

Precedent Citation at the WTO

Shifting the Empirical Focus to Panelists

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Abstract

Scholars of judicial decision making have long theorized and studied how personal characteristics are related to judicial outcomes in the domestic sphere. But few such studies have been done in the international legal environment, where scholars largely neglect the person of the judge as a relevant dimension for understanding decision making and judicial outcomes. We turn our attention to the WTO dispute settlement system and its rules on precedent usage. Since the WTO's official rules on precedent usage are ambiguous—and thus fail to provide determinative guidance—we show that personal characteristics may matter greatly in how individual panelists approach precedents usage in panel decisions.

Applying both parametric and non-parametric methods, we find that panel chairs who are lawyers cite precedents with less frequency than chairs who are not lawyers. By contrast, we find insufficient evidence to support that chairs from common law countries cite precedent at rates differing from those of chairs from non-common law countries. Overall, our findings suggest that the background of those appointed to the panels plays an important role in the creation and flexibility of WTO rulemaking through the use of precedent.

Introduction

The WTO's ambiguous stance on precedents is puzzling. On the surface, the WTO rejects the doctrine of precedent. But in fact the appellate panel

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has taken great care to rule that, while there is no binding precedent under WTO rules, dispute settlement panels of the first instance cannot ignore the appellate panel's previous rulings.¹ Confusing rhetoric aside, recent scholarly studies have found widespread and de facto use of precedent in WTO panel decisions (Pauwelyn, 2016). Some scholars have found that economically powerful states react to WTO's use of precedent by strategically bringing test cases before the dispute settlement panels in order to establish beneficial precedents (Pelc, 2014; Mazumder, 2015). Other scholars, however, have found that not all states react to the WTO's use of precedents in similar ways (Busch, 2007). Some states are less likely to invoke precedent in their own filings, or caution the court about overusing precedent (Strezhnev, 2014; Pelc, 2014).² For their part, the WTO panels are themselves more likely to cite precedent when the cases before it concern highly controversial matters, which lends credence to the idea that precedent usage can be interpreted as institutionally necessary to ensure continued legitimate adjudication at the WTO (Strezhnev, 2014).

On the whole, the current literature focuses on the argument that precedent usage by WTO dispute resolution panels is a result of state preferences and institutional necessity. Powerful states fight over whether precedent usage is appropriate in the first instance; then they attempt to shape precedent by pursuing specific litigation strategies in the second instance. The WTO appellate body reacts to states' divergent preferences and seeks to buttress the WTO's credibility as an independent judicial body by setting forth an ambiguous approach to precedent, affording the WTO a maximum amount of flexibility and adaptability on any decision.

Undoubtedly, the current literature has greatly advanced our understanding of precedent usage at the WTO and tells a very convincing story from a state and institutional perspective. But it does not tell the entire story. Instead, we believe that the current literature leaves a substantial lacuna, failing to adequately explain the behavior of the panelists themselves and minimizing their role. After all, WTO panelists are not unsophisticated agents working solely for states, and characterizing them that way potentially leaves out important explanatory factors.

¹See, e.g., Appellate Body Report, *United States – Final Anti-Dumping Measures on Stainless Steel From Mexico*, ¶158, WT/DS344/AB/R (April. 30, 2008).

²“The United States considers that a concern over consistency with a prior report adopted by the DSB should not and cannot override [DSU] provisions [in particular, DSU Article 11 directing a panel to make an objective examination of the matter before it] which do not direct a panel to apply or defer to previously adopted reports” Panel Report, *United States — Anti-Dumping Measures on Shrimp and Diamond Sawblades from China*, ¶6.7, WT/DS422/R.

In order to fill the lacuna, we pose a new question: how do different kinds of panelists respond to the WTO's ambiguous stance on precedent? Does it affect the frequency with which they cite precedent in panel reports? We are inspired by studies in domestic law on the relationship between judges' personal characteristics and judicial outcomes (Steffensmeier and Britt, 2001; Welch et al., 1988; Cox and Miles, 2008; Boyd et al., 2010; Peresie, 2005; Farhang and Wawro, 2004). These studies have found that personal characteristics—such as race and gender—can help explain outcomes in some judicial decisions.³ However, personal characteristics do not change all aspects of judicial decision making, instead making a difference in specific subject matters and proceedings. This may be because domestic judges are relatively homogeneous and are socialized in the law in largely similar ways, even when they are of different races and genders. By contrast, because WTO panelists are heterogeneous across more dimensions than domestic judges, we believe there may be good reason to suspect that personal characteristics have a great impact on the judicial behavior of WTO panelists.

While the universe of personal characteristics we can potentially examine is undoubtedly vast, in this article we identify two that are foundational to WTO panelists and for which analogues cannot be found in the domestic court system. First, whether the panelists are lawyers. And second, whether they are from countries with common law or civil law systems. Lawyer-panelists may interact with the WTO ambiguous stance on precedent differently than non-lawyer-panelists (Cohen, 2013). Similarly, common law panelists may hold very different ideas about precedent usage than their counterparts from civil law countries.

Lawyer-Panelists versus Non-Lawyer-Panelists

By our definition, lawyers-panelists are those who have undergone specialized training in legal methods and reasoning culminating in a post-secondary law degree. As such, they are likely more cognizant of the letter of the law, methods of legal reasoning, and concerns surrounding the legitimacy of law than non-lawyer-panelists. At first glance, this might suggest that lawyers-panelists use precedent at a greater frequency than non-lawyer-panelists. But on a second pass, it becomes clear that this is not the obvious

³Studies have found that in some issue areas, personal characteristics such as race are strong predictors for judicial decision making outcomes. For example, in Cox and Miles (2008), the authors found that African-American judges are twice as likely to find §2 liability under the Voting Rights Act. The authors also found that the presence of an African-American judge on a panel is enough to increase the chances of white judges on the same panel finding a §2 violation by twenty percent.

conclusion. Due to the WTO's ambiguous stance on precedent, the specialized legal education that lawyer-panelists receive could instead produce fundamentally divergent views on whether legitimate dispute settlement at the WTO requires the use of precedent.

On one hand, lawyer-panelists may be motivated to use precedent more frequently because they believe in fidelity to developed case law. Lawyer-panelists could put more emphasis on developing consistent jurisprudence in an organic manner, viewing this as the best way to offer consistent, predictable, and fair results. On the other hand, lawyer-panelists may use precedent less frequently because the WTO has gone to great lengths to explicitly deny that there is binding precedent. Lawyer-panelists might therefore interpret this as the WTO deemphasizing the importance of precedent to a compelling legal argument. Under this theory, the glaring contradictions between the explicit written rules on precedent and actual panelist practice could be seen as a blow against the entire system's coherence and legitimacy (Pelc, 2014). Lawyer-panelists may also point to the fact that precedent is rarely enshrined as mandatory in international law as further evidence that precedent usage is neither necessary nor desirable.⁴

On an even more fundamental level, whether panelists have legal training may predispose them to respond to the WTO's legalistic dispute resolution system in specific ways. By design, the WTO dispute resolution system invokes legal concepts and demands that panelists make respectable legal arguments to support their conclusions. Given these factors, the legal community might hold negative biases towards opinions that have been issued by those who are unfamiliar with the law. In order to signal their competence, non-lawyer-panelists have an incentive to invest considerable time and effort, taking on more legalistic trappings—such as citing precedent—in their work. Conversely, lawyer-panelists tend to signal their familiarity with the law by the virtue of their profession, and as such, have fewer incentives to make such investments.

There may also be any number of sociological and personal psychological reasons that affect the way lawyer-panelists cite precedent. For example, some lawyers-panelists may be cognizant that the international legal system is often considered underdeveloped compared to well-functioning domestic legal systems (Hart, 1961). This may motivate them to be especially proactive in creating a coherent set of jurisprudence. For others, though, it can

⁴Only the Caribbean Court of Justice formally establishes legally binding precedents. See *Revised Treaty of Chaguaramas Establishing the Caribbean Community Including the CARICOM Single Market and Economy*, art. 221, July 4, 1973.

motivate them to do the exact opposite, wanting to maintain international law's unique contributions rather than mimicking domestic law.

In our analysis, we choose to focus on the chair of any given panel. From a theoretical perspective, this is adequate because the chair is the most influential member on a panel, as supported both by anecdotal (Cottier, 2003) as well as empirical evidence (Busch and Pelc, 2009). From an empirical perspective, it allows us to define a binary treatment indicator, enabling us to employ well-studied methods from the literature on causal inference.

Hypothesis 1: Assigning a lawyer-chair to a dispute increases the propensity to cite decisions of previous WTO panel reports and appellate panel reports as precedent.

Hypothesis 2: Assigning a lawyer-chair to a dispute decreases the propensity to cite decisions of previous WTO panel reports and appellate panel reports as precedent.

Common Law Panelists versus Civil Law Panelists

Panelists from common law countries may have very different relationships with precedent than those from civil law countries. This might be the case because the way each respective system conceptualizes precedent is fundamentally different. It is very likely that anyone who is in a position to become a WTO panelist internalizes many of the philosophical and practical arguments that buttress each systems' approach to precedent.

In common law countries, precedent usage is a ubiquitous part of modern legal practice. It might not even be an exaggeration to say that precedent—and its corollary *stare decisis*—are cherished parts of common law systems.⁵ Compare this with civil law countries, where precedent exists but the doctrine of *stare decisis* does not (Fon and Parisi, 2006). Without *stare decisis*, precedent is usually considered discretionary. Nonetheless, there is a limit to the level of discretion, as many modern civil law countries adhere to the doctrine of *jurisprudence constante*, where judges are expected to follow previous decisions if there is substantial conformity in case law.

The point we wish to make here is not about the granular differences between *stare decisis* and *jurisprudence constante*, but rather that common law

⁵The Supreme Court of the United States characterized precedent as “a foundation stone of the rule of law” and that “it promotes the evenhanded, predictable, and consistent development of legal principles, fosters reliance on judicial decisions, and contributes to the actual and perceived integrity of the judicial process.” *Kimble v. Marvel Entertainment*, 576 U.S. ___ at 7 (2015).

countries place much more emphasis on precedent usage in legal argumentation and reasoning. We suspect that individuals who are trained and work in common law countries become far more attuned to precedent, viewing it as an indispensable part of legal practice. When these individuals move to the WTO, they may carry their strongly internalized preferences with them. And since the WTO's stance on precedent is so ambiguous, there may be little constraining them from acting in accordance to their own preferences on precedent.

Hypothesis 3: Assigning a dispute to a common law chair increases the propensity to cite precedent.

Beyond filling in a lacuna in the current literature, our research has practical implications for the way states approach WTO litigation. If—as we claim—the type of panelist a decision is assigned to affects precedent usage, it stands to reason that states may be further motivated to influence the choice of panelists on cases. As Pelc's article demonstrates, certain powerful states attempt to establish beneficial precedents by bringing test cases before the WTO. For this endeavor to be successful, panelists on cases subsequent to the original test cases must take precedent seriously.

From an institutional perspective, then, the WTO itself may have a great stake in understanding how panelists' personal characteristics influence precedent usage. In the light of powerful states pursuing purposive projects to establish beneficial precedent, the WTO must carefully balance the interests of these powerful states against the rest of its membership. States that are less powerful, wealthy, or sophisticated in WTO litigation strategies may find themselves unable to fully participate in the lawmaking process. This is not a good outcome for the WTO. As an organization with a truly international mandate, it can ill afford to be seen as a blatant mechanism for validating the policy preferences of powerful states. Thus, the WTO may find it useful to appoint panelists who are less likely to cite precedent. This may, in turn, partially counter the effect of powerful states and their sophisticated litigation strategies.

The rest of the paper proceeds in four parts. In section 1, we expand on our theoretical motivations, laying out reasons why we expect personal characteristics to make a difference in WTO panelist behavior. Section 2 describes our empirical methods and data. We present and interpret our results in Section 3. We find that, both parametric and non-parametric methods indicate a substantively and statistically significant negative effect of assigning a dispute to a lawyer-chair on the propensity to cite precedent.

On the other hand, we find no effect of assigning a dispute to a common law chair. Section 4 concludes.

1 Theory

1.1 What is Precedent and Why does it Matter?

At its most basic level, a precedent is simply a ruling made by a court that helps guide subsequent rulings made by that or other courts. In common law jurisdictions, the doctrine of *stare decisis* serves to operationalize precedents and demands that courts take it seriously, sometimes as mandatory authority (Hanna, 1957).⁶ In civil law jurisdictions, there is no formal *stare decisis* doctrine, but courts tend to treat precedent as highly persuasive authority (Fon and Parisi, 2006). One could thus think of precedent as a specific type of instruction one court at a specific point in time passes on to courts (including itself) at later points in time.

Thinking of precedent as instructions to subsequent courts would mean that citation frequency is a key signal that courts can pass on. When a case is cited often, subsequent judges can infer that previous judges thought the case was useful to adjudicating disputes or integral to the jurisprudence. As such, important and central cases can usually be identified by looking at the frequency with which other decisions refer to them. This approach of identifying importance through frequency of citation is a common one and has recently been formalized more rigorously by legal scholars employing network analysis to identify the central cases in domestic jurisdictions (Fowler et al., 2007).

One potential drawback of this approach is that citation frequency could have little to do with whether a precedent is perceived as binding. That is to say, panelists might treat precedents as binding, even though they do not refer to them explicitly in their writings. However, this seems like an unlikely outcome, as it would require WTO panelists to be able to collectively decide and transmit what counts as precedent without sending any formal signals. We discount this possibility as WTO panelists tend not to serve multiple times and are largely drawn from a relatively disconnected network of mid-

⁶The common law doctrine of *stare decisis* (et non quia movere) embodies a “[p]olicy of courts to stand by precedent and not to disturb settled point. [...] Doctrine that, when court has once laid down a principle of law as applicable to a certain state of facts, it will adhere to that principle, and apply it to all future cases, where facts are substantially the same; regardless of whether the parties and property are the same” (Black, 1990, p.1406).

level government bureaucrats from across the world (Pauwelyn, 2015).

While transmitting instruction from court to court is perhaps the most important internal function of precedent, it also has external functions. These external functions affect how non-court actors interact with and perceive the court. For example, it is often claimed that usage of precedent promotes predictability, clarity, stability, and fairness in process and outcomes (Lauterpacht, 1982). Precedent is also seen as a tool that courts use to legitimize their decisions vis-à-vis other political actors (Hansford and Spriggs, 2006).

In the international context, one particularly important function of precedent is that it can “bind” a tribunal’s hands.⁷ In this way, an international tribunal can voluntarily limit the potential number of legally supportable outcomes, signaling to state observers that it has not overreached its mandate (Guillaume, 2011). This is particularly important for international tribunals because they exist and operate at the mercy of states (Guzman, 2008). Should an international tribunal make decisions wholly contrary to state interests, it risks irrelevance. By appealing to precedent, then, an international tribunal can preemptively deflect some criticism that it is making ad hoc and politicized decisions.

1.2 How WTO Decisions are Drafted

The actual process through which the WTO produces panel reports deserves mention because it determines the respective roles of chairs, panelists, and the Secretariat. Since WTO panelists are drawn from across the globe, the panel decisionmaking process has to accommodate geographical realities and busy schedules. Despite these obstacles, chairs and panelists will travel to Geneva approximately three times over the course of any given dispute in order to deliberate and work face-to-face.

To facilitate the panel decisionmaking process, the Secretariat provides independent support to states and panels. It falls to the Secretariat to prepare case documents, liaise with state parties, and arrange for the chairs and panelists to work in Geneva. Legal officers within the Secretariat will conduct research and draft reports in close conjunction with their assigned chairs and panelists. When the legal officers finish drafting, the chairs and panelists review the reports line-by-line, making changes as they see fit. Thus panel reports are best described as collaborative endeavors. Occasionally

⁷This has long been an observed function in domestic legal systems (Knight and Epstein, 1996).

a panelist will prefer to personally draft a section of a report, but this is considered rare.

Although the Secretariat is integral to the process, chairs nonetheless wield great influence over the form and substance of the final panel report. Chairs oversee the drafting process to ensure that reports meet their preferences. Furthermore, the personality of the chairs can influence how panel reports are written. Consider that chairs are usually experienced in the WTO panel process and have participated in past panel decisions. Such individuals often hold strong opinions on legal arguments and the language of decisions. For example, chairs are known to make their opinions about precedents clear to the legal officers assigned to the case. Others, however, may see themselves more as facilitators, promoting a more consensus-based approach and smoothing over disputes between panelists and the Secretariat. Whatever the case, chairs have the power to shape a panel and its final report.

1.3 The WTO's Stance on Precedent

As a baseline, there is no explicit textual rule that supports finding precedents binding at the WTO. While both the Dispute Settlement Understanding (DSU) and WTO Agreement do not explicitly rule out binding precedent, they are reasonably read to preclude it.⁸ The Appellate Body, however, has been far more forthcoming in articulating an official stance on precedent, writing that “[i]t is well settled that Appellate Body reports are not binding, except with respect to resolving the particular dispute between the parties.” Nevertheless, the Appellate Body is just as insistent that “this, however, does not mean that subsequent panels are free to disregard the legal interpretations and the ratio decidendi contained in previous Appellate Body reports that have been adopted by the DSB.”

What this leaves us is an ambiguous stance on precedent that privileges decisions and reasoning made by past panels (both appellate and of the first instance), yet does not hold panelists to an ironclad obligation to use precedent. Instead, the Appellate Body declared that “absent cogent reasons, an adjudicatory body will resolve the same legal question in the same way in

⁸For example, Art. 3.2 of the DSU states that “[r]ecommendations and rulings of the DSB [i.e., the WTO Dispute Settlement Body] cannot add to or diminish the rights and obligations provided in the covered agreements. Understanding on Rules and Procedures Governing the Settlement of Disputes, Apr. 15, 1994, art. 3.2, Marrakesh Agreement Establishing the World Trade Organization, Annex 2 (1994).

a subsequent case.”⁹. It remains unclear whether a panel could ever come up with cogent reasons to deviate from prior cases, but it is a possibility that is contemplated by the Appellate Body. From an institutional perspective, this ambiguous stance on precedent allows the WTO to create an environment where states have legitimate expectations of how cases will be decided without completely giving up the flexibility expected from an international institution.¹⁰

1.4 Why Personal Characteristics Matter at the WTO

Scholars have carried out numerous studies on how personal characteristics affect judicial decision making in the domestic context. But we think that the international legal system—including the WTO dispute settlement system—possesses traits that diverge significantly enough from domestic legal systems as to warrant a separate analysis. Here we identify three fundamental differences between domestic and international legal systems that make personal characteristics more relevant in the international context: heterogeneity of the candidates from which international judicial decision-makers are drawn, the external environment in which the international tribunals are situated in, and the internal jurisprudential environment of international tribunals. In other words, we believe the international legal system provides a new and ideal framework to investigate the question whether and to what extent personal characteristics matter for judicial outcomes.

First, unlike in domestic legal systems, judicial decision-makers in the international legal system are drawn from a pool of candidates that may share very little in common. When observing domestic legal systems, one can reasonably assume that all (or nearly all) judges are educated in the law in similar ways. They largely read the same texts, and are taught the same legal principles, doctrines, and canons of interpretation. Furthermore, the vast majority of domestic judges spend their careers learning a shared set of rules and expectations that all other judges in that country should know; their shared experience makes domestic judges more like each other than different in many ways.

By contrast, judicial decision-makers on international tribunals are much more heterogeneous than judges in domestic legal systems. In the WTO, panelists from different legal systems may hold extremely divergent views on

⁹Appellate Body Report, *United States – Final Anti-Dumping Measures on Stainless Steel From Mexico*, ¶160, WT/DS344/AB/R (April. 30, 2008)

¹⁰Appellate Body Report, *Japan - Taxes on Alcoholic Beverages*, p. 14, WT/DS8/AB/R (Oct. 4, 1996).

legal training, legal doctrine, and so forth. They may also have very different conceptions of the role of law vis-à-vis political actors. On a personal level, some may view serving as a WTO panelist as an extremely prestigious career choice, while others may find it much less so. While panelists do share some attributes (e.g., well educated, informed about trade matter), they are also very different in important ways; an observer must recognize the possibility that their personal characteristics might play an elevated role in their decision making process.

Second, the international legal system operates in an anarchical space, giving judges a different role compared to their domestic counterparts. Unlike in well-developed domestic legal systems, international judicial bodies largely exist because states want them to exist. Among their many duties, international judicial bodies help states make sense of what constitutes legal behavior under treaties and other hard law obligations. Since formal hard law is always incomplete, states often look to international judicial bodies to fill in the gaps when necessary (Guzman, 2008). In theory, states retain the ultimate power over the existence and vitality of any tribunal. As such, international judicial bodies are far less removed from the danger of becoming irrelevant and must constantly balance the tension between being agents of powerful states and being entirely independent. An international tribunal that is merely an agent of powerful states runs the risk of driving less powerful states away from using the tribunal, as those states cannot ensure impartial adjudication. Conversely, an entirely independent tribunal runs the risk of not serving the interests of states, thereby inviting states to break off cooperation. Given this set of circumstances surrounding international tribunals, it seems very likely that international judicial decision-makers have different motivations than domestic judges.

Third, internally, international tribunals have much less jurisprudence to draw upon compared to domestic legal systems. The WTO, for example, has only been hearing cases for twenty years. Since established jurisprudence can serve to constrain judicial decision-makers, (Knight and Epstein, 1996) the relative lack of it may increase the importance of idiosyncratic differences between international tribunal judges.

2 Data Description and Methodology

The unit of observation in our data set is the individual panel report of a WTO panel. Our data set contains every panel report that has been written

by a WTO panel from its existence to date (1995 – 2015).¹¹ By definition, we have no information on disputes in which the parties settled in an early stage such that a panel did not issue a report. We exclude GATT panel reports, as the transition from the WTO to the GATT was accompanied by significant structural changes in the international body. We also exclude appellate body reports and reports by arbitration panels, as their function is fundamentally different from those of regular panel reports. Panel reports don't have their own fact-finding ability and only consider questions of law. Arbitration panels follow their idiosyncratic rules and are thus not comparably embedded into the WTO system.¹²

Our outcome of interest is the propensity to rely on precedent, established either under the WTO or the GATT, from both regular panels and the appellate body. An instance of reliance on precedent is defined as a citation reference in a footnote to a dispute other than the current dispute itself. In total, we analyzed 214 disputes for a total of 174,371 footnotes. As this process is labor intensive and prone to error when executed manually, we relied on an automated process using Python.

WTO decisions are always cited in the form “WT/DS***/”, where *** stands for the dispute number assigned by the WTO to a particular conflict. GATT decisions are published in the GATT Basic Instruments and Selected Documents and thus include a reference to “BISD”. These facts allow us to easily and accurately identify which footnote references a prior case and which does not. We divide the number of absolute reliances on precedents by the number of words in the document to acquire a relative measure. We multiply this relative measure by 1,000 for easier interpretability.

The obvious advantage of using the frequency of references as a measure for reliance on precedent is its objectivity and reproducibility, as human judgment does not factor into our analysis. However, this also leads to certain caveats. Not every reference to precedent indicates reliance. The panel might refer to prior decisions for other reasons, e.g. because it wants to distinguish its decisions from a prior decision or because it responds to assertions of a party that referenced a prior dispute. An individual, substantive assessment of each dispute and its footnotes would allow the researcher to ascertain the reasons for the reference of the panel. But this would come at the expense of both labor and objectivity, as the measure would then depend on the individual's contextual understanding and thus is prone to change based on the researcher assessing the document. Further, we have no indication for

¹¹The panel reports are available at https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm.

¹²With this exclusion, we follow Pelc (2014).

assuming that our objective measure is biased in any direction. That is, while we possibly overestimate the reliance on precedent, there is no reason to assume that we systematically do so in a way that could affect our estimation. We thus conclude that the benefits of the objective measure outweigh its potential drawbacks.

Based on the hypotheses formulated in the preceding section, our two main variables of interest are (1) whether the chair is a lawyer, holding a law degree in the respective home countries; and (2) whether she has a common law background or not. To code the former, we rely on a data set generously provided to us by Pauwelyn (2015). The data set includes substantial background information on each panelist at the WTO, collected by analyzing their CVs and conducting extensive internet searches and personal interviews. Among the variables in the data set is a binary variable indicating whether the chair holds a law degree or not, which we use as our first treatment indicator.

The data set further includes information on the panelists' home country, which we combined with the JuriGlobe database on legal origin to create an indicator taking the value 1 if a country has a common law system and 0 if it has a civil law system.¹³ This indicator acts as our second treatment indicator.

We are interested in the causal effect that assigning a lawyer / common law chair to a dispute has on the citation frequency of precedent. Defining treatment as the assignment of a chair guarantees that our treatment indicator T is well defined and does not rely on the alteration of immutable characteristics: Treatment status for observation i can be changed from 0 to 1 simply by assigning a different chair to the dispute.¹⁴

¹³JuriGlobe data available at <http://www.juriglobe.ca/eng/sys-juri/index-alpha.php>. The JuriGlobe database uses five different categories: Civil, Common, Muslim, Jewish and Customary. When a country has a mix of multiple legal systems, we coded it 1 if it was based on the common law and other systems which are not the civil law system. For example, India has common law, customary law and Muslim law and is thus coded 1 in our data set. Similarly, we code a country 0 if it was based on the civil law and other legal systems, but not the common law. For example, Japan uses both civil and customary law and is coded 0 in our data base. This leaves us three states home to panelists with legal systems that possess aspects of both civil and common law: Israel, Mauritius and South Africa. We decided to code these three states 0, indicating that they are not predominantly common law systems. However, whether these are coded 0 or 1 has no significant effect on our results.

¹⁴It should also be noted that under this definition, both treatments (lawyer-chair and common-law-chair) are assigned simultaneously. Thus, including both variables in our analysis simultaneously does not constitute control for post-treatment covariates.

Our quantities of interest are the average treatment effect for the treated (ATT), the controls (ATC) and the overall average treatment effect (ATE). The ATT is the average treatment effect for all decisions that received treatment, weighted by their proportion in the sample. Using the potential outcomes framework from Rubin (1974), the the quantities are formally defined as

$$ATT = \tau_{ATT} = E[Y_{i1} - Y_{i0} | T_i = 1]$$

$$ATC = \tau_{ATC} = E[Y_{i1} - Y_{i0} | T_i = 0]$$

$$ATE = \tau_{ATE} = E[Y_{i1} - Y_{i0}]$$

The ATT is the most commonly estimated quantity in causal studies. It is of interest because it provides an estimate of the treatment effects for those decisions which receive treatment under the current regime at the WTO. In that sense, it is a quantity of primary interest for positive questions, seeking to describe current the state of the world.

However, many studies in the social sciences do not only seek to investigate causal effects under the current regime of treatment allocation, but also have normative implications. Whenever researchers are interested in making policy recommendations that imply an extension of the treatment regime, this cannot be done purely based on the estimation of an ATT. To illustrate, consider the following stylized example in which $\tau_{ATT} = 0.5$ and $\tau_{ATC} = -0.1$. The example illustrates that a policy recommendation seeking to expand treatment solely based on the estimate for $\tau_{ATT} = 0.5$ might actually have effects that are adverse to the original intent, as the treatment effect for those not under the current treatment regime is negative. Conscious of this possibility, we choose to also estimate the ATC and the ATE where appropriate.

We are primarily interested in the direction and the statistical and substantive significance of the effects, not in the exact point estimates.

If complaints were randomly assigned to panels, we would be able to treat WTO decision making as a natural experiment and identification of the causal effects of interest would be fairly simple. Unfortunately, this is not the case. According to Article 8.6 of the DSU, the Secretariat first proposes nominations to the panel, which have to meet certain criteria formulated in Articles 8.1, 8.2 and 8.10 DSU.¹⁵ Further, Article 8.10 requires that at least one panelist is from a developing country if the dispute is between a developing and a developed country. The parties then have the opportunity

¹⁵For example, they have to be sufficiently experienced and diverse.

to reject panelists for “compelling reasons.”¹⁶ Subsequently, the Secretariat proposes new names. If, following this procedure, the parties cannot agree on a set of panelists, they are determinatively selected by the Director-General of the WTO. According to our data, the latter occurs in about 60% of disputes. It is at least possible that decisions of certain types are more (or less) likely to be assigned to panels with lawyer / common law chairs and that these decisions require more (or less) reference to precedent.

Because treatment is not randomly assigned, identification of the treatment effects relies on the selection on observables assumption. That is, treatment assignment is required to be independent of the potential outcome Y_{it} for disputes with similar covariates X_i . Formally, we assume

$$E[Y_{it}|X_i, T_i] = E[Y_{it}|X_i]$$

We argue that there are three dimensions which could govern both the choice of which chair to appoint to the dispute and the propensity to cite precedent. First, there are dispute-specific covariates that need to be controlled for. For example, the central *National Treatment* doctrine at the WTO, formulated in Article III GATT, requires states to not discriminate between national and foreign “like products.” Of course, whether two products are “like” has been and continues to be subject of great legal debate, with some emphasizing that like products have to have similar external attributes, such as shape and form, and others requiring that like products have to be of similar use to the consumer (which translates into a high cross-price elasticity). Consequently, panelists have much precedent to draw from when considering whether two products are like, such as the famous case on *Japan – Alcoholic Beverages*.¹⁷ At the same time, Article III GATT cases are often legally complex and might require the appointment of a legal chair. If left unaccounted for, the dispute type could then potentially be correlated both with the propensity for treatment assignment and our outcome variable.

If one were to take the view that each dispute is unique, this would call for the inclusion of dispute fixed-effects and a statistical analysis would become impossible. We instead classify disputes based on a number of covariates, drawing from the WTO Dispute Settlement Database by Horn and Mavroidis.¹⁸ This database codes which GATT articles and other codes

¹⁶*Understanding on Rules and Procedures Governing the Settlement of Disputes*, Apr. 15, 1994, art. 8.6, in *Marrakesh Agreement Establishing the World Trade Organization*, Annex 2 (1994).

¹⁷Panel Report, *Japan - Taxes on Alcoholic Beverages*, WT/DS8/AB/R (Oct. 4, 1996).

¹⁸Database available at <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:469382,00.html>.

were allegedly violated in the initial complaint by the party.¹⁹ We include indicators for whether a violation of GATT Art. I, Art. II, Art. III, the Safeguards Agreement (SG), the Agreement on Subsidies and Countervailing Measures (SCM) or the Sanitary and Phytosanitary Agreement (SPS) in connection with Art. XII GATT was raised. We also control for whether the issue of the dispute was an alleged initial violation or whether it is an Art. 21.5 DSU proceeding, pertaining exclusively to the enforcement of a prior panel report.

The second dimension we control for is the panel dimension. For example, lawyer-chairs tend to be more experienced than non-lawyers. If a difficult case requires an experienced panelist that is familiar with the WTO's prior case law on the issue, it is more likely that the observation is treated and that the observation will include many references to said prior case law. To control for the panel-specific dimension, we include variables that indicate the sum of the law degrees among the other two panelists, as well as the experience of the chair and the other two panelists (measured in prior panels they sat on).

The third dimension we control for is the party dimension. Since Article 8.10 requires at least one panelist from a developing country on the panel if the dispute is between a developing and a developed country, we include an indicator for whether it is such a dispute. Further, one may argue that the legal system of the parties matters. It may be the case that common law countries have a higher propensity to nominate common law panelists, because they speak the same "legal language". We thus control for the total number of common law countries that are part of the dispute.

Lastly, we control for time, measured as year in which the panel was constituted.

Table 1 summarizes the covariates used in our analysis.

A second assumption that needs to hold in order to make the causal effects identifiable is the assumption of common support, i.e. that treated and control units are observed over the same range of X . Formally,

$$\chi = \chi_0 = \chi_1$$

where χ_t is the support for X_i with treatment status $t = \{0, 1\}$. Fortunately, this assumption is verifiable.

As can be seen in Figure 1, the density of the plots show common support over most of the range of X . The only outliers can be found at very

¹⁹Note that the initial complaint is filed before the panel is established, thus making it a pre-treatment covariate.

high values for panelist experience. However, since uncommon support is minimal, at the extremes and we have no reason to believe that treatment would have a substantially different effect on our outcome at these extremes, we see no reason for concern.

Assuming that the above assumptions hold, the relevant estimands can be estimated both parametrically and non-parametrically. We start our analysis by using parametric methods. Our outcome is the number of references to precedent. Hence, count data models are suitable. However, the decisions are of varying lengths. Finding 20 references to precedent in a document of 1,000 words is qualitatively different from finding 20 references in a document on 50,000 words. We are thus not interested in the absolute number of precedential references, but in the rate of reference. The document length can be understood as the exposure, i.e. the opportunities to cite precedent. The more words in a decision, the more exposure and the more opportunities to cite precedent there are.

Let μ denote the expected count, n be the exposure (document length in words) and \mathbf{x} be the covariate matrix. Then our model is

$$\log\left(\frac{\mu}{n}\right) = \alpha + \beta'\mathbf{x}$$

which can be rewritten as

$$\log(\mu) = \alpha + \beta'\mathbf{x} + \log(n)$$

This model can be estimated like any regular count model, where the logged exposure is included as an offset, i.e. the coefficient is fixed at 1.

Of the count data models, a deviance test suggests to prefer the negative binomial model over a Poisson model. Further, a Vuong non-nested test indicates that the zero-inflated negative binomial model is inferior to the regular negative-binomial model. We thus choose the negative-binomial model. Through cross-validation, we verified that a model containing no interactions with the covariates is superior to a model including interactions with the covariates. It is noteworthy that this feature of our model implies a constant average treatment effect on the logged citation rate, which translates into fixed percentage change in the citation rate. Though validated through cross-validation, this is a potentially strong assumption.

Due to possible concerns with the functional form of the model that one may have, we complement our analysis with non-parametric estimation techniques, namely genetic matching (Diamond and Sekhon, 2013). The genetic matching algorithm optimizes a weighted version of the Mahalanobis distance, formally denoted as

$$d(X_i, X_j) = \{(X_i - X_j)^T (S^{-\frac{1}{2}})^T W S^{-\frac{1}{2}} (X_i - X_j)\}^{\frac{1}{2}}$$

where S is the sample covariate matrix of X and W is the weight matrix (with zeroes off the diagonal) that is chosen to optimize balance. If, as we do, propensity scores are added to X , then genetic matching can be understood as a generalization of Mahalanobis distance and propensity score matching. In that, it is able to achieve balance on a number of covariates, even when the number of observations is limited. In order to conduct the analysis, we convert our outcome variable from an absolute citation frequency to a relative measure, citations per 1,000 words.

3 Results and Interpretation

Figure 2 illustrates that, based on a negative-binomial model, holding everything else constant, the coefficient on our indicator for lawyer-chairs is negative and significant at the 5% level. This result is robust both in significance and substance to each of the four model specifications (controlling only for the panel dimension, only for the dispute dimension, only for the party dimension and the full model). Therefore, the analysis provides support for hypothesis 2, namely that assigning a dispute to a lawyer chair decreases the propensity to cite precedent. We fail to reject, however, that common law chairs rely on precedent at a rate that is similar to those of civil law chairs. Thus, the parametric models lend no evidence in support of hypothesis 3. We limit our substantive interpretation to the full model. The coefficients describe the difference in the log of expected counts for a unit change in the covariate; the difference in the expected counts between panels with and without lawyer-chairs is defined relative to the other covariate values. We will provide an interpretation of the outcome in terms of citation rates momentarily.

Before assessing the outcome for genetic matching, it has to be established that treated and control groups are well balanced. We will provide balance plots for the estimation of the ATT. Other balance plots do not substantively differ and can be found in the appendix.

For illustrative purposes, the balance plot for estimating the ATT on the relevant covariates is depicted in Figure 2. Other balance plots are in the appendix. They include p-values derived from t-tests for differences in means between panels with lawyer-chairs and non-lawyer-chairs, as well as bootstrapped p-values for KS-tests to investigate differences in distributions. For all estimands, balance could be significantly improved through genetic

matching. None of the plots show any imbalance at conventional significance levels. Defining imbalance as $p < 10\%$, none of the balance plots show any imbalances. Defining imbalance as $p < 20\%$, only one covariate for the ATC shows imbalance.

Investigating the question whether the legal origin matters requires us to perform matching again, with the treatment covariate defined as the indicator variable taking the value 1 if the chair is from a common law country and 0 otherwise. While overall, balance was harder to achieve than for the previous treatment variable, we are again satisfied with the results. Defining imbalance as $p < 10\%$, none of the balance plots show any imbalances. Defining imbalance as $p < 20\%$, only two covariate for the ATC show imbalance.

Table 3 depicts the results for our outcome variable, interpreted in terms of absolute and relative changes in the citation rate per 1,000 words. We find that both the parametric and the non-parametric estimation suggests a negative, statistically significant ATT, ATC and ATE of assigning a lawyer-chair to a dispute. Expressed at rates, our estimates for assigning a lawyer-chair to a dispute vary between -37% and -22% . The negative estimate is robust for both estimation procedures and all estimands. This indicates not only that the WTO's current practice of assigning panelists to disputes significantly lowers citation rates on the panels which have lawyer-chairs assigned to them (ATT). The findings also suggest that we can expect further, significant drops in citation rates should the WTO change its practice and increase the number of lawyer-chairs (ATC).

Both the parametric and the non-parametric estimation suggest a positive effect of assigning a common law chair to a dispute. The point estimates are smaller using negative binomial regression. However, the results are insignificant throughout at conventional significance levels. There is only weak evidence to support the hypothesis that the means of treated and control groups differ and this difference can only be found when employing the genetic matching algorithm, not in the parametric regression. Thus, we find no sufficient evidence in support of hypothesis 3.

To summarize, we find evidence in support of hypothesis 2 and against hypothesis 1, but insufficient evidence in support of hypothesis 3.

In our introduction, we proposed two mechanisms through which legal education might decrease citation frequency. First, the fact that the WTO goes to great lengths to deny the bindingness of precedent might incentivize panelists to rely less on past decisions when writing their opinion and lawyers, being trained in the craft of legal argumentation, might be more susceptible to the WTO's directives. Second, a legal education might alleviate

the necessity for panelists to signal their competence and familiarity with the law to a skeptical legal audience. As the consequences of both mechanisms are observationally equivalent, we conducted unstructured interviews with experts in the field of international trade law who are currently holding or in the past have held positions as WTO panelists and in the Secretariat. The general consensus is that the second mechanism is more plausible. Lawyer-panelists are sometimes described as displaying a greater sense of independence when making their legal arguments. By contrast, it was noted that non-lawyer-panelists may feel more social pressure to demonstrate their competence in making legal arguments by assiduously citing precedents. Though the interviews are indicative, more research will be required in the future in order to determine which mechanism ultimately drives the results.

Our results have important implications on dispute resolution at the WTO from an institutionalists' perspective. The WTO has a vested interest in making sure it is seen as legitimate by all of its members. This suggests that it would be a major problem if lawmaking at the WTO is captured by a small number of states. But as Pelc argues, powerful states have begun strategically bringing test cases at the WTO in order to establish beneficial precedents that favor their overall policy goals. For example, the EU—which has traditionally relied very little on safeguards—introduced a test case of minimal economic value against Korean safeguards on powdered milk in order to prospectively limit the scope with which safeguards could be legally employed under WTO law. Pelc explains how the EU strategically initiated the dispute with Korea in order to improve its legal position in the US-Line Pipe and US-Steel Safeguards cases, two much more valuable safeguard disputes between the EU and the US. By introducing the test case against Korea, the EU managed to successfully establish beneficial precedents that it could rely upon in its disputes with the US.

Since bringing test cases at the WTO is very costly in terms of resources and time, it is likely an option that is open only to powerful states, such as the US, the EU or China. Smaller states often lack the resources and legal capacity to consistently pursue such a legal strategy. Perhaps more importantly, it may be a strategy simply not worth pursuing from a cost-benefit perspective as there may be no high stakes cases to follow.

It is likely, then, that powerful states have an outsized role in shaping precedent at the WTO: precisely the kind of outcome that erodes the WTO's legitimacy in the eyes of many of its member states. Our results suggest that the WTO can counterbalance powerful states—at least formally—by strategically appointing more lawyer-panelists to high stakes cases. And while we cannot fully rule out the possibility that citation frequency has

little to no impact on substantive bindingness, we think it is reasonable to assume that reducing the frequency with which past WTO decisions are invoked as precedent in panel reports will likely diminish the precedential power of those decisions as well. By reducing the overall frequency of citing precedent, the WTO could plausibly dilute the impact powerful states' litigation strategies have on lawmaking.

4 Conclusion

Relying on both parametric and non-parametric estimation techniques, we have found strong evidence that panels with legally trained chairs rely on precedent substantively and statistically significantly less than those panels on which the chair has not received formal legal training. The results hold even after controlling for a number of dispute- and panel-specific covariates as well as years. However, we found no support for the hypothesis that common law chairs cite precedent more often than civil law chairs.

The international legal sphere offers a great amount of heterogeneity among its legal decision makers. This heterogeneity can be exploited by researchers to inform the discussions that have evolved within the domestic context of judicial decision making, but could not yet have been resolved due to homogeneity on domestic courts. For example, our findings suggest that legally trained judicial decision makers react differently to ambiguity in the law compared with those without legal training. We are unaware of any other studies that uses heterogeneity of international judges to inform the process of judicial decision making in a similar way and suggest that this is an area holding great potential for future, successful research.

From an institutional point of view, we find that using more legally trained panelists can be an effective way to address concerns of judicial rulemaking at the WTO that is open only to rich and powerful countries, causing power discrepancies to perpetuate past the creation of the WTO as an international organization.

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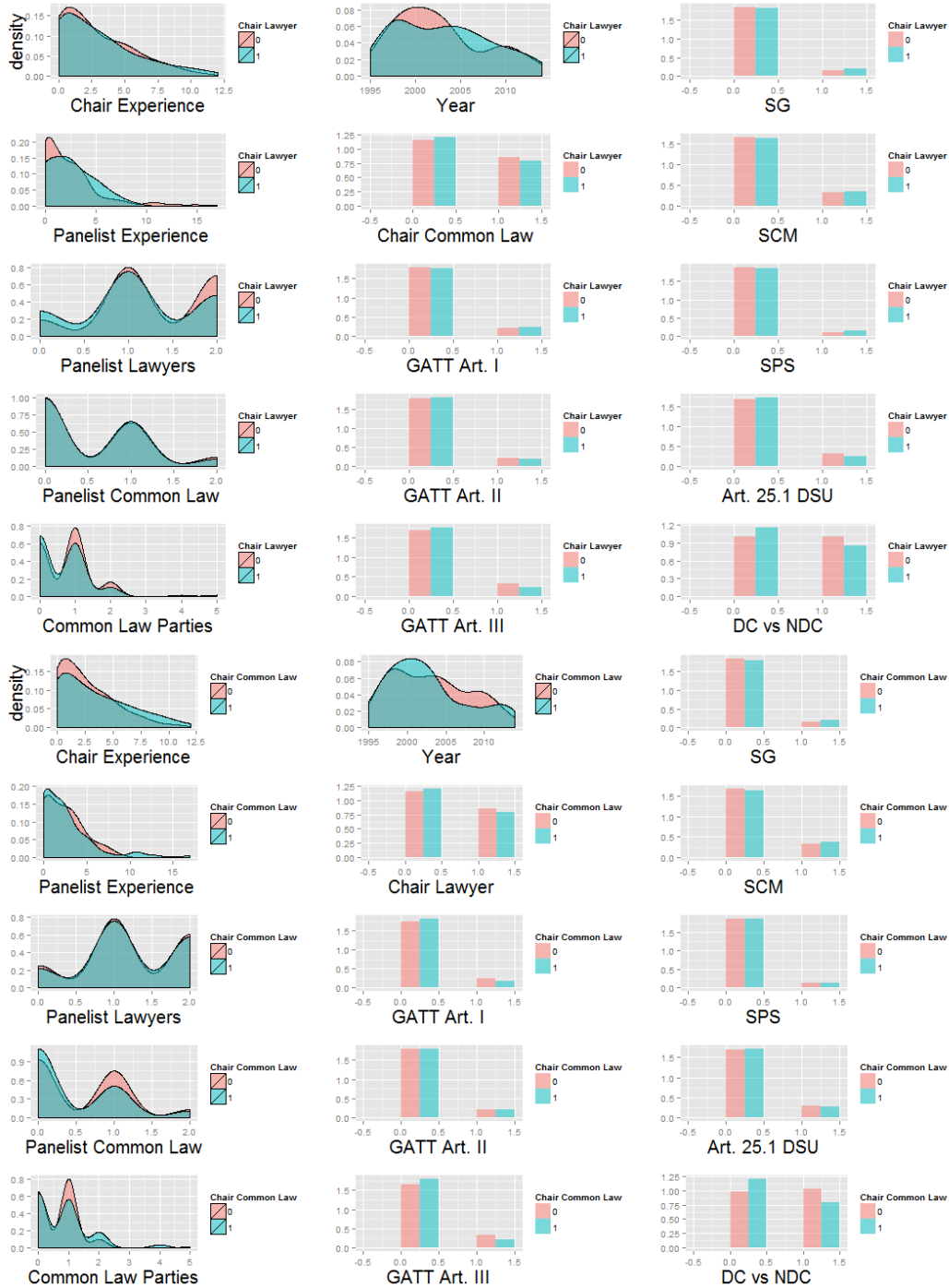
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Table 1: Summary Statistics

	min	max	mean	sd	var	median	IQR
Precedent (absolute)	0	255.00	27.81	41.08	1687.34	14	33.00
Precedent (relative)	0	2.05	0.28	0.33	0.11	0	0.39
Number of Words	0	606.10	103.07	82.65	6831.69	84	72.55
Chair Lawyer	0	1.00	0.44	0.50	0.25	0	1.00
Chair Common Law	0	1.00	0.41	0.49	0.24	0	1.00
Chair Experience	0	12.00	2.89	2.83	8.04	2	4.00
Panel Experience	0	17.00	2.56	2.86	8.15	2	4.00
Panel Lawyer	0	2.00	1.22	0.69	0.47	1	1.00
Panel Common Law	0	2.00	0.50	0.62	0.39	0	1.00
Year of Constitution	1995	2014.00	2002.89	5.05	25.46	2002	7.00
GATT I	0	1.00	0.11	0.32	0.10	0	0.00
GATT II	0	1.00	0.11	0.31	0.10	0	0.00
GATT III	0	1.00	0.14	0.35	0.12	0	0.00
Safeguards	0	1.00	0.08	0.28	0.08	0	0.00
SPS	0	1.00	0.06	0.24	0.06	0	0.00
SCM	0	1.00	0.17	0.38	0.14	0	0.00
Art. 21.5 DSU	0	1.00	0.15	0.36	0.13	0	0.00
Common Law Parties	0	5.00	0.71	0.79	0.62	1	1.00
DC vs NDC	0	1.00	0.47	0.50	0.25	0	1.00

Summary statistics for the variables in the data set. Relative precedential references are measured in 1,000 words. Similarly, number of words are measured in units of 1,000 words.

Figure 1: Density Plots for the Covariates of Interest



The Figures depict densities for for the covariates, once for lawyer chairs vs. non-lawyer chairs and once for chairs from common law vs. civil law countries. It can be seen that overall, common support is guaranteed across covariates.

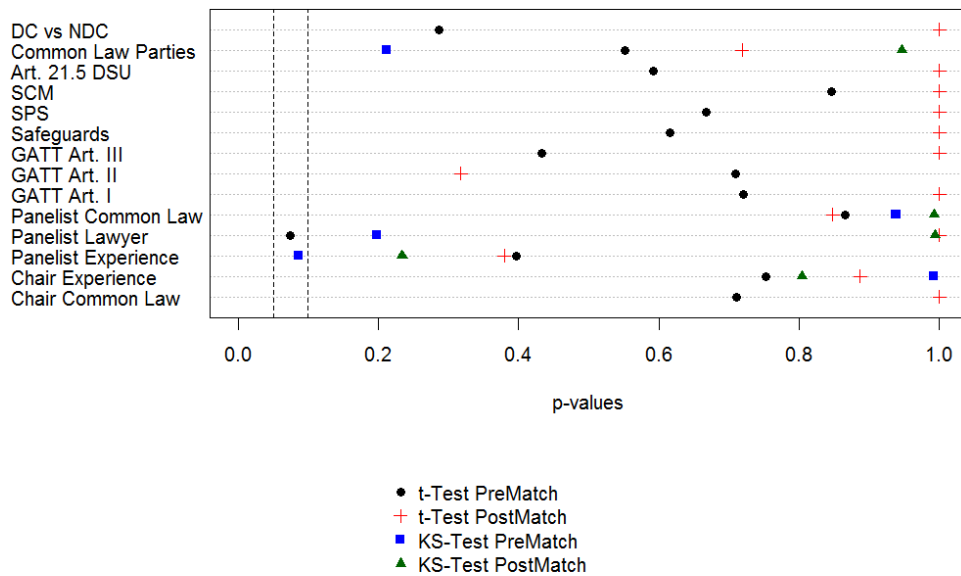
Table 2: Negative-Binomial Regression

	(1)	(2)	(3)	(4)
Lawyer-Chair	-0.312** (0.154)	-0.338** (0.145)	-0.314** (0.153)	-0.370** (0.147)
Common Law Chair	0.029 (0.156)	0.060 (0.147)	0.026 (0.155)	0.033 (0.149)
Chair Experience	-0.014 (0.028)			-0.004 (0.028)
Panelist Experience	0.007 (0.029)			0.031 (0.028)
Panelist Lawyer	-0.016 (0.119)			-0.118 (0.118)
Panelist Common Law	-0.015 (0.129)			-0.033 (0.127)
GATT I		-0.065 (0.236)		-0.138 (0.238)
GATT II		-0.215 (0.236)		-0.265 (0.239)
GATT III		-0.232 (0.217)		-0.227 (0.223)
SG		-0.055 (0.271)		-0.079 (0.275)
SPS		-1.563*** (0.312)		-1.702*** (0.332)
SCM		0.009 (0.196)		-0.011 (0.198)
Art. 21.5 DSU		-0.401* (0.212)		-0.461** (0.222)
Common Law Parties			0.021 (0.100)	-0.055 (0.098)
DC vs NDC			-0.057 (0.167)	-0.062 (0.162)
Year	-0.131** (0.063)	-0.188*** (0.057)	-0.136** (0.058)	-0.205*** (0.062)
Year ²	-0.001 (0.003)	0.001 (0.003)	-0.001 (0.003)	0.002 (0.003)
Constant	-7.096*** (0.263)	367.588*** (114.511)	264.217** (116.623)	402.724*** (123.547)
Observations	189	189	189	189
Log Likelihood	-726.562	-716.024	-726.679	-714.717
θ	1.047*** (0.118)	1.192*** (0.139)	1.046*** (0.118)	1.210*** (0.142)
Akaike Inf. Crit.	1,471.124	1,456.049	1,467.358	1,465.435

*p<0.1; **p<0.05; ***p<0.01

The output of a negative binomial regression. (1) only controls for panel-specific characteristics, (2) includes only dispute-specific characteristics, (3) controls for party-specific characteristics and (4) is the full model. Standard errors in parentheses.

Figure 2: Balance Plot for Lawyer Chairs vs. Non-Lawyer Chairs



The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATT. Years as linear trend. The results do not substantively change when introducing years as a categorical variable, though balance is worse due to the large number of variables. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.

Table 3: Results

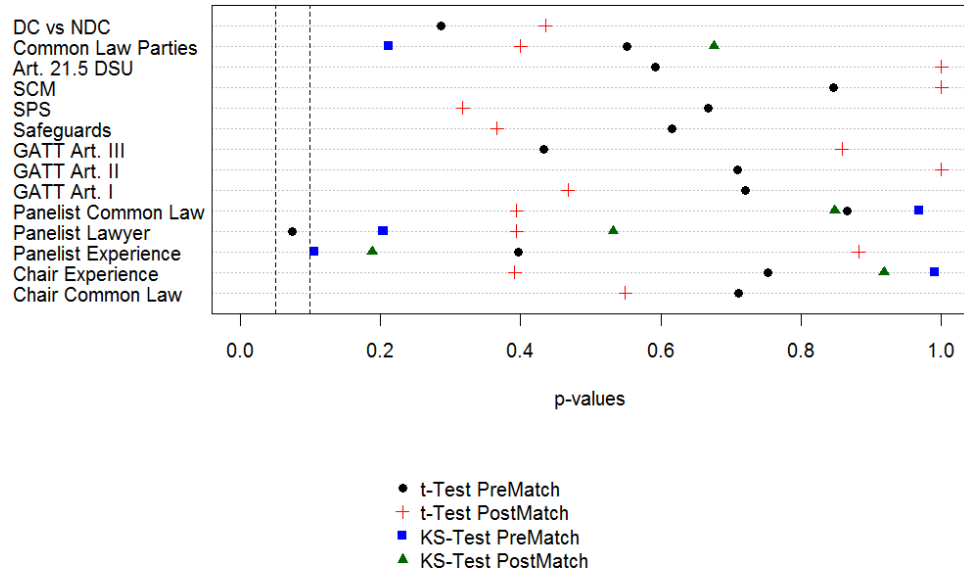
		<i>Absolute Rate</i>			<i>Relative Change</i>		
		ATT	ATC	ATE	ATT	ATC	ATE
NBM	Lawyer- Chair	-0.128**	-0.094**	-0.109**	-37%	-29%	-32%
	Common Law Chair	0.015	0.04	0.03	5%	16%	11%
GM	Lawyer- Chair	-0.125***	-0.076**	-0.07**	-36%	-27%	-22%
	Common Law Chair	0.055	0.083*	0.05*	19%	34%	18%

*p<0.1; **p<0.05; ***p<0.01

The results of the Negative Binomial Model (NBM) and Genetic Matching (GM). Absolute rate is the absolute difference in precedent citation rates per 1,000 words. Relative change is the percentage change in precedent citation rates.

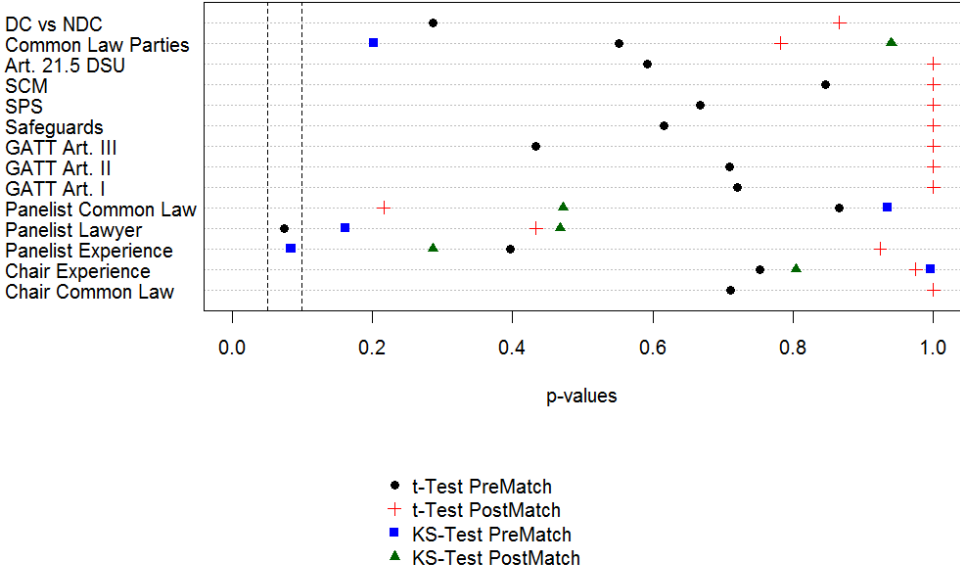
Appendix

Figure 1: Balance Plots for Lawyer Chairs vs. Non-Lawyer Chairs, ATC



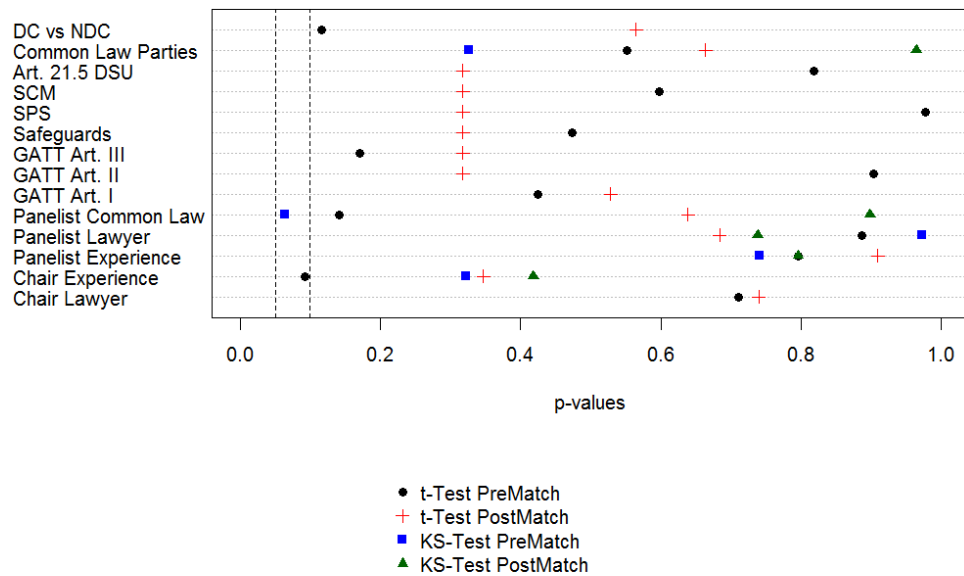
The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATC. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.

Figure 2: Balance Plots for Lawyer Chairs vs. Non-Lawyer Chairs, ATE



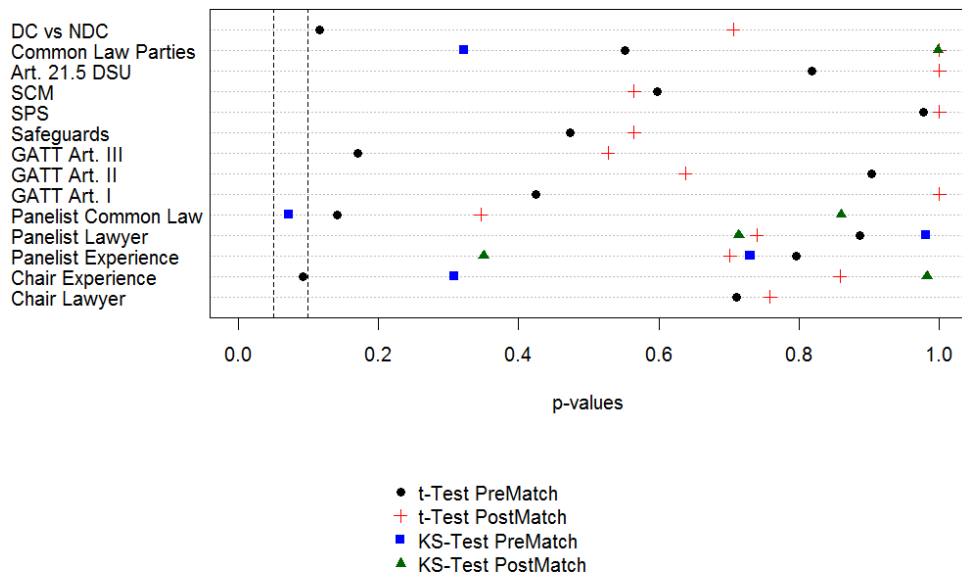
The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATE. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.

Figure 3: Balance Plots for Common Law Chairs vs. Civil Law Chairs, ATT



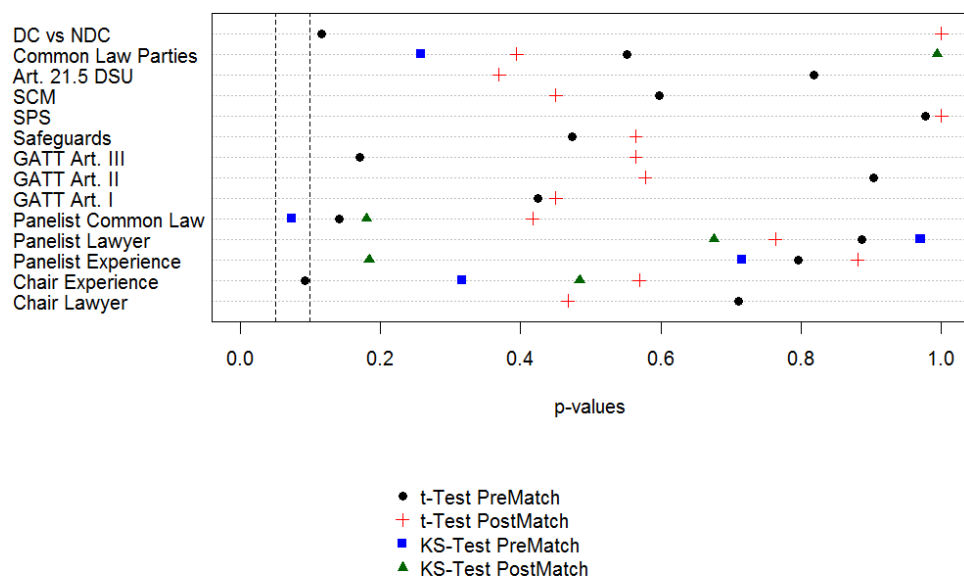
The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATT. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.

Figure 4: Balance Plots for Common Law Chairs vs. Civil Law Chairs, ATC



The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATC. Years as linear trend. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.

Figure 5: Balance Plots for Common Law Chairs vs. Civil Law Chairs, ATE



The Figure depicts balance on the covariates prior to and after employing the genetic matching algorithm estimating the ATE. Years as linear trend. Optimization is done using a custom loss function maximizing average p-values subject to the constraint $p > 10\%$. Population size is set to 5,000. p-values for the KS-test are obtained using a Bootstrap. Balance plots for the estimation of the ATC and the ATE depict good balance as well. Related plots can be found in the Appendix.