**Special Section**
***Network Analysis and Comparative Law Methods***

# Network Analysis and the Use of Precedent in the Case Law of the CJEU – A Reply to Derlén and Lindholm

*By Jens Frankenreiter*[*]

## A. Introduction

During the last decades, social network analysis has been established as a key technique in a number of disciplines in social science. Its main promise is that it provides tools for researchers to take into account the social context of individual entities or actors.[1] Legal scholars, by contrast, have only recently started to make use of these tools. Nowadays, one particularly prominent application is the use of network analysis to analyze the citation networks of different national and international courts.[2] The contribution by Derlén and Lindholm published in this issue of the *German Law Journal* forms part of this trend. It is the latest in a series of papers studying citations in the case law of the Court of Justice of the European Union (CJEU).[3] Unlike the authors' previous contributions, the paper specifically addresses the use of precedent by the CJEU and assesses the merits of criticism in the

[*] Dr. Jens Frankenreiter, LL.M. (Harvard) is a Senior Research Fellow at the Max Planck Institute for Research on Collective Goods in Bonn, Germany. He can be reached at frankenreiter@coll.mpg.de. The author is thankful to Dr. Dr. Hanjo Hamann for providing useful comments. Errors and omissions are solely those of the author.

[1] Evelien Otte and Ronald Rousseau, *Social network analysis: a powerful strategy, also for the information sciences*, 28 JOURNAL OF INFORMATION SCIENCE 442 (2002).

[2] Ryan Whalen, *Legal Networks: The Promises and Challenges of Legal Network Analysis*, 2016 MICHIGAN STATE LAW REVIEW 539, 547 (2016) (providing an overview on previous work in this area and other applications in legal research). There are other examples of research using a similar approach to the one in the present paper. *See* James H. Fowler *et al.*, *Network Analysis and the Law: Measuring the Legal Importance of Precedent at the U.S. Supreme Court*, 15 POLITICAL ANALYSIS 324 (2007) (in the context of the Supreme Court of the United States); Jonathan Lupu and Erik Voeten, *Precedent in International Courts: A Network Analysis of Case Citations by the European Court of Human Rights*, 42 BRITISH JOURNAL OF POLITICAL SCIENCE 413 (2011) (in the context of the European Court of Human Rights).

[3] *See* Mattias Derlén & Johan Lindholm, *Characteristics of Precedent: The Case Law of the European Court of Justice in Three Dimensions*, 16 GERMAN LAW JOURNAL 1073 (2015); Mattias Derlén and Johan Lindholm, *Goodbye van Gend en Loos, Hello Bosman? Using Network Analysis to Measure the Importance of Individual CJEU Judgments*, 20 EUROPEAN LAW JOURNAL *667* (2014); Mattias Derlén *et al.*, *Coherence out of Chaos: Mapping European Union Law by Running Randomly Through the Maze of CJEU Case Law*, 2013 EUROPARÄTTSLIG TIDSKRIFT 517 (2013).

literature arguing that the citation practice of the CJEU lacks an acceptable method.[4] The paper provides novel insights into the use of precedent by the CJEU and thus makes an interesting contribution to the emerging scholarship investigating the decision-making of the CJEU by means of quantitative analysis. At the same time, the design of the research raises severe doubts about whether the authors succeed in providing a conclusive response to the critics of the CJEU's citation practice.

**B. A Critical Appraisal of Derlén and Lindholm's Analysis**

The analysis of Derlén and Lindholm is motivated by their observation that, while the case law of the CJEU now constitutes an important source of the law, the use of references to prior case law in the decisions of the CJEU has been subject to severe criticism (Derlén and Lindholm, pp. 648–649).[5] By investigating the network comprised of decisions from the CJEU and cross-citations between these decisions, they intend to resolve the question whether the use of precedent by the CJEU constitutes "an acceptable exercise of judicial authority in a case law system" (Derlén and Lindholm, p. 650). While they do not explicitly say so, they seem to imply that evidence in favor of an "acceptable exercise of judicial authority" would mean that at least some of the criticism voiced against the use of precedent by the CJEU is unfounded.

In order to support their hypothesis, the authors look for similarities in the citation networks of the CJEU[6] and the Supreme Court of the United States (SCOTUS). By choosing a professedly empirical approach, they hope to avoid one central limitation of traditional legal analysis, namely the focus on just "a limited number of well-known judgments" (Derlén and Lindholm, p. 650). The analysis reveals a number of similarities and differences between the citation networks of both courts. In sum, the authors conclude that the use of precedent by the CJEU is "an acceptable exercise of judicial authority" and that it conforms to a "case law system" (Derlén and Lindholm, pp. 649–650, 685).

Derlén and Lindholm deserve recognition for their endeavor to use quantitative methods to study the decision-making of the CJEU. As they correctly note, quantitative methods have the potential to serve as an important complement to traditional doctrinal or qualitative analyses of the decisions of the Court. A significant stream of literature has demonstrated that the analysis of citations can be used to test various hypotheses about judicial decision-

[4] *See, e.g.*, Anthony Arnull, *Owning up to Fallibility: Precedent and the European Court of Justice*, 30 COMMON MARKET LAW REVIEW *253* (1993); John J. Barceló, *Precedent in European Community Law*, *in* INTERPRETING PRECEDENTS – A COMPARATIVE STUDY 407, 416 (D. Neil MacCormick & Robert S. Summers eds., 1997).

[5] For example, Arnull accused the Court of ignoring and obscuring the meaning of prior judgments in contradiction with the Court's argument. *See* Arnull, *supra* note 4.

[6] More precisely, the authors seem to use only judgments issued between 1954 and May 2011 by the highest branch of the CJEU, the Court of Justice.

making and the behavior of judges in general,[7] and network analysis techniques show great promise to exploit the rich information available in such networks to a higher degree than other quantitative methods.[8] Besides, the paper presents a number of interesting findings. It is fascinating to see that common notions about the citation behavior of the CJEU are reflected in statistical properties of its citation network. Also, the authors' finding that the use of references to prior judgments in the decision-making of both the CJEU and the SCOTUS follows roughly similar patterns deserves attention.

The paper, therefore, achieves quite a lot. But the research is not designed in a way that allows for conclusions about the "acceptability" of the CJEU's citation practice or the designation of EU law as a "case law system." It is possible to identify two particular and partly overlapping concerns with the project in this respect. On the one hand, the authors do not adequately develop the theory required to connect certain aspects of the use of precedent with particular features of citation networks. On the other hand, the authors do not make use of formal hypothesis testing. Rather, their analysis is limited to informally comparing various descriptive statistics and plots derived from the application of methods developed in network analysis to the network of citations of both courts. As a result, despite the authors' pledge to improve the study of precedent use through quantitative methods (Derlén and Lindholm, p. 651), their findings appear rather subjective.

*I. First Problem – Lack of Theory*

First, the paper suffers from a lack of theory. The authors do not offer a clear definition of what constitutes "acceptable" citation behavior and what they mean by a "case law system." Most importantly, this failure to define central concepts of the paper prevents a sound operationalization of these concepts and therefore also the development of a convincing test whether the data in fact support the hypotheses put forward in the paper.

For example, in order to devise a test for the acceptable use of precedent, one would first have to develop a theory about how different uses of precedent would play out in the data. While the paper does not itself develop such a theory, it uses the citation practice of the SCOTUS as an example of an acceptable citation practice. Put very simply, the argument of

---

[7] *See* Stephen J. Choi & G. Mitu Gulati, *Bias in Judicial Citations: A Window into the Behavior of Judges?*, 37 JOURNAL OF LEGAL STUDIES 87 (2008); Stephen J. Choi & G. Mitu Gulati, *Ranking Judges According to Citation Bias (as a Means to Reduce Bias)*, 82 NOTRE DAME LAW REVIEW 1279 (2007); Tom S. Clark & Benjamin Lauderdale, *Locating Supreme Court Opinions in Doctrine Space*, 54 AMERICAN JOURNAL OF POLITICAL SCIENCE 871 (2010); Frank B. Cross, *The Ideology of Supreme Court Opinions and Citations*, 97 IOWA LAW REVIEW 693 (2012); William M. Landes, Lawrence Lessig, and Michael E. Solimine, *Judicial Influence: A Citation Analysis of Federal Courts of Appeals Judges*, 27 JOURNAL OF LEGAL STUDIES 271 (1998); William M. Landes & Richard A. Posner, *Citations, Age, Fame, and the Web*, 29 THE JOURNAL OF LEGAL STUDIES 319 (2000); Anthony Niblett & Albert H. Yoon, *Judicial Disharmony: A Study of Dissent*, 42 INTERNATIONAL REVIEW OF LAW AND ECONOMICS 60 (2015).

[8] *See also* Whalen, *supra* note 2, at 543, 549.

the authors is that, if the citation network of the CJEU resembles that of the SCOTUS (the acceptability of which is taken as granted), then the CJEU must be considered to use citations in an acceptable way as well. Yet, in order to provide evidence for acceptable citation behavior, one would also have to describe what it would mean for a court to act unacceptable in this regard, and how such an unacceptable use of precedent would play out in the data. Derlén and Lindholm do not do this. This is more than a mere technicality. In order to infer from the statistics and plots provided in the paper that the citation practice is acceptable, one would have to form an expectation that an unacceptable citation practice would only with a very low probability generate data akin to those observed in the CJEU citation network. If, by contrast, both an acceptable and an unacceptable citation practice potentially yield data similar to those observed, the respective statistical parameter or plot may help us understand whether the citation networks of the CJEU and the SCOTUS resemble each other, but it contributes nothing to answering the question whether the citation practice of the Court is "acceptable."

To further illustrate this point, consider an example from Section D.-III. of the paper. The authors analyze the distribution of the numbers of links (citations) to and from individual nodes (judgments). They argue that, "[i]n a random network, where links are placed randomly between nodes, most nodes will have the same number of links" (Derlén and Lindholm, p. 662). Instead, similar to a prior study on the SCOTUS's citation network, they find that the distribution of the number of links follows a so-called power law, with many nodes showing few links, and only a small number of nodes showing many links. From that, Derlén and Lindholm conclude that "the CJEU case law network is not random but follows established patterns" (Derlén and Lindholm, p. 663). They interpret this finding as evidence "in favor of a conscious approach *vis-à-vis* case law at the CJEU" and as an indication that "some form of method" is at work (Derlén and Lindholm, p. 664).

It is certainly intuitive to assume that the distribution observed could not be the result of a network in which links are placed randomly between nodes. Still, the finding that the distribution of the number of links follows a power law is neither surprising, nor does it allow for any meaningful conclusion about the acceptability of the use of precedent by the CJEU. This is because not even the harshest critics of the CJEU's citations practice seem to suggest that the judges and their *référendaires* (judicial clerks) randomly pick the judgments they refer to from a list of all judgments available at a certain point in time. Instead, it seems more reasonable to assume that an "unconscious" approach to citing prior case law relies on echoing citations from previous cases on a similar topic, without considering whether the judgments cited contain any meaningful information for the case at hand. Such a citation practice, however, could very well result in a network in which the distribution of the number of links per node follows a power law distribution.[9]

[9] Note that it has long been established in other disciplines which dealt with power law distributions that these distributions can be the result of random growth processes. *See* Xavier Gabaix, *Zipf's Law for Cities: An Explanation*, 114 THE QUARTERLY JOURNAL OF ECONOMICS 739 (1999).

*II. Second Problem – No Formal Hypothesis Testing*

Second, the authors do not attempt to devise formal tests for their hypotheses. Rather, they base their conclusions on subjective comparisons of statistics and plots depicting certain aspects of the citation networks of the SCOTUS and the CJEU. For example, analyzing the development of the numbers of citations to judgments by the CJEU and the SCOTUS over time, Derlén and Lindholm observe similarities as well as differences between both courts. Without further explanation they go on to conclude that the similarities observed are sufficient to warrant the assessment that "overall the empirically-observable elements of the CJEU's approach are consistent with that of a constitutional, precedent-driven court" (Derlén and Lindholm, p. 685). At no point in the paper do the authors attempt to define a "critical region"[10] of results that would allow them to distinguish findings that support the hypothesis of an acceptable use of precedent from findings that do not support this hypothesis. Again, whether to use formal hypothesis testing is not merely a question of style. Arguably, one of the greatest advantages of quantitative research as compared to traditional legal analysis is its greater degree of objectivity.[11] In the absence of formal tests, in contrast, the authors' findings appear rather subjective.

This problem is exacerbated by the fact that the authors give little weight to features that potentially point to fundamental differences in the use of precedent by the CJEU and the SCOTUS. For example, as the authors rightly note, the data seem to imply that the use of references to precedent in decisions of the CJEU does not decrease when the Court establishes new case law (Derlén and Lindholm, p. 671). By contrast, this is potentially different for the SCOTUS. Fowler and Jeon report that the number of links to and from judgments issued by the activist Warren Court is substantially lower than the number of links to judgments issued before and after this period.[12] This has been interpreted as showing that, when the SCOTUS creates new law, it gains less from citing precedent.[13] Against this background, a finding that the CJEU uses references at least at the same rate when creating new case law seems to suggest that the motivation of both courts for citing precedent differs at least to some degree. The authors acknowledge this difference and speculate that the CJEU, in these cases, uses references as a means to increase the legitimacy of a decision (Derlén and Lindholm, p. 671). But they do not discuss how this finding affects the appraisal of their hypothesis that the CJEU is a "precedent-driven constitutional court comparable the

[10] In statistics the term "critical region" denotes the hypothetical set of results that allow for a rejection of a null hypothesis. In the present context, critical area would comprise those results that are incompatible with the hypothesis that the use of citations by the CJEU is unacceptable or incompatible with a case-law system.

[11] *See also* Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CALIFORNIA LAW REVIEW 63, 78 (2008).

[12] James H. Fowler & Sangick Jeon, *The Authority of Supreme Court Precedent*, 30 SOCIAL NETWORKS 16, 19 (2008).

[13] *Id*.

[SCOTUS]" (Derlén and Lindholm, p. 650). To the contrary, data suggesting that the use of citations by the CJEU in such cases serves at least partly rhetorical goals arguably is at odds with this hypothesis.[14]

### C. General Reflections on the Use of Network Analysis in Empirical Legal Research

It should be noted that the challenges the authors encountered in using network analysis are not unique to this paper. In fact, as has been noted before, legal research using these tools has generally "remain[ed] descriptive in nature," often limiting itself to identifying the judgments that are classified as central by the respective tools.[15] It seems reasonable to assume that one of the main causes for this state of the literature is the absence of a clear theory describing how certain aspects of the legal system affect the structure of legal (citation) networks. Only when such a theory is available will results obtained from network analysis reveal, without more, features of legal systems. That is the point at which it will also be insightful to use these techniques in comparative studies like the one conducted by Derlén and Lindholm.[16]

There is, however, a second potential way for network analysis to make substantial contributions to empirical legal research, an approach that does not necessarily require the development of a theory explaining how features of the legal system affect the shape of (citation) networks. Even in the absence of such a theory, network analysis can be used to generate variables for use in other empirical studies. Quantitative studies, as a matter of principle, require numeric variables representing the outcome and potential causes that are being investigated. Currently, one limitation of large-scale empirical investigations of judicial decision-making is that, for many characteristics of judgments (for example, their perceived importance), there are no measures readily available. While manual coding can solve this problem, it is expensive and entails potential problems regarding the replicability of the study.

Network analysis can help solve this problem. For example, if we knew that the authority score[17] of a judgment showed a strong correlation with its perceived importance as

---

[14] The question whether precedent effectively constrains the justices of the SCOTUS is controversial. *See* Jeffrey A. Segal & Harold J. Spaeth, *The Influence of Stare Decisis on the Votes of United States Supreme Court Justices*, 40 AMERICAN JOURNAL OF POLITICAL SCIENCE 971 (1996).

[15] Whalen, *supra* note 2, at 556.

[16] More precisely, such a theory would allow the development of reasoned expectations about how the presence of certain features of a legal system affects the citations network, which in turn would allow for the drawing of inferences from the data by means of hypothesis testing.

[17] Authority score is a measure of the centrality of a node in a network based on the number and centrality of nodes linking to this node.

established by other means (e.g., by manually coding a random subset of cases)[18] we could use this score as a proxy for the importance of a case. This, in turn, would make it possible to conduct large-scale investigations of the factors that predict the importance of a judgment. Potential examples include studies of whether the perceived importance is correlated with the individual judge authoring the opinion, and whether the importance of a judgment changes once its author leaves the Court.[19] Derlén and Lindholm's paper—together with their previous work on related topics—helps understand the general shape of the CJEU's citation network and could therefore serve as an important first step in the development of such measures.

**D. Conclusion**

Network analysis techniques potentially offer great promise for legal research, and Derlén and Lindholm's paper demonstrates both the strengths and the potential pitfalls of using such techniques in the context of judicial behavior. On the one hand, their analysis provides interesting novel insights into the use of precedent by the CJEU. In particular, it reveals remarkable similarities between the citation networks of the CJEU and the SCOTUS. By using network analysis techniques, the authors are able to include in their analysis references to prior case law in the universe of decisions by the CJEU instead of just a small number of landmark cases. On the other hand, the study suffers from both a lack of theory about how a specific type of precedent use is reflected in a citation network, and from the authors' failure to test their hypotheses in a more rigorous way. These shortcomings reflect central challenges for the use of network analysis in legal research in general, and it stands to reason that the significance of these techniques will be limited as long as these challenges cannot be overcome.

[18] Derlén & Lindholm, along with others, have also conducted research on the potential of authority scores to serve as a proxy for the importance of a decision in the context of the CJEU and the SCOTUS. *See, e.g.,* Derlén & Lindholm, *supra* note 3; Fowler *et al.*, *supra* note 2.

[19] Some studies have used measures derived from network analysis as the dependent variable in statistical analyses. *See* Yonatan Lupu & James H. Fowler, *Strategic Citations to Precedent on the U.S. Supreme Court*, 42 THE JOURNAL OF LEGAL STUDIES 151 (2013); Lupu & Voeten, *supra* note 2.