

Article

Cluster Activities in Different Institutional Environments. Case Studies of ICT-Clusters from Austria, Germany, Ukraine and Serbia

Anastasiia Konstantynova ^{1,*} and Tine Lehmann ²

¹ Orkestra-Basque Institute of Competitiveness, Mundiaz 50, 20012 San Sebastián, Spain

² Hochschule für Technik und Wirtschaft (HTW) Berlin, Treskowallee 8, 10318 Berlin, Germany; Tine.Lehmann@htw-berlin.de

* Correspondence: anastasiia.konstantynova@orquestra.deusto.es; Tel.: +34-622-326-227

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Abstract: In recent decades, numerous cluster associations with public and/or private support have been established to facilitate clusters. These cluster associations have launched a number of activities and services aiming to increase the competitiveness, innovation, and productivity of their members and beyond. At the same time, it appears that many of these associations apply similar activity bundles to reach their objectives. However, the institutional context differs between clusters and their countries. This paper questions how these activity bundles are influenced by different sets of institutional conditions and proposes a framework for the explorative analysis of cluster activity bundles in specific institutional environments. Moreover, using the framework, a detailed review of cluster associations and their activities in different information and communication technologies (ICT) clusters is presented, the development of which is central to regional advanced industrial transformation in the context of regional smart specialization and the Industrial Renaissance.

Keywords: clusters; cluster policy; cluster association; institutions; ICT

1. Introduction and Research Objectives

In recent decades, industrial clusters and agglomerations have been recognized as drivers of regional and often national economic growth and competitiveness. This cluster policy has been widely used to spur economic change, especially on the sub-national level.

Public support for cluster development was widely gained following the successful examples that were set in the United States. The most common approach applied within cluster policy was built on cluster mapping and the establishment of organizations (often named cluster association) in respective clusters, which with the help of public-private funding were developing activities for cluster actors. However, the implementation of blue-printed cluster policy and especially simple establishment of cluster associations did not always lead to positive paths of cluster development due to the negligence of country/region specific institutional conditions.

This paper aims to fill this void by exploring selected cases of cluster associations and analyze if and how their activities are influenced by different sets of institutional conditions. To achieve this, a qualitative approach has been taken, where the information and communication technologies (ICT) clusters and their associations in the European Union (EU) and Non-EU countries were selected for the multiple case study analysis. The data is gathered from secondary and primary sources (observations and interviews with key cluster actors). In this paper, only the cross-case analysis of individual cases is illustrated.

These findings contribute to the research by amalgamating institutional economics and cluster literature. Particularly, we bring a new perspective on the specifics and diversity of activities developed by cluster associations for clusters' support, which can be related to and affected by different institutional environments.

Therefore, the findings invite and encourage cluster managers and policy makers alike to revisit and potentially redesign existing cluster development activities by questioning their appropriateness within specific institutional settings.

The next section of this paper gives a brief overview of the main literature sources related to clusters, cluster associations and institutional environments. This literature review sets the basis for the research framework, which is presented in the third section and is followed by an exploration of the applied methodology in the fourth section. Section five provides extensive information on our case studies and a comparative cross-case analysis. Section six concludes the paper by highlighting the main results, contributions, limitations, and opportunities for further research.

2. Literature Review

2.1. Clusters and Cluster Policy

Among numerous contributions to the definition of the cluster concept made by different researchers, Michael Porter's [1,2] notion of industrial or business clusters (formulated as: "clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions" (1:197) is considered to be one of the most influential in terms of popularizing the cluster concept [3,4] and is the one referred to in this paper. The meaning of 'geographic concentration' of clusters has led to various discussions and confusion [4–6]. Alcácer and Zhao [7] provide a new perspective in an ongoing debate. For a detailed discussion on the definition of clusters and different type of clusters, and a detailed proposal on the new classifications, one can make reference to Rosenfeld [8], and Delgado, Porter, and Stern [9].

Meanwhile, an increasing body of literature [2,10–15] demonstrates that clusters principally lead to an increase in production, innovation rates, and new business opportunities. Clusters can be of different size, character and can exist in different types of industries and sectors, e.g., aerospace, restaurant, tourism, retail, etc. [2]. Enright [16] provides a detailed review of the existing cluster literature and Provan, Fish, and Sydow [17] give a review on interorganizational networks in general.

Since the development of the argument that clusters have a positive influence on territorial development, policy makers have actively applied different instruments for their support; this is called cluster policy. Kiese [18] and Hospers [19] see cluster policy as all state measures towards the support and development of clusters, whereas Benner [20] developed a broader view and claims that cluster policies contain not only governmental contributions but also activities in collaboration with private actors that are oriented to stimulate the cluster's efficiency. Enright [16] demonstrated five levels of political influence on clusters, from non-existent cluster policy via catalytic and supportive to directive and interventionist. This policy has often been recognized as an effective approach for cluster and further regional development. Moreover, clusters and cluster policy continue to stay at the heart of the latest European agenda on regional smart specialization strategies [21–24].

2.2. Cluster Associations and Their Activities

Within cluster policy, along with the (co-)funding of collaborative projects or the direct organization of activities by cluster actors, one of the possible and most common instruments is the establishment of a cluster association (CA), which is seen as an organization that facilitates clusters [25] (Figure 1). In reference to the World Bank [26] cluster associations are seen as a platform for support of a specific cluster, and are coordinated from either a local/regional/national private and/or public side. Beyond this, cluster associations are also recognized as being a form of mediator between government and business [27], enhancers of clusters' dynamism via its multitude of forms and types [28] and an evolutionary instrument

within the cluster policy in light of the cluster life-cycle [29,30]. These organizations build particular interest that supports our further research.

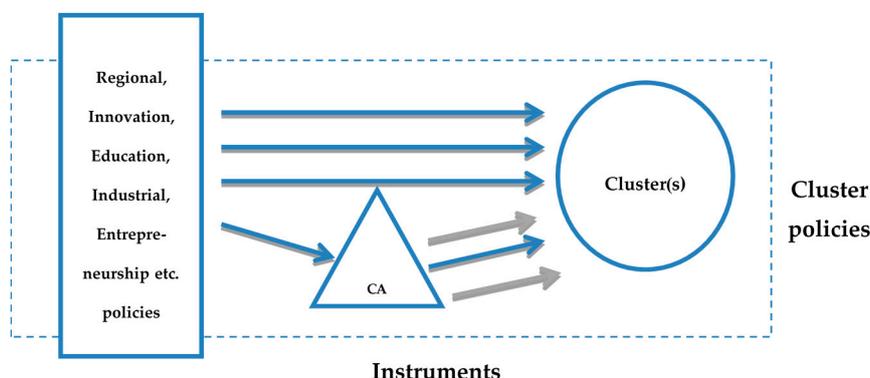


Figure 1. Positioning cluster association within cluster policies. Source: Konstantynova and Wilson [25].

Overall, the character and forms of cluster associations can strongly vary, from being more or less publicly/privately funded, structured or flexible to be with/without official membership. Nevertheless, the majority of cluster associations have very similar objectives, which primarily center on issues such as strengthening cooperation and common vision among actors working in related economic activities [1,5]. De La Maza-Y-Aramburu, Vendrell-Herrero, and Wilson [31] discuss the value of cluster associations in more detail. Recently, the role of cluster associations has once again been raised, especially in light of smart specialization strategies. Konstantynova and Wilson [32] identify six areas in which cluster associations could contribute to implementation of RIS3, e.g., participate, propose or coordinate working groups along the identified thematic RIS3 domains.

In the range of existing cluster associations, all of them develop clusters in some way by providing different cluster activities. Several authors have already discussed cluster activities or cluster services. Jungwirth, Grundgreif, and Müller [33] demonstrate these activities with the example of the Bavarian clusters, Taylor, McRae-Williams, and Lowe [34] discuss determinants of cluster activities in Australian tourism clusters, Aranguren et al. [35] present the character and activities based on cluster associations in the Basque Country, and Gretzinger and Royer [36] analyze relational resources in value adding webs in Danish firm clusters. The number of activities implemented by cluster associations can be numerous, which results in typological differences [27]. With the aforementioned examples in mind, the baseline for our case studies builds on the typology of Interreg IIIC [37], and is presented in Table 1 below.

Table 1. Typologies for grouping activities of cluster associations.

Interreg IIIC (2006)	Solvell et al. (2005)
<ul style="list-style-type: none"> • Information and Communication; • Training and Qualification; • Co-operation; • Marketing and PR; • Internationalization; 	<ul style="list-style-type: none"> • Research and networking; • Cluster expansion; • Innovation and technology; • Education and training; • Commercial co-operation; and • Policy action

Source: Authors’ development based on indicated sources.

Cluster activities developed by cluster associations could target only members of the respective cluster associations, or it could have a more general audience, such as all actors of the cluster. In this paper, reference to the both groups is made while introducing the activities.

2.3. Institutional Environment

Cluster associations, as a governance structure, are set within an institutional environment. The institutional environment is comprised of formal and informal institutions that shape and constrain human interaction and are considered the 'rules of the game' [38,39]. Formal institutions are commonly regarded as laws, rules and policies whereas informal institutions are referred to as norms, morals, and culture [40,41]. Concerning clusters, some formal institutions have an obvious influence on clusters, namely cluster policies. Furthermore, Glückler and Lenz [42] call for a 'systematic inclusion of institutions into the analysis of regional policy effectiveness' and highlight that the consideration of the institutional context in policy development can have a positive influence on innovation rates, among other benefits.

Cluster policies and their potential influence on clusters themselves have been widely researched [19,43–46]. However, there are further formal institutions that might influence cluster activities. Unfortunately, cluster literature largely neglected the potential influences of institutional factors on cluster governance and especially on the activities, which are being developed by cluster associations. Molina-Morales, López-Navarro, and Guía-Julve [47] discuss, mainly theoretically, the influence of local institutions on industrial districts. Gallardo and Stich [48], as well as Miller [49], are among the few authors to include further institutional factors in their model, such as tax structures, but they could not demonstrate significant influences. Schrammel [50,51] discusses institutional voids in transition economies as a motivating factor for clusters to adapt their activities. Müller and Jungwirth [52,53] include contextual factors, such as planning security, in their analysis on cluster performance and can demonstrate their influence on goal attainment. Lehmann and Benner [54] discuss the influence of institutional factors on the design of cluster policy and Lehmann and Jungwirth [55] highlight differences in cluster activities between transition and non-transition economies.

More recently, the economic geography literature emphasizes the relevance of institutional factors on cluster emergence and development [56]. Martin and Coenen [57] demonstrate that the emergence of a Swedish biogas cluster is related to the existing institution. Other researchers have displayed similar cluster developments based on path dependency and regional specific institutions [58–60]. In this way, our research will add to the existing limited literature on the influence of contextual—specifically institutional—factors on cluster activities in the context of cluster associations. In this, we follow Fornahl, Hassink, and Menzel's [61] call for a broadened perspective on clusters, however, we do not focus on cluster evolution and cluster life cycles, but solely on the cluster activities and their potential connection to the institutional context.

3. Research Framework

Examining the review, it has been observed that the approach to cluster development is evolving and that there are calls to stronger consideration of the institutional environment, especially in relation to cluster policy and its instruments. These policy approaches are generally related to an increase in productiveness and innovativeness of individual firms and the region overall. Whether or not clusters adapt to the institutional constraints autonomously is under-researched.

In this way, our research question aims to explore how the activities bundle of cluster associations are influenced by different institutional environments. Hence, with our research we intend to (1) demonstrate in-depth cases of ICT clusters; and (2) classify applied activities of cluster associations in different bundles of activities under different institutional constraints (see Figure 2). To do so, clusters in institutional environments with different development status are chosen.

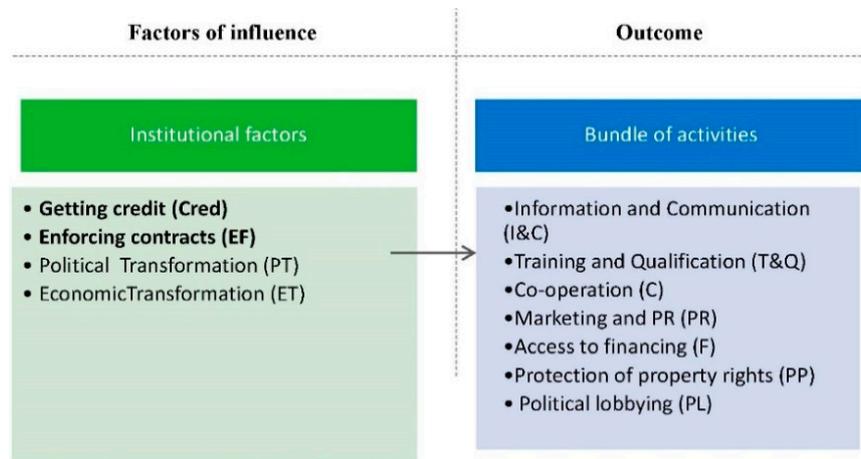


Figure 2. Research framework. Source: Authors' development.

In more detail, the theoretical framework is composed of institutional factors, which influence the dependent outcome: a bundle of cluster association activities.

As proxies defined to measure institutional constraints, reference to internationally available data from the World Bank's Doing Business Reports and the Bertelsmann Transformation Index is made. Lower Rankings in the World Banks Doing Business Report on 'getting credit', and 'enforcing contracts' points to the existence of voids in the institutional framework [50,51]. It is assumed that this will have a direct influence on the design of cluster activity bundles. Furthermore, the indicators for institutional factors from the Bertelsmann Foundation's Transformation index are expanded, aiming to get a clearer picture of the formal institutional environment. The rankings on political and economic transformation also indicate the completeness of the institutional environment. Germany and Austria are not listed in the Transformation Index as they are considered to be readily transformed.

It is proposed that the institutional environment has a direct influence on the choice of cluster activity bundles. As a qualitative approach is followed the following propositions [62] are formulated:

Proposition 1: *clusters of countries which rank low in political transformation will tend to offer more fundamental political lobbying activities, than clusters of countries which rank high in political transformation.*

Proposition 2: *clusters situated in countries that rank low in contract enforcement or access to credit, will offer activities that remedy such deficiencies in the institutional environment, whereas clusters of countries that rank high in contract enforcement or access to credit will not offer any activities in that area.*

The bundle of activities are categorized with reference to Interreg IIIC [37] by defining five types of cluster activities: Information and Communication (I&C), Training and Qualification (T&Q), Co-operation (C), Marketing and PR (PR) and joining them with the activities defined by Schrammel [52] in the research work on the performance of cluster associations in different institutional contexts. These activities primarily target the development of clusters and also may increase the effectiveness of the association itself, which in turn also leads to cluster development.

4. Methodology

Referring to Yin [62] and the remarks of Lijphart [63] and Creswell [64], an exploratory, qualitative approach by the application of a multiple (four) case study method has been followed. This approach has been considered to be the most suitable one, due to giving a structural yet open and flexible framework to learn the specifics of the activities provided by cluster associations (these associations by often having similar names can be very distinct in their nature). Therefore, these character-based distinctions in activities are better captured via a qualitative approach. Meanwhile, the application

of other methods, especially quantitative ones, would restrict and limit the richness of the gathered information, particularly in the context of understanding different institutional conditions.

Methodologically, the logic of the multiple case study expressed by Yin [65] has been considered. This means that after the developed theory, case selection and designing the data collection protocol, the first and second case study have been conducted. Afterwards, an in-depth individual case report for each case study has been written by presenting the key research findings via cross-case conclusions. The development of the arguments within each of the cases was processed by means of a qualitative technique: typology setting, which was applied to identify and group activity bundles of cluster associations in respective institutional settings.

The case data for interviews was taken both from primary sources (interviews and observations) and secondary sources (documents, webpages and cluster promotion activities). The interviews, which were in both cases semi-structured, were conducted by the two authors independently. Four interviews with the Serbian Cluster and four interviews with the German cluster were conducted. In each case, a cluster manager and cluster companies were interviewed to verify the statements. All interviewees were male and the Serbian interviews (conducted in the English language) lasted around 34 min whereas the German interviews lasted, on average, 55 min. A similar approach has been taken for clusters in Ukraine and Austria, where in the first country four interviews were conducted and in the second country six interviews were conducted (in Ukrainian and German, respectively); the interviews included representatives from cluster associations, research/academic institutions, government authorities and companies. On average, interviews in Ukraine lasted longer than interviews in Austria.

The selected clusters and cluster associations have been taken within the regional framework of operation, which in our case was an administrative territory, where the state level is defined as 'Nomenclature des unites territories statistics' (NUTS) by European Council for Statistics in 1980. For Austria and Germany its NUTS 2, 3 respectively, in Ukraine and Serbia its regional administrative level is defined by national state classification system. All clusters also equally represent two kinds of institutional settings: EU and non- EU.

The information and communication industry (ICT) was chosen for a case study due to the availability of data for observation, which include the existence of a cluster association, implementing a range of policy activities related to cluster development. Furthermore, in all of the selected regions, the ICT cluster was considered a strategic one from the government/public side. Finally, the role of information and communication technologies has increasingly grown in recent years, in particular, its contribution to upgrading the technological capacities of numerous industries, referred to as Industry 4.0, and its transversal character within the range of RIS3 domains has grown [23].

5. The Results

5.1. Main Findings from the Case Studies

Following the developed theoretical framework, the case study of the cluster associations and their activity bundles was done in three parts: (1) institutional settings; (2) cluster association background; and (3) bundle of cluster activities. The main findings from each case are individually presented in Table 2.

The table provides a general overview of the institutional context of cluster associations and lists the activities delivered by the associations. The next section drives the main conclusions based on the cross-case synthesis of the similarities and differences across cluster associations' activity bundles.

Table 2. Main findings from case studies.

Parts/Case study	Germany (EU)	Austria (EU)	Ukraine (non-EU)	Serbia (non-EU)
I. Institutional context				
Political structure	Federal state with centralized tax system	Federal state with centralized tax system	Centralized governance system	Centralized governance system, but autonomous region
Institutional Factors ¹				
<i>Getting credit (Cred)</i> ²	24	52	17	52
<i>Enforcing contracts (EF)</i> ³	11	6	98	73
<i>Political Transformation (PT)</i> ⁴	–	–	58 (6,10 points)	21 (7,95 points)
<i>Economic Transformation (ET)</i> ⁵	–	–	62 (5,68 points)	29 (7,07 points)
II. Cluster association				
Established	2012	2013	2011	2010
Rational for establishment/ mission or objectives	Enhance the economic development of the region and the market potential of its member companies	Desire to broaden regional and international opportunities for IT companies and research lefts. Goals: 1. a competence hub for digitization in all branches. 2. a driver promoting visibility for region from digital perspective	Creating the city with suitable conditions attracting national and international IT companies and experts. Goals: 1. make the city as a IT left 2. development of eco-business system 3. development of IT system in Ukraine	To create a strong positive influence on social and business environment. Goals: 1. create a platform for cooperation and provide a portfolio of services 2. build links with the education system and the creation of a Cluster Academy 3. build tighter bonds in the triple helix.
Thematic focus	Software sector of ICT	Software sector of ICT	Software sector of ICT	Software sector of ICT
Scale of cluster	28 companies	80–90 companies	45 companies	33 companies
Size of companies	Micro or small companies	Micro and small companies with some global players	Micro or small companies	Micro or small companies; a few are subsidiaries of MNEs
Cluster origin	Founded as a bottom-up initiative at an IT fair in 2012. No governmental support	Since the 1990s developed from the creation of an impulse left/technological park. The establishment has been promoted by regional Government via re-allocation of the Research Institute and University due to space shortage to the nearby city.	The origin of cluster goes back to 2008, when with support of private Foundation executed by Monitor Group the study on 2 regions with later design of cluster implementation strategy in these regions; through this study this IT cluster has been identified and supported setting the basis for establishment of the association	Founded in 2010 as a bottom-up initiative but supported by international development donors and the Serbian Government.
Organizational form of cluster	Registered as an association	Cluster association as a juridical institution, which was formed within the bigger formal public/private institution	Cluster association as a juridical institution	Registered as a business association

Table 2. Cont.

Parts/Case study	Germany (EU)	Austria (EU)	Ukraine (non-EU)	Serbia (non-EU)
II. Cluster association				
Organizational structure (overall)	The cluster is headed by the cluster manager who works on a volunteer basis	The institution has horizontal structure, meaning, implementation of activities is done by project managers and are chaired by CEO	The institution has horizontal and clear structure; Implementation of activities is done by project managers and are chaired by CEO; The cluster is assisted by the team of project managers, PR and communication experts	The cluster is headed by the cluster manager. The cluster manager is supported by a Project Office and an Assistant
Financing	Membership fee: 100-€/year Sponsors: 1.000€/e.	Membership-fee, additional payment for some of the activities 1. 345€ for 1–9 e. 2. 510€ for 10–49 e. 3. 685€ for 50–249 e. 4. 1.360€ more 250 e.	Membership-fee, additional payment for some of the activities	Membership fee of 100€/month per Company. Several EU Projects
III. Bundle of activities (the description of each activity is given in the table listed in Table 3.				
<i>Information & Communication</i>	<ul style="list-style-type: none"> Updated Website with information on events IT Atlas with information on all companies 	<ul style="list-style-type: none"> IT Summit (conference); Database & Map (online free accessible); Info-sharing via IT cluster webpage; 	<ul style="list-style-type: none"> IT Arena (conference); Cluster visits national & international; IT Club (networking, etc.); IT Research (sector/cluster market data and trends reports); IT Future (attracting new generation to the industry) 	<ul style="list-style-type: none"> Regular study on ICT in Serbia Updated Website with information on projects, calls, and events Blog
<i>Training and Qualification</i>	<ul style="list-style-type: none"> IT surf camp (conference character) 	<ul style="list-style-type: none"> Training, master classes on cluster cooperation projects; Micro SMEs sector specific training 	<ul style="list-style-type: none"> IT Expert (Organization of mainly learning and knowledge raising events); CSIT (competition, fellowships, and prizes) 	<ul style="list-style-type: none"> Cluster Academy (Providing education according to the needs of the members) Conferences
<i>Co-operation</i>	<ul style="list-style-type: none"> IT surf camp (conference character) Regular network evenings Co-working space 	<ul style="list-style-type: none"> IT Summit Info-sharing via IT cluster webpage; Cluster cooperation projects; Working Groups to develop projects; Smart Future (link companies with other clusters); Industry 4.0 (cooperation with mechatronic cluster) 	<ul style="list-style-type: none"> IT Arena (B2B); Cluster visits national/international; IT Club (networking); 	<ul style="list-style-type: none"> Cluster Project office to support joint project developments Cooperation with other clusters

Table 2. Cont.

Parts/Case study	Germany (EU)	Austria (EU)	Ukraine (non-EU)	Serbia (non-EU)
III. Bundle of activities (the description of each activity is given in the table listed in Table 3.)				
<i>Marketing and PR</i>	<ul style="list-style-type: none"> • Support to regional fair • Publication • Presentation at fairs 	<ul style="list-style-type: none"> • IT Summit; • Database & Map; • Info-sharing via IT cluster webpage; 	<ul style="list-style-type: none"> • IT Arena; • Cluster visits; • IT Club; • IT Research; • Overall marketing; • Webpage 	<ul style="list-style-type: none"> • Cluster visits • Publication • Presentation at fairs
<i>Access to financing</i>		<ul style="list-style-type: none"> • Sponsoring • Discounts • Cluster cooperation projects 		<ul style="list-style-type: none"> • Cluster Project office to support joint project developments
<i>Protection of property rights</i>				<ul style="list-style-type: none"> • Internal court of honor to ensure contract enforcement between members
<i>Political lobbying</i>			<ul style="list-style-type: none"> • Cluster manager is politically well connected and established, especially with local administration (office in the same building) 	<ul style="list-style-type: none"> • Cluster manager is politically well connected and established • Regular study on needs in the ICT in Serbia • Development of (internal) standards

Source: Authors' development; ¹ The institutional factors are given in international comparable ranks (with Rank 1 as the best); ² Data from 2015. <http://www.doingbusiness.org>; ³ Data from 2015. <http://www.doingbusiness.org>; ⁴ Data from 2014. <http://www.bti-project.de>; ⁵ Data from 2014. <http://www.bti-project.de>.

5.2. Comparative Findings from Cross-Case Synthesis

Following reflection on the individual cases of cluster associations, Table 3 summarizes via cross-case synthesis the institutional conditions and the dominant activity bundles per case study, reflecting the main findings. The table indicates that there are several potential voids in the institutional environment of Serbia and Ukraine in contrast to Germany and Austria. Interestingly, financial institutional voids do not seem to be an issue in Ukraine. The low ranks in contract enforcement of Serbia and Ukraine indicate an institutional void in the product market [66], with potentially negative effects on employment and formal business cooperation. The transformation indices reflect Serbia's advancement as an EU candidate country in contrast to Ukraine.

Table 3. Cross-case synthesis of institutional factors and activity bundles.

	EU Countries (Germany, Austria) ¹	Non-EU Countries (Ukraine, Serbia) ²
<i>Institutional Context</i>		
Getting credit (Cred) ³	Germany high, Austria low	Ukraine high, Serbia low
Enforcing contracts (EF) ⁴	Both high	Both Low
Political Transformation (PT) ⁵	Both transformed	Ukraine low, Serbia medium
Economic Transformation (ET) ⁶	Both transformed	Ukraine low, Serbia medium
<i>Bundles of Activities</i>		
Information and communication	In both medium	In both high
Training and Qualification	Austria	Serbia
Cooperation	In both high	In both medium
Marketing & PR	In both low	In both high
Access to financing	Germany: none Austria: many	Ukraine: none Serbia: many
Protection of property rights	Both none	Serbia: some; Ukraine: none
Political lobbying	Both none	Serbia: some; Ukraine: some

Source: Authors' development. ¹ Reference countries of the case study cluster associations; ² Reference countries of the case study cluster associations; ³ Data from 2015. <http://www.doingbusiness.org>; ⁴ Data from 2015. <http://www.doingbusiness.org>; ⁵ Data from 2014. <http://www.bti-project.de>; ⁶ Data from 2014. <http://www.bti-project.de>.

Among the main findings, it can be stated that different patterns among activity bundles have been observed in cluster associations operating in various institutional environments (EU and non-EU countries/regions).

As an example, in the Ukrainian IT cluster, more activities are addressing such areas as information and communication, as well as marketing and public relations. At the same time, as the cluster grows to its maturity, more attention is being drawn to training and availability of qualified human resources. This is seen via means of tightening the cooperation with the local universities and specialized programs.

“One of our leading initiatives is to strengthen the cooperation with the local university aiming to increase the quality of education and knowledge in the area of IT.” (Interview UKR CM, para 47, translated)

Meanwhile, in Austria, the cluster activities deal more with raising the qualification and cooperation. In contrast, the Serbian cluster provides a wide array of services clearly targeting institutional voids in contract enforcement and political lobbying. The major activities are the cluster academy and the cluster internal court of honor. The German cluster focuses on fostering cooperation among actors and information provision, as institutional voids in contract enforcement and human capital are not prevailing.

Returning to our proposition, the following can be stated:

Proposition 1: *clusters of countries which rank low in political transformation will tend to offer more fundamental political lobbying activities, than clusters of countries which rank high in political transformation.*

The cases indicate approval of the proposition. The clusters of Germany and Austria do not proceed in fundamental political lobbying activities, whereas the Serbian example is quite active in the field. The same situation is shown for Ukraine; for activities related to technical support for companies, work towards political lobbying is also done. Meanwhile, this political lobbying in Ukraine is also mixed with overall active public relations and marketing activities. For example, the Serbian cluster manager stated:

“We’re also doing lobbying activities towards the government to enable—to help actually—the government to introduce measurements that will make the life of the companies in the ICT sector easier and more favorable.” (Interview SR CM, para 111)

And the companies confirmed, when asked about benefits of the cluster participation:

“He [*the cluster manager*] has much more contacts in Belgrade in governmental institution than I have.” (Interview SR UN 3, para. 50)

“Yes, yes we are heard. [. . .] we are working also with some government agencies so we do have influence in some parts of the law that is mainly for informatics. And also we are trying to do something about this salary taxes and things.” (Interview SR UN 3, para. 35)

The German Cluster, in contrast, states that they are active in political lobbying, but when asked for its activities, the German Cluster sees itself as a representative for the companies when liaising with the government. The only specific activity refers to establishing Wi-Fi hotspots within the city (Interview MVL CM, para.100). The companies do not state political lobbying as a beneficial activity by the cluster. Similarly in Austria, there was no reference to political lobbying having been done, on the contrary, much has been focused on trying to strengthen the cluster from the perspective of the triple helix approach in cooperation:

“We are trying to work and approach the cluster development from the perspective like in the theory, from the side of three pillars: business, research and public sector” (Interview AT RI, para 162, translated)

Proposition 2: *clusters situated in countries that rank low in contract enforcement or access to credit, will offer activities that remedy such deficiencies in the institutional environment, whereas clusters of countries that rank high in contract enforcement or access to credit will not offer any activities in that area.*

The cases from Austria and Serbia demonstrate very clearly that the cluster associations recognize the institutional voids in access to financing and hence have developed services that address these issues. The Serbian cluster manager states clearly:

“There is no venture capital in Serbia at all.” (Interview SR CM, para. 175)

Similarly for the Austrian cluster association, where the ICT cluster association has been formalized within an already existing structure of clusters associations, it has one of its aims to strengthen the international and national links and investments.

“Having a formalized cluster association enables to have a centralized point for capturing information and resources from outside, as well as presenting better the image of the cluster outside” (Interview AT RI, para 279)

However, the activities of the Serbian cluster remain limited. They contain access to foreign business angels and mainly applying funds of the European Commission for support for start-ups.

The cluster associations of Germany and Ukraine, in contrast, do not offer such activity bundles as the institutional environment offers these services.

Contract enforcement is low in both non-EU countries. The Serbian cluster developed an activity to counter that issue for its members. This allows the cluster to have a relatively high membership fee, as the cluster members highly value this activity (Interview SR CM, para.105). In Ukraine, the issue of legislative disputes is relevant for ICT companies; nevertheless, due to limited resource capacity, the cluster association is not handling it directly and sets stronger focus on education and knowledge upgrade. Further to this, many software developers or companies are working for international companies, which take over the property rights handling the disputes. In contrast, the German cluster manager and companies clearly state that contract enforcement is not an issue.

As such, the difference is due to the positioning of the cluster associations and their activities in different institutional contexts. While in non-EU countries, the cluster issues are not well known and applied, more activities are being done aiming to raise awareness. Meanwhile, in EU countries, the utilization of the cluster approach as a means to foster regional development has already been actively promoted since the middle of the 1990s, therefore resulting in the use of another set of activities.

6. Final Conclusions

In conclusion, this paper has proposed the framework for the descriptive and explorative analysis of cluster activity bundles in specific institutional environments, which contributes to the existing literature on activities of cluster associations. Moreover, along with the framework, it has presented a detailed review of cluster associations and their activities in different ICT clusters, the development of which is central to regional advanced industrial transformation in the framework of regional smart specialization and Industrial Renaissance.

In this way, the main contribution of this paper lies in broadening the debate on the influence, relation and connections between the institutional environment and the cluster development. Specifically, the view has been taken through the prism of activity bundles that has been developed by cluster associations. With the explored propositions and cross-case synthesis, it can be stated that the institutional variables void the character of applied cluster association activity bundles, which is related to overall territorial context, patterns, and needs.

In addition, this paper contributes to expanding the knowledge of the activities of cluster associations in general and in ICT clusters in particular. The descriptive approach applied to exploration of ICT cluster associations provides rich insights into the specific activities developed by cluster associations and can be useful for clusters of related industries and policy makers alike.

Following the conclusions, the paper invites policy makers and cluster managers in particular to consider the given institutional environment along with the cluster's character (stage of the life-cycle, sector, scale, etc.) at the time of design and development of activities stimulating growth and promotion of clusters.

At the same time, one of the main limitations of our research is the small number of observed case studies. More cases from a wider set of institutional frameworks, as well as from the same sectors or industries, would contribute to the generalization of our research findings.

Finally, further exploration of the activities delivered by cluster associations and a stronger consideration of institutional context on their character, as well as their relation with the performance of associations and clusters are rich areas for further research.

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