

ESSAY

The Mathematical Question: Defining “Relatively Easy” Political Questions

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ABSTRACT

*Justiciability doctrines are intertwined with constitutional commands and prudential concerns. They weave together text and history; they aim to protect democracy and individual rights. In 2019, the Supreme Court, in *Rucho v. Common Cause*, determined that partisan gerrymandering claims suffer from justiciability problems by implicating a doctrinal subpart—the political question doctrine. Within its decision, the Court intended to calm fears that the decision would reach too far, so it wrote that other types of politically implicated claims were not impacted. For example, one-person, one-vote claims are still justiciable, the Court wrote, because they are “relatively easy to administer as a matter of math.” But, beyond one-person, one-vote claims, where else is math “relatively easy”? Multiple courts are now struggling to answer this question across diverse legal problems.*

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This Essay proposes an analytic framework to ease that struggle and answer that question: the mathematical question doctrine. In turn, this Essay defines the contours, shows its advantages, and reconceptualizes Rucho. First, it explores the background of the political question doctrine and articulates a set of its justifications. Second, it explains how those justifications flare when courts need to consider math, but it rejects a categorical treatment. Instead, the Essay enumerates factors at the core of a mathematical question: the complexity of math, numerosity of variables, and ease of quantifiability. It roots these factors within the jurisprudential justifications of the political question doctrine and shows their problematic traits. Third, the Essay revisits Rucho to show that although the proposed approach is consistent with caselaw, it is more fully fleshed out, better explains the approach and outcome of Rucho, and gives useful guidance to future courts.

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There is an old saying that lawyers can't do math. While this is a tired stereotype, there is no question that some lawyers and math just don't mix. For that reason, much like the "some assembly required" warning on certain products, we start off by cautioning that there is "some math required" in this [Essay]. Fear not, however, for it is simple math and instructions are included.

—Justice Carlos A. Samour¹

INTRODUCTION

For some, doctrines of justiciability² are "esoteric concepts" left to the ramblings of judges and lawyers.³ Yet justiciability falls at the center of core societal disputes. It implicates military soldiers⁴ and domestic farmers.⁵ It decides issues involving Congress⁶ and the Executive.⁷ It has prevented a mother from challenging the execution of her son.⁸ And it is intertwined with adversarialism, which permeates the American judicial system.⁹

In 2019, the Supreme Court, in *Rucho v. Common Cause*,¹⁰ added partisan gerrymandering to the list of nonjusticiable political questions because it held that partisan gerrymandering presented questions that could not be answered with judicially manageable standards.¹¹ But the Court was clear; although it struck down partisan gerrymandering claims, it did not disturb other areas of law like one-person, one-vote claims.¹²

Unlike partisan gerrymandering claims, one-person, one-vote claims, the Court reasoned, are "relatively easy to administer as a matter of math."¹³ Yet math is rarely easy, especially for lawyers,¹⁴ and

¹ Owens v. Carlson, 511 P.3d 637, 639 (Colo. 2022) (en banc) (citation omitted).

² "The umbrella term 'justiciability' generally includes the related doctrines of standing, ripeness, mootness, and political question." Susan Bandes, *The Idea of a Case*, 42 STAN. L. REV. 227, 228 n.11 (1990).

³ See *Stephenson v. Woodward*, 182 S.W.3d 162, 175 (Ky. 2005) (Lambert, C.J., concurring), modified (Ky. 2006).

⁴ *Gilligan v. Morgan*, 413 U.S. 1, 5 (1973).

⁵ *Schroder v. Bush*, 263 F.3d 1169, 1176 (10th Cir. 2001).

⁶ *Powell v. McCormack*, 395 U.S. 486, 549–50 (1969).

⁷ *Oetjen v. Cent. Leather Co.*, 246 U.S. 297, 302 (1918).

⁸ *Gilmore v. Utah*, 429 U.S. 1012, 1016–17 (1976) (Burger, C.J., concurring) (concurring in termination of stay of execution).

⁹ See Bandes, *supra* note 2, at 248.

¹⁰ 588 U.S. 684 (2019).

¹¹ *Id.* at 716–18.

¹² *Id.* at 707–08.

¹³ *Id.*

¹⁴ See, e.g., *Jackson v. Pollion*, 733 F.3d 786, 788 (7th Cir. 2013) ("The discomfort of the legal profession, including the judiciary, with science and technology is not a new phenomenon. Innumerable are the lawyers who explain that they picked law over a technical field because they have

the Court left a group “peculiarly averse to math”¹⁵ to determine that ease.¹⁶ Accordingly, courts are struggling with this application.¹⁷

This Essay recasts the political question doctrine into an easier inquiry by introducing an analytical framework: the “mathematical question.” *Rucho* differentiated gerrymandering claims and one-person, one-vote claims on the basis of math, and the mathematical question posits that the distinction is neither categorical nor inherently obvious. Instead, courts ought to consider a series of factors—complexity, numerosity, and quantifiability—to determine whether math brings a dispute out of judicial reach. This approach is rooted in the underlying justifications behind the political question doctrine. Although this approach is consistent with *Rucho*, it rejects the summary dismissal of claims and elaborates on the meaning of “relatively easy” math.¹⁸ This analytical framework can resolve ongoing justiciability questions arising in areas of law ranging from election ballot design to environmental policy.¹⁹

While proposing this analytical framework, Part I explains the history behind the traditional political question doctrine and its justifications. Part II elaborates on the mathematical question, situates math within the political question doctrine, rejects a categorical approach to courts’ hesitancy about math, and breaks down the justiciability inquiry into a more digestible set of factors courts ought to consider. In doing so, it ties the factors to the justifications for the political question doctrine and establishes this approach’s comparable ease. Part III revisits *Rucho* and the one-person, one-vote doctrine to demonstrate how the proposed mathematical question leads to better analysis than

a ‘math block’—‘law students as a group, seem peculiarly averse to math and science.’” (quoting DAVID L. FAIGMAN, MICHAEL J. SAKS, JOSEPH SANDERS & EDWARD K. CHENG, *MODERN SCIENTIFIC EVIDENCE: STANDARDS, STATISTICS, AND RESEARCH METHODS*, at v (student ed. 2008)); Malech v. Malech, No. 154192FL, 2022 WL 2230874, at *1 (Md. Ct. Spec. App. June 21, 2022) (“Lawyers often joke that we went to law school because we aren’t good at or don’t like math. But sometimes math and law intersect, and when they do the results can be messy.”).

¹⁵ See FAIGMAN ET AL., *supra* note 14, at v.

¹⁶ *Rucho*, 588 U.S. at 707–08.

¹⁷ Compare *Nelson v. Warner*, 472 F. Supp. 3d 297, 311 (S.D. W. Va. 2020) (holding question of ballot ordering justiciable because they “involve[d] far fewer variables” and thus were relatively easy math), and *Jacobson v. Lee*, 411 F. Supp. 3d 1249, 1257–58 (N.D. Fla. 2019) (holding question of ballot ordering justiciable), *vacated and remanded*, 974 F.3d 1236 (11th Cir. 2020), with *Jacobson v. Fla. Sec’y*, 957 F.3d 1193, 1215 (11th Cir. 2020) (holding question of ballot ordering nonjusticiable because no clear and manageable standards could be identified), *vacated and superseded*, 974 F.3d 1236 (11th Cir. 2020). Compare *Juliana v. United States*, 947 F.3d 1159, 1173 (9th Cir. 2020) (holding plaintiffs’ challenge to fossil fuel use nonjusticiable because lack of manageable standards resulting from mathematical comparisons), with *id.* at 1187–88 (Staton, J., dissenting) (finding challenge justiciable in part because standards were manageable).

¹⁸ *Rucho*, 588 U.S. at 708.

¹⁹ See *supra* note 17.

the traditional conception of political questions. Lastly, this Essay concludes by summarizing the contribution of the mathematical question and proposing its future application.

I. THE POLITICAL QUESTION

A. Doctrinal Development

Today's political question doctrine asks whether a particular controversy is the "sort of question that is within the competence of the federal courts to decide or whether it is instead a nonjusticiable political question outside the scope of the judicial power."²⁰ Courts are particularly worried about deciding cases without judicial standards or that require making policy decisions.²¹

However, the political question doctrine did not begin in recent history; instead, it traces its origin to the inception of judicial review.²² As Chief Justice John Marshall explained, certain "[q]uestions, in their nature political, or which are, by the constitution and laws, submitted to the executive, can never be made in this court."²³ In other words, the establishment of judicial review in *Marbury v. Madison*²⁴ came with a limitation that the Court would not interfere with political questions.²⁵ Early cases seized on Chief Justice Marshall's language and declined to review questions "submitted to" other branches.²⁶ For example, the Court has articulated that questions of foreign relations and the military belong to the Executive,²⁷ and questions of congressional procedure belong to Congress.²⁸

In contrast, determining who has the right to decide a policy, rather than determining the policy itself, does not pose a political question.²⁹ Nor does the fact that the law is about politics provide immunity from judicial review.³⁰ "In passing, the Court also rejected the political question doctrine in claims challenging Congress's plenary authority over

²⁰ Chad M. Oldfather & Sydney Star, *Roberts, Rules, and Rucho*, 53 CONN. L. REV. 705, 718 (2022).

²¹ See *id.* at 718–19.

²² See *Marbury v. Madison*, 5 U.S. (1 Cranch) 137, 170 (1803).

²³ *Id.*

²⁴ 5 U.S. (1 Cranch) 137 (1803).

²⁵ Robert J. Pushaw, Jr., *Justiciability and Separation of Powers: A Neo-Federalist Approach*, 81 CORNELL L. REV. 393, 449–51 (1996).

²⁶ *Marbury*, 5 U.S. (1 Cranch) at 170; see also Pushaw, *supra* note 25, at 450–51.

²⁷ See *Oetjen v. Cent. Leather Co.*, 246 U.S. 297, 302, 304 (1918); *Gilligan v. Morgan*, 413 U.S. 1, 10–11 (1973).

²⁸ See *Nixon v. United States*, 506 U.S. 224, 226 (1993).

²⁹ See *Zivotofsky ex rel. Zivotofsky v. Clinton*, 566 U.S. 189, 196 (2012).

³⁰ See *Powell v. McCormack*, 395 U.S. 486, 547–48 (1969) (holding that whether the House properly expelled a member was not a political question).

American Indian tribes, the assertion of executive privilege in response to a congressional subpoena, and the President's authority to disregard a treaty."³¹

Yet Marshall did not label questions "by the constitution and laws, submitted to" other branches as the only type of nonjusticiable questions.³² Instead, that was only one of the prongs; the justiciability doctrine, more broadly, also reaches questions that, "in their nature[,] [are] political."³³ Thus, courts have sought to determine what naturally belongs within each branch's power.³⁴ Yet merely stating that certain questions naturally do not belong to the judiciary simply restates the ultimate question without identifying factors contributing to that nature.

In 1962, the Court in *Baker v. Carr*³⁵ aimed to synthesize the political question doctrine.³⁶ First, there are questions with "a textually demonstrable constitutional commitment of the issue to a coordinate political department."³⁷ This bucket neatly mirrors what Marshall envisioned as questions "submitted to" other branches.³⁸ Second, there are questions with "a lack of judicially discoverable and manageable standards for resolving" them.³⁹ This seems to define a judicial question—and by contrast, a political question—by its answer; a judicial question can be answered only with a judicial answer. Third, political questions can require "an initial policy determination of a kind clearly for nonjudicial discretion."⁴⁰ Fourth, they can express a "lack of the respect due coordinate branches of government."⁴¹ Fifth, a political question can require "an unusual need for unquestioning adherence to a political decision already made."⁴² Lastly, it may risk "the potentiality of embarrassment from multifarious pronouncements by various departments on one

³¹ Scott Dodson, *Article III and the Political Question Doctrine*, 116 NW. U. L. REV. 681, 696 n.96 (2021) (citing *Cnty. of Oneida v. Oneida Indian Nation*, 470 U.S. 226, 248–50 (1985); *United States v. Nixon*, 418 U.S. 683, 692–97 (1974); *Japan Whaling Ass'n v. Am. Cetacean Soc'y*, 478 U.S. 221, 229–30 (1986)).

³² *Marbury v. Madison*, 5 U.S. (1 Cranch) 137, 170 (1803).

³³ *Id.*

³⁴ See Pushaw, *supra* note 25, at 478; see also *Massachusetts v. Mellon*, 262 U.S. 447, 488 (1923) ("The functions of government under our system are apportioned.").

³⁵ 369 U.S. 186 (1962).

³⁶ *Id.* at 217.

³⁷ *Id.*

³⁸ *Marbury*, 5 U.S. (1 Cranch) at 170. Admittedly, Marshall only spoke of questions "submitted to the executive." *Id.* However, as *Baker* indicates, the Court has been clear that courts should neither encroach on the Executive nor Congress in certain areas. *Baker*, 369 U.S. at 211.

³⁹ *Baker*, 369 U.S. at 217.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

question.”⁴³ Any of these situations presents a question with a political nature.⁴⁴

Against this backdrop, the Supreme Court in *Rucho v. Common Cause* held that the political question doctrine barred partisan gerrymandering claims from being considered by federal courts.⁴⁵ The Court rooted its holding to the words of Marshall.⁴⁶ The Court did not “condone excessive partisan gerrymandering,” but it found that “the avenue for reform” fell outside the federal judiciary.⁴⁷ The Court based its holding on the absence of any specific constitutional text, the lack of developed caselaw, the inability to distinguish between illegality and legality, the complexity of underlying calculations, and the existence of intertwined policy judgments.⁴⁸

Before *Rucho* was decided, there was fear among some that an adverse court ruling might disturb more than just partisan gerrymandering claims.⁴⁹ For example, some amici noted that the underlying standards that lower courts employed in the districting context were similar to tests deployed in one-person, one-vote claims.⁵⁰ As background, one-person, one-vote claims were established through a series of Supreme Court cases that held that the Constitution requires states to give their citizenry equal representation in voting.⁵¹ In practice, this means that districts must be drawn with relatively equal sizes so that all individuals have equal voting power.⁵²

Yet, in *Rucho*, the Court declined to overturn its prior holdings and explicitly noted that one-person, one-vote claims did not raise political questions.⁵³ Although the language was explicit, the reasoning was not

⁴³ *Id.*

⁴⁴ *Id.* But see *Al-Tamimi v. Adelson*, 916 F.3d 1, 12 (D.C. Cir. 2019) (noting that the Supreme Court seems to focus most heavily—if not exclusively—on the first two factors identified in *Baker*); *Oldfather & Star*, *supra* note 20, at 718 (noting how *Rucho* focused solely on the second and third factors).

⁴⁵ *Rucho v. Common Cause*, 588 U.S. 684, 718 (2019).

⁴⁶ *Id.* at 695–96 (quoting *Marbury v. Madison*, 5 U.S. (1 Cranch) 137, 177 (1803)).

⁴⁷ *Id.* at 719–21.

⁴⁸ *Oldfather & Star*, *supra* note 20, at 721–31 (2022) (summarizing and synthesizing the rationales in *Rucho*).

⁴⁹ See, e.g., Richard L. Hasen, *Roberts’ Rules*, SLATE (Mar. 25, 2019, 11:08 AM), <https://slate.com/news-and-politics/2019/03/john-roberts-supreme-court-gerrymandering-cases.html> [<https://perma.cc/U99R-ZD7X>] (discussing how the then-looming decision in *Rucho*, and other cases, would reflect broader jurisprudence in future years).

⁵⁰ Brief for Eric S. Lander as Amicus Curiae Supporting Respondents at 24, *Rucho*, 588 U.S. 684 (No. 18-422).

⁵¹ See Kent D. Krabill & Jeremy A. Fielding, *No More Weighting: One Person, One Vote Means One Person, One Vote*, 16 TEX. REV. L. & POL. 275, 278–81 (2012).

⁵² See *id.* at 280. This simplifies the analysis somewhat, but for an example of some of the intricacy, see *infra* note 182.

⁵³ *Rucho*, 588 U.S. at 709.

fully developed.⁵⁴ In turn, it opened the door to lower courts' current confusion.⁵⁵

B. Doctrinal Justifications

Courts are not always clear why the political question doctrine exists despite it stretching back to the inception of judicial review.⁵⁶ As *Baker* illuminated, different categories of cases implicate the doctrine, and each of those categories may implicate different justifications.⁵⁷ Given that this Essay focuses mostly on the second *Baker* factor—the nonexistence of judicially manageable standards—this discussion concentrates on justifications in cases implicating that factor.⁵⁸

1. Protecting Democracy

The constitutional arguments take two main strands. First, “The nonjusticiability of a political question is primarily a function of the separation of powers.”⁵⁹ In other words, if a question is best resolved by a political branch (i.e., the legislature or the executive), courts should not try to take that power away. Second, it is a jurisdictional question rooted in the Article III case or controversy requirement (i.e., a *judicial* case or controversy).⁶⁰ Given that courts only have jurisdiction over judicial questions, the other branches answer political questions.⁶¹

Although these constitutional justifications are independently important for application, they also suggest a broader goal. Separation of powers and Article III are not merely ends in themselves, but they are also means to protect individual rights.⁶² The theories are rooted in the idea that if power is distributed across branches, it will be harder for any one body to consolidate enough power to impose its arbitrary

⁵⁴ See *infra* Part III.

⁵⁵ See *supra* note 17.

⁵⁶ Justice Sotomayor has articulated that the first *Baker* factor reflects a textual commitment away from the judicial branch, the second and third *Baker* factors represent areas where decision-making extends beyond “courts’ competence,” and the last three *Baker* factors represent prudential concerns. *Zivotofsky ex rel. Zivotofsky v. Clinton*, 566 U.S. 189, 202–06 (2012) (Sotomayor, J., concurring). Other judges have characterized the last four as prudential factors. *Al-Tamimi v. Adelson*, 916 F.3d 1, 12 (D.C. Cir. 2019).

⁵⁷ See *Baker v. Carr*, 369 U.S. 186, 211–16 (1962); see also *supra* Section I.A.

⁵⁸ However, justifications for the doctrine often reflect on multiple of the *Baker* factors and, therefore, are also discussed here.

⁵⁹ *Baker*, 369 U.S. at 210.

⁶⁰ See *Schlesinger v. Reservists Comm. to Stop the War*, 418 U.S. 208, 227 (1974).

⁶¹ However, these two strands, may, in turn blend together. See *Bandes, supra* note 2, at 232 n.32.

⁶² See, e.g., *Sierra Club v. Trump*, 929 F.3d 670, 704 (9th Cir. 2019) (noting that separation of powers aims to protect “individual rights and liberties—not merely separation for separation’s sake”).

will.⁶³ The Founders were particularly worried that the judicial branch would interfere with the other branches because the Court is the least democratic branch. When the Court strikes down the goals of the legislature (or executive), it runs against democracy's protection of liberty; collectively, this is referred to as "the countermajoritarian difficulty."⁶⁴ The constitutional justification for the justiciability doctrines—and the political question doctrine specifically—represents a core response to this problem.⁶⁵

2. *Protecting Competency*

Beyond merely deferring to democratic branches for structural protection, the political question doctrine is prudential.⁶⁶ This theory argues that courts should not answer certain questions because they are not the best actor to do so.⁶⁷

Especially regarding the second and third *Baker* factors, some political questions ask courts to engage in "decision-making beyond courts' competence."⁶⁸ For example, courts competently weigh equities of injunctive relief,⁶⁹ interpret the meaning of laws, and apply precedent to facts because those are the types of things judges are trained to do well.⁷⁰ In fact, it is well enshrined that the judiciary has the supreme power to declare "what the law is."⁷¹

In contrast, courts resolve questions outside of their competency when they engage in domestic and foreign policy decisions because those decisions require determinations based on skills and information the judiciary does not have.⁷² For example, the executive branch

⁶³ See generally Paul R. Verkuil, *Separation of Powers, the Rule of Law and the Idea of Independence*, 30 WM. & MARY L. REV. 301, 303 (1989) (explaining Justice Brandeis's view that the purpose of separation of powers was "to preclude the exercise of arbitrary power" (quoting *Myers v. United States*, 272 U.S. 52, 293 (1926) (Brandeis, J., dissenting))).

⁶⁴ Barry Friedman, *The History of the Countermajoritarian Difficulty, Part One: The Road to Judicial Supremacy*, 73 N.Y.U. L. REV. 333, 334–43 (1998).

⁶⁵ See *id.* at 405–07.

⁶⁶ Fred O. Smith, Jr., *Undemocratic Restraint*, 70 VAND. L. REV. 845, 848 (2017); see also *id.* at 877–90 (arguing that the Court has, at times, conflated the prudential requirements as constitutional).

⁶⁷ Jay Shapiro, *Terrorism, the Constitution, and the Courts*, 18 N.Y.L. SCH. J. HUM. RTS. 189, 198 (2002) (framing certain political questions as those where the "judiciary is not the best branch" to provide answers).

⁶⁸ *Zivotofsky ex rel. Zivotofsky v. Clinton*, 566 U.S. 189, 202–06 (2012) (Sotomayor, J., concurring in part and concurring in the judgment).

⁶⁹ *Ctr. for Biological Diversity v. Mattis*, 868 F.3d 803, 829 (9th Cir. 2017).

⁷⁰ See Lisa Rudikoff Price, Note, *Banishing the Specter of Judicial Foreign Policymaking: A Competence-Based Approach to the Political Question Doctrine*, 38 N.Y.U. J. INT'L L. & POL. 323, 344–45 (2006).

⁷¹ *Marbury v. Madison*, 5 U.S. (1 Cranch) 137, 177 (1803).

⁷² See Price, *supra* note 70, at 345–47.

is tasked with dealing with extradition requests because the branch is responsible for understanding relations between America and foreign nations.⁷³ Whether in the scope of foreign relations, national security, or ordinary policy, political questions require judgments about the nation's interest.⁷⁴ Thus, these political questions ask what the law *ought* to be rather than “what the law *is*.”⁷⁵

3. *Protecting Efficiency*

Some courts even admit that the doctrine promotes judicial economy.⁷⁶ For situations in which issues will likely reoccur, courts risk constantly needing to relitigate an issue. Thus, political questions can become more than an isolated question with which courts engage; instead, by opening the door to engaging with political decisions, courts run the risk of turning into a political body with the constant need of reengaging on those political issues.⁷⁷ Accordingly, the Supreme Court declared that “[c]ourts ought not . . . enter . . . political thicket[s].”⁷⁸

Additionally, the Founders assumed that policymaking would be slow and gridlock would ensue.⁷⁹ In fact, the Framers believed that this gridlock would force factions to come together, which would require compromise to follow.⁸⁰ Yet the same institutional constraints are likely not present with courts that need to decide individual rights. It seems undesirable for judges to compromise parties' rights in one case for an outcome in a different case. Thus, the goal of avoiding repetitive questions is unique for a judiciary that should resolve the case in front of it rather than considering the scope of possible questions that might arise again.⁸¹

⁷³ Rachel E. Barkow, *More Supreme Than Court? The Fall of the Political Question Doctrine and the Rise of Judicial Supremacy*, 102 COLUM. L. REV. 237, 249–50 (2002).

⁷⁴ *Id.* at 250.

⁷⁵ *Marbury*, 5 U.S. (1 Cranch) at 177 (emphasis added).

⁷⁶ *Sw. Pub. Serv. Co. v. Thunder Basin Coal Co.*, 978 P.2d 1138, 1142 (Wyo. 1999) (quoting *Reiman Corp. v. City of Cheyenne*, 838 P.2d 1182, 1186 (Wyo. 1992)); *see also* Transcript of Oral Argument at 20, *Rucho v. Common Cause*, 588 U.S. 684 (2019) (No. 18–422) (Breyer, J. trying to find a test to avoid “every judge in the country” needing to get involved in gerrymandering claims).

⁷⁷ *Colegrove v. Green*, 328 U.S. 549, 553–54 (1946), *implied overruling recognized by* *Dobbs v. Jackson Women's Health Org.*, 597 U.S. 215 (2022).

⁷⁸ *Id.* at 556.

⁷⁹ Franita Tolson, Essay, *The Union as a Safeguard Against Faction: Congressional Gridlock as State Empowerment*, 88 NOTRE DAME L. REV. 2267, 2275 (2013).

⁸⁰ *See id.*

⁸¹ Some scholars argue for other justifications for the doctrine or reject it entirely. *See* Dodson, *supra* note 31, at 681 (arguing that the substantive law of relevant issue makes decisions nonjusticiable); G. Michael Parsons, *Gerrymandering & Justiciability: The Political Question Doctrine After Rucho v. Common Cause*, 95 IND. L.J. 1295, 1295–99 (2020) (arguing that the standing doctrine, equitable remedies doctrine, and common law remedies of tailoring all justify the political question doctrine); Martin H. Redish & Matthew Heins, *Premodern Constitutionalism*,

II. THE MATHEMATICAL QUESTION

This Essay, through the “mathematical question,” proposes a seemingly simple proposition: too much math implicates the political question doctrine. This Essay justifies the hypothesis by showing a well-founded hesitancy of math in the law. Then, it seeks to answer the next logical question: how much is “too much” math? The Essay suggests factors that derive from doctrine. Finally, Part III shows the advantage of the mathematical question as an easier tool to evaluate justiciability.

A. *From Justifications to Hesitancy*

Courts express hesitancy when approaching math.⁸² As Justice Breyer argued, courts ought not to try to “find[] answers to complex empirically based questions of a kind that legislatures are better able than courts to make.”⁸³ These “empirically based questions” represent the kinds of questions mathematicians often answer.⁸⁴ For example, Justice Breyer imagined a scenario where “after a gun regulation’s adoption[,] the murder rate went up.”⁸⁵ Determining whether “the murder rate [would] have risen even faster” if there was not the regulation is a question of causal inference that can be answered with directed acyclic graphs.⁸⁶ Considering the effect of “the local recession which has left numerous people unemployed” is a question of confounding variables that might be answered with adjusting log odds ratios or pairwise models.⁸⁷ Justice Breyer likely did not consider using directed acyclic graphs or pairwise models, but he knew that the type of question required a complex answer that the courts should not answer.⁸⁸ Even more broadly, courts hesitate to do math even when something is as simple as counting

57 WM. & MARY L. REV. 1825, 1881 (2016) (arguing that the doctrine is not actually justified at all). Because the Court has not embraced this opinion, this Essay saves this discussion for a different day.

⁸² See *supra* note 14.

⁸³ *McDonald v. City of Chicago*, 561 U.S. 742, 922 (2010) (Breyer, J., dissenting).

⁸⁴ *Id.*

⁸⁵ *Id.* at 923.

⁸⁶ *Id.*; see also, e.g., Thomas C. Williams, Cathrine C. Bach, Niels B. Matthiesen, Tine B. Henriksen & Luigi Gagliardi, *Directed Acyclic Graphs: A Tool for Causal Studies in Paediatrics*, 84 PEDIATRIC RSCH. 487, 487 (2018) (discussing causal inference).

⁸⁷ *McDonald*, 561 U.S. at 923 (Breyer, J., dissenting); see also Daniel Westreich & Sander Greenland, *The Table 2 Fallacy: Presenting and Interpreting Confounder and Modifier Coefficients*, 177 AM. J. EPIDEMIOLOGY 292 (2013) (discussing confounding variables).

⁸⁸ *McDonald*, 561 U.S. at 925–26 (Breyer, J., dissenting) (“Judges cannot easily make empirically based predictions . . . [T]here is no institutional need to send judges off on this ‘mission-almost-impossible.’”).

the number of years to determine the applicability of the statute of limitations.⁸⁹

Still, that hesitancy is not without reason. First, courts are slower at getting the right answer than the policy branches. They are often slow to catch mathematical errors.⁹⁰ Even when they do catch errors, *stare decisis* pressures may limit their ability to correct prior wrongs by emphasizing consistency over accuracy.⁹¹ And even if it is not an error in the traditional sense but a shift in knowledge, *stare decisis* may make it difficult for judges to adapt to a change in the field.⁹² Second, courts are less able to get the right answer. Courts can only deal with the data in front of them.⁹³ In contrast, legislatures and the executive are better at gathering data necessary for accurate mathematical analyses.⁹⁴ Similarly, the judiciary does not have the capacity for “finding and evaluating the technical material submitted by others.”⁹⁵ Additionally, legislatures can hire technical staff and bring witnesses into committee hearings for their perspectives; judges, in contrast, often yield to the arguments the advocates present.⁹⁶ Moreover, legislatures are not tied to the single record before them; they can constantly seek to supplant technical data.⁹⁷

B. *From Hesitancy to a Categorical Answer*

Section II.A argues that *too much* math implicates the political question doctrine. But how much is *too much*? At first blush, the answer might be something categorical; for example, *any* reliance on

⁸⁹ See, e.g., *Albritton v. Morris*, No. 13-CV-3708, 2016 WL 1267799, at *11 (S.D.N.Y. Mar. 30, 2016) (noting the court applied the statute of limitations only “at the risk of breathing further life into tired stereotypes about lawyers’ aptitude for math”).

⁹⁰ See LEILA SCHNEPS & CORALIE COLMEZ, *MATH ON TRIAL: HOW NUMBERS GET USED AND ABUSED IN THE COURTROOM 2* (2013) (describing “mathematics’ disastrous record of causing judicial error”).

⁹¹ See Richard M. Re, *Precedent as Permission*, 99 TEX. L. REV. 907, 939–40 (2021).

⁹² See *id.*

⁹³ See, e.g., *Cicchetti v. Davis*, No. 07-CIV-10546, 2008 WL 619013, at *4 (S.D.N.Y. Mar. 5, 2008) (noting how the decision was confined by limited information before the judge).

⁹⁴ *City of Los Angeles v. Alameda Books, Inc.*, 535 U.S. 425, 440 (2002) (“On the other hand, we must acknowledge that the Los Angeles City Council is in a better position than the Judiciary to gather and evaluate data on local problems.”); see also *Turner Broad. Sys. v. FCC*, 512 U.S. 622, 665–66 (1994) (“As an institution, moreover, Congress is far better equipped than the judiciary to ‘amass and evaluate the vast amounts of data’ bearing upon an issue as complex and dynamic as that presented here.” (quoting *Walters v. Nat’l Ass’n of Radiation Survivors*, 473 U.S. 305, 331 n.12 (1985))).

⁹⁵ *McDonald v. City of Chicago*, 561 U.S. 742, 925 (2010) (Breyer, J., dissenting).

⁹⁶ There are some procedures for federal judges to appoint experts, but the procedures are rarely used. See, e.g., Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1190 (noting rarity of judges using FED. R. EVID. 706).

⁹⁷ See *Williamson v. Lee Optical of Okla., Inc.*, 348 U.S. 483, 489 (1955).

math might be too much. No doubt this is a workable standard. The idea also seems to be rooted in general human nature where a lack of confidence can manifest itself in avoidance.⁹⁸ But courts should not categorically reject mathematical evidence because of fear that it will be misapplied or improper. Courts, through *Daubert*⁹⁹ hearings, can gate-keep the introduction of the evidence. In turn, they can exclude the source of potentially problematic technical testimony.¹⁰⁰

Similarly, considering math in deciding whether there is too much math raises another metaproblem: are courts even qualified to do this analysis? This metaproblem, however, has been solved elsewhere in the political question sphere: courts are qualified to answer jurisdictional questions. For example, in *Zivotofsky ex rel. Zivotofsky v. Clinton*,¹⁰¹ the Court held that resolving the threshold question of who was able to answer an interbranch dispute did not raise a political question even if deciding the policy question may have.¹⁰² Likewise, courts can answer the threshold question of whether they can answer a question—i.e., whether the political question is implicated—even if they cannot answer underlying questions.¹⁰³ Returning to Justice Breyer, courts can recognize something involves too much math even if they do not know exactly what kind of math is necessary.¹⁰⁴ Therefore, a categorical rejection of math is inappropriate.

On the flip side, some argue that certain issues are so important that courts must engage regardless of how much math is needed; in other words, courts “*can* address [an issue] because it *must*.”¹⁰⁵ Although that may sound compelling, it misstates the doctrine.¹⁰⁶ No matter how important the issues, harmed the parties, or necessary the courts, a political question is beyond the reach of courts.¹⁰⁷ The corollary to the mathematical question is simply that even if math is the only way to understand an issue, it may still present problematic jurisdiction.¹⁰⁸

⁹⁸ Lisa Milot, *Illuminating Innumeracy*, 63 CASE W. RESV. L. REV. 769, 769–73 (2013).

⁹⁹ 509 U.S. 579 (1993).

¹⁰⁰ See, e.g., *Raskin v Wyatt Co.*, 125 F.3d 55 (2d Cir. 1997).

¹⁰¹ 566 U.S. 189 (2012).

¹⁰² *Id.* at 196, 201–02.

¹⁰³ *Id.*

¹⁰⁴ See *supra* notes 83–88 and accompanying text. Moreover, a similar argument could be made for *Baker’s* broader “judicially manageable standards” outside of any technical context because those, too, require the court to analyze whether something they do not have the competency to judge is, in fact, judgeable. See *id.*

¹⁰⁵ *Gill v. Whitford*, 585 U.S. 48, 64 (2018).

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 68–69.

¹⁰⁸ This did not need to be the rule. See, e.g., *Bivens v. Six Unknown Named Agents of Fed. Bureau of Narcotics*, 403 U.S. 388, 409–10 (1971) (Harlan, J., concurring in the judgment) (upholding a constitutional cause of action where it would allow for the *only* remedy); *United States v.*

Thus, despite the appeal of these categorical answers, they are ultimately irrelevant.

C. *From Hesitancy to Factors*

To return to the question of Section II.A, how much is *too much* math? No categorical answer will do, and much like other areas of the law, “no one factor is dispositive.”¹⁰⁹ However, this Essay proposes that complexity, numerosity, and quantifiability can determine when there is too much math for courts to handle.

1. *Complexity*

“Judicial history is replete with examples of misapplied statistics”¹¹⁰ Yet some misapplication can be solved through the evidentiary gatekeeping rules.¹¹¹ Nonetheless, as math becomes more complex or novel, it becomes more likely that math’s usage will raise problems. For instance, judges are likely to be intrinsically impressed and not understand problems in math.¹¹² This is especially true if the experts are unique within that field of law or if the reliability of the evidence cannot be checked by experts with less-vested legal incentives.¹¹³ As a note, mathematical complexity differs from legal complexity that discusses math. For example, although the sentencing guidelines require “engaging with . . . math,” the true complexity comes from determining legal assumptions; the math itself is simpler.¹¹⁴

Complexity, as a factor, reflects the underlying political question justifications. First, complex legal questions are often answered by courts, so they fall within standard judicial competence; complex mathematical questions, as above, slip beyond the standard skills judges possess.¹¹⁵ Second, simple math used in complex legal cases can provide an efficient solution. For example, the sentencing guidelines give judges a way to aggregate diverse perspectives on the philosophy of sentencing

Carolene Prods. Co., 304 U.S. 144, 152 n.4 (1938) (noting that constitutional rules may be different when the underlying issues implicate the political process). Nonetheless, it is.

¹⁰⁹ *Aymes v. Bonelli*, 980 F.2d 857, 861 (2d Cir. 1992). Likewise, not all factors will be relevant in every case. *See id.*

¹¹⁰ *Hull v. United States*, 404 U.S. 893, 895 n.3 (1971) (Douglas, J., dissenting from denial of certiorari).

¹¹¹ *See supra* Section II.B.

¹¹² *See* Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1332–34 (1971) (discussing how judges are easily impressed by math).

¹¹³ *Cf.* FED. R. EVID. 702 advisory committee’s notes to 2000 amendment (discussing amendments to codify *Daubert* and noting that whether expert testimony within litigation was as rigorous as experts perform in the field regardless of litigation is an important factor in expert admissibility).

¹¹⁴ *United States v. Felder*, No. 18-2294 (3d Cir. Feb. 13, 2019) (per curiam).

¹¹⁵ *See supra* notes 110–13 and accompanying text.

and allow judges to apply law uniformity¹¹⁶ by translating legal complexity into simple math. Finally, defined complexity (e.g., sentencing guidelines) is within the control of another branch. This means that the other democratically responsible branches determine the substantive scope, and power does aggregate in courts. Mathematical complexity, in contrast, does not have a backstop of another branch.

Thus, courts should be careful to limit mathematical complexity and look more favorably at math used outside of just the specific legal issue.

2. Numerosity

Beyond just considering the complexity of the analysis, courts need to consider the numerosity of the analysis or the number of variables to analyze. In part, this restates the concerns of complexity.¹¹⁷ As courts consider more variables, they need to make more assumptions.¹¹⁸ Yet, when judges seek to make assumptions, even under the veil of objectivity, they might also “substitute their own values” despite labeling final decisions as a mathematical output.¹¹⁹ This is not an intentional misrepresentation, but it is still problematic.¹²⁰

Hiding behind math removes questions from traditional public debate because it phrases them as decided calculations of mathematical certainty rather than policy concepts that can be debated.¹²¹ That should not be surprising; it is one thing to have profound disagreements on policy—that is what democracy strives for—it is another thing to vigorously disagree with an abstract rule of math. This problem confounds as the number of variables increases because once parties start to go through mathematic calculations, studies have found that they

¹¹⁶ Robin L. Lubitz & Thomas W. Ross, *Sentencing Guidelines: Reflections on the Future*, SENTENCING & CORR., June 2001, at 1.

¹¹⁷ See *supra* Section II.C.1.

¹¹⁸ Cf. Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613, 1631–39 (1995) (discussing the unintentional “science charade” when regulators aim to engage in mathematical and scientific analysis but allow policy and political preference to creep in). Wagner shows that, to some degree, these are intrinsic problems in any mathematical analysis whether by the courts or another branch. *Id.* However, as she explains, the problems are exacerbated with a “deficient understanding” of the underlying issue. *Id.* at 1632. Thus, courts’ unique limitations would seem to show a higher likelihood of error. See *supra* Section II.A.

¹¹⁹ Cf. Wagner, *supra* note 118, at 1632.

¹²⁰ See *id.* at 1631–39. But see *id.* at 1644–49 (noting that the use of mathematics and science also opens the door to intentional and premediated mischaracterizations, where actors purposefully misrepresent policy judgments as technical judgments).

¹²¹ See *id.* at 1676–77 (discussing how the public often stays away from weighing in on decisions “disguised as issues of scientific judgment”).

continue to use math for other questions.¹²² The phenomenon is most pronounced when parties need to do more math upfront.¹²³

This factor also touches on the anticommandeering doctrine. For example, in *New York v. United States*,¹²⁴ the Court emphasized that one constitutional problem with commandeering was that it shifted blame away from the ultimately responsible party.¹²⁵ In other words, the doctrine recognizes that the electorate will blame who they perceive as responsible even if that actor is not actually responsible. There, the Court was afraid that the electorate would blame state legislatures even though the federal government pushed its values to the states.¹²⁶ The mathematical question poses a similar problem: the electorate will blame the alleged culprit—“math”—even if policy considerations drive the analysis. And this problem takes an even more problematic turn when citizens feel helpless against the force of math.¹²⁷

Thus, courts should be careful to limit the number of variables they consider and assumptions that the numerosity causes.

3. *Quantifiability*

Attempting to quantify variables—a task oft required throughout a mathematical analysis—raises a few problems for courts. First, courts may conflate political judgments for mathematical law.¹²⁸ Second, there is a problem of the “[d]warfing of [s]oft [v]ariables.”¹²⁹ When parties attempt to quantify some variables, there is a natural emphasis toward focusing on variables that are easiest to quantify, and analysts tend to ignore variables that are harder to quantify.¹³⁰ Third, legal theories are more difficult to quantify because courts are bad at determining what

¹²² See M. Asher Lawson, Richard P. Larrick & Jack B. Soll, *When and Why People Perform Mindless Math*, 17 JUDGMENT & DECISION MAKING 1208 (2022) (discussing the principle of “mindless math,” where after using math to solve a math-appropriate question, parties continue to apply math inappropriately, and finding the phenomenon is most pronounced when parties do more complex math upfront).

¹²³ *Id.* at 1211.

¹²⁴ 505 U.S. 144 (1992).

¹²⁵ *Id.* at 168–69.

¹²⁶ *Id.*

¹²⁷ See *supra* note 120.

¹²⁸ See *supra* Section II.C.2.

¹²⁹ Tribe, *supra* note 112, at 1361.

¹³⁰ See *id.* at 1362; see also Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. PA. L. REV. 1553, 1579–80 (2002).

they should be measuring.¹³¹ Yet mathematicians cannot “be successful unless” they know what they are “testing for.”¹³²

As an example in the probable cause realm, imagine a judge is trying to evaluate whether a dog sniff was accurate enough to justify probable cause of drug use.¹³³ Most judges would inquire into the “correctness” of the dog sniffs; for instance, a dog that correctly alerts seventy-five percent of the time when drugs are present might be sufficient for probable cause. But that is not the measurement that courts should consider. The Fourth Amendment is principally focused on limiting intrusions on innocent individuals, so instead, courts should determine a dog’s “false-positive” rate; for example, a dog that barks every time it sees a person likely will correctly identify lots of drugs but will also incorrectly target innocent individuals. This example is representative of just the last problem; courts often fail in translating ordinary problems into measurable questions. That is confounded by the other limitations; principally, even if the “equation” was translated correctly, it is hard to quantify the underlying elements.

This is unlike when math is just the means of implementing existing substantive law. For example, courts use math to determine how to recalibrate damages after insolvency because “[t]here is no way to articulate or conceptualize the rules related to reallocation in a joint and several liability [jurisdiction] without using math.”¹³⁴ In cases like this, the substantive law defines the standard, so courts are not attempting to quantify legal principles; instead, they are just applying a legal standard.¹³⁵

Because the math, when used in this way, is just applying an existing standard, it will not expand judicial power because the standard is what could expand the court’s power. In other words, if a political branch defines a standard, a court’s application—with or without math—of that standard honors the political branch’s intent. When the courts instead define the standard, they are controlling the substantive scope; for example, determining what causes a violation of a law is the same as

¹³¹ See generally Erica Goldberg, *Getting Beyond Intuition in the Probable Cause Inquiry*, 17 LEWIS & CLARK L. REV. 789, 795 (2013) (explaining in the Fourth Amendment context that “courts already incorporate quantifiable evidence into the [probable cause] inquiry; they are just not doing so in a standardized way”).

¹³² *Vieth v. Jubelirer*, 541 U.S. 267, 297 (2004) (plurality opinion).

¹³³ See Goldberg, *supra* note 131, at 808–09 (providing this hypothetical).

¹³⁴ Erica Goldberg, *When and How Should Courts Use Math?*, IN A CROWDED THEATER (Nov. 26, 2017), <https://inacrowdedtheater.com/2017/11/26/when-and-how-should-courts-use-math> [<https://perma.cc/Y6ZP-4VZA>]; see also Tribe, *supra* note 112, at 1338 (listing other examples, like market control in antitrust, of scenarios where math just implements an existing legal rule).

¹³⁵ See *Rucho v. Common Cause*, 588 U.S. 684, 715–16 (2019) (discussing how a comparison to antitrust law that also requires substantial math is not applicable because the underlying legal standards come from common law and historical practice).

determining when a violation occurs. Accordingly, courts should limit scenarios where it is unclear what needs to be quantified or the range of potential inputs includes hard-to-quantify variables.¹³⁶

III. *RUCHO* REVISITED

Having laid out the contours of the mathematical question,¹³⁷ the Essay turns toward its application. In *Rucho*, the Supreme Court added partisan gerrymandering to a list of nonjusticiable political questions.¹³⁸ Yet the Court explained that one-person, one-vote claims were justiciable.¹³⁹ The Court dealt with this difference summarily, determining that the latter claims were “relatively easy to administer as a matter of math.”¹⁴⁰ However, as this Essay shows, “relative[] eas[e]” is not self-defining.¹⁴¹

Although the Supreme Court disposed of the difference in nine words, this Part fills in the gap and elaborates on the reasoning. First, it defines *Rucho* in the absence of the mathematical question.¹⁴² Specifically, it shows that the justifications emphasized in *Rucho* would also apply to one-person, one-vote cases. Second, with the incompleteness of the traditional doctrine, the Essay applies the factors of the mathematical question to *Rucho*, showing an easier path to *Rucho*’s conclusion.¹⁴³

A. *Traditional Political Question Conception*

In *Rucho*, the Court determined partisan gerrymandering posed a nonjusticiable political question, yet it differentiated one-person, one-vote claims.¹⁴⁴ However, the traditional discussion of the political question doctrine, as articulated in *Baker*, does not seem to fully resolve this issue, and, alternatively, does not apply more in gerrymandering cases than in one-person, one-vote cases.

First, the Court held that gerrymandering was “one of the most intensely partisan aspects of American political life” that should be resolved by state courts based on state statutes and state constitutions.¹⁴⁵ In turn, this reflects the deeply held structural arguments of separation

¹³⁶ As above, there may be other justifications for the doctrine, and those justifications could suggest different factors. See discussion *supra* note 81.

¹³⁷ See *supra* Part II.

¹³⁸ *Rucho*, 588 U.S. at 707.

¹³⁹ *Id.* at 708.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*; see also *supra* Part II.

¹⁴² See *infra* Section III.A.

¹⁴³ See *infra* Section III.B.

¹⁴⁴ *Rucho*, 588 U.S. at 707–09.

¹⁴⁵ *Id.* at 718–19.

of powers and federalism.¹⁴⁶ Although courts generally resist their counter-majoritarian impulses, this justification is weakest for subsets of laws that interfere with “political processes” that “ordinarily . . . protect minorities.”¹⁴⁷

Second, the Court noted that if they found the claims justiciable, they “would recur over and over again around the country with each new round of districting, for state as well as federal representatives.”¹⁴⁸ The concern for efficiency is indeed an important one.¹⁴⁹ However, partisan gerrymandering claims arise no more often than one-person, one-vote claims.¹⁵⁰ Despite the risk of constantly involving courts, one-person, one-vote claims are justiciable.¹⁵¹

Third, the Court generally stated that there were no “limited and precise standards” within the “competence of the federal courts” to define partisan gerrymandering.¹⁵² At the abstract level, however, the same criticism of limitless and imprecise standards could be leveled at one-person, one-vote claims because the latter also involves open questions that might implicate policy.¹⁵³ Additionally, lower courts considering the merits of partisan gerrymandering claims did not seem to feel that the questions reigned beyond their core competencies.¹⁵⁴

The Court differentiated the types of claims in passing,¹⁵⁵ and the distinction may even appear clear on its face.¹⁵⁶ According to the Court, one-person, one-vote claims are obviously less challenging. But why?

¹⁴⁶ See *supra* Section I.B.1.

¹⁴⁷ *United States v. Carolene Prods. Co.*, 304 U.S. 144, 152 n.4 (1938) (describing how courts ought to ordinarily defer to legislatures, but there should be more skepticism for laws that target the political process).

¹⁴⁸ *Rucho*, 588 U.S. at 719.

¹⁴⁹ See *supra* Section I.B.3.

¹⁵⁰ In fact, both arise in the same context of redistricting and courts often apply the principles in tandem. See Michael S. Kang, *Gerrymandering and the Constitutional Norm Against Government Partisanship*, 116 MICH. L. REV. 351, 384–90 (2017).

¹⁵¹ *Baten v. McMaster*, 967 F.3d 345, 352 (4th Cir. 2020).

¹⁵² *Rucho*, 588 U.S. at 707.

¹⁵³ Compare Nicholas O. Stephanopoulos & Eric M. McGhee, Essay, *The Measure of a Metric: The Debate over Quantifying Partisan Gerrymandering*, 70 STAN. L. REV. 1503, 1505 (2018) (discussing different methods to quantify partisan gerrymandering), with R. Alta Charo, *Designing Mathematical Models to Describe One-Person, One-Vote Compliance by Unique Governmental Structures: The Case of the New York City Board of Estimate*, 53 FORDHAM L. REV. 735, 765 (1985) (describing the mathematical analysis behind one-person, one-claim). In fact, the same authors whose work is instrumental in the partisan gerrymandering claims are equally involved in the one-person, one-vote arena. See, e.g., Jowei Chen & Nicholas O. Stephanopoulos, *Democracy's Denominator*, 109 CALIF. L. REV. 1019, 1065 (2021).

¹⁵⁴ See, e.g., Jacob Eisler, *Partisan Gerrymandering and the Constitutionalization of Statistics*, 68 EMORY L.J. 979, 982–83 (2019).

¹⁵⁵ See *Rucho*, 588 U.S. at 707.

¹⁵⁶ See Eisler, *supra* note 154, at 998 n.107 (describing one-person, one-vote claims as easier questions at the “conceptual level”).

It cannot be because they involve math done by judges.¹⁵⁷ It cannot be because courts are relying on some specific and absolute text.¹⁵⁸ In fact, the Court explicitly stated that the key is not a categorical difference but a “relative[] eas[e].”¹⁵⁹

The traditional conception of the political question doctrine, as evidenced in *Rucho*, seems to address this by saying courts do not need to “attempt [to] further . . . define the kinds of” questions beyond justiciability, “[b]ut [they] know it when [they] see it.”¹⁶⁰ The mathematical question seeks a further definition.

B. *Mathematical Question Conception*

Given the limited analytical value of the traditional political question doctrine,¹⁶¹ this Essay reconceptualizes *Rucho* under the proposed mathematical question doctrine by redescribing the *Rucho* outcome under the proposed factors.

Complexity proposes the first hurdle for courts evaluating partisan gerrymandering claims. For example, the math is complicated in gerrymandering cases; in fact, some scientists have suggested gerrymandering calculations require up to 131,000 computer processors.¹⁶² Additionally, because gerrymandering suits seek to rectify partisan imbalances in elections, the mathematics behind them will be tied specifically, and only, to the redistricting context.¹⁶³ In other words, some of this complex math is specific to the field rather than generic across all mathematics, which makes it hard for judges to evaluate.¹⁶⁴ On the opposite side, one-person, one-vote claims propose a claim that, despite any complexity, can be boiled down to division.¹⁶⁵ And group population equality is not unique to bodies debating redistricting; it is deployed across

¹⁵⁷ See sources cited *supra* note 153 (discussing the math involved in both claims).

¹⁵⁸ See Adam Raviv, *Unsafe Harbors: One Person, One Vote and Partisan Redistricting*, 7 U. PA. J. CONST. L. 1001, 1003, 1012–14 (2005) (describing the variation of population districts allowed underneath one-person, one-vote claims).

¹⁵⁹ *Rucho*, 588 U.S. at 708.

¹⁶⁰ *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring).

¹⁶¹ See *supra* Section II.C.

¹⁶² See Yan Y. Liu, Wendy K. Tam Cho & Shaowen Wang, *PEAR: A Massively Parallel Evolutionary Computation Approach for Political Redistricting Optimization and Analysis*, 30 SWARM & EVOLUTIONARY COMPUTATION 78, 78 (2016). Even experts in the field describe the “exceedingly complex area of redistricting.” Nicholas O. Stephanopoulos & Eric M. McGhee, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. CHI. L. REV. 831, 885 (2015).

¹⁶³ See, e.g., Stephanopoulos & McGhee, *supra* note 162, at 831 (describing one statistic to measure partisan gerrymandering: the efficiency gap).

¹⁶⁴ See *supra* Section II.C.1.

¹⁶⁵ Lyle Denniston, *The New Look at “One Person, One Vote,” Made Simple*, SCOTUSBLOG (July 27, 2015, 12:01 AM), <https://www.scotusblog.com/2015/07/the-new-look-at-one-person-one-vote-made-simple> [<https://perma.cc/WZF5-VCHH>] (“[T]he starting point would be a state’s total population divided by the number of election districts . . .”).

economics and mathematics.¹⁶⁶ Moreover, in the one-person, one-vote context, some of the underlying complex questions come from external sources of law,¹⁶⁷ whereas the gerrymandering context requires courts to define the violation itself rather than solely determining whether a standard was met because the dispositive question is not whether there is political gerrymandering but whether it is too much.¹⁶⁸

Additionally, courts face problems with the quantity of variables within the partisan gerrymandering context. In fact, almost all the variables involve complex political assumptions. First, courts need to determine what variables should be used. Yet, for example, whether incumbency is something that should be protected is a political science question.¹⁶⁹ Additionally, even where there is agreement, like how most people agree states should consider “communities of interest” in their redistricting plans, there is still debate over defining variables.¹⁷⁰ That contrasts to something like one-person, one-vote, where there are minimal debates on *what* criteria should be used (population size); calculating those criteria (equal population) is relatively simple math, and there is a binary output (either population is equal, or it is not).

Likewise, partisan gerrymandering, but not one-person, one-vote, raises quantification problems. For example, gerrymandering claims are prone to “[d]warfing of soft variables.”¹⁷¹ Although quantifying variables like competitiveness may be challenging,¹⁷² it is easier than nontangible goals. For example, there is likely no way to quantify the goal of ease of administration, yet it is important in the districting context.¹⁷³

¹⁶⁶ See, e.g., Chao Fan, Xiangqi Jiang, Ronald Lee & Ali Mostafavi, *Equality of Access and Resilience in Urban Population-Facility Networks*, URBAN SUSTAINABILITY, Mar. 31, 2022, at 9 (employing the method to calculate “the distributions of urban populations and facilities in counties”).

¹⁶⁷ See *infra* note 181.

¹⁶⁸ *Rucho v. Common Cause*, 588 U.S. 684, 685 (2019) (“The question is one of degree: How to ‘provid[e] a standard for deciding how much partisan dominance is too much.’” (alteration in original) (quoting *League of United Latin Am. Citizens v. Perry*, 548 U.S. 399, 420 (2006))).

¹⁶⁹ Compare Justin Buchler, *The Social Sub-Optimality of Competitive Elections*, 133 PUB. CHOICE 439, 444–46 (2007) (arguing that protecting incumbents via redistricting ensures they are most invested in electoral outcomes and, therefore, constituents), and *White v. Weiser*, 412 U.S. 783, 793–97 (1973) (finding that protecting incumbency was a legislative state interest), with Sally Dworak-Fisher, Note, *Drawing the Line on Incumbency Protection*, 2 MICH. J. RACE & L. 131, 131 (1996) (arguing that incumbency protection entrenches groups with political power at the expense of minorities).

¹⁷⁰ See e.g., Sandra J. Chen, Samuel S.-H. Wang, Bernard Grofman, Richard F. Ober, Jr., Kyle T. Barnes & Jonathan R. Cervas, *Turning Communities of Interest into a Rigorous Standard for Fair Districting*, 18 STAN. J.C.R. & C.L. 101, 113–14 (2022) (describing debate over whether race and ethnicity should be considered within community of interest criteria).

¹⁷¹ Tribe, *supra* note 112, at 1361.

¹⁷² See *supra* Section II.C.3.

¹⁷³ See *After Redistricting Is Done: Election Processes and Implementation*, NAT’L CONF. STATE LEGISLATURES (Jan. 28, 2022), <https://www.ncsl.org/elections-and-campaigns/>

Partisan gerrymandering also requires courts to quantify legal theories in problematic ways.¹⁷⁴ First, considering the “community of interest” criteria, and even assuming everyone could agree on the important factors, there is substantial disagreement on how to measure it.¹⁷⁵ Second, partisanship itself is hard to measure. Most states do not have party registration data, so social scientists often need to use prior election data extrapolated toward current, or proposed, districts or modeled partisan behavior.¹⁷⁶ Even in states where there is party registration data or accurately estimated partisan behavior, partisan affiliation is not fixed nor does everyone vote at equal rates; thus, estimating the effect of gerrymandering requires mixing a multitude of imperfect statistics that are intertwined with politics (e.g., affiliation, turnout, ideology, etc.).¹⁷⁷ Third, even nonpolitical criteria can be hard to measure. Almost every state seeks to minimize the compactness of a district, but how to measure compactness is not universally agreed upon.¹⁷⁸ Fourth, assuming every criterion—both partisan and apolitical—could be accurately determined and measured, it still needs to be “converted” to a gerrymandering “level.” In turn, this requires quantifying the “amount of gerrymandering” and comparing that against a baseline of acceptable amount. But what is acceptable is not readily definable.¹⁷⁹ Thus, for partisan gerrymandering claims, courts need to answer a mathematical question without knowing their analysis’s end goal. Yet mathematical

after-redistricting-is-done-election-processes-and-implementation [https://perma.cc/LBW7-3FXT] (describing the impact of redistricting on the administrability of elections); *see also supra* note 169 (discussing the impact of incumbency on the hard to quantify goal of representation); *Rucho v. Common Cause*, 588 U.S. 684, 712–13 (2019) (discussing other hard-to-quantify factors like relative importance of local issues, incentives for turnout, ticket-splitting and more).

¹⁷⁴ *See, e.g., Rucho*, 588 U.S. at 712 (Certain proposed tests are problematic because “[j]udges must forecast with unspecified certainty whether a prospective winner will have a margin of victory sufficient to permit him to ignore the supporters of his defeated opponent (whoever that may turn out to be). Judges not only have to pick the winner—they have to beat the point spread.”).

¹⁷⁵ *See, e.g., Chen et al., supra* note 170, at 107, 112–17 (describing debate over how to measure communities of interest).

¹⁷⁶ *See* RUTH IGIELNIK, SCOTT KEETER, COURTNEY KENNEDY & BRADLEY SPAHN, PEW RSCH. CTR., COMMERCIAL VOTER FILES AND THE STUDY OF U.S. POLITICS 20 (2018).

¹⁷⁷ *See id.* at 20–32.

¹⁷⁸ *Carter v. Chapman*, 270 A.3d 444, 499 n.11 (Pa. 2022) (Brobson, J., dissenting) (noting the Polsby-Popper, Schwartzberg, Reock, Convex Hull, Population-Polygon, and Cut Edges methods for calculating compactness with each method having “strengths and weaknesses,” but cautioning that “[f]urther elucidation of this topic from a mathematical point of view is beyond the scope of this dissenting opinion”).

¹⁷⁹ *Vieth v. Jubelirer*, 541 U.S. 267, 291 (2004) (plurality opinion) (noting that legislatures have “districting discretion”). The *Rucho* majority also considered—and rejected—whether courts ought to first consider the criteria states use and then just apply math to determine which map best fits those criteria. *See Rucho*, 588 U.S. at 715–16. This is the type of problem that likely does not pose a mathematical question, in theory. However, the Court held that the theory is not justified in the Constitution, so even if it may be manageable, it is not textual. *Id.*

analysis generally cannot “be successful unless” the analyst knows what they are “testing for.”¹⁸⁰

One-person, one-vote questions do not suffer from these problems. The actual solution that needs quantification—population equality—only needs two variables: a numerator and a denominator. That is not a decision wholly without political assumptions.¹⁸¹ However, courts can still evaluate the question without deciding those alleged political questions because the political question—which population metric to use—is not wholly intertwined with the final question—equality.¹⁸²

Although the result in *Rucho* is consistent with the proposed mathematical question, courts looking to this analysis in future cases will be better served by knowing when math poses a political question.

CONCLUSION

Ultimately, gerrymandering claims and one-person, one-vote claims are different. The Court simply says that the latter are “relatively eas[ier].”¹⁸³ This Essay explains why: the former, but not the latter, raises every factor that makes math so triggering. The former, but not the latter, raises a mathematical question.

The mathematical question theory, proposed here, has its roots in the justifications courts currently use to determine political questions.¹⁸⁴ Its application does not lead to different results.¹⁸⁵ Yet it provides a

¹⁸⁰ *Vieth*, 541 U.S. at 297.

¹⁸¹ See Travis Crum, *Deregulated Redistricting*, 107 CORNELL L. REV. 359, 361 (2022) (discussing how the law has not clarified if states need to balance districts for voting age population or citizen voting age population). It is not clear whether determining which metric states ought to use would pose a political question. See *id.* at 436. The reference to an alleged political question merely demonstrates how courts do not always need to be the ones quantifying legal theories even if the theories need to be quantified.

¹⁸² Original one-person, one-vote case law was stricter around absolute equality; however, more recent cases have allowed for some deviations from equality. Raviv, *supra* note 158, at 1002–03. In *Brown v. Thompson*, the Court stated that population deviations within ten percent generally would be within acceptable deviations. 462 U.S. 835, 842 (1983). Although this sounds like one-person, one-vote may have discretion within the rule of law, it differs in a crucial way from the problematic discretion discussed in this Essay. First, the discretionary framework in one-person, one-votes is essentially a “means of allocating the burden of proof.” Raviv, *supra* note 158, at 1013. Deviations above or below ten percent will be presumed to be unconstitutional or constitutional, but the presumptions are rebuttable. *Id.* Second, the debate for where to draw the line is not intertwined with the debate for how to measure deviation. For one-person, one-vote claims, the Court will look to see if asserted state interests explain a deviation. See *id.* Partisan gerrymandering claims, however, do not have a specific goal (like equality) to look at, so they need to intertwine the state interest within the test itself.

¹⁸³ *Rucho*, 588 U.S. at 708.

¹⁸⁴ See *supra* Section II.A.

¹⁸⁵ See *supra* Section III.B (showing the application to *Rucho* and one-person, one-vote claims).

crucial framework. First, it “articulate[s] a standard” for answering what is too much math.¹⁸⁶ In doing so, it discusses and validates courts’ general hesitation when encountering potentially problematic jurisprudence,¹⁸⁷ but it rejects any categorical response.¹⁸⁸ It then converts that hesitance into factors to answer the question of what is too much math.¹⁸⁹

After defining the mathematical question, the Essay elaborates on its importance. *Rucho* summarily distinguishes two types of claims that are not as different as they first seem.¹⁹⁰ The Essay, in contrast, distinguishes the claims in detail by exploring not merely categorical differences but relative ones.¹⁹¹ In turn, this seeks to do what the Court claims is important: defining a standard that can be applied in future cases from first principles rather than just looking at a problem and intrinsically knowing what to do.¹⁹²

But beyond just clarifying *Rucho*, the mathematical question can resolve future complicated questions. The factors identified here may be implicated in ballot ordering cases and environmental tort claims.¹⁹³ Or they may be implicated in upcoming fights over racial gerrymandering.¹⁹⁴ Ultimately, courts can use these factors for a robust analysis while remaining tethered to the broader political question doctrine. By understanding the factors, courts can also simplify their analyses.

To return to where this began, justiciability is esoteric.¹⁹⁵ Mathematics, too, introduces esoteric concepts.¹⁹⁶ This may explain why judges and lawyers run from its application.¹⁹⁷ It might be why two claims can seem so obviously different.¹⁹⁸ Although *Rucho* may have raised unanswered questions, it hinted at where to go. The answer, according to

¹⁸⁶ See *Rucho*, 588 U.S. at 716.

¹⁸⁷ See *supra* Section II.A.

¹⁸⁸ See *supra* Section II.B.

¹⁸⁹ See *supra* Section II.C.

¹⁹⁰ See *supra* Section III.A.

¹⁹¹ See *supra* Section III.B.

¹⁹² *Rucho v. Common Cause*, 588 U.S. 684, 715–16 (2019) (rejecting the approach to gerrymandering that can summarily conclude what is “too much” because that approach does not lead to a standard that can be used in future cases).

¹⁹³ See *supra* note 17.

¹⁹⁴ One-person, one-vote cases were not the only cases that *Rucho* differentiated from partisan gerrymandering. In fact, *Rucho* held that racial gerrymandering cases also did not pose justiciability problems. *Rucho*, 588 U.S. at 699. Now, however, at least one Justice has suggested that “[t]he same logic” of *Rucho* means that racial gerrymandering claims are also nonjusticiable. *Alexander v. S.C. State Conf. of the NAACP*, 144 S. Ct. 1221, 1253 (2024) (Thomas, J., concurring in part). Although beyond the scope of this Essay, the mathematical question may provide a framework for differentiating partisan and racial gerrymandering.

¹⁹⁵ See *supra* notes 2–9 and accompanying text.

¹⁹⁶ Mike Townsend, *Implications of Foundational Crises in Mathematics: A Case Study in Interdisciplinary Legal Research*, 71 WASH. L. REV. 51, 53 (1996).

¹⁹⁷ See *supra* Section II.A.

¹⁹⁸ See *supra* notes 150–51 and accompanying text.

Rucho, is not categorical obviousness, it is a question of degree.¹⁹⁹ *Rucho* explains that too much math is a problem; the mathematical question answers what is “too much.”

¹⁹⁹ See *supra* Section III.A.