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RESEARCH ARTICLE

Geographical indications as global knowledge commons: Ostrom's law on common intellectual property and collective action

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Abstract

In this article, we reconceptualize, using an extended discrete and dynamic Ostrom's classification, the specific intellectual property (IP) regimes that support geographical indications (GIs) as 'knowledge commons', e.g. a set of shared collective knowledge resources constituting a complex ecosystem created and shared by a group of people that has remained subject to social dilemma. Geographical names are usually considered part of the public domain. However, under certain circumstances, geographical names have also been appropriated through trademark registration. Our analysis suggests that IP laws that support GIs first emerged in Europe and spread worldwide as a response to the threat of undue usurpation or private confiscation through trademark registration. We thus emphasize the nature of the tradeoffs faced when shifting GIs from the public domain to shared common property regimes, as defined by the EU legislation pertaining to GIs. In the context of trade globalization, we also compare the pros and cons of regulating GIs *ex-ante* rather than engaging in *ex-post* trademark litigation in the courts.

Key words: Collective reputation; GKC framework; IAD/SES framework; international trade agreement; self-governance; trademark; traditional knowledge

JEL Classification: D02; D23; K11; L51; O34; Q13

1. Introduction

The reference to geographical names has been part of human heritage since ancient times and has supported the development of the long-distance trade of agricultural and food products across Europe and its Eurasian networks (Barham and Sylvander, 2011; Galli, 2017). Geographical names or 'toponyms' are usually considered part of the public domain since they designate specific places, thus helping to localize places, establish territories and facilitate travel. However, being part of the 'public domain' is not the same as being open and free access, as this access depends on the nature of property rights regimes and *de facto* or *de jure* enforcement policies (Boyle, 2003; Ostrom, 2003). Geographical names are also part of a broader market for language (Landes and Posner, 1987). Similar to other trademarks, when geographical names become valuable assets by acquiring a large notoriety and reputation among consumers, private appropriation is more likely to occur, whether as a result of usurpation, confiscation, undue use, or trademark registration (Landes and Posner, 1987; Stanziani, 2004).

In this article, we thus develop an original analytical framework, bridging recent theoretical developments in public choice and institutional economics to explain why and when geographical names remain part of the inalienable public domain or can, rather, become collectively owned through collective

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trademark registration or even as part of the *sui generis* IPR¹ regimes attached to EU geographical indications (GIs) instead of to a regime of individual producer's trademark. Building upon the seminal work of Hess and Ostrom (2007), we propose reconceptualizing GIs as 'knowledge commons', defined as 'the shared collective knowledge resources, a complex ecosystem that is created and shared by a group or place-based local communities, and subject to social dilemmas' (Hess and Ostrom, 2007: 3). Our analysis contributes to a broader research program on the Governing Knowledge Commons (GKC) framework (Frischmann *et al.*, 2014; Madison *et al.*, 2010). In the field of intellectual property (IP), our study extends more specifically the classical economic analysis of trademark law applied by Landes and Posner (1987) to the context of collective trademarks and, specifically, to the *sui generis* IPR regimes attached to EU GIs.

First initiated in Europe and extended at the end of the 19th century through international legislation, well-known GIs include Champagne or Bordeaux wines, Chianti wine or the Parmigiano-Reggiano cheese in Italy, among many others (Bonanno *et al.*, 2019; Meloni and Swinnen, 2018). Following the multilateral trade negotiations started in the 1990s through the actions of the WTO and its Uruguay Round and the inclusion of GIs in the TRIPS agreement (Art. 22 and 23) in 1994, the legal protection of GIs has become a major subject in trade disputes between the EU and the USA, sparking what Josling (2006) has called the 'war on terroir' at the international level (Arfini *et al.*, 2016; Chen, 1996; Lorvellec, 1996). Despite sharp oppositions, a growing number of countries worldwide have adopted specific IP laws on GIs that are similar in the spirit of both the original French model and the more recent EU GIs regulations, albeit with some differences (Arfini *et al.*, 2016; Marie-Vivien and Biénabe, 2017). Thus, our analysis establishes stronger analytical foundations to identify the relevance and limitations of GIs legislation in the context of trade globalization.

Our theoretical contribution is twofold. First, we expand the GKC framework that applies the IAD framework to knowledge commons (Frischmann *et al.*, 2014) using the dynamic Ostrom's classification proposed by Rayamajhee (2020). Second, we consider the role of knowledge commons as applied to agroecosystems and environmental infrastructures in connection with the IAD/SES (Institutional Analysis and Development/Social-Ecological Systems) framework (Cole *et al.*, 2019; Frischmann, 2012: 217; Ostrom, 2009). From this perspective, we believe that GIs provide a particularly relevant example of what Madison *et al.* (2010) and Frischmann *et al.* (2014) have called the 'commons' in the cultural environment.² Analyzing GIs as 'knowledge commons' introduces a paradigm shift by defining a positive ontological approach to the public domain, as advocated by Boyle (2003), which can foster, *ex-ante*, their sustainable self-governance by local communities and facilitate, *ex-post*, the role of judges and public regulatory authorities in preventing and adjudicating the trade disputes that are at stake when geographical names become valuable assets that may become increasingly subject to undue private appropriation.

To substantiate our analysis, we start by presenting the nature of services provided by geographical names, in a similar way to trademarks, and the existing and missing links between the economic analysis of trademark law by Landes and Posner (1987) and the specific legal issues raised by the threat of the undue appropriation of GIs through trademark registration. We thus use the novel, discrete, and dynamic scheme of Ostrom's taxonomy, first developed by Rayamajhee (2020) and later extended by Rayamajhee and Paniagua (2021: 82), to explain the emergence, first in Europe and more recently worldwide, of *sui generis* legislating of GIs as shared common IP³ and the tradeoffs faced in the

¹IPR: Intellectual Property Rights – The legal protection of GIs started with the signing of several international conventions at the end of the 19th century (the convention of Paris in 1883 and of Madrid in 1891) and the Lisbon Agreement in 1958 by means of their registration at the International Bureau of the World Intellectual Property Organization (WIPO). In 1992, the European Council (EC) regulation No 2081/92 of 14 July 1992 defined the protection of geographical indications (PGI) and designations of origin (PDO) for agricultural products and foodstuffs and extended their protection in Europe.

²For an overview of the GKC research program, see <https://knowledge-commons.net/publications>.

³Here, in line with Schlager and Ostrom (1992), property rights are not considered to be absolute, but rather a 'bundle of rights', which includes access to enjoy nonsubtractive benefits, withdrawal through the right to obtain resource units or products, management to regulate the internal use patterns and transform resources by improving them, the right to determine who can and cannot have access, the right to sell or lease, and management with withdrawal rights.

absence of a panacea or one-size-fits-all solutions. Hence, we proceed to a detailed analysis of how legal rules that support GIs – first designed in France and Europe – fit into the category of knowledge commons and the reasons for their successful extension worldwide in the context of trade globalization.

The article is organized as follows: section 2 introduces the institutional and legal context and our analytical framework, using a discrete and dynamic version of Ostrom's classification, in which the legal framework is institutionally contingent and subject to legal regime shifts, as identified by Rayamajhee and Paniagua (2021). Section 3 presents the theoretical foundations for our analysis of GIs as 'knowledge commons'; these foundations echo what Hess and Ostrom (2003, 2007) have called the physical objects, knowledge artifacts, and human and social resources required to generate shared and collective knowledge, as well as specific models of collective action. Section 4 discusses the reasons behind the growing adoption of GIs, the social dilemmas and limitations triggered by GIs, and the recent trends toward regulatory convergences on each side of the Atlantic.

2. Analytical framework

In the tradition of Bloomington institutionalism, the nature of goods and services in relation to property rights is still viewed as 'the analytical entry point' and a chief driver of institutional arrangements (Aligica and Boettke, 2009; Ostrom, 2003; Rayamajhee, 2020). In this section, we thus start by clarifying what is the nature of the goods and/or services one is classifying and evaluating when using geographical names in relation to trademark law. Hence, through the lens of the extended Ostrom's classification, we examine the nature of the tradeoffs that emerge when geographical names remain in the public domain and are appropriated through private or collective trademarks or other common property regimes, such as the EU's *sui generis* GIs regimes.

2.1 Geographical names, trademark law and the market for language

In theory, geographical names, or 'toponyms', are considered common knowledge and thus a public good, since they designate specific places and cannot be appropriated by anyone. However, as stressed by Ostrom (2003), being part of the 'public domain' is not synonymous with being open and providing free access, as this access depends on the nature and proper enforcement of *de facto* or *de jure* IPR regimes. Geographical names have been used since ancient times as a quality signal in the trade of goods and in helping consumers identify the specific quality attributes of goods (Stanziani, 2004). Therefore, geographical names are also part of a market for language (Landes and Posner, 1987: 268). The collective character of geographical names also makes them more vulnerable to possible risks of confiscation or usurpation by private interests, especially through when these names are registered under the regular trademark regime (Brauneis and Schechter, 2006). In line with earlier property rights studies by Demsetz (1967) and Allen (2002), a number of studies have emphasized that when geographical names become valuable assets, as they acquire wide notoriety and a positive reputation among consumers, private appropriation, including through usurpation, confiscation, undue use, or trademark registration, is more likely to arise (Stanziani, 2004).

In most countries, a general precept of IP laws on trademarks stipulates that a trademark should not deceive the general public about the origin of the product, nor should it provide false, confusing, or misleading information to consumers. In the US context, the registration of individual trademarks is often possible under various jurisdictions, following the rule of 'first come, first served', and subject to a number of conditions, such as (in US law) the condition of 'secondary meaning' (Brauneis and Schechter, 2006; Landes and Posner, 1987). In Europe, and especially in France, a stronger protection statute of geographical names emerged at the end of the 19th century through the so-called *sui generis* legal regime of 'Appellation d'Origine' (AO). This legal regime arose as a means to protect consumers against counterfeit goods and fraud in product quality resulting from food adulteration and falsification; its adoption also constituted an attempt to reduce the number of legal cases and the political

struggles that emerged as a result of conflicts between wine producers and traders over the use of well-known geographical names and the risk of undue appropriation of these names through trademark registration in the Bordeaux area (Stanziani, 2004).

Stanziani (2004) identified another important issue regarding the adoption of legislation pertaining to GIs in France: the aim to hedge against the threat of the transformation of renowned GIs into generic names that would become part of the public domain, leading to their possible commodification. The threat of becoming a generic name is a specific dimension of trademark law (Landes and Posner, 1987). In the literature, a large body of research has focused on the benefits of individual or collective trademarks and their reputation capital, as a means to reduce consumers' search costs by acting as a 'summary information' about the quality attributes of a product (Landes and Posner, 1987; Winfree and McCluskey, 2005). Brand names also define self-enforcing devices that provide *ex-ante* incentives to invest in the maintenance of their own reputation over time, which allow the trademark to become valuable (Klein and Leffler, 1981).

In the case of geographical names, such collective investment is often considered part of the local cultural identity, a common heritage and collective knowledge shared by local communities; indeed, this collective investment cannot be privately appropriated by private firms unless being a form of intellectual grabbing (Gangjee, 2016). Thus, the EU legislation on GIs adopted in 1992 for agricultural products and foodstuffs intended to provide legal protection to highly valued geographical names, making these names inalienable and granted the exclusive rights to use these names to the groups of producers of a particular region subjected to their registration.⁴ The development of GIs as a *sui generis* common property regime has become a major source of policy debate at the international level in recent decades.

2.2 Geographical names: an extended discrete and dynamic Ostrom's taxonomy

In the literature, academic debates surrounding the legal protection of European GIs have emphasized, either implicitly or explicitly, the position of these GIs in relation to Ostrom's taxonomy (Ostrom and Ostrom, 1977). Moving beyond the private-public dichotomy in the provision of goods (and services) proposed by Samuelson (1954), Rayamajhee (2020) stressed that the question should instead pertain to the types of institutional arrangements that best provide a variety of goods and services in a dynamic economy in which technology and institutions constantly evolve. Because of the cultural heritage and collective dimensions of geographical names, their public good dimension has often been viewed as common knowledge embodied in products characterized by GIs based on historicity, typicality, and tradition (Barham and Sylvander, 2011; Giovannucci *et al.*, 2009). However, other studies have also classified GIs as either club goods (Langinier and Babcock, 2008; Thiedig and Sylvander, 2000) or common-pool-resources (CPRs) and thus as commons (Fournier *et al.*, 2018; Quinões-Ruiz *et al.*, 2016). Each case involves specific properties of knowledge and informational resources attached to geographical names (Frischmann *et al.*, 2014). In his article, Rayamajhee (2020) also reminded us that Ostrom's taxonomy is not static and ontologically given; instead, it is the result of the biophysical attributes of goods (or services) on one hand, including the geographical characteristics that create different sets of challenges for the production and provision of these goods and services, and on the other hand the *de facto* or *de jure* property rights affecting collective action (Ostrom, 2003). Threshold effects can exist, depending on legal or informal property regimes and enforcement costs (Schlager and Ostrom, 1992). These effects are contingent upon technology and institutions, which can be continuously transformed (Aligicá and Boettke, 2009; Rayamajhee, 2020).

⁴The 1992 EU legislation on GIs (EC 2081/92) differentiates 'protected geographical indications' (PGIs) and protected denominations of origin (PDOs) for agricultural products and foodstuffs, the latter being directly inspired by the original French AO system. The link with the geographical area is less strong in the case of PGIs than with PDOs because PGIs refer to products with 'a specific quality, reputation or other characteristics attributable to that geographical origin; and the production and/or processing and/or preparation of which take place in the defined geographical area'. In this article, we refer indistinctively to PDOs and PGIs as GIs.

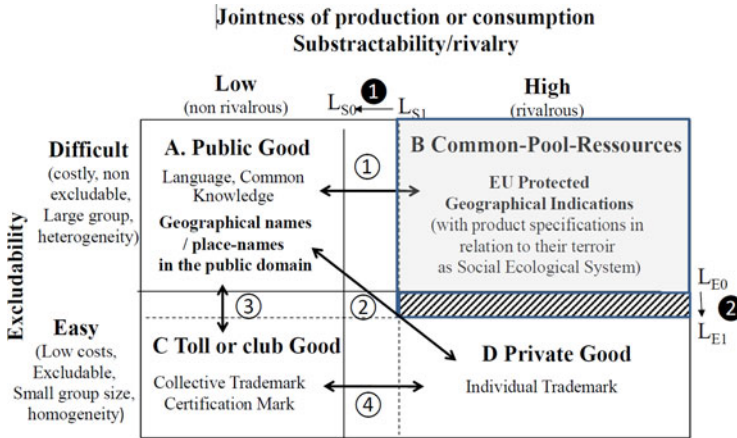


Figure 1. Geographical names as public, private, or common-pool resources.

In his analysis, Rayamajhee (2020) also contended that it is possible to introduce more fluidity into the 4 × 4 matrix of Ostrom’s classification by defining varying degrees on the excludability/subtractability continuum rather than boxing them in specific quadrants, depending on the technological and institutional parameters. In Figure 1, geographical names can be viewed either as part of the public domain (quadrant A) at time t_1 or transformed at time t_2 into private goods after being registered as individual trademarks (quadrant D) or at time t_3 as collective trademarks – thus falling into the category of ‘club goods’ (quadrant C) – or even at time t_4 after being registered as EU *sui generis* legal regime on GIs, taking the form of the inalienable and collective, but regulated, rights of use of a geographical name through their registration as EU GIs (quadrant B). The nonzero costs of delineating property rights introduce thresholds between categories, depending on legal rules and related enforcement costs (Allen, 2002; Demsetz, 1967).

Figure 1 also illustrates the creation of GIs as a legal regime shift that opens an additional legal solution to fill the gaps and caveats created by existing trademark laws when the collective coproduction of typical quality products, as defined by GIs regulations, is needed to ensure their provision. A legal regime shift, similar to the shift introduced through the creation of legislation on GIs, does not simply affect specific goods or services but an entire class of goods or services (Rayamajhee and Paniagua, 2021: 82). For instance, a regime shift, as shown in Figure 2, entails not only that goods or services move across boxes/quadrants in the goods classification table but also that the lines (separating the types themselves) become blurry or flexible (Rayamajhee, 2020: 20).

In Figure 2, we assume a continuum of N feasible configurations of good I in the matrix with varying probability P_i , such as $\sum_{i=1}^{N-1} P_i = 1$ for each A_i defined by institutional parameters with a probability P_i influenced by a complex interplay of biophysical, technological, and geographical factors. Here, A_0 is the original position of the good at a specific period. Alternate positions in A_{1p} , A_{2p} , and A_{3p} constitute other feasible configurations. Depending on the legal regime adopted, A_i can move from A_0 to A_1 , A_2 , or A_3 with probability P'_1 , P'_2 , P'_3 . The position of geographical names in the matrix is influenced by the risk of undue appropriation, subject to their relative value and the level (and costs) of protection and enforcement defined by the different legal regimes (Allen, 2002).

When the value and reputation of a geographical name is enhanced, the risk of undue appropriation is greater, unless specific *de facto* or *de jure* rules facilitate their protection. Depending on the legal regime, L_{Et} and L_{St} can shift from their initial positions (L_{H0} and L_{V0}) to new positions with probabilities P_{x4} , P_{x5} , P_{x6} and P_{x7} . For each L_{Et} and L_{St} , $\sum_t P_{tx} = 1$. First, entitling producers of GIs to specific use rights, represented by L_{S0} and L_{S1} (the horizontal axis in Figure 2), can facilitate the joint coproduction needed to maintain shared collective knowledge and natural resources, or prevent excessive consumption over time (Ostrom and Ostrom, 1977). Second, specific governance rules can be adopted in response to a

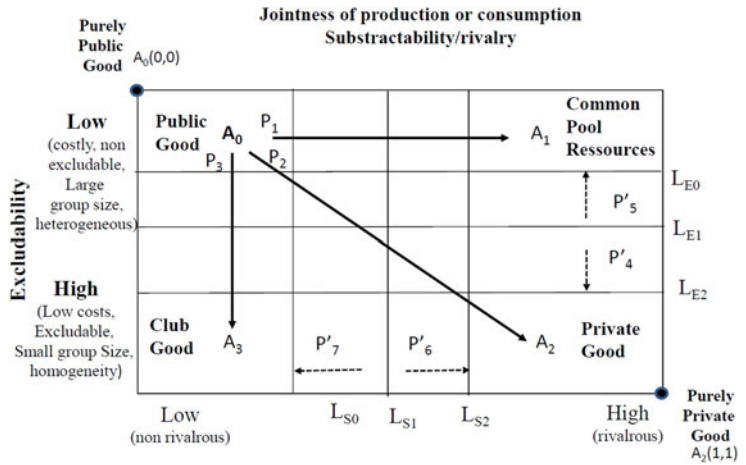


Figure 2. Dynamic Ostrom’s classification adapted from Rayamajhee (2020).

gradual situation ranging from easy to difficult excludability, represented by L_{e0} and L_{e1} (vertical axis in Figure 2); moreover, these rules are needed to maintain cooperation among group members and reduce potential free-riding by insiders or outsiders (Olson, 1965; Ostrom, 1992).

2.3 Geographical indications: a positive ontological approach to the public domain

At a more fundamental level, Figure 1 illustrates Boyle’s (2003) argument that the public domain, and more generally open-access resources, can lack effective rules and thus define property rights by default. The absence of adequate enforcement policies tends to reify negative aspects in a context in which the public domain remains vulnerable (Boyle, 2003). Thus, a possible ‘tragedy of the commons’ (Hardin, 1968) becomes less relevant than a ‘tragedy of the public domain’; e.g. a negative definition of the public domain that refers to ‘non-occupied spaces as de facto dedicated to property rights domains and as spaces that have still not been appropriated’ (Coriat, 2015). Thus, adopting a positive ontological approach to the ‘public domain’ through the creation of ‘commons’ appears as an alternative that prevents the privatization of specific goods or services (Boyle, 2003; Coriat, 2015).

From this perspective, we argue that the growing adoption worldwide of IP laws on GIs can be analyzed as a pragmatic response to the increased judicial fragmentation and imperfect legal enforcement created by trade globalization and as an attempt against potential infringement and undue private appropriation. Legislation on GIs provides a legal framework to protect the longstanding collective effort of local communities to develop and maintain their specific local collective knowhow over time and the ‘specific features’ of their quality products recognized by consumers and contributing to their collective reputation capital (Stanziani, 2004). The rationale for the legal protection of GIs thus appears very similar to the classical economic analysis of trademark law by Landes and Posner (1987).

To act as a quality and perform this economizing function in the face of consumers, a brand name must not be duplicated and must be differentiated enough to prevent consumers from being confused (Landes and Posner, 1987: 269). A brand name provides incentives to invest resources not only to maintain quality but also to invent new words and other signifiers such as symbols and specific ‘design features’ – for example, the shape and color of the ‘Perrier bottle’. These strategies enhance the stock of words referring to ‘things’ and of generic words that denote entire products and that may in turn even become generic names (Landes and Posner, 1987). Without protection, a free-riding competitor could, at little cost, capture some of the profits associated with a strong trademark and eventually destroy the information and knowledge capital embodied in that trademark, as well as past investments made by the producers in the reputation of the brand (Brauneis and Schechter, 2006; Klein and Leffler, 1981). Establishing *de facto* or *de jure* property rights is nevertheless costly and thus depends on expected

product value and benefits for producers, which are subject to available enforcement costs and threats of undue appropriation (Allen, 2002; Demsetz, 1967).

A detailed analysis of the effects of infringement is provided by Landes and Posner (1987: 302) who showed that the likelihood of confusion and misleading information, as a form of undue appropriation, can affect both consumers and producers. Let us consider two producers: A with a stronger reputation and B producing different brands of product X. If not prevented, producer B's infringement harms consumers through the elimination of A's incentives to produce more valuable products with lower search costs for consumers and producers; B's infringement also harms A⁵ through a reduction in the price and quantity of goods sold by A. Preventing infringement and loss in value is thus a critical issue for producer A, who is subjected to the fact that his or her expected benefits exceed the enforcement costs (Allen, 2002; Demsetz, 1967). Whereas geographical names with low reputation may remain in the public domain, those with greater notoriety among consumers may require additional legal protection, such as the protection provided by the EU legislation on GIs and the regulation against possible usurpation, confiscation, or undue trademark registration.

2.4 GIs as shared common property: club good versus CPR?

The classification of GIs as club goods (or club assets) or as CPRs has recently emerged as a major source of policy debates, as club goods are subject to the suspicion of collusive and anticompetitive practices with possible negative effects on the welfare of consumers and producers. Indeed, collective action facilitates the realization of economies of scale and economies of scope in the provision of public or collective goods that would otherwise be unreachable for individuals (Ostrom and Ostrom, 1977). A number of studies have suggested that the adoption of GIs contributes to the competitive provision of quality goods (Moschini *et al.*, 2008). However, when joint coproduction is needed, Rayamajhee (2020: 22) also stressed that there is a tendency for goods and services to move away from the classic private-public diagonal toward a club-CPR diagonal (see Figure 1), as is the case for GIs. The distinction between the two interpretations of GIs – either as club goods or as CPRs – has key policy implications.

Inspired by the theory of clubs developed by Buchanan (1965), some studies have considered the nature of GIs as possible 'club goods' or 'club assets' based on the selective nature of GI membership in relation to the criteria of easy excludability when rivalry is at a low level (Figure 1). In line with Ostrom (2000), when a good or service is considered a club good, it can be interpreted as a means to reinforce the social norms of trust that are needed to reach quality standards (Thiedig and Sylvander, 2000; Torre, 2002). Unfortunately, this interpretation has not been included in policy debates (Ménard, 1996). Another approach to club goods has stressed that they may have negative welfare effects because they increase market prices (Benavente, 2013; Langinier and Babcock, 2008; Marette and Crespi, 2003).

When interpreted as club goods, GIs have been suspected of running afoul competition laws by acting as cartels and of favoring collusive and rent-seeking behaviors by imposing price premiums, quality standards, or production quotas (such as yield restrictions) to reach the quality requirements (Mérel and Sexton, 2012). In these economic models, for the sake of analytical tractability, key assumptions are based on a small set of homogenous economic actors, such as agrifood firms, thus neglecting the many small agricultural suppliers who suffer additional coordination costs and are faced with the group size paradox (Olson, 1965).⁶ Many historical GIs, such as Parmigiano Reggiano cheese or Bordeaux wine, do not entail small and homogenous groups of producers, instead pertaining to hundreds and even thousands of small heterogeneous agricultural producers (Thiedig

⁵In their model, Landes and Posner (1987) indicated that the probability of consumers' confusion ($1-\phi^c$) also directly causes losses for producers in group A that are equal to $(P^c1-P^c0)X = (1-\phi^c)(H^b-H^c)X$. Thus, for judges and courts, the proof of actual or even likely consumers' confusion is a key issue.

⁶The Olson's Paradox suggests that there is a tendency for large groups to fail in providing any collective good at all, whereas there is a tendency in small groups toward a suboptimal provision of collective goods (Olson, 1965: 34). Thus, the larger the group is, the more it will need agreement and formal organization, especially with regards to consensus seeking, conflict prevention, resolution, and balance of power (Olson, 1965: 46).

and Sylvander, 2000). As Olson (1965) argued, when the size of a group increases, that group becomes more likely to suffer from free-riding and individual opportunistic behaviors; therefore, specific rules are needed to overcome this possibility.

By analyzing GIs as ‘knowledge commons’, an analytical shift is thus proposed in addressing the endogeneity of Ostrom’s classification (Figure 1). In this case, collective action is the endogenous solution to the CPR dilemma, subject to Olson’s group size paradox (Olson, 1965; Ostrom, 1990). Instead of an anticompetitive approach, collective action and self-governance are in fact needed to reduce possible mismanagement and resource degradation (Ostrom, 1990). In the next sections, we analyze how, by reconceptualizing GIs as knowledge commons, the legal and common property regimes backing European GIs, especially in France, have addressed the group size paradox, the challenges posed by collective action, and the social dilemma that has emerged in the context of trade globalization.

3. Reconceptualizing GIs as knowledge commons

In this section, we extend the analysis by explicitly reconceptualizing GIs through the concept of ‘knowledge commons’ (Frischmann *et al.*, 2014; Hess, 2012; Hess and Ostrom, 2007; Madison *et al.*, 2010) and showing how that concept fits with the GIs definition first implemented in France and later endorsed at the EU and international levels.

3.1 Governing knowledge commons: an extension to GIs

Over the last few years, the study of knowledge commons has been extended to a growing number of knowledge domains (Frischmann *et al.*, 2014; Hess, 2012). In the literature, knowledge in its intangible form has usually been analyzed as falling into the category of a ‘public good’ because it is difficult to exclude people once someone has made a discovery, such as in the case of language, mathematics, or scientific knowledge. However, acquiring and discovering knowledge is also a cumulative and highly distributed process involving both a social process and a deeply personal process (Polanyi, 1958). This cumulative effect constitutes a public good, as long as people have access to the vast storehouse of knowledge and have the cultural heritage and knowledge capital required to maintain it over time (Hess and Ostrom, 2003, 2007; North, 2005). However, knowledge coproduction is also a costly process (Hess and Ostrom, 2007). The centrality of coproduction is foundational in Ostrom’s classification, as reiterated by Rayamajhee and Paniagua (2021), and it requires the active engagement of those who are endowed with the knowledge and ability to minimize the costs of knowledge coproduction and sharing.

The study of knowledge commons by Hess and Ostrom (2007) and its extension by the GKC framework (Frischmann *et al.*, 2014) have introduced a paradigm shift by considering the new challenges faced by scholarly knowledge and formal systems of property rights, especially in the context of digital technologies, which has created a threat of a second enclosure of the ‘intangible commons of the mind’ (Boyle, 2003; Frischmann *et al.*, 2014; Hess and Ostrom, 2007). The characterization and extended map of ‘knowledge commons’ as defined by Hess (2012) includes ‘all the shared collective knowledge resources, a complex knowledge ecosystem that is created and shared by a group of place-based local communities, and subject to social dilemmas’ (p. 3). That map also includes all forms of ‘shared understanding gained by experience or study’ as well as ‘useful knowledge, whatever the forms in which they are expressed or obtained’ (Hess, 2012: 14), i.e. Indigenous, traditional, vernacular, scientific, cultural, and creative works. In the recent literature, the study of traditional natural and agrarian commons has been disconnected from studies on knowledge and cultural commons (Frischmann *et al.*, 2014; Hess, 2012). A broader approach was thus proposed by Hess and Ostrom (2007: 14), by considering knowledge commons as knowledge ecosystems defined as the models of collective action and self-governance in which these ecosystems are nested and their interactions with the complex natural and socially constructed environments (Frischmann, 2012: 127; Frischmann *et al.*, 2014; Hess, 2012; Ostrom, 2009).

Adopting the vision of knowledge commons as knowledge ecosystems, Frischmann *et al.* (2014) defined as the ‘institutionalized community governance of the sharing [...], creation, of information, science, knowledge, data, and other types of intellectual and cultural resources’ (p. 3). Participants must not only share existing resources but also engage in a set of generative practices, in maintaining, sharing and producing situated knowledge resources (Madison *et al.*, 2010) that are both intangible and material, e.g. ideas, discrete cultural artifacts, and facilities (Hess and Ostrom, 2003; North, 2005; Ostrom, 2005). They form what Douglas North (2005) called the ‘artifactual structure’ and the sociomaterial environment of thinking facilitating collective learning and knowledge transmission. The essential questions are also closely connected to equity, efficiency, and sustainability (Hess and Ostrom, 2007: 6). The question is how to blend systems of rules and norms related to these new commons to guarantee general access to the knowledge that empowers humans while ensuring recognition and support for those who create that knowledge in its various forms.

3.2 GIs as a shared coevolving natural and cultural heritage

In the literature, the protection of GIs has often been restricted to the protection of their collective reputational capital without consideration of the importance of the specific natural and knowledge ecosystems and the role of local communities in first creating and maintaining collective local know-how over time (Fournier *et al.*, 2018). The statutory definition of GIs was developed in France by the INAO (*Institut National des Appellations d’Origine*), and extended to the EU context and adopted by international organizations, such as the OIV (International Organization of Vine and Wine).⁷ This statutory definition by the OIV includes the idea of shared ‘collective knowledge’ that has been developed by a group of human actors through the specific definition of ‘terroir’, making GIs good potential ‘knowledge commons’.

The term ‘terroir’ is defined by the INAO as follows: ‘*a specific geographical area where production takes its originality directly from the specific nature of its production area. Terroir is based on a system of interactions between physical and biological environments and a set of human factors within a space that a human community built during its history with collective productive knowledge. There are elements of originality and typicality of the product*’. These elements coincide with what Landes and Posner (1987) called the specific ‘design features’ in trademark law. Like in other IPR regimes supporting patents or trademarks, the registration and protection of GIs thus requires noteworthy and distinctive features defined and codified within the ‘codes of practice’ (‘cahier des charges’ in French, or ‘product specifications’ in Art 7 in EU regulation⁸), which include a number of minimum standards about the agricultural practices to be applied by farmers to prove distinctiveness and to legitimize the legal protection of these products (Barham and Sylvander, 2011).

In the case of GIs, the distinctiveness principle has been conceptualized through the concept of ‘terroir’, influencing the ‘typicity’ or ‘typicality’ of agricultural and food products through the complex and intimate combination of cultural and natural resources in relation to local environment and by extension their specific SES, as defined by Ostrom (2009). This statutory definition of GIs fits perfectly with the concept of ‘knowledge commons’ refined by Hess (2012) as the combination of (i) cultural resources, such as the informational and knowledge resources that are collectively created, owned, and shared across and within communities and (ii) the natural resources accessible to the members of a society, including natural materials such as air and water. The study of GIs thus expands the GKC research program on knowledge commons (Frischmann *et al.*, 2014) by combining the IAD/SES frameworks (Cole *et al.*, 2019) applied to agroecosystems viewed as human-made cultural/natural

⁷The 2010 OIV definition of a ‘vitivicultural terroir’ refers to ‘an area in which collective knowledge of the interactions between the identifiable physical and biological environment and applied vitivicultural practices develops, providing distinctive characteristics for the products originating from this area’ (Resolution OIV-VITI 333/2010).

⁸For example, the contents of applications for EU registration as a PGI or PDO in the case of wine shall include (Art 35 – EC no 479/2008) a technical file including (i) the name to be protected, the name and address of the applicant, the product specifications, and a single document summarizing the product’s specifications.

artifacts and their SES in relation to natural commons, such as biodiversity, soil, landscape, climate, and water management (Frischmann, 2012; Hess, 2012; Mazé *et al.*, 2021; Ostrom, 2009).

In the literature, agricultural knowledge has often been viewed as traditional (Dagne, 2014). However, farmers are also key innovators who adapt their agricultural practices and take advantage of their local environment through ingenious innovations. Local farmer groups form both ‘communities of practice’ and ‘epistemic communities’ defining knowledge ecosystems in which farmers share practices and knowledge, as well as an identity-based history that goes beyond individuals (Mazé *et al.*, 2021).⁹ Within the GKC framework, generative practices of coproducing, creating, and preserving shared common knowledge require the active participation and collective engagement of individuals (Frischmann *et al.*, 2014; Madison *et al.*, 2010). It thus introduces a paradigmatic shift capturing not only the collective and shared reputation but also the collective investments made to maintain the coevolution of the natural and cultural heritage, and the specific knowhows and ‘designed features’ that have been developed over time by a group of people in a specific place. This evolution is clearly reflected in the 2012 EU regulation (Reg 1151/2012), where GIs appear as a means of protecting the ‘living cultural and gastronomic heritage, as GIs are part of the EU culture, its traditions and its heritage’.

3.3 GIs as a response to the threat of undue private appropriation

In the European context, the reputation of products protected by GIs was built over time by groups of producers based on local or long-distance consumer demands, a collective reputation-dedicated investments by local communities to sustain their distinctive knowhows (Meloni and Swinnen, 2018; Stanziani, 2004). In France, Stanziani (2004) showed that legislation pertaining to GIs first emerged at the end of the 19th century to resolve repeated litigation between wine producers and traders about the use of local geographical names in the Bordeaux region and other places in France. Instead of privatizing geographical names, the legal protection provided by GIs thus acts primarily as a common umbrella branding, defining broad product styles (e.g. in the case of Bordeaux or Burgundy wines) recognized by consumers. At that time, a major issue emerged with respect to a small number of legal cases concerning the undue private appropriation of place names through trademark registration, conflicts between grape growers and traders (especially in the Bordeaux area), the threat posed by the transformation of GIs into generic names, and the risk that they be progressively commodified (Stanziani, 2004).

The two main questions for the local French judges who had to settle litigation concerning Bordeaux wines were the following: (i) what are generic names (with regard to geographical origin and place names)?¹⁰ Once a trademark becomes generic and falls into the public domain, the protection ceases. The threat that a place name could become a generic name unless specific action is taken represents a nontrivial issue in the context of trademark law (Landes and Posner, 1987). (ii) What defines the collective trademark (in relation to product characteristics) and possible wine blending – ‘mélanges’ – as a possible source of confusion for the consumer? Defining a trademark requires a high degree of expertise and involves technical aspects that can impose limitations on the judges’ evaluation and create legal insecurity, due to variable judicial outcomes that lead toward an *ex-ante* regulation that provides more precise guidelines for and definitions of expected product specifications.

In the French context, the creation of legislation on GIs thus facilitated the shift from a pure judicial approach with an *ex-post* resolution of litigation by judges, as currently applied in common law countries,

⁹While the reputation of GIs is usually closely associated with ‘traditional products’, they are also the result of continuous innovations and of the development of specific know-hows, incorporating new technological developments, as illustrated by the ecological crisis created by the phylloxera epidemic that destroyed most of the vineyards in Europe and stimulated the adoption of GI legislation (Meloni and Swinnen, 2018).

¹⁰Landes and Posner (1987) defined generic words as words that denote entire common products, as opposed to simple individual brands (such as ‘aspirin’, ‘cellophane’, or ‘thermos’) and that have become part of ordinary language.

to an *ex-ante* state-controlled registration system and the creation of a dedicated public agency, the National Committee for Origin Appellations (CNAO in French),¹¹ renamed the INAO in 1947. This public agency has helped prevent conflicts between contemporary traders and growers and resolve related political struggles, thus reducing litigation and political transaction costs. The adoption of GIs legislation reflects the classic tradeoff in law and economics between the vagueness of the law and the costs of *ex-post* litigation created by legal uncertainty about the outcomes of litigation (Kolstad *et al.*, 1990).¹²

3.4 A shift in form from *ex-post* trademark litigation to *ex-ante* regulation

Analyzing the way GIs have been organized and regulated in France and later extended at the EU level provides interesting insights into how knowledge commons can contain typical threats, such as commodification, degradation, and unsustainability (Hess, 2012). Collective brand names can help reduce the individual cost of investments in reputation capital for small agricultural producers via the backing of the collective reputation that remains more subjected to possible free-riding and requires specific enforcement. A major issue when developing a common property regime for GIs is the ways in which the group size paradox identified by Olson (1965) and the related social dilemma of collective action (Ostrom, 1990) are addressed. The legal recognition of GIs in France is organized through a complex set of nested organizational and institutional rules identified by Bingen (2012) around three main distinctive features:

- i) The characterization of the *typicity* of place-based products, which combines natural and cultural factors, as defined by ‘product’s specifications’ (Art 7 Reg 1151/2012) that establishes the links between the product’s attributes and its ‘terroir’ from which it emanates and defines its distinctiveness. As in the case of other IPR tools, knowledge codification, as a coordinating artifact, plays a double role, first in defining what the parties agree to comply with and then in facilitating cooperation in the building, sharing, and preservation of traditional knowledge, as well as in fostering peer-to-peer collective learning processes over time (Cowan *et al.*, 2000; Frischmann *et al.*, 2014; Mazé, 2017).¹³
- ii) *The collectivity*, through collective organization of producers, is perceived as a masterpiece of GIs. This principle entails the collective self-governance of GIs and is central in the way in which collective rules balance the power among producers, traders, and large agrifood firms, which are often placed in a monopsonistic position toward their suppliers. The role of collective action also contributes to building shared social norms of cooperation and reciprocity among members (Ostrom, 2000).
- iii) *The governmentality principle* refers to supervision by public authorities. In the French context, these authorities include a dedicated public agency, the INAO, which is in charge of supervising GIs and provides a stronger protection status¹⁴ and added guarantees to consumers about product integrity and identity against possible fraud and quality defects, as well as to producers of GIs by acting as an official collective umbrella brand that reduces the level of initial investment needed to build shared knowledge and reputation capital.

¹¹In French, the Comité National des Appellations d’Origine pour les Vins et Eaux-de-vie (CNAO).

¹²For civil law countries, such as France, Stanziani (2004) suggested that if the law is slow to change, an *ex-ante* administrative regulation decreases the costs of the modification, as well as the cost of the uncertainty created by fluctuating decisions by judges; such a regulation also improves efficiency by reducing litigation and transaction costs.

¹³In other IPR regimes, such as patents, innovators are also requested to codify their inventions in exchange for temporary property rights over them. Knowledge codification is never exhaustive and remains incomplete. Under certain circumstances, secrecy also constitutes good protection against counterfeiting (Bessy and Brousseau, 1997; Cowan *et al.*, 2000; Frischmann *et al.*, 2014). A key issue is then the determination of the best strategies of knowledge codification and the tradeoffs between the protection and diffusion of specific knowledge and knowhow among producers.

¹⁴See Mazé and Ménard (2010) for a similar example about interprofessional agreements in France.

Through the adoption of these specific constitutional and collective rules, regulations over GIs contribute to the rebundling and repackaging of related goods and services, including knowledge resources (Rayamajhee and Panaguaia, 2021: 80). The stronger protection status provided by this governmentality principle is a central piece in the governance of GIs in France, thanks to the specific role played by the public agency, the INAO, since its creation in 1947. The INAO plays a key role in adjudicating and actively fostering what Bingen (2012) called ‘*a meaningful democratic culture to advocate and defend the interests of producers and consumers of place-based products*’. The participatory governance adopted by the INAO has involved the participation and stewardship of producers of GIs in national committees, as well as the building of shared common knowledge and social norms (Olson, 1965; Ostrom, 1990, 2003). Thus, the common property regime defined by GIs in France can be viewed as a type of egalitarian contract taking the form of shared access, which solves not only incentive problems but also allocation problems and value-sharing among members (Allen, 1991, 2002). Whereas the emergence of GIs in France remains a major historical benchmark, the growing adoption of GIs worldwide has yielded more diversified models of regulation and collective action than the original model (Marie-Vivien and Bienabé, 2017).

4. Discussion

Instead of adhering to a static model of Ostrom’s classification, Rayamajhee (2020) emphasized the need to constantly reexamine the dynamic shift in the nature of goods or services, not only through the move of specific goods from one quadrant to another but also, more importantly, through the ways in which institutional shifts in L_{ht} and L_{vt} parameters (see Figure 2) can affect the scope of feasible reconfigurations. In this section, we discuss a number of policy issues and the factors driving the adoption of legislations about GIs worldwide, highlighting, possible regulatory convergence between each side of the Atlantic.

4.1 The growing adoption of protection for GIs at the international level

Over the last decades, the growing adoption of legislation on GIs has been observed at the international level in world powers such as India, Japan, and China, as well as countries in South America, Africa, and South Asia (Bonanno *et al.*, 2019; Calboli and Ng-Loy, 2017). Despite the failure to reach a common agreement in the so-called ‘war on terroir’ that has opposed the EU to the USA (Josling, 2006), WTO negotiations have contributed to raising awareness about the potential economic value of place names and their strong cultural and historical dimensions as identity markers in the context of globalization. A number of studies have questioned how relevant it is for small farmers in developing countries to adopt a *sui generis* legal system that protects GIs. In fact, in most countries, both trademarks and GIs are deployed to achieve the same rural development policy goals through market-based instruments, to allow local communities to capture the market value of their local resources and to build their shared collective knowledge over time (Yeung and Kerr, 2011).

In his study, Dagne (2014) interestingly identified three main motivations for the adoption of GIs: (i) GIs are seen as instruments of remunerative marketing for agricultural production based upon traditional cultivation techniques (e.g. Brazil, Panama, Peru); (ii) GIs embody the protection of traditional knowledge (e.g. Venezuela, Vietnam); and (iii) GIs are a response to the threat of undue appropriation of local geographical denominations in export markets (India and Pakistan). In many cases, the initial adoption of GIs appears as a response to a set of highly publicized cases of undue appropriation by large international corporations through trademark registration, leading to a suspicion of intellectual grabbing of local cultural heritage (Dagne, 2014; Marie-Vivien and Biénabe, 2017).

Among the most well-known legal cases widely covered by the media features the basmati case. Indeed, in 1997, an American company was granted a patent by the US patent office (USPTO) to call an aromatic rice grown outside India ‘Basmati’. Another legal case reported by Dagne (2014) implicated Ethiopia, Africa’s leading coffee producer, and the US coffee company Starbucks over

indigenous coffee varieties, such as Sidamo, Harar, and Yrgacheffe. Despite Ethiopia's initial application to register a trademark on Sidamo in the USPTO and the Canadian IP office, Starbucks refused to acknowledge Ethiopia's right to trademark its coffee varieties, based on the argument that these coffee's names are generic.¹⁵ In their survey, Giovannucci *et al.* (2009) estimated that the export value for Basmati rice in India and Pakistan was USD 1.5 billion and USD 250 million, respectively, in 2008. A recent survey by the European Union Intellectual Property office (EUIPO, 2016) estimated the value and economic costs of IPR infringement in the EU to be approximately €4.3 billion, only for wine and spirits (approximately 9% of the GIs market). All these legal cases illustrate the importance of the cultural and economic value attached to GIs worldwide and the growing attention paid to the threat of undue appropriation in the context of trade globalization.

4.2 Protecting GIs: reducing transaction costs through public registration

A major driver of the growing adoption of GIs worldwide has been a reaction to the costly and imperfect enforcement strategies by US state jurisdictions in preventing legal actions against the abusive appropriation of geographical names, as well as the costs of legal claims imposed on defendants in the US in cases in which products are passed off as others, which are often underestimated (Linguist, 1999). In their study, Hess and Ostrom (2003, 2007) stressed that common property regimes were rarely granted formal status in the US tradition, despite potential positive outcomes, based on the implicit assumption that private property is superior to other forms of communal or collective property (Demsetz, 1967; Ostrom, 1990).

In their study of US trademark law, Landes and Posner (1987: 282) showed that it encompasses a mixture of state common-law rights and an optional federal registration system (which itself is based on a mixture of registration and first-possession principles) under the Lanham Act. The extension of the public domain in the US has constantly been subject to revisions, with fuzzy and overlapping frontiers and triggered tensions between the public and private sectors (Lamoreaux, 2011). Public authorities have continually reallocated property to promote economic development or other political goals (Jaffee and Lerner 2004; Lamoreaux, 2011). In the absence of federal harmonization, Landes and Posner (1987) suggested that 'the principal social benefit of a federal registration system is that notice is likely to be more widespread, so that inadvertent duplication is less likely' (p. 282). As consumers have become more mobile, public registers have been able to help solve problems emanating from territoriality, geographic overlap, and judicial fragmentation (Landes and Posner, 1987).¹⁶

A number of recent studies have highlighted that the demarcation between the 'liberal and self-policing' US model of trademark registration law and the 'bureaucratic' EU system of *sui generis* registration of GIs established in 1992 might be evolving, suggesting possible regulatory convergences between both sides of the Atlantic (Barham and Sylvander, 2011; Dagne, 2014; Le Goffic and Zappalaglio, 2017).¹⁷ Over the last few years, opposition to the protection of GIs in the US has mainly been led by the American Cheese Association. Thanks to early Italian migrants, the most popular cheese names in the US, such as Parmesan, Asiago, Gorgonzola, Fontina, and Romano, are considered generic and 'common names' and represent almost 14% of US cheese production (valued at \$4.2 billion per year) (Johnson 2017). Recently, alternative voices, including those of artisanal cheese makers (Paxson, 2010) and powerful Californian wine producers, have emerged in the US claiming their interest in GIs (Barham, 2003). This question is of particular interest to the members of the Napa Valley Vintners, who due to their growing reputation have faced the issue of counterfeited and falsely labeled products, thus fostering their interest in stronger protection. The adoption by

¹⁵Another example is the case of a Canadian company, Maple Leaf Food, which registered a trademark on Parma in 1971. The Canadian court refused to cancel the trademark after legal action by Italian Parma producers.

¹⁶See Arruñada (2012) for a more general analysis of the role of public registries in reducing titling costs.

¹⁷As a result of the WTO disputes under the Doha mandate (article 23), the EU has established an official and open access multilateral register for GIs (the database eAmbrosia), launched in 2019.

the US TTB (Alcohol and Tobacco Tax and Trade Bureau) of some references to terroir has also indicated policy changes (Le Goffic and Zappalaglio, 2017).

4.3 GIs as a vehicle for the protection of traditional knowledge

The adoption of legislation pertaining to GIs has also been increasingly viewed as a means to enhance the protection of traditional knowledge and biodiversity (Bérard and Marchenay, 2006; Dagne, 2014; Singhal, 2008). Geographical names, as place names, are often considered by local communities as part of their cultural identity, giving them a sense of place and defining a specific relationship with their terroir and their specific SES (Bowen, 2010). However, traditional knowledge is often perceived as ‘*ancient, static, and natural*’ and as such falls out of the scope of any protection under IP rights. In fact, the relegation of the so-called traditional knowledge to the public domain denies its intellectual worth and value both in terms of invention and innovation and shows that local agricultural communities are considered as mere wardens of traditional knowledge about natural resources and biodiversity (Dagne, 2014). Far from the fixed vision of traditional knowledge, the legal protection of GIs reflects a dynamic vision of communities’ continuously evolving shared collective knowledge and knowhow, which are attached to their cultural heritage as it relates to the natural environment. Protecting the public domain against possible misappropriation is not viewed here as a defensive strategy against the encroachment of property rights and thus as a possible second enclosure movement (Boyle, 2003).

By reconceptualizing GIs as knowledge commons, a paradigm shift is proposed whereby GIs are viewed as part of the collective natural and cultural heritage shared by local place-based communities, including all the intellectual and natural resources that relate to the ways in which communities’ terroir defines the ‘distinctive features’ of agricultural and food products. All these components define the unique properties of knowledge and informational resources attached to GIs, justifying their extended legal protection. If properly designed, legislation aimed at GIs can provide additional legal resources to reinforce the stewardship of local producer communities in the preservation of their culture and their local social ecological systems (Ostrom, 2009). However, as stressed by Elinor Ostrom, there is no institutional panacea or one-size-fits-all solution. A precise evaluation of GIs’ policy relevance, alongside an evaluation of their expected benefits for local communities and the tradeoffs caused by possible adverse side effects¹⁸ remains needed.

5. Conclusion

Our analysis has important policy implications and fills a gap in the academic literature, in which GIs have been analyzed either as part of a free and open-access public domain or as a reputational ‘club asset’ shared by a small set of privileged club members and built upon exclusionary rules rather than inclusion. Using the discrete and dynamic Ostrom’s classification developed by Rayamajhee (2020), we contribute a systematic analytical approach to the ways in which geographical names can, depending on the legal regimes and the specific rules of collective action and regulation adopted, switch from one category to another and be considered a public good, a club or private good, or a CPR. Building on the public choice foundations and Ostrom’s early epistemic choices, our analysis supports the idea that Ostrom’s taxonomy is not a static binary concept. Instead, it is institutionally contingent, malleable, and dynamic and changes over time (Rayamajhee, 2020: 7). Applied to the specific IP laws on GIs, this notion expands the narrow private–public dichotomies by using a realistic and inclusive taxonomy of goods and services.

Our analysis is also a key contribution to the growing amount of research being conducted on the GKC framework and its recent extensions (Frischmann *et al.*, 2014). It also provides insights into possible connections with the IAD/SES framework (Cole *et al.*, 2019; Ostrom, 2009). Beyond the classical

¹⁸See, for example, Bowen and Zapata (2009), on unintended side effects on Tequila and Mezcal production in Mexico, or Vitrolles (2011) in Brazil, among others.

civil and common law divide, our analysis suggests that the classical economic analysis of trademark law by Landes and Posner (1987) can be applied to common property regimes, such as GIs, and to their original mixture of state-backed, collective organizations inspired by the French model. Whereas the growing adoption of GIs worldwide appears to be a pragmatic response to the undue private appropriation of geographical names through trademark registrations and an attempt to adopt a positive and inclusive approach to the public domain, the setting of properly designed institutional arrangements remains a key condition for overcoming the dilemma of collective action and its evolution across contexts bounded by time and space.

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