Merchant Hubs and Spatial Disparities in the Private Enforcement of International Trade Regimes

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Abstract

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Keywords: European Court of Justice; EU Trademark registration; Judicial behaviour; Litigation; Negative binomial fixed effect regression; Spatial analysis

JEL Classification: C23, F15, K10, K49, R10

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Private enforcement through courts has been put forward as a possible substitute to public enforcement of federal and international trade regimes. In this article, we seek to advance the empirical literature on private enforcement in the EU context by overcoming the limitations of existing datasets. We present a new dataset measuring referral activity at subnational level and argue that EU trademark registrations represent a better proxy for cross-border economic activity than intra-EU trade in goods. EU trademark registrations capture trade in services as well as goods are measured at the regional rather than at the national level. Consistent with theories emphasising the link between economic and legal integration, we find that regions with higher concentrations of EU trademark users generate significantly more referrals. Our analysis suggests that private enforcement is more effective in regions with large trade hubs and less so in more peripheral regions with less trade-oriented economies.

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1 Introduction

Economic and social integration represent a central goal of multi-level governance structures such as federal states and supranational polities (Carruba et al., 2012). Both the US Constitution and the European Union (EU) founding treaties aim to facilitate trade and mobility across their constituent units. The US Constitution by prohibiting restrictions to interstate commerce; the EU treaties by laying down rules for the creation of an internal market. Weak enforcement capacities, though, can be an obstacle to the accomplishment of this goal. This problem seems especially acute in the case of supranational regimes like the EU. While it arguably constitutes the most far-reaching experiment in peaceful supranational governance, the EU possesses very little administrative capacity. Despite popular depictions of the EU as an oversized and bloated bureaucracy, it has fewer than 35,000 permanent civil servants on its payroll. There is no EU police or EU armed forces. Nor is there an EU court system comparable to the US federal judiciary. The Court of Justice and the General Court are the only judicial bodies erected by the EU. A corollary is that the primary responsibility for enforcing EU laws and regulations lies with national governments. The enforcement of EU rules thus depends on domestic actors and institutions the EU did not create and does not control directly. Yet governments can prove ineffective and may even seek to evade their enforcement duties (Börzel et al., 2004). Private enforcement through domestic courts is viewed – and seemingly actively pursued by EU institutions – as a remedy to the enforcement deficit (Kelemen, 2012). To the extent that they create legal rights enforceable in courts, regulations can be enforced by business and private individuals acting "as private attorney generals" (Kagan, 2001, 47).

Empirically, the extent to which private enforcement represents an effective enforcement approach is a question that naturally ties into the broader issue of what drives EU law use. Empirical research has relied on the number of requests for a preliminary ruling passed on to the Court of Justice of the European Union as the most reliable proxy for EU law use (Hornuf and Voigt, 2015; Pitarakis and Tridimas, 2003; Stone Sweet and Brunell, 1998a). Requests for preliminary rulings are submitted to the ECJ judges at the behest of domestic judges. Following Article 267 of the Treaty on the Functioning of the European Union (TFEU), the decision is a matter of discretion for courts whose rulings are subject to appeal but mandatory for last instance courts when EU law is material to the legal dispute. Based on this proxy, EU law use seems to vary significantly across member states. This observation has spurred a search for explanations. One prominent theory – which can be described as "economic Neo-functionalism" – emphasises the role of transnational exchange as both catalyst and engine of legal integration. Positing a positive, self-reinforcing relationship between cross-border activity and EU law litigation, it claims that economic agents engaging in cross-border activities are those with the strongest incentive to invoke EU rules to challenge domestic violations. Where these agents are more present, therefore, we should expect EU law use to be more frequent. The main piece of empirical evidence marshalled to back the trade hypothesis has been the correlation between intra-EU trade in goods and annual referral rates per member state (Stone Sweet and Brunell, 1998a). This account of legal integration has not gone unchallenged. Schol-

ars have questioned the validity and robustness of the alleged causal nexus (Wind et al., 2009; Pitarakis and Tridimas, 2003; Hornuf and Voigt, 2015). The data and broad empirical strategy that has informed this debate, though, present several limitations. The relationship between trade and referral activity has been estimated by aggregating the data at the country level. While, according to Article 267 TFEU, the decision to submit a preliminary reference formally lies with judges, the nature of a dispute and, therefore, its relation to EU law are normally defined by the parties. The parties also decide what legal arguments to make before the judge and whether to invoke EU law. So patterns of referral activity are obviously influenced by both litigants and judges (Pitarakis and Tridimas, 2003). Yet these dynamics are hard to separate out with data aggregated at the country level. Another limitation relates to the proxy used for trade. Eurostat data on intra-EU trade only captures trade in goods, although EU internal market regulations go beyond trade in goods. The EU's remit has expanded significantly since the 1960s to cover areas such as services, capital flows and labour mobility. At the same time, the share of manufacturing and agriculture in the economic output of its member states has decreased while the share of services has gone up. Dyevre and Lampach (2018a) show that the correlation between referral rates and intra-EU trade in goods has decreased steadily over time, which implies that trade in goods may not adequately capture the role of transnational economic exchange at more advanced stages of integration.

In this article, we seek to advance our empirical understanding of private enforcement by addressing these measurement limitations. First, we follow Kelemen and Pavone (2016) in adopting the subnational region as our level of analysis. While data aggregated at the regional level offers less analytical leverage than would court or judge-level data, it is a substantial improvement on country-level aggregation. Compiling the geographic coordinates of the entire universe of courts that have submitted references to the ECJ from 1961 to 2017, our new dataset allows us, in particular, to exploit variations in the location of institutions, such as courts of last resorts, to control for their effect – something impossible to do in a country-level analysis. Second, we present a new proxy for cross-border economic activity. We argue that EU trademark registrations represent a strong proxy for cross-border economic activity, because the net benefits of using EU trademark protection are a function of the number of member states in which the trademark user operates. Unlike other proxies for international commerce, EU trademark registrations cover trade in services as well as goods. Consistent with theories emphasising the link between economic and legal integration, we find that regions with higher concentrations of EU trademark users generate significantly more referrals. Our analysis suggests that private enforcement is more effective in regions with large trade hubs and less so in more peripheral regions with economies less exposed to international trade. Global players and multinational companies are likely to be the most reliable private enforcers of EU regulations.

The paper is organised as follows. Section 2 summarizes the two strands of literature which, combined, provide the theoretical context for our empirical argument. Section 3 defends two important assumptions underpinning our hypothesis, which respectively pertain to the evolution of transnational economic exchange and the general focus of EU rules and regulations. Section 4 explains why, in our view, EU trademark registrations

better capture the nature of cross-border trade at advanced stages of the integration process than measures exclusively based on intra-EU trade in goods. This Section further elaborates on the analytical gains of shifting the level of analysis from the national to the subnational level. Section 5 presents the methodology and results of our empirical assessment of the relationship between EU trademark registrations and referral rates. Finally, we conclude with some remarks on possible improvements and future research.

2 Private Enforcement and the Trade Hypothesis

Our theoretical framework pulls together distinct strands of literature and relates the logic of private enforcement to the trade-integration dynamic emphasised by Neo-functionalist scholars.

2.1 Private Enforcement of EU Law

Both lawyers and economists have recognised that legal systems rely on private as well as public enforcement (Becker, 1968; Stigler, 1970; Becker and Stigler, 1974; Landes and Posner, 1975; Kessler, 2010; Rose, 2010). The distinction between private and public litigation is typically presumed to turn on the involvement of government officials such as public prosecutors (Levinson, 1988; Polinsky and Shavell, 2000). Whether private lawsuits constitute an effective enforcement mechanism and a viable alternative to public enforcement depends on the incentives of private parties to report violations of the law (Shavell, 1993, 2004). While private parties may have information about the context of violation and identity of violators (Shavell, 1993), private enforcement may be inefficient even when private parties are incentivised to bring lawsuits (Polinsky and Shavell, 2000). Likewise, where identifying violators is difficult and costly, as with criminal offences, private enforcement may prove ineffective (Polinsky and Shavell, 2000). More generally, theory suggests that there is no systematic relationship between the social and private benefits of bringing suit (Shavell, 1982; Kaplow, 1986). However, the federal regulation of economic activities is arguably a domain where private benefits are, at least in some circumstances, easier to align with social ones. If federal regulations aim to liberalise markets or to harmonise technical standards across territorial units, private businesses stand to accrue significant benefits from their effective enforcement.

In parallel to the law and economics literature, private enforcement has been discussed in the political science literature, initially in the US context (Kagan, 1991) and later in the European Union (Kelemen, 2008, 2011, 2006; Hofmann, 2019). According to this literature, private enforcement is a strategy attractive to weaker states and fragmented polities. When diluted political authority limits the ability of policy-makers to introduce and enforce legislation, judicially enforceable rights and procedures designed to foster private litigation in a manner that advances regulatory interests constitutes an alternative

over more hierarchical, command-and-control modes of governance. By drafting transparent legislation containing enforceable goals, deadlines and procedures, lawmakers provide private parties with shared interests with a legislative framework to access political power through the judiciary, whose decisions are themselves shielded from political interference by political fragmentation (Kagan, 1991, 1998, 2001). US congressional policy making during the 1960s and 1970s is said to provide an illustration of this approach. Congress aspired to increase its federal regulatory activity without enlarging the size of the federal bureaucracy. To prevent policy implementation from grinding to a halt as a result of the diversion of regulatory ambition and political fragmentation, Congress relied on private individual reformers to implement federal rules. The aim was to create an adversarial legalist system to promote the "private enforcement of public law by means of litigation" (Kagan, 2001, 45). Kagan sums up the problem and the solution that private enforcement was intended to provide as follows:

> Congress assigned primary enforcement responsibility to state and local governmental officials. But then how could reformers and their congressional allies be sure that the new federal norms would be faithfully implemented? Adversarial legalism provided one answer. Regulatory reformers couched their goals in the form of sweeping legal rights—to equal treatment, a safe workplace, clean water, clean air. Armed with those rights, individual victims of injustice and energetic reform lawyers could act as "private attorneys general," bringing lawsuits against state and local governments for half-hearted implementation of federal laws, or they could sue regulated businesses directly (Kagan, 2001, 47).

Policy implementation by private law enforcement is not limited to the US. According to Volcansek (2015), transnationally regulated policy fields such as trade, environmental policy and human rights have given rise to a form of cosmopolitan legalism. According to Kelemen (2008, 2011), the process of European integration creates and strengthens a distinctly European brand of adversarial legalism. The EU sought to deregulate national economies by introducing the single market, in effect re-regulating the liberalized marketplace at the supranational level. The EU sacrificed opaque and informal national procedures for a more formal, transparent and uniform regulatory framework across all member states. Despite the strong commitment to establishing a supranational form of governance, the EU has many of the typical characteristics of a weak political organization. Internally, legislative power is fragmented across the European Commission, the European Council and the European Parliament. EU decision making procedures have many veto points, making reforms slow and difficult to implement. At the domestic level, the EU depends on the support and cooperation of national actors – legislators and government officials – to ensure that its policies are implemented and complied with. But poor public management, misaligned incentives and political divisions at the domestic level can make effective cooperation elusive. According to Kelemen (2011), the EU has, at least to some degree, pushed a style of regulation specifically devised to delegate implementation and enforcement capacity to private parties as a strategy to overcome these constraints.

Formally, the Treaties empower the European Commission to bring direct actions against member states for failure to fulfil their enforcement duties (Article 258 TFEU). However, the Commission is itself subject to political pressures and this enforcement avenue clearly has problems of its own, as is illustrated by the sharp decline in direct actions regarding environmental regulations (Hofmann, 2019). Private enforcement through domestic courts presents itself as an attractive alternative to escape these constraints. Solidly established in the jurisprudence of the Court of Justice, the doctrines of supremacy and direct effect grant all national courts the power to enforce EU regulations, including against state officials and policymakers. Where interpretive questions arise, domestic judicial bodies have the possibility – and, for last instance courts, even the obligation – to request a preliminary ruling from the European Court (Article 267 TFEU), ensuring that EU law is applied uniformly across national legal systems. Also, unlike ECJ judges and Commission officials, domestic judges have the power to reverse domestic measures and practices violating EU rules.

2.2 Economic Neo-functionalism and the Trade Hypothesis

The other leg of our argument draws on Neo-functionalism or, more specifically, on the link it posits between economic and legal integration. Neo-functionalism is a theory of European integration. It asserts that transnational exchange worked as both a catalyst and an engine of sustained integration because actors engaged in cross-border transactions had strong incentives to invoke EU rules as a means to remove trade barriers (Stone Sweet and Sandholtz, 1997; Stone Sweet and Brunell, 1998a,b; Fligstein and Stone Sweet, 2002; Stone Sweet and Brunell, 2004). While some aspects of the Neo-functionalist framework, notably regarding the degree of autonomy ascribed to supranational institutions, warrant a measure of scepticism, we believe that the connection the theory establishes between trade and EU law litigation is, in essence, correct. To the extent that the creation of a single market was and remains a central goal of the European project, importers and exporters of services and goods are those who stand to benefit most from the harmonisation of regulatory standards and the liberalisation of domestic markets. Accordingly, we should expect them to be the first to seek the enforcement of EU measures through national courts.

Neofunctionalists found empirical support for this trade hypothesis in the correlation between referral rates and intra-EU trade in goods. However, as shown below, not only has this correlation shrunk steadily over time but it has been demonstrated that the existence of a causal effect of cross-border trade in goods on Article 267 use can only be established with some degree of certainty for the first decades of integration (Dyevre and Lampach, 2018a). The weakening association between trade in goods and referral rates had been noted by Neofunctionalists and their theory allowed to rationalize it. By enabling the Court of Justice to develop new doctrines, EU law litigation created new opportunities for litigation as well as demands for EU-level legislation. This produced spill-over effects, resulting in the expansion of EU law to new domains. As the scope of EU law litigation broadened, the share of cases relating to the free movement of goods

and commodities, initially very high, declined, thereby causing the association between intra-EU trade in goods and referral activity to shrink (Stone Sweet and Brunell, 1998b; Dyevre and Lampach, 2018a). This, however, left somewhat open the question as to what would drive legal integration and referral activity at later stages of integration.

In the next Section, we update the Neo-functionalist account of EU law litigation by making two points. The first is that cross-border trade is still central to EU rulemaking, even at a more advanced stage of integration. The second is that the nature of trade has changed, reflecting the growing importance of services in the economies of EU member states.

3 The Changing Nature of Trade and the Enduring Centrality of Market Integration

Our argument presumes that while the nature of transnational economic activity in the EU has changed, the construction of the internal market continues to be central to EU lawmaking. If EU trademark registrations constitute a powerful predictor of EU law use, it is because EU rules still concentrate on the liberalisation and regulation of domestic markets and because transnational economic activity increasingly involves trade in services as well as in goods.

3.1 Goods, Services and Capital

Farming and manufacturing represented a much larger share of the economic output of European countries in the early phase of European integration than nowadays. As other developed nations, European countries have experienced a deindustrialisation process. The share of the primary and secondary sectors has declined while the share of services in employment and GDP has grown considerably. The tertiary sector only accounted for 57 and 58 percent of, respectively, Dutch and French economic output in 1970. By 2000 this share had increased to 73 per cent in both countries. In 2018, it reached 78 per cent for the Netherlands and 79 per cent for France. While the share of manufacturing has declined more slowly in Germany, the situation of the French and Dutch economies is by no means exceptional.[1] Similarly, though international trade in goods has grown, trade in services has grown faster. Capital flows – foreign direct investment (FDI) – among member states as well as from third countries have increased, too (Dyevre and Lampach, 2018a).

Figure 1 shows how the correlation between Article 267 references and intra-EU trade in goods has declined over time. The decline is remarkably continuous – although some of it can be attributed to enlargement (new member states were less export-oriented than the founding member states). Yet such a trend should be expected if one assumes that a growing number of legal cases involving EU law pertained not to goods but to other forms of economic exchange. By definition, data on trade in goods cannot properly capture these

[1] See Figure 5 in Supplementary Materials.

trade dynamics. But a variable capturing cross-border trade in services as well as goods, such as EU trademark registrations, should.

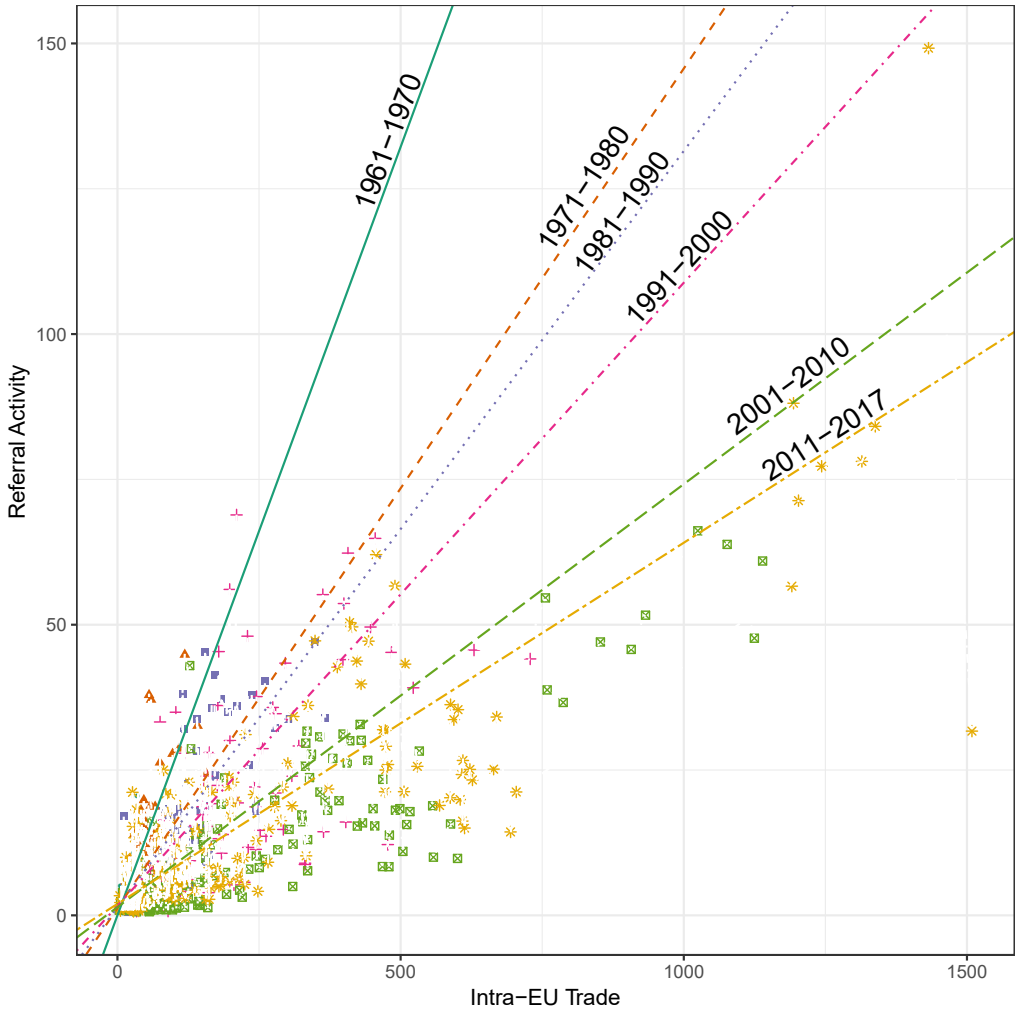

Figure 1: Relationship between Referral Activity and Intra-EU Trade, 1961-2017

Note. The slope of each line is computed from a negative binomial regression with country fixed effects.

3.2 The Centrality of Market Regulation in EU Rulemaking

EU Treaties have undergone repeated revisions to expand the remit of EU rulemaking while the number of EU legislative acts has increased considerably. EU legislation and Treaty provisions now cover areas such as age discrimination and criminal procedure. But an examination of the issues addressed by EU regulations reveals that they still largely concentrate on market integration. To inspect issue attention in EU rulemaking, we apply topic modelling to the entire universe of judgements issued by the Court of Justice of the European Union (n=4380) and EU regulations (n=83610) between 1998 and 2017. The topic model in Figure 2 shows that measures related to the single market continue to

dominate EU lawmaking.

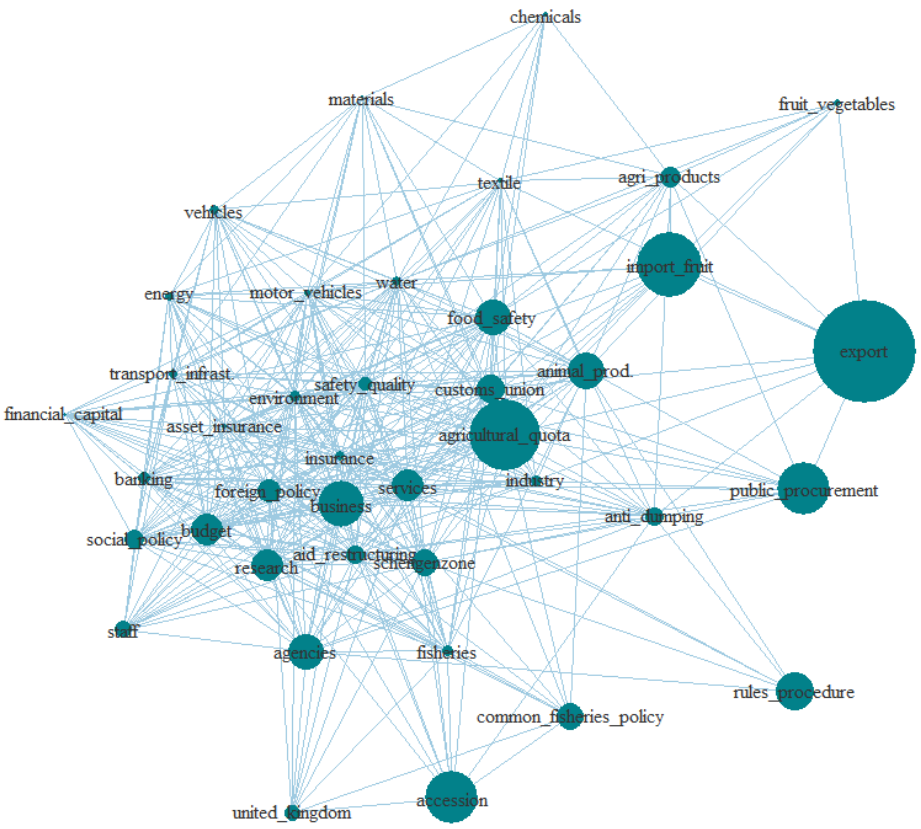

Figure 2: Topic Prevalence Network of EU legislation, 1998-2017. Latent Dirichlet Allocation (LDA).

Note. Node size denotes topic prevalence. Edges highlight topics with shared words. Labels were chosen after looking both at the words most characteristic of the topic and at the EU legislation displaying the highest prevalence of the topic according to the topic model.

Although legal scholars often write as if fundamental rights were central to EU law,[2] the same appears to apply for the case law of the ECJ, as illustrated by the topic model in Figure 3. (We explain the construction of the topic models in the Supplementary Materials.) Even tax and VAT cases seem to be strongly related to the cross-border operations of firms.

[2]See the discussion in Phelan (1992).

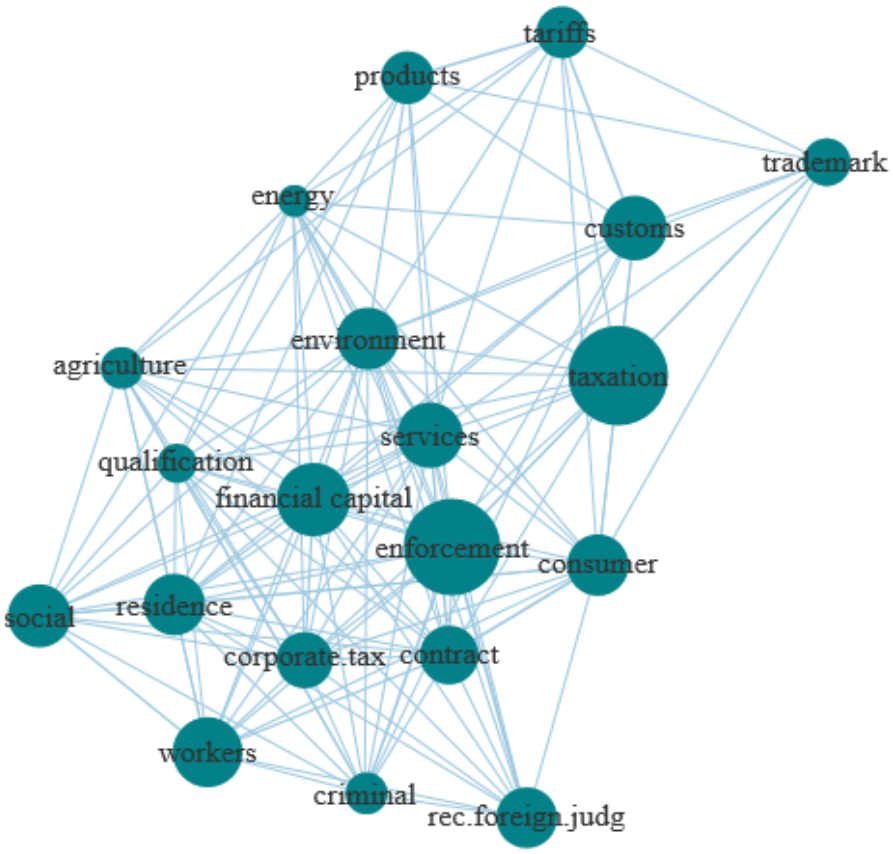

Figure 3: Topic Prevalence Network of ECJ cases, 1998-2017. Latent Dirichlet Allocation.

Note. Node size denotes topic prevalence. Edges highlight topics with shared words.

4 Measuring Referral and Transnational Economic Activity

Having shored up the basic assumptions of our analysis, our main contribution is to propose a new proxy for cross-border activity in the EU and to move the empirical study of EU law use to the subnational level.

4.1 EU Trademark Registrations

In the European Union, businesses seeking to protect the distinctiveness of their commercial brands can apply to either of two co-existing trademark registration regimes. One is the national trademark system. Each member state has its own, national trademark registration system, which offers protection but only within national borders.[3] The

[3]Benelux countries have set up the Benelux Office of Intellectual Property (BOIP) which protects registered trademarks in the three constituent jurisdictions.

other is the EU trademark registration system, which guarantees protection across all EU member states (Davis et al., 2014).[4]

The choice of one over the other involves a trade-off. In short, the EU trademark regime promises protection in 28 jurisdictions but at greater cost and risk. This is not only because the application fee is typically significantly higher than for a domestic trademark[5], but the EU trademark regime rests on an "all or nothing principle": a successful application must be distinctive in all EU member states and the existence of a single similar registration in one of the national systems can lead to the rejection of the entire application. In the face of a challenge in one or more countries, securing registration can involve complex and financially onerous legal proceedings. Applicants are explicitly warned about these risks.[6] If an applicant only operates in two or three member states, he is likely to be better off breaking down the application in separate national applications (Enghardt, 2008). The comparative advantage of securing an EU trademark increases with the number of countries in which the applicant wishes to use her brand. It is believed that the benefits of uniform EU-wide legal protection outweigh the costs when a business operates in more than four member states (Seville, 2009; Pila and Torremans, 2016). For that reason, businesses tend to opt for the national route when they require protection in less than a handful of member states.

Trademark registrations have been linked to innovation (Gotsch and Hipp, 2012; Mendonça et al., 2004; Luini et al., 2004; Aaker, 2007; Paallysaho and Kuusisto, 2008; Baroncelli, 2004; Schmoch, 2003) and the composition of exports (Baroncelli, 2004; Gotsch and Hipp, 2012; Luini et al., 2004; Sandner and Block, 2011; Krasnikov et al., 2009; Greenhalgh and Rogers, 2012; Griffiths et al., 2005). They have also been used as a proxy for foreign economic activity accounting for entry and exit of foreign market (Giarratana and Torrisi, 2010). Similar to this latter line of research, we use trademark registrations as a proxy for involvement in cross-border trade. In short, we assume that agents who engage more in cross-border trade have more incentives to apply for an EU trademarks. Owing to the EU's continued focus on trade, these agents are also those with the strongest interest to invoke EU rules. From these assumptions, we derive the hypothesis – assessed in the next Section – that regions with greater concentrations of EU trademark users should also witness higher levels of EU law use.

Unlike other proxies used in the preliminary ruling literature, EU trademarks cover trade in both services and goods. The data is readily available from EUIPO from 1997 onwards. The EUIPO data comprises important information about individual applications: data, name, country and the address of the seat or establishment of the applicant (pursuant to the Guidelines for the Examination of European Union Trade Marks Part B, Section 2, under 8.1). According to the case law of the Court of Justice, the term establishment must refer to "a certain real and stable presence, from which commercial

[4]The European Union Trademark system is managed by the European Union Intellectual Property Office (EUIPO) in Alicante, Spain. The EUIPO processed its first application in April 1996.

[5]EUR 875 or EUR 1.000 for a paper form. By comparison, in Benelux countries for example, the BOIP charges EUR 244 basic fee for processing an application.

[6]See the website of BOIP https://www.boip.int/en/ip-professionals/registration-maintenance/outside-the-benelux/eu-trademark

activity is pursued, as manifested by the presence of personnel and material equipment" (Case C-617/15, para. 37). In line with the specified mechanism behind the choice for EU trademark registration and the tendency of companies that operate across borders to cluster regionally, we expect that the location of both the seat and address equally refer to places with increased cross-border economic activity. Moreover, it is measured at the regional level, which facilitates the assessment of its relationship to referral rates. As depicted in Figure 6 in the Supplementary Materials, EU trademark registrations are strongly correlated with GDP and more so than with population. The correlation with intra-EU trade in goods is $r = 0.257$, which is consistent with the assumption that EU trademark registrations capture more than just trade in goods. Although one may intuitively expect that EU trademark registrations will be higher in capital cities because many large multinational companies have their headquarters there, the correlation, though real, is not very large. Regions with large cargo ports are more exposed to international trade in goods, but that correlation, too, is small.

4.2 EU Law Use: Moving to the Subnational Level

We follow Kelemen and Pavone (2016) and Kelemen and Pavone (2018) in measuring referral activity at the subnational level. Yet, unlike theirs, our cartography of referral activity covers not just three member states, but all of them. Our dataset compiles the geographic coordinates, mined from Google maps, of all the courts that have submitted a preliminary reference over the period 1998-2017. Also coded – either manually or by scraping the data directly from the EurLex website[7] – are the following variables: member state of origin, case number, date on which the reference was filed with the ECJ, name of the referring court and position of the referring court in the domestic judicial hierarchy (i.e first instance, intermediate, courts of last resort). The geographic coordinates enable us to assign each court to its corresponding NUTS-2 territorial unit and to link it with other covariates, including trademark registrations, measured at regional level.

Figure 4 depicts the spatial distribution of cumulated referrals together with average EU trademark registrations for the period 1998-2017. To enable better visualization of the spatial dynamics over time, the Supplementary Materials provide an animated plot (see Figure 8). Overall, our maps reveal considerable spatial variations in referral activity as well as in EU trademark registrations. Regional variations in Article 267 use may partly be attributed to the high number of referrals submitted by courts of last resort (the red dots in the maps). Interestingly, some regions with high levels of EU trademark registrations also happen to be the seat of last instance courts and of the country's capital citiy (e.g. Lazio, Ile de France, Comunidad de Madrid). Yet we do observe high referral rates as well as high levels of EU trademark registrations in regions that do not display these characteristics: e.g. Lombardy in Northern Italy, Catalonia and the Valencian Community in Spain, Northern Holland and Rhones-Alpes in France.[8]

[7] i.e https://eur-lex.europa.eu/collection/eu-law/eu-case-law.html

[8] Table 3 in the Supplementary Materials lists the most-referring regions.

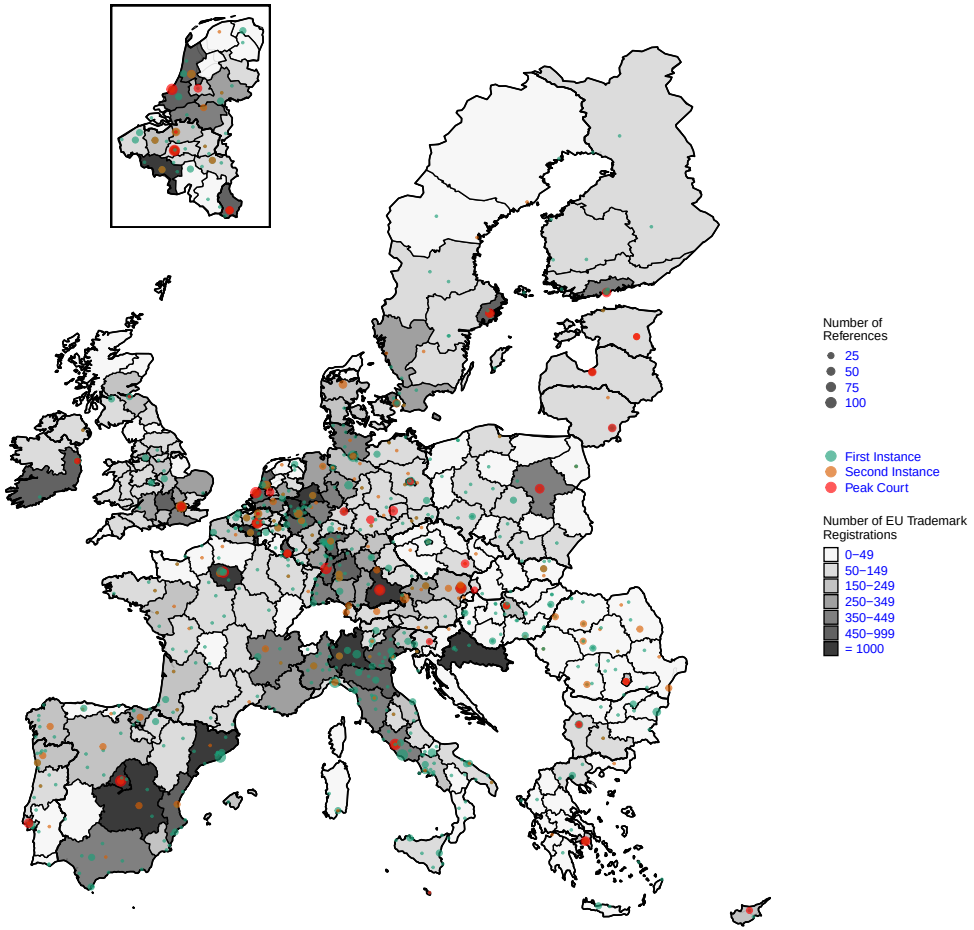

Figure 4: Cartography of Referral Activity and EU Trademark Registrations.

Note. Dot colour denotes the referring courts' position in the judicial hierarchy and dot size represents number of referrals. Colour intensity corresponds to the aggregated number of EU trademark registrations for the the period 1998-2017 in a given NUTS-2 region.

5 Using EU Trademark Registrations to Assess the Impact of Cross-border Trade on EU Law Use

In this Section we attempt to assess how our new proxy for cross-border trade relates to our regional measure of EU law use. If businesses engaged in cross-border economic activity have strong incentives to seek the enforcement of EU regulations, we should find higher referral rates in regions with more EU trademark registrations.

5.1 Baseline Estimation

To estimate the effect of EU trademark registrations – our proxy for transnational economic exchange – on referral activity, we specify a negative binomial regression with country, region and year fixed effects as baseline model. Our fixed effect negative binomial regression setup allows both unrestricted heterogeneity across subnational level and overdispersion (i.e variance may exceed the mean). Our independent variable consists of the annual number of EU trademark registrations in NUTS-2 region. Our negative binomial fixed effect model can be expressed as:

$$Y_{ijt} = exp(\delta_{ij} + \theta_j + \nu_t + \alpha I_{ijt} + \beta_k X'_{ijtK} + \tau T_{jt} + \epsilon_{ijt}) \tag{1}$$

where Y_{ijt} is the dependent variable; δ_{ij} is the regional-country specific fixed effect; θ_j is the country fixed effect and ν_t is the year fixed effect. α is the estimated coefficient of our independent variable I; β_K captures the estimated coefficient for the vector X_K including $1, \ldots, K$ exogenous control variables while τ reflects the estimated coefficient for the one-dimensional vector T_{jt} and ϵ_{ijt} denotes the error term.

Alternatively, we estimate a negative binomial regression where we replaced the fixed effects with a set of time-invariant regional attributes. Eq. 1 can be reformulated as:

$$Y_{ijt} = exp(\alpha I_{ijt} + \beta_k X'_{ijtK} + \gamma_P Z_{ijP} + \epsilon_{ijt}) \tag{2}$$

where γ denotes the estimated coefficient of time-invariant variables Z_{ijP} with $P = \{1, \ldots, P\}$. Following Dyevre and Lampach (2018b), these time-invariant factors include the presence of a large cargo port (Kelemen and Pavone, 2016), the country's capital city (Dyevre and Lampach, 2018b) or of a court of last resort in the region (Kelemen and Pavone, 2016). A limitation of our estimation strategy results from the difficulty of controlling for time-varying unobserved factors as well as from the absence of NUTS-2 level data for many covariates that may be thought to influence EU law use, notably caseload and judicial resources. As time-varying factors (X'_{ijt}), we are able to include gross domestic product (GDP), population and years of EU membership. While population is broadly correlated with the number of judges and potential litigants, GDP is a proxy for litigiousness (Eisenberg et al., 2012; Jacobi, 2009). Membership duration account for the possibility that judges and litigants who have been in the EU longer may be more familiar with EU law procedures such as the preliminary ruling system, leading to higher referral rates (Dyevre and Lampach, 2018a). Although measures of intra-EU trade in goods only exist at country level, we also include the variable in some of our model specifications.

Owing to large regional and annual variations in EU trademark registrations, GDP, intra-EU trade in goods and population, we express these variables on a logarithmic scale. While neither theory nor any previous empirical literature provide insights into how the relationship between the outcome and variable of interest ought to be modelled, we deviate from the conventional, default approximation of a linear relationship by applying a log function to stabilize the variance of EU trademark registrations. The log-transformation helps address heteroscedasticity when the spread is proportional to the conditional mean. Alternatively, we use a square-root transformation, which assumes that dispersion is proportional to the squared conditional mean.

Reported in Table 1 are the results from our negative binomial baseline regression models. We report robust standard errors clustered at the regional level. As shown in Figure 7 in the Supplementary Materials, the relationship between trademark registrations and referral rates is non-linear. This motivates the log on the number of EU trademark registrations. (In the Supplementary Materials we also report results with squared term instead of a log form.) Table 1 indicates that the number of EU trademark registrations is positively and strongly associated with referral rates across all model specifications. The variable is significant at the $p < 0.001$ level in all models, while the size of the coefficient varies from 0.490 to 0.220.

Our basic model (column 2) only includes region, country and year fixed effects. But EU trademark registrations remains positive and highly significant when controlling for either GDP and membership duration (column 3) or population (column 4) or intra-EU trade in goods (column 3, 4 and 5), or all these time-varying factors simultaneously (column 6). As an alternative to fixed effects estimation, model 1 includes seven controls – GDP, population, cargo port, court of last resort, capital city, intra-EU trade in goods and membership duration – instead of year, country and region fixed effects. The coefficient for EU trademark registrations remains strongly significant.

Table 4 in the Supplementary Materials reports the results for models identical in all respects except that we do not take the log of our variable of interest. EU trademark registrations remains highly significant but its effect size drops. This seems to suggest that the the log function better captures the non-linear relationship between transnational economic exchange and referral activity at the subnational level.

These findings are consistent with our hypothesis that a stronger presence of EU trademark users should result in more frequent reliance on EU law. Owing to the trade focus of EU legislation, EU trademark users, which we assume to be relatively large businesses operating across multiple member states, are the private actors with the strongest incentives to seek the enforcement of EU law before national courts.

Table 1: Baseline negative binomial regression results

	Referral Activity					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−8.317***	−1.682**	−4.723	−10.934	−6.860***	−6.113
	(0.927)	(0.678)	(3.196)	(9.259)	(1.563)	(11.214)
Trademark (log)	0.513***	0.299***	0.414***	0.237***	0.220***	0.439***
	(0.055)	(0.066)	(0.097)	(0.071)	(0.070)	(0.101)
GDP (log)	−0.099		−0.350			−0.295
	(0.201)		(0.384)			(0.429)
Population (log)	0.572***			0.326		0.102
	(0.170)			(0.702)		(0.940)
Cargo Port	0.007					
	(0.098)					
Court of Last Resort	1.267***					
	(0.162)					
Capital	0.475***					
	(0.155)					
Intra-EU Trade	−0.409***		0.753**	1.154***	1.125***	0.680*
	(0.046)		(0.356)	(0.321)	(0.297)	(0.402)
Membership	0.012***		0.052	−0.013		0.040
	(0.003)		(0.058)	(0.072)		(0.092)
Region Fixed Effect	No	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	No	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	No	Yes	Yes	Yes	Yes	Yes
Dispersion (θ)	0.565*** (0.033)	3.947*** (0.355)	10.274*** (1.863)	3.930*** (0.358)	4.012*** (0.364)	9.910*** (1.794)
Observations	3,469	4,222	3,550	4,099	4,220	3,469
Log-Lik	−3,703.167	−3,773.657	−2,757.391	−3,659.012	−3,761.820	−2,690.807
MacFadden Pseudo R^2	0.691	0.766	0.845	0.773	0.767	0.849

Note. *p<0.1; **p<0.05; ***p<0.01; Cluster robust standard errors are given in parentheses

5.2 Robustness Checks

While studies have pointed out that the relationship between cross-border activity and Article 267 use is characterised by reverse causality (Dyevre and Lampach, 2018a; Pitarakis and Tridimas, 2003), this is less a reason to doubt the validity of our baseline results. EU trademark registrations provide a proxy for, rather than a direct measure of transnational economic activity. Nor can increased EU law use directly cause trademark registrations to increase. Even if preliminary rulings contribute to opening up markets and facilitate cross-border economic activity, the Court's dicta apply EU-wide. They do not create region-specific incentives to apply for EU trademark protection.

More worrisome is the possibility of omitted variable bias resulting from unaccounted time-varying covariates. For example, the number of lawyers has a positive effect on litigation, even after controlling for GDP (Buonanno and Galizzi, 2014; Mora-Sanguinetti and Garoupa, 2015; Rosales and Jiménez-Rubio, 2017). It could be that the number of lawyers has grown faster in EU regions more exposed to trans-border economic activity, spurring growth in EU law litigation. Another possibility is that our baseline results capture similar but causally unrelated time trends in Article 267 referrals and EU trademark registrations. Both variables display positive time trends, although membership duration should eliminate the effect of this possibly spurious correlation.

As robustness check, we estimate random effect models with a lag of the dependent variable to account for temporal correlations in referral activity:

$$Y_{ijt} = exp(\rho Y_{ijt-1} + \alpha I_{ijt} + \beta_k X'_{ijtK} + \tau T_{jt} + \mu_j + \epsilon_{ijt}) \quad (3)$$

where μ_j and ϵ_{ijt} capture the variance at, respectively, the country level and regional level while Y_{ijt-1} denotes the number of referrals in region i in country j in year $t-1$.

As reported in Table 2, the coefficient for EU trademark registrations remains positive and strongly significant irrespective of log transformation, the inclusion of the lag or of a squared term.

Table 2: Random effects estimations

	Referral Activity					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−13.816***	−13.837***	−16.890***	−16.913***	−16.570***	−16.593***
	(2.193)	(2.189)	(2.229)	(2.230)	(2.233)	(2.209)
Referral $(t-1)$		0.004		0.004		0.004
		(0.007)		(0.007)		(0.007)
Trademark (log)	0.492***	0.492***				
	(0.054)	(0.054)				
Trademark			1.849***	1.848***	0.670***	0.669***
			(0.409)	(0.408)	(0.103)	(0.103)
Trademark^2			−1.053***	−1.053***		
			(0.352)	(0.352)		
GDP (log)	−0.140	−0.137	0.566***	0.569***	0.653***	0.655***
	(0.218)	(0.218)	(0.198)	(0.198)	(0.197)	(0.196)
Population (log)	0.967***	0.967***	0.792***	0.792***	0.712***	0.713***
	(0.226)	(0.225)	(0.229)	(0.229)	(0.227)	(0.225)
Intra-EU Trade (log)	−0.448***	−0.447***	−0.486***	−0.486***	−0.447***	−0.447***
	(0.129)	(0.129)	(0.133)	(0.133)	(0.133)	(0.133)
Membership	0.012*	0.012*	0.011	0.011	0.009	0.008
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
Dispersion θ	1.509	1.508	1.560	1.559	1.565	1.564
Observations	3,469	3,469	3,469	3,469	3,469	3,469
Log-Lik	−3,144.741	−3,144.624	−3,161.866	−3,161.696	−3,166.351	−3,166.182
Marginal R^2	0.288	0.289	0.263	0.264	0.256	0.257
Conditional R^2	0.736	0.736	0.735	0.735	0.732	0.732

Note. *p<0.1; **p<0.05; ***p<0.01, Cluster robust standard errors are given in parentheses

These results lend further support to the hypothesised relationship between cross-border economic activity – as measured by our proxy – and EU law use. Higher concentrations of EU trademark users reflect more intense cross-border flows generating more EU law litigation. Still, the limitations of our analysis mean that they do not provide perfect identification and should be interpreted with caution.

6 Discussion and Conclusion

The main objective of our study was to advance our empirical understanding of private enforcement of regulations in the EU context by proposing a new proxy for transnational trade and by moving the analysis to the regional level. Pulling together several strands of literature on private enforcement and European integration, we argued that trade, understood as encompassing both goods and services, remains central to EU rulemaking. Because businesses operating across multiple member states have both strong incentives to invoke EU trade-liberalizing regulations and to seek EU trademark protection, EU trademark registrations represent a good proxy for the presence of potential private enforcers of EU law. EU trademarks can protect trade in services as well as in goods and, for that reason, is more likely to track trade dynamics in later stages of integration than measures focusing on trade in goods only. Using a new dataset measuring the number of Article 267 references across EU NUTS-2 regions, we found strong evidence that a higher concentration of EU trademark users is associated with more intense referral activity.

Whereas the limitations of our econometric analysis suggest caution in interpreting our results as evidence for a causal relation, they do imply that private enforcement of EU law might be most effective in merchant hubs. Both theoretical and empirical work in the economic geography literature suggest that regions with better access to foreign markets benefit more from trade liberalization (Henderson, 2000; Brülhart, 2011). Firms in these regions are also likely to be those benefiting most from EU trade-liberalising regulations. It is there that EU law will be the most relevant to social interactions and legal disputes. In other words, legal and economic integration should go hand in hand.

Our analysis points to several avenues for future research. EU trademark registrations provide a good proxy for the presence of private enforcers because EU law concentrates on the liberalisation and regulation of cross-border trade. In other settings where the focus of regulations is different and less trade-oriented, other proxies will be needed to locate potential private enforcers. Also, while shifting the analysis to the regional level is a considerable improvement over studies looking only at country-level dynamics, firm-, litigant-, judge- and lawyer-level data would, of course, permit a more fine-grained investigation still.

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Supplementary Materials

The proportion of topics in documents is treated as a random variable drawn from a Dirichlet prior distribution. Formally, estimating an LDA model requires computing the following posterior distribution:

$$p(\beta_{1:K}, \theta_{1:D}, z_{1:D}, w_{1:D}) = \frac{p(\beta_{1:K}, \theta_{1:D}, z_{1:D}|w_{1:D})}{p(w_{1:D})} \quad . \tag{4}$$

where $\beta_{1:K}$ are the topics and β_k is the distribution over words for topic k; θ_d is the topic proportion for document d (and $\theta_{d,k}$ is the proportion of topic k in document d); z_d is the topic assignments for words in document d and w_d are the observed words for document d. The numerator on the right-hand side of the equation is the joint distribution of the hidden and observed variables while the denominator is the marginal probability of the words observed in the corpus.

For preliminary rulings and EU legislation, the number of topics $K = 20$ and $K = 40$ were found to strike a good balance between interpretability and specificity. The topics generated by the topic models were labelled manually by the research team. Labels were chosen after looking both at the words most characteristic of the topic and at the decision displaying the highest prevalence of the topic according to the year-topic model.

Table 3: Ranking NUTS-2 Regions by Referral Rates and EU trademark Registrations, 1961-2017

Benchmark: Referral rates			Benchmark: EU trademark registration		
Top 20 regions	Referral rates	EU trademark registrations	Top 20 regions	EU trademark registrations	Referral Rates
South Holland (NL33)	499	400	Paris (FR10)	1963	320
Oberbayern (DE21)	452	1212	Lombardie (ITC4)	1433	125
Inner London (UKI3)	395	1348	Inner London (UKI3)	1348	395
Bruxelles (BE10)	366	227	Catalonia (ES51)	1261	51
Paris (FR10)	320	1963	Oberbayern (DE21)	1212	452
Lazio (ITI4)	305	361	Madrid (ES30)	965	95
Piemonte (ITC1)	254	359	Düsseldorf (DEA1)	855	151
Karlsruhe (DE12)	238	441	Veneto (ITH3)	751	70
Vienna (AT13)	224	368	Köln (DEA2)	736	95
Hamburg (DE60)	184	508	Darmstadt (DE71)	716	160
Darmstadt (DE71	160	716	Stuttgart (DE11)	709	64
Düsseldorf (DEA1)	151	855	Valencia (ES52)	648	23
Kassel (DE73)	145	85	North Holland (NL32)	573	103
Lombardie (ITC4)	125	1433	Stockholm (SE11)	557	80
Hovedstaden (DK01)	118	393	Emilia-Romagna (ITH5)	545	32
Berlin (DE30)	114	470	Luxembourg (LU00)	533	70
Border, Midland and Western (IE01)	108	70	Hamburg (DE60)	508	184
North Holland (NL32)	103	573	Berlin (DE30)	470	114
Köln (DEA2)	95	736	Southern and Eastern (IE02)	458	4
Madrid (ES30)	95	965	Karlsruhe (DE12)	441	238

Note. EU trademark registrations is aggregated over the period 1998-2017.

Table 4: Negative Bionomial Regression, 1998-2017

	Referral Activity				
	(1)	(2)	(3)	(4)	(5)
Constant	-11.3715***	0.4709***	-9.0107***	-2.5807	0.3317***
	(0.8386)	(0.0873)	(1.2582)	(1.7172)	(0.0935)
EU Trademark	0.0028***	0.0012***	0.0004**	0.0012***	0.0008***
	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
EU Trademark^2	-0.0000***	-0.0000***	-0.0000	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Population (log)	0.6850***			0.2067*	
	(0.0964)			(0.1179)	
GDP (log)	-0.1621		0.9490***		
	(0.1096)		(0.1212)		
Capital	0.5760***				
	(0.1103)				
Cargo Port	0.0426				
	(0.0977)				
Court of Last Resort	1.4440***				
	(0.0986)				
Intra-EU Trade					0.0008***
					(0.0002)
Region Fixed Effect	No	Yes	Yes	Yes	Yes
Country Fixed Effect	No	Yes	Yes	Yes	Yes
Year Fixed Effect	No	Yes	Yes	Yes	Yes
Obs	3,469	3,286	2,574	3,190	3,284
Log-Lik	-3,717.94	-3,470.32	-2,414.02	-3,364.89	-3,458.40
MacFadden Pseudo R^2	0.138	0.565	0.681	0.555	0.543
RMSE (10-fold cross-validation)	5.479	3.651	3.093	2.733	3.016

Note. $^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.1$; Cluster robust standard errors are reported in parentheses

Table 5: Negative Binomial Regression using GDP as Regressor

	Referral Activity
	(1)
Constant	-9.977^{***}
	(2.935)
GDP (log)	0.831^{**}
	(0.323)
Region Fixed Effect	Yes
Country Fixed Effect	Yes
Year Fixed Effect	Yes
Dispersion θ	8.573^{***} (1.407)
Observations	3,714
Log Likelihood	−2,799.963
MacFadden Pseudo R^2	0.841

Note. *p<0.1; **p<0.05; ***p<0.01, Cluster robust standard errors are reported in parentheses

Table 6: Correlation matrix of Covariates

	Capital*	Cargo Port*	Court of Last Resort*	EU Trademark	GDP	Population	Intra-EU Trade	Membership
Capital	–	0.005	0.655	0.388	0.275	0.164	-0.059	-0.065
		$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$
Cargo Port	0.005	–	0.040	0.103	0.158	0.217	0.010	0.122
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$
Court of Last Resort	0.655	0.040	–	0.289	0.299	0.219	-0.066	-0.063
	$pvalue < 0$	$pvalue < 0$		$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$
EU Trademark	0.388	0.103	0.289	–	0.861	0.653	0.257	0.241
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$		$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$
GDP	0.275	0.158	0.299	0.861	–	0.849	0.282	0.334
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$		$pvalue < 0$	$pvalue < 0$	$pvalue < 0$
Population	0.164	0.217	0.219	0.653	0.849	–	0.166	0.176
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$		$pvalue < 0$	$pvalue < 0$
Intra-EU Trade	-0.059	0.010	-0.066	0.257	0.282	0.166	–	0.752
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$		$pvalue < 0$
Membership	-0.065	0.122	-0.063	0.241	0.334	0.176	0.752	–
	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	$pvalue < 0$	

Note. * denotes biserial correlation, otherwise Pearson correlation coefficient

Table 7: First Difference Regression (1998-2017)

	Referral Activity					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.047	0.063**	0.042	0.056	0.044	0.058*
	(0.030)	(0.032)	(0.034)	(0.034)	(0.034)	(0.034)
Referral $(t-1)$		−0.332***		−0.332***		−0.332***
		(0.036)		(0.035)		(0.035)
Trademark (log)	0.114**	0.061				
	(0.050)	(0.048)				
Trademark			0.001	0.001	0.001	0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Trademark^2			−0.00000	−0.00000		
			(0.00000)	(0.00000)		
GDP (log)	−0.639	−0.989**	−0.550	−0.943**	−0.557	−0.947**
	(0.468)	(0.448)	(0.473)	(0.454)	(0.470)	(0.451)
Population (log)	−5.912	−4.295	−6.944*	−5.016	−6.890	−4.984
	(4.380)	(3.886)	(4.176)	(3.754)	(4.196)	(3.751)
Intra-EU Trade (log)	0.539	0.573	0.522	0.561	0.529	0.565
	(0.417)	(0.376)	(0.421)	(0.379)	(0.416)	(0.376)
Membership	0.018	0.020	0.022	0.024	0.021	0.024
	(0.026)	(0.024)	(0.026)	(0.025)	(0.026)	(0.025)
Observations	3,206	3,206	3,206	3,206	3,206	3,206
R^2	0.002	0.129	0.003	0.130	0.003	0.130
Adjusted R^2	0.001	0.128	0.001	0.128	0.001	0.128
F Statistic	1.604	79.154***	1.637	68.130***	1.924*	79.494***
	(df = 5; 3200)	(df = 6; 3199)	(df = 6; 3199)	(df = 7; 3198)	(df = 5; 3200)	(df = 6; 3199)

Note. *p<0.1; **p<0.05; ***p<0.01, Cluster robust standard errors are given in parentheses

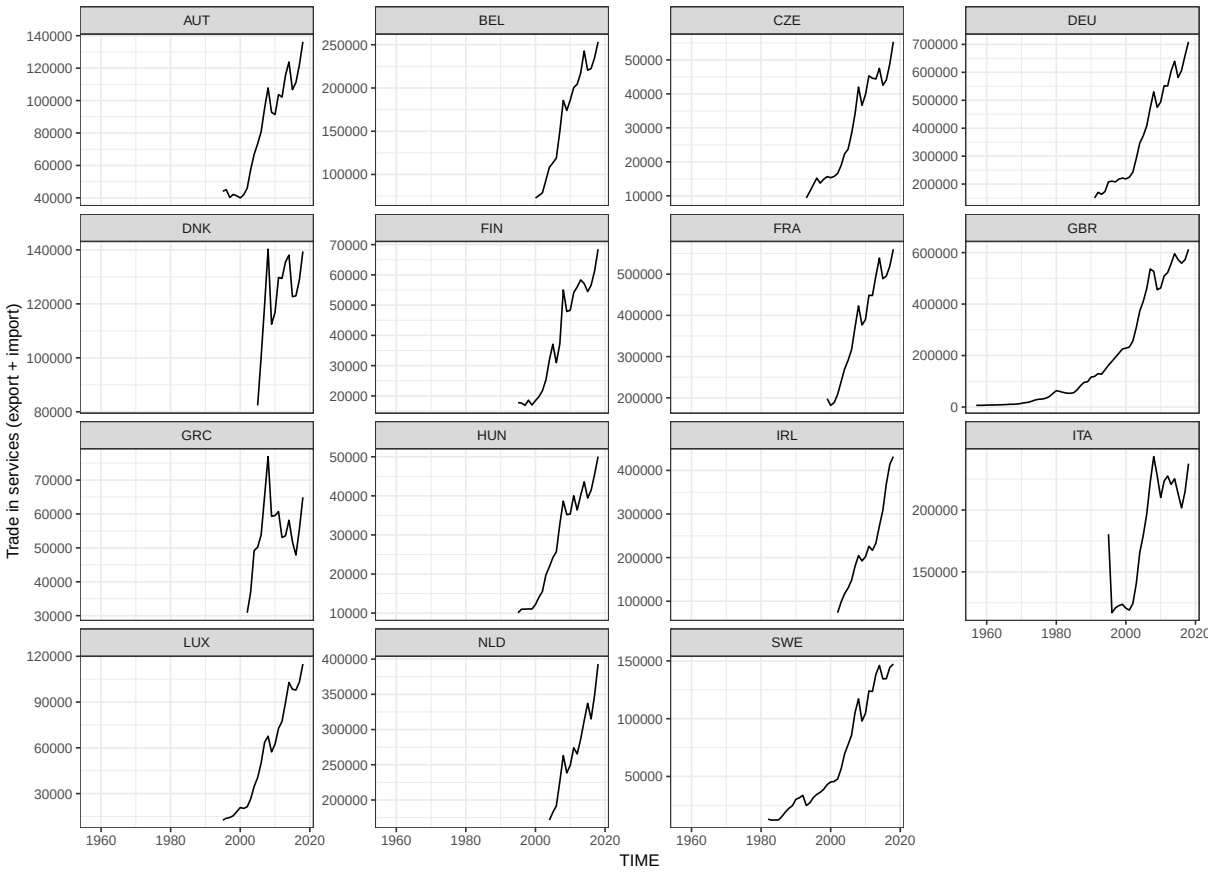

Figure 5: Growth of Trade in Services (in million US$).

Note. Source: OECD (2019)

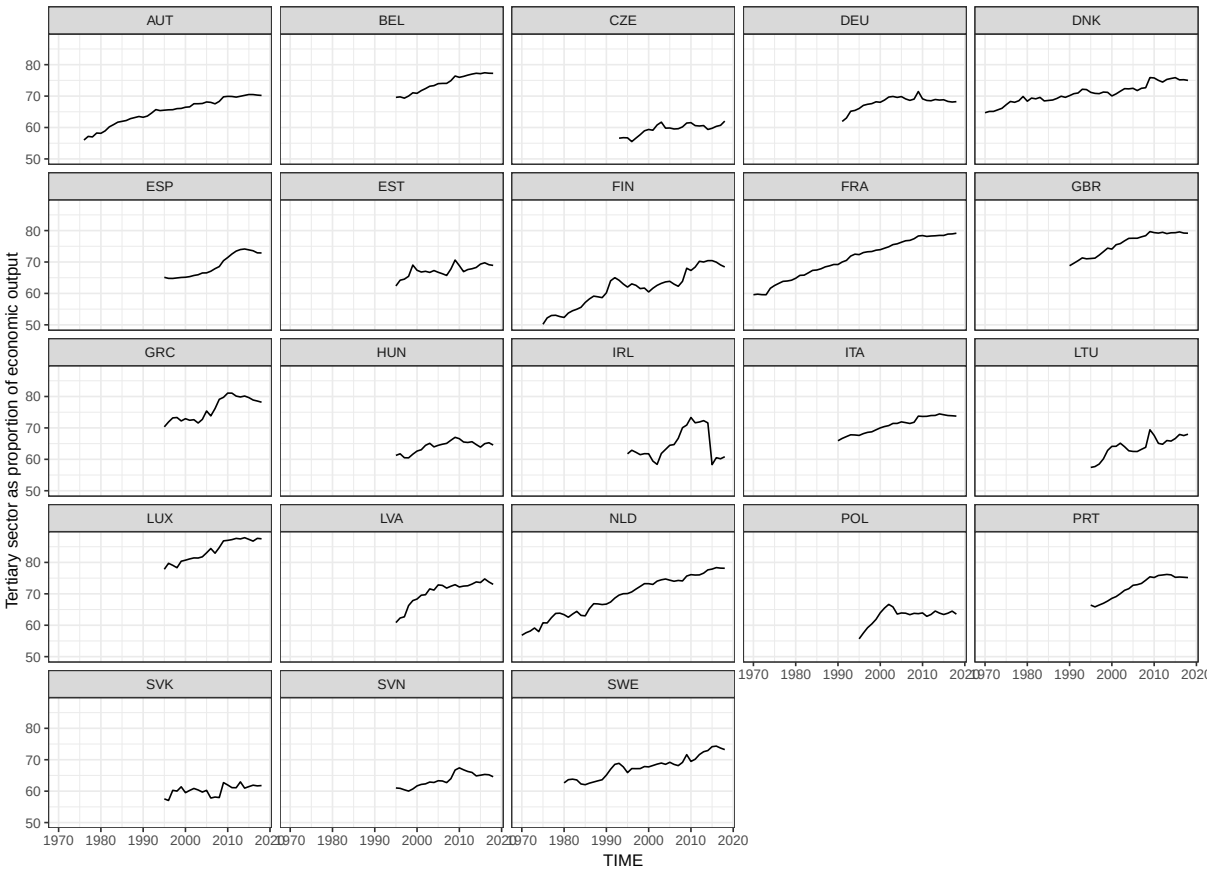

Figure 6: Growth of Tertiary Sector as a Proportion of Economic Output.

Note. Source: OECD (2019)



Figure 7: Relationship between Referral Activity and EU Trademark Registrations, 1998-2017

Note. Each dot represents a NUTS-2 region in a given year

Figure 8: Spatial heterogeneity in EU law use and number of EU trademark registrations across time

Note. To display the animated plot 3D content has to be enabled in pdf reader. Alternatively, the plot can be visualized directly from the video file (Referral_Trademark_1998_2017.flv).