
# EXTENDED ABSTRACT

**Title: Local capability domain transformation from firm diversification in the Toy Valley district: 1895-2019**

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**Abstract:** *(minimum1500 words)*

This article analyzes how industrial districts (IDs) get transformed by recombining their capabilities in order to fit into new competitive forces, disentangling the local firms' diversification process shaping transformation. Utilizing mix-methods based on archival analysis, interviews and patent analysis (1895-2019; 3,592 patents and utility models), the learning dynamics and diversification of the Toy Valley district in Alicante (Spain) are analyzed. It evolves, from a capability domain centered on toys, into a multi-industry manufacturing territory driven by the role of local companies' diversification

and the local institutional reconfiguration. This study also adds a geography of innovation approach to firm diversification strategy: diversification of local ID firms differs from non-local ID firms.

## 1.- Introduction

Positioned in the debate about how industrial districts (IDs) are transformed, evolve and adapt to globalization forces (e.g. Bellandi et al., 2018). We assume that IDs do that by transforming their *capability domains* in order to fit into new competitive forces, demands and changing environments. Capability domains are utilized in this study in the sense of Andreoni (2018); that is, as those distinctive territorially-based resources and capabilities shaped by local firm heterogeneity. Districts' *capability domains* are made up of the combination of the different technological competences of their firms and support organizations, reflecting the types of products and technologies produced in the local system, evoking the resource-based view of the firm (RBV, Barney, 1991). ID cognitive structure or the set of local skills, competencies and know-how (Bellandi et al., 2018; Menzel & Fornahl, 2009) would be equivalent to capability domains.

While local capability domains shift following a positive *specialization* path, creating the same focal product but using different strategies (i.e. targeting different niche markets or introducing more high-value non-manufacturing activities, such as marketing or ecommerce), districts can also be transformed by diversification. Examples of the former are the Vinalopo footwear district in Alicante, following the arrival of Zara and its design, logistics and knowledge that spills over in the district (Hervas-Oliver et al., 2021) or the district of Vicenza jewelry district moving to high quality niche markets (De Marchi et al., 2014). District diversification also occurs by recombining existing capabilities, as in the case of Sport system of Montebelluna, from boots and skis to mountain sports equipment (see Belussi & Sedita, 2009).

Despite ample evidence on ID transformation and their different conditions or drivers, there is no clear evidence about *how* this transformation process occurs from local firms' diversification.

Our study is positioned in the diversification of districts, attempting to show how firms' diversification strategies shape local capability domains and foster district transformation. Complementary, local context shapes a firm's diversification. In doing so, this article is set in the debate about firms' strategies in agglomerations (e.g. Grashof, 2021) and, particularly, we contribute by showing the diversification process and its micro-mechanisms at the firm level that provoke the meso-level recombination of capabilities. Intersecting RBV and ID literature, we cross-fertilize these strands in

order to disentangle the process of ID diversification. Most research on regional diversification is based on industrial changes at the structural composition of regional economies (e.g. Bellandi et al., 2018; Isaksen et al., 2020; MacKinnon et al., 2019; Miörner & Trippl, 2019), however, there is scant research on the process about how district firms' diversification drive district transformation (some exceptions Andreoni, 2018; Belussi & Sedita, 2009, 2012; Harris, 2021; Moodysson & Sack, 2016). In particular, we show the diversification micro-mechanisms that drive knowledge heterogeneity (Asheim et al., 2011; Menzel & Fornahl, 2009) and the subsequent district transformation.

Assuming that districts and clusters evolve from firms' strategies and their knowledge heterogeneity shift, our rationale is as follows. Environmental pressures and changes make local firms' capabilities obsolete or less valuable, fostering strategic change. This change, when following a diversification basis, implies that the district capability domains are transformed. After a few pioneering firm-level changes, the district is contaminated by existing imitation and interactions that circulate among local socio-economic networks. This adaptation legitimates new technologies, products, markets and also challenges existing institutional configuration (see Harris, 2021). At the firm level, Neffke & Henning (2013) point out that firms are far more likely to diversify into industries that have ties to the firms' core activities in terms of skill-relatedness, that is, related diversification is based on releasing new activities from existing capabilities. Introducing the geography of innovation in the topic and point out how local context moderates and shapes knowledge recombination. We posit that new activities leveraged by a firm's existing skills are also recombined with local knowledge, resources, ideas, information and skills. Put differently, as IDs present abundant tacit non-easily transferable knowledge and diversification is constrained or restricted to local tacit knowledge abundant in IDs, as the local learning-by-doing technology and institutions moderate the transformation of in-house resources and capabilities.

We cross-fertilize the resource-based view of the firm and MID literature, using mixed-methods, analyzing the Toy Valley district (Alicante, Spain) from 1895 to 2021, deciphering district evolution and transformation of capability domains, passing from manufacturing toys to producing parts and components for packaging, automotive, health, food and other industries. For doing so, we analyze 3,592 patents and utility models for more than one century (1895-2019), complementing with direct interviews

with local firms and support organizations in the focal district. As results show, starting from a rather homogenous institutional precondition around toys manufacturing up to the 80s, local firms start to develop new trajectories, abandoning established institutional frameworks around toys and provoking a path diversification into new industries based on locally related knowledge combinations. Results show new path development based on diversification in the sense of Isaksen and Trippl (2014). Our main contribution and novelty, however, is based on showing the transformation process, that is, the micro-mechanisms at the firm level that provoke changes and transformation at the meso-level, and how local context shapes local firms' diversification. We also show how diversification in IDs is more restrained because of low transferibility of local tacit knolwedge that is context dependent vis-à-vis non-ID firms. Therefore, the locus of diversification will be reduced to those new activities that use existing skills and shaped by local competences and institutions.

This study contributes to the Marshallian literature and complements economic geography, showing how firms drive change (Harris, 2021; Miörner & Trippl, 2019; Moodysson & Sack, 2016), asset and institutions reconfiguration (e.g. Isaksen et al., 2020; Miörner & Trippl, 2019), going beyond the study of industrial change at the structural composition of regional economies (e.g. MacKinnon et al., 2019). In addition, it cross-fertilizes RBV, diversification and ID by introducing a geography of innovation approach, contributing to understand better ID transformations, contributing to firm-level diversification strategy (e.g. Feldman & Hernandez, 2021) by adding a geography of innovation dimension.

## 2.- Study

We studied the patents and utility models in the valley and the IPC (international patent code).

Table 1. Table of variables

| Name of variable | Description | |
|---|---|---|
| **Title** | Title of the patent/utility model | |
| **N_Publication** | Number of publication of the patent or UM | |
| **Municipality** | Town of the first applicant in the patent/utility model. | |
| **IPC** | Code | Number of the international patent classification[1] |

[1] IPC codes were taken from:
http://cip.oepm.es/ipcpub/#refresh=page&notion=scheme&version=20060101

| | | |
|---|---|---|
| **IPC_fields** | Code | Number of IPC field of different fields that contain that patent or utility model. In this case we consider the first four digits of IPC, version 2006.01 |
| **Patent** | 0,1 | Takes value 1 if it's a patent |
| **Utility_model** | 0,1 | Takes value 1 if it's a utility model |
| **Year_Publication** | year | Year that the patent or utility model is published. |
| **Periods** | 1,2,3,4,5 | Period 1 (1893-1957), inception; Period 2 (1958-1979), growth; Period 3 (1980-1992), crisis and transformation; Period 4 (1993-2007), diversification started; Period 5 (2008-2019) diversification fully adopted in the territory. Each period takes a natural number from 1 to 5 respectively, according to the year that the patent was published. |
| **Classification** | 0,1,2,3,4 | Indicates the type of product according to its use, it is made from the variable IPC_fields, when there is no IPC code the authors did the classification reading the name of the patent. 0 Others; 1 Packaging; 2 Toys; 3 Industrial components; 4 Furniture (See Appendix) |

Source: own

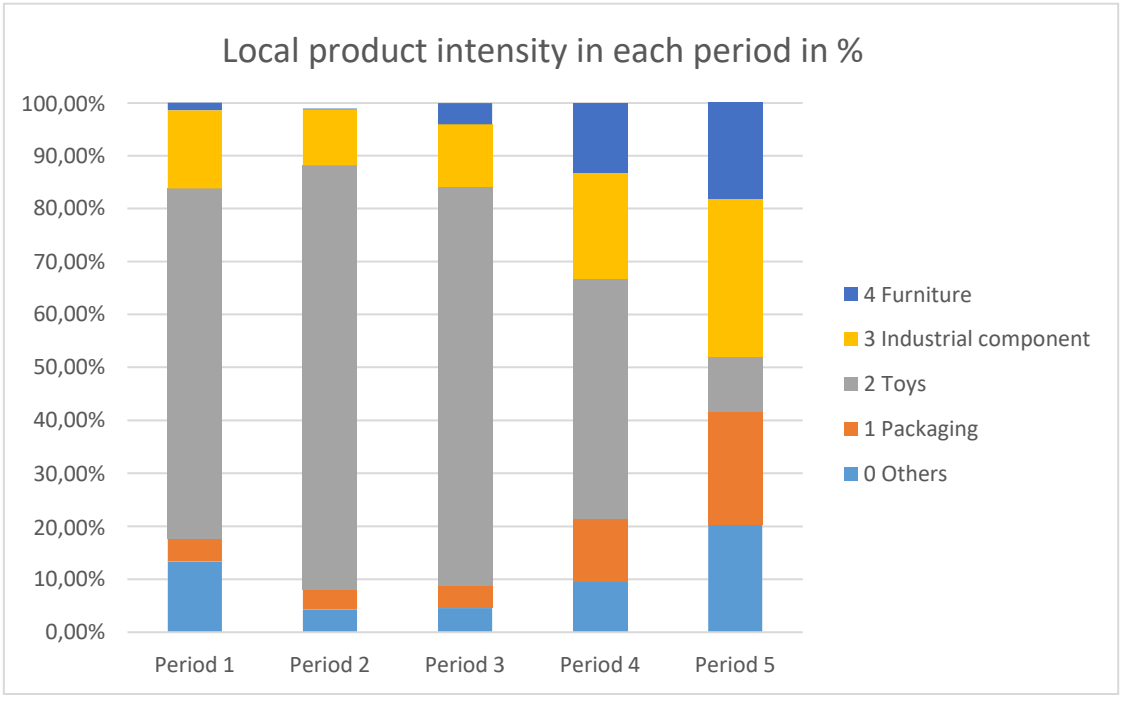
We divided the periods per years corresponding with different stages of the development of the cluster and classified the patents according to each IPC into products, when IPC codes were not available (old applications) we did that according to the name and description of the patent or utility model

Table 2. Description of products per periods on average.

| | 0 Others | 1 Packaging | 2 Toys | 3 Industrial component | 4 Furniture | |
|---|---|---|---|---|---|---|
| Period 1 | 13.33% | 4.29% | 66.19% | 14.76% | 1.43% | 100.00% |
| Period 2 | 4.31% | 3.67% | 80.19% | 10.54% | 0.16% | 98.88% |
| Period 3 | 4.54% | 4.29% | 75.33% | 11.75% | 4.04% | 99.94% |
| Period 4 | 9.58% | 11.78% | 45.38% | 20.09% | 13.16% | 100.00% |
| Period 5 | 20.28% | 21.35% | 10.32% | 29.89% | 18.15% | 100.00% |

Source: own elaboration from data.

Figure 1. Description of products per periods on average.



Source: own elaboration from data.

Figure 1 shows a good example of how the valley evolved from toys to a diversified production of goods.

## 3.- Conclusion

This article analyzes how industrial districts (IDs) evolve and adapt to globalization forces and recombine their capabilities in order to fit into new competitive forces, demands and changing environments. Positioned in the recent debate about the role of firms in agglomerations (e.g. Grashof, 2021), we focus on how local firms, through diversification strategies, shape industrial district transformation. Cross-fertilizing the resource-based view of the firm and ID literature, and using mixed-methods, we analyzed the Toy Valley district (Alicante, Spain) from 1895 to 2021, deciphering district evolution and transformation of its capability domains. For doing so, we analyzed 3,592 patents and utility models for more than one century (1895-2019), being complemented by direct interviews with local firms and support organizations in the focal district. Results show the transformation from manufacturing toys to produce parts and components for packaging, automotive, health, food and other industries. Our main theoretical contribution and novelty is based on showing the micro-mechanisms at the firm level that provoke changes at the meso-level, unfolding the path diversification process, going beyond the focus on structural composition of regional economies. This study concludes that the main difference between district and non-district firms along a diversification process, however, is that a local district moderates and shapes the knowledge recombination process, limiting the diversification along existing firms' in-house resources and capabilities.

Following the RBV, our rationale is based on the fact that new activities leveraged by a firm's existing skills are also recombined with local knowledge, resources, ideas, information and skills. Strategic diversification is primarily devoted to existing firms' in-house resources and capabilities. Our study adds a *geography of innovation* approach to the topic of diversification by showing the importance of local context for knowledge recombination and diversification, arguing that in IDs, abundant tacit knowledge, which is not easily transferable, moderate the diversification process.

As results indicate, the transformation was accomplished, in a bottom-up process, by recombining local existing technologies and skills around metallic and plastic

knowledge, with new ones for application to different products and industries, diversifying entirely the range of customers and products in the territory. Local firms' diversification transforms the focal district's capability domains from toys to multi-industry products around plastic and metallic technologies cultivated for almost 80 years upon a toy manufacturing basis. The learning dynamics of the district firms since the 90s, was based on gradual firm diversification and not driven by policy makers. The learning process and capability reconfiguration was primarily based on local firms' recombination of capabilities, capitalizing on their previous toy-dedicated molding, plastic injection or metal-mechanic capabilities for embracing new opportunities in other industries where those capabilities were applicable. This path diversification was pervasively imitated by local firms that were learning from other local firms that successfully shift to other products. *Imitation*, rather than *cooperation* was a core driver reinforced by the rapid circulation of knowledge in districts. As Staber (2009) points out, firms learn from each other based on observation, as the entire industry is located in the focal spot.

Eventually, the focal district recombined its capability domains and also its identity. Thus, the district gradually accepted different sub-identities beyond toys and, once legitimized, challenged the historical *district institutional configuration*, that is, the combination of shared goals, behaviors and relations (in the sense of Harris, 2021). The narratives for legitimizing new products, customers, routines and information were pervasively founded in the territory and local routines were developed around new applications of existing local technologies that turned into new opportunities. These new routines were framed in a new local collective identity, the common purpose and "who we are" *a là Staber,* starting in the 90s: from "we are toys" to we are "multi-industry products", capitalizing on their original plastic and metallic manufacturing expertise. Clearly, the different technological trajectories of local firms drove a *path diversification* (Isaksen et al., 2018) in the focal district, being local firms the main actors enacting change and driving district evolution. This diversification was also supported by a re-adaptation of the local supporting organizations to provide knowledge-intensive services, information and technological support on the new assets of the territory and subsequent policymaking initiatives that started to consider those specificities. Planned changed from policymakers, however, was not the case nor the driver but spontaneous firms' strategies to adapt.

In this study, we use *new path development* generically for the local transformation, referring to Isaksen et al., (2018: 223-224) branching (diversification of existing industries into new but related ones); As regards types of local innovation systems, the Toy Valley is a thin one, as the region is a non-core one. Coinciding with the *multi-actor perspective* (Garud & Karnøe, 2003; Isaksen et al., 2018) to create new knowledge and thus stimulate change, all range of local/regional actors (universities, clusters, public research organizations, trade associations, policymakers, entrepreneurs, businesses, etc.) matter. This case, however, was remarkably driven by local firms.

Empirically, the article presents the novelty of using the patents' IPCs for analyzing quantitatively the diversification process, complementing traditional qualitative-based evidence. In addition, the article cross-fertilizes the resource-based view of the firm (e.g. Barney, 1991; Penrose, 1959) with that of EG (e.g. Andreoni, 2018; Harris, 2021; Menzel & Fornahl, 2009) and that of the Marshallian literature (e.g. Andreoni, 2018; Bellandi, 1996; Belussi & Hervas-Oliver, 2018; De Propris, 2001). In the latter, this present study developed more in-depth understanding of the sub-line of inquiry focused on the role of firms, i.e. firm heterogeneity, in clusters and industrial districts (e.g. Belussi & Sedita, 2009; Grashof, 2021; Hervas-Oliver et al., 2018). The study is not free from limitations, especially from the type of patents analyzed that are mainly utility models with less information. For future studies, the spinoff process should be unfolded.

**Keywords:** *Cluster, diversification, evolution, patents*
**JEL codes:** O33