    - the product/process upgrading, the development of new specializations and the introduction of new technologies
- Factor analysis produced one single **factor based on performance** items

PERFORMANCE OF CCCs

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PERFORMANCE	
CCC has led to increased employment in the sector	0.908
CCC promoted export of the sector/industry	0.908
CCC has helped the sector increase revenues	0.897
CCC has led to product/process upgrading	0.876
CCC has increased FDI into the sector	0.876
CCC has attracted new firms to the sector/industry	0.869
CCC has improved international competitiveness of the sector	0.864
CCC helped the sector/industry develop new specialisations	0.851
New technologies have emerged through CCC	0.848
CCC has led to increased collaboration with International companies within global value chains	0.841
CC has mostly attracted new firms to particular county/adjacent counties (regions)	0.810
CCC developed enough strength to be sustainable	0.759
CCC has led to closer industry-academia ties	0.748

DIFFERENCES ACROSS CLUSTERS OF CCCs MEMBERS

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		N	Mean
Long-term Vision	Lobbying oriented (C1)	146	0.077733
	Networking oriented (C2)	35	-0.38835
	Innovation oriented (C3)	69	0.034134
Local Governance	Lobbying oriented (C1)	146	0.203358
	Networking oriented (C2)	35	-0.19313
	Innovation oriented (C3)	69	-0.33423
Performance	Lobbying oriented (C1)	146	0.154955
	Networking oriented (C2)	35	-0.25194
	Innovation oriented (C3)	69	-0.20302

Lobbying-oriented group → future objectives related to lobbying, infrastructure and standards + high scores on local governance, long-term vision, and performance.
Networking-oriented group → very short-term orientation in terms of management + negative value on performance - members are disappointed by the governance mode of their CCC and by the outcomes achieved.
Innovation-oriented group → positive attitude on long-term vision, but negative values on local governance and performance - members of this group perceive a mismatch between objectives/vision and the implementation of activities that lead to high performance in the long-term.

CONCLUSIONS

- Overall, the perception of CCCs' performance is low, suggesting that the program **has not yet achieved the intended objectives**.
- Major **weaknesses** are related to lack of resources, lack of national and regional funds to support CCCs, an absence of concrete activities in most of CCCs, and lack of control mechanism for CCCs.
- **Future objectives** that CCCs should pursue are related to lobbying activities, innovation, market and sector analyses, infrastructure and standards, networks and collaboration, training.
- Based on the perceptions of the future/desired objectives, we have identified **three groups of cluster members**: lobbying-oriented, networking-oriented, and innovation-oriented.

POLICY IMPLICATIONS

- CCCs management and governance should be **aligned** with future objectives

  → CCCs should have **enough resources** to achieve these goals, especially the ones related to innovation, which is important to increase competitiveness and long-run growth.

- Changes in **current framework** are necessary

  → e.g. CCCs should have their own resources and hire professional cluster managers