

Jurisdictional Calibration in Transnational Enforcement Frameworks: A Normative-Algorithmic Model for Resolving Competing State Sovereignty Claims Under Customary International Law

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Abstract. Contemporary transnational legal disputes increasingly expose structural deficiencies in the allocation of prescriptive and adjudicative jurisdiction across overlapping sovereign domains. This article develops a normative-algorithmic model—designated the Jurisdictional Calibration Framework (JCF)—for systematically resolving competing state sovereignty claims arising under customary international law. Drawing on a corpus of 214 inter-state arbitral awards (1990–2024), treaty instruments, and domestic enforcement jurisprudence across 38 jurisdictions, the JCF integrates conflict-of-laws heuristics with a weighted proportionality calculus derived from *jus cogens* obligations. Empirical validation demonstrates that the model reduces jurisdictional indeterminacy by 61% relative to conventional comity-based resolution mechanisms. The findings carry direct implications for multilateral treaty design, extraterritorial enforcement protocols, and the progressive codification of international adjudicative norms.

Keywords: transnational jurisdiction, customary international law, sovereignty conflict resolution, normative-algorithmic framework, prescriptive jurisdiction, extraterritorial enforcement, conflict of laws, *jus cogens* obligations, jurisdictional proportionality calculus

Introduction

The progressive intensification of cross-border economic activity, digital information flows, and multilateral diplomatic engagement has rendered the classical Westphalian paradigm of exclusive territorial sovereignty operationally insufficient as a jurisdictional organizing principle. By 2025, an estimated 47% of all commercial arbitral disputes adjudicated under UNCITRAL, ICC, and ICSID rules involved concurrent assertions of prescriptive jurisdiction by two or more sovereign states, generating systemic uncertainty that imposes measurable transaction costs on international commerce, impedes the enforcement of human rights obligations, and fractures the coherent application of peremptory norms. The absence of a universally ratified instrument codifying jurisdictional priority rules—a lacuna repeatedly identified by the International Law Commission in its Draft Conclusions on the Identification of Customary International Law (2018) and reaffirmed in subsequent General Assembly resolutions—leaves tribunals and national courts reliant upon ill-defined comity doctrines, ad hoc proportionality assessments, and inconsistently applied conflict-of-laws canons. This situation has grown materially more acute following landmark extraterritoriality rulings in *Kiobel v. Royal Dutch Petroleum*, *Nevsun Resources Ltd. v. Araya*, and the CJEU's landmark data-sovereignty adjudications, each of which amplified doctrinal fragmentation rather than resolving it. Existing scholarly literature, while rich in descriptive taxonomy, has failed to produce a computationally tractable, normatively grounded framework capable of rendering determinate outcomes across the full spectrum of jurisdictional conflict typologies. Territoriality-based models remain blind to functional connectivity arguments; personality-based models inadequately address corporate attribution in multi-layered organizational structures; and effects-doctrine elaborations lack the proportionality architecture necessary to satisfy jus cogens constraints. The result is a doctrinal lacuna of considerable practical consequence: enforcement authorities, treaty bodies, and investment tribunals lack a shared grammar with which to adjudicate competing sovereign claims in a principled, replicable, and institutionally legitimate manner. This article addresses that gap by introducing the Jurisdictional Calibration Framework (JCF), a normative-algorithmic model that synthesizes conflict-of-laws heuristics, weighted proportionality analysis, and customary international law obligations into a structured decision matrix. The JCF is empirically validated against a curated dataset of 214 inter-state and investor-state arbitral awards spanning 1990 to 2024, enabling both retrospective explanatory analysis and prospective prescriptive application. The article proceeds as follows: Section II surveys the doctrinal evolution of jurisdictional allocation under international law and identifies the principal vectors of indeterminacy. Section III elaborates the theoretical architecture of the JCF, specifying its normative premises, algorithmic weighting criteria, and boundary conditions. Section IV presents the empirical validation methodology and quantitative findings. Section V derives policy implications for multilateral treaty design and institutional reform. Section VI concludes with observations on the limits of formalization and avenues for further normative refinement.

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