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Shared Resources and Cluster Life Cycle: A study in the footwear sector in Brazil and Italy

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ABSTRACT:

Clusters are considered sources of competitive advantage. A cluster is understood as a set of resources; however, it is noted that these resources vary according to their trajectory. Thus, this paper seeks to analyze the relationship between shared resources in the life cycle of the cluster. We conducted a cross-country study with two clusters in the footwear industry: Brazil and Italy. We present two main contributions. First, the competitiveness of clusters is sustained by their ability to renew and change their dependent trajectory. Second, we propose five elements that positively influence cluster competitiveness. These elements also help us understand the trajectory of clusters.

KEYWORDS: Regional clusters; cluster life cycle; strategic resources; competitiveness; cross-country study.

JEL CLASSIFICATION: R1; R11; O52; O54.

Recursos compartidos y ciclo de vida del clúster: Un estudio en el sector del calzado en Brasil e Italia

RESUMEN:

Los clusters se consideran fuentes de ventaja competitiva. El cluster se entiende como un conjunto de recursos; sin embargo, se observa que estos recursos varían según su trayectoria. Así, este trabajo pretende analizar la relación entre los recursos compartidos en el ciclo de vida del cluster. Realizamos un estudio transnacional con dos clusters de la industria del calzado: Brasil e Italia. Presentamos dos contribuciones principales. En primer lugar, la competitividad de los clusters se sustenta en su capacidad de renovar y cambiar su trayectoria dependiente. En segundo lugar, proponemos cinco elementos que influyen positivamente en la competitividad de los clusters. Estos elementos también nos ayudan a entender la trayectoria de los clusters.

PALABRAS CLAVE: Clusters regionales; ciclo de vida de los clusters; recursos estratégicos; competitividad; estudio transnacional.

CLASIFICACIÓN JEL: R1; R11; O52; O54.

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1. INTRODUCTION

The clusters are systemic structures that are subject to research since they are considered an engine of economic development and a source of competitiveness (Felzensztein, Gimmon, & Deans, 2018). Due to the direct relationship between the cluster system and competitiveness, the notion of these structures and their approach have changed, answering to the need to evolve and adapt to current market conditions (Mudambi et al. 2017; Castellacci 2018; Yoon and Nadvi 2018; Comunian and England 2019). For instance, the premise used to be to gain a competitive advantage based on the synergy in a geographical location; whereas now, synergy is directed towards the formation of knowledge networks based on multiple factors that affect competitiveness (Cano-Kollmann, Cantwell, Hannigan, Mudambi, & Song, 2016; Sosnovskikh, 2017; Taddeo, Simboli, Morgante, & Erkman, 2017).

Several models have been developed to relate the main factors and capacities with the contribution to business and cluster competitiveness (Martínez-Marín, Puello-Pereira & Ovallos-Gazabon, 2020). Probably the most appropriate theoretical lens is the Resource-Based View (RBV) since its central proposition is that the source of competitive advantage can be found in the resources and competencies developed and controlled by organizations (Barney, 1991; Dierickx and Cool, 1989; Grant, 1991; Wernerfelt, 1984). The *Resource-Based View* perspective (Wernerfelt, 1984; Prahalad and Hamel, 1990; Barney, 1991; Grant, 1991; Peteraf, 1993) initially developed to analyze the firm competitiveness through its resources and capabilities has been expanded to understand the cluster resources (Molina-Morales, 2001; Hervás-Oliver and Albors-Garrigós, 2007; Molina-Morales and Martinez-Fernandez, 2008; Zen, 2010; Zen, Fensterseifer and Prévot, 2011; Li and Geng, 2011; Gohe and Oliveira, 2019) using it as the unity of analysis.

The importance of such a perspective resides in the fact that competition goes beyond products and markets, involving strategic resources. Such resources are generally intangible and highly valuable since they are neither easily identifiable nor quickly developed by competitors (Fensterseifer, 2009). As the firm requires the development and renewal of strategic resources (Grant, 1991), the cluster development trajectory of strategic resources impacts its competitiveness (Hassink, 2007). Therefore, the cluster development trajectory over time is called the cluster life cycle (CLC), thus resulting in a dynamic that involves diverse cluster stages and resources. Finally, the cluster resources and life cycle stage of the cluster reflect the competitiveness of the clustered firms.

In this context, we argue that the cluster resources can influence the firms' competitiveness (Zen, Fensterseifer and Prévot, 2011), and those resources may be related to the stage at which the cluster is in its lifecycle. Thereby, this paper analyses the relationship between shared resources in the CLC. Cross-country studies provide richer analysis possibilities since countries have unique complexities and characteristics (Ghemawat, 2001), then, this study analyses the relationship between cluster life cycle and resources from the perspective of distinct contexts within the footwear industry: Brazil and Italy.

This study contributes in several ways to the literature on the CLC, discussing triggers to new stages and the competitiveness of clusters. The results suggest that the key elements to maintain cluster competitiveness are related to the resources and stages of CLC. These elements also help us to understand the trajectory of clusters and the role of cluster resources. The following section explores the literature review, followed by the methodological procedures, the research findings, and discussions. The final section presents the final considerations, our contributions, limitations, and further research.

2. THEORETICAL FOUNDATIONS

2.1. THE CLUSTER RESOURCES

Clusters are economic agents resulting from synergies among their actors (Morosini, 2004). Thus, inter-company connections, as well as company-institution connections, and the individual firms' perfecting enhances the set of unique cluster resources and capabilities (Hervás-Oliver and Albors-Garrigós, 2007). Molina-Morales (2001) suggested the term *shared resources* to refer to resources and

capabilities shared by clustered firms. A characteristic of shared resources is causal ambiguity (Reed and DeFillippi, 1990; Fahy, 2002) for non-members because it is difficult to understand what combination of resources is responsible for the cluster success, therefore turning it difficult to imitate (Molina-Morales, 2001).

Seeking to understand the resources and capabilities of the cluster in a study of ceramic tiles in Italy and Spain, Hervás-Oliver and Albors-Garrigós (2007) identified the following cluster resources: availability of skilled labor; social interactions; marketing sophistication; connections with suppliers; institutional connections and support in R&D; and institutional connections and training support. According to Fensterseifer (2009), clustered firms can benefit in two ways: the Marshallian positive externalities, accessible to all the clustered companies, and the advanced benefits, available to firms with higher knowledge bases and capabilities. Therefore, two distinct classes of resources at the clustered firm level are highlighted (Zen, 2010): singular resources and cluster resources. Singular resources refer to the firm's unique resources, that are supported by its strategy and result in the heterogeneous performance of the clustered firm.

Shared or cluster resources result from their spillovers on the environment and are shared among clustered firms, serving as elements of inter-clusters competitiveness and impacting the internationalization process of the firms. These shared resources are a source of competitive advantage for the clustered firms (Li and Geng, 2011). The cluster has a portfolio of resources, which fosters the competitiveness of the clustered companies, and the governance of actors is paramount for the articulation and use of resources. Additionally, it generates collective efficiency (Schmitz, 1999) in clusters.

As each firm has a unique set of resources, the cluster resources emerge from the combination of the firms' resources, the exchanges among actors, the collective knowledge and capabilities generated, and the external relations of the cluster. The cluster resources evolve over a sustained period through a mechanism of regional collective learning (Li and Geng, 2011). Based on the literature review (Molina-Morales, 2001, Fahy, 2002, Hervás-Oliver and Albors-Garrigós, 2007; Zen, 2010; Li and Geng, 2011), we propose a classification of cluster resources in Table 1.

In our classification, we consider cluster resources as tangible or intangible. Tangible resources are of financial, physical and operational, and technological nature. The financial resources involve the financial solidity of the companies in the region as well as their access to such resources through institutions, government incentives, and credit lines. Physical and operational resources refer to the productive infrastructure as well as logistics and distribution availability, such as distribution centers, ports, roads and railways, qualified carriers, and ease of access. The technological resources are related to knowledge and technology development, such as research, development, and regional qualification centers, which generate synergies and enrich the territory, specialized training centers, and technical committees when applicable, since the standardization of technical aspects may depend on the industry and market.

As for intangible resources, human resources involve the workforce's level of qualification as well as its ease of access. Additionally, it relates to regional cultural factors, which impact the manner companies and institutions interact and how people work. Marketing resources are related to cluster collectivity, such as quality certifications, marketing development, and reputation. Reputation relates to the recognition of either the region or the country for a given product or service. The reputational capital of a country determines its ability to build alliances, attract investments, stimulate channels for tourism flow, and influence consumer behavior abroad, that is the *country-of-origin effect*, whose country's reputation may exert influence on the perceptions of foreign consumers (Marino and Mainolfi, 2013). Internal management is directly related to the governance of actors, involving its articulation, access to the cluster's resources, the incentive to interact and cooperate, and the collective exploration of strategic opportunities. Finally, external relations involve the prospection of opportunities, contacts, and knowledge outside the cluster. The strong governance of players is paramount in this regard to assist firms with external linkages.

Since cluster competitiveness involves the development of resources within a complex environment, it is possible to affirm that there is a trajectory of cluster resource development over time, because there is a recurrent need to improve existing resources, as well as to acquire and create new ones.

TABLE 1.
The Classification of Cluster Strategic Resources

Resources		Description
Tangibles	Financial	Access to credit Government incentives and benefits Financial soundness of regional firms
	Physical and Operational	Geographical location Production infrastructure Logistics and distribution
	Technological	The existence of technological research institutes Access to technical assistance, consultancy, and technological orientation sharing of technical resources (laboratories and testing centres) The existence of specific training centres and technological development specific to the region technical committees of standardization and quality
Intangibles	Marketing	Reputation (country, region, cluster) Market development Quality certification
	Human	Access to skilled production workforce Access to specialized management and strategy workforce Regional culture (cultural aspects, entrepreneurship, and competition between companies)
	Internal Management	Horizontal and vertical cooperation Governance Social networks Acquisition of internal knowledge Exploitation of knowledge and creation of cluster strategies
	External Relations	Horizontal and vertical cooperation Acquisition of external knowledge The search for opportunities and partnerships Linkages with institutions and clusters within and outside the regional scope

Source: Elaborated by the authors, based on Wernerfelt (1984), Grant (1991), Barney (1991), Bonaccorsi (1992), Molina-Morales (2001), Fahy (2002), Hervás-Oliver and Albors-Garrigós (2007), and Zen (2010).

2.1. CLUSTER LIFE CYCLE

The literature on cluster life cycle (CLC) originates from questioning the reasons that lead clusters to present different trajectories (Cusmano, Morrison and Pandolfo, 2015). Despite the development of approaches in this field, the cluster trajectory is still a developing topic since there is no empirical model or evidence that explains how clusters evolve (Belussi and Hervás-Oliver, 2016). The CLC approach has grown in popularity in the analysis of the development of agglomerations (Tripl, Grillitsch and Isaksen, 2016). One principle of this approach is that the cluster has a dependent path through which it undergoes phases of success and decline, independently of the size or robustness of the agglomeration (Santner and Fornahl, 2014).

Scholars present various characteristics of different stages of the CLC (see, e.g. Van Klink and De Langen 2001; Menzel and Fornahl 2010; Martin and Sunley, 2011), but all of them agree that there are distinct 'emergence', 'growth', 'maturity' and 'decline' phases (Hervás-Oliver and Albors-Garrigós, 2014). During the emergency phase the agglomeration is not a proper cluster yet, however, the cluster foundations, as well as the growth process, are designed during this phase. Thus, an emerging cluster presents a few companies and synergies (Menzel and Fornahl, 2010). There are two possible paths at this stage, the first is to lose strength and not become a cluster, second is to develop to the extent of the growth stage. The growth phase characterizes the increase of companies and employees, start-ups, as well as the

presence of institutions. Hence, opportunities such as innovation networks and value chain relationships emerge. The stage of sustainment or maturity is a stage of equilibrium in which the regional environment molds the cluster. This stage is characterized by homogeneous networks that reduce local diversity, and consequently, the potential for renewal. At this stage, there are three possible trajectories: (i) change the current path through new technologies, (ii) change to completely different fields/industries, or (iii) the cluster's end (Menzel and Fornahl, 2010).

The cluster reaching the maturity or sustainment stage tends to undergo a *lock-in* process, in which it is difficult to adapt, innovate and respond to the market, leading to the loss of competitiveness, and putting at risk the agglomeration's future. However, if the cluster overcomes the obstacles, it can proceed to a transition period, entering a new cycle. Such change in trajectory is often driven by new actors (Van Klink and De Langen, 2001; Menzel and Fornahl, 2010). Thus, this approach not only indicates the relationships between life cycle stages and the cluster but other driving factors.

Elola, Valdalisó, López and Aranguren (2012) identified several factors of influence divided among those who support the emergency and those who support the growth stage. The emergency factors of influence are locally related, whereas the growth stage factors are either locally or globally related. Tradition, history, anchor companies, entrepreneurship, local demand, and local policies are local factors, whereas the internationalization process influences both the emergence and growth stages. Additionally, the entry of multinational corporations (MNCs) within the region, as well as foreign investment, entrepreneurship, and the entry of external knowledge and technologies could be related to the cluster emergence. The growth stage influencing factors are strategic capabilities, the sophistication of local demand, regional and national policies, global competition, and demand growth. Therefore, endogenous and exogenous factors characterize the current stage of CLC (Martin and Sunley, 2011).

Thus, the emergence stage presents a small number of firms and low or no interaction among them, at this stage, the cluster is not yet consolidated, but rather its foundations are forming (Menzel and Fornahl, 2010). Additionally, the absorptive capacity also tends to be minimal (Presutti, Boari and Majocchi, 2013). As the local industry develops the geographical agglomeration grows, increasing the number of firms and startups, and interaction processes such as spin-offs. Additionally, knowledge exchanges occur, aiding in the generation of innovations (Menzel and Fornahl, 2010). Finally, spin-offs are a key factor for cluster growth and performance (Cusmano, Morrison and Pandolfo, 2015).

At the growth stage, the cluster knowledge system is already built, and the local institutions are well developed (Presutti, Boari and Majocchi, 2013). When this stage ends, the firms tend to disperse, and the knowledge generated within the cluster is less heterogeneous. This leads to the equilibrium state where there is neither growth nor decline in terms of firm numbers and knowledge generation, characterizing the sustainment stage ((Menzel and Fornahl, 2010). The decline phase occurs through the loss of the ability to adjust to environmental changes. Otherwise, the cluster would undergo a period of renewal, adaptation, or transformation. The renewal stage implies the development of a new technological trajectory or related technologies, generally from other localities. Transformation, on the other hand, is the cluster transition to completely different operational areas (Menzel and Fornahl, 2010).

We can understand that cluster development involves stages in which the firm resources, the availability, and usage of technologies, as well as learning and innovation capabilities differ. Thus, actors (firms and institutions), networks, the industry, and the region are the main elements for the analysis of the cluster stages (Bergman, 2008; Menzel and Fornahl, 2010; Tödting, Sinozic and Auer, 2016). Hervás-Oliver and Albors-Garrigós (2014) explore technological gatekeepers' resilience across different stages of the CLC. Their findings indicate that not all technological gatekeepers are resilient and necessary for cluster renewal. In addition, technological gatekeepers are necessary to facilitate a cluster's transition across stages thanks to their control of the most vital aspect of clusters: networks.

The understanding of the current stage of the cluster life cycle, as well as the past stages, involves several quantitative and qualitative factors as well as characteristics, which will differ according to the life cycle stage. Thus, Table 2 shows the characteristics of the four main life cycle stages.

TABLE 2.
Characteristics of the clusters life cycle stages

Stage	Characteristics	Authors
Emergence	Startups, spin-offs, and few technologically differentiated firms; minimal firms' absorptive capacity; aid public policies; the necessity of scientific foundation and skills.	Menzel and Fornahl (2010); Presutti, Boari, and Majocchi (2013)
Growth	Increasing number and size of the firms; the increasing in specialization; significative interaction and learning; innovation; new institutions arise; institutional development; homogeneous knowledge base; better designed knowledge system; development of innovation and supplier networks; skilled workforce; local infrastructure; access to sophisticated markets and consumers.	Menzel and Fornahl (2010); Presutti, Boari, and Majocchi (2013)
Sustainment	Dense firm networks; single technological trajectory; propensity to lock-in process due to exhaustive renewal capacity.	Menzel and Fornahl (2010); Tödting, Sinozic, and Auer (2016)
Decline	Decreasing number of firms and employees, and bankruptcies occur; focus on a narrow trajectory; closed networks prevent the cluster adaptability; negative feelings about the cluster.	Menzel and Fornahl (2010)

Source: Elaborated by the authors.

The perspective of the RBV seeks to identify the capacities, competencies, and resources necessary for the implementation of emerging technologies, which allow low-technological sectors to add value and thereby generate competitive advantages for a segment. In the different stages of the CLC, we can observe the creation, modification, and destruction of cluster resources, mainly in the emergence and growth stages. However, during the maturity stage, the clustered firms can enter in a lock-in process and going to decline (Schmidt, Santos, Zen, Bittencourt and Belussi, 2020). the lock-in process keeps the cluster inertia and will restrict the evolution of cluster resources, i.e. the creation of new resources, modification, or destruction of old resources. As an alternative, the renewal stage demands new and modification of assets and resources, such as new knowledge, technological resources and institutional changes (Isaksen, Trippl, Kyllingstad and Rypestol, 2020). Considering the evolutionary perspective, the cluster's decline can indicate that the current trajectory and cluster resources no longer fit the established economic structure (Martin and Sunley, 2011; Menzel and Fornahl, 2010; Schmidt et. al., 2020).

The cluster is characteristically incipient and unstable during the emergence stage, whereas during the growth phase, it is stable, and manifests growth trends. The cluster in the sustainment state reaches its peak of strength and stability. However, innovations tend to decrease, as well as the heterogeneity of knowledge. The cluster can move through alternative trajectories, which, according to Menzel & Fornahl (2010) are the stages of renewal, adaptation, and transformation. However, changing the path requires an increase in firms and knowledge. Tödting, Sinozic and Auer (2016) affirm that the cluster can either transform and renew itself during the sustainment stage, by employing new knowledge or technologies, or enter a phase of decline. The decline stage characterizes contraction and a weakening. Thus, according to the life cycle stage in which the cluster is, it will present a set of different characteristics and resources that will impact its activities, the inter-organizational relationships, and the strategy adopted by the cluster.

3. METHOD

We conducted qualitative research based on two case studies, the Italian footwear cluster in the Marche region, and the Brazilian footwear cluster in the Rio Grande do Sul region. The choice of both clusters is due to the reputation of the two countries as global players in the footwear industry. Additionally, the research has rich analytical potential once the clusters seem to be in diverse phases of the life cycle, and

both have undergone different trajectories. The selection criteria were based on: (i) being a consolidated cluster; (ii) having joint strategies. The data collection was carried out with different actors, aiming at an understanding of diverse perspectives of the clusters.

Three dimensions of analysis were defined for the development of this research: (i) cluster life cycle; (ii) resources identified in the current stage of the cluster life cycle. The dimensions of analysis were investigated from secondary data such as reports and databases of industry associations in both countries to understand the performance of such socioeconomic entities (Morosini, 2004). The contact with the interviewees was carried out firstly in Italy, where the interviews and visits happened between April and June 2016. The interviews were conducted in Italian and lasted between 30 minutes to 1 hour. Table 3 lists the fictitious names of the players interviewed and their respective positions.

TABLE 3.
List of interviewed actors and positions in Italy

Organization	Foundation Year	Code	Role	Service Years
COMPANY A	1972	EI_A	Founder	45 years
COMPANY B	1969	EI_B	Founder	48 years
COMPANY C	1989	EI_C	Business Successor	2 years
COMPANY D	1991	EI_D	Commercial Director	11 years
COMPANY E	1973	EI_E	Commercial Director	24 years
COMPANY F	1979	EI_F	Manager	32 years
COMPANY G	1969	EI_G	Business Successor	30 years
INSTITUTION A	1946	II_A	International Manager	10 years
INSTITUTION B	1979	II_B	General Manager	18 years
INSTITUTION C	1980	II_C	President Director	12 years

Data collection in Brazil occurred between August and October 2016, and the interviews lasted between 40min to 1h15min. Since this research is part of a greater research project on clusters by the Research Group on Strategy, Internationalization, and Innovation (GPEI-UFRGS), a few interviews were conducted by the author with the attendance of other GPEI researchers. Table 4 lists the interviewees in Brazil as well as their identification and roles.

TABLE 4.
List of interviewed actors and positions in Brazil

Organization	Foundation Year	Code	Role	Service Years
COMPANY A	1928	EBR_A	Marketing and Communication Director	11 years
COMPANY B	2002	EBR_B	Entrepreneur	15 years
COMPANY C	2001	EBR_C	Entrepreneur	16 years
COMPANY D	1987	EBR_D	Chief operating officer	16 years
COMPANY E	1962	EBR_E	President Director	16 years in the role
COMPANY F	1995	EBR_F	Vice-President	7 years in the role
COMPANY G	1945	EBR_G	Marketing and Communication Manager	3 years

TABLE 4. CONT.
List of interviewed actors and positions in Brazil

Organization	Foundation Year	Code	Role	Service Years
COMPANY H	2013	EBR_H	Entrepreneur	4 years
COMPANY I	1985	EBR_I	Export Manager	27 years
COMPANY J	1980	EBR_J	Export Manager	9 years
COMPANY K	1949	EBR_K	Supply Chain Manager	17 years
COMPANY L	1945	EBR_L	Product Development	7 years
INSTITUTION A	1983	IBR_A	Project Manager	10 years
INSTITUTION B	1983	IBR_B	Director	16 yearstem

Data processing was conducted through content analysis, which according to Bardin (2011) is a set of communication study techniques with systematic and objective procedures, aiming to describe the content of the messages through indicators (either quantitative or not) that allow the inference of knowledge related to the production and perception of these messages. Thus, data processing was done based on interview transcripts, data gathered by observation, and data resulting from the documentary survey.

4. RESULTS

Footwear production migrated from the artisanal sphere to mass production after the sewing machine invention in the twentieth century. The footwear sector is part of the so-called traditional industries (Guidolin, Costa and Rocha, 2010), and despite the change in production scale and automation of some productive stages, it is yet considered semi-artisanal once it is labor-intensive (Baldi, 2004; Guidolin, Costa and Rocha, 2010). Due to its workforce intensity, the global footwear industry has gone through a process of migratory production for countries and regions plentiful in lower-paid workers (Baldi, 2004; Blois and Souza, 2007).

There are two standards of worldwide competition in this sector, through prices or via factors related to status and quality, such as design, comfort, quality, fashion, and branding (Baldi, 2004). Thus, countries investing in design, marketing, and the coordination of the production and distribution chain sustain competitive advantages, due to their ability to maintain an active role in the value chain. Therefore, countries that focus on costs tend to lose competitiveness, playing the role of coadjuvants in the footwear value (Guidolin, Costa and Rocha, 2010).

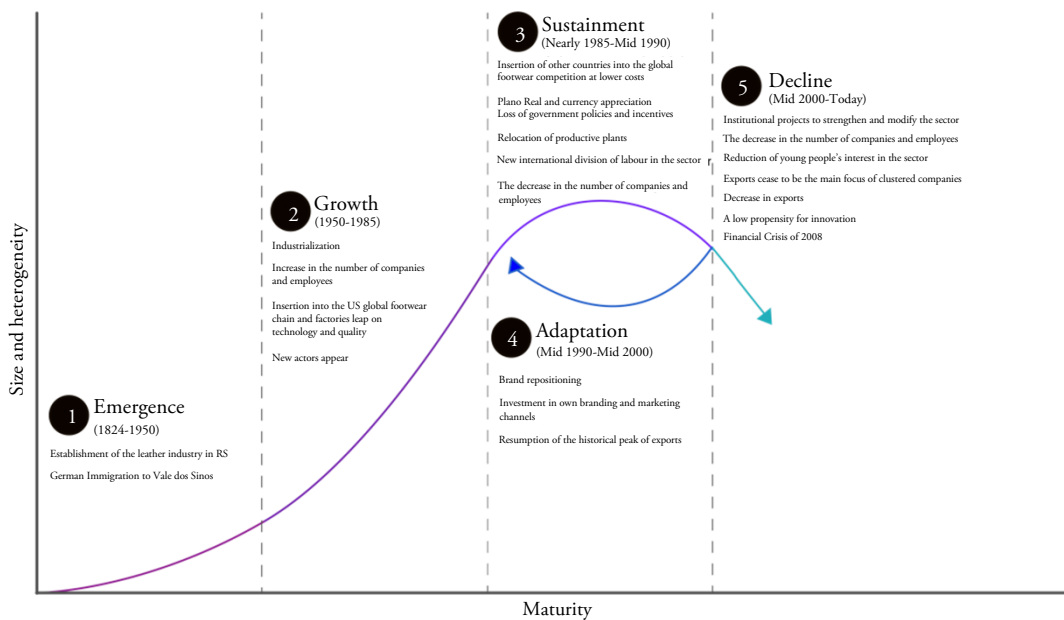
Brazil holds 4th place in the ranking of the world's largest producers of footwear, and it is in the Rio Grande do Sul region where its largest cluster by revenue, the Sinos Valley cluster, is located (Abicalçados, 2018). Despite the difficulties that have been faced by the Brazilian footwear industry abroad given the increase in the dollar and the competition with Asian countries, Brazilian footwear is exported to five continents, generating 271,1 thousand direct jobs (Abicalçados, 2018).

Italy, on the other hand, is the 10th footwear biggest producer, and the Marche region is the country's largest cluster in the number of jobs and companies. The Italian footwear industry generates about 77 thousand direct jobs (Assocalzaturifici, 2016). However, when measured in value by exported dollar, while Brazil is ranked 17th, Italy is the 3rd (Abicalçados, 2018). Despite China's lower-quality production, it has the largest share of the world's footwear exports - which explains China's leading position within the industry. Thus, Italy has maintained its relevance concerning high-value-added footwear production.

4.1. ANALYZING THE CLUSTERS LIFE CYCLE

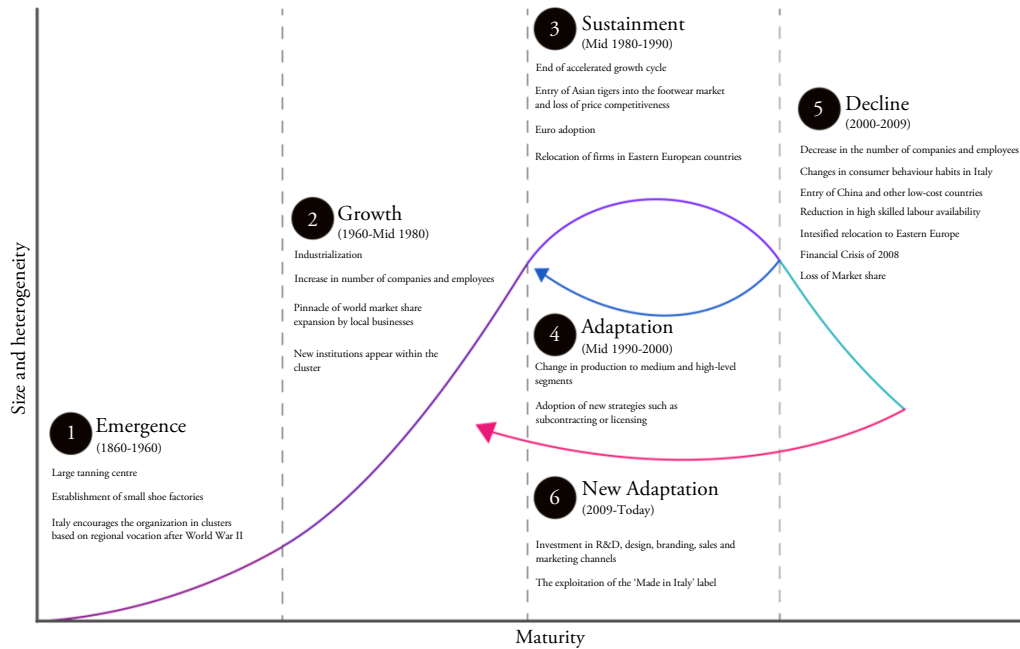
The Sinos Valley cluster is the major national footwear agglomeration and the country's main producer of women's footwear. The local industry is labor-intensive, being responsible for more than 80 thousand jobs through more than 2.7 thousand companies. The Brazilian cluster has undergone a decline since the middle of the 2000s. The cluster predominantly presents declining traits, such as a fall in the number of companies and employees, closed networks, and low collaboration. The lock-in effect helps us to explain how productive, cognitive, and political inertia may drive the decline of a cluster (Schimdt et. al., 2020). However, it may soon enter a period of renewal or adaptation. It is due to factors such as the components industry transformation, which has reinvented itself and now stands out for innovation and design; the increasing investment in branding and design; the development of internationalization strategies; and the proximity among cluster institutions through projects to evolve the current productive and technological paradigm.

FIGURE 1.



Fermo and Macerata, on the other hand, has the largest number of companies and employees in the Italian footwear industry, and the region is specialized in handmade shoes. The Italian cluster experienced adversities in the 1970s, the 1990s, and 2000s and is currently undergoing a new process of adaptation. Two main factors impacted the cluster trajectory: China's entry as a global footwear producer and the financial crisis of 2008. The regional model is strongly impacted by a mindset reluctant to cooperate. However, the generational management shift yet to happen can improve collaboration. Finally, business management is predominantly family-oriented and tends to be more conservative concerning financial matters, preventing higher-risk movements.

FIGURE 2.



Both clusters are already consolidated and have been studied by several researchers on clusters, which allows the identification of their resources and life cycle stages.

4.2. THE CLUSTER' RESOURCES

Both clusters have their particularities even though they are from the same industry. Hence, their insertion in the global value chain, as well as adopted strategies and productive specialization are distinctive. The Sinos Valley firms, for example, began their international insertion as outsourced producers for the United States and abandoned their designs and branding to carry out the footwear manufacture for the American market.

Most of the companies in both clusters recognize the value of their regional productive chain as a factor of international competitive advantage. Therefore, the locality is relevant for the international strategy since the available resources and their usage impact the competitiveness of the clustered firms. For a better understanding, Table 5 presents the cluster resources in both cases.

Several respondents in both clusters highlighted the reduction of financial incentives. However, given the 2008 global crisis, the availability of financial resources has become limited worldwide, impacting incentive policies. Particularly in the Sinos Valley, the financial support that strongly supported the agglomeration's growth has caused a local dependency on financial incentives. Therefore, despite the financial resources not being a strategic source of competitive advantage, their absence can support a decline process.

Regarding the technological resources, Fermo and Macerata have a higher level of design development, however, due to the smaller size of the firms, the investment in R&D is low. Joint research as well as R&D collaboration among firms and universities is yet incipient, missing opportunities for long-term research.

“There are very important meetings at a technological and also stylistic level, as a projection for the future of the market, for sales.” (EI_B).

While the traditional footwear industry innovation is incremental and in design, however, initiatives are seeking a technological leap in both investigated clusters since companies cannot be limited to the currently available technologies. To remain competitive, it is necessary to invest in a technological

breakthrough. Especially in the Brazilian cluster, where technological investments are focused on cost reduction, which is not a factor of competitive differentiation.

TABLE 5.
Analysys of the clusters resources

Category	Vale Dos Sinos	Fermo e Macerata
Financial Resources	Drastic reduction in access to financial resources.	Limited access and of little relevance to the firms.
Physical and Operational Resources	The productive chain is the main highlight as well as the services of carriers.	The geographic disadvantages regarding the highways as well as the distance and inefficiency of the local airport are healed by the carriers; the broad and complete local production chain provides greater competitiveness.
Technological Resources	Low interaction with technological training and R&D players. Few companies carry out initiatives due to the local fear of sharing information. There are projects to stimulate innovation and quality improvement such as Future Footwear and By Brasil.	The regional investment is mainly focused on design and materials. There is a lack of initiatives for the component industry and low interaction with universities and research centers. The value chain proximity is seen as a way to evolve technologically and in design.
Marketing Resources	The country image is a resource given the association of Brazilian culture, which is well accepted abroad, with the footwear production.	The Italian reputation abroad, that is, the Made in Italy quality and presence of internationally renowned brands in the region adds value to the locality.
Human Resources	Skilled labor, but there is a labour shortage in some functions. There are institutions of qualification and excellence and projects of qualification and professional insertion such as the Young Apprentice project.	Individualistic local culture and skilled labor shortage in some functions. Strong local identity with footwear and the relation of the production with craftsmanship is seen as central to their competitiveness. Workforce training and their inclusion through companies' initiatives.
Internal Management Resources	Several players constitute the cluster governance to meet the needs of local firms and stimulate a collaborative culture. The collaborative culture is still in its infancy, but it is under development.	There are institutional players in the region, however, there is no common strategic direction; the collective actions are isolated and targeted to specific audiences; seminars and collective meetings are held for associate members of the local institutions, and the adhesion is low, what reflects in the relevance of this resource in the cluster.
External Relations Resources	Collective actions such as fairs, events, commercial missions and definition of target markers are made, being Brazilian Footwear the main project related to such activities.	There are collective actions such as fairs, promotions abroad, and commercial missions; There is the belief that such resource could bring more benefits than it actually does, but greater collaboration is necessary for an outcome related to the needs of the community.

As for human resources, despite the decrease in the number of companies and employees in those regions, new business models emerge. In both cases, due to market saturation, the new businesses are brands or companies specialized in other areas of the production chain, such as design. This scenario indicates that the current footwear industry model may change in the future, with fewer factories and more

brands outsourcing their production. Also, in both cases the qualification of the local workforce is prominent. In Fermo and Macerata, for instance, the main adding value element is the artisan's work. Thus, human resources are strategic for both clusters. However, the failure to renew the local workforce can drive both clusters to decline since the attraction and retention of new talents is a challenge in the actual scenario.

“the workforce here is very good (...) The problem with this workforce is that this workforce is getting older, there will come a time when these people will start to retire and die, and there will not be many new people to replace them” (EBR_H).

In terms of marketing resources, the Made in Italy label is a valuable resource for Fermo and Macerata. Additionally, the international presence of renowned brands that produce and are headquartered in the cluster has a positive impact on local companies.

“Being Italian helps, because we still have a great reputation in terms of style at least” (EI_G).

Brazil, on the other hand, does not have a powerful national label like Italy, but promotional projects like By Brazil or Brazilian Footwear, that focus on the national industry image. Trade fairs and missions are the main way to do business abroad, and the Brazilian Footwear project has proved to be critical for the international operation of several companies. Both the Brazilian Footwear and By Brazil projects support the firms in establishing their strategic target countries, international branding, and external knowledge acquisition.

“Brazil, with all its internal problems, has a good image abroad, of a peaceful country, a creative country, a happy country, a country of colors and such. So there are clients of mine who even ask me to put a tag on a shoe with the Brazilian flag, so that the client knows that it is a Brazilian product, even in the Middle East, more than one client has already asked me to put in Arabic “Made in Brazil”, they value it a lot” (EBR_A).

Additionally, another factor that impacts marketing resources is the cluster's position in the value chain, which enabled the Italian companies to develop better marketing knowledge and privileged connections than the Brazilian ones. The Brazilian marketing strategy is focused on brand development, neglecting other marketing aspects that go beyond design, such as the establishment of partnerships, investments in R&D, sales channels, and the development of the cluster reputation. Therefore, the cluster needs to develop marketing resources to remain competitive (Zen, Fensterseifer and Prévot, 2011; Li and Geng, 2011).

During the crisis of 2008, Intra-cluster Relations is a fundamental element for cluster adaptation. Fermo and Macerata would benefit from the governance of actors focused exclusively on the sector since the main local entities foster all the local industries, and the collective actions are international fairs. The Sinos Valley, however, has two institutions responsible for governance that operate separately in pursuit of the sector's interests, each for its niche: components and footwear. The joint efforts, however, are yet at the institutional level, with little impact on businesses.

Extra-cluster Relations (domestic and international markets) are a critical resource because it is necessary to build connections outside the cluster to sustain competitiveness in the medium and long term. However, fairs are yet the main opportunity to access external knowledge and business networking. If the clusters had external relations aiming at what is called cluster internationalization (Köcker, Müller and Zombori, 2011; Islankina, 2015), firms could benefit more from the access to external knowledge and networking to sustain itself and adapt to external events. The Fermo and Macerata cluster is better developed in this regard than the Sinos Valley, in which the main focus is yet on the internal market.

“[...] we are a company that maybe has been abroad for over 30 years, so let's say very internationalized. We work 80% with foreign countries, in percentage” (EI_F).

The importance of the cluster resources and the necessity of their articulation and maintenance is evident for sustaining competitiveness. The relationship between resources and the CLC stages exists since the cluster response to external changes depends on the level of resource development. Therefore, as the capabilities have a life cycle (Helfat and Peteraf, 2003), if the cluster resources are not renewed the ability to respond to external changes is weakened, which could direct the agglomeration to a declining trajectory.

5. CONCLUSIONS

This paper aimed to analyze the relationship between the cluster resources and the stages of the CLC. The relationship between resources and life cycle allows an understanding of the cluster trajectory, the agglomeration idiosyncrasies, and strategic possibilities. Aligned with previous studies (Hervás-Oliver and Albors-Garrigós, 2007; Molina-Morales and Martínez-Fernández, 2008; Zen, Fensterseifer and Prévot, 2011; Li and Geng, 2011; Gohe and Oliveira, 2019), we identified cluster's resources as a source of competitive advantages of the region.

This research has several contributions. First, we proposed a classification of seven types of cluster resources based on the literature: financial, physical and operational, technological, marketing, human resources, internal management, and external relations. Our empirical data allows a theoretical validation of this taxonomy, which could be used in future studies. Comparing the cluster resources of Fermo and Macerata, the Italian cluster, to Sinos Valley, the Brazilian cluster, our evidence indicates that the Italian cluster presents better resources and more capacity to start an adaptation and renewal.

Second, we highlight the importance of the articulation of resources, which allows the realization of new strategic actions to change the path of a cluster, and the articulation of resources is directly related to governance. Through resources and routines, governance generates collective efficiency gains (ERBER, 2008), optimizing the productivity of local companies (MOLINA-MORALES, 2001; SCHMITZ, 1999). However, the governance of actors could help generate positive externalities, generated through joint actions (SCHMITZ, 1999; ERBER, 2008).

The competitiveness of clusters is sustained by their capability of renewing and changing their dependent trajectory. However, success depends on how resilient a cluster can be to articulate the firm's and cluster's resources to adapt and reinvent during an economic crisis. Among the different cluster resources, technological ones played an important role in the adaptation to enter a renewal stage in Fermo and Macerata cluster. The individual and collective action of actors supports the digital transformation in that cluster.

As managerial implications, managers of cluster firms should identify and explore shared resources in their strategies, such as reputation and technological resources in the cluster. Our results also indicate the importance of participation in global value chains and a closer relationship with the international market in the competitiveness of clusters and renewal capacity of them. Public managers should orchestrate collective actions in the clusters and support the extra-cluster network and the development of marketing resources. The governance of the cluster actors assumes the role of facilitator and promoter of companies and the region through connections, investments and development policies.

One limitation of this research is that it focused on the footwear industry reality, which is a traditional industry. Therefore, quantitative studies involving a broad range of industries could help in empirical generalization. Another limitation is the balancing of insertion. The research engagement was greater in the Sinos Valley cluster due to several factors, such as the greater openness of companies, the possibility of participating in more events, physical proximity, and access to more information, studies, and documents than Fermo and Macerata.

Further research could investigate the influence of the external relations of the cluster on the development of shared resources. Based on the cases analyzed, we noticed that the life cycle stages overlap each other. Even if there are dominant characteristics of a particular stage, there may still be traits of other phases, being difficult to define the actual life cycle stage of the cluster. Thus, there are mixed periods during the cluster development. Finally, despite several theoretical advances being made on clusters, this field can evolve and the analysis of cluster internationalization brings new perspectives of research on CLC.

REFERENCES

- Abicalçados (2018). *Relatório setorial indústria de calçados*. Novo Hamburgo.
- Assocalzaturifici (2016). Associazione Nazionale Calzaturifici Italiani. Available at: <https://www.assocalzaturifici.it/ancimain/doc.html?id=18808>
- Baldi, M. (2004). *A imersão social da ação econômica dos atores do setor coureiro-calçadista do Vale do Sinos: uma análise a partir dos mecanismos estrutural, cultural, cognitivo e político*. Universidade Federal do Rio Grande do Sul.
- Bardin, L. (2011). *Análise de Conteúdo* (1a Edição). Edições 70.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Belussi, F. and Hervás-Oliver, J. L. (2016). *Unfolding cluster evolution* (1st ed.). Routledge.
- Belussi, F. and Sedita, S. R. (2009). Life cycle vs. multiple path dependency in industrial districts. *European Planning Studies*, 17(4), 505-528. <https://doi.org/10.1080/09654310802682065>
- Bergman, E. M. (2008). Cluster Life-Cycle: An Emerging Synthesis, in C. K. (ed.) *Handbook of Research on Cluster Theory* (114-32). Edward Elgar. <https://doi.org/10.4337/9781848442849.00013>
- Blois, H. D. and Souza, J. C. (2007). Cenários prospectivos e a dinâmica de sistemas: proposta de um modelo para o setor calçadista. *Revista de Administração de Empresas*, 48(3), 35-45. <https://doi.org/10.1007/s12647-017-0213-9>
- Cusmano, L., Morrison, A. and Pandolfo, E. (2015). Spin-off and clustering: A return to the Marshallian district. *Cambridge Journal of Economics*, 39, 49-66. <https://doi.org/10.1093/cje/beu032>
- Elola, A. et al. (2012). Cluster Life Cycles, Path Dependency and Regional Economic Development: Insights from a Meta-Study on Basque Clusters. *European Planning Studies*, 20(2), 257-279. <https://doi.org/10.1080/09654313.2012.650902>
- Fahy, J. (2002). A resource-based analysis of sustainable competitive advantage in a global environment. *International Business Review*, 11(1), 57-77. [https://doi.org/10.1016/S0969-5931\(01\)00047-6](https://doi.org/10.1016/S0969-5931(01)00047-6)
- Fensterseifer, J. E. (2009). *Strategic Resources and Sustainability of Competitive Advantages in Industrial Clusters: Towards a General Analytical Framework* in EnaPAD, 1-15.
- Ghemawat, P. (2001), Distance Still Matters. *Harvard Business Review*, 79(September), 137–147. Available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=5134712&site=ehost-live>
- Giuliani, E., Pietrobelli, C. and Rabellotti, R. (2005). Upgrading in global value chains: Lessons from Latin American clusters. *World Development*, 33(4), 549-573. <https://doi.org/10.1016/j.worlddev.2005.01.002>
- Gohr, C. F. and Oliveira, I. S. V. (2019). Collaboration in cluster-based firms as a source of competitive advantage: evidence from a footwear cluster. *Production*, 29. <https://doi.org/10.1590/0103-6513.20180018>
- Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33(3), 114-135. <https://doi.org/10.1016/b978-0-7506-7088-3.50004-8>
- Guidolin, S. M., da Costa, A. C. R. and Rocha, É. R. P. da (2010). *Indústria calçadista e estratégias de fortalecimento da competitividade*. Rio de Janeiro.
- Hassink, R. (2007). The strength of weak lock-ins: The renewal of the Westmünsterland textile industry. *Environment and Planning A*, 39(5), 1147-1165. <https://doi.org/10.1068/a3848>

- Helfat, C. E. and Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10 SPEC ISS.), 997-1010. <https://doi.org/10.1002/smj.332>
- Hervás-Oliver, J. L. and Albors-Garrigós, J. (2007). Do clusters capabilities matter? An empirical application of the resource-based view in clusters. *Entrepreneurship and Regional Development*, 19(2), 113-136. <https://doi.org/10.1080/08985620601137554>
- Hervás-Oliver, J. L. and Albors-Garrigós, J. (2014). Are technology gatekeepers renewing clusters? Understanding gatekeepers and their dynamics across cluster life cycles. *Entrepreneurship & Regional Development*, 26(5-6), 431-452. <https://doi.org/10.1080/08985626.2014.933489>
- Islankina, E. (2015). Internationalization of Regional Clusters: Theoretical and Empirical Issues. SSRN *Electronic Journal*. <https://doi.org/10.2139/ssrn.2623532>
- Isaksen, A., Trippel, M., Kyllingstad, N. and Rypestol, J. O. (2021). Digital transformation of Regional Industry through asset modification. *Competitiveness Review: An International Business Journal*, 31(1), 130-144. <https://doi.org/10.1108/CR-12-2019-0140>
- Köcker, G. M. zu, Müller, L. and Zombori, Z. (2011). Networks and clusters as instruments for the initiation of international business cooperation, European Clusters Go International. Berlin. Available at: http://www.iit-berlin.de/publications/iit_European Clusters go International.pdf
- Li, J. and Geng, S. (2012). Industrial clusters, shared resources and firm performance. *Entrepreneurship & Regional Development*, 24(5-6), 357-381. <https://doi.org/10.1080/08985626.2011.591841>
- Marino, V. and Mainolfi, G. (2013). Country reputation and attitudes towards made in Italy products: a study on Chinese consumers. *International Journal of Chinese Culture and Management*, 3(3), 228. <https://doi.org/10.1504/ijccm.2013.055420>
- Martin, R. and Sunley, P. (2011). Conceptualizing Cluster Evolution: Beyond the Life Cycle Model? Conceptualizing Cluster Evolution : Beyond the Life Cycle Model? *Regional Studies*, 45(10), 1299-1318. <https://doi.org/10.1080/00343404.2011.622263>
- Menzel, M.-P. and Fornahl, D. (2010). Cluster life cycles—dimensions and rationales of cluster evolution. *Industrial and Corporate Change*, 19(1), 205-238.
- Molina-Morales, F. X. (2001). European industrial districts: Influence of geographic concentration on performance of the firm. *Journal of International Management*, 7(4), 277-294. [https://doi.org/10.1016/S1075-4253\(01\)00048-5](https://doi.org/10.1016/S1075-4253(01)00048-5)
- Morosini, P. (2004). Industrial clusters, knowledge integration and performance. *World Development*, 32(2), 305-326. <https://doi.org/10.1016/j.worlddev.2002.12.001>
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3), 179-191.
- Prahalad, C. K. and Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79-91. <https://doi.org/10.1016/b978-0-7506-7223-8.50003-4>
- Presutti, M., Boari, C. and Majocchi, A. (2013). Inter-organizational geographical proximity and local start-ups' knowledge acquisition: A contingency approach. *Entrepreneurship and Regional Development*, 25(5-6), 446-467. <https://doi.org/10.1080/08985626.2012.760003>
- Reed, R. and DeFillippi, R. J. (1990). Causal Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage. *Academy of Management Review*, 15(1), 88-102. <https://doi.org/10.5465/amr.1990.4308277>
- Santner, D. and Fornahl, D. (2014). From here, from there, and from beyond: endogenous and exogenous factors triggering change along the cluster life cycle in a multi-scalar environment. Working Papers on Innovation and Space 02.14.
- Schmidt, V.K., Santos, D.A.G., Zen, A.C., Bittencourt, B.A. and Belussi, F. (2020). Trajectory Dependence, Lock-In Effect, and Cluster Decline: A Case Study of the Footwear Cluster in Sinos-

- Paranhana Valley. *Latin American Business Review*, 371 - 391. <https://doi.org/10.1080/10978526.2020.1770607>
- Schmitz, H. (1999). Collective efficiency and increasing returns. *Cambridge Journal of Economics*, 23, 465-483.
- Tödting, F., Sinožic, T. and Auer, A. (2016). Driving factors of cluster evolution: A multi-scalar comparative perspective. In F. Belussi and J.-L. Hervás-Oliver (eds) *Unfolding Cluster Evolution* (1st ed., p. 17). Routledge.
- Tripl, M., Grillitsch, M. and Isaksen, A. (2016). Understanding Cluster Evolution. In F. Belussi and J.-L. Hervás-Oliver, (eds), *Unfolding Cluster Evolution* (1st ed, p. 15). Routledge.
- Van Klink, A. and De Langen, P. (2001). Cycles in industrial clusters: The case of the shipbuilding industry in the Northern Netherlands. *Tijdschrift voor Economische en Sociale Geografie*, 92(4), 449-463. <https://doi.org/10.1111/1467-9663.00171>
- Wernerfelt, B. (1984). A Resource-Based View of the Firm Birger. *Strategic management journal*, 5(2), 171-180. <https://doi.org/10.1002/smj.4250050207>
- Zen, A. C. (2010). A Influência dos recursos na internacionalização de empresas inseridas em clusters: uma pesquisa no setor vitivinícola no Brasil e na França. 270f. Tese (Doutorado em Administração)-Escola de Administração, Universidade.
- Zen, A. C., Fensterseifer, J. E. and Prévot, F. (2011). Internationalization of clustered companies and the influence of resources: A case study on wine clusters in brazil and France. *Latin American Business Review*, 12(2), 123-141. <https://doi.org/10.1080/10978526.2011.592799>

