

Friends or Foes? Investigating the Relationship Between Collective Intellectual Property Rights and Regional Innovation in the EU Wine Industry

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EXTENDED ABSTRACT

1. Introduction and Motivation

Innovation policy has increasingly shifted beyond aggregate growth to address where innovation occurs, how it diffuses across territories, and which mechanisms sustain long-term competitiveness. These concerns are especially salient in the European Union, where innovation capacity remains unevenly distributed across highly heterogeneous regions, reinforcing persistent core–periphery divides. While much of the regional innovation literature has focused on R&D-intensive sectors, the place-based perspective is equally consequential for traditional industries, where competitive advantage depends on local institutions and the governance of place-based assets.

This study investigates the interplay between collective intellectual property rights (CIPRs) and regional innovation in the EU wine industry. We focus on two key instruments: geographical indications (GIs) and collective trademarks. Both are intended to support collective reputation and mitigate information asymmetries by signalling the origin and shared characteristics of products. Yet their implications for innovation are ambiguous. CIPRs may facilitate coordination among dispersed producers, strengthen collective reputation, and sustain price premia that make upgrading profitable (Menapace & Moschini, 2024). Alternatively, the same rule-based protection may embed rigidity, reduce competitive pressure, and encourage rent-preserving strategies that weaken incentives for experimentation (Josling, 2006).

Building on Ostrom's (1990) framework for commons governance and its extension to knowledge commons (Hess & Ostrom, 2007; Mazé, 2023), we argue that the same collective IP instrument can function as either a coordination device enabling innovation or a rent-seeking mechanism inhibiting it, depending on the quality of formal institutions and the depth of social trust in the region where it operates. Our empirical strategy focuses on regional exposure to CIPRs and subsequent innovation activity, proxied by individual trademark registrations. We complement trademark counts with a semantic novelty analysis using

BERT-based sentence embeddings that captures whether regions generate differentiated market signals rather than repetitive filings.

The paper contributes in three ways. First, it demonstrates that the CIPR–innovation relationship is profoundly conditioned by institutional capacity, reconciling conflicting theoretical perspectives. Second, it reveals heterogeneous moderating effects of formal governance and social trust, which shape innovation outcomes in structurally distinct ways. Third, it introduces a novel approach to assessing innovation quality using BERT-based semantic embeddings to measure trademark distinctiveness.

2. Theoretical Framework and Hypotheses

Innovation is closely tied to the social and physical conditions in which it takes place, including regional institutions (Doloreux & Parto, 2005; Rodríguez-Pose, 2020). In experience-intensive sectors such as wine, innovation relies on tacit knowledge (Giuliani & Bell, 2005) and symbolic knowledge related to branding and cultural values (Asheim & Hansen, 2009). To translate localised assets into sustained economic performance, regions employ collective branding strategies. Geographical indications protect the link between product reputation and geographic origin (Crescenzi et al., 2022), while collective trademarks carry no mandatory territorial anchorage and function primarily as associational coordination devices (Castaldi & Mendonça, 2022).

Two divergent theoretical positions exist. The first holds that CIPRs actively shape innovation behaviour: rigorous production specifications compel firms to upgrade capabilities (Meloni & Swinnen, 2018), and by resolving information asymmetries, GIs lower costs of entering new markets (Durand & Fournier, 2017). Conversely, Josling (2006) argues that GIs elevate producers to “the foothills of monopolistic competition,” while Frankel (2011) notes they are designed to “preserve the status quo.” EU Regulation 1151/2012 imposes strict product specifications that can create institutional lock-in, and the GI functions as a club good where reputation is non-rivalrous but excludable (Moschini et al., 2008), creating free-riding risks that may discourage individual R&D investment. Given these dynamics, we hypothesise:

H1: *CIPRs are negatively associated with regional innovative performance.*

Yet this expectation rests on the assumption that institutional environments are homogeneous. Building on Ostrom’s (1990) framework, CIPRs can be understood as a knowledge common whose fate depends on local actors’ ability to develop rules, resolve conflicts, and prevent

elite capture. In institutionally strong environments, producers face lower barriers to consortium formation, while generalised social trust reduces monitoring costs and enables credible commitments (Putnam, 1993). Where both formal and informal institutional quality is high, CIPRs are more likely to function as coordination-enabling devices; where institutional quality is low, they may reinforce rent-seeking. We therefore hypothesise:

H2: *The association between CIPRs and innovation is moderated by institutional quality: the negative association is weaker (or reversed) in regions with stronger formal institutions and higher social trust.*

Finally, CIPRs may serve as institutional kits to offset peripheral disadvantages through resource pooling (Castaldi et al., 2025). However, peripheral regions are frequently characterised by institutional thinness (Trippel et al., 2018), where fragmented local actors increase coordination costs. Given this ambiguity, we explore:

H3: *The association between CIPR intensity and regional innovation differs between core and peripheral regions.*

3. Data and Methodology

We investigate the CIPR–innovation relationship in the EU wine industry between 1996 and 2024. Data on 1,633 GIs were collected from the European Commission’s eAmbrosia and GIview databases, geo-referenced to NUTS-2 regions. We identified 193 EU collective trademarks relevant to wine from the EUIPO database. As a proxy for regional innovation, we use 25,506 registered EU individual trademarks in wine-relevant NICE classes.

Trademarks are particularly suitable for this SME-dominated industry: they provide broader geographical coverage than patents (Castaldi, 2024) and capture the marketing-driven, incremental innovation characteristic of the sector (Flikkema et al., 2014). Regional controls include GDP per capita, population, tertiary education share (Eurostat), patent counts (OECD REGPAT), and vineyard share (FADN). Formal institutional quality is sourced from the European Quality of Government Index, and social trust from the European Social Survey.

Given the count nature of the dependent variable and the prevalence of zeros, we implement a Poisson Pseudo-Maximum Likelihood (PPML) estimator with high-dimensional fixed effects (Correia et al., 2020; Silva & Tenreiro, 2006). Institutional heterogeneity is captured through interaction terms between CIPR variables and formal institutional quality or social trust.

Marginal effects are evaluated at one standard deviation below, at, and above the mean. For identification, we construct a shift-share instrumental variable exploiting exogenous variation

in regional viticultural suitability, derived from the Huglin Index (Huglin, 1978), interacted with aggregate EU-wide GI registration trends. For semantic novelty analysis, we encode each trademark's goods and services description using the all-mpnet-base-v2 sentence-transformer model, mapping text into 768-dimensional embedding vectors. Novelty is defined as average cosine distance to the $k = 5$ nearest neighbours, controlling for baseline archive size to ensure results reflect semantic differentiation rather than statistical artefacts of larger archives.

4. Key Results

Baseline results. The baseline PPML estimates reveal a persistent negative association between GI registration and individual trademark applications. In the aggregate model, a one-unit increase in lagged GI registration correlates with a 3.8% reduction in trademark applications ($\beta = -0.038$, $p < 0.01$). This crowding-out effect is stronger in the food and beverage sector ($\beta = -0.042$, $p < 0.05$). Collective trademarks show heterogeneous effects: statistically indistinguishable from zero in the broader sample but marginally positive in food and beverage trademarks ($\beta = 0.030$, $p < 0.10$). In the wine-specific specification, the GI coefficient remains negative but loses statistical significance. A placebo test on non-food categories yields insignificant coefficients for both IP types, confirming sector-specific rather than spurious dynamics.

Institutional heterogeneity. The $GI \times$ institutional quality interaction is positive and highly significant across all specifications ($\beta = 0.099$ – 0.151 , $p < 0.01$). The marginal effects demonstrate a striking reversal: in a region with institutional quality one standard deviation below the EU mean, an additional GI is associated with 7.2% fewer trademarks ($p < 0.01$); at the mean, the association is statistically zero; and at one standard deviation above, the same GI is associated with 12.5% more trademarks ($p < 0.01$). For wine-specific trademarks, this range widens from -9.8% to $+20.5\%$. Collective trademark interactions with institutional quality are insignificant throughout. For social trust, the $GI \times$ trust interaction is negligible for broad outcomes but positive and marginally significant for wine-specific trademarks ($\beta = 0.127$, $p < 0.10$).

Peripheral heterogeneity. The baseline crowding-out effect is driven almost entirely by core regions ($\beta = -0.039$, $p < 0.01$). In peripheral regions, defined as those falling simultaneously in the bottom quartile of GDP per capita and tertiary education share,

the interaction term neutralises the negative effect. For collective trademarks, the interaction with peripherality in food and beverages is large and significant ($\beta = 0.873$, $p < 0.01$), suggesting that while CTs may be redundant in developed hubs, they may induce market-oriented innovation in regions lacking alternative institutional support.

Instrumental variable results. The Bartik instrument is strongly predictive (first-stage F-statistic = 27.8, exceeding the Stock–Yogo critical value). The instrumented GI coefficients reverse sign but none reach significance. Endogeneity tests do not reject exogeneity. This pattern is consistent with the finding that the average GI effect aggregates opposing forces across heterogeneous institutional environments.

Semantic novelty. For wine-specific trademarks, GI registration does not significantly affect within-region novelty but marginally reduces within-region homogeneity ($\beta = -0.005$, $p = 0.073$), suggesting diversification in trademark language, fewer but more varied filings. The institutional interaction reveals a stark asymmetry: GI registration increases homogeneity in weak-governance environments but strongly decreases it in high-quality environments. Social trust moderates in the opposite direction: in high-trust environments, GI registration increases homogeneity, meaning producers converge around shared descriptive conventions. This confirms that formal institutions secure conditions for individual differentiation, while trust sustains collective coherence that strengthens shared reputation at the expense of individual departures.

5. Discussion and Conclusions

The central finding is that the CIPR–innovation relationship is fundamentally institutionally conditional. The average negative association between GI registration and regional innovation masks a deep asymmetry: GIs are associated with significantly lower innovative activity in weak-governance regions but significantly higher activity where institutional quality is strong. This reframes the policy debate from “are GIs good or bad for innovation?” to “under what institutional conditions do GIs enable innovation?”

The semantic novelty analysis addresses whether GI registration suppresses innovation outright or displaces routine filings while leaving substantive differentiation intact. The pattern of fewer but more varied filings suggests selective displacement: collective quality governance establishes a shared reputational baseline, pushing individual trademarking toward differentiation rather than imitation. Formal institutions provide the credible enforcement architecture that secures individual investments in differentiation, while trust

facilitates collective coordination and norm compliance, sustaining shared standards that strengthen collective reputation but constrain individual departures.

Three policy implications follow. First, CIPRs are not generally beneficial for innovation; they function as institutional multipliers only when supported by appropriate governance frameworks. Second, the qualitative character of GI-induced innovation depends on which governance dimension dominates: formal institutions promote differentiation, while trust promotes convergence. Third, GIs and collective trademarks are not interchangeable developmental tools; in peripheral regions, collective trademarks may serve a more effective coordination role for broader market-facing innovation.

Limitations include reliance on EU-wide rather than national trademark registrations, measurement of governance at the general regional level, the treatment of GIs as homogeneous, and the focus on the wine sector. Future research should explore sector-specific governance metrics and qualitative case studies of the practices that build trust and enable innovation within CIPR frameworks.

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