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Clusters as institutional entrepreneurs: lessons from Russia

Evgeniya Lupova-Henry* , Sam Blili and Cinzia Dal Zotto

* Correspondence: elupova@gmail.com

University of Neuchâtel, A.-L.
Breguet 2, 2000 Neuchâtel,
Switzerland

Abstract

In this article, we explore whether organized clusters can act as institutional entrepreneurs to create conditions favorable to innovation in their constituent members. We view self-aware and organized clusters as “context-embedded meta-organizations” which engage in deliberate decision- and strategy-making. As such, clusters are not only shaped by their environments, as “traditional” cluster approaches suggest but can also act upon these. Their ability to act as “change agents” is crucial in countries with high institutional barriers to innovation, such as most transition economies. Focusing on Russia, we conduct two cluster case studies to analyze the strategies these adopt to alter and shape their institutional environments. We find that clusters have a dual role as institutional entrepreneurs. First, these can act collectively to shape their environments due to the power they wield. Second, they can be mechanisms empowering their constituent actors, fostering their reflexivity and creativity, and allowing them to engage in institutional entrepreneurship. Moreover, both collective and individual cluster actors adopt “bricolage” approaches to institutional entrepreneurship to compensate for the lack of resources or institutional frameworks or avoid the pressures of ineffective institutions.

Keywords: Cluster, Meta-organization, Institutional entrepreneurship, Institutional contradictions, Transition economy

Introduction

In this paper, we explore whether and how clusters can act as institutional entrepreneurs to create conditions supportive of innovation in transition economy contexts. Indeed, clusters can be crucial in settings characterized by high institutional barriers to innovation and entrepreneurship and missing or underdeveloped formal institutions (Lehmann & Benner, 2015; Puffer, McCarthy, & Boisot, 2010; Schrammel, 2013). While traditionally clusters have been seen as “*geographic concentrations of organizations*” (Porter, 1990), a recent line of studies suggests that “managed” or organized clusters can more precisely be described as “*organizations of organizations*” or meta-organizations (cf. Gadille, Tremblay, & Vion, 2013; Lupova-Henry, Blili, & Dal Zotto, 2021). As such, these are not only acted upon by external forces but can themselves be deliberate actors and agents of change.

Recently, the interrelations between the organizational agency and the external environment have been increasingly drawing the attention of researchers within the neo-institutionalist stream of thought (e.g., Dorado, 2005; Lawrence, 1999; Marquis & Raynard, 2015; Oliver, 1991). Although providing valuable insight into the strategies organizations adopt to deal with external pressures, these studies do not provide sufficient insight into how different types of organizations vary in their strategic responses to institutional pressures (Greenwood, Hinings, & Whetten, 2014; King, Felin, & Whetten, 2010). While both the neo-institutional theory and meta-organizational approach can be promising for studying “managed” or organized clusters, these have not yet provided insight into clusters’ agentic role in unsupportive institutional contexts.

This study aims to contribute to the institutional, meta-organizational, and cluster theories by answering the following research question:

- How do clusters engage in institutional entrepreneurship in transition economies to alleviate institutional barriers to innovation?

Specifically, when looking into this research question, we are interested in two sub-themes: the role of institutional tensions and contradictions, and the types of strategies adopted in response to these in the cluster context.

Institutional contradictions—or inconsistencies between different institutions—enable institutional entrepreneurship (e.g., Battilana, Leca, & Boxenbaum, 2009; Seo & Creed, 2002). These, however, also influence the choice of strategies adopted by institutional entrepreneurs. Transition economies represent a fertile ground for a study of institutional contradictions as these are inherent in the institutional transition process (Li, Peng, & Macaulay, 2013; Meyer & Peng, 2005). In such contexts, multiple contradictions may co-exist, such as those between the legacies of the Soviet era and the “new” market economy institutions, or tensions between market and political forces (Kalandaridis, 2007; Li et al., 2013). Furthermore, organizational and individual actors adopt different strategies with respect to institutional contradictions depending on resources these have available and the way they experience these contradictions (Battilana et al., 2009; Pache & Santos, 2010; Pache & Santos, 2013). Understanding how these influence clusters and, in turn, the ways clusters, as institutional entrepreneurs, cope with them may inform both policy- and strategy-making in transition economy contexts.

To answer our research question, we adopt a theory-elaborating case study approach (Ketokivi & Choi, 2014) and analyze two clusters in Russia. We focus on clusters that have been recognized as some of the examples of “best practices” as we assume that these may have acted as institutional entrepreneurs to challenge the barriers and contradictions in their contexts. To theorize their role as institutional entrepreneurs, we extend the existing theories within the neo-institutionalist perspective to apply these in the context of clusters, seen as “context-embedded meta-organizations”. Our study suggests that transition economy clusters continuously manage multiple institutional contradictions and simultaneously adopt multiple institutional strategies in response to these. The choice of the strategies may depend both on the power distribution within the cluster and the specific institutional contradictions the clusters deal with. Moreover, clusters’ role in institutional entrepreneurship may be dual: these may act to change or create new institutions collectively or create conditions empowering their members to

engage in institutional entrepreneurship individually. Finally, our findings suggest that both clusters collectives and individual actors within these make use of “bricolage” approaches to institutional entrepreneurship. These were found to serve three purposes: obtaining more resources in resource-scarce environments, creating the missing institutions, or avoiding the pressures of ineffective institutions.

This article is structured as follows: First, we provide a theoretical background for the study placing clusters within the framework of institutional and organizational studies and discussing the role of institutional contradictions and strategies which may be adopted to cope with these. We proceed to describe our research design. Then, we present the findings of our empirical research. We then formulate the propositions regarding the institutional strategies in the cluster context. Finally, we conclude by outlining the contributions and limitations of our study and proposing avenues for future research.

Theoretical background

Clusters, organizations, and institutions

The institutional theory and innovation studies distinguish between organizations and institutions which interact and, in doing so, shape the dynamics and patterns of the innovation activity (Edquist & Johnson, 1997; North, 1990, 1991). Institutions are defined as “sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals and groups.” (Edquist & Johnson, 1997, p. 46). Organizations are seen as players or actors and are “formal structures with an explicit purpose and they are consciously created.” (Edquist & Johnson, 1997, p. 47). The neo-institutionalist theory, however, recognizes that although institutions shape the ways in which organizations operate and interact, the latter do enjoy at least some discretion in crafting strategic responses to institutional processes (e.g., Heugens & Lander, 2009; Oliver, 1991). Thus, not only do institutions constrain and orient organizational action, but they at the same time enable it (cf. Cardinale, 2018).

So where do clusters stand in this stream of thinking? Traditionally, in the regional economics and economic geography studies, geographical agglomerations of organizations have been seen as “products” of their environments shaped by the historical development of their institutional environments, policies, regional path dependencies, or industry dynamics (e.g., Arıkan & Schilling, 2011; Markusen, 1996; Paniccia, 1998; Porter, 1990). However, with the advent of the “cluster” concept and the ensuing global interest in cluster policies, the nature of the phenomenon has changed (Motoyama, 2008). Indeed, a new form of a “managed” or “organized” cluster has taken hold and has been spreading over the globe (Lindqvist, Ketels, & Sölvell, 2013; Sölvell, Lindqvist, & Ketels, 2003). Such clusters have—although to varying degrees—the attributes of formal organizations, such as membership, monitoring, rules, sanctions, and hierarchy (Ahrne & Brunsson, 2011; Leys & Joffre, 2014; Lupova-Henry et al., 2021). They can thus be seen as “context-embedded meta-organizations” (Lupova-Henry, Blili, & Dal Zotto, 2021a: Innovation-centric cluster business model: Findings from a design-oriented literature review. *Triple Helix Journal*, forthcoming), or “organizations of organizations” whereby their constituents retain their autonomy but act collectively in the pursuit of common, system-level, goals (Ahrne & Brunsson, 2008; Gadille et al., 2013; Gulati, Puranam, & Tushman, 2012). On the other hand, clusters can be seen as

institutions in their own right whereby an institutional environment conducive to innovation and learning is created within the cluster boundaries (Steiner, 2006).

The view of clusters as “context-embedded meta-organizations” thus suggests that these are not only shaped by their environments but can take deliberate actions to influence these, just as individual organizations (King et al., 2010). As meta-organizations, clusters can be both seen as collective actors within broader institutional settings and an institutional environment in itself within which individual entrepreneurial action may take place (cf. Battilana et al., 2009; Berkowitz, 2018; Sotarauta & Pulkkinen, 2011; Steiner, 2006).

Institutional contradictions in transition economies

Institutional contradictions—inconsistencies among and within institutions (cf. Seo & Creed, 2002)—can lead to actors’ reflexivity and their questioning of the institutional arrangements which used to be taken for granted (cf. Battilana et al., 2009; Fligstein, 1997; Seo & Creed, 2002). Such contradictions may be more acutely experienced by organizations in settings undergoing profound institutional change, such as the transition economies (Li et al., 2013; Marquis & Raynard, 2015). The latter display multiple institutional contradictions such as tensions between the newly created institutions and the legacies of the past regimes and market-political tensions (Kalantaridis, 2007; Li et al., 2013; Marquis & Raynard, 2015; Yakovlev, 2006).

In transition economies, organizations have to interpret the new institutions superimposed on the previous institutional settings (Kalantaridis, 2007; Marquis & Raynard, 2015). New institutional logics—such as newly introduced regulations governing market relations—come into conflict with the pre-existing informal institutions which had been substituting the missing or ineffective formal institutions (Estrin & Prevezer, 2011; Filatotchev, Jackson, & Nakajima, 2013; Puffer et al., 2010; Yakovlev, 2006).

Moreover, an important source of institutional contradictions is the heavy involvement of government in the markets (Greenwood, Díaz, Li, & Lorente, 2010; Li et al., 2013). The state can directly influence market activities through its control of large state-owned enterprises which represent a significant share of the transition economy markets (Belloc, 2014; Fainshmidt, Judge, Aguilera, & Smith, 2018; Gershman & Thurner, 2016). On the other hand, the state is indirectly involved in markets by providing subsidies and other financial stimuli for entrepreneurship and innovation (Fainshmidt et al., 2018). In transition economies, this source of funding is crucial and often significantly outweighs private funding of innovation activities and R&D (Fainshmidt et al., 2018; OECD, 2017). Thus, organizations operating in transition economies need to sense and strategically respond to both market and government dynamics (Filatotchev et al., 2013; Li et al., 2013; Volberda, van der Weerd, Verwaal, Stienstra, & Verdu, 2012).

For clusters operating in such settings, these institutional contradictions are likely to be crucial. Indeed, in transition and emerging economies cluster policies aim at alleviating “systemic failures”, i.e., inconsistencies in the institutional environment (Andersson, Schwaag Serger, Sörvik, & Wise Hansson, 2004; Kutsenko, Islankina, & Abashkin, 2017). In practice, this means that clusters are often created in a top-down manner as a solution to regional “ills”, such as over-reliance on natural resources. Thereby, the newly created institutions are superimposed on the existing ways of doing business, challenging the status quo. However, actors do not react to the newly created institutional logics in the same manner, some leveraging these to facilitate change, others

adopting them only formally, while in practice sticking to the “old” ways (cf. Kowalski & Marcinkowski, 2014).

These contradictions, however, may be experienced by clusters to a different degree. Indeed, the composition of ownership shapes the relative receptivity of organizations to different logics and their strategic responses to these depend on the presence and interests of the powerful actors (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011; Pache & Santos, 2010). Indeed, multiple groups of powerful stakeholders or “legitimizing audiences” within a cluster may have different agendas, interests and contradictory prescriptions that must be managed in cluster’s day to day operations (Berkowitz, 2018; Jarzabkowski, Smets, Bednarek, Burke, & Spee, 2013; Morgulis-Yakushev & Sölvell, 2017).

In the case of transition economy clusters promoted in a top-down manner, the hand of the government is likely to be heavy. Indeed, the government may be a major source of funding and, at the same time, may be present as a shareholder in the state-owned enterprises making part of the cluster. Furthermore, transition economies rely on exogenous sources of economic growth, such as foreign direct investment (FDI), to fuel their economic growth and “upgrade” their clusters (cf. Birkinshaw, 2000; Grosse & Trevino, 2005; Zukauskaitė, Trippel, & Plechero, 2017). The “imported” actors from the developed economies may re-shape the dynamics of innovation systems, bring their own institutions and, in some cases, may deliberately defy the existing ones if these are not considered supportive (Crouch, Schröder, & Voelzkow, 2009; Zukauskaitė et al., 2017). Indeed, the subsidiaries of multinational corporations (MNCs) established in host countries’ clusters have varying mandates and strategies depending on their innovation competencies as well as the external environment and have varying influence on their host locations (Birkinshaw & Hood, 2000; Dunning & Lundan, 2008; Enright, 2000; Frost, 1998; Williams & Vrabie, 2018; Zeller, 2010). This implies that while MNCs can drive institutional change in their host regions, their presence in clusters may exacerbate the market-political institutional contradictions given the importance of the state actors in cluster development.

Thus, transition economies may present multiple institutional contradictions stemming from the transition processes themselves where the “old” institutions of the planned economy are substituted by the “new” institutions of the market economy. In this process, some of the formal institutions may be underdeveloped and be substituted by informal institutions. Moreover, the important role of the government in the economy may lead to market-political institutional contradictions. However, the way clusters experience these various contradictions may depend on their composition and, in particular, the presence of the MNCs and that of the state-owned companies or public funding.

Coping with institutional contradictions

Actors operating in settings characterized by the presence of multiple and competing institutions face contradictory prescriptions from different constituents (Jarzabkowski et al., 2013). In such contexts, actors adopt deliberate strategies in response to these (Oliver, 1991; Pache & Santos, 2010). The deliberate nature of actors’ approach to coping with institutional challenges has been the focus of the literature on institutional

strategies (Kraatz & Block, 2008; Lawrence, 1999; Marquis & Raynard, 2015; Oliver, 1991; Pache & Santos, 2010; Pache & Santos, 2013), institutional entrepreneurship (Battilana et al., 2009; DiMaggio, 1988; Dorado, 2005; Mair & Marti, 2009), and institutional work (Lawrence & Suddaby, 2006; Lawrence, Suddaby, & Leca, 2009).

Much of this work (e.g., Kraatz & Block, 2008; Pache & Santos, 2010; Welter & Smallbone, 2011) draws upon the typology of strategic responses to institutional pressures developed by Oliver (1991). These studies suggest that although institutional strategies may range from passive, such as conformity, to active, such as manipulation, in environments characterized by the presence of contradictory institutional logics, only the active approaches are applicable (Pache & Santos, 2010). These can include (1) strategies satisfying only one pole of the institutional contradiction at the expense of the other; (2) those where a trade-off is found to satisfy, to some extent, both poles; and (3) those re-framing the contradictory logics to become complementary (Bjerregaard & Luring, 2012; Hargrave & Van de Ven, 2009; Kraatz & Block, 2008; Oliver, 1991; Pache & Santos, 2010).

The first set of strategies implies that the organization chooses to avoid, defy, or manipulate one of the poles of the institutional contradiction while satisfying the other. The *avoidance strategy* may imply concealing the nonconformity, “deleting” some of the institutional identities, and escaping from institutional rules or expectations by changing goals, activities, or domains (Kraatz & Block, 2008; Oliver, 1991). The *defiance strategy* implies ignoring or actively disrupting the norms, values, and rules and/or assaulting the sources of institutional pressure (Hargrave & Van de Ven, 2009; Lawrence & Suddaby, 2006; Oliver, 1991). Finally, the *manipulation strategy* implies attempting to change the institutional environment by “importing” influential constituents or controlling or dominating institutional constituents and processes (Oliver, 1991), shaping institutions through direct political action or by influencing the norms and belief systems (Kalantaridis, 2007; Lawrence & Suddaby, 2006; Marquis & Raynard, 2015).

The second strategy implies that a *compromise* is found to satisfy to some extent both poles at once by establishing a trade-off or moderating between the poles (Hargrave & Van de Ven, 2009; Kraatz & Block, 2008). In doing so, organizations balance the expectations of multiple constituents, placate, and accommodate different institutional elements and negotiate with institutional stakeholders (Oliver, 1991).

The third strategy implies a “*creative embrace*” of conflicting logics (Bjerregaard & Luring, 2012; Hargrave & Van de Ven, 2009; Kraatz & Block, 2008) which requires to re-frame the issue, tailor the conflicting logics into becoming complementary, and adopt new hybridized work practices and business models (Casasnovas & Ventresca, 2019; Greenwood et al., 2011; Jarzabkowski et al., 2013). This may be possible if an organization is able to forge a durable identity combining pluralistic legitimacy imperatives and becoming “valued as an end in its own right, rather than a mere means for achieving pre-existing or externally-given ends” (Kraatz & Block, 2008, p. 252).

The choice of the institutional strategy may depend on such factors as resource endowment of institutional entrepreneurs and the relative importance of the conflicting institutional logics within the organization (e.g., Battilana et al., 2009; Pache & Santos, 2010). Thus, the choice of the institutional strategy will differ for collective and individual actors (Battilana et al., 2009; Pache & Santos, 2010; Pache & Santos, 2013).

Collectively, cluster actors could engage in direct political action (Kalantaridis, 2007; Martí & Mair, 2009; Welter & Smallbone, 2011), while less powerful or peripheral individual cluster actors may be more prone to manipulating norms and belief systems or acting to obtain support and resources from the elites (Lawrence & Suddaby, 2006; Martí & Mair, 2009). Such actors can also use the “bricolage” approach to construct opportunities for entrepreneurial action (Mair & Marti, 2009; Phillips & Tracey, 2007). This approach implies “making do by applying combinations of the resources at hand to new problems and opportunities” (Baker & Nelson, 2005, p. 333). Resources may imply organizational mechanisms, fragments of legal frameworks, and other prior and existing institutions, among others (Baker & Nelson, 2005).

To sum up, clusters operating in transition economy contexts may be subject to multiple institutional contradictions and are likely to adopt different strategic responses. As discussed previously, these may depend on the cluster composition but also on the level at which the acts of institutional entrepreneurship take place. Specifically, clusters may act collectively as institutional entrepreneurs to shape their broader institutional environments by wielding their collective power. At the same time, they can be seen as an “arena” for individual entrepreneurial action of their members. While collective strategies may involve direct political action, individual actors are likely to favor less confrontational strategies and use the “bricolage” approaches.

Research design

Methodology

Given the scarcity of research in organizational and institutional studies focusing on clusters as the object of analysis and recognizing its “agentic” nature, we opted for an exploratory, theory-elaborating approach to extend the existing theory (Ketokivi & Choi, 2014). To do so, we adopted an embedded multiple case study methodology (Yin, 2008), whereby the clusters were considered the main units of analysis and the individual acts of institutional entrepreneurship constituted the sub-units of analysis. Such an approach allowed us to analyze both the acts of institutional entrepreneurship performed by the cluster actors collectively and by individual actors nested within the cluster context.

Case selection

Our case selection was based on the criteria of relevance, the potential for knowledge production and feasibility (Miles, Huberman, & Sdana, 2014). The initial screening for potential candidates was made based on the data of the Russian Cluster Observatory openly available at the Observatory website (<https://map.cluster.hse.ru/>). We also made use of the reports and policy analysis papers produced by the researchers at the National Research University “Higher School of Economics” hosting the Observatory. This stage resulted in a pre-selection of around 15 clusters. This pre-selection was further refined after the discussions with three Russian academics specialized in the field. We then contacted the pre-selected clusters and held initial discussions with cluster managers and regional development authorities to evaluate the potential for knowledge production. This resulted in the final selection of two case studies—Kaluga Pharmaceutical Cluster (FKF) and Innokam cluster in the Republic of Tatarstan.

To select the cases answering the relevance criterion, we gave preference to clusters located in innovation-active regions and supported through the government policies. By focusing on innovation-active regions, we limited our research to those displaying a significant level of contradictions between the “old” and “new” as well as market and political logics. We thus assumed that these regions display tensions between the systemic institutional barriers present at the national level and the regional policies aiming at alleviating these. Both, Kaluga and Tatarstan regions have been repeatedly listed as some of the most innovation-active regions of the Russian Federation (Abdrakhmanova et al., 2017; Agency of Strategic Initiatives (ASI), 2019)

By focusing on clusters receiving government funding, we limited our research to those having better access to resources to engage in institutional entrepreneurship. We also assumed that due to the presence of public actors in cluster governance, these clusters face market-political institutional contradictions.

We also chose two clusters representing “extreme” cases in terms of their sector of activity to uncover the differences in their institutional strategies. Thus, one of the selected clusters operates in the pharmaceutical and biotech sectors, while the other in oil extraction and refinery, automotive, and machinery sectors. The sectors represent different innovation patterns (Giuliani, Pietrobelli, & Rabellotti, 2005; Perrons, 2014; Tödting, Lengauer, & Höglinger, 2011) and different degrees of institutionalization (Ponomarev & Dezhina, 2016) which suggests that different actors and knowledge channels will matter most for the innovativeness of the cluster actors and these will experience different institutional pressures. This selection criteria allowed us to focus on clusters situated in the contexts with a complex interplay between different levels of institutions—national, regional, and sectoral—and thus gain insight into the different strategies these adopted. By focusing on different sectors of activity, we also aimed at better generalizability of our theoretical propositions, suggesting that the entrepreneurial behaviors we analyzed are not specific to a certain industry or field of activity.

Data collection and analysis

In this study, we combined two levels of analysis to focus both on cluster-level strategies and individual-level approaches to institutional entrepreneurship in cluster context. Thus, we included field-level data in the form of industry reports, policy documents (such as regional and national economic development strategies) and interview data. These data sources were treated as primary, while observations constituted a secondary data source.

We opted for semi-structured and unstructured in-depth interviews given the exploratory nature of the study. The interviews took place from November 2018 to January 2019 and were conducted according to the same interview guide. The latter outlined a set of themes rather than detailed interview questions. The themes were established to gain insight into cluster-environment interactions and included cluster membership, governance structures, regional and national specifics, cluster strategy-making process and key priority areas, ways of overcoming barriers to innovation, shared values and norms in the cluster, and innovation capabilities and performance.

The interviewees were selected to represent the key groups of cluster actors: industry, academia, cluster management organizations, and public bodies. This allowed

uncovering institutional tensions and contradictions and the resulting conflicting demands of different stakeholder groups involved in the cluster. Table 1 describes the interviewees and their involvement with the clusters.

All interviews, presentations, and other sessions were recorded and transcribed with one exception where the interview was noted down following the wish of the interviewee. The average duration of the interviews was around 60 min. Some of the participants were interviewed more than once. The total duration of the audio material collected was close to 14 h.

To analyze field-level characteristics and the institutional contradictions present in cluster environments, we collected data from open sources, such as the clusters' websites (cluster strategy, performance reports, charters, and press releases), industry reports, policy documents (regional strategy documents, national regulations relative to economic development, innovation, and science as well as relevant industry regulations), press articles, and academic articles.

For data analysis, we applied the "provisional coding" approach (Miles et al., 2014). Thus, we established provisional codes based on the preliminary literature review but then identified additional codes during the coding process. Two matrices have been developed for data analysis. A categorization matrix (Elo & Kyngäs, 2008) established the relationship between the elements of the theoretical framework, interview themes, and their codes. An observations coding matrix (Miles et al., 2014) was used to systematize and analyze the memos produced during the research process. The data was categorized, coded, and analyzed with the help of NVivo software.

Case description

The setting

Cluster-based development has been prioritized in Russia since 2008 as a mechanism of overcoming the inconsistencies in the country's institutional environment (Anderson et al., 2004; Kutsenko et al., 2017). In 2010, the Russian Ministry of Economic Development started to provide subsidies to regions to support the creation of regional "cluster development centers" and launched two consecutive programs to support "innovation clusters" in 2012 and 2016 (Vasily Abashkin, Boyarov, & Kutsenko, 2012;

Table 1 Interviewees list

Kaluga Pharmaceutical Cluster (KFK)—pharma and biotech, Kaluga region	Innokam—automotive and petrochemicals, Republic of Tatarstan
<ul style="list-style-type: none"> • PAM founder—serial entrepreneur in the field of biotech, formerly an academic, currently manages, and runs the "Park of Active Molecules" (PAM) • Head of University department—academic in the field of pharmaceutical chemistry at the National Research Nuclear University MEPhI (Moscow Engineering Physics Institute) • Chairman of the cluster Board of Directors—a "Big Pharma" representative (holds a top management position at the Kaluga subsidiary of AstraZeneca) • Cluster organization representative—Executive director of "Kaluga Pharmaceutical Cluster" (KFK) association • Regional government official—Director General at the "Agency for innovative development—Centre for cluster development of the Kaluga region" 	<ul style="list-style-type: none"> • High-tech SME owner-manager—entrepreneur (business process management, digitalization for manufacturing companies), formerly an academic • Academic, high-tech entrepreneur—lecturer, researcher at Kazan National Research Technical University, runs an R&D services company • Chairman of the cluster HR committee—representative of one of the cluster's "anchor" companies (Ford-Sollers), HR director • Cluster organization representative 1—Vice-president of "Innokam" association • Cluster organization representative 2—Head of the Innovation Development Service at "Innokam" • Regional government official—Director at the "Centre for Cluster Development of the Tatarstan Republic"

Bortnik et al., 2015; Islankina, Kutsenko, Rudnik, & Shadrin, 2017). In parallel, the Ministry of Industry and Trade launched its own cluster support program focusing on “industry clusters” to support cooperation projects under the “import substitution” policy introduced by the Federal Government in 2013–2014 to decrease the dependence on the external resources and technologies in Russian businesses (Komkov & Bondareva, 2017).

The clusters

Kaluga pharmaceutical cluster (KFK) The cluster is located in the Kaluga region and is one of the largest pharmaceuticals and biotechnology clusters in Russia counting 63 companies and over 9000 employees. The cluster was initiated in 2011 by the regional authorities and was incorporated in 2012 as an association.

The cluster includes a number of subsidiaries of global pharmaceutical companies such as Novo Nordisk, AstraZeneca, Hemofarm, and Berlin-Chemie Menarini. It also involves several research organizations and universities specialized, in particular, in radio pharmaceuticals, biotech, and nuclear medicine, as well as several spin-offs from the Scientific Medical and Radiological Centre.

The cluster has three levels of governance: a coordination council under the Governor of Kaluga region (high-level monitoring of the cluster development strategy), center for cluster development of Kaluga region (investor relations and representation of the cluster interests with the public authorities), and the Association “Kaluga Pharmaceutical Cluster” (responsible for capacity building, cooperation development, and joint projects coordination).

Innokam The cluster is located in the Tatarstan Republic and is one of the biggest clusters in Russia. It was incorporated in 2011 as a non-commercial partnership and involves around 300 companies with approximately 110,000 employees in total. The cluster member companies operate in such fields as crude oil refining, petrochemicals, automotive components, and automobile manufacturing. A small number of companies are specialized in supporting industries such as robotics and IT and provide services to the “anchor” cluster businesses, i.e., the biggest regional companies, such as Tatneft (petroleum) and KAMAZ (automotive).

The cluster is governed by the board which includes the representatives of the key “anchor” enterprises, education and research organizations, public authorities as well as representatives of Special Economic Zones, other regional clusters, and investment funds.

Results

To contextualize our findings, we will first present the institutional contradictions that the studied clusters faced. We will then describe our findings through the lens of four acts of institutional entrepreneurship that surfaced during our empirical research, describing the institutional strategies used by entrepreneurial actors.

Institutional contradictions in studied regions

In Russia, many of the current barriers to innovation, science, and entrepreneurship can be traced back to the Soviet era or explained by the major socio-political and

economic transformations that have been taking place after the demise of the USSR (Dezhina & Kiseleva, 2008; Graham, 2013; Yakovlev, 2006). The contradictions the studied clusters face stem from these processes of transition from a planned to a market economy on the national scale and the traditionally important role of the state in the economy, leading to contradictions between formal and informal institutions as well as market-political contradictions. These have been experienced by the clusters differently due to their regional and sectoral specifics.

Market-political contradictions

Our findings suggest that in KFK cluster in the Kaluga region, the market-political contradictions are related to the contradictions between the regional investment attraction policy and the innovation pattern of the pharmaceutical and biotechnology sectors.

As the Kaluga region is not rich in natural resources, it was one of the first in Russia to introduce FDI attraction strategies in 1998–2001 to stimulate its economic development (Zimin, 2010). The regional authorities introduced tax breaks for investors, created a regional development agency, and developed industrial parks/zones to attract greenfield investment (Zimin, 2010). Not only was this strategy used to attract foreign investors, but it also allowed to avoid high institutional pressures for conformity in the region and to bring new institutional logics by bringing in new constituents, such as MNCs (Yakovlev, Freinkman, & Ershova, 2017) including one of the major pharmaceutical companies which later constituted the basis for the creation of a pharmaceutical cluster. The effectiveness of the regional policies in this sector, however, is very much defined by the national-level policies: “In Russia, the pharmaceutical industry is regulated at the federal level. So, whatever the region does, it does not have any influence on industry development. It cannot support any localized companies in any way since all the influence is at the national level.” (Cluster organization representative, KFK cluster).

Moreover, although one of the important goals of the regional authorities is to stimulate regional innovativeness, our findings suggest a contradiction between the sectoral innovation patterns in the pharma and biotech sectors and the FDI attraction logic of Kaluga’s regional authorities. Indeed, the focus of this strategy—which bets on “greenfield investment” facilitation and tax breaks—is on attracting production facilities of MNCs. In case of the big pharmaceutical companies, this means that the most knowledge-intensive stages of drug development are still performed in these companies’ R&D facilities abroad: “... they do not build deeply integrated pharmaceutical production plants here, they basically build packaging companies where they import substances, turn them into final drugs, package and sell them. It is the last stage in the process of drug development.” (Regional government official, Kaluga region). This situation persists despite the Federal government’s push to increase the share of locally produced drugs that came with the adoption of the national strategy for the development of the pharmaceutical industry in 2009.

Indeed, the sectoral innovation processes in the biotech field rely on scientific knowledge and applied research where academia-industry partnerships are crucial for knowledge generation and innovation (Tödtling, Lehner, & Trippl, 2006). In Russia, however, the severing of formal and informal ties within the innovation system and the drastic reduction in government funding after the collapse of the USSR lead to the

dissipation of the country's innovation potential (Dezhina & Kiseleva, 2008; Graham & Dezhina, 2008). Thus, despite its significant resource pool in terms of scientific and educational organizations (cf. Cornell University, INSEAD, and WIPO, 2019), Russia is not considered a "hotspot" of pharmaceutical and biotech innovation by the major global pharmaceutical companies in their location decisions (Zeller, 2010). Thus, the KFK cluster faces institutional contradictions stemming from the specifics of Russia's science sector, the economic development policy of the Kaluga region and the sectoral innovation patterns in the pharmaceutical and biotech fields.

In contrast to the Kaluga region, Tatarstan's economy has been dependent on its natural resources, in particular, oil and gas. The region has a lower orientation towards international markets and FDI attraction has not been actively used as a mechanism of economic development by the regional elites in order to avoid any potential loss of control over regional strategic resources (Yakovlev, Freinkman, Makarov, & Pogodaev, 2018; Zolotarev & Mukhlisova, 2014). Indeed, Tatarstan's regional governance system has its specifics such as a high level of regional autonomy, the presence of strong regional leadership, a high level of social capital and the cohesion of regional elites who managed to retain control over the regional resources during the period of privatizations in the 1990s (Yakovlev et al., 2018). As one of the interviewees described it: "Compared to other regions in Russia, the situation is better in Tatarstan, but it is a question of mentality. [...] The Republic works to achieve specific and understandable results and does it with inspiration and patriotism." (Cluster organization representative 2, Innokam).

The region is dominated by large enterprises under the federal or regional control operating in the oil and gas as well as automotive and machinery manufacturing sectors. The innovation patterns in the latter sectors suggest that the key learning and innovation sources are in-house R&D in scale intensive firms (Giuliani et al., 2005), while in oil and gas sectors innovation and learning are mostly driven by suppliers and oilfield service companies, as well as basic and applied research organizations (Giuliani et al., 2005; Perrons, 2014). In Russia, however, these sectors have been characterized by low R&D intensity and stimulus to innovate (Dezhina & Frolov, 2018; Kontareva, 2015; Zolotarev & Mukhlisova, 2014). Indeed, despite a significant government power over the state-controlled companies in Russia, these for a long time showed a low level of innovation and only incremental modernization (Gershman & Thurner, 2016). This lack of innovation has been associated, in particular, with the market structure that resulted from the wave of privatizations in the 1990s and the uneven distribution of resources and wealth in the country still visible today (Dezhina & Kiseleva, 2008). The extreme concentration of ownership and lack of competition meant that businesses did not consider innovation a source of competitiveness and the introduction of foreign technologies has been one of the most common types of innovations in Russian businesses (Dezhina & Kiseleva, 2008; European University in Saint Petersburg, 2010). "Most companies just sit there hoping that no one comes to bother them. Many order goods in China while we could have easily manufactured them here. But they just do not want to do anything. 'Another day has passed and we are fine' – this kind of mentality." (Academic, high-tech entrepreneur, Tatarstan).

However, in 2010, the federal government introduced legislation requiring joint R&D between the state-owned enterprises and the national research and education

organizations (Federal government Decree No. 218). This created a stimulus for Tatarstan's state-controlled companies to look for opportunities for collaboration with the local innovation actors. However, the ties in Russia's innovation ecosystem, severed further to the socio-economic processes described above, are yet to be recovered. "When we ask our large regional companies 'Why don't you use the research potential of our local universities?', they reply 'This is not enough for us. We work as "vacuum cleaners" gathering ideas from all over the world'" (Cluster organization representative 1, Innokam).

Thus, in Innokam cluster in Tatarstan, the market-political contradictions stem from the dominance of the state-controlled companies in the region, their lack of innovation capabilities and low demand for innovation that led to low collaboration in the region and low capabilities of local actors. With the government push for collaboration, the situation has started to change but this policy push has yet to stimulate the local innovation market.

Contradictions between formal and informal institutions

The KFK cluster in Kaluga region faces contradictions between formal and informal institutions or the "old" and "new" institutions stemming from the economic transitions processes as well as regional specifics. Indeed, one of the unique characteristics of the region is the presence of a relatively well-developed scientific and research capabilities and a high the number of scientists and researchers in its population (Pospelova, 2016). As mentioned by one of our interviewees: "...The best specialists from the whole Soviet Union were gathered here [...] and there was a number of companies in the 90s that were created by senior researchers" (PAM founder).

However, in Russia, the scientific and innovation potential is not fully exploited (Gokhberg & Roud, 2016), partly due to the "old" institutional logics which dominated in the Soviet Union and persist to this day. In the Soviet period, the directions of scientific research and the implementation of innovations were decided upon by the government and were mostly focused on the defense sector (cf. Dezhina & Kiseleva, 2008; Kontareva, 2015). Although the inventive activity itself was endorsed, the commercialization of innovations was not considered its logical continuation (European University in Saint Petersburg, 2010). Over the years, this has led to negative views of technology commercialization and academic entrepreneurship which persist today (RVC, 2017). These "old" informal institutions or norms which define what is considered acceptable by the society have important ramifications for the pharmaceutical and biotech sectors, where innovations are driven by the knowledge generated in and transferred from academic and research organizations.

Thus, in KFK, the institutional contradictions can be associated with the regional development policies that have led to a predominance of "production-orientated" MNCs in the region. Since these do not have the mandate for innovative drug development in Russia, their presence does not necessarily stimulate the innovation potential of the local biotech companies through collaborative R&D projects. This means that the Kaluga cluster has to manage these contradictions daily balancing the interests of the region's major investors and its local knowledge actors. One of the manifestations of these contradictions and the compromises that have been made to reconcile them is the collaboration between the educational organizations and the cluster's

pharmaceutical companies: “As most of the lecturers at the department are pharmaceutical companies’ employees, we only have three full-time internal staff. Our dream is to set up science here, but we have these ‘scissors’... because I’m interested in having a lot of full-time internal researchers while the companies are interested in ensuring that the students – their future employees – have the most up-to-date knowledge. [...] We try to find a compromise here, but for now, this compromise results in only three full-time researchers.” (Head of the university department, Kaluga region).

Another characteristic specific to the biotech sector in Russia is its comparatively low level of institutionalization, whereby the regulations and government support mechanisms are currently underdeveloped (Ponomarev & Dezhina, 2016). This suggests that current institutional logic fails to support the long cycles of development in biotech, which can take up to 10–15 years before the business becomes profitable. Indeed, R&D companies do not have a special legal status in Russia, which means that these are subject to the same requirements as other businesses and are required to consistently report benefit. In a case where a company declares a loss, it is automatically subject to tax audits: “We cannot ‘be in the red’ as in the West, we cannot accumulate losses. They [the tax authorities] immediately rush in and ask how that could happen.” (PAM founder).

In the case of Innokam cluster, the picture is quite different which, again, is related to the regional and sectoral characteristics. Russia in general and, in particular the industries that are highly institutionalized, such as the petroleum, automotive, and machinery sectors (Ponomarev & Dezhina, 2016) dominating Tatarstan’s economy, are characterized by informal institutions that “compete” with the formal ones whereby corruption and clientelism undermine the functioning of laws and regulations governing these industries (Estrin & Prevezer, 2011; Filatotchev et al., 2013). This is also true for Tatarstan: “The region has always been a pioneer for all sorts of innovations which, unfortunately, then succumbed to serious corruption.” (Academic, high-tech entrepreneur, Tatarstan).

One of the examples of how these institutional contradictions manifest themselves within the cluster is the “Kamatainer” pilot project developed by several cluster companies, including one of the biggest Russian automotive company—“KAMAZ”. The project aims at developing a long-distance relay cargo transportation system as well as supporting terminals, and information systems (Abashkin et al., 2018). The project is disruptive for the logistics sector in Russia and has great potential for the improvement of the postal and logistics services opening the possibilities of multimodal transportation, including in the framework of the New Silk Road international project. In 2016, the project was supported by the then-prime minister Dmitri Medvedev and funding was allocated to its development. However, later the funding was discontinued. One of the interviewees hinted that the reason might be in the vested interests of some of the top officials and businesspeople since the project would disrupt the status quo and introduce new processes and players in the existing system: “We cannot do anything about it, we are a small company, we cannot pressure ministers and oligarchs who have their own interests. There are many interesting projects and innovations, but their implementation is very, very difficult. [...] These oligarchs are happy with the status quo and do not want to develop anything. They are the element that leads to the stagnation of the economy even though there is great potential in the population.” (Academic, high-tech entrepreneur, Tatarstan).

Another institutional contradiction that became apparent from the analysis of Innokam case comes from the internal management practices in the state-controlled companies that dominate the cluster and the regional economy. These companies have been shown to have poorer innovation performance due to institutional barriers, such as the lack of internal policies and practices which would facilitate innovation development and adoption as well as the lack of support from the senior management (Gershman & Thurner, 2016). “As far as I understand, the top-level management’s only goal is safeguarding their jobs, they do not think about business development. There is interest in innovations among young people, the project managers, but the top-management does not react to their initiatives, they only hold on to their ‘seats.’” (Academic, high-tech entrepreneur, Tatarstan).

Cluster creation as an act of institutional entrepreneurship

Due to the regional and sectoral differences discussed above as well as the composition of the studied clusters, these have faced the institutional contradictions differently and adopted different institutional strategies in response. Our analysis of the cases suggests that the cluster development itself can be considered an act of institutional entrepreneurship as it challenges the existing institutions and seeks to create new ones which would support cluster-based collaboration and innovation orientation where none existed before.

Indeed, in some cases, in Russia, the cluster approach was only adopted “on paper” to fulfill government KPIs and receive “cluster funding”: “Companies were ‘herded’ into clusters not because they felt that they needed it but because they ‘had to’ do it. [...] No one explained to us the goals or responsibilities, nothing...” (High-tech SME owner-manager, Tatarstan). However, this was not the case in both studied clusters. While in both regions, the geographical concentration of companies in respective fields had been present before the creation of formal membership-based clusters, there has been almost no collaboration between geographically proximate firms. With the introduction of cluster policies, regional entrepreneurial actors saw an opportunity to transform “geographical concentrations of organizations” into “organizations of organizations”. “Thanks to the cluster, the localization of the companies improves, they start expanding, new production plants open. The cluster brings companies together. They can be located 50 meters from one another, but no one knows who does what, who needs what and who can do what – this is the trouble.” (Academic, high-tech entrepreneur, Tatarstan).

Although in both cases setting up the clusters could be seen as an entrepreneurial endeavor, the way the cluster actors engaged in it varies significantly between the studied clusters. These variations can be associated with the regional and sectoral institutional contexts as well as the composition of the clusters.

In Kaluga region, the creation of the cluster was driven by the regional authorities who initiated negotiations with the subsidiaries of MNCs located in the region to find premises for cluster-based collaboration. These latter were initially skeptical of the idea and did not see any value in collaboration due to their production mandate. This

required negotiation and sense-making by the regional authorities who saw a possibility to leverage the newly introduced cluster policies to improve the competitiveness of the region. Ultimately, several possibilities were identified to justify the need for collaboration for MNCs: joint lobbying of the pharmaceutical industry interests, a joint approach to human resources development, and the development of joint-use infrastructure (e.g., pharmaceutical waste treatment facilities). As the buy-in of the MNCs was ensured, the regional authorities also involved local biotechnology companies and research and education organizations to help the region re-establish the linkages within its innovation ecosystem.

In contrast to KFK cluster, in Tatarstan, there has been a consensus among the regional authorities and the large state-controlled companies about the need to change the regional development path and to establish a value chain from oil extraction to the production of manufactured goods within the cluster. This was motivated by the government's push for more collaboration between the state-controlled companies and research and education institutions. While the initiative of cluster creation has come from big businesses, many have low innovation capabilities and a lack of collaborative approach. Thus, cluster creation and development mostly aimed at defying the existing institutional barriers to innovation and breaking the "silos" in which actors have been operating. In particular, an important role in this work played the initiative of the cluster facilitators to create an online platform for open innovation. The platform allows users to post technological projects and competencies and requests for these, thus serving as a matchmaking tool that brings together the innovators and the potential users of their innovations. The platform is not limited to the cluster, nor to the region, it is national in scope and is also open for foreign users. The cluster activities thus can have more far-reaching effects: "Innokam does not see itself as a regional cluster, but as something much bigger than that, as a cluster operating nationally." (High-tech SME owner-manager, Tatarstan).

The cluster collective also aims at improving regional innovation and entrepreneurial culture through outreach and education activities. A number of committees have been organized by cluster members to exchange knowledge and create positive practices for collaboration among cluster companies. Such direct action was made possible due to the support of powerful regional players.

Finally, there are some similarities between the studied clusters in the way these engaged in institutional entrepreneurship. Specifically, both employed the "bricolage" strategy to leverage different institutional mechanisms for cluster development and tried to creatively embrace the institutional contradictions they are facing to institutionalize the cluster concept and thus ensure its long-term survival.

Indeed, in Russia, the concept of an "innovation cluster" has not been clearly defined in the relevant policy documents. As one of the interviewees put it: "When I started [in this position] there was no understanding whatsoever of what a cluster development center is supposed to do." (Regional government official, Tatarstan). The vagueness of the "cluster" concept was leveraged by the studied clusters to "mold" it into a form that would be understandable and acceptable for the local actors: "This 'cluster' idea was foisted upon us. But it is good that our people do not easily submit to these things. In Novosibirsk, they established their own model, in Kazan - another one. And everybody adapts in their own manner." (PAM founder, Kaluga region).

In creating the clusters and looking for ways to institutionalize cluster-based collaboration, both clusters used the “bricolage” approach and sought to create several complementary institutional “identities” allowing them to benefit from several sources of funding. Indeed, the fact that two cluster approaches exist in Russia under different ministries’ mandates has been leveraged by the two studied clusters. While both have been enjoying government support under the Ministry of Economic Development “innovation clusters” program since 2011, these have also been taking measures to “fit” the “industrial clusters” support program launched by the Ministry of Industry and Trade in 2016. This would allow obtaining additional support for collaborative innovation projects by the cluster firms.

Park of active molecules (KFK cluster)

As mentioned previously, some of the cultural factors, or informal institutions, in Russia represent significant barriers to technology commercialization, such as the researchers’ lack of willingness to commercialize their innovations and the generally negative perception of academic entrepreneurship by the public. One of the members of KFK cluster—the “Park of Active Molecules” (hereafter, PAM)—is an interesting example of institutional entrepreneurship aiming at overcoming these challenges to promote and facilitate biotech innovation.

The organization was created in 2011 to help scientists commercialize their research results in the field of biotechnologies by bringing the necessary complementary competencies while allowing scientists to focus exclusively on research. Over its 20-year history, the organization tried on different “institutional identities”, such as technoparks and clusters promoted by government policies in different points in time. However, they deliberately chose not to adhere to any of these since they—being spatially bound forms of cooperation—presented limitations for the biotech sector that relies on global fundamental research. Instead, they chose to create a new business model which they refer to as the “competence alliance”: “In comparison to the so-called clusters, we do not have boundaries. We collaborate with colleagues in Novosibirsk, in Saint-Petersburg, in Moscow, in Kazan, anywhere, because innovations do not have boundaries.” (PAM founder).

The organization’s business model “creatively embraces” the institutional contradictions stemming from the reliance of the biotech industry on research commercialization and the inability or unwillingness of the Russian scientists to engage in this process: “One of the mottos of the Park of Active Molecules is that a scientist stays a scientist and continues doing what he [or she] does best. On the other hand, we add those competencies which are needed to create a business, to create a product. We do not make entrepreneurs from scientists.” (PAM founder).

Moreover, PAM has been experiencing contradictory institutional logics stemming from the lack of institutionalization of the biotech sector, as discussed above, and the long drug development cycles requiring specific institutional support. Thus, PAM has been looking for legal forms that would allow it to avoid these institutional pressures and initiated a business accelerator whereby the innovative projects will not be registered as companies but will be run as projects: “There is a whole range of limitations if one is to run a project under the small company framework. It is easier to develop

these ideas not as companies but as projects in the accelerator.” (PAM founder). Thus, PAM has been facing various institutional contradictions stemming from the conflict between the sectoral institutional logics and national cultural specifics and the underdevelopment of the formal institutions in the biotech sector in Russia. To overcome these challenges, PAM tried on different institutional identities and used “bricolage” approach to avoid certain pressures while creatively embracing other pressures to develop its business model.

Dual education system (Innokam cluster)

While the quality of education in Russia in general has been criticized for its inability to respond to industry needs (Klucharev & Dezhina, 2018), the creation of clusters and the related attraction of FDI have exacerbated the problem of the lack of talent in the regions. The risk of unhealthy practices of “talent poaching” among cluster companies has been acutely perceived by the members of Innokam cluster. “The problem is that few companies are ready to spend time and resources to build relationships with educational organizations. Many think that the task of the universities is to provide labor that can be ‘operational’ in their companies from day one.” (High-tech SME owner-manager, Tatarstan).

One of the institutional innovations which were made possible due to the newly established cooperation channels within the Innokam cluster was the introduction of the “dual education system” based on the approach applied in Germany, Austria, and Switzerland. However, the implementation of this program in Russia has been extremely challenging due to the presence of significant institutional barriers, such as the absence of relevant provisions in federal education standards. “All this we need to overcome, get around, invent and re-invent and so on. For those who have introduced this system of dual education it is a real innovation in our country and a constant struggle.” (Chairman of the cluster HR committee, Innokam). To implement the practice and overcome the rigidities of the current system, the cluster actors used the “bricolage” approach and leveraged the available legal mechanisms such as provisional cooperation agreements (Dudyrev, Romanova, & Shabalin, 2018) to fill the voids in the regulatory environment.

The role of the cluster has been crucial in making this happen. The coordination between the company and the educational institutions was facilitated by the HR committee meetings. The committee is composed of engaged and motivated individuals who see an important role of the cluster in re-shaping the regional industrial dynamics: “The role of the cluster is to commission the education organizations to provide human resources, to consolidate the knowledge of the future, of the industry plans and needs and the job market in general” (Chairman of the cluster HR committee, Innokam). Currently, the committee is working to implement the dual education system on a larger scale and to involve smaller companies.

Discussion

In this paper, we set out to understand whether and how clusters act as institutional entrepreneurs in unsupportive institutional environments to overcome barriers to their members’ innovativeness. In particular, we have been interested in the role of

institutional contradictions and the strategies adopted by clusters as institutional entrepreneurs. We will now discuss our findings with respect to these two topics.

Our case studies suggest that transition economy clusters operate in institutional settings characterized by multiple institutional contradictions. Indeed, contrasting the two cases suggested that the sectoral specifics—such as innovation patterns—and regional characteristics interweave and create a complex institutional “fabric” presenting a multitude of institutional contradictions to the regional actors. In Kaluga, the regional authorities have been the major driving force for cluster development. Their strong orientation towards FDI attraction means that important financial resources are being devoted to creating an “investment-friendly” environment in the region, especially by developing “hard” infrastructure and facilitating the construction of production facilities. However, the case studies suggest that the institutional set-up relevant to such an environment does not necessarily correspond to an institutional set-up conducive to innovation in the pharmaceutical and biotech sectors. The “imported” cluster members have their own agendas which do not correspond to the national or regional innovation development priorities, such as the improvement of innovation potential of the local actors. Thus, clustering has brought about an additional source of tensions whereby the interests of the multinational companies may be out of line with the interests of the local players. The cluster thus faces contradictory logics emanating from the region’s research tradition, the innovation patterns in pharmaceutical and biotech sectors, the economic development approach of the regional authorities and the needs and capabilities of the newly “imported” actors, whose mandate is mostly in localized production while the R&D activities are conducted elsewhere.

In Tatarstan, the sources of contradictions are different. These are related to the region’s strong reliance on the natural resources, the lack of innovation orientation in the big local state-owned players and, as a result, the lack of small innovative companies and the innovation culture in the region. Due to the government push through several important federal policy initiatives, the cluster companies have been experiencing the growing need to innovate in collaboration with the local actors. These have faced challenges related to the limited capacity of the local markets and insufficient capabilities of the research and education organizations.

Moreover, both studied regions have been betting upon cluster-based economic development and using clusters to re-shape the regional institutional settings which place these into the position of “change agents”. Thus, the cluster environment raises contradictions and tensions between the previously existing informal institutions and the newly created formal institutions, whereby the idea of clustering itself comes as an opposition to the “old” ways of doing business.

Thus, while most previous research addressing organizational responses to institutional complexity focused on situations where two contradictory institutional logics are present (Greenwood et al., 2011), our study suggests that institutional actors may experience a multitude of institutional contradictions and adopt different institutional strategies simultaneously to cope with these. We thus propose the following:

- (1) P_1 . As institutional entrepreneurs, clusters operating within multiple conflicting institutional logics adopt multiple institutional strategies simultaneously.

So what institutional strategies did our studied clusters adopt? Our research suggests that clusters may play a dual role in institutional entrepreneurship by acting collectively on the one hand, and by creating enabling conditions for individual entrepreneurial actors on the other hand.

Seeing cluster creation as an act of institutional entrepreneurship, we found that regional pre-conditions and power balance shape the institutional strategies adopted by entrepreneurial actors. Here, the support of powerful constituents is a crucial consideration. In the Kaluga region, the initiative to create the cluster came from the regional authorities, while the major pharmaceutical companies located in the region were skeptical of the idea. This required negotiating and finding a compromise to balance and accommodate the requirements of different stakeholders operating within different market logics, i.e., adopting a “compromise” strategy (Oliver, 1991). This strategy also involved the “molding” of the cluster’s institutional identity to fit the expectations and demands of multiple stakeholders which was made possible by the ambiguity of the “cluster” concept in Russia.

Tatarstan, to the contrary, has been recognized for its “elite consensus” (Yakovlev et al., 2018) and the alignment between the strategies of the major regional players has been evident also in cluster development. Thus, when the push from the federal government came to stimulate collaborative innovation between state-controlled companies and research organizations, the cluster adopted a defiance strategy to address the barriers presented by the informal institutions in the region. Cluster actors worked to break the “silos” within which many of the firms and research and education institutions had been working after the demise of the Soviet Union. It did so, in particular, by developing an open innovation platform to help the local businesses look for innovative projects across the country. This initiative has the potential to produce effects beyond the cluster or even the region and to create linkages between actors located in different parts of the country. This discussion leads us to formulate the following theoretical propositions:

- (2) P_2 . The interests of dominant actors shape the direction of the clusters’ institutional strategies.
- (3) P_{2a} . Where the initial support of powerful actors exists, clusters may rely on defiance strategies, by actively contesting the existing norms, values, and rules.
- (4) P_{2b} . Where the initial support of powerful actors is lacking, the compromising strategies can be used to establish the premises for cluster-based collaboration.

Moreover, both clusters recognize that their success and sustainability, in the long run, depend on their ability to become institutions in their own right by embracing the prescriptions of different stakeholders. The entrepreneurial work is conducted by various cluster actors (the regional authorities, active business community members, education professionals, and the cluster organization) to raise awareness about the need for collaboration, theorize innovation, and narrativize the role of the cluster as an institution in itself. We thus propose the following:

- (5) P_3 . Clusters can ensure their long-term survival by engaging in the “creative embrace” strategy to become institutions in their own right.

Both clusters engaged collectively in “manipulation” strategies (Oliver, 1991) to shape their institutional environments. In the case of Kaluga cluster, by “importing” influential constituents—major global pharmaceutical companies—the cluster gained leverage in influencing the institutional processes, such as the development of industry-related standards and obtained access to additional resources. In Tatarstan, both the weight of the “anchor” companies and the connectedness of the regional elites with the federal authorities gave the cluster the possibility to engage in manipulations strategies. We thus formulate the following propositions:

P₄. Clusters in unsupportive institutional contexts can act as collective institutional entrepreneurs by engaging in manipulation strategies.

Not only did clusters act as institutional entrepreneurs collectively, but these also provided enabling conditions for individual entrepreneurial action by their constituent actors. For instance, the establishment of a formal cluster structure improved collaboration and communication between the actors and facilitated the creation of the dual education system in the Innokam cluster. While the major drive came from individual entrepreneurial actors within the cluster, their participation in the cluster made the implementation of the system possible by connecting actors and helping these find common goals. We thus propose the following:

- (6) *P₅*. Clusters in unsupportive institutional contexts can create enabling conditions for institutional entrepreneurship of individual actors within their boundaries.

Finally, the “bricolage” approach has been evident in three acts of institutional entrepreneurship: the creation of the clusters, the development of the PAM business model and the development of the dual education system in Innokam. Indeed, both clusters aim at leveraging the opportunities presented by the different conceptions of clusters existing in different government bodies to access additional resources. Given the multiplicity of cluster approaches in Russia (one led by the Ministry of Economic Development and the other by the Ministry of Industry and Trade), the clusters have been trying to leverage the resources provided by both cluster support programs. PAM model demonstrated how existing institutionalized forms (such as that of a business accelerator) can be adapted and re-framed to support the emerging structures and business models lacking institutional support and subject to an excessive bureaucratic burden. Finally, the case of the dual education system in the Innokam cluster demonstrated that new structures for collaboration between industries and education organizations can be created from scratch by entrepreneurial actors even in the absence of supporting formal institutions. While previous research demonstrated the value of the “bricolage” approach for less powerful actors (Baker & Nelson, 2005; Mair & Marti, 2009), our study shows that in conditions of resource scarcity it is practiced both by powerful and peripheral institutional actors. In each of the discussed cases, however, it served a different purpose: gaining access to additional resources by clusters, alleviating the bureaucratic burden for the Park of Active Molecules and compensating for the lack of formal institutions supporting the dual education system in Innokam. We thus formulate the following propositions:

- (7) *P₆*. “Bricolage” as an approach to institutional entrepreneurship can be leveraged in unsupportive institutional environments both by the cluster collective and

individual actors within it to obtain additional resources, alleviate the bureaucratic burden or compensate for the lack of formal institutions.

Conclusion

Having set out to analyze how clusters engage in institutional entrepreneurship in transition economies, we focused on the institutional strategies adopted by clusters as meta-organizations to respond to tensions and contradictions in their institutional environments. Our analysis suggests that clusters, driven by entrepreneurial agents at different levels—be these government officials, individual entrepreneurs, or academics—can, indeed, become agents of change in their regions. We propose that such clusters can have a dual role as institutional entrepreneurs. First, these can be institutional actors themselves by allowing the cluster collective to wield more power and thus have a say in shaping institutions. Second, clusters can create an environment enabling individual entrepreneurial action by making the opportunities more apparent and more easily enacted through the pool of resources available to the entrepreneurial actors.

The contributions of this research to theory development are threefold. First, we expand the cluster theory by focusing on self-aware and organized clusters and viewing these as deliberate actors rather than passive “elements” of institutional setup. By analyzing clusters through the lens of the neo-institutional theory, we were able to develop a novel perspective on their role as institutional entrepreneurs in the transition economies, such as Russia. We thus contribute to the development of cluster theory by proposing a new perspective on clusters: seeing these not as geographical areas which are shaped by external forces, but as deliberate and organized actors which can re-shape their regions and nations. Moreover, while most research on the “managed” or “organized” clusters focuses on the role of the cluster facilitators, our study shows that other cluster actors have a significant influence on the direction of cluster development. The roles, interests, power, and affiliations of cluster actors define to a large extent the cluster strategy and the way the cluster interacts with its external environment. Future studies in this field could delve into the analysis of power relations within clusters and their influence on cluster strategy-making. The “power school” in strategic management can provide a suitable lens: it sees strategy-making as a process of negotiation by conflicting groups within an organization or between the organization itself and its external environment (cf. Mintzberg, Ahlstrand, & Lampel, 2005). Thus, it may be worthwhile to explore the differences between clusters’ structures (e.g., mostly “flat” structures in SME clusters vs. “hierarchical” clusters dominated by large private or state-controlled companies, etc.) and their strategies.

Second, we contribute to the field of organization studies by elaborating on a novel concept of “meta-organizations”. We addressed a specific type of meta-organizations, such as “managed” clusters, and suggested that this can be seen as a specific type of a meta-organization due to its context-embeddedness. Future research could explore other types of meta-organizations and their approaches to institutional entrepreneurship. Indeed, meta-organizations are often created to shape their environments and can wield important resources and power (cf. Berkowitz, 2018). However, while the current research mostly focuses on the lobbying activities of meta-organizations (e.g., the institutional strategies of “manipulation”), our research has shown that a wider range of strategic action is possible. Future studies could address this issue, bringing insight into

the influence of meta-organizations on their institutional environments and the types of institutional strategies these adopt collectively.

Finally, we contribute to the institutional theory by examining the institutional action in the context of multiple conflicting institutional logics. While most empirical studies of institutional contradictions assume that organizations face two conflicting institutional prescriptions and adopt a single institutional response to address these (Greenwood et al., 2011), our research suggests that in environments characterized by multiple institutional pressures, several institutional strategies may co-exist. We thus suggest that future research in the field of institutional strategies focuses on the ways different institutional strategies are combined by institutional actors. While we deliberately chose to focus on clusters in different regional and sectoral settings to uncover the complex interactions between various institutional levels and contradictions stemming from these, it would also be worthwhile to analyze same-sector clusters located in different regional settings to gain further insight into the influence of the regional specifics on institutional strategies clusters adopt in unsupportive institutional contexts.

Moreover, our unconventional view of clusters as “context-embedded meta-organizations” may have an impact in practice by providing new language to refer to “managed” or “organized” clusters, thus affecting how these are seen by external audiences and how they perceive themselves (Ferraro, Pfeffer, & Sutton, 2005). Seeing clusters as “organizations of organizations” rather than “geographic concentrations of organizations” can drive their empowerment and cohesion around common system-level goals, ultimately contributing to their innovativeness (Matinheikki, Pesonen, Artto, & Peltokorpi, 2017). If one of the elements of institutional work implies changing the ways actors see things so that they could emancipate themselves and step out of their established roles, then this research can be a steppingstone for clusters to achieve agency and realize their potential as institutional entrepreneurs in unsupportive environments. Constructing agency through discourse, such as this very article, can help achieve legitimacy and establish clusters as important players in the organizational field rather than passive “elements” of broader institutional environments.

Finally, the findings of our research suggest that while clusters can influence their institutional contexts, the strategies they adopt will depend on how they experience their contexts and contradictions stemming from these which is defined by the composition of the cluster. This leads to an important implication for regional policy-making suggesting that by defining the regional actor composition through regional policies—such as investment attraction policies—regional authorities influence the ability of a cluster to act and the range of strategies available to it.

This study is, of course, not without limitations. Specifically, our research was based on Russia as an example of a transition economy. Although transition countries are similar in that they display a multiplicity of institutional logics, there may be important differences across countries in how specific institutional tensions and contradictions interact and shape actors’ behavior. Thus, our findings may not be generalizable to all transition economies. However, we did our best to distill the most general learnings from our cases. Future research could address this issue by adopting a comparative institutionalism approach to analyze the clusters’ institutional strategies in different transition economies, in developed countries versus transition economies or countries corresponding to different varieties of capitalism, i.e., liberal versus coordinated market

economies (Hall & Soskice, 2001; Hotho & Saka-Helmhout, 2017). Moreover, we deliberately chose to focus on clusters that are considered examples of “best practices” to uncover the institutional strategies these adopted to achieve the desired results in un-supportive institutional contexts. This, however, does not suggest that less “successful” clusters do not engage in institutional entrepreneurship and future studies may address such cases to analyze whether these did adopt institutional strategies and why these did not bring the desired results. Such studies may bring important insights into the barriers to institutional entrepreneurship in organized clusters.

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Authors' contributions

ELH collected, analyzed, and interpreted case study data and designed and drafted the work. SB and CDZ provided contributions to the conception and supervised the work. All authors read and approved the final manuscript.

Authors' information

ELH is a post-doctoral researcher in Organisation and Management studies. Her current research focuses on understanding the role of meta-organized clusters in sustainability transitions. This article makes part of her doctoral dissertation written under the supervision of SB and CDZ at the University of Neuchatel in Switzerland and defended in September 2020.

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Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available to preserve the privacy of the interviewees but are available from the corresponding author on reasonable request.

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