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# Innovation cooperative systems and structural change: An evolutionary analysis of Anecoop and Mondragon cases☆☆☆

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## ABSTRACT

In a globalized world, clusters, or territorial production systems, need to evolve into innovation systems to retain their competitive advantages and be able to develop. This study analyzes the cooperative entrepreneurship model as a means of structural change for these clusters, constituting a third way between the private business way and the government-oriented way. Building on an evolutionist approach and a qualitative comparative methodology, the study analyzes two successful cooperatives: Mondragon and Anecoop. As a novelty, this article explains the innovation process from an institutional perspective, combining micro–meso–macro levels. The results confirm that cooperatives are able to articulate structural change processes at the meso-level and to give rise to meso-rules that are functional and determinant in the processes of structural change. The two factors that enable these processes are the cooperative Schumpeterian entrepreneurs and the Hayekian meta-institutions.

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## 1. Introduction

Clusters or territorial production systems need to evolve into innovation systems to face the challenges of globalization. This necessity requires forging closer ties between businesses, science, and technology centers (Carbonara, 2004; Howells, 2012; Lundvall, 1992). To date, the literature offers three essential ways to transform clusters into innovation systems: 1) the private way, 2) the public way (Cooke, 2003), and 3) the “cooperative third way” (Gallego & Chaves, 2015). This article discusses the latter, most recent way, which draws on the meso- rather than the micro-economic nature of change, entailing the adoption of a generic technological, organizational meso-rule by a business population (Dopfer & Potts, 2008). The cooperative model defines a suitable set-up to promote change via collective entrepreneurship (Gallego & Chaves, 2015).

However, this cooperative way does not explain how the necessary coordination mechanisms might emerge to restore stability to the territorial system (Dopfer & Potts, 2008), or how to resolve the “disorganization” effect associated with the process of “destructive creation” that comes with meso-economic change. This disinformation occurs because

the introduction of a meso-rule not only challenges products and processes generating a business population disruption (the Schumpeterian disorganization), but also transforms other meso-rules (generating a macro disruption). To overcome these limitations, this article aims to show that cooperatives in innovative systems are not only able to stimulate innovation within a business population, but also to develop abstract rules to overcome the inevitable imbalances that arise from the innovation process. Cooperatives overcome these problems thanks to their role connecting the different levels of institutional architecture involved in the change.

In the second section, the article outlines an evolutionary approach that draws on the literature on intermediaries, communities of practice (CP), and epistemic communities (CE), to consolidate the micro–meso–macro focus (Dopfer & Potts, 2008). The study uses a qualitative methodology to analyze two successful cases of innovative systems: Mondragon and ANECOOP. The article ends with some conclusions.

## 2. Theoretical framework

### 2.1. The innovative leap in SME systems: the need for a collective push

To face up to globalization, clusters must develop more formal means of learning and cooperation to derive competitive advantages from innovative capacity (Carbonara, 2004). Structural heterogeneity within the business population (skills-scarce businesses with low absorptive capacities) requires the existence of intermediaries (market leaders, entrepreneurial associations, etc.) to enable businesses to cover internal gaps and to instigate a change of vision, business strategy, and collective action (Howells, 2006).

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These cooperative Schumpeterian entrepreneurs (collective intermediaries) play a double role, both driving radical change and supporting innovation policy, thanks to their strategic position within the business production system. They carry out the roles of both leader and nurturer, engaging other members of the system in collective projects, while providing services to help businesses increase their absorptive capacity. The second tier structure of cooperatives leaves them in a better position than market leaders and entrepreneurial associations to carry out this role.

### 2.2. Innovation via meso-economic change and its “destabilizing” effect

According to Dopfer and Potts (2008), an economic system distinguishes between an “operational” and a “generic domain.” The former includes the relationships of exchange that exist between individuals and the organizations they belong to, as well as with the various production and consumption processes. A body of institutions known as “1st order rules or institutions” regulates all these relationships (Dopfer & Potts, 2008). However, the operational domain gives only a static representation of the economy. From the evolutionary perspective of the micro–meso–macro approach, the focus of analysis is the change in the economic system, according to the generic domain (Dopfer & Potts, 2008). Two essential dimensions stand out, inspiring this article:

- 1) Change does not come through the innovation of a single business. Rather, change is the result of the generation, adoption, and retention of innovation by an entire business population, defining a meso-trajectory that drives the configuration of a generic meso-rule. This meso-rule might include new cognitive, behavioral, technological, and/or organizational practices, all rolled up into one (Dopfer & Potts, 2008). The creativity of business owners and entrepreneurs in general is the basic driver of change in this meso-rule (Foster & Metcalfe, 2012). A body of second-tier institutions is also essential in this process to define the “rules for changing the rules,” particularly those governing the relationships and institutions that define the innovation system (Dopfer & Potts, 2008, p. 9).
- 2) Meso-trajectories generate a disorganization effect at the macro level (Dopfer & Potts, 2008). Schumpeter (1934) explains how structural change occurs through a process of “creative destruction” on an essentially micro or meso plane, but he does not pay enough attention to the macro-order effects of the meso-trajectories. Therefore, Dopfer and Potts (2008) examine Hayek’s (1988) institutions to argue the existence of a body of general institutions within an economic system called *0th order institutions*, which are a set of very stable values, rules, and beliefs that play a key role in coordinating the disorder that the meso-trajectories cause. In fact, these meta-institutions would limit the possible behaviors and trajectories, making them compatible.

### 2.3. Cooperatives: changes to meso-rules via collective entrepreneurship

Cooperatives can be valuable actors in supporting the transformation of clusters due to their ability to promote collective entrepreneurship among their members. This promotion is possible thanks to their entrepreneurial and participatory internal governance that, in turn, is the result of their vertical structures with various levels of integratory measures. Furthermore, the genuine cooperative features tend to improve social capital (Spear, 2001). The cooperative’s characteristics result in greater capacity for intra- and inter-sectorial cooperation, including actions in the research and training system.

In addition, cooperatives are good at creating generic rules in three ways: a) by sharing values and routines, they can spread similar practices throughout the organization; b) by bringing together heterogeneous strata and units, they become essential for the internal dissemination of innovation; and their strong territorial ties and

the mutual duty between second and first-level cooperatives mean that c) they tend to “exercise their voice”, in the Hirschman (1970) sense. This combination of (simultaneously) putting pressure on and assisting members, leads cooperatives to increase their skills and absorptive capacities, and adopt innovations. This process is how they contribute to unleashing, adopting, or retaining the meso-rule (Gallego & Chaves, 2015). However, the cognitive distance in absorptive capacities between the various cooperatives does not lend itself to a direct process of imitation and emulation; instead, the process requires second-tier cooperatives to turn to other collective actors, such as communities of practice and epistemic communities.

A community of practice is a body of people who share a set of tasks and formal and informal rules for carrying them out. An epistemic community is a community of practice whose members focus on acquiring knowledge in a given field through a particular scientific approach or cultural perspective. These communities find their definition in the relationships among businesses and other science–technology actors, ushering in a change in the routines on the meso-economic plane. The articulation of the meso-economic level is a way of coordinating the different public and private actors, CP/ECs, and forms of knowing in action (Amin & Roberts, 2008).

CP/ECs play a double role in the configuration of 2nd order institutions: 1) they are vital in the emergence of innovation, because innovation requires the redrawing of the outlines of the CP/ECs, and 2) they are vital in spreading innovation, through the improvement of skills and absorptive capacities included in CP/ECs.

Belonging to several CP/ECs and exploring the creation of new strategies and new CP/ECs makes cross-cutting communities, such as the engineering community, fundamental to the integration of fragmented knowledge (Foray, 2004). This relevance owes to a strong relational tie, which avoids the disintegration of knowledge as the CPs, ECs, and knowledge in action increase their complexity and level of integration. Here, relationships between teacher and student, and students sharing the same profession, serve as force for integration. From this perspective, this article sustains that, together with the 0th order institutions, the networks between CP and ECs include a mechanism for the meta-coordination of the different meso-trajectories, which help to forge meso-trajectory synergies with a coordinating effect, while also generating new and varied meso-trajectories. Meanwhile, the strategic position and central role of cooperative Schumpeterian entrepreneurs, places them at the core innovative network. In fact, their proactive role in the generation of meso-rules, plus their organic entrepreneurial heterogeneity, makes them key actors in the dissemination of said meso-rules. In turn, this dissemination makes them key actors in the creation of new CP/ECs and an essential vehicle for public policies on technology and innovation. “Schumpeterian cooperative entrepreneurs” are essential for articulating meta-coordination mechanisms in the area of knowledge.

Integration structures, like second-tier cooperatives and cooperative groups, spread the meso-rule, but do nothing to address entrepreneurial heterogeneity, which means that they adopt the generic rule in different ways. This process can lead to a “disorganization” effect within and between different meso-trajectories, making them a potential source of tension and a new form of creativity, albeit one in need of coordination. The hypothesis is that cooperatives are spaces for the *organic and spontaneous generation of 0th order institutions* that can include and guide both the meso-trajectories and the different ways in which cooperatives might follow the meso-rule.

Cooperatives create these 0th order institutions, as a result of the interaction between the original goals and principles of the cooperative groups, on the one hand, and the *modi operandi* of cooperatives, on the other. This article argues that the coordinating influence these *meta-institutions* have on internal differences lies in their definition of a code of conduct common to cooperatives, whose evolutions in other respects might diverge considerably.

### 3. Method

Because this research aims to study change in a collective unit (a body of integrated cooperatives), the empirical methodology is qualitative, and consists of two case studies representing realities which, although similar, diverge sufficiently to make the comparison relevant. The cases are Mondragon and ANECOOP Spanish clusters, because of their strong innovation activity in a long term. In both cases, the primary qualitative data comes from in-depth, personal interviews and open questionnaires with the main actors of business, technology and training, and universities within the innovative system. Interviews in 2014–15 addressed technicians, professors, and managers of university departments, technology centers, cooperatives, private companies, and public administrations. The questions focus on the innovation processes' key factors, the innovation networks' dynamics, and the tensions between actors, innovations, and regulatory mechanisms.

### 4. Mondragon case

#### 4.1. Background

Mondragon Group is one of the largest global industrial and cooperative groups, having in 2014, 74,117 employees, 1676 full-time researchers, a turnover of 11,876 million euros, and an allocation of the 8.9% of its industrial added value to R&D across its 15 technology centers and research units (Mondragon, 2015).

The “Mondragon cooperative experience” begins in the Basque Country in the 1950s as an initiative between the parish priest of Mondragon, José María Arizmendiarieta, and a group of five young “disciples.” Arizmendiarieta envisions cooperativism as a means of generating work, while also enabling personal realization and social cooperation. He also considers effort, education, and training as crucial elements for achieving a fairer society (Irizar & MacLeod, 2008). Arizmendiarieta's social and economic project begins with the creation of education associations and institutes to promote his beliefs and values, and imbue a generation of qualified individuals with business sense and know-how.

Arizmendiarieta and some cooperative managers soon become aware of the budding cooperative's limitations. To overcome them, following the “cooperative Schumpeterian entrepreneur,” they execute a series of organizational innovations and create “cover entities.” The Lagun Aro voluntary social welfare body is one of them, though the main entity is the second-tier credit cooperative, Caja Laboral. Caja Laboral constitutes a major milestone: besides creating a financial institution, the credit cooperative establishes a set of meso-rules for the emerging group of cooperative businesses, in the form of an association contract that all cooperatives must sign upon entry. The cooperatives have to follow certain rules, such as reinvesting the whole of their profits and exclusivity to Caja Laboral.

Since the goal is to develop profitable cooperatives, with a relatively high number of job-offers and good working conditions, the company decides that cooperatives would work in sectors with medium-level technological requirements and good market outlooks: “Foreign manufacturing patents were imported, not to use as they were, but to adapt them to the Spanish market. This defined a propensity for process innovations, acquiring new foreign patents to address product innovation needs” (Quevedo, 2015, personal interview).

#### 4.2. Dynamics of the Mondragon innovation cooperative system

The cooperative education system offers increasingly advanced studies to ensure an adequate flow of engineers, managers, technologists, and production workers. The Eskola Politeknikoa is essential in this respect, along with other training initiatives, which come together to form the Mondragon University.

What would later come to define the meta-coordination par excellence of this group of cooperatives is already present right from the first decades of the “Mondragon experience”: “The development of the cooperative was based on reinvestment of profits which, together with injections of capital from the worker-members, were to be sufficient to allow the investment necessary to subsist as a business” (M. Quevedo, personal communication, February 4, 2015).

In the early seventies, a second stage in the industrial evolution of the Mondragon cooperative group begins, with the creation of Ikerlan, a research center which would become the benchmark technology center for both the Group's and Basque's industrial and technological policy from the eighties onwards: “Ikerlan emerged as a direct initiative of Caja Laboral, as an expression of its leadership and enterprise, not in response to a need identified and pushed for by the Group's cooperatives” (M. Quevedo, personal communication, February 4, 2015).

Ikerlan was developed out of the Eskola with a clear focus on technological improvement within the Group's cooperatives. Ikerlan's operational structure was organized around two project types. On the one side, there were the generic projects, financed essentially by Caja Laboral and devoted to training Ikerlan's scientific-technical personnel. They were considered essential to both the learning process and that of encouraging the businesses to generate new technologies. The second type of project and activity were those carried out under contract with Ikerlan, with and financed by the businesses. To ensure close ties between the businesses and Ikerlan, joint teams were formed with technical personnel from both sides, forming the basis of a smooth communication between the Eskola, Ikerlan and the businesses (M. Quevedo, personal communication, February 4, 2015).

These joint teams are the basic development mechanisms of the meso-trajectories of innovation in the different sectors of the Basque industry.

#### 4.3. Meso-trajectories, tensions, and meta-coordination mechanisms

The literature barely covers the effect of the previously mentioned association contract, the regional and sectorial groups of cooperatives, and the Mondragón Cooperative Corporation (MCC) itself since its creation in 1991. Through this contract, the cooperatives receive financial support and quality business-consulting from the credit cooperative, in exchange for adhering to a set of management guidelines ensuring business viability and competitiveness. These mechanisms enable a) the homogenization of the cooperatives' codes of conduct, and b) the activation of new meso-trajectories through innovative cooperatives.

Mondragon has regulated tensions internally:

- 1) Tensions related to the strategic mission of the MCC innovative system's technology centers, deriving from changes in their skilled human resources and financial support. The Mondragon Group's technology centers send their best students to the Eskola Politeknika for training abroad, to boost the teaching and research capacity of the Eskola and the technology centers. However, the resulting scientific-technological upgrading of the newly-qualified personnel causes tension at the technology centers, because this upgrade puts research aimed at serving the interests of the cooperatives at loggerheads with the more strictly scientific ambitions of some of the newly-trained personnel. The Group resolves this tension allowing some of these researchers to leave to work at other technology or research centers of the MCC group, other businesses, and sometimes even abroad. Similarly, another source of tension changes to the origin and purpose of the financial support of the technology centers (the Group, the Basque government or the European Union) (M. Quevedo, personal communication, February 4, 2015).
- 2) Tensions deriving from the increasing fragmentation of the R&D units. As the MCC cooperatives develop and diversify, the technology

centers and other units multiply, from general-focus technology centers (targeting various sectors and SMEs) to specialized technology centers catering to single large cooperatives, having emerged as spin-offs from their in-house R&D department. The historical ties between key personnel at these units mitigate the tensions that this process creates.

- 3) Tensions deriving from changes in the worker-member culture. Worker-members, especially the younger generations, tend to value job security and immediate profit distribution over the collective cooperative project (Heras-Saizarbitoria, 2014). However, the founders' meta-rules allay these tensions.

## 5. ANECOOP case

### 5.1. Background

ANECOOP is a second-tier cooperative and one of the leading citrus exporter multinationals in the world. The cooperative accounts for around 10% of all Spanish citrus exports (ANECOOP, 2015: 8), with Spain currently being the largest global citrus exporter. 31 Valencian fruit and vegetable first-tier cooperatives created ANECOOP in 1977.

Its origins lie necessarily in the unique conditions of the citrus sector in Valencia. This sector has traditionally been a fragmented sector with a clear market focus, which raises a generalized speculative behavior. In this sense, the sector's actors seek to exploit the advantage of information (asymmetric information) to get the most out of their produce. Farmers delay sales as long as possible, holding out for the best prices. They also tend to select which produce to sell, and where, according to its quality, selling the worst quality produce to the regional government or the cooperative itself, where prices are more or less stable, and selling the best quality to the private sector. Over a century and a half of these practices leads to the emergence of a "speculative convention" across an entire body of traditional Mediterranean fresh fruit and vegetable farming systems (Gallego & Lamanthe, 2011). This convention constitutes a meta-coordination mechanism, regulating both the clusters' process of transformation into innovative systems, and the role of the cooperatives within them.

### 5.2. Dynamics of the ANECOOP innovation cooperative system

The citrus cooperatives' development model consists on the creation of one or more cooperatives in each municipality (Gallego & Lamanthe, 2011). This process limits the growth of the cooperatives and the professionalism of the managerial ranks (Giagnocavo, Gerez, & Campos, 2014).

ANECOOP emerges in this context, comprising cooperatives that coexisted despite large differences in size, entrepreneurial dynamism, and technical and managerial professionalism. Although its original objective is to increase the export capacities of its member cooperatives, ANECOOP assumes new roles over time. Specifically, the cooperative leads the structural transformation of the citrus production system, while also adapting the system to the changing context. This structural change focuses on mitigating the effects of the "speculative convention", obliging member cooperatives to sell a high percentage of their production through ANECOOP channels (today this percentage stands at 62%). Other long-standing objectives are to increase managerial efficiency and professionalism, to promote organizational innovation within the cooperative cluster, and to foster first-tier cooperative mergers (Julià, Melià, & García, 2012). More recent times have seen the creation of the Anecoop Business Group, which constitutes the most advanced of these structural changes (ANECOOP, 2015).

ANECOOP leads an innovative collective response to the radical changes going on in the citrus cooperatives' operational area, changing market conditions, with big distribution chains now dominating, and changing quality, food security, and environmental requirements.

For this immense challenge, ANECOOP needs to implement organizational innovations to ensure that all the cooperatives can continue to do so under these new conditions. ANECOOP's innovations instigate a change in the production and sales knowledge bases (generic rule) of its cooperative members.

First, ANECOOP improves its research capacity, going beyond the strictly commercial and venturing into post-harvest and agricultural production. ANECOOP does this by forging relationships with providers, with research and training centers, and public administrations (Gallego & Chaves, 2015). Second, ANECOOP shares R&D's research's results and technical consulting with the first-tier cooperatives with a view to fostering the spread of innovation (ANECOOP, 2015). Third, ANECOOP establishes a CP of technicians requiring its member cooperatives to recruit technical personnel, agricultural engineers primarily. These new recruits, along with ANECOOP's internal technicians from Valencian public universities (UPV and UV), become the vehicle through which ANECOOP spreads its vision and structural change strategy.

Other forums for interaction between new science-technology actors emerge alongside this CP, which engenders new CPs and ECs. This situation gives the relationships between researchers and technicians working at ANECOOP member cooperatives' fruit processing installations and test fields. All of this generates an interactive, cooperative and symbiotic relationship between technicians and researchers, thanks to the applied nature of the research across multiple areas (plagues and diseases, vegetable physiology, etc.). This cooperation in turn leads to the increasing integration of the CPs and ECs, which fuels the development of stable informal relationships between cooperative technicians and researchers. Training initiatives consolidate these growing ties, generating new interactions between key actors in the system.

A final important interaction space is the national citrus work group, which brings together researchers, public administration technicians, and other companies from the value chain. The interaction deals with new issues in applied research, in which technicians, researchers, lecturers, and managers participate, bringing and merging together the different CPs and ECs. The vast majority of technicians and researchers of this national group are agricultural engineers, with strong and trusted teacher–student relationships and cognitive proximity (Gallego & Chaves, 2015).

### 5.3. Meso-trajectories, tensions, and meta-coordination mechanisms

This structural change also has tensions. First, tensions arise between the larger (professional) and the smaller (non-professional) cooperatives, because the former want a more profound structural change (integration, etc.) than the latter; second, the tensions derive from the issues of legitimacy surrounding the existence of non-professional managers, which makes adjustments between technological, organizational, cognitive, and behavioral innovations quite difficult. This issue of legitimacy generates strong tensions among cooperative members and employees. To the former, only employees, alongside managers, benefit from the cooperative.

The competition between the cooperatives and other competing organizational structures is also a source of tension. The cooperatives are unable to grow because they have to fight against the "speculative convention". This convention fosters only a limited commitment in two directions: from the cooperative members towards the cooperative and from the cooperatives towards ANECOOP. However, this speculative convention, along with the threat of members leaving, is what fuels the dynamism of the cooperatives and the sectorial/territorial system as a whole. This situation occurs because the combination of different possible ways to market is in itself a source of dynamism (Gallego & Lamanthe, 2011). In addition, these speculative behaviors mean that the actors exploit any legal loophole and/or any business opportunity to forge new means of conducting business, leading to the appearance of variety, the basis of innovation.

## 6. Conclusions

Clusters/territorial production systems face the challenge of becoming innovation systems to take on globalization. The processes of change that this transformation requires are meso-economic processes, entailing the need for a heterogeneous business population to introduce innovations by developing meso-trajectories. However, these technological, organizational, cognitive, and behavioral meso-trajectories generate imbalances in the macro order, needing to integrate the different meso-trajectories. This process requires an abstract institution with previously-established rules and values (Hayek, 1988), which coordinates these meso-trajectories imposing behavioral limits throughout their course (Dopfer & Potts, 2008).

Cooperative systems represent a third way for shaping innovation systems, other than the public and private ways. On the one hand, the integration structures of the cooperatives and the cooperatives' principles, allow them to generate a set of pressure and support mechanisms for their member entities. This process turns them into a useful mechanism for collective entrepreneurship, both for the creation of innovation and for its dissemination (Gallego & Chaves, 2015).

Nevertheless, the main feature of cooperatives is that, during their development process, integration structures (genuine *cooperative Schumpeterian entrepreneurs*) feel the need to establish a set of basic rules by which an entire heterogeneous business population must abide. Over time, these rules, emerging initially as entirely intentional, have become meta-institutions with the capacity to internally self-regulate the tensions of the processes of technological and organizational innovation, which have featured the formation of Cooperative innovation systems.

This article goes beyond the literature on cooperatives, and even beyond Dopfer and Potts (2008) micro-meso-macro approach, demonstrating the capacity of cooperative innovation systems to stimulate from within the development of meta-institutions.

The above processes allow cooperatives to blossom into genuine *innovative core of networks*. That is, into intermediaries with the capacity to participate in the formation of the innovation systems' defining institutions, what Dopfer and Potts (2008) call 2nd order institutions. Cooperatives' condition as proactive nexuses in the generation of innovation networks allow them to be vehicles for public policy on technological innovation, and to coordinate communities of practice and epistemic communities.

In the case of Mondragon and ANECOOP, their success and their ability to navigate important processes of technological and organizational innovation are clear. In both instances, boosting the member cooperatives' technological and organizational capacities leads to meeting the imperatives of the market. This situation brings both cooperatives closer to complex and developed communities of practice and epistemic communities, and consolidates ties with science and technology centers and other actors in regional technological policy. In both cases, these processes of change generate tensions, which have been possible to resolve from inside the cooperative systems thanks to the meta-institutions from the vision of the *cooperative Schumpeterian entrepreneurs*.

In the case of Mondragon, profit reinvestment meta rule is a major cornerstone and a cooperative support mechanism for the cohesion of the group. In addition, the leaders' concern towards a pro-industrial focus for the Group's technology policy reinforces the linkages of the cooperatives with universities, technology centers, and businesses. Cooperatives generate then not only routines in the innovation system, but also regulatory meta-institutions governing the imbalances that continually generate within a dynamic organization.

With ANECOOP, the development of the cooperative in the context of a meta-institution so territorially-rooted in Valencia, specifically in its citrus sector, as the "speculative convention," limits the growth of the founder cooperatives in the area of commercialization, and kick-starts the ongoing development of this second-tier cooperative, and its first-tier cooperatives' competitiveness.

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