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Strategic litigation and reform in global legal pluralism. An (exploratory) empirical study of climate litigation cases in comparative perspective

Abstract. *Introducing social change via law faces challenges in the global context when multiple legal systems are involved. Thus, social movements increasingly use strategic litigation to promote legal reform domestically and transnationally. To study the dynamic of strategic litigation in the domain of climate change law and in the international context, an informal model of intermediary expressive effects of law is introduced here as a basic framework. The empirical comparative study of climate change-related lawsuits shows that strategic litigation increased in an aftermath of the introduction if the Paris Agreement across 36 jurisdictions. The results indicate also that the effects vary across jurisdictions and that the legal system adoption context is a significant predictor of those differences.*

Introduction

Among many competing definitions and theories of institutions, one characterizes them primarily as social equilibria. Sociological as well as game-theoretical approaches suggest that the core function of institutions is shaping expectations and coordinating patterns of behaviour among individuals. Stability of beliefs about others' beliefs makes institutions last over time (Guala 2016; Greif and Kingston 2011; Schelling 1971). Reforming institutions can be challenging for that very reason: beliefs and institutions reinforce each other (Schelling 1960; Greif and Laitin 2004; Greif and Kingston 2011). Institutions are "sticky" and path-dependent (Boettke, Coyne, and Leeson

2008). Institutional change depends, however, on adjustment of beliefs (Greif and Laitin 2004). People do not easily update their beliefs, and often tend to follow the already known patterns – unless they perceive changes in the behaviour of others. This is why the successful institutional change occurs only when a big enough number of individuals – a "critical mass" - updates their expectations for it to have a large-scale effect on the patterns of behaviour (Granovetter 1978; Greif and Laitin 2004; Kuran and Sunstein 1998; Witt 1989).

Expressive effects theory of law asserts that it is an important focal point and signaling device.[1] Legal reform can be a tool of social change because, by communicating a new rule, it affects beliefs of people and prompts a shift of their expectations and behaviour to new social equilibrium (McAdams 2000a; 2000b; 2015). On the other hand, law is itself an institution and, as such, is also largely dependent on beliefs. This is why legal reform is not always successful – if it fails to inform people or even convince them that a new rule applies – the "law in books" and "law in action" diverge. Sometimes it is sanction that facilitates change by means of legal reform (McAdams 2015, 96–97). Other times, the need of "legal-institutional entrepreneurship" emerges - as the critical mass is needed for the social change to occur (Guala 2016).

While limited access to adjudication may be an obstacle in the process of legal change, courts play an increasingly important role in the context of legal pluralism (McAdams 2005; O'Connell and White 2019; Shaffer 2012). Due to their status in the legal system, they may function as signaling devices: if a court case and decision gain significant public attention, it may lead to the belief update on a sufficient scale and result in a shift of institutional equilibrium. The focal point potential of adjudication has been used by social movements and promoters of legal change in strategic (or "public interest") litigation (Ramsden and Gledhill 2019; Freeman and Farris 1991; Cummings and Rhode 2009). The defining features of strategic litigation, as opposed to regular litigation, are that they are aimed at advancing legal change with an effect applicable beyond a single case and extend over many available legal dispute resolution instances (Ramsden and Gledhill 2019).

In the present paper, I focus on strategic litigation as a step in a sequential process of legal-social change in the context of legal pluralism. Strategic litigation "…concept is anchored in a globalised legal order, where there are many ways in which activists can seek to pursue legal and social change, be it in domestic, regional or international courts. Similarly, implicit in the broadly-applicable

[1] I refer here to the "expressive **effects** theory of law" (McAdams 2000b; 2015) that is focused on the role of law in social coordination and its ability to "convey" new information affecting the expectations and choices – and **not** on the other "expressive theory of law" that focuses on the "opposite" phenomenon - law as an important platform of communicating moral attitudes and social values (Sunstein 1996; 1999; Nadler 2017).

terminology of strategic litigation is that the technique transcends jurisdictions and frontiers, remaining relevant in common law and civil law systems, and in regional and international courts" (Ramsden and Gledhill 2019, 31). "Social movement" is defined, broadly, as individuals and groups that have a strong preference for certain legal reform or institutional change and are involved in some activities aimed at pursuing that change. Throughout the article, it is used interchangeably with "agents of legal reform". Importantly, this category is not limited to organized groups and institutionalized organizations; an individual person that engages in promoting new social attitudes also counts as a "social movement" in that sense (similarly to McAdams 2015, 100–110).

I introduce the concept of "an intermediary expressive effect of law", defined as a response of social movements to an early-stage legal reform. An informal model of intermediary expressive effects of law will be applied here as a basic framework to study the dynamic of strategic litigation in the domain of climate change law and in international context. In the case study, I focus on strategic litigation as a response to the introduction the Paris Agreement of 2015, an international treaty on climate change. Using the data on 270 climate change-related lawsuits from 36 non-US countries, I find that the introduction of recent international treaty regarding climate change, the Paris Agreement of 2015, had intermediary expressive effect on climate change litigation across jurisdictions. The results indicate also that the effects vary across jurisdictions and that the legal system adoption context is a significant predictor of those differences.

The first section introduces an informal model of intermediary expressive effects of law in legal pluralism. Section 2 reviews the literature on climate change law and strategic litigation against the framework of the model and develops hypotheses for the study. Section 3 introduces the formal model, data and methodology. Section 4 reports the results, and section 5 provides the discussion. Last section concludes.

1. Informal model of intermediary effects of law

Efficacy of legal reform depends on the expressive power of law, understood as its ability to affect people's beliefs, decisions and choices (McAdams 2015). Legislative change may have an immediate expressive effect. However, it depends on the power of legislative expression. If the new law or policy is not perceived by the society or does not affect the beliefs of a significant part of the population (the critical mass needed to change the overall expectations) – it fails to shift society to a new institutional equilibrium.

Legal reform takes place not only at legislation stage, but also at following stages of law application and at different levels of complex legal system. The expressive effect of legislated law may be strengthened by the expressive effect of adjudication (McAdams 2000a; 2005). The courts play a

significant role in the legal system not only by enforcing the rules, applying the law to ordinary legal disputes – but also by resolving "conceptual disputes" about the content and interpretation of law (McAdams 2005, 109). Strategic litigation is a tool aimed at using that expressive power of adjudication to advance legal reform – and it is of particular interest in the present article.[2]

McAdams suggests another angle to look at the expressive function of law and legal change: "[i]f legal change follows a certain amount of social change, then it will often be plausible that law can work as a focal point to refocus expectations about how to coordinate" (2015, 100). A new legal rule, even though not bringing about the immediate massive shift of beliefs, may change the relative costs of coordination for people that have strong preferences over or stakes in the legal change. Therefore, new law – or even a policy declaration – may create a focal point for social movements and enhance their activity.

Social movement actors play part in legal reform's pursue and diffusion at different stages of legal process. Those legal reform agents aim to maximize the initial expressive effect of the new law, i.e. the belief update and following behavioural change in the population, given the expected costs of strategic litigation. Therefore, the higher expected benefit from the strategic litigation the more the share of strategic litigation will increase in response to a new law. By the same token, the higher the costs of litigation relative to other tools of legal reform diffusion the lower the share of strategic litigation.

Issuing a new law or policy sends an informative signal[3] that is first received by a social movement – an **intermediary expressive effect** of interest. As the new law undermines the beliefs of some part of population, making the existing social equilibrium less stable, the expected expressive effect from strategic litigation increases. However, I expect this effect to vary across jurisdictions, depending on their institutional characteristics.

How big both the initial and intermediary expressive effect of the law will be may depend on various factors. Information asymmetry and divergent beliefs about the law's content are reasons for which legal reform may fail – the law cannot bring about any effect if people are not aware of the change (Guala 2016, 120–31). However, it may also fail to bring about the social change for

[2] While I rely on McAdams' expressive theory of law to a great extent, the strategic litigation definition adopted here is not compatible with what McAdams defines as "strategic dispute" ("A strategic dispute exists when the parties actually have consistent expectations, but one party pretends otherwise in an effort to gain some advantage from disputing." (McAdams 2005, 1090).

[3] Not to be confused with the information-asymmetry game-theoretic signaling.

other reasons. Some scholars point to the link between perceived legitimacy of law and its expressive power: if the law is not widely seen as legitimate and internalized, the changes in law may not reflect on the change of behaviour (Nadler 2017). Similarly, if the new law does not correspond with public values, it may not have any effect (McAdams 2000a). The behavioural deterrence effect of sanctions depends also on the credibility of legal system and its officials (Basu 2018; Eisenberg 2014). In different instances, expressive power of law, sanctions and legitimacy may reinforce each other, or one of them may be a unique force at work (McAdams 2015, 119–35). Legal pluralism poses yet another challenge to expressive legal reform. Law and its expressive power varies across different jurisdictions, which may depend on the historical contexts, types of legal systems and their inherent path-dependencies (Berkowitz, Pistor, and Richard 2003b, 178; Teubner 1998; Deakin 2011).

Expressive power of law may – at least indirectly – depend on the efficacy of legal system. Some authors in a widely discussed thesis in comparative law and development studies proposed the legal origin theory suggested the link between law's efficacy and type of legal system (LaPorta et al. 1998; LaPorta, Lopez-de-Silanes, and Shleifer 2008).[4] The legal origins theory has been criticized on several grounds from comparative lawyers and institutional scholars. Berkowitz, Pistor, and Richard (2003b) scrutinized the bundling the countries of origin of the rules and the receiving countries, and showed that the way of adoption of the law explains efficacy of law better than the legal family, dubbing it the "transplant effect". Along similar lines (Boettke, Coyne, and Leeson 2008) relate the institutional success or failure to their legitimization in adoption process rather than merely to their origin.

Berkowitz et al. show that the way the legal system has been historically introduced – whether it developed within the country (origin), was voluntarily adopted (receptive transplant) or imposed (unreceptive transplant) – determine its overall performance (Berkowitz, Pistor, and Richard 2003b). The historical contingencies of the context of adoption affect the attitudes of society towards law and result in lower "legality" – efficacy of legal institutions. The authors suggest that, even though legal pluralism is a feature of all societies, the disparity between "law in books" and "law in action" is bigger in the countries with legal transplants, and the more so – unreceptive ones (Berkowitz, Pistor, and Richard 2003a, 175). I aim to verify whether the "transplant effect" is visible also in the domain of strategic litigation – and if so, how the intermediary expressive effects

[4] They demonstrated the correlation between the legal family origin of financial law as a factor of development of capital markets and economic growth; however, they went on to suggest a much broader causal relation between common law origin of legal rules selected domains and overall performance of legal system.

of the introduction of the new law differ between the "origin" and "transplant" jurisdictions. In the model, I hypothesize that the expected benefit of strategic litigation is higher in the legal system with higher perceived legality. In the next sections, I test this conceptual framework in the context of climate law and strategic legislation.

2. Global legal reform to tackle climate change: Paris Agreement and strategic climate litigation

Climate change is one of the biggest policy challenges of the time. International efforts to mitigate climate change are paralleled with country level laws and executive policies. Recent research on legal and policy reforms in that domain points to several trends. One is the universal recognition of the problem – there is no country that has not issued at least one law regarding climate change, and climate litigation is on the rise globally as well (Eskander, Fankhauser, and Setzer 2020). Second is the expected role of the Paris Agreement – the international treaty signed in 2015, obliging all its signatories to take part in global climate change response (Bodansky 2016; Carlarne and Colavecchio 2019). Third, it suggests that the patterns of legal climate reform, both in terms of legislative measures and litigation, differ across jurisdictions (Peel and Lin 2019; Setzer and Vanhala 2019).

The Paris Agreement was signed on 13 December 2015 and came into force on 4 November 2016 (UNFCCC 2016). It is a legally binding international treaty with currently 189 countries being an active party to it.[5] It imposes obligations on all parties to contribute to the global climate change response. Countries-signatories are obliged to determine their climate change reduction targets but are allowed to develop the implementation tools from the national bottom-up, rather than global top-down. However, the Agreement came into effect only in 2020, with countries submitting their "nationally determined contributions" pledges.

While five years after its approval there are not many signs of the reversal of the climate change trends nor substantive effects of the new policies (Roelfsema et al. 2020), new dynamics in law on climate change emerges. On the one hand, states and international organizations are submitting their environmental targets and enacting new laws aimed at enhancing the transition. On the other hand, citizens seek to hold the governments accountable and demand more decisive actions, in the increasingly widespread climate litigation. It is that legal dynamics that is of primary interest in this article.

[5] https://unfccc.int/process/the-paris-agreement/status-of-ratification

Climate litigation: strategic and regular cases

Among climate and environmental litigation cases there are both regular cases, aimed at enforcement of existing laws, and strategic ones. The latter's distinctive feature is the strategic aim of bringing the case before the court, while particular claims and detailed litigation strategies differ (Peel and Osofsky 2019). The range of the climate litigation cases is defined broadly. The broad definition, proposed by Markell and Ruhl in their empirical assessment of US cases, covers "any piece of federal, state, tribal, or local administrative or judicial litigation in which the tribunal decisions directly and expressly raise an issue of fact or law regarding the substance or policy of climate change causes and impacts"(Markell and Ruhl 2012, 9). The authors profile climate litigation cases along different categories. They find that climate change is widely admitted by judges as facts of the case in the proceedings. However, the courts have not developed a separate and systematic climate change jurisprudence, and the climate litigation occurs across different domains of law. A similar study was conducted by Wilensky for the non-US cases sample (Wilensky 2015). She notes that the non-US litigation cases have been of more "tactical" character but finds that the courts tend to avoid the interference with policy in the climate adjudication. However, the qualitative research from more recent years, after the Paris Agreement was signed, indicates reinvigoration of climate litigation, in absolute, geographic and qualitative terms (Peel and Osofsky 2019; Osofsky 2020; Eskander, Fankhauser, and Setzer 2020; Setzer and Benjamin 2020a; Peel and Lin 2019).

In order to verify the existence of an intermediate expressive effect of Paris Agreement on the global climate litigation cases – i.e. whether the signing of the treaty has affected the dynamics of strategic litigation in the overall climate litigation cases, I propose the following hypothesis:

> *H1: The Paris Agreement had an intermediary expressive effect on the share of strategic litigation in the overall climate litigation cases (the intermediary expressive effect hypothesis).*

Climate litigation and legal pluralism

The climate litigation literature suggests a disparity between countries of the Global North (higher income and human development countries) and South (lower income and human development countries). Climate litigation in the Global North is more common (Peel and Lin 2019)[6]. The

[6] The research is largely focused on the legal case studies of high profile cases, and in vast majority on the Global North litigation – see (Setzer and Vanhala 2019).

literature suggest that it is not only more frequent, but also more bold, adopting novel strategies and bringing in 'test-cases' to verify the potential of different new legal arguments (Peel and Osofsky 2019, 312–13). Litigation concerning climate change is less frequent in the Global South, and the claims are less straightforward: claimants more often seek to ground their argument in the existing laws and policies to increase the chances of admitting the case to proceedings. Among reasons for more cautious approach is expected judicial reluctance to the innovative litigation strategies or more stringent budgetary constraints facing the plaintiffs (Peel and Lin 2019, 715). On the other hand, the approaches differ among the countries in the Global South: while some maintain the low climate litigation profile, others witness their social movements trying innovative litigation routs and the courts "filling the gaps" despite the relatively low level of environmental regulation (Setzer and Benjamin 2020a; Rodríguez-Garavito 2020). Qualitatively, the picture of the Global North is not uniform either – for example, Europe has fewer cases but of increasingly progressive content; while Australia is a jurisdiction with relatively high number of cases, but most of them are administrative cases of low profile (Peel and Osofsky 2019; Noonan 2018).

Those findings suggest the qualitative differences between legal routs in climate litigation. However, I am interested in a much broader question, i.e. whether the probability of strategic litigation varies systematically across legal systems, given their overall legality characteristics. I expect a stronger intermediate expressive effect of law in jurisdictions with higher perceived legality. It follows from the previous theoretical considerations that with wider recognition of the law's legality, it has stronger expressive potential; while in the jurisdictions where the perceived legality of the legal system is lower, the expressive effect should be weaker. The lower expressive power of law implies lower expected benefit from strategic litigation from the social movements' perspective. Therefore, the second hypothesis is as follows:

> *H2: The probability of strategic climate litigation is higher in the legal systems with higher legality (the "transplant effect" hypothesis).*

In what follows, I develop a formal model to test the two hypotheses. To verify whether the intermediary expressive effect occurs in the climate law and litigation domain, I aim to see whether the probability that the climate litigation case is of strategic character as opposed to regular varies both with regard to the introduction of the Paris Agreement and across legal systems according to their adoption characteristics.

3. Data and methodology

Dataset

To identify the trends in climate litigation, I use the data from Climate Laws of the World database of the Grantham Research Institute on Climate Change and the Environment at London School of Economics (the Grantham Research Institute on Climate Change and the Environment and Sabin Center for Climate Change Law, n.d.)[7]. The database, searchable and publicly accessible, contains two datasets, one featuring climate laws and policies, and the other one climate litigation cases. At the end of November 2020, the database covers 2086 laws from 198 jurisdictions, and 412 litigation cases from 41 jurisdictions.

The litigation database contains the range of climate-related cases, inclusive of different types of actors (public, private and NGO) and levels of jurisdiction (local, national and international). Proceedings before administrative bodies other that courts are also included (Burger et al. 2017). The criterion for including the case in the database is that the subject matter "address in direct or meaningful fashion the laws, policies or actions that compel, support or facilitate climate mitigation or adaptation", with keywords "climate change, global warming, global change, greenhouse gas, GHGs, and sea level rise" (Eskander, Fankhauser, and Setzer 2020, 8).

From the original database, provided that the focus of the present study is on national-courts litigation and the regressors data are available at a country level, I select the cases before the court, at national jurisdiction level, where the plaintiff was a private individual or NGO. In effect, the study sample contains 270 climate court litigation cases from 36 countries (see Appendix 1). Similarly to Markell and Ruhl (2012) and Wilensky (2015), I code the cases according to specified characteristics in order to build the categorical variables. However, as the research question differs from the previous studies, I define additional categories to distinguish between strategic and regular litigation cases.

The model

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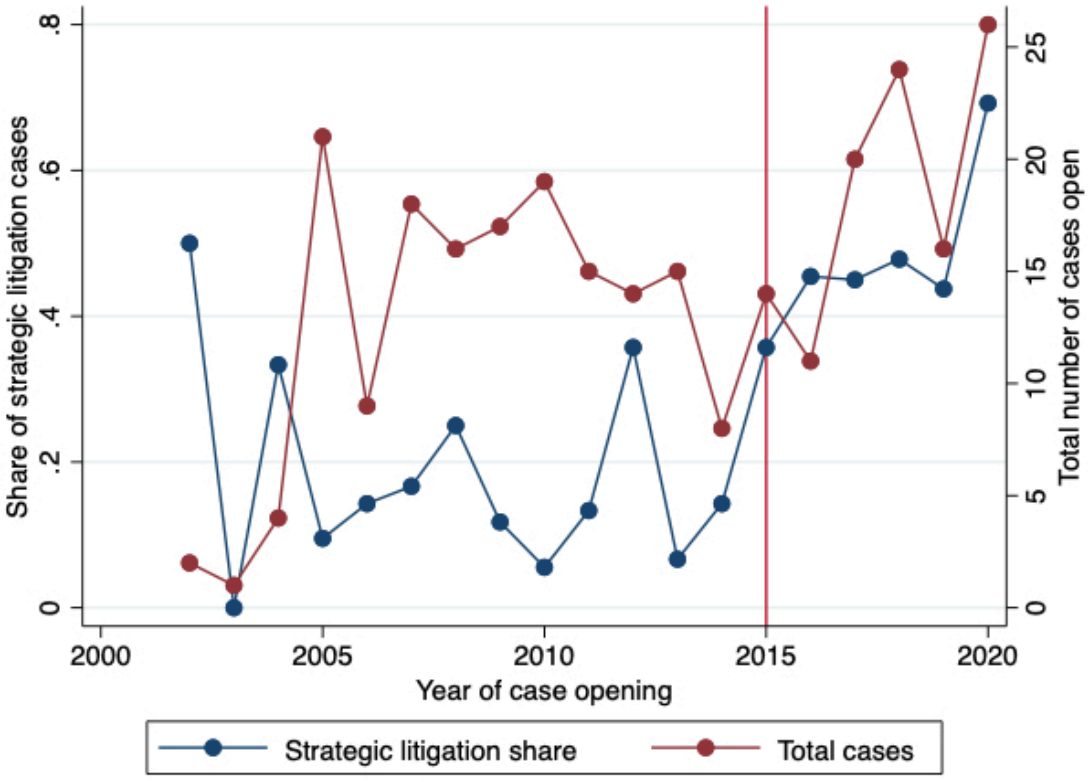
[7] Change Laws of the World database (Grantham Research Institute on Climate Change and the Environment and Sabin Center for Climate Change Law, n.d.). Available at climate-laws.org.

The database does not include US, which – as of the time of writing – has withdrawn from the Paris Agreement. The climate litigation in US is well-established, with the jurisdiction having 1308 registered climate litigation cases alone. Collected by Sabin Center for Climate Change Law at Columbia Law School and Arnold & Porter, available at: http://climatecasechart.com/search/. That database includes very broad range of cases, covering also extra-litigation citizens' interventions under that label, so the two numbers are not directly comparable; nor can the databases be directly integrated. For the analysis of the US climate litigation, see (Markell and Ruhl 2012; McCormick et al. 2018).

The present study looks into the dynamic of strategic litigation in response to the introduction of new law. I build the dichotomous dependent variable "strategic litigation", taking on value 1 for all the strategic litigation cases and 0 for regular litigation cases. In order to identify the cases, I review the documentation provided in the cases database and hand-code them, using binary variables, according to the following criteria: climate change claim is directly referred as a relevant fact of the case (fact climate change claim), the case includes novel legal argument or interpretation (novelty), the case directly claims the public interest or relevance character or scope of the case (scope). If one or more of those variables takes on value 1, it is classified as a strategic litigation case.

Graph 1 below illustrates the trends in the climate litigation, regarding the number of new cases per year (right y-axis) and share of strategic litigation claims among the new cases (left y-axis). It can be seen from graph 1 that last five years brought about significant increase in both the number of cases as well as the share of strategic litigation in the overall cases.

Graph 1. Climate litigation trends



Source: Own elaboration on LSE data

As stated in the hypotheses 1 and 2 above, I am interested in the intermediary expressive effect of law in legal pluralism, i.e. how the probability that the climate litigation case is strategic changes with the introduction of new international agreement and how this response varies across different legal systems.

The independent variables are defined as follows. Using the base climate litigation data, I create a simple Paris Agreement dummy, taking value 1 for all the cases opened after year 2015 and 0 for the cases opened before 2016, to account for the effect of the Paris Agreement (Eskander, Fankhauser, and Setzer 2020). For the characteristics of legal jurisdictions, I use data on legal families from LaPorta et al. (1998) and data on the legal system adoption context from Berkowitz et al. (2003a; 2003b). Based on their codes, I create a dummy variable Legal origin vs unreceptive transplant. The variable takes on value 1 when the legal system originated in the jurisdiction or was voluntarily adopted ("origins" and "receptive transplants" in Berkowitz et al.'s parlance) and 0 when the legal system was adopted involuntarily ("unreceptive transplants").

Further, to account for the other possible determinants of the dynamic of strategic litigation, the following independent variables are introduced. First, to proxy for the relation between the strategic litigation and the overall advancement of climate change legislation in the country, the variable Number of climate laws is defined as the total number of climate change related laws and policies in a given jurisdiction in a given year. (I calculate it using the database of laws and policies from "Climate Laws of the World".[8])

Second, covariate Representative Democracy is included as another variable that potentially explains the variation in the share of strategic litigation across jurisdictions. To account for that that specific category rather than more general governance indicators, I use the disaggregated data from The Global State of Democracy Indices published by International Institute for Democracy and Electoral Assistance (2019).[9] The Representative Democracy index accounts for 18 indicators along 4 sub-attributes categories (Skaaning 2017, 11–34).[10]

Third, I include the (logarithm of) GDP per capita as a control variable for the level of economic development at the moment of opening the case. To verify the robustness of the results, I run the alternative regression models also with other variables: controlling the Representative Democracy

[8] Change Laws of the World database (Grantham Research Institute on Climate Change and the Environment and Sabin Center for Climate Change Law, n.d.). Available at climate-laws.org.

[9] Available at: http://www.idea.int/gsod-indices.

[10] Categories include: Clean elections, Inclusive suffrage, Free political parties, Elected government.

choice with the standard rule of law indicator from the World Bank's governance database (the World Bank, n.d.; Kraay, Kaufmann, and Mastruzzi 2010)[11], and the "transplant effect" with the data on common and civil law systems as a potential alternative explanation, using data from LaPorta et al. (1998). The dummy characteristics of legal system are stable over time. Other variables used in the study are matched with the year of the case opening, and panel data indices used in the model are 1 year lagged. Table 1. below contains summary statistics for the dependent and independent variables.

Table 1. Summary statistics

Variable	Definition	count	mean	sd	min	max
StLit (d)	Climate litigation case (strategic=1, regular=0)	270	0.29	0.46	0.00	1.00
ParAgr (d)	Paris Agreement (after=1, before=0)	270	0.36	0.48	0.00	1.00
OrigTpl (d)	Legal origin vs. unreceptive transplant (origin=1, unrec. transplant =0)	270	0.80	0.40	0.00	1.00
ClimLaws	Number of climate laws	270	13.07	7.47	0.00	45.00
RepDem	Representative Democracy	270	0.84	0.08	0.38	0.96
LogGDP	Log GDP	270	10.49	0.60	7.59	11.64

The unit of observation is one climate change court case, and the sample contains 270 observations. The dependent variable, Strategic Litigation, and two independent variables, Paris Agreement and Legal origin vs unreceptive transplant, are binary variables.

In the sample, 79 cases (29%) are strategic litigation and 191 (71%) - regular litigation cases. 173 cases (64%) were opened before the Paris Agreement, and 97 (36%) – after. 215 cases (80%) belong to the jurisdiction with the legal system that originated or was voluntarily adopted, and 55 (20%) to the jurisdictions with "transplanted" legal systems. The average Number of climate laws per jurisdiction (at the moment of the case opening) amounts to 13, with the variable taking values between 0 and 45. The average Representative Democracy score is 0.84, with minimum of 0.38 and maximum of 0.96 in the sample (the higher the score, the higher the representative democracy

[11] Available at: https://databank.worldbank.org/source/worldwide-governance-indicators

level in the country is assessed, between 0 and 1). Average Logarithm GDP value in the sample is 10.49 and takes values between 7.59 and 11.64.

Table 2. below contains the correlation matrix for the independent variables.

Table 2. Correlation matrix

	Paris Agreement	Origin vs transp.	Climate laws	Rep. Democracy	Log GDP
Paris Agreement	1				
Origin vs transp.	-0.158	1			
Climate laws	0.583	-0.192	1		
Rep. democracy	-0.259	0.509	-0.106	1	
Log GDP	-0.103	0.673	-0.0592	0.792	1

Methodology

For the purposes of the current study, the climate litigation cases sample is treated as cross-sectional data, despite the fact that the cases were filed over the course of 20 years. There are several reasons to do so. First, this follows from the typology and characteristics of the data. The basic unit of observation is a single litigation case. The cases, even filed in the same jurisdiction over the course of years, are qualitatively different.[12] The climate litigation dataset from the Climate Laws database cannot be treated as systematic panel data (Eskander, Fankhauser, and Setzer 2020). Second, for the purposes of definition of the dependent variable, the distinction between strategic and regular litigation is introduced at a very high level of generalization. It is comprehensive of qualitatively diverse legal cases and therefore insensitive to the particular changes that may occur in legal argumentation or other qualitative characteristics of filed cases with time (like e.g. Peel and Osofsky 2018). Third, I am primarily interested in the differences in the response to the Paris Agreement event across jurisdictions. The cases are grouped into country clusters, to verify how different jurisdictional characteristics affect the strength of response.

Given the dichotomous dependent variable, use of the logistic model is appropriate. Indeed, the response values for categorical variable are not continuous, and residuals are not normally

[12] E.g. (Guzman and Simmons 2002; George and Epstein 1992) use a similar approach.

distributed as linear regression models assume; results of such a model would be inaccurate here (Wooldridge 2012, 584–96).

The cases data are clustered in 36 country groups to account for the country level heterogeneity and unobserved cluster-level effects. I estimate the likelihood of strategic climate litigation using the following model:

$$(1)\ Log\ \frac{Prob(StLit = 1)}{Prob(StLit = 0)} = \beta_0 + \beta_1 D.ParAgr_i + \beta_2 D.OrigTpl_i + \beta_3 ClimLaws_i + \beta_4 RepDem_i + \beta_5 LogGdp_i + \sum_{i=6}^{i=42} \beta_i Country_i + \eta_i + \mu_i$$

Where all variables are indexed by i for the individual cross-sectional unit $i=(1, 2, ..., n)$. $StLit$ stands for Strategic climate litigation case (as opposed to regular climate litigation case if $StLit = 0$), $ParAgr$ for the Paris Agreement dummy (equal to 1 for all cases opened after 2015 and 0 otherwise), $OrigTpl$ for Legal origins vs unreceptive transplant dummy (equal to 1 if the legal system of the country is legal origin or receptive transplant and 0 otherwise), $ClimLaws$ for the Number of climate laws variable, $RepDem$ for Representative Democracy indicator for the jurisdiction, $LogGDP$ for logarithm of GDP per capita, and $Country$ for 36 country clusters. The error term is decomposed for the part accounting for the combined individual cases and country effects μ_i, and another one, capturing the inter-group country effects η_i.

As a robustness check, I estimate the model in equation (1) using the penalized-likelihood logit model. The use of the penalized-likelihood technique improves fit of the model by reducing both the small sample bias and variance of logit coefficients (Firth 1993; Rainey and McCaskey 2015).[13] Further, I verify the significance of estimators by controlling for other potential explanatory variables, always using the penalized-likelihood model.

[13] The use of the technique "offers a substantial improvement in small samples (e.g. 100 observations) and noticeable improvements even in large samples (e.g., 1000 observations)" (Rainey and McCaskey 2015, 2).

Table 3. Logit Coefficients for Strategic Climate Litigation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paris Agreement	1.394***		1.390***		1.654***		1.653***	
	(0.476)		(0.366)		(0.398)		(0.386)	
Legal origin vs transplant	1.806*	2.050**	0.919*	0.944*				
	(0.933)	(1.031)	(0.543)	(0.572)				
Number of climate laws	0.0512	0.109***	0.0169	0.0677***	-0.00131	0.0501**	0.0231	0.0735***
	(0.0344)	(0.0312)	(0.0238)	(0.0194)	(0.0248)	(0.0207)	(0.0236)	(0.0200)
Representative Democracy	-9.845**	-14.09***	-6.489**	-9.541***	-5.693	-11.18***	-7.175**	-10.55***
	(4.727)	(4.855)	(3.265)	(3.253)	(3.710)	(3.570)	(3.411)	(3.343)
Civil vs common law					-0.0121	0.277		
					(0.378)	(0.356)		
Rule of law							1.079***	0.665
							(0.412)	(0.410)
Log GDP	-0.149	0.246	-0.159	0.0855	0.340	0.840*	-0.866	-0.112
	(0.658)	(0.669)	(0.440)	(0.454)	(0.452)	(0.446)	(0.559)	(0.535)
Constant	6.313	5.447	4.618	4.467	-0.353	-1.129	11.67**	7.151
	(4.786)	(5.044)	(3.108)	(3.231)	(2.791)	(2.752)	(4.704)	(4.575)
RE Country	1.358	1.590						
	(0.846)	(0.993)						
Observations	270	270	270	270	259	259	268	268
Wald Chi-squared	28.83	19.11	38.88	25.65	40.26	24.18	42.57	27.15
p>Chi-squared	0.0000	0.0007	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
LR test	18.94	25.02						
p>LR test	0.0000	0.0000						

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. (1)-(2) mixed-effects logit model, (3)-(8) penalized-likelihood logit model.

4. Results

Table 3 displays the regression results. The log-likelihood Wald Chi-squared test verifies the statistical significance of the difference between the log-likelihoods of the full model and the one with only the constant. The model is statistically significant at 99% confidence level. The likelihood ratio test, comparing the two-level mixed effect model fit with an ordinary logistic regression, also is highly significant for the analysed data. Using clustering in this case improves the fit of the model. The reported residual intraclass correlation is 0.291. Moreover, use of the two-level mixed-effects logistic model allows us to partially account for the short-comings of the dataset, that contains the groups of different sizes, by improving the estimates for the low-number groups (Gelman and Hill 2006, 301–21).[14]

The results obtained show that effect of Paris Agreement on the propensity to strategic litigation is statistically significant at 1% level and has a positive sign. Similarly, the "transplant effect" in strategic litigation can be observed – a fact of jurisdiction belonging to the "Legal origin and receptive transplant" category is a significant predictor (at 10% level) of a higher share of strategic climate litigation cases. Representative democracy score is another statistically significant determinant (at 5% level), but with a negative coefficient. To the contrary, GDP is not a significant explanatory variable.

While the three explanatory variables of interest prove significant across alternative models, the control variables do not show stable significance. As regards the legal system variables, the common law vs civil law classification – included as a control for the Legal origins variable to account between the two competing explanations of legal system's efficacy (LaPorta et al. 1998; Berkowitz, Pistor, and Richard 2003a; 2003b) – it does not show any significance. The same is true for the aggregate rule of law governance indicator. One regularity that can be observed is that the number of climate laws is highly significant regressor in the models excluding the Paris Agreement dummy, but not significant in the models that include it.

The standardized-coefficients representation of models gives more intuitive picture of the explanatory power of respective regressors – all of them predicting the change in the dependent variable's within similar range (see table 4).

[14] In low-sampled groups, the variance can be inflated. As the mixed-effects model automatically uses the partial-pooling of group variances, it corrects the overly high variance estimates in small groups. Overall, the mean variance inflation factor for the model coefficients amounts to 2.4.

Table 4. Standardized mixed-effects logit coefficients for Strategic Climate Litigation

	(1)	(2)
Paris Agreement	1.470***	
	(0.476)	
Legal origin vs transplant	1.599*	1.815**
	(0.933)	(1.031)
Number of climate laws	0.839	1.794***
	(0.0344)	(0.0312)
Representative Democracy	-1.656**	-2.370***
	(4.727)	(4.855)
Log GDP	-0.197	0.324
	(0.658)	(0.669)
RE Country	1.358	1.590
	(0.846)	(0.993)
Observations	270	270
Wald Chi-squared	28.83	19.11
p>Chi-squared	0.0000	0.0007
LR test	18.94	25.02
p>LR test	0.0000	0.0000

Standardized beta coefficients; Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The interpretation of the coefficients of the logit model from a coefficient table is not straightforward: besides the unintuitive log odds metric, the logistic model is not linear – so the effect of the covariates may differ for different values of other variables. To get a better comprehension of how the covariates Paris Agreement and Legal origin vs. transplant affect the decision to pursue strategic litigation, I calculate the adjusted probability predictions at mean values of other variables of interest (see table 5 below). The marginal effect of both variables, conditional on other variables at their mean values, is rather high. For an "average" case – at mean values of all other variables – the probability of it being strategic climate litigation case is 25.3 p.p. higher if the case takes place after Paris Agreement was signed than before that. The marginal effect of Legal origin vs. transplant variable at the means amounts to 26.9 p.p.

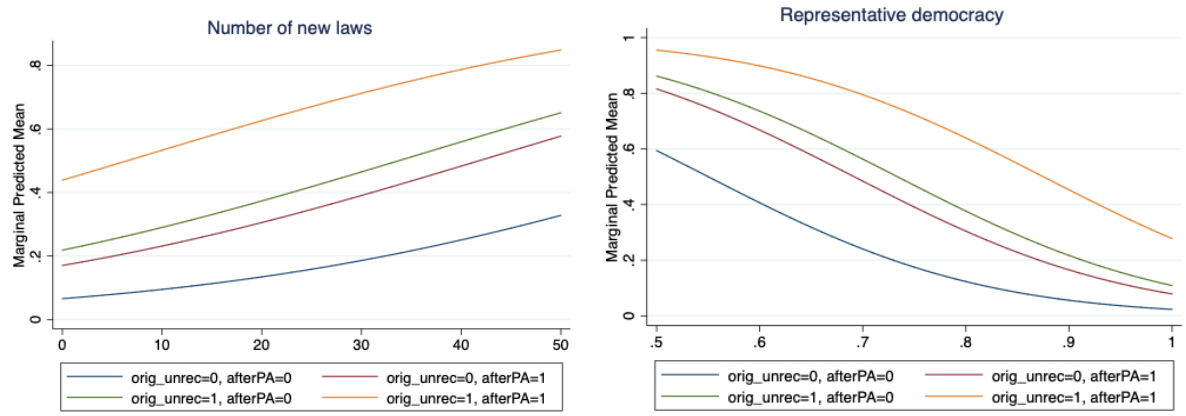
Table 5. Adjusted probability predictions at the means

	Margins
Paris Agreement	
1	0.503***
0	0.250***
Legal origin vs transplant	
1	0.401***
0	0.132*
Observations	270

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Still, the analysis at means value in the dataset may be complemented by more precise information. To get a better comprehension of how the covariates Paris Agreement and Legal origin vs. transplant affect the decision to pursue strategic litigation, I can look at adjusted probability predictions at different value points of the Number of climate laws and Representative Democracy variables (graph 2).

Graph 2. Predictive margins over Number of climate laws and Representative Democracy



Source: Own elaboration on LSE data

The graph shows the marginal effect on probability of the pursue of strategic litigation (y axis) of the two independent variables taking values 1 or 0, from the baseline scenario - "legal transplant" jurisdiction before Paris Agreement (blue line) - along the value range of the two other

independent variables (x axes). In the case of the Number of laws (left-hand side of Graph 2), the marginal effects occur along all the value range to a similar extent, with the difference from the baseline scenario slightly bigger for higher number of climate laws. The marginal "transplant" effect, i.e. the difference in predicted probability of the pursue of strategic climate litigation between the legal origin and unreceptive transplant country, is higher than the marginal Paris Agreement effect for all the number of climate laws in jurisdiction (green line above the red one). The predicted probability of strategic climate litigation increases with the number of cases – which is also an effect indicated by a positive coefficient; however, not statistically significant in the model.

As for the marginal effects over Representative Democracy scores, they vary slightly more along the values – the marginal effect of both Legal Transplants and Paris Agreement being bigger in the jurisdictions with the representative democracy score between c. 0.5-0.7 and diminishing for higher scores. Also here the marginal "Transplant Effect" remains a somewhat stronger predictor than the Paris Agreement. Representative Democracy variable is an important predictor of strategic climate litigation, statistically significant but of a negative sign: the higher the score, the lower the share of strategic cases in the overall climate litigation.

5. Discussion

Overall, the estimates of the model confirm the hypotheses 1 and 2. Both the introduction of the Paris Agreement and the legal origin jurisdiction are statistically significant predictors of the higher share of strategic litigation in climate litigation cases.

Number of laws. The explanation of the relation of the share of strategic litigation cases and number of climate laws in the jurisdiction, the proxy for the level of legal protection of climate, may be twofold. On the one hand, the higher number of climate laws may indicate that the laws addressing climate change is better established in the jurisdiction – so that the strategic litigation is not necessary (Peel and Osofsky 2019, 318–19). On the other hand, issuing the new domestic law can also provoke the intermediate expressive effect, and lead to an increased strategic litigation in the jurisdiction. The results obtained in the current study seems to point to the latter relation. Moreover, earlier research of the climate change law indicates that new international law act (Kyoto Protocol, in that particular study) has caused the increase in climate legislation around the world (Fankhauser, Gennaioli, and Collins 2016). While the legislative activity accelerated anew several years before the Paris Agreement (Eskander, Fankhauser, and Setzer 2020), the correlation of 0.583 between the two variables may indicate the mutually-reinforcing intermediate expressive effect of international and national law on strategic climate litigation.

Representative Democracy. Looking at the Representative Democracy variable complements the picture: the higher the score, the less probable strategic climate litigation. The conceptual model of the intermediate expressive effect on law relates the decision regarding strategic litigation depends on the expected costs of litigation. In real-life considerations, those would comprise also the opportunity costs of alternative social reform activities. The better access to other political decision-making procedures, the higher the opportunity cost of strategic litigation may be, as engaging in other forms of activism may lead to similar or better results. Another factor could be related with the differing judicial tendencies when it comes to the scope of judicial review.[15] In the countries with high representative democracy scores judges may be more reluctant towards progressive revision of the statutes (Tufis 2019; Skaaning 2017, 17). Thus, the chances of success of a strategic litigation case, and therefore expected benefits of pursuing strategic litigation might be relatively lower. However, this theoretical prediction still needs to be verified empirically.

Further considerations

The results of the study indicate that signing of the Paris Agreement has had intermediary expressive effect across jurisdictions, with social movements mobilized to pursue strategic climate litigation cases, on average, more often. The probability of observing strategic litigation cases among those initiated after the Paris Agreement is much higher (25.3 p.p. at the means) than among those started before it – and it occurs with the increase in the absolute number of the overall climate litigation cases. Importantly, the hypothesis of the intermediate character of this effect is supported by the fact that, before the year 2020, no signatory country has begun the implementation of it (Peel and Osofsky 2019). For the analysed sample of cases, the Paris Agreement can be treated as a declaratory act of primarily expressive character. Increased strategic climate litigation may therefore be interpreted as a correlated response of the social movements to the 'signal' of the international treaty – by increased effort to promote the legal and social reform in the climate change domain.

That interpretation seems the more plausible when one takes into account that strategic litigation is a legal reform tool of often transnational, or global character. While the social movements response can be decentralized and pursued at the individual level, it does also have an institutionalized dimension – with organizations sharing their knowledge, often across national

[15] Those considerations are beyond the scope of the present article. The ongoing judicial review legitimacy debate considers the relationship between the appropriate scope of judicial review and democracy. Some authors argue that strong review is an undemocratic interference with other branches of government, others see it as an alternative democratic tool. For the competing views, see e.g. (Waldron 2006; Lever 2009).

boundaries (Ramsden and Gledhill 2019). The efforts, however, need not be coordinated transnationally. Some authors point to another evolutionary dimension of strategic climate litigation – a pioneering case, with high publicity, may simply inspire the followers to adopt more progressive strategies (Burger et al. 2017; Noonan 2018).

Legal Transplants. The model's estimates confirm the prevalent "transplant effect" on the strategic climate litigation dynamics. Both absolute number of cases from the countries with the legacy of badly received legal system and the probability of strategic litigation cases among them is lower with respect to the countries with better-adapt legal system. The explanation builds on the analysis provided by authors of the pioneering legal transplants study: „The context specificity of formal legal order has important implications for the effectiveness of the legal order (legality) in transplant countries. Where the meaning of specific legal rules or legal institutions is not apparent, they will either not be applied or applied in a way that may be inconsistent with the intention of the rule in the context in which it originated" (Berkowitz, Pistor, and Richard 2003a, 178). In the context of the present analysis, it affects the relative costs facing the social movement. The expected benefit of pursuing strategic litigation case is lower, as the expressive effect of adjudication is expectedly lower. Reforming official law, overall, may be a less plausible path to shifting social equilibria.

While both the Paris Agreement and "transplant effect" predictors add up in explaining the share of strategic litigation, the interaction between them is not statistically significant; the effect of the treaty has not varied greatly between observations from the two groups of countries. For some jurisdictions, the first climate litigation cases were reported only after the introduction of the Paris Agreement – the interrelation that the model may have underestimated. Some caution, however, is necessary in the interpretation of the results regarding the "transplant effect". Due to the potential limitations of the dataset, the representation of the cases from legal origins- and transplants countries in the sample may be biased. As it comes to the representation of strategic litigation cases against the regular ones, two phenomena of opposing effect may have been unaccounted for in the model. On the one hand, the better publicity of strategic litigation cases may lead to their overrepresentation in the sample relative to regular cases (Setzer and Vanhala 2019). On the other hand, the strategic litigation in the countries of lower "legality" may take less-standard paths. For one, the cases that do not explicitly refer the climate change related problems may be pursued with strategic aim of addressing such a problem – only using more nuanced, context-dependent legal arguments that can be overlooked (Peel and Lin 2019). Moreover, the strategic litigation can be pursued not on the national, but international litigation level (Rodríguez-

Garavito 2020; Peel and Osofsky 2018; Setzer and Benjamin 2020b). The overall balance of this effects should be explored in future studies.

6. Conclusions

In this article, I proposed an informal model of intermediary expressive effects of law. Issuing a new law does not necessarily result in an immediate social equilibrium shift, as the institutional change occurs only with the change of beliefs and respective expectations in the society. However, enacting a new law may have an intermediate expressive effect among groups of the society that have a strong preference in the actual change – and incentivize them to increased activity to propagate the legal reform.

To verify empirically the plausibility of the model, I conduct an exploratory quantitative study in the domain of global climate change law. It focuses on the social movements as actors of the intermediate stage of legal reform and on the strategic litigation as an instance of their activity. I hypothesise that the introduction of the Paris Agreement in 2015 has an intermediate expressive effect of the climate litigation, visible in an "early response" of the social movements. Of interest here is the use of strategic litigation in response to the legal reform, aimed at its propagation.

The empirical test, using the data on 270 climate change-related lawsuits from 36 non-US countries confirms this hypothesis. The share of strategic climate litigation is higher in the cases opened after the Paris Agreement was signed. Moreover, I find that the effects vary across jurisdictions. The legal system adoption context is a significant predictor of those differences – with the countries of original or voluntarily adopted legal systems predicting the higher share of strategic litigation cases. The democratic political system characteristic, representative democracy, is also a significant predictor, but with the opposite sign: the better the representative democracy score, the lower the share of strategic litigation cases.

To my knowledge, this is the first study quantitatively analysing strategic climate litigation data, and the indicated relations, analysed here from the birds-eye view perspective, should be confirmed by further empirical studies. Especially, the further studies should account for the more nuanced, jurisdiction dependent legal arguments that constitute examples of climate litigation but have not been included in the current data due to information availability problem. Including the climate litigation from other levels of the legal system – e.g. international cases – could also improve the analysis. Further, this approach can also be used to verify the intermediary expressive effects of law in other legal domains.

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Appendix 1.

Table A.1. Climate litigation by country

Country	Paris Agreement					
	Before (0)		After (1)		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Argentina	0	0.00	8	2.96	8	2.96
Australia	87	32.22	14	5.19	101	37.41
Austria	0	0.00	2	0.74	2	0.74
Belgium	1	0.37	0	0.00	1	0.37
Brazil	2	0.74	4	1.48	6	2.22
Canada	4	1.48	9	3.33	13	4.81
Chile	0	0.00	2	0.74	2	0.74
Colombia	1	0.37	1	0.37	2	0.74
Estonia	0	0.00	1	0.37	1	0.37
France	2	0.74	6	2.22	8	2.96
Germany	6	2.22	3	1.11	9	3.33
India	3	1.11	1	0.37	4	1.48
Indonesia	0	0.00	1	0.37	1	0.37
Ireland	1	0.37	3	1.11	4	1.48
Japan	0	0.00	4	1.48	4	1.48
Kenya	0	0.00	1	0.37	1	0.37
Luxembourg	0	0.00	1	0.37	1	0.37

Mexico	0	0.00	2	0.74	2	0.74
Nepal	0	0.00	1	0.37	1	0.37
Netherlands	1	0.37	2	0.74	3	1.11
New Zealand	16	5.93	2	0.74	18	6.67
Nigeria	1	0.37	0	0.00	1	0.37
Norway	1	0.37	1	0.37	2	0.74
Pakistan	1	0.37	3	1.11	4	1.48
Peru	0	0.00	1	0.37	1	0.37
Philippines	2	0.74	0	0.00	2	0.74
Poland	0	0.00	4	1.48	4	1.48
Slovenia	0	0.00	1	0.37	1	0.37
South Africa	1	0.37	3	1.11	4	1.48
South Korea	0	0.00	2	0.74	2	0.74
Spain	13	4.81	1	0.37	14	5.19
Sweden	0	0.00	1	0.37	1	0.37
Switzerland	0	0.00	1	0.37	1	0.37
Uganda	1	0.37	0	0.00	1	0.37
Ukraine	2	0.74	0	0.00	2	0.74
United Kingdom	27	10.00	11	4.07	38	14.07
Total	**173**	**64.07**	**97**	**35.93**	**270**	**100.00**

Table A2. Summary statistics – other characteristics of the climate litigation data

Variable	count	mean	sd	min	max
Defendant type (private =1, government=0)	270	0.16	0.37	0.00	1.00
Climate litigation case (strategic=1, regular=0)	270	0.29	0.46	0.00	1.00
Case status (closed=1, pending=0)	270	0.80	0.40	0.00	1.00
Paris Agreement (after=1, before=0)	270	0.36	0.48	0.00	1.00
Legal system (origin=1, unrec. transplant =0)	270	0.80	0.40	0.00	1.00
Number of climate laws	270	13.07	7.47	0.00	45.00
Representative democracy	270	0.84	0.08	0.38	0.96
Log GDP	270	10.49	0.60	7.59	11.64

Table A3. Paris Agreement and Legal origin vs unreceptive transplant

	Paris Agreement		
Legal origin vs unrec. transplant			
	Before	After	Total
Unrec. transplant	27 (10.00%)	28 (10.37%)	55 (77.41%)
Legal origin	146 (54.07%)	69 (25.56%)	215 (22.59%)
Total	173 (64.07 %)	97 (35.93%)	270 (100%)