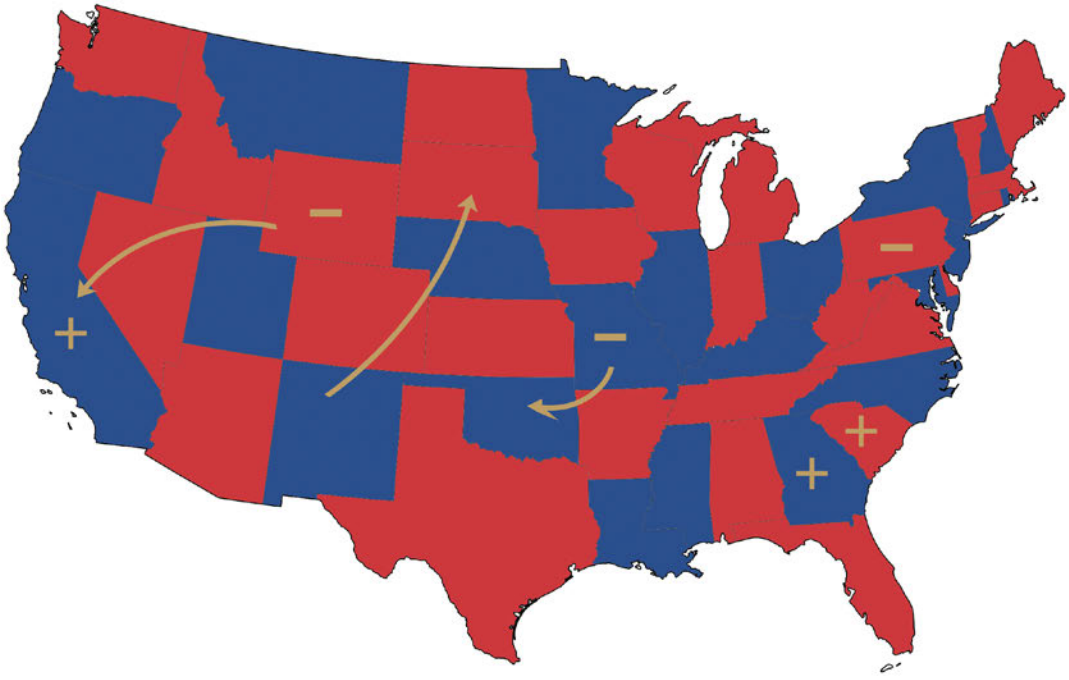
SHIFTING SEATS

The Congressional Apportionment Game



Keith L. Dougherty

Shifting Seats

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SHIFTING SEATS

The Congressional Apportionment Game

Keith L. Dougherty

University of Michigan Press
Ann Arbor

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To Anjali, for her love and support.

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To you all, I am very grateful.

ONE

Apportioning Congress

Legislative apportionment is the political process of dividing the seats in an assembly among political subdivisions, such as states. In the United States it can influence the voice of individual states, the partisan composition of Congress, and the winner of the Electoral College. Americans have used a variety of metrics and methods throughout their history to determine the division. Their choices have shaped the relative power of the states and the political parties. Adopting different apportionment methods would have changed the winner of the 2000 presidential election and altered the partisan majority in the House on several occasions. With a nearly tied House and deep partisan polarization in Washington today, conditions are ripe for apportionment to transform national politics again.

Congressional apportionment provides a unique blend of interesting mathematics and fascinating political maneuvering. In the spring of 1787, James Madison crafted a political strategy based on apportionment. He sat at his desk and outlined a plan of government that he planned to introduce in Philadelphia as a solution to the problems of the union. The confederation government he lived under did not have the power to tax, the power to enforce trade policies, or the ability to stave off foreign invasions. Madison thought a stronger national government would solve many of those problems.

But he needed the assent of the states that were expected to lose power to the stronger national government. His political maneuver was to apportion the national legislature according to the size of each state so that key states would have greater control over national affairs. The advantage, he thought, was that

a "majority of the States, and those of greatest influence, will regard it as favorable to them" and "it will obviate the principal objections of the larger States to the necessary concessions of power." The smaller states would then submit "to the predominant will" of the larger states and succumb to his plan (To George Washington, April 16, 1787, Hutchinson and Rachel 1962–1989, 9:382–87).[1]

Madison realized that if each representative had one vote, relative control over the national government would be determined by the distribution of representatives among the states. Early in the convention, he proposed to distribute representatives in a more "equitable ratio" than one vote per state, as dictated by the Articles of Confederation (Farrand 1966, 1:36). By that he meant apportioning the legislature according to each state's size. Proportional representation seemed straightforward, but there were at least three problems with his idea.

First, it was not clear whether the size of a state should be based on population, property, or state contributions to the federal treasury, to name a few. This is a question about the proper "metric of apportionment." Members of the Constitutional Convention considered nine different metrics, more than the standard two-metric story taught in American politics courses, then settled on the infamous Three-Fifths Clause. The Three-Fifths Clause counted the whole number of a state's free population and three-fifths of its slaves as the metric of apportionment. After the Civil War, Congress replaced the three-fifths population with total population. Today some Americans believe the US House of Representatives should be apportioned by the number of citizens in each state instead. Of course, the potential list of metrics is infinite.

Second, even if a majority of politicians manage to agree on a single metric of apportionment, there is still the problem of translating the appropriate proportion of seats assigned to each state (rational numbers) into the number of seats each state actually receives (integers). This is a question about the proper "method of apportionment." For example, if a state has 1.5 percent of the population and population is the metric of apportionment, should the state be given one seat or two seats in a 100-seat chamber? If the number is rounded up to two, the state might receive more representation than it deserves at the expense of another state that receives less. If it is rounded down, the opposite might occur. Gaining or losing a single seat may seem trivial for those living in large states, but for those living in small states getting two seats rather than one doubles their representation. With a large number of seats, such as 435,

1. For similar statements also see Madison to Thomas Jefferson, March 19, 1787, Hutchinson and Rachel 1962–1989, 9:317–22; and Madison to Edmund Randolph, April 8, 1787, Hutchinson and Rachel 1962–1989, 9:368–71.

the method of apportionment has added or subtracted as many as five seats for a single state.

The best method of apportionment has been hotly debated throughout US history. For example, Thomas Jefferson and Alexander Hamilton proposed different methods to apportion the House after the first census. Both methods had their flaws. Jefferson's method, and other divisor methods that were later proposed, allocated the remainders, but they could also reallocate the whole number of seats. For example, in the 2020 census California should have been assigned 51.99 seats in the US House based on its proportion of the population. The Jefferson method, however, would have given California 54 seats, two more than rounding up would suggest.

Third, even if politicians agreed on the metric of apportionment and the method of apportionment, the question about the proper "size of the chamber" still remains. Even with a fixed metric and method, different sizes of a chamber can imply different distributions of seats among the states and political parties. In early US history, the size of the chamber was determined by first choosing an appropriate ratio of representation between a single representative and their constituents, then dividing the three-fifths population by the divisor in that ratio. Since 1850, members of Congress have determined the size of the House before applying a method of apportionment. Both can affect a state's relative voice in the chamber. For example, a state with ten representatives in a 100-member chamber controls 10 percent of the votes, while a state with the same number of representatives in a 200-member chamber controls only 5 percent of the votes. Because the size of a chamber can affect a state's voice, representatives have fought for sizes that advantaged their states from the early republic through the Permanent Apportionment Act of 1929, which fixed the size at 435 members.

To make matters worse, it is not clear which metric, method, or chamber size is most fair. Consider the metric of apportionment. Apportioning legislative seats equally among the states might be fair if one thinks of states as indivisible units that are equal in nature. Apportioning seats according to voting-age citizens might be fair if one thinks "one person, one vote" should be the guiding principle. And apportioning seats according to the amount each state pays in federal taxes might be fair if one thinks that a state's voice in spending common funds should be proportional to its contribution to those funds.

Trying to find the fairest metric, method, or chamber size is exacerbated by the fact that states often receive different proportions of seats from different metrics, methods, and sizes of the chamber. Representatives of the states, vying for position, often argue for the system that advantages their state. They develop

clever rationales for why the apportionment that suits their state is fairest, which makes it difficult to separate principled arguments from selfish ones.

The question of apportionment has pitted slave states against free states, small states against large states, and eastern states against western states. Jefferson thought the issue "introduces into Congress a scramble, or a vendue, for the surplus members, it generates waste of time, hotblood, and may at some time, when the passions are high, extend a disagreement between the two houses to the perpetual loss of the thing" ("Opinion on Apportionment Bill," April 4, 1792, Cullen 1990, 23:370–77).

Prior to the Civil War, members of Congress entertained more constitutional amendments on congressional apportionment than on any other issue (United States, National Archives 2016). After the Civil War, they proposed more amendments on apportionment than on popular election of the president, the regulation of taxes, or campaign finance reform. Of course, with the House reapportioned every ten years, additional bills and resolutions have been fought over.

Relevance

Congressional apportionment has proven to be important for individual states. After the 1991 reapportionment, Montana lost a representative and sued the Department of Commerce to regain its seat (*Montana v. United States Department of Commerce*, 1991). Attorneys for Montana wanted Congress to switch from the Hill-Huntington method to the Dean method to minimize differences in district sizes. They reasoned that if the Supreme Court required congressional districts to be created as equally as possible within a state, then the court should require district sizes to be as equal as possible across states. Not surprisingly, Montana would have gained a representative if its lawsuit succeeded.

Massachusetts also lost a representative, which sparked a separate lawsuit. Attorneys for Massachusetts asked the court to reapportion the House using the Webster method because the Webster method fulfilled the principle of "one person, one vote" better than the Hill-Huntington method (*Massachusetts v. Mosbacher*, 1992). If Massachusetts had won its case, it would have preserved its lost representative at the expense of Washington. The US District Court rejected Massachusetts's claim and the Supreme Court decided not to hear the case.[2]

2. See Ernst (1994) for a thorough description of these two cases.

Ten years later, Utah experienced a sizable gain in its population, but it did not attain an additional representative. Advocates for the state noticed that if "imputed populations" were excluded from the census figures (i.e., populations estimated after repeated attempts to get the actual numbers failed), then the Hill-Huntington method would shift a seat from North Carolina to Utah. Utah asked the Supreme Court to prevent the use of imputed populations (*Utah v. Evans*, 2002), but the Supreme Court denied its request.

Congressional apportionment has also affected the winner of the Electoral College. Each state is assigned the number of electors equal to its total number of members in the US House and Senate. A state that gains representatives during reapportionment of the US House suddenly has more electors and greater influence in presidential elections, while a state that loses representatives suddenly has less. This seemingly technical process of counting members of Congress rather than people themselves can actually influence who wins a majority of the electoral vote. For example, Al Gore (D) would have won the 2000 presidential election if the House was apportioned using the Jefferson method. George Bush (R) would have won, and did win, using the Hill-Huntington method.

Congressional apportionment can also affect the distribution of seats among the political parties. For example, some recent politicians have argued that the House should be apportioned by citizens rather than the full population of each state. They claim using citizens would bring the number closer to the number of voters in each state, rather than the number of voters, permanent residents, temporary visa holders, and unauthorized immigrants associated with population. In 2020, President Donald Trump declared:

> Last summer in the Rose Garden, I told the American people that I would not back down in my effort to determine the citizenship status of the United States population. Today I am following through on that commitment by directing the Secretary of Commerce to exclude illegal aliens from the apportionment base following the 2020 census. (United States, National Archives 2020)

Apportioning the House based on citizens rather than population would affect the partisan divide of the House and generally favor Republicans. It should be no surprise that Republicans support the change. Nevertheless, as shown here, a citizen-based apportionment would provide mild advantages for the Republicans, but not enough to change the results of Trump's presidential elections.

Finally, congressional apportionment can be changed by something as

seemingly innocuous as chamber size. In 2024 two conservative House Democrats, Marie Gluesenkamp Perez (WA) and Jared Golden (ME), proposed a bipartisan task force to consider nonpartisan primaries, independent redistricting commissions, and increasing the size of the House (Beckwith 2024). Some analysts have called for increasing the size of the House to minimize the differences in district sizes (Harden 2011; Ladewig 2011; DiDomenico 2022). Prior to the 2020 census, one advocate noticed that Wyoming's single congressional district contained roughly 500,000 people, while Montana's single congressional district contained roughly 900,000 people. "As a result, one vote in Montana [was] worth only 55% of a vote in Wyoming" (Harden 2011, 82). Such disparity demonstrates a failure to provide equal representation for an equal number of people. But if history is any indication, allowing Congress to determine the size of the House would rekindle many of the apportionment problems uncovered in this book. There is no guarantee that representatives vying for a larger piece of the pie would pick the chamber size that an analyst desires.

Previous Research

Balinski and Young (2001) wrote the seminal book on apportionment. They showed how various apportionment methods proposed throughout US history have affected the distribution of seats among the states. They also examined which methods adhere to mathematical properties such as the quota condition, population condition, and the new states paradox. Their study provided a clear application of mathematics to the social sciences. So clear that studying the normative properties of various apportionment methods has become a staple in introductory mathematics courses at some universities. See COMPAC (2009) for a textbook on the topic.

Congressional apportionment can be easily confused with another concept, called redistricting. Congressional apportionment assigns the number of representatives to each state according to some prespecified rule. Redistricting changes the shape and location of congressional districts within a state, often with the goal of gerrymandering districts to increase a party's representation in Congress. Apportionment is largely decided by Congress. Redistricting is largely decided by the majority party in a state legislature. Apportionment distributes representatives across states. Redistricting distributes representatives within a state.

There have been many studies of redistricting (Grofman 2005; Grofman and Brunell 2005; Handley and Grofman 2008; McKee 2010; Engstrom and

Kernell 2005; Chen and Rodden 2013; Engstrom 2013; McGann et al. 2016). There have also been studies of the history of apportionment (Biles 2017; Karlan 2018). There has however been almost no research on state interests in apportionment decisions in the United States and how those interests might explain why various metrics, methods, and chamber sizes were adopted.[3] The limitation is unfortunate because understanding how Congress divides power internally is crucial for understanding some of the pathologies in American political development. Such findings help expand theories of political change (Aldrich 2011; Merrill, Grofman, and Brunell 2023), political institutions (Patty and Penn 2014; Squire 2017; Ingham 2019), and Congress (Poole and Rosenthal 1997; Quirk and Binder 2005; Carson and Roberts 2013; Nokken 2013; Carson and Sievert 2018; Wallner 2019; Curry and Lee 2020; Gelman 2020; Smith 2021; Dearborn 2021; Bullock et al., 2023).

Thesis and Approach

This book addresses two fundamental questions about the apportionment of Congress: Why is a rule of apportionment abandoned and what keeps it in place? A rule of apportionment is anything that can affect the proportion of seats assigned to each state. Metric, method, and chamber size are three of those factors. A fourth factor includes the ratio of representation that was used for apportionment decisions in the early republic. As chapter 2 shows, a majority of states always have an interest in abandoning a given distribution of seats because legislative apportionment is similar to what economists call a divide-the-dollar game. There is no equilibrium in such a game.[4] Instead there are only centrifugal forces that explain why rules of apportionment have been repeatedly abandoned throughout US history.

There are multiple reasons why various apportionments have been held in place. They are often held in place by increasing the threshold of votes needed to make changes, such as requiring a supermajority of states to amend a metric, as required by the Constitution. Another reason has been moving the decision away from the stakeholders, that is, representatives of the states, and giving reapportionment powers to the executive branch. Both barriers have been imperfect and have occasionally broken down. When they have broken

3. See Ballingrud and Dougherty (2018) and Dougherty and Pittman (2022) for two exceptions.

4. Of course, there can be an equilibrium if one switches the definition of an equilibrium from the core to something like a stationary strategy equilibrium. A legislative bargaining game with that type of equilibrium is considered in the book appendix.

down, a flurry of legislative action has occurred. In each case, politicians have used the opportunity to create gains for their states or to put a tighter cap on the apportionment issue after they successfully manipulated the division in their favor.

Rather than focusing on normative qualities that make one apportionment rule more desirable than another, as done by Balinski and Young (2001), this book focuses on positive qualities. That means it focuses on the interests states have had, and continue to have, in increasing their portion of legislative seats. A greater proportion of seats, defined here as seat shares, gives a state a greater say over federal politics and explains why apportionment has been so hotly debated. This study examines state interests in the method of apportionment, which Balinski and Young only mention in passing, as well as state interests in the apportionment metric, ratio of representation, and House size, which Balinski and Young did not consider. In the process of studying particular apportionment problems in the United States, it also discovers which apportionments were "preferred" by a majority of states and in some cases the cycles in the majority preference relation that resulted. The latter provides examples of majority cycles for a literature struggling to find them (Mackie 2003; Kaminski 2015).

The approach considers what would happen if members of Congress voted for a rule of apportionment that gave their state a greater proportion of seats. In a sense, this is like asking "what if" representatives represented their state's interests on an issue directly related to the division of state power. Historically, states maintained distinct political cultures and unique interests. Cohesion among representatives from the same state was so strong that prior to the mid-twentieth century, knowing a member's state was a better predictor of their vote choice than their party or ideology (Treul 2017). After the mid-1900s, state-centric politics started to change. Party and ideology have become more important factors, but that does not mean that members do not overcome those factors and rally behind their state's interest when it is at stake. "Even in today's polarized Congress, members act as agents of their state and are sometimes willing to buck the party line or side with someone of the opposite party if it means supporting the state's priorities" (Treul 2017, 4).

Despite asking what would happen if members of Congress voted for their state's interest, the author fully recognizes that members of Congress have multiple motivations. Rather than considering them all at once, like a historian might do, the analysis focuses exclusively on members' interests in maximizing their state's control over Congress at the beginning of each chapter, then returns to multiple motivations toward the end of specific chapters. This cre-

ates a generalizable framework that helps identify interesting observations about the behavior of representatives that might be missed if all possible motivations were examined simultaneously.

The approach is widely known as an analytical narrative. An analytical narrative "combines analytic tools that are commonly employed in economics and political science with the narrative form, which is more commonly employed in history" (Bates et al. 1998, 10; Carpenter 2000, 2023). Both the analytical and the historical narrative are based on a single datum, but they have different goals. The purpose of the analytical narrative is to help refine generalizable, systematic explanations of a phenomenon based on case studies. It uses those studies to generate further hypotheses and generalizable relationships. Political scientists have written a variety of analytical narratives to help them refine rational choice theory (Jenkins and Nokken 2000; Jenkins and Munger 2003; Querubin and Snyder 2013; Aldrich 2011; Gailmard 2024; Jensen, Pardelli, and Timmons 2024) and to help them understand how leaders can manipulate agendas when majority cycles exist (Riker 1980, 1984, 1986; Ballingrud and Dougherty 2018; Dougherty and Pittman 2022). This book examines four case studies as analytical narratives to explain why rules of apportionment were abandoned and what kept them in place: the prefederal period, 1822, 1866, and the 1920s. Statistical analyses are reserved for the book appendix.

In contrast, a traditional historical approach attempts to describe events as closely as possible to the case. By their very nature historical narratives provide a more accurate description of events than analytical narratives, but analytical narratives help scholars improve their theories, improve their generalizations, and demonstrate how history truly repeats itself.

Assuming that a representative wants to increase their state's proportion of legislative seats is similar to David Mayhew's (1974) assumption that members of Congress are single-minded seekers of re-election. If that assumption is true, members of Congress would devote substantial resources to advertising, credit claiming, and position taking, which they do. Mayhew does not claim that members of Congress are motivated exclusively by re-election. His goal is only to deduce the behaviors that one would expect if his assumption were correct. That provides insights into how Congress works partly because it strips away distractions. Similarly, this study assumes that members of Congress pursue the interests of the states they represent. That assumption was uncontroversial in the early republic and holds surprisingly true for apportionment issues today. It has been muddied by partisan motivations, lobbying, and other priorities. Nevertheless, as long as one is conscious of alternative motivations, starting with the desire to promote state interests can be an effective

starting point. It can provide great insights into why various apportionments were proposed in a generalizable way.

Occasionally, this study examines what would happen if members vote on various apportionments sophisticatedly or what some scholars might call "rationally." Sophisticated voting means that actors vote to produce a more preferred outcome at the end of a series of votes even if it requires voting against their preferences in an earlier vote.

Some scholars believe people are not rational and do not vote sophisticatedly. The position taken here is similar to that taken by Avinash Dixit (2005), who argues that individuals are not always rational in the sense that they do not always play the strategies needed to attain the outcomes they prefer. They can, and often do, however, learn the correct strategies by playing a game repeatedly. Hence, if a game is played by experienced players, one might expect them to play the correct strategies and for the equilibria predicted by game theorists to apply. Typically, members of Congress are experts at deciding how to get things passed. They frame bills, introduce them at the right time, and organize agendas that advance their interests. Even if they never develop the formulas used by game theorists to find a particular equilibrium, they can develop cognitive schema and rules of thumb that help them attain the outcomes predicted by those theories.

Rather than applying a single rational choice model to all the apportionment decisions made throughout US history, the study first establishes the incentive structure for each decision, then examines how historical actors solved the problem before them. Were politicians aware of dominance relationships and majority cycles? To what extent did leaders manipulate the agenda to their advantage? And what tactics did leaders use to prevent their rank and file from dragging outcomes in different directions? Examining these types of questions provides new insights into how decisions about the distribution of power are made. It generates new hypotheses about apportionment, connecting theory to the case.

Outline

The next chapter outlines my theory about why decisions on legislative apportionment are inherently unstable and why a majority of states may want a division of seats other than the one chosen by a majority. It also shows how the metric of apportionment, the method of apportionment, ratio of representa-

tion, and the number of seats in a chamber can affect the proportion of seats assigned to each state.

Chapter 3 examines the issue of apportionment from the Continental Congress in 1774 through the Constitutional Convention of 1787. Congress considered roughly 18 different metrics of apportionment during the prefederal period that advantaged different groups of states. Initially they divided votes equally among the states because they did not have the surveys needed for more proportional metrics. Equal apportionment was partly dislodged at the Constitutional Convention of 1787, not because the Three-Fifths Clause was more convincing, but because two of the small states, Rhode Island and New Hampshire, did not participate in the decision.

Chapter 4 focuses on an early apportionment: the Reapportionment Act of 1822. In that year representatives proposed 24 different ratios of representation for the House, which produced instability in the majority preference relation. The committee's proposal of one representative for every 40,000 constituents passed in light of the instability, partly because the proposals that could defeat it were not voted upon and partly because the proposal contained some stable properties described in that chapter.

Chapter 5 moves just past the Civil War to examine state interests in the nine metrics of apportionment proposed to replace the Three-Fifths Clause. It shows that with all 36 states in the union, a majority of states preferred a specific population-based apportionment more than the other apportionments proposed, including the one adopted. In both chambers of Congress, pure majority voting created a different ordering, with a majority preferring a citizen-based apportionment to all the other proposals. Ironically, Congress did not select either idea. Instead, the population-based apportionment enshrined in the Constitution was proposed in both chambers because the leaders who controlled the agenda were generally afraid of pairwise votes, and the differences in metrics were not large enough to make them realize their mistake.

Chapter 6 examines the turmoil in the 1920s over reapportionment. Early in that decade Congress failed to reapportion the House using the 1920 census because reapportionment was assigned to a committee with interest in protecting the status quo. Congress pushed the issue off until 1929, when House leaders forced the issue. Congress then fixed the size of the House at 435 members and delegated reapportionment to the Census Bureau.

Chapter 7 examines the effects of congressional apportionment on the partisan composition of the House and the Electoral College. Although the met-

ric and method of apportionment had few effects on which party controlled the House and which candidate won the presidency, the chapter chronicles cases in which the Three-Fifths Clause, citizen-based apportionment, and a different method of apportionment would have altered partisan control or the winner of a presidential election. The victory of George Bush in 2000 and Rutherford Hayes in 1876 were due in part to Congress's choice of its apportionment method.

Historical interludes that explain changes in congressional apportionment between the major events are included near the beginning of most chapters. The data used to implement the theory are included in chapter appendices.

The appendix at the end of the book examines roll call data from each era to determine whether representatives from the same state tended to vote together on apportionment—a necessary behavior for representatives to pursue state interests—and whether they voted for the alternative that gave their state a larger metric share (respectively, seat share). It also provides evidence for a sophisticated vote in the 1920s and examines the applicability of some general formal theories to the four periods.

Finally, chapter 8 concludes the analysis with a reflection on how apportionment affected US history, how its centrifugal forces were controlled, and how apportionment affects politics today. Arguments for and against D.C. statehood, and statehood for territories, often revolve around questions about which states and which party will control the US House. Proposals to replace our population-based apportionment with a citizen-based apportionment often spring from similar motivations. Ironically, James Madison articulated the solutions to these problems that reformers might want to consider. Before those solutions are addressed, the study examines state interests in various rules of apportionment and how those interests help explain majority preferences on the issue.

TWO

Theory

Legislative apportionment among states, provinces, or even parties requires at least two steps. First, one must establish the metric of apportionment, that is the metric that one uses to determine each state's weight in the distribution of seats, such as whether the distribution will be weighted by each state's population, citizens, or property. In proportional representation systems that metric is usually the votes received by each party.

Second, one must establish an apportionment method, which is an algorithm for translating each state's percentage of the metric into seats. Two types of apportionment methods have been applied in US history. The first, which this study calls the early version, did not start with a fixed chamber size. Instead, members of Congress chose an apportionment method (e.g., Jefferson method, Webster method, etc.) followed by a ratio of representation (i.e., the number of representatives for each metric unit, such as one representative for every 30,000 people). They then derived the size of the House and the distribution of seats from the apportionment method and the ratio of representation they chose.

After the 1840 census, members of Congress determined the size of the House first, then used a slightly different version of the apportionment method to get the allocation of seats, which this study calls the textbook version. During both periods of US history the method of apportionment affected the distribution of seats. Establishing the proper metric, ratio, method, and chamber size were political questions often resolved by considering which combination advantaged different states.

This chapter explains how these concepts work and provides simple examples that show how the metric, method, ratio of representation, and size of the chamber can affect the distribution of seats. The chapter also uses an example from the Constitutional Convention of 1787 to show how state interests in apportionment lead to collective preferences in which no single option was preferred by a stable majority.

The Metric of Apportionment

Two concepts that are used throughout this book are metric shares and seat shares. A state's metric share is simply the proportion of the metric within a state.[1] For a chamber apportioned by population, a state's metric share is its proportion of the total population. For a chamber apportioned by property, a state's metric share is its proportion of the property. Because states with larger metric shares are typically assigned more seats, metric shares provide a measure of the relative voice of each state in a chamber when the distribution of the seats is unknown.

In contrast, a state's seat share is the proportion of the chamber's seats allocated to the state. For example, if a state has 9 representatives in a 100-member chamber, then its seat share is 0.09. Seat shares are better measures of a state's relative position in a chamber than metric shares because they account for the metric of apportionment, chamber size, and method of apportionment. They indicate the relative representation of a state in the chamber.

To see how different metrics of apportionment can affect each state's metric share, consider a hypothetical example with the three states listed in table 2.1. In this example, decision makers are trying to apportion a unicameral legislature among the three states: Massachusetts Bay, Connecticut, and Plymouth. Massachusetts Bay receives a metric share of 0.508 = 10,150/20,000 from the population-based apportionment and a metric share of 0.556 = 139/250 from the property-based apportionment. If representatives of Massachusetts Bay wanted to maximize metric shares (i.e., maximize their relative representation based on the metric of apportionment), they would prefer apportioning the legislature based on property rather than population because property gives Massachusetts a greater metric share than population. The same would be true for representatives from Plymouth. Representatives from Connecticut

1. My earlier works referred to "metric" shares as "vote" shares (Ballingrud and Dougherty 2018; Dougherty and Pittman 2022). I changed the nomenclature here to differentiate metric shares from seats shares.

TABLE 2.1. Metric Shares

	Population		Property (in millions)	
State	People	Metric Share	Value	Metric Share
Mass Bay	10,150	0.508	139	0.556
Connecticut	9,150	0.458	70	0.280
Plymouth	700	0.035	41	0.164
Total	**20,000**	**1.000**	**250**	**1.000**

would prefer the population-based metric instead. Metric shares are used in chapter 3 to help explain why the original Constitution apportioned the US House of Representatives according to the Three-Fifths Clause and the Senate according to equal representation. They are used again in chapter 5 to help explain why population reduced by the number of disenfranchised male voters was adopted for the House after the Civil War.

In contrast, a state's seat share is its proportion of the chamber's seats. To determine seats based on metric shares, textbook apportionment methods typically start with the ideal quota. A state's ideal quota is the product of the state's metric share and the number of seats in the chamber. It can also be found by dividing the value of the metric in the state (e.g., the state's population) by the standard divisor. The standard divisor is the sum of metric values for all states (e.g., sum of each state's population) divided by the number of seats. It is useful for many apportionment methods.

A state's ideal quota can be thought of as the state's fair share of the seats, which often includes a whole number and a fraction. When the ideal quota is fractional, such as 4.5, it is unclear what a state's fair share of the seats should be. Should the state be given four seats or five seats? This is where a method of apportionment comes in. It translates ideal quotas into seats and apportions the remainders.

Table 2.2 shows how the metric is translated into seat shares using the Hamilton method for a chamber with 40 seats. The Hamilton method, named after Alexander Hamilton, who proposed it in 1791, starts by creating the ideal quota for each state. For example, in the top frame of table 2.2 the population-based apportionment for Massachusetts Bay in a legislature with 40 seats produces an ideal quota of $20.3 = 0.5075 \times 40$, where 0.5075 is Massachusetts Bay's proportion of the population, that is, its metric share. The Hamilton method first allocates the whole number of a state's ideal quota to the state, which initially gives Massachusetts Bay 20 seats, Connecticut 18 seats, and Plymouth 1 seat. Since the whole numbers sum to 39 seats ($39 = 20 + 18 + 1$) rather than

TABLE 2.2. Seat Shares (Hamilton Method)

Population					
State	Population	Metric Share	Ideal Quota	Seats	Seat Share
Mass Bay	10,150	0.508	20.300	20	0.500
Connecticut	9,150	0.458	18.300	18	0.450
Plymouth	700	0.035	1.400	2	0.050
Total	**20,000**	**1.000**	**40.000**	**40**	**1.000**
Property					
State	Property	Metric Share	Ideal Quota	Seats	Seat Share
Mass Bay	139	0.556	22.240	22	0.550
Connecticut	70	0.280	11.200	11	0.275
Plymouth	41	0.164	6.560	7	0.175
Total	**250**	**1.000**	**40.000**	**40**	**1.000**

Note: A hypothetical legislature with 40 seats is apportioned using the Hamilton method. Property values are in millions.

the requisite 40 seats, an additional seat has to be allocated. According to the Hamilton method, remaining seats are assigned to the states with the largest fractions (after assuring each state has at least one seat). Because Plymouth has the largest fraction in its ideal quota (0.400 compared to 0.300 for both Massachusetts Bay and Connecticut), Plymouth is assigned the extra seat. If there were more remaining seats, they would be assigned to the state with the next largest remainder, etc., until all of the extra seats were allocated.

Seats shares are simply the proportion of seats allocated to a state among all of the seats in the chamber. The seat share for Massachusetts Bay is 0.5 = 20/40. For Connecticut it is 0.45 = 18/40.

Following similar logic, it is fairly easy to calculate the ideal quotas, numbers of seats, and seat shares from the property statistics in table 2.2. In the bottom of the table, Massachusetts Bay has an ideal quota of 22.240 = 0.556 × 40, where 0.556 is Massachusetts Bay's proportion of the property and 40 is the number of seats in the chamber. Since the whole number of the ideal quotas from property sum to 39 seats, there is again an extra seat that goes to the state with the largest remainder. Plymouth has the largest remainder and gets the extra seat again.

It should be pretty clear that the metric of apportionment can affect the distribution of seats. Apportioning the chamber based on population gives Plymouth only two seats, while apportioning the chamber based on property gives it seven seats, three and a half times its population-based

number. The number of seats assigned to Connecticut changes dramatically as well. Both changes are reflected in the raw number of seats as well as in the seat shares.

In almost every Congress in US history at least half of the states received fewer than nine seats. For such smaller states, the difference in one seat can be quite substantial. Going from eight to nine seats increases a state's representation by one-eighth. Going from one to two seats doubles the state's representation. It should be no surprise that representatives of those states have gone to great lengths to find metrics of apportionment and methods of apportionment that favor their state.

The Method of Apportionment

To see how the apportionment method can affect seat shares, compare the results from Hamilton's method to the results from Jefferson's method. The Jefferson method requires adjusting the divisor so that the whole numbers in each state's quota sum to the required number of seats, that is each state's quota rounded down. For example, consider table 2.3. The standard divisor is used in the top part of the table. Recall that the standard divisor is the total population divided by the number of seats. Each state's ideal quota is then calculated, which is the state's population divided by the standard divisor. The fractions are then dropped and the whole numbers are summed to get the total number of seats. Because the total is 39, the divisor has to be adjusted until the whole number sums to 40. A little trial and error reveals a divisor that creates 40 seats. If the divisor were 482 instead of 500, the quota would no longer be "ideal" but the number of seats would sum to the requisite 40 seats (bottom of table 2.3).[2] Jefferson's method would assign 21, 18, and 1 seats to Massachusetts Bay, Connecticut, and Plymouth, respectively.

Compare the seat allocation from Hamilton's method (top of table 2.2) to the seat allocation from Jefferson's method (bottom of table 2.3). Both are based on population. Massachusetts Bay would receive one more seat from Jefferson's method and Plymouth would receive one fewer. Massachusetts Bay would have a seat share of 0.500 under Hamilton's method and a seat share of 0.508 under Jefferson's method. Plymouth would have a seat share of 0.050 under Hamilton's method and a seat share of 0.025 under Jefferson's method.

2. Note, there is typically a range of divisors that create the same distribution of seats. In our example, 482 and 483 are the only integers that create 40 seats.

TABLE 2.3. The Jefferson Method (40 seats apportioned by population)

Standard Divisor = 500				
State	Population	Ideal Quota	Seats	Seat Share
Mass Bay	10,150	20.300	20	0.508
Connecticut	9,150	18.300	18	0.458
Plymouth	700	1.400	1	0.035
Total	**20,000**	**40.000**	**39**	**1.000**
Divisor = 482				
State	Population	Quota	Seats	Seat Share
Mass Bay	10,150	21.058	21	0.525
Connecticut	9,150	18.983	18	0.450
Plymouth	700	1.452	1	0.025
Total	**20,000**	**41.494**	**40**	**1.000**

Note: Seats are apportioned for a hypothetical legislature with 40 seats using the Jefferson method.

Connecticut would get the same share in both cases. The difference might affect the method a representative favored.

In 1832 John Quincy Adams, son of the second president of the United States John Adams, proposed a different method of apportionment, known as the Adams method. For a fixed chamber size, Adams proposed to adjust the divisor so that a state's quota *rounded up* summed to the requisite number of seats, rather than round down as required by the Jefferson method. A divisor was then chosen that made the whole numbers after rounding up sum to the desired number of seats.

In the same year that Adams proposed his new method, Daniel Webster, a prominent lawyer and senator from Massachusetts, proposed what is known as the Webster method. With a fixed chamber size, the Webster method requires administrators to adjust the divisor so that the distribution of seats after natural rounding sums to the required number of seats. After state populations are divided by the divisor, states with quotients containing fractions of 0.5 or greater are awarded an extra seat, while states with quotients containing fractions below 0.5 have their fraction dropped. In this way, the Webster method might be viewed as a middle ground between the Jefferson and Adams methods.

The method used to apportion Congress today is a fifth method, called the Hill-Huntington method. The Hill-Huntington method is similar to the Webster method, but it rounds differently. The Webster method rounds arithmetically at 0.5. The Hill-Huntington method rounds at the geometric mean.

TABLE 2.4. The Hill-Huntington Method (40 seats apportioned by population)

Standard Divisor = 500

State	Population	Ideal Quota	LQ	UQ	Geometric Mean	Seats	Seat Share
Mass Bay	10,150	20.300	20	21	20.494	20	0.513
Connecticut	9,150	18.300	18	19	18.493	18	0.462
Plymouth	700	1.400	1	2	1.414	1	0.026
Total	**20,000**	**40.000**	**39**	**42**	**40**	**39**	**1.000**

Divisor = 495

State	Population	Quota	LQ	UQ	Geometric Mean	Seats	Seat Share
Mass Bay	10,150	20.505	20	21	20.494	21	0.525
Connecticut	9,150	18.485	18	19	18.493	18	0.450
Plymouth	700	1.414	1	2	1.414	1	0.025
Total	**20,000**	**40.404**	**39**	**42**	**40**	**40**	**1.000**

Note: Seats are apportioned for a hypothetical legislature with 40 seats using the Hill-Huntington method.

If a state's quota is at least as great as its geometric mean, the state is allocated an additional seat. If a state's quota is less than its geometric mean, the fraction is discarded.

Table 2.4 shows how the Hill-Huntington method works using our hypothetical example. The top part of the table shows what results from the ideal quotas. The lower quotient (LQ) and the upper quotient (UQ) are simply the quota rounded down to the nearest integer and the quota rounded up to the nearest integer, respectively. The geometric mean is calculated as the square root of the LQ times UQ. So for Massachusetts Bay the geometric mean is $\sqrt{20 \times 21}$. Because the quota is less than the geometric mean for Massachusetts Bay, the fraction for Massachusetts Bay is discarded and the state is assigned seats equal to its lower quota. The seats allocated to Connecticut and Plymouth can be found similarly. Because the total number of seats allocated do not sum to the requisite 40, the divisor has to be adjusted until the total number of seats matches the number of seats in the chamber.

Trial and error reveals that a divisor of 495 creates 40 seats. Again, the new quota is no longer "ideal" because it is not the exact number of seats one would assign to each state in a perfect world, but the new quota does produce an apportionment based on the population of each state and the Hill-Huntington method. Massachusetts Bay, Connecticut, and Plymouth, would be assigned 21, 18, and 1 seats, respectively, the same allocation provided by the Jefferson method.

TABLE 2.5. Comparison of Four Apportionment Methods for Nine Select States, 2020

State	Population	Ideal Quota	Jefferson	Adams	Webster	Hill
California	39,576,757	52.797	55	51	53	53
Texas	29,183,290	38.932	40	38	39	39
Florida	21,570,527	28.776	30	28	29	29
New York	20,215,751	26.969	28	26	27	27
Pennsylvania	13,011,844	17.358	18	17	17	17
Ohio	11,808,848	15.753	16	15	16	16
Georgia	10,725,274	14.308	15	14	14	14
Michigan	10,084,442	13.453	14	13	14	13
Virginia	8,654,542	11.545	12	11	12	12
U.S. Total	**326,078,381**	**435.000**	**435**	**435**	**435**	**435**

Table 2.5 compares the distribution of seats based on population data from the 2020 census for nine select states under the Jefferson, Adams, Webster, and Hill-Huntington methods. In a perfect world, California would be assigned 52.797 seats because that is its ideal quota. Yet it receives 55 seats under the Jefferson method, which is more than its ideal quota rounded up to the nearest integer, and it receives 51 seats under the Adams method, which is less than its ideal quota rounded down to the nearest integer. Both demonstrate violations of the quota condition, which requires assigned seats to be either the closest integer less than the ideal quota or the closest integer greater than the ideal quota. In fact, the first four states listed in the table violate the quota condition under the Jefferson method because they receive more than their ideal quota rounded up to the nearest integer. Fifteen states, not shown, have one fewer seat under the Jefferson method than under the Adams method. The two methods change the number of representatives for 24 different states, roughly half of the country.

While the Jefferson method favors larger states and the Adams method favors smaller states, the Webster and Hill-Huntington methods tend to produce apportionments in between the two extremes. In this example, the four largest states of California, Texas, Florida, and New York are assigned three different numbers of seats from the four apportionment methods. The Webster and Hill-Huntington methods produce fairly similar apportionments in this example, but even in this example four states receive a different number of seats under Webster and Hill-Huntington. Montana and Rhode Island (not shown) each receive one more seat under Hill-Huntington than they receive under Webster. Michigan (shown) and New Jersey (not shown) each receive one fewer. With so many states affected by the method of the apportionment,

it is clear that the method of apportionment chosen by Congress matters. Representatives of the states have an interest in choosing one method over the other.

The Ratio of Representation

In addition to specifying the metric of apportionment, which was initially the Three-Fifths Clause, the Constitution declared that there would be at least one representative per state and the "[n]umber of Representatives shall not exceed one for every thirty Thousand" people (Article 1, section 2). The latter, called the ratio of representation, assured that the House did not become too large and ineffective. In the early years of the republic, members of Congress apportioned the House using an early version of the Jefferson method, that is, they chose a ratio of representation and allowed the size of the chamber to fall where it may. Later they replaced the early version of the Jefferson method with an early version of the Webster method. The approach was considered constitutional because the Constitution does not enumerate a method of apportionment nor the number of seats for the US House of Representatives.

Table 2.6 shows how the early version would work for an apportionment based on population and the Jefferson method. For a divisor of 300 people, Massachusetts Bay would be assigned 33 seats (= $\lfloor 10{,}150 \times 1/300 \rfloor$), where = $\lfloor\ \rfloor$ indicates round down to the nearest integer. Connecticut would be assigned 30 seats (= $\lfloor 9{,}150 \times 1/300 \rfloor$) and Plymouth would be assigned 2 seats (= $\lfloor 700 \times 1/300 \rfloor$). The size of the chamber, 65 members, would be then determined by summing the seats assigned to each state (65 = 33 + 30 + 2). Notice that the fractions remaining after rounding down are simply discarded.

Each state's seat share is the proportion of seats assigned to the state from that divisor. In table 2.6, Massachusetts Bay's seat share from a divisor of 300

TABLE 2.6. The Ratio of Representation (Jefferson Method)

		1 per 300		1 per 400	
State	Population	Seats	Seat Share	Seats	Seat Share
Mass Bay	10,150	33	0.508	25	0.521
Connecticut	9,150	30	0.462	22	0.458
Plymouth	700	2	0.031	1	0.021
Total	**20,000**	**65**	**1.000**	**48**	**1.000**

Note: 1 per 300 (respectively 400) indicates the apportionment from one representative for every 300 people (respectively 400 people) in the state's population.

would be 0.508 = 33/65. Seat shares for Connecticut and Plymouth can be found similarly.

The right side of table 2.6 shows a similar calculation for a ratio of 1/400 people. Comparing the two results shows that the ratio of representation affects both the size of the chamber as well as the proportion of seats assigned to each state. If the ratio of one representative for every 300 people were applied, Massachusetts Bay, Connecticut, and Plymouth would receive 33, 30, and 2 seats, respectively. But if the ratio of representation was one representative for every 400 people, they would be assigned 25, 22, and 1 seats, respectively. A decision maker that was concerned about the relative number of seats controlled by his or her state should consider seat shares rather than seats. With one representative for every three hundred people, Plymouth has a seat share of 0.031. With one representative for every four hundred people, Plymouth has a seat share of 0.021, a decrease of 32 percent. The ratio of representation affects the proportion of seats assigned to Massachusetts Bay and Connecticut as well.[3]

Roughly 50 years after the first apportionment was applied, Congress tried to control the growth of the US House of Representatives by applying both a fixed chamber size and an acceptable apportionment method. It soon realized that it could not maintain both, because for any given apportionment method the ratio of representation and a fixed chamber size often contradicted each other.

The early solution was to simply derive the chamber size from the method and ratio. But even as the idea was being proposed at the Constitutional Convention of 1787, Madison realized its futility. "The future increase of population if the Union should be permanent, will render the number of Representatives excessive" (Farrand 1966, 2:221). As Oliver Ellsworth later put it, "By the proposed constitution the new Congress will consist of nearly one hundred men; when our population is equal to Great Britain [it will be composed] of three hundred men, and when it equal[s] France [it will be composed] of nine hundred. Plenty of Lawgivers!" (Farrand 1966, 3:143). If the ratio of one representative for every 30,000 people were maintained today, the House would have more than 11,000 representatives.

3. Of course, different apportionment methods can distribute seats differently, even if the same ratio of representation is applied. For example, if the Adams method was used in place of the Jefferson method but the divisor of 300 people were still applied, Massachusetts Bay would be assigned 34 seats rather than 33 seats (34 = ⌈10,150/300⌉, where = ⌈ ⌉ indicates round up to the nearest integer). Connecticut and Plymouth would receive 31 and 3 seats, respectively, giving the chamber a total of 68 seats, three more than under the Jefferson method. Seat shares would change as well.

Assembly Size

After the 1850 census, members of Congress became more focused on the size of the House than on the ratio of representation and decided to fix the size of the House first and apportion the chamber based on the given size. In other words, they permanently moved from the early version of the apportionment methods to the textbook version. The change did not reduce jockeying for position. Instead of proposing divisors that advantaged their state, members of Congress simply jockeyed for House sizes that advantaged their state.

Table 2.7 illustrates how the size of a chamber can affect the distribution of seats using a population metric and the Jefferson method. As shown at the bottom of table 2.3, if the chamber had 40 members, Massachusetts Bay would have a seat share of 0.525, Connecticut would have a seat share of 0.450, and Plymouth would have a seat share of 0.025. These figures are reproduced under "40-Member Chamber" in table 2.7.

If the chamber had 50 members, as shown on the right of that table, the quota needed to fill the chamber would increase. Massachusetts Bay would have a seat share of 0.520, Connecticut would have a seat share of 0.460, and Plymouth would have a seat share of 0.020. The differences appear small, but they reflect noticeable differences in the number of representatives assigned to the state. For example, going from a 40-member chamber to a 50-member chamber increases Connecticut's seat share by only 0.01, but the difference reflects five additional seats for Connecticut, albeit each seat is less effective in the larger chamber.

Focusing solely on the number of seats assigned to a state, Plymouth receives one seat in both the 40-member chamber and in the 50-member chamber. Nevertheless, one representative is considerably less effective in the larger chamber. Hence, one advantage of examining seat shares, rather than

TABLE 2.7. Assembly Size (Jefferson Method)

			40-Member Chamber			50-Member Chamber		
State	Population	Ideal Quota	Quota	Seats	Seat Share	Quota	Seats	Seat Share
Mass Bay	10,150	20.300	21.058	21	0.525	26.026	26	0.520
Connecticut	9,150	18.300	18.983	18	0.450	23.462	23	0.460
Plymouth	700	1.400	1.452	1	0.025	1.795	1	0.020
Total	**20,000**	**40.000**	**41.494**	**40**	**1.000**	**51.282**	**50**	**1.000**

Note: The table compares the apportionment of a 40-member chamber and a 50-member chamber assuming a population-based metric and the Jefferson method. In the former case the divisor is 482. In the latter, it is 390. Other values produce the same apportionment.

seats, is that seat shares capture a state's relative representation in the chamber. Raw seats misses the distinction and rates a 40-member chamber and a 50-member chamber as equivalent for Plymouth.

Clearly, the metric of apportionment, method of apportionment, ratio of representation, and assembly size can affect the distribution of seats in Congress.

Preferences

This study examines what would happen if members of Congress wanted the metric of apportionment, method of apportionment, ratio of representation, or assembly size that gave their state a greater share of the national legislature, either a greater metric share or a greater seat share, depending on the context. In cases where the assumption breaks down, the reasons that representatives deviate from state interests can be quite interesting. For example, chapter 4 shows that for each ratio of representation proposed by a member of the House in 1822, there was another ratio that gave a majority of members greater seat shares. Chapter 5 shows that a majority of states received greater seat shares from a metric of apportionment other than one they adopted for the Fourteenth Amendment.

To make the analysis more tractable, the study assumes voters want to maximize their state's interests lexicographically. That means they think about their state's interest first before considering any other differences in the apportionments, such as which choice is fairest for small states. Metric shares are used for decisions about metrics, because the metric chosen was supposed to apply to any method, ratio, and assembly size that Congress later adopted. With those other factors held constant, greater metric shares are weakly monotonic with greater seat shares.

Seat shares are used whenever the distribution of seats can be calculated, that is, for decisions on the method of apportionment, the ratio of representation, or the assembly size. Seat shares are a more accurate measure of a state's relative say in Congress than are metric shares. In both cases, state agents are considered indifferent between two apportionments if the difference between the two shares is less than 0.001. Much smaller cutoffs fail to create meaningful differences in the number of allocated seats. Much larger cutoffs fail to discriminate between metrics, methods, ratios, and assembly sizes.

An important caveat is worth noting. Each state's proportion of the seats is

not a perfect measure of its power either. Work on power indices focuses on an actor's ability to change the outcome of a vote by changing their own vote (Shapley and Shubik 1954; Banzhaf 1964). That literature shows that power is not always proportional to seat shares because an actor with only a few seats, such as a party or a state, may be equally capable of affecting the outcome of a vote as an actor with many seats. For example, if there are three states in a 100-seat legislature, one with 47 seats, a second with 45 seats, and a third with 8 seats, and representatives vote according to their state's interests, then each state would have equal power in a majority rule voting game. Two states would be required to form a majority and any two could form that majority, despite the difference in their sizes.

The study assumes actors want to maximize seat shares rather than a power index for two reasons. First, seat shares are highly correlated with a Banzhaf power index and the Shapley-Shubik power index when they are applied to the data reported in this study: seat shares in 1822 (chapter 4) and seat shares in the 1920s (chapter 6). In both cases, the power indexes are correlated with seat shares at least 0.997.[4] Second, early Americans were unaware of power indices and were more likely to think in terms of the simpler proportion of seats controlled by their state.

To translate metric shares and seat shares into preferences, only two assumptions are needed:

1. Members of Congress from state *i* prefer the metric of apportionment (respectively, method of apportionment, ratio of representation, or chamber size) that gives state *i* a larger metric share (respectively, seat share).
2. Members of Congress measure metric shares (respectively, seat shares) using the figures presented here.

4. Although there can be important differences between the Banzhaf and Shapley-Shubik power indices, "in many cases the Shapley-Shubik and Banzhaf indices have fairly similar values" (Felsenthal and Machover 2015, 129). For this analysis, the Banzhaf and the Shapley-Shubik indices were calculated using the apportioned seats from each of the twenty-four ratios of representation proposed in the House in 1822 and the powerindexR package. They correlated with seat shares at a minimum of 0.997 per comparison (48 comparisons). Similarly, among the possible House sizes between 300 and 500 that could have been considered for the House in the 1920s, the Banzhaf power index correlated with seat shares at least 0.999 (201 comparisons). The Shapley-Shubik index was not applied to the 1920 figures because the application requires lining up 48 states in $48! = 1.2 \times 1{,}061$ different ways, too many combinations for the package. These power indices were not applied to the prefederal or 1866 data because metric shares are percentages and the indexes do not work with percentages.

Pre-Federal

Difference	Nay	Yea	Total
diff < 0	45	11	**56**
diff > 0	46	35	**81**
Total	**91**	**46**	**137**

Pearson $\chi^2(1) = 8.25$, *p-value = 0.004*

1822

Difference	Nay	Yea	Total
diff < 0	544	154	**698**
diff > 0	358	318	**676**
Total	**902**	**472**	**1374**

Pearson $\chi^2(1) = 95.01$, *p-value < 0.001*

1866

Difference	Nay	Yea	Total
diff < 0	220	70	**290**
diff > 0	43	22	**65**
Total	**263**	**92**	**355**

Pearson $\chi^2(1) = 2.61$, *p-value = 0.106*

1920s

Difference	Nay	Yea	Total
diff < 0	578	373	**951**
diff > 0	144	588	**732**
Total	**722**	**961**	**1683**

Pearson $\chi^2(1) = 2.61$, *p-value < 0.001*

Fig. 2.1. Votes for Apportionment and Differences in Shares

The first assumption seems reasonable because members of Congress, particularly those in the Confederation Congress or the US Senate, were elected to represent their state and should have their state's interest in mind when they vote on issues of apportionment. Furthermore, individuals rarely have personal interests in apportionment that differ from their state's interests. The second assumption is more controversial, but it provides minimal coherence for any analysis of individual preferences. Without it, or a similar assumption, measuring individual valuations of different apportionments would be impossible.

Figure 2.1 provides evidence that representatives voted for larger shares for their states. For any two apportionments, A and B, a representative from a state with a positive difference between the shares from A and B should vote for apportionment A, and representatives from states with a negative difference should vote for apportionment B. For each of the four periods studied in this book, the roll call votes that pair two apportionments head-to-head are pooled to determine whether a relationship exists. See the book appendix for data.[5]

5. For the prefederal period, the pool of votes based on equal apportionment versus proportional apportionment are used in the cross-tab. An additional pool is described in the book appendix.

Each of the cross-tabs in table 2.1 display the results from a different historical era: prefederal, 1822, 1866, and the 1920s. A cross-tab is simply a count of how often two variables occur together; in this case it is a count of how often the apportionment difference and a particular type of vote occurs. If the theory is correct, most of the representatives from states with a positive difference (diff > 0) should vote yea and most of the representatives from states with a negative difference should vote nay. Of course, some votes will be in the other two boxes because representatives make mistakes and have additional motivations.

Consider the cross-tab for the prefederal period in the top-left corner. Here a clear pattern emerges. Members representing states with negative differences (diff < 0) were four times as likely to vote nay than yea (45 nay vs. 11 yea). Members representing states with positive differences (diff > 0) had more nay votes as well, but in this case the ratio was much closer, suggesting that their state's loss of metric share is related to their opposition to apportionment proposals. The Pearson Chi-Squared statistic beneath the table confirms the relationship. If p-value < .01, a fairly conservative level of statistical significance, one would conclude that the relationship on major-diagonal is not due to chance (i.e., diff < 0 is associated with nay and diff > 0 is associated with yea). In this case the probability is 0.004, suggesting that that hypothesis that the two variables are independent can be rejected.

The relationship is more pronounced in 1822. Representatives from states advantaged by the status quo apportionment (diff < 0) voted nay by a margin of 544 to 154, showing a powerful tendency to reject a proposed apportionment when it placed their state at a disadvantage. Representatives from states that were advantaged by a proposed apportionment were much more evenly split with a count of 358 nay to 318 yea, confirming that while losing from a proposed apportionment strongly drove a nay vote, gaining from a proposed apportionment did not guarantee a yea vote. The Chi-Squared statistic again suggests that the relationship is not due to chance.

The pattern weakens in 1866. Here the relationship between representative voting and state interests is not statistically significant at traditional levels (p-value = 0.106). The observed pattern could have been due to chance, suggesting that other issues may have dominated decision making during the period. As shown in the appendix, there is some relationship between votes on apportionment and the metric share difference when other factors are controlled in 1866, but that relationship is weak at best.

Finally, the relationship between voting and share difference is strongest in the 1920s. For that period the Chi-Squared statistic is the largest of the four

and the probability of an independent relationship is less than 0.001. In this case, representative behavior is clearly divided along the lines of state gain and loss from the apportionment votes. Representatives from states that stood to lose from a proposed apportionment voted nay by a margin of 578 to 373, while representatives from states that stood to gain from a proposed apportionment voted yea by a margin of 588 to 144, indicating a state's gains and losses were a strong predictor of how its representatives voted in the 1920s.

These relationships are explored more carefully in the book appendix. The appendix shows that (1) representatives from the same state voted together on apportionment issues; (2) voting was affected by the *magnitude* of the share difference with other variables controlled; (3) representatives responded to their state's seat shares, not just raw seats; and (4) there was at least one case of widespread sophisticated voting. The appendix also describes some formal theories that could have been applied to apportionment decisions but for various reasons did not fit particularly well.

Majority Interests

Now if members of Congress always favor an apportionment that gives their state a greater metric share (or seat share), then determining the interests of a majority seems straightforward. First determine what advantages a majority on each pairwise comparison, then find the apportionment that is in equilibrium based on state interests. Unfortunately, it is not that simple.

Consider the metric of apportionment. Among all possible metrics there can be an infinite division of seats, each one corresponding to a different share for each state. Voting over the metric of apportionment is voting over the division of power, similar to a high-stakes version of a divide-the-dollar game. The divide-the-dollar game requires three or more voters to agree on a fixed division of the resource. Game theorists have applied several equilibrium concepts to the game, the most common of which is based on dominance relationships. Suppose the rules of the game dictate that decisions are made solely by majority rule. Apportionment rule x strictly dominates apportionment rule y, indicated by $x \succ y$, if and only if a majority of states receive a greater share from x than from y.[6]

The *core* of a majority rule voting game is the set of undominated outcomes, that is, the set of outcomes that once in place cannot be overturned

6. x weakly dominates y, indicated by $x \succeq y$ if and only if a majority of states receive a greater share from x than from y or there is a tie in the majority relation.

by a majority. Such outcomes are in equilibrium because there does not exist another outcome that can beat them using the rules of the game. Once a group attains an outcome in the core, they should not get away. For example, in a single-dimensional voting model with single-peaked preferences, the location of the median voter is the only element of the core in a pure majority rule voting game. Once an assembly chooses this location, it cannot move to another point through majority voting because a majority of voters would not prefer any other location to that location (Black 1948).

For now, consider pure majority rule voting with each voter taking a turn proposing a division of seats as the rules of our game. In this case, the majority rule core may be empty. In other words, the game may not have an equilibrium because every division is dominated by another division.

To see this, consider a legislature with three players {1, 2, 3} attempting to divide a scarce resource, such as the allocation of seats in a national legislature. Players take turns proposing a distribution of seats until a majority of players settle on a distribution that (1) allocates at least one seat to each player (temporarily modeled by $a_i \geq 0.01$) and (2) defeats (or ties) all other feasible distributions. The feasible distributions for this game are:

$$S_1 = S_2 = S_3 = \{(a_1, a_2, a_3) \in \mathcal{R}^3 : a_1 + a_2 + a_3 = 1; a_1 > 0.01, a_2 > 0.01, a_3 > 0.01\}$$

In this case none of the distributions are in equilibrium because for each distribution there is another distribution that a majority of players prefer. For example, Player 1 might propose the equitable distribution (0.33, 0.33, 0.33). Player 2, however, could propose replacing that distribution with (.01, .50, .49), which would make them and Player 3 better off, defeating (0.33, 0.33, 0.33) by a majority. Of course, (.01, .50, .49) would not be stable either because Player 1 could propose (.49, .01, .50) to gain the support of Player 3.

For any distribution of the resource, a player could always propose a new distribution that makes a majority of players better off. No distribution is coalitionally stable, that is, there is no equilibrium as defined by the core. This is true even if there are more than three players and minimum allocations are greater than $a_i = .01$.

The result is fairly general (Ward 1961). If all allocations are possible and the preferences of players are unrestricted, then a top cycle is likely to encompass the entire set of divisions, similar to McKelvey (1976) and Schofield's (1978) so-called "chaos theorem."[7]

7. Alternatives in the set X are in a top cycle if all elements of X are in a cycle (of any length) and there does not exist another alternative y not in X that dominates all elements of X (Austen-Smith and Banks 2000, 169).

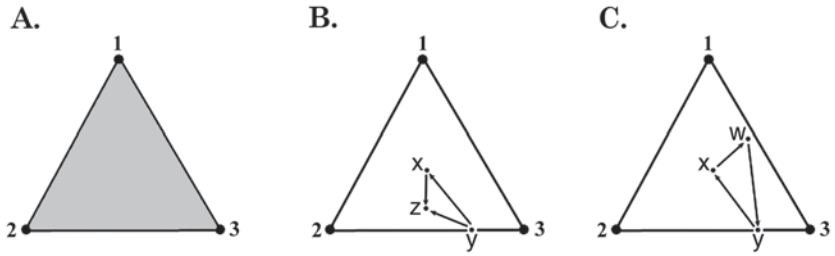


Fig. 2.2. A Modified Divide-the-Dollar Game

Such instability is affected by (1) player preferences, (2) feasible divisions, and (3) the rules of voting. To see the second point, consider figure 2.2, frame A. Here players {1, 2, 3} can choose any division of the resource, which is equivalent to choosing any shaded point in the triangle. Locations closer to a player's ideal point, that is, their corner of the triangle, indicate a greater proportion for that player. Hence, players prefer points closer to their ideal point more than points farther away. For every division (i.e., every point in or on the triangle), there is another division (i.e., another point in or on the triangle) that a majority of the players prefer to the original division. In this sense, majority rule is unstable.

If the set of feasible divisions is limited to the three divisions $\{x, y, z\}$ depicted in frame B, then the story changes. In frame B, division x is preferred to division y by a majority of voters (Players 1 and 2), division z is preferred to division x by a majority of voters (Players 2 and 3), and division z is preferred to division y by a majority of voters (Players 1 and 2 again). If x, y, and z were the only divisions, perhaps because they corresponded to the only reasonable metrics of apportionment for the voters, then majority rule would produce the ordered chain $z \succ x \succ y$, which is called a *Condorcet ordering* (Nurmi 1999). A Condorcet ordering creates an ordered list of priorities determined by majority rule. More precisely, it is the transitive order of all divisions in terms of dominance, ranked from Condorcet winner to Condorcet loser.

A Condorcet winner dominates each of the other alternatives when alternatives are considered in head-to-head contests. In this case, z is the Condorcet winner because it dominates x and y. A Condorcet loser is the alternative that is dominated by all of the other alternatives in head-to-head contests. In this case, y is the Condorcet loser because it is dominated by both x and z. As long as the ordering is entirely made up of strict dominance, alternatives in the middle of the chain, such as x, dominate all alternatives listed lower in the chain and are dominated by all alternatives listed higher in the chain.

TABLE 2.8. A Cycle with Eleven States

State	Quota of Contribution (Co)	Free Inhabitants (F)	Three-Fifths Clause (3f)
MA	0.213	0.156	0.137
CT	0.042	0.077	0.068
NY	0.151	0.105	0.096
NJ	0.008	0.057	0.052
PA	0.232	0.141	0.125
DE	0.022	0.016	0.016
MD	0.074	0.071	0.080
VA	0.206	0.149	0.182
NC	0.010	0.096	0.102
SC	0.015	0.047	0.060
GA	0.000	0.018	0.021

Note: Delaware's metric share was roughly .0164 for F and .0160 for 3f. Hence, six states receive greater metric shares from Co than from F (MA, NY, PA, DE, MD, and VA), six states receive greater metric shares from F than from 3f (DE northward), and six states receive greater metric shares from 3f then from Co (CT, NJ, MD, NC, SC, and GA).

Unfortunately, the stability of majority rule in frame B is not entirely due to limiting the set of feasible alternatives to three. A different set of alternatives produces what is known as a cycle, as shown in frame C. Frame C is identical to frame B, except division z is replaced by division w. This single change alters the result quite a bit. A majority of players still prefer x to y, but a majority of players prefer w to x (Players 1 and 3) and a majority prefer y to w (Players 2 and 3), creating the vote cycle $y \succ w \succ x \succ y$. With a limited set of divisions, majority rule can produce an ordering or a cycle, depending upon the set of feasible divisions. It can also produce mixtures of both.

Majority cycles are not merely chalk talk. When it comes to apportionment, it is fairly clear that they existed in US history. Consider an example from the US Constitutional Convention of 1787 shown in table 2.8. The table includes the metric shares of eleven states from three different metrics of apportionment that were proposed at the Constitutional Convention of 1787. These states were the only ones attending the convention from May 30 to July 10, 1787, when the issue of legislative apportionment was largely decided. Co, which was included in the Virginia Plan, apportions legislative seats in proportion to the amount each state contributes in taxes. F apportions seats according to the number of free inhabitants in each state. 3f apportions seats according to the Three-Fifths Clause, the metric the convention eventually adopted for the US House of Representatives. In this case, 6 states (a majority of 11) received greater metric shares from Co than from F. Another 6 states

received greater metric shares from F than from 3f. One might think that if Co dominates F and F dominates 3f, then Co must dominate 3f. But this is not the case. A majority of states receive greater metric shares from 3f than from Co, showing there was a majority cycle. In such cases, group preferences based on dominance relationships are inconsistent. For each metric of apportionment there is another metric of apportionment that produces greater metric shares for a majority of states.

Other examples existed in US history, such as cycles over various ratios of representation in 1822, cycles over various metrics of apportionment considered for the Fourteenth Amendment, and cycles over House sizes considered in the 1920s.

Conclusion

It is easy to imagine that a majority of states welcomed the Three-Fifths Clause at the Constitutional Convention and a majority gained from a population-based apportionment after the Civil War. Both conceptions, however, are misleading. In both cases a majority of states would have gained a greater metric share from another metric than the one adopted. In the first case, members of the large state coalition benefited from a majority cycle. In the latter case, members of Congress managed to pass a metric that was Condorcet inferior to another metric that a majority preferred simply because few alternatives were put to a vote.

Why the Three-Fifths Clause and subsequent population-based apportionments were adopted is largely a story about a subset of actors making decisions for a larger population and how they controlled the agenda. Often leaders simply prevent certain proposals from being considered in pairwise votes. Lack of pairwise voting obscures the fact that other alternatives may be preferred by a majority of actors. How specific metrics managed to succeed in such settings is the topic of chapters 3 and 5. Why a specific ratio of representation was chosen for the House in 1822 is the topic of chapter 4. And why Congress failed to reapportion the House in the early 1920s then chose to fix the House at 435 members in 1929 is the topic of chapter 6.

The next chapter examines the problem of selecting a metric of apportionment for the United States when the first Continental Congress met in 1775, why that metric was maintained when the Articles of Confederation were cre-

ated in the late 1770s, and how that metric was partially dislodged at the Constitutional Convention of 1787. Every schoolchild knows that the convention produced a compromise with proportional representation in the House and equal representation in the Senate. What is less well known is that the convention proposed nine different apportionments that were "proportional." Any one of those could have been adopted for the House.

THREE

Tensions in the Prefederal Period

The First Continental Congress met in 1774 to discuss the future of the American colonies and a proper response to British aggression. The British had just passed the Coercive Acts, which the Americans described as the Intolerable Acts, to reassert their authority over the American colonies. The Coercive Acts, among other things, closed Boston Harbor, rescinded the Massachusetts charter, and quartered British troops in American homes. Before the Americans could respond, they had to decide how to make decisions, namely the number of delegates allowed from each colony and how decisions would be made among those delegates. Delegates from the small colonies advocated for equal representation of the colonies, while delegates from the large colonies supported representation proportional to each colony's size. Realizing that they did not have the surveys needed to apportion seats based on population, the First Continental Congress decided, simply to get going, that each colony should have an equal vote.

In 1776 the Declaration of Independence transformed the colonies into states. Shortly thereafter, early Americans began drafting the Articles of Confederation and readdressed the question of legislative apportionment. Although Article XIII would declare that the states were bound in a permanent alliance, the primary purpose of the confederation was to administer the war and to remove the British from American soil. The task was daunting and dangerous, making it imperative that Congress resolve the apportionment issue equitably and quickly. Ultimately, they agreed to maintain equal representation of the states.

By the time the Constitutional Convention of 1787 had formed in Philadelphia, the large state delegates had had enough. They insisted on proportional representation in a bicameral legislature and only conceded equal apportionment for the upper chamber after the small state delegates threatened to leave. Apportionment was the single most divisive issue at the Constitutional Convention, one that could have separated the nation if it was not properly resolved.

This chapter examines the origin of equal apportionment in the United States and why that principle was originally set in place. It also examines the alternative metrics proposed by various delegates during the prefederal period. Rather than finding a conflict between those who wanted equal apportionment and those who wanted a population-based apportionment, the chapter shows that politicians had a variety of ideas. They considered roughly 18 different metrics of apportionment during the prefederal period, each of which advantaged different coalitions of states depending upon which two metrics were compared. Equal apportionment emerged early because it was simple and it produced greater metric shares for a majority of colonies. It was partially dislodged at the Constitutional Convention, not because the small states suddenly warmed up to a concession of power, but because two of the small states, Rhode Island and New Hampshire, did not attend the proceedings when decisions on apportionment were made. Their absence made a majority of decision makers receive greater metric shares from some proportional metrics than from equal apportionment.

The First Continental Congress

The debate over the proper "basis of representation," as delegates referred to it at the time, started on the first day of the Continental Congress in 1774 when James Duane (NY) moved that a committee be appointed to draw up rules for the congress, which was an assembly of colonies. Duane was particularly interested in how they would apportion seats among the colonies and wanted to know "whether it should be by Colonies, or by the poll, or by interests" (Adams 1969, 365).

Patrick Henry (VA) rose and said:

> This was the first General Congress which had ever happened; that no former Congress could be a precedent; that we should have occasion for more general congresses, and therefore that a precedent ought to be established now; that it would be great injustice if a little Colony

> should have the same weight in the councils of America, as a great one. (Adams 1969, 366)

Henry was right. There was no clear precedent. Franklin's Albany Plan of 1754 apportioned the assembly based on the size of each colony, but the Albany Plan was never adopted. The Stamp Act Congress of 1765 apportioned votes equally among colonies, but it was a single-issue meeting.

There were sound reasons to believe that apportioning seats equally was a fair division. But there were also sound reasons to believe that dividing seats according to population was a fair division. In a sense, a population-based apportionment represents equality among the people rather than equality among administrative units. Arguments also could be made for dividing seats by polls, that is, the number of voters in each colony, particularly if the Congress was trying to divide seats among decision makers. Because the congressional apportionment game does not have a clearly "fair" division, like the divide-the-dollar game might appear to have, delegates were left lobbying for the interests of their colony, which they often rationalized using abstract reasoning, pleas for compromise, and eventually forceful assertions of their colony's interests. As historian Merrill Jensen described it, "their arguments were dictated by a desire to give their states a dominant voice in the affairs of the union" (1959, 140). Arguments based on philosophical principles and notions of justice were often overlaid post factum.

John Adams (MA) pointed out:

> This is a question of great importance. If we vote by Colonies, this method will be liable to great inequality and injustice; for five small Colonies, with one hundred thousand people in each may outvote four large ones, each of which has five hundred thousand inhabitants. If we vote by the poll, some colonies have more than their proportion of members, and others have less. If we vote by interests, it will be attended with insuperable difficulties to ascertain the true importance of each colony. Is the weight of a Colony to be ascertained by the number of inhabitants merely, or by the amount of their trade, the quantity of their exports and imports, or by any compound ratio of both? (Adams 1969, 366)

Adams was introducing additional ideas. Each colony's trade, particularly their international trade, indicated their contribution to the economy, and each colony's voice could have been proportional to that contribution.

Thomas Lynch (SC) said, "I differ in one point from the gentleman from Virginia, that is in thinking that numbers only ought to determine the weight of Colonies. I think that property ought to be considered, and that it ought to be a compound of numbers and property, that should determine the weight of the Colonies" (Adams 1969, 367).

Property-based apportionments were often justified using the Lockean notion that property predates government and could not be taken without the consent of the people or their representatives. Early Americans objected to the Stamp Act using these types of principles. Hence, some argued that seats ought to be apportioned by property. Theophilus Parsons, a member of the Massachusetts Constitutional Convention of 1780, said that "the only objects of legislation . . . are the person and property of the individuals which compose the state. . . . If the law affects the property only, the consent of those who hold a majority of the property is enough" (Taylor 1961, 78). Lynch may have considered a combination of population and property for reasons similar to those stated by Parsons.

The Massachusetts constitution of 1780 and the New Hampshire constitution of 1784 apportioned their respective state senates according to taxes paid, which was yet another idea. The constitution adopted by Pennsylvania in 1790 apportioned representation in both of its legislative houses according to taxable inhabitants, which differed from inhabitants, property, and taxes paid.

Governor Samuel Ward (RI) then entered the debate and "insisted that every Colony should have an equal vote" (Smith 1976–2000, 1:30). He argued that "There are a great number of counties, in Virginia, very unequal in point of wealth and Numbers, yet each has a right to send two members" to the Virginia House of Burgesses (Adams 1965, 367).

The convention eventually agreed to equal apportionment, not because Ward's speech was the most persuasive, but because Congress did not have the proper means to determine each colony's population, trade, nor property, and it had to start making decisions soon. As Richard Bland (VA) put it, "we are not at present provided with materials to ascertain the importance of each Colony" (Adams 1965, 367), which was "an objection that could not be answered" (Smith 1976–2000, 1:31).

Dominance

The metrics mentioned in the debate can be used to determine which metric of apportionment (if any) dominates the others (see table 3.1). Apportioning

TABLE 3.1. Apportionments Discussed in the First Continental Congress

Label	Basis of Apportionment	Proposer	Source
P	total population	Henry (VA)	366–367
T	registered tonnage in foreign trade	Adams (MA)	366
PT	population and tonnage, weighted equally	Adams (MA)	366
M1	population and tonnage, weighted two to one	Adams (MA)	366
PR	population and property, weighted equally	Lynch (SC)	367
M2	population and property, weighted two to one	Lynch (SC)	367
E	equal apportionment	Ward (RI)	367

Note: Apportionments are presented in the order in which they were discussed in the First Continental Congress. Several of the ideas were not officially proposed. Sources refer to page numbers in Adams (1969).

votes equally among states (E) and dividing them according to total population (P) are two of the most well-known ideas. Adams's proposal to apportion seats using a combination of population and international trade (PT and M1) are less well known, as are the combinations of population and property mentioned by Lynch (PR and M2). Although the combination of any two metrics are infinite, only two combinations of Adams's and Lynch's proposals are listed in the table and considered in the forthcoming analysis. PT weighs the proportion of a colony's population and the proportion of its trade equally, while M1 weighs the proportion of a colony's population twice as heavily as the proportion of its trade. PR weighs the proportion of a colony's population and property equally, while M2 weighs population twice as heavily as property.

By gathering data on each colony's population, trade, and property, each colony's metric share can be easily calculated for each of the apportionments listed in table 3.1. Pairwise comparisons can then be made to determine which, if any, metric dominates the others. Recall that a metric dominates all the other metrics if a majority of decision makers, in this case a majority of the colonies, receive a greater share from that metric than from any of the others.

The 1780 data is used for these comparisons because data from 1780 is more readily available than data from earlier years and because it makes the results more comparable to those presented in the next section on the Articles of Confederation.[1] The value of trade is measured as the registered tonnage of ships used in a colony's foreign trade. See the appendix at the end of this chapter for each colony's metric shares, a description of how each metric is calculated, and the sources of the data.

1. Population figures come from 1780. Because 1780 figures for trade and property could not be found, trade is an average of the registered tonnage in foreign trade 1793–1795 (Pitkin 1817, 435). Property values came from 1800 (Lindert and Williamson 2015).

The dominance relationships among the apportionments initially discussed by the Continental Congress are:

$$E \succ P \succ M\,2 \succ PR \succ M\,1 \succ PT \succ T.$$

Equal apportionment (E) is the Condorcet winner and trade (T) is the Condorcet loser. This means that a majority of colonies would receive a greater metric share from equal apportionment than from any of the other apportionments discussed in 1774 and that a majority of colonies would receive smaller metric shares from an apportionment based on trade than from any of the other apportionments. The reason for the two relationships is clear. Seven of the thirteen colonies were "small": New Hampshire, Rhode Island, Connecticut, New Jersey, Delaware, South Carolina, and Georgia. They received larger metric shares from equal apportionment than from any of the other apportionments, providing a clear majority of the thirteen colonies. Similarly, eight of the thirteen colonies, New Hampshire, Connecticut, New Jersey, Delaware, Virginia, North Carolina, South Carolina, and Georgia, would receive the smallest share from a trade-based apportionment because two-thirds of the nation's trade came through Massachusetts, New York, and Pennsylvania, leaving only a third of the metric share to be divided among the remaining ten colonies. Hence, any of the other apportionments would produce a larger metric share for a majority of colonies than trade.

This does not mean that a metric could not be created that dominates E; the divide-the-dollar game suggests that such an apportionment can always be created. But if delegates restricted themselves to the metrics listed in table 3.1, perhaps because they found them to be the only reasonable ones, then E would be in equilibrium (as defined by the core). Larger colonies may have disliked it, but there was little that they could have done to dislodge equal apportionment.

Equal apportionment had three advantages: (1) a majority of colonies received greater metric shares from equal apportionment than from any of the other ideas discussed, (2) it had been used before, and (3) Congress did not have the information needed to implement the other ideas.[2]

In 1774 Congress agreed that each colony could choose to send between

2. Equal apportionment would remain the Condorcet winner if the average value of exports 1791–1793 were used in place of the average registered tonnage in foreign trade 1793–1795. Furthermore, the data produce the same Condorcet ordering if population figures from 1790 are used in place of population figures from 1780, which is useful for later comparisons to the Constitutional Convention of 1787.

two and seven delegates to Congress, but voting would be by colony, with each colonial delegation casting a single vote. Each colony's vote would be determined by a majority of its delegation. If members of the delegation split evenly, perhaps because there were an even number of delegates, the colony's vote would be counted as "divided."

The Articles of Confederation

The debate over the proper metric of apportionment continued in 1776 when colonies were converted into states and Congress began drafting the Articles of Confederation. John Dickinson chaired the committee that produced the first draft. The Dickinson draft, as it was later known, enumerated equal apportionment for all questions before Congress, consistent with established practice.

When apportionment came up for discussion on July 30, Benjamin Franklin (PA) argued against equal division. He thought the confederation would not last long if the small states had an equal vote without an equal burden and suggested that the small states should contribute equal money to the union if they wanted an equal say over common funds (Butterfield 1961, 2:496). The next day Franklin proposed to replace equal apportionment with population (Ford et al. 1904–1937, 6:1081). Benjamin Rush pointed out that "Montesquieu pronounces the confederation of Lycia, the best that was ever made" (Ford et al. 1904–1937, 6:1081). In that confederation "the cities had different weights in the scale."

Henry Middleton (SC) developed Franklin's first idea about contributions. He wanted to apportion Congress according to the amount each state paid to the national government (Ford et al. 1904–1937, 6:1081). Although he did not elaborate on his reasons, the idea was to give states that paid more to the common fund a greater say over common spending. It may have also given them some incentive to contribute. Massachusetts apportioned one chamber of its legislature this way in the early 1780s (Taylor 1961). Ironically, John Dickinson, who supported equal apportionment in 1776 when he represented Pennsylvania, supported contributions when he represented Delaware in 1787. Dickinson favored contributions (based on returns from previous years) in 1787 because he feared equal apportionment would give future western states too much voice (Hutson 1983). He thought small eastern states, such as Delaware, would have a slightly larger voice if they used state contributions.

Samuel Chase (MD) observed that "the larger colonies had threatened they would not confederate at all if their weight in Congress should not be

equal to the numbers of people they added to the confederacy; while the smaller ones declared against a union if they did not retain an equal vote for the protection of their rights" (Ford et al. 1904–1937, 6:1102). He suggested "that in votes relating to money, the voice of each colony should be proportioned to the number of its inhabitants," and for votes unrelated to money, each state should have an equal vote (Ford et al. 1904–1937, 6:1102).

Earlier, Roger Sherman (CT) proposed a different mix. He thought, "The vote should be taken two ways; call the Colonies, and call the individuals, and have a majority of both" (Ford et al. 1904–1937, 6:1081). The ideas presented by Chase and Sherman were not given further consideration (Jensen 1959, 143). As a result, metric shares for those ideas will not be included in the analysis.

John Witherspoon (NJ) objected to any modification of the principle of one state one vote, and defended the idea eloquently:

> The colonies should in fact be considered as individuals; and that as such in all disputes they should have an equal vote. [T]hey are now collected as individuals making a bargain with each other, and of course [have] a right to vote as individuals. [H]e admitted that equality of representation was an excellent principle; but it must be of things which are co-ordinate; that is of things similar, and of the same nature. (Ford et al. 1904–1937, 6:1103)

Witherspoon viewed the Articles of Confederation as a compact between sovereign states. As such, he thought each state should be treated equally, like countries are treated equally in the United Nations today.

The August 20, 1776, draft of the Articles of Confederation included equal apportionment (Jensen 1959, 144). The only concession for the large states was an agreement that for matters of great importance, nine of the thirteen state delegations would be needed to pass proposals, rather than the usual seven. This assured that a minority of the people in the union, living in the small states, would not rule the majority of people in the union, living in the large states. By 1784 attendance in the Confederation Congress dwindled and many members began to regret the supermajority requirement because it felt like unanimity among the states attending (Jillson and Wilson 1994).[3]

The issue was not considered again until October 7, 1777. Instead of pro-

3. For more on the attendance problem and Congress's pleas to the states, see Boyd and Lester 1950–2001, 26: 245; 27: 421–22, 631–32; 28: 629–30.

posing a population-based apportionment, which had insufficient appeal in the past, the large state delegates now proposed two ad hoc apportionments and one based on contributions instead, though the exact proposer of each was not recorded in the journal.

The first proposal gave one vote for every 50,000 white inhabitants and guaranteed at least one vote for the states that did not have at least 50,000. Presumably, any excess population would be discarded when calculating increments of 50,000. Only Pennsylvania and Virginia supported this measure. The second proposal gave one vote for every thirty thousand inhabitants, without specifying race. It too failed with only Virginia voting in favor of it. A third proposal was then made to apportion Congress according to the amount of money each state contributed to the common treasury. Again, Virginia was the only state supporting the motion. A vote was then taken on equal apportionment, as reported in the Dickinson draft, which passed. The victory of the small states was complete. Equal apportionment was enumerated in Article V of the Articles of Confederation, which was sent to the states for ratification on November 15, 1777.

Dominance

The metrics of apportionment formally proposed for the Articles of Confederation are listed in table 3.2. Among them, equal apportionment (E) and total population (P) were previously considered for the First Continental Congress. See the chapter appendix for the metric shares from each apportionment, a description of how each metric was calculated, and the sources of the data.

If delegates voted for the metric that gave their state the greatest share, again a Condorcet ordering would exist:

$$E \succ F \succ H1 \succ P \succ H2 \succ Co.$$

A majority of states would prefer equal apportionment (E) to any of the other five proposals. In this sense, equal apportionment would remain the natural choice. Not only was it the precedent from the First Continental Congress and easy to calculate, none of the other proposals would have given a majority of states greater voice. Hence, there is no reason to have expected the status quo, E, to change.

Equal apportionment is the Condorcet winner because six of the small states, New Hampshire, Rhode Island, New Jersey, Delaware, South Carolina, and Georgia, received larger apportionments from equal apportion-

TABLE 3.2. Apportionments Proposed for the Articles of Confederation

Label	Basis of Apportionment	Proposer	Source
E	equal apportionment	Dickinson Draft	6:1079
P	total population	Franklin (PA)	6:1081
Co	state contributions to the central government	Middleton (SC)	6:1081
F	free population	Wilson (PA)	6:1105
H1	one delegate for every 50,000 white inhabitants	unknown	9:779
H2	one delegate for every 30,000 inhabitants	unknown	9:780

Note: Apportionments are presented in the order in which they were proposed. Sources refer to volumes and page numbers in Ford et al. (1904–1937).

ment than either of the two population-based apportionments, the two ad hoc apportionments, or state contributions in the 1780s.[4] If one additional state worked with the six-state coalition, which in each case at least one state did, equal apportionment would have had the majority needed to defeat any other proposal.

State contributions is the Condorcet loser in this case because, like trade during the First Continental Congress, the distribution of contributions to the union were extremely skewed. The six states that ranked state contributions last (New York, Delaware, and all Southern states except Virginia) made only 3 percent of the contributions to the union combined. The remaining seven states made 97 percent of the contributions combined. In any pairwise comparison, at least six of the states would oppose the metric of state contributions. If at least one other state received a smaller metric share from state contributions than the other metric in the pair, which at least one state did, then state contributions would be dominated by the other proposal.

The distinction is this. Equal apportionment is an absolute winner for six states, and could win any pairwise contest with the help of an additional state, which it always got, whereas state contributions is an absolute loser for six states, requiring only one state to share that view in a pairwise contest to be defeated, which is always got.

Interestingly, state contributions remains the Condorcet loser if requisition payments in 1784–1789 (Dougherty 2001, 95) are used in place of state contributions prior to 1782. Furthermore, roughly the same Condorcet ordering is produced if 1790 figures are used in place of 1780 figures.[5] The only difference

4. Connecticut received greater metric shares from state contributions, free population, and one delegate for every 50,000 white inhabitants than from equal apportionment.

5. The 1790 figures contain both population from the 1790 census as well as state requisition payments in 1784–1789 (Dougherty 2001, 95).

between the two orderings is that P and H2 switch positions and H1 and P tie.[6] This suggests that a strict ordering with equal apportionment as the Condorcet winner is robust.

The important thing to note is that eleven different metrics of apportionment were considered during the prefederal period. Equal apportionment produced greater metric shares for a majority of the states than any other idea proposed. Equal apportionment was the unique solution from the small-state perspective because it was the status quo established by the First Continental Congress and it created the largest metric share for the small states of New Hampshire, Rhode Island, New Jersey, Delaware, South Carolina, and Georgia. None of the other eight proposals maximized metric shares for so many states. Because the other proposals measured state size, or partially weighted state size, these six states would experience a considerable drop off in their metric share if the nation moved from equal apportionment to one of their second-best options. As a result, equal apportionment was deeply embedded.

Exactly how equal apportionment was dislodged at the Constitutional Convention of 1787 is the topic of the next section.

The Constitutional Convention

Madison arrived in Philadelphia on May 3, 1787, eleven days before the convention was scheduled to start, to talk informally with delegates, most notably those from the Pennsylvania delegation.[7] Earlier he had urged Edmund Randolph, the governor of Virginia and natural leader of the Virginia delegation, to arrive a week before the convention so they might take the lead in preparing "some materials for the work of the Convention" (Madison to Randolph, April 15, 1787, Hutchinson and Rachel 1962–1989, 9:379). It is believed that during this time, Madison, Randolph, and members of the Virginia and Pennsylvania delegations drafted the Virginia Plan. With Charles Pinckney and John Rutledge arriving on May 17, two of the South Carolina delegates may have joined them.

6. H1 and P tie because for Rhode Island the metric shares for H1 and P differ by less than 0.001, making Rhode Island indifferent. The remaining twelve states split between the two apportionments, six favoring P and six favoring H1.

7. Large parts of this section come from a coauthored article, Gordon Ballingrud and Keith L. Dougherty, 2018, "Coalitional Instability and the Three-Fifths Compromise," *American Journal of Political Science* 62 (4): 861–72.

The plan outlined a strong national government that acted on people rather than states. The government would have three branches: legislative, executive, and judicial. The legislature would be divided into two chambers. The upper branch would be elected by members of the lower branch, with each branch having the right to originate acts. More importantly, both chambers would be apportioned according to "the quotas of contribution, or the number of free inhabitants" (Hutchinson and Rachel 1962–1989, 10:12–18). Presumably members of the convention would pick one of the two. Or they could apply the quotas of contribution to one chamber and free population to the other.

When the convention started, members quickly adopted procedural rules. Votes would be conducted in state blocs, with each delegation casting one vote. Rather than requiring yeas from a majority of the states in the union for passage, the convention required more states to vote yea than nay with seven states comprising a quorum.

The convention's remaining rules facilitated an institution-free environment. Any delegate could make a motion, propose to table a motion, or proposed to revisit a motion that had previously passed or failed (Dougherty 2019). There were no assembly leaders, no rights of first recognition, and no political parties. Nor were there other mechanisms that might give a single delegate, or a group of delegates, innate control of the agenda. Washington presided over the meetings but he had no special powers, similar to the president pro tempore in a modern Senate. With decentralized rules such as these, the influence of each delegate depended upon their personal qualities, not their position as an institutional leader.

The issue of apportionment dominated the first seven weeks of the Constitutional Convention and created an impasse that threatened to derail the proceedings. The dominant historical narrative about apportionment describes a conflict between two dominant coalitions, a large-state coalition and a small-state coalition (Farrand 1913; Rakove 1987; Robertson 2013; Klarman 2016). The large-state coalition, generally considered Virginia, Pennsylvania, and Massachusetts, alongside the rapidly growing Southern states of Georgia, South Carolina, and North Carolina, championed proportional representation based on population. Advocates such as James Madison argued that population-based apportionment was fair because people should have equal representation in government, not states. The small-state coalition, formed by Connecticut, New York, New Jersey, Delaware, and Maryland, vigorously defended equal representation, consistent with the precedents set by the Continental Congress and the Articles of Confederation. Small-state delegates, such as William Paterson (NJ), Luther Martin (MD), and Gunning Bedford

(DE), argued that states were confederated on equality and if they conceded to proportional representation, the large states would "crush the small ones" (Klarman 2016, 188; Farrand 1966, 1:167). The impasse seemed unsolvable until the Connecticut delegation proposed the Great Compromise, also known as the Connecticut Compromise, with proportional representation in the House and equal representation in the Senate.

While the classic large-state/small-state divide was central to the debates in Philadelphia, other scholars have noted important departures from that narrative. Jillson and Eubanks (1984) challenge the simple, size-based narrative by demonstrating that voting blocs shifted depending on whether the convention addressed "higher-order" (philosophical) or "lower-order" (interest-driven) questions. The Deep South joined the large-state coalition because their delegates anticipated greater population growth in their states than in other states and ultimately viewed the decision as a "lower-order" decision. Fehrenbacher (2001) observes that the debate over proportional representation extended beyond population, with proposals including metrics based on wealth and the quota of contribution. Nevertheless, he argues that the Three-Fifths compromise was one of the few proposals that could ultimately succeed because the three largest states would not surrender power to a stronger national government unless they had the protection of proportional representation. States from the Deep South needed property to find proportional representation sufficiently enticing.

More recent quantitative studies have analyzed why the Great Compromise succeeded and its subsequent effects on the structure of the legislature. Pope and Treier (2011) use roll-call analysis to examine why various large-state delegates switched positions. They find that Massachusetts's shift toward the compromise was consistent with deliberation and moderation, while North Carolina's shift resulted from agenda effects, specifically linking representation to taxation. Dougherty and Hitefield (2024) test the effects of the compromise on subsequent voting and find that, contrary to conventional wisdom, the overall probability of passing nationalist proposals was not significantly changed by the compromise. The compromise did, however, affect the proceedings. After the compromise, large-state delegates increasingly supported strengthening the power of the House relative to the Senate, while small-state delegates resisted the move.

The problem with the classic characterization of two coalitions fighting over apportionment is that delegates formally proposed eighteen different metrics of apportionment over the course of the convention, seventeen of which were "proportional." Different coalitions formed over different appor-

tionments depending upon which pairs were considered. In other words, there were multiple coalitions, not just two.

In addition, three states seem misplaced by the characterization. Georgia was the smallest state in the union, both in population and in wealth, but as Madison noted "she is actuated by the prospect of soon being a great one" (Farrand 1966, 1:491). South Carolina had a smaller free population than New Jersey, yet both South Carolina and Georgia voted as if they would soon be among the large states. From 1780 to 1790 Georgia's population had grown by 47 percent and South Carolina's population had grown by 38 percent, making a population-based apportionment enticing for both states.[8] A substantial percentage of their populations, however, were enslaved. To secure the support of these two states, slaves might have to be included in the apportionment.

New York had the fourth largest population but voted with the small states because two of its three delegates were antifederalists who did not want to change the system of representation enumerated by the Articles of Confederation. After those two delegates left on July 10, Alexander Hamilton's vote was rendered useless because members of the New York assembly required at least two delegates to represent their state.

Nine of the eighteen apportionments proposed at the convention were principled and nine were ad hoc. Ad hoc means that the distribution cannot be generalized after a new state is admitted. An ad hoc apportionment might read "three seats for New Hampshire, eight for Massachusetts, etc." Such distributions were proposed for the first House of Representatives, before a proper census could be taken. The remaining analysis focuses exclusively on the nine principled metrics because delegates wanted a perpetual union that could adjust to new states and changing demographics. Table 3.3 lists the nine principled apportionments proposed over the course of the Constitutional Convention in the order in which they were introduced. State contributions (also known as the quotas of contribution), free population, equal apportionment, property, and total population have been introduced previously.

The Three-Fifths Clause (3f) was proposed by James Wilson (PA). In its final form, it apportioned a chamber by "the whole number of white & other free Citizens & inhabitants of every age sex & condition including those bound to servitude for a term of years and *three-fifths of all other persons* not comprehended in the foregoing description except Indians not paying taxes,

8. Growth in both states continued but at a much slower rate relative to the other states than had been predicted. By 1820, South Carolina was ranked fourteenth in free population and Georgia was ranked sixteenth, out of 26 states. Six of those states had been admitted after the previous census.

TABLE 3.3. Principled Apportionments Proposed at the Constitutional Convention

Label	Basis of Apportionment	Proposer	Source
Co	quotas of contribution (taxes paid)	VA Plan	1:20
F	free population	VA Plan	1:20
E	equal representation	Sherman (CT)	1:196
3f	free population & three-fifths slaves	Wilson (PA)	1:201
R	property	Baldwin (GA)	1:469–70
S	one senator for every 100,000 souls	Wilson (PA)	1:488
H3	one rep. for every 40,000 people	Gerry Committee	1:523, 526
P	total population	Butler / C.C. Pinckney (SC)	1:580
H4	one rep. for every 30,000 people	Gorham (MA)	2:643–44

Note: Apportionments are presented in the order in which they were proposed. Sources refer to a volume and page number from Farrand (1966). For H3 and H4, "people" refer to the number of people under the Three-Fifths Clause. See the chapter appendix for metric shares, a description of how each metric is calculated, and data sources.

in each State" (emphasis added, Farrand 1966, 1:201). "All other persons" referred to slaves.

The three-fifths ratio was an estimate of a slave's ability to produce wealth compared to that of a free man (Fehrenbacher 2001, 41). Wilson had reason to believe that the ratio might succeed because that ratio had been used in the past (Ford 1904–37, 24:260–61; Farrand 1966, 1:205). Eleven states agreed to the ratio in 1783, giving it the nickname the "federal ratio." In 1783, however, it was used to apportion congressional requisitions (i.e., taxes) not to distribute seats in Congress (i.e., votes). In 1787, the federal ratio was a way of combining free population, which Wilson favored, with property, which delegates from the Deep South favored. Initially delegates from the larger states wanted to apportion at least one branch of the national legislature using the federal ratio. Requiring taxes to be distributed according to the same ratio came later in the proceedings.

Anyone who thinks the Three-Fifths Clause was a natural extension of the 1783 principle should consider that the 1783 principle could have been applied in a variety of ways. In the antebellum South, Georgia counted white inhabitants and three-fifths of all Blacks, thereby lumping together free Blacks and slaves. Florida counted white inhabitants and three-fifths of slaves, thereby omitting free Blacks and nonwhites who were not enslaved (Thorpe 1909, 2:676, 791, 5:2795).

On June 13 the Committee of the Whole made its report, which included the Three-Fifths Clause for both chambers of Congress. Delegates from the small states dug in, at which point both sides used a range of tactics, "everything from heavy-handed threats and poker-faced bluffs to heartfelt pleas

for accommodation, from candid avowals of interest to abstract appeals for justice" (Rakove 1987, 424). In the midst of the debate, Wilson proposed another compromise. For the upper chamber he proposed one senator for every 100,000 souls, S in table 3.3 (Farrand 1966, 1:488). States with less than that number would have one representative each. He thought this was a "temporary concession to the small States: and threw out the idea as a ground of compromise" (Farrand 1966, 1:488).

The issue was assigned to a committee chaired by Elbridge Gerry (MA), which later recommended apportioning the lower chamber one member for every 40,000 people as calculated by the Three-Fifths Clause, H3 in the table. Ballingrud and Dougherty (2018) treat it as a separate metric because it is general and it produces a different distribution of seats than the Three-Fifths Clause itself.

Dominance

It is important to note that the analysis of dominance relationships applies to bicameral legislatures as well as unicameral legislatures. To see this, let (A,B) indicate a bicameral legislature apportioned with metric A in the first chamber and metric B in the second chamber. If metric C dominates metric A in a unicameral legislature, then A is not coalitionally stable. Moreover, in the comparison of bicameral apportionments (A,B) and (C,B), if C dominates A, then it must be the case that (C,B) dominates (A,B). Hence, (A,B) is not coalitionally stable either. In other words, an apportionment that is not unicamerally stable cannot be part of a coalitionally stable bicameral legislature. For this reason, dominance comparisons are made one chamber at a time.[9] Comparisons based on the average metric share from both chambers are briefly examined at the end of the "Robustness" section below.

For all thirteen states in the union, the dominance relationships among the nine metrics of apportionment proposed at the Constitutional Convention would be:

$$E \succ F \succ 3f \succ P \succ H3 \succ (\text{cycle of R, S, H4}) \succ Co.$$

Equal apportionment (E) would be the strict Condorcet winner again and state contributions (Co) would be the strict Condorcet loser. If delegates restricted themselves to the metrics presented in table 3.3, then E would

9. Results from 45 bicameral apportionments, $= \binom{9}{2} + 9$, are available upon request.

remain in equilibrium. Not much would have changed from the earlier periods, even with a new set of proposals. Hence, the set of proposals cannot be the reason E was dislodged.

Furthermore, because equal apportionment was the Condorcet winner at the First Continental Congress and during the creation of the Articles of Confederation using 1790 figures, a majority of states would receive greater metric shares from equal apportionment than from each of the other fifteen unique proposals made during the two decades prior to the Constitution. If the only thing that changed during that period was New York and Connecticut acting like small states and Georgia and South Carolina acting like large states, then equal apportionment would still be entrenched. Something else dislodged equal apportionment . . . two of the small states did not vote on the issue.

Rhode Island never sent a delegation to the convention, and the New Hampshire delegation did not arrive until the apportionment issue was largely resolved. This meant that at least two states that were strong advocates for equal apportionment were absent. To exacerbate matters, two of the three delegates from New York left the convention on July 10, eliminating another small-state advocate and creating three periods of attendance: May 30 to July 10, when New York attended but New Hampshire and Rhode Island did not; July 11 to July 22, when neither New York, New Hampshire, nor Rhode Island attended; and July 23 to September 17, when New Hampshire attended but New York and Rhode Island did not. The small states could not control apportionment without their usual numbers.

The Three-Fifths Clause passed in the first period and was accepted as part of the Great Compromise during the second period. Because the issue of apportionment was largely resolved before the third period, the analysis focuses on the first two.

The absence of New Hampshire and Rhode Island changed the dominance relationships. Equal apportionment no longer dominated the other metrics proposed at the convention with two of its proponents missing. Instead, every metric of apportionment, including equal apportionment, was caught in a top cycle with each apportionment dominated by at least one other. The relationships are displayed in figure 3.1. An arrow from B to A in the figure indicates that A dominates B. Every node (i.e., every metric of apportionment) has at least one outgoing arrow because every metric of apportionment is directly dominated by another metric. This includes both a chamber apportioned according to the Three-Fifths Clause and a chamber apportioned equally: the apportionments ultimately agreed upon for the House and Senate, respectively. The fact that every metric is directly domi-

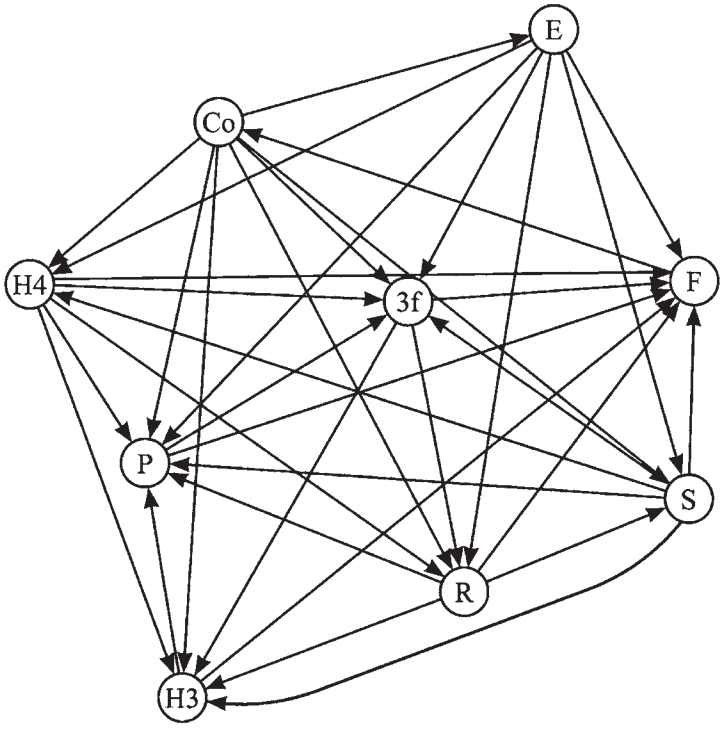


Fig. 3.1. Dominance Relationships among 11 States

nated by another metric is similar to the result of the divide-the-dollar game. The game in 1787 is more surprising, however, because there would have been coalitional stability with thirteen states voting, but there was coalitional instability with eleven states voting.

Consider the Three-Fifths Clause, which was ultimately adopted for the House. A majority of states would have received greater metric shares from three different metrics of apportionment than they would from the Three-Fifths Clause (3f): free population (F), property (R), and one representative for every 40,000 people (H3). Furthermore, a majority of states would have received greater metric shares if the Senate was apportioned by one of six different metrics rather than equal apportionment. These include free inhabitants (F), the Three-Fifths Clause (3f), and total population (P). For every apportionment, including those appearing in the original Constitution, a majority of states would have received greater metric shares from adopting something else.

Among the convention's 9 metrics, there were 11 vote cycles of length three (i.e., 11 different three-tuples were in a cycle similar to the one presented in chapter 2). Three of them were 3f $\succ$ Co $\succ$ F $\succ$ 3f; F $\succ$ E $\succ$ Co $\succ$ F; and 3f $\succ$ 5f $\succ$ Pr $\succ$ 3f, each of which contains a metric enumerated in the original Constitution.

Of course, cycles are not limited to three-tuples. They can contain any number of metrics in the intermediate steps. In our case, the entire set of apportionments is in a top cycle. Such a result is reminiscent of Plott's (1967) and McKelvey's (1976) discovery of majority cycling in multidimensional spatial voting theory. Unless specific conditions are met, no alternative is in equilibrium and majority rule produces an intransitive relation for the convention.

The Three-Fifths Clause

Historians have repeatedly asked why the Three-Fifths Clause was proposed at the Constitutional Convention and why it was adopted. While a wealth of historical arguments are based on archival documents, consider an explanation based on metric shares. Delegates were aware of metric shares and were remarkably accurate in their estimates of how each metric was distributed among the states.[10] State delegations did not always vote in favor of the larger metric share for their state, as was the case for Lansing and Yates from New York. Nevertheless, one can gain insights by assuming they did.

When the Dickinson committee proposed its first draft of the Articles of Confederation 11 years earlier, 13 state delegations made the decision. Because equal apportionment (E) was the status quo and was the only coalitionally stable metric among those considered, it is not surprising that equal apportionment could not be dislodged.

But things changed at the Constitutional Convention because Rhode Island and New Hampshire were no longer decision makers. On May 29, Edmund Randolph began the substantive business of the convention with the introduction of the Virginia Plan. The Virginia Plan recommended that the lower chamber be apportioned according to free population or the quota of contribution. To avoid getting bogged down in the particulars, delegates quickly agreed to reject the "equality of suffrage established by the Articles of Con-

10. For example, David Brearley (NJ) estimated the white population of each state in his notes (Farrand 1966, 1:573). While the total differed from the 1790 census by roughly 750,000 people, each state's *proportion* of the total differed from the 1790 census by an average of only 0.007 per state.

federation" (Farrand 1966, 1:36). Two votes later the convention agreed that the legislature ought to be bicameral, following the suggestion of prominent thinkers such as Montesquieu.

On June 11, the convention resumed its discussion of apportionment. John Rutledge and Pierce Butler of South Carolina proposed quotas of contribution (Co) for the lower house, one of the two apportionments in the Virginia Plan. Before it could be voted upon, Wilson jumped from his seat to propose the Three-Fifths Clause in its place. This is an interesting juncture because both South Carolina and Wilson's state of Pennsylvania were part of the large-state coalition. While Rutledge and Butler proposed one prong of the Virginia Plan, Wilson proposed the other, with the Three-Fifths Clause added in to sweeten the pot for the Deep South.

Wilson was one of the greatest advocates of popular sovereignty and one of the most faithful democrats at the convention (Farrand 1966, 1:605; Hall 1997, 90). He believed in popular government and wanted popular institutions. He preferred apportioning the legislature by free inhabitants (F) to the Three-Fifths Clause (3f) and the Three-Fifths Clause to various property-based apportionments such as the one proposed by the South Carolina delegates. Wilson favored F to 3f because his state had few slaves, he opposed slavery, and he would not want an institution that perpetuated slavery (Farrand 1966, 1:587). His preference for free population is further shown in his 1776 proposal of *free* population as the proper apportionment for Congress. Given his preferences, it may be surprising that he proposed the Three-Fifths Clause rather than free inhabitants. The Three-Fifths Clause went against his convictions and provided a smaller metric share for Pennsylvania.

The reason Wilson proposed the Three-Fifths Clause appears to have been strategic. The "large-state" coalition that was soon to emerge at the convention included Massachusetts, Pennsylvania, and four Southern states: Virginia, North Carolina, South Carolina, and Georgia. Wilson may have included slaves to gain the support of South Carolina and Georgia, which were teetering between equal apportionment (which advantaged them now) and population (which may have advantaged them in the future).

For Wilson, proposing the Three-Fifths Clause would improve the chances of a popular apportionment eventually succeeding. Wilson believed slavery's days were numbered, and, through the course of normal politics, the institution would soon be extinguished (Hall 1997, 60; Van Cleve 2010, 178). If this were the case, passing the Three-Fifths Clause would eventually achieve his goal: an apportionment based on free population that was consistent with his opposition to slavery. Wilson's motion passed in the Committee of the Whole

with nine states supporting it and only New Jersey and Delaware opposed (Farrand 1966, 1:201).

It is important to reflect on Wilson's initial strategy because it is a major reason why the Three-Fifths Clause was adopted. Suppose Wilson thought that delegates would vote in favor of their state's metric share on each vote, and he carefully compared the metrics laid on the table: E, 3f, and Co, as well as his preferred metric F. He would know that a majority of states would prefer Rutledge and Butler's motion of Co over F, so he could not propose F without it quickly being defeated by Co in a subsequent vote. He would have also known that a majority of states would prefer 3f to Co and a majority would prefer 3f to E, making 3f a reasonable proposal. If 3f was proposed, it would provide an overture to Southern interests, and it would defeat Co if someone like Rutledge, Butler, or Dickinson tried to propose it again. The Three-Fifths Clause would also defeat equal apportionment if the small states reintroduced E, which seemed likely. This made 3f a reasonable introductory move, one that would defeat the other two metrics on the table. Moreover, the only thing that could defeat 3f among the four metrics was F, which is what Wilson ultimately wanted. A House apportioned according to free population could be either proposed later in the convention or it might naturally come into existence after slavery's end.

As soon as the Three-Fifths Clause was initially adopted for the House, Roger Sherman (CT) proposed equal apportionment for the Senate, which failed five states to six. This was a premature proposal of the Great Compromise: three-fifths for the House and equal apportionment for the Senate. Had it passed at this early stage, the convention might have saved itself considerable grief. Instead, Wilson and Hamilton countered with a proposal to apportion the second branch using the same metric as used in the first, which quickly passed with the six "large" states voting in favor (Farrand 1966, 1:202). At the end of the day, the Committee of the Whole agreed to the Three-Fifths Clause for both houses.

Two weeks later, Lansing (NY) and Jonathan Dayton (NJ) proposed equal apportionment for the House again, which failed 4-6-1. Metric shares would have predicted this outcome. The debate continued: Delegates from both the large and small states tried to break the other side (Rakove 1987). Some of the arguments reflected deep conviction while others openly advanced the interests of a state. Shortly after equal apportionment for the House failed, Oliver Ellsworth from Connecticut proposed equal apportionment for the Senate. This proposal was defeated, but now by the narrow margin of 5-5-1. Abraham Baldwin (GA) defected from the large-state coalition, causing his

state to divide. The proposal did not pass, but it was clear that a few delegates in the large state coalition were willing to compromise. Delegates immediately referred the apportionment issue to a committee. Before the committee could report, Rutledge proposed Co again for the first branch. Although his proposal failed, as metric shares would predict, the proposal demonstrated that Co was a threat. Had Wilson proposed F instead of 3f and it passed, F may have been replaced by Co at this juncture.

A committee report on July 5 contained the basis of the Great Compromise: three-fifths for the first chamber and equal apportionment for the second (3f, E). Two days later, the convention preliminarily accepted equal apportionment for the second branch in a vote of 6-3-2. North Carolina had changed positions, because of subtle changes in the proposal (Pope and Treier 2011), while Massachusetts and Georgia both divided, because their delegates started to see the need for compromise.

New York departed three days later, changing the dominance relationships once again. There was no longer a strict cycle among all of the apportionments proposed, nor among any subset. Instead, 3f, F, P, and E were all weak Condorcet winners among the nine metrics of apportionment listed in table 3.3. The remaining five metrics were dominated by at least one of the metrics listed in the table. Of course, 3f, F, P, and E tied among themselves. With (3f, E) temporarily adopted and New York out of the picture, the convention settled down into a temporary equilibrium of (3f, E). On the same day, Butler and General Pinckney of South Carolina insisted that total population (i.e., five-fifths of the slaves) replace the Three-Fifths Clause in the House (Farrand 1966, 1:580). It was another attempt to sweeten the pot for the Deep South, this time proposed by delegates from the Deep South. It failed as metric shares would predict.

To broaden the appeal of the Three-Fifths Clause and to shield Northern delegates from the inevitable criticism of it during the ratification process, Wilson then proposed that both House seats and direct taxes be apportioned according to the Three-Fifths Clause. The South would then pay taxes based on free population plus three-fifths of its slaves. The idea passed 6-2-2 which sealed the Great Compromise on July 16.

Five days later delegates from New Hampshire arrived, ending the temporary stability of the Three-Fifths Clause caused by New York's absence. The temporary stability was long enough for the convention to settle on a metric for both chambers. New Hampshire's arrival made E a Condorcet winner again, but apportionment was such a touchy issue that most delegates did not want to reconsider it.

Such a narrative explains how the infamous Three-Fifths Clause was adopted for the House, but it does not explain how equal apportionment was allowed back into the Senate. The answer to that is the small-state interest in equal apportionment was so entrenched that the small states would not have ratified the Constitution without this concession. Equal apportionment was a unique solution from the small-state perspective because it had been the status quo for decades and created the largest metric shares for New Hampshire, Rhode Island, New Jersey, and Delaware.[11] None of the other eight proposals maximized metric shares for that many states. Because the other proposals were proportional, meaning they measured or partially weighted state size, these four states would experience a considerable drop-off in their share of the apportionment if the nation moved away from equal apportionment to one of their second-best options. For example, moving from equal apportionment to the Three-Fifths Clause reduced the metric shares of those four states by an average of 58 percent. Wary of a looming battle over ratification, it must have been obvious to some of the large-state delegates that they would have to allow equal apportionment in one of the chambers.

Wilson could have proposed free population in place of the Three-Fifths Clause later in the convention. But he chose not to, perhaps because delegates had managed to come to some agreement over an extremely divisive issue. If he managed to replace the Three-Fifths Clause with free population, it would have upset the Southern states and might have led someone to propose a property-based apportionment that could defeat free population. Given his belief that slavery would soon be extinguished through normal politics, he may have felt confident that this compromise position would evolve into his first preference, perhaps within his lifetime.

After the Constitution was ratified, (3f, E) remained in place because the Constitution required three-quarters of the states to ratify amendments. None of the apportionments listed in table 3.3 could defeat the Three-Fifths Clause in the House or equal apportionment in the Senate using a three-fourths supermajority rule. Nor could other apportionments, such as the ad hoc apportionments proposed at the Constitutional Convention. This made (3f, E) stable under the Constitution, much like E was stable under the Articles of Confederation. A brief window of opportunity at the Constitutional Con-

11. It also maximized the metric shares of South Carolina and Georgia. With the expansion of slavery in the South, South Carolina would have a larger metric share under total population than equal apportionment as early as 1810. Georgia, whose delegates mistakenly behaved as if their state would become highly populated and wealthy relative to other states, received larger metric shares under equal apportionment than total population as late as 1820.

vention allowed the Three-Fifths Clause to slither in as the metric. Once that window closed, (3f, E) was held in place by supermajority rules.

Robustness

Up until this point, the analysis has focused on a limited set of metrics that delegates found worthy of proposing at the Constitutional Convention. But what if delegates thought the metrics in their notes and the ones mentioned in debate were also worthy of consideration? Including such metrics creates a list of 18 apportionments, two of which are new to our study: wealth (W) and taxes requested (X). On July 6, William Davie (NC) floated the idea of apportioning the Senate based on wealth, but he did not formally propose it (Farrand 1966, 1:542). Taxes assigned to each state appeared as a possible apportionment in David Brearley's notes of the convention (Farrand 1966, 1:574). Although adding these metrics makes the analysis more cumbersome, it does not affect the primary result. With thirteen states, equal apportionment (E) is still a strict Condorcet winner as was the case earlier in this chapter. With Rhode Island and New Hampshire excluded, the eighteen metrics of apportionment would be in a top cycle, including the cycle 3f $\succ$ Co $\succ$ F $\succ$ 3f. Furthermore, a majority of states would still prefer the Three-Fifths Clause to equal apportionment. Thus, the same conditions would exist that enticed Wilson to propose the Three-Fifths Clause. When New York departed, the window of opportunity would close and stability would return, as before. Equal apportionment and free inhabitants, however, would be the only weak Condorcet winners after New York departed, rather than the Three-Fifths Clause, total population, equal apportionment, and free inhabitants. Taxes requested (X), which was not formally proposed, would dominate the Three-Fifths Clause.

But what if delegates were forward looking, like the delegates from South Carolina and Georgia portended to be? As a separate robustness check, consider the same analysis of the nine metrics proposed at the convention using figures from 1800, 1810, and 1820 separately.[12] In each case, all the states in the

12. In each case, metric shares were calculated using the total number of states in the union at the time, but dominance relationships were compared using the subset of states present during the three periods of analysis: the original thirteen states, eleven states, and ten states. Data for the quotas of contribution came from United States (1832, 1:687 for 1800, 2:860–61 for 1810, and 3:438 for 1820). Alabama was not included in the 1820 figures because it did not submit a return in 1818. Property values came from Lindert and Williamson (2015) for 1800 and United States (1832, 3:99–100) for 1815. Ballingrud and Dougherty (2018) used 1815 property values for 1810. South Carolina's property values in 1815 came from South Carolina (1817). Virginia and Tennessee's

union are included but percentages are analyzed in three subsets: the original thirteen states, eleven states that attended the convention early, and the ten states that attended after New York left but before New Hampshire arrived. Using any year of these figures, equal apportionment (E) is the strict Condorcet winner with all thirteen states, as it was before. With Rhode Island and New Hampshire excluded, all the metrics are in a strict cycle with the exception of the quota of contribution (Co), which is a strict Condorcet loser in the 1800 and 1820 data. With New York also excluded, equal apportionment (E) is a weak Condorcet winner.

This suggests that our story is fairly robust for forward-thinking delegates. E would be in equilibrium among the original thirteen states. But without Rhode Island and New Hampshire, no metric would be stable, even if delegates considered metric shares three decades forward. All that would differ is that the Three-Fifths Clause would not be coalitionally stable during the second period. A commitment to compromise would have to keep it in place.

As a final robustness check, consider what would happen if delegates compared the average of their state's metric share across the two chambers rather than considering each chamber one at a time. Using the nine principled metrics proposed at the convention produces 45 possible bicameral apportionments that can be compared using the 1790 data. The results are surprisingly similar. With thirteen states, (E,E) is a strict Condorcet winner, consistent with the stability under the Articles of Confederation. With Rhode Island and New Hampshire excluded, all 45 bicameral apportionments are in a top cycle, with an average of only 1.5 steps from one bicameral apportionment to any other bicameral apportionment. With Rhode Island, New Hampshire, and New York excluded, partial stability returns with (E,E), (3f,E), and (P,E) all weak Condorcet winners.[13]

Conclusion

Sandy Levinson (2015) argued that the Three-Fifths compromise "was necessary to avoid dissolution of the fragile United States." The Three-Fifths Clause was morally repugnant and could only be defensible as the glue needed to

property values in 1815 were estimated using a simple regression of the 1815 figures on the 1800 figures. Property values were omitted from the analysis for 1820 because data after 1815 could not be found and any such data would have to include Indiana, Mississippi, and Illinois, which joined the union between 1815 and 1820. Remaining data came from the decennial census.

13. For these statements bicameral apportionments such as (3f,E) should be considered unordered pairs.

bind the union together. But as this chapter has shown, the apportionment of the House of Representatives did not result from a choice between the Three-Fifths compromise or no constitution at all. There were dozens of apportionments considered for the Continental Congress, for the Articles of Confederation, and for the Federal Congress. The Three-Fifths Clause was only one of these options, one that combined the principle of popular consent with property.

Prior to the convention, equal apportionment was entrenched. It was adopted by the First Continental Congress because it was easy to calculate when surveys and censuses were not readily available. It was then adopted for the Articles of Confederation because a majority of states received a greater metric share from it than from any other apportionment considered. In the vernacular, equal apportionment was a Condorcet winner among the thirteen states. None of the other apportionments proposed during this period would have beaten equal apportionment if delegates voted for their state's metric share and all thirteen states participated in a vote. The reason that the Three-Fifths Clause succeeded was not that it was "the" apportionment that could beat equal apportionment. It was because the Three-Fifths Clause was proposed during a quirk in time when two of the small states that gained from equal apportionment were not among the decision makers. During that time, the Three-Fifths Clause did not uniquely dominate equal apportionment. Instead, all the apportionments considered were in a top cycle. Any one of them could have been selected after a series of votes.

The reason that the convention selected the Three-Fifths Clause appears to be that Wilson wanted a national government grounded in popular sovereignty. The Three-Fifths Clause was not his first choice. He preferred apportioning Congress based on each state's free population and hoped that slavery would soon wither away. As it turned out, slavery did not wither as Wilson had expected. Instead, it became the center of sectional tensions for another seventy-five years.

Finding cycles and the potential for unstable coalitions in the first third of the convention does not mean that cycles prevailed in other settings nor that they would readily appear with other aspects of apportionment, such as the ratio of representation or votes over chamber size. Cycles may have been less common in those arenas than they were in the prefederal period for metrics. The next chapter examines whether the instability extended to the ratio of representation.

APPENDIX

Table 3.4 lists the metric shares associated with each apportionment discussed at the First Continental Congress in alphabetical order. Table 3.5 lists the metric shares associated with each apportionment proposed for the Articles of Confederation. Both are based on 1780 data. The construction of variables and data sources are listed below.

TABLE 3.4. Metric Shares: First Continental Congress

State	E	M1	M2	P	PR	PT	T
NH	0.0769	0.0365	0.0368	0.0401	0.0351	0.0346	0.0291
MA	0.0769	0.1887	0.1123	0.1143	0.1113	0.2259	0.3375
RI	0.0769	0.0269	0.0175	0.0190	0.0167	0.0308	0.0426
CT	0.0769	0.0651	0.0704	0.0743	0.0685	0.0604	0.0465
NY	0.0769	0.1087	0.1005	0.0843	0.1085	0.1209	0.1576
NJ	0.0769	0.0338	0.0499	0.0502	0.0498	0.0256	0.0010
PA	0.0769	0.1315	0.1224	0.1177	0.1247	0.1384	0.1590
DE	0.0769	0.0117	0.0139	0.0163	0.0127	0.0094	0.0025
MD	0.0769	0.0870	0.0869	0.0883	0.0862	0.0864	0.0844
VA	0.0769	0.1602	0.2064	0.2097	0.2048	0.1355	0.0613
NC	0.0769	0.0765	0.0950	0.1008	0.0922	0.0643	0.0279
SC	0.0769	0.0581	0.0631	0.0647	0.0623	0.0548	0.0448
GA	0.0769	0.0154	0.0249	0.0202	0.0273	0.0130	0.0058

TABLE 3.5. Metric Shares: Articles of Confederation

State	Co	E	F	H1	H2	P
NH	0.0423	0.0769	0.0561	0.0488	0.0353	0.0401
MA	0.2881	0.0769	0.1599	0.1463	0.1176	0.1143
RI	0.0151	0.0769	0.0263	0.0244	0.0118	0.0190
CT	0.1070	0.0769	0.1028	0.0976	0.0706	0.0743
NY	0.0363	0.0769	0.1101	0.0976	0.0824	0.0843
NJ	0.0732	0.0769	0.0656	0.0488	0.0471	0.0502
PA	0.1797	0.0769	0.1633	0.1463	0.1176	0.1177
DE	0.0108	0.0769	0.0188	0.0244	0.0118	0.0163
MD	0.0437	0.0769	0.0648	0.0732	0.0941	0.0883
VA	0.1781	0.0769	0.1047	0.1707	0.2235	0.2097
NC	0.0257	0.0769	0.0927	0.0732	0.1059	0.1008
SC	0.0000	0.0769	0.0223	0.0244	0.0706	0.0647
GA	0.0000	0.0769	0.0127	0.0244	0.0118	0.0202

TABLE 3.6. Metric Shares: The Constitutional Convention and Previous Apportionments

State	**3f**	**Co**	**E**	**F**	H1	H2	**H3**	**H4**	M1
NH	0.0410	0.0229	0.0769	0.0464	0.0370	0.0342	0.0385	0.0370	0.0350
MA	0.1373	0.2129	0.0769	0.1556	0.1667	0.1282	0.1410	0.1389	0.1973
RI	0.0199	0.0040	0.0769	0.0223	0.0185	0.0171	0.0128	0.0185	0.0265
CT	0.0683	0.0420	0.0769	0.0770	0.0741	0.0598	0.0641	0.0648	0.0579
NY	0.0958	0.1511	0.0769	0.1045	0.1111	0.0940	0.1026	0.1019	0.1132
NJ	0.0519	0.0076	0.0769	0.0566	0.0556	0.0513	0.0513	0.0463	0.0332
PA	0.1248	0.2322	0.0769	0.1408	0.1481	0.1197	0.1282	0.1296	0.1304
DE	0.0160	0.0221	0.0769	0.0164	0.0185	0.0085	0.0128	0.0093	0.0114
MD	0.0804	0.0744	0.0769	0.0710	0.0741	0.0855	0.0769	0.0833	0.0852
VA	0.1821	0.2058	0.0769	0.1490	0.1481	0.2051	0.1923	0.1944	0.1539
NC	0.1024	0.0097	0.0769	0.0964	0.0926	0.1111	0.1026	0.1019	0.0798
SC	0.0596	0.0154	0.0769	0.0465	0.0370	0.0684	0.0641	0.0556	0.0594
GA	0.0205	0.0000	0.0769	0.0175	0.0185	0.0171	0.0128	0.0185	0.0167

State	M2	**P**	PR	PT	**R**	**S**	T	W	X
NH	0.0354	0.0380	0.0340	0.0336	0.0301	0.0303	0.0291	0.0213	0.0350
MA	0.1209	0.1272	0.1178	0.2324	0.1083	0.1212	0.3375	0.0762	0.1509
RI	0.0171	0.0185	0.0164	0.0305	0.0143	0.0303	0.0426	0.0101	0.0216
CT	0.0633	0.0636	0.0631	0.0550	0.0626	0.0606	0.0465	0.0417	0.0863
NY	0.1050	0.0911	0.1119	0.1243	0.1328	0.0909	0.1576	0.1310	0.0863
NJ	0.0493	0.0493	0.0493	0.0252	0.0493	0.0303	0.0010	0.0464	0.0539
PA	0.1213	0.1161	0.1239	0.1376	0.1317	0.1212	0.1590	0.1283	0.1375
DE	0.0135	0.0158	0.0124	0.0092	0.0090	0.0303	0.0025	0.0108	0.0135
MD	0.0851	0.0856	0.0849	0.0850	0.0842	0.0909	0.0844	0.0924	0.0943
VA	0.2001	0.2002	0.2000	0.1307	0.1999	0.2121	0.0613	0.2220	0.1725
NC	0.0984	0.1058	0.0947	0.0668	0.0836	0.0909	0.0279	0.0985	0.0728
SC	0.0644	0.0667	0.0632	0.0557	0.0598	0.0606	0.0448	0.0812	0.0647
GA	0.0262	0.0221	0.0283	0.0139	0.0344	0.0303	0.0058	0.0401	0.0108

Table 3.6 lists the metric shares associated with the apportionments proposed at the constitutional convention (in bold), apportionments that were previously introduced for the First Continental Congress or the Articles of Confederation (unbolded), as well as wealth (W) and taxes requested (X). All of the apportionments listed in this table are based on 1790 data. Data for the 1800, 1810, and 1820 robustness checks are described in the text and available upon request.

The construction of variables and data sources are listed below.

3f is the Three-Fifths Clause calculated as the total free population plus three-fifths of the slave population in the state, using figures from

the 1790 census (Manson et al. 2019). The 1790 census excluded native Americans not taxed.

Co is the quota of contribution of each state to the central government. For 1780, it is the sum of old money emissions paid to the confederation treasury and state warrants prior to 1782 (United States 1832, 1:58–62). For 1790, it is the total requisitions paid by each state, 1784–1789 (Dougherty 2001, 95).

E is equal apportionment, constructed as each state receiving a metric share of 1/13 (prior to the statehood of Vermont).

F is the free population of each state. For 1790, figures come directly from the census (Manson et al. 2019). For 1780, free population is calculated as the state's total population (United States, Census Bureau 1989, Table Z 1–19, 1168) minus the proportion of the state's population that was slave in the 1790 census (Manson et al. 2019). See P below.

H1 is one representative for every 50,000 white inhabitants, calculated as $\lfloor W_i / 50,000 \rfloor$, where W_i is the white population of state *i*.

H2 is one representative for every 30,000 inhabitants, calculated as $\lfloor P_i / 30,000 \rfloor$, where P_i is the total population of state *i*.

H3 is one representative for every 40,000 people as defined by the Three-Fifths Clause. It is calculated as $\lfloor 3f_i / 40,000 \rfloor$, where $3f_i$ is the number of people from state *i* counted by the Three-Fifths Clause.

H4 is one representative for every 30,000 people as defined by the Three-Fifths Clause. It is calculated as $\lfloor 3f_i / 30,000 \rfloor$, where $3f_i$ is the number of people from state *i* counted by the Three-Fifths Clause.

M1 $= \frac{2(P_i / \sum_i P_i) + (T_i / \sum_i T_i)}{3}$, where P_i is the population of state *i*, and T_i is the registered tonnage in state *i*. The resulting fraction is the state's metric share.

M2 $= \frac{2(P_i / \sum_i P_i) + (R_i / \sum_i R_i)}{3}$, where P_i is the population of state *i*, and R_i is the value of property in state *i*. Property values, based on 1800 data, came from Lindert and Williamson (2015). The resulting fraction is the state's metric share.

P is the total population of each state as recorded by the Census Bureau. The 1780 figures come from United States, Census Bureau (1989, Table Z 1–19, 1168). For this data, the population of Maine was added to that of Massachusetts, the population of Kentucky was added to that of Virginia, and the population of Tennessee was added to that of North Carolina. Since both New Hampshire and New York laid claim to Vermont, Vermont's population is divided

evenly between the two states. Population figures for 1790 do not require such calculations (Manson et al. 2019).

PR is the equally weighted combination of metric shares from population and property, calculated as $PR = \frac{(P_i / \sum_i P_i) + (R_i / \sum_i R_i)}{2}$, where P_i is the population of state *i* and R_i is the value of property in state *i*. The resulting fraction is the state's metric share. Property values, based on 1800 data, came from Lindert and Williamson (2015).

PT is the equally weighted combination of metric shares from population and trade, calculated $PT = \frac{(P_i / \sum_i P_i) + (T_i / \sum_i T_i)}{2}$, where P_i is the population of state *i*, and T_i is the registered tonnage in state *i*. The resulting fraction is the state's metric share.

R is the value of property in each state, based on 1800 data (Lindert and Williamson 2015).

S is one Senator for every 100,000 souls from the 1790 census figures (Manson et al. 2019). It is calculated as $\lfloor P_i / 100{,}000 \rfloor$, where P_i is the population of state *i*.

T is the average registered tonnage of ships employed in foreign trade, 1793–1795 (Pitkin 1817, 435).[14]

W is the wealth of each state in 1800 from Lindert and Williamson (2015).

X are the taxes assigned to each state from David Brearley's notes (Farrand 1966, 1:574).

14. Pitkin does not provide data on the value of imports nor exports prior to 1791 that vary by state, nor does he report registered tonnage for earlier years.

FOUR

The Early Antebellum Period

Political theorists, such as Montesquieu, had long suggested that republics would thrive only in small societies, where citizens could meet with their representatives and share their thoughts on public issues. If elected officials represented too many people, they would not get to know their constituents nor their interests.

Shortly after the Philadelphia convention, opponents of the Constitution, known as the Anti-Federalists, showed their sympathy for this view. Cato wrote, "It is a very important objection to this government, that the representation consists of so few; too few to resist the influence of corruption, and the temptation to treachery, against which all governments ought to take precautions" (Bailyn 1993, 1:402). "To make representation real and actual," George Mason added, "the number of representatives ought to be adequate; they ought to mix with the people, think as they think, feel as they feel—ought to be perfectly amenable to them, and thoroughly acquainted with their interest and condition" (Elliot 1888, 3:32).

Anti-Federalists addressed this concern by focusing on the ratio of representation, that is the ratio of one member of the House to the number of people a member would represent. The Anti-Federalists wanted larger ratios, that is, fewer people in the denominator. The trade-off of course was a larger House.

This chapter describes the history of apportionment from the First Federal Congress until 1822. It then examines how Congress chose a ratio of representation among the 24 ratios proposed that year. The year 1822 provides a good environment for studying state interests because it falls within the Era of Good

Feelings, when party politics did not control Congress and did not dissuade members from the interests of their states.[1] In 1822 the 24 ratios produced a cycle in seat shares for a majority of states and for a majority of the House. The ratio of one representative for every 40,000 constituents eventually passed because 40,000 was uncovered, a term of the trade explained below, and the only other uncovered alternative paired against 40,000 was proposed after the bill was engrossed. Norms of congressional behavior discouraged members from considering full substitutes at that juncture.

Interlude, 1787–1822

At the Constitutional Convention, the committee on representation proposed that each state would be allowed one member for every 40,000 inhabitants, with inhabitants defined by the Three-Fifths Clause (Farrand 1966, 1:526). This would produce a moderate number of members for the first House. Roger Sherman and James Madison proposed to insert "not exceeding" before one for every 40,000, which passed without objection (Farrand 1966, 2:221). The change prevented the House from becoming too large in the future, contrary to Anti-Federalist concerns about keeping a tight connection between representatives and their constituents.

As one of the final acts of the convention, Nathanial Gorham (MA) said that "if it was not too late he could wish, for the purpose of lessening objections to the Constitution," that they might replace 40,000 with 30,000 (Farrand 1966, 2:643–44). That change would allow Congress to become larger, addressing some of the anticipated objections of those who wanted a closer relationship between representatives and constituents. In a rare act of support, George Washington stood in defense of Gorham's proposal. "It was much to be desired," he said, "that the objections to the plan recommended might be made as few as possible—The smallness of the proportion of Representatives had been considered by many members of the Convention, an insufficient security for the rights & interests of the people" (Farrand 1966, 2:644). The convention unanimously agreed to Gorham's change. Members of Congress could determine the size of the House by legislation, but it was hoped that they would keep the ratio at one representative for every 30,000 to assure that the relationship between representative and constituents did not break.

1. For evidence of partisan identity in the electorate during the Era of Good Feelings see Dow (2022).

The problem with the Constitution is that it did not provide for a specific ratio nor for a method of apportionment. It only put an upper bound on the ratio of representation. Four days after Washington was inaugurated president, James Madison began writing a bill of rights to address some concerns of the Anti-Federalists. The first Congress, of which he was a member, proposed twelve amendments, but the states ratified only the last ten. In the eyes of the Congress the first of the proposed amendments had nothing to do with freedom of speech, press, or religion. Article the First, as they called it, was about the apportionment of the US House of Representatives. It adjusted the ratio of representation to the inevitability of population growth:

> After the enumeration required by the first article of the Constitution, there shall be one Representative for every thirty thousand, until the number shall amount to one hundred, after which the proportion shall be so regulated by Congress, that there shall be not less than one hundred Representatives, nor less than one Representative for every forty thousand persons, until the number of Representatives shall amount to two hundred; after which the proportion shall be so regulated by Congress, that there shall not be less than two hundred Representatives, nor more than one Representative for every fifty thousand persons.

Article the First was an explicit attempt to "fix," as Melancton Smith suggested, the clause mandating that the "Number of Representatives shall not exceed one for every thirty Thousand" people (Kaminski 2003–2009, 1754). The fix allowed for larger House sizes as the population increased, but it also maintained the connection between representative and constituent by assuring that as the population grew the ratio of representation would keep in line. Only ten states approved Article the First, falling one state short of the eleven states needed for ratification. Failing to ratify the amendment meant that members of Congress could use divisors larger than 30,000 as they saw fit. As George Mason put it:

> What I conceive to be so dangerous, is the provision with respect to the number of representatives: it does not expressly provide that we shall have one for every thirty thousand, but that the number shall not exceed that proportion. Suppose Congress should say that we should have one for every forty thousand; will not the Constitution be complied with?—for one for every forty thousand does not exceed one for every thirty thousand. (Elliot 1888, 3:32)

Failure to pass Article the First meant that Congress would vote on the ratio of representation after every census for another 50 years. Over time the divisors used in that ratio increased along with House size.

The Apportionment Act of 1792

The Constitution divided seats in the first House in an arbitrary fashion. The idea was to provide an initial apportionment until returns from the first census were available. Three days after Congress received the results of the first census from President Washington, the House started working on the apportionment of the chamber. Since this was the first time Congress attempted to apportion the House, several questions remained. Did the ratio of representation apply to the nation as a whole or did it apply to each state individually? Would the House agree to a ratio of one for 30,000 people or would it accept a larger divisor, straining the relationship between representatives and constituents? And how would Congress translate the quotient found by dividing the apportionment population by a divisor into seats?

Initially, members of Congress did not fix the size of the House, then adjust a divisor until the number of apportioned seats equaled the size of the chamber. Modern congresses and modern textbooks typically approach the problem this way. Initially, members determined the divisor for a ratio of one representative to the apportionment population, multiplied that ratio times the population of each state, and assigned each state the whole number of representatives resulting from the multiplication. They differed over what to do with the remainders, but the predominant view was to simply drop them. The size of the House would then be determined by adding up the seats resulting from the whole numbers.

The House entertained a variety of denominators for the ratio of representation in 1791 ranging from one for every 30,000 to one for every 40,000 (Annals, c. 2, House, s. 1, 148–49; 154–55; 168–75). Arguments for various divisors ranged from the points raised earlier by the Anti-Federalists to demands for a smaller, more efficient chamber. There were also concerns about the equality of representation between different states. Dropping the remainders tended to favor the large states. For example, if the House was apportioned with a divisor of 30,000 people in 1791, Delaware would be assigned one representative for its population of 55,541, leaving 25,541 people remaining. Pennsylvania would be assigned fourteen representatives for its population of 432,878 people, leaving 12,878 people remaining. Hence, an

argument could be made that more people in Delaware were unrepresented than people in Pennsylvania.[2]

Normative concerns over the equality of representation were strained by the fact that different divisors advantaged different states, so much so that John Page (VA) complained, "I can no longer refrain from expressing my sentiments. . . . it gave me pain to find those worthy members calculating and coldly applying the rules of arithmetic to a subject beyond the power of numbers to express the degree of its importance to their fellow-citizens" (Annals, c. 2, House, s. 1, 179).

On November 24, 1791, the House passed an apportionment bill with a divisor of 30,000, which created a House with 112 members (Annals, c. 2, House, s. 1, 208, 210). Shortly thereafter the Senate passed a version with a divisor of 33,000 that created a House with 105 members (Annals, c. 2, Senate, s. 1, 47).[3]

A group led by supporters of the secretary of the treasury, Alexander Hamilton, attempted to break the deadlock by trying an entirely new approach. Rather than starting with the ratio of representation and dropping the remainders, they suggested that the size of the House be determined first, then each state would be assigned its proportionate share. For example, if the House had 112 members, Delaware's share would be 112 times Delaware's fraction of the total population $112 \times 0.0154 = 1.720$ seats. This is the state's "ideal quota" (Balinski and Young 2001). In a perfect world, this is the number of seats that would be assigned to Delaware. But since fractions cannot be assigned, the supporters of the Hamilton method proposed a second-best option.

They suggested that the House should have 120 members (Balinski and Young 2001). They justified this size by interpreting the clause "the number of representatives shall not exceed one for every thirty thousand" to mean that the total number of representatives in the United States were not to exceed one representative for every 30,000 in the US population. The nation's appor-

2. The figures used throughout this book are based on state apportionment data, not census data, unless otherwise noted. The Census Bureau reports state apportionment populations (United States, Census Bureau 2021a, 2021b, 2021c, 2021d) that occasionally differ from population figures it reports in the decennial census (Manson et al. 2019). Setting aside the three-fifths population, which could be calculated from census data, major differences include, for 1790, the separate treatment of Kentucky and Virginia in the apportionment data but not in the census data; for 1900 to 1930, the exclusion of Indians not taxed from the apportionment data, which are included in the census data; and for 1970 to 2020, military and civilian employees abroad that are attributed to a state. Such persons are included in the apportionment data but they are not included in the census data. There are other differences as well.

3. *Maryland Journal*, November 29, 1791, 18, no. 95: 2; *Gazette of the United States*, December 10, 1791, 3, no. 65: 259.

tionment population at the time was 3,615,823 as defined by the Three-Fifths Clause. Dividing that number by 30,000 produced 120 seats plus a fraction. Second, Hamilton's supporters argued that it would be better to assign additional seats to the states with the largest remainders, like Delaware, until the total number of apportioned seats equaled 120.

The idea was offered as a compromise to the House and Senate versions. It passed both chambers of Congress by narrow majorities (Annals, c. 2, s. 1, House 482–83, Senate 111–12).[4] There were eight remaining seats under that version, which were assigned to the eight states with the largest fractions. The bill was sent to Washington for approval on March 26, 1792. Although an algorithm for calculating the apportionment was not included with the figures, Hamilton later explained to Washington how the figures were calculated (Balinski and Young 2001).

Several Southerners claimed that the procedure intentionally moved the balance of power away from the South toward the North. Richard Henry Lee, who represented Virginia, wrote:

> [S]ix Eastern States have one apiece more than they ought, Jersey and Delaware the same, and North and South Carolina each one more than these States would have had, if the plain constitutional mode had been pursued of dividing the number of people in each State Respectively by the agreed ratio of 30,000. But by a certain arithmetico-political sophistry an arrangement of six to two against the South had been made of the eight members gained by this sophism. (cited in Balinski and Young 2001, 16)

Lee exaggerated the effects of the Hamilton method on the South, but the rumor made its way to the president's desk and may have affected his perception of the bill (Boyd and Lester 1950–2021, 23: 258–65).[5]

Washington, who was a Virginian, exercised the first presidential veto in US history against the bill. He gave two reasons for his veto. First, "there is no one proportion of division which, applied to the respective numbers of the States, will yield the number and allotment of Representatives proposed by the bill" (Haggard and Mastromarino, 2002, 10:213–14). Washington seems to have interpreted the clause that prevented the ratio of representation from

4. *National Gazette*, March 26, 1792, 1, no. 43: 172.

5. James Madison made a similar claim in a letter to his father (From James Madison to James Madison, Sr., March 15, 1792, *Founders Online*, National Archives, https://founders.archives.gov/documents/Madison/01-14-02-0227).

exceeding one for every 30,000 as requiring a specific divisor to apportion representatives. Second, the same clause should "be applied to the separate and respective numbers of the States," not just the country as a whole, "and the bill has allotted to eight of the States more than 1 for every 30,000," contrary to the principle (Haggard and Mastromarino, 2002, 10:213–14).[6] During his two terms in office, Washington exercised his veto power only one more time, rejecting an act reducing cavalry units.

After Hamilton's method was rejected, Congress went back to the method attributed to Jefferson. As a compromise between the House and Senate versions, one representative for every 33,000 people was proposed, which produced a 105-member chamber (Annals, c. 2, s. 1, House 550, Senate 120).[7] Washington signed the new version.

The Jefferson method was used from 1790 to 1830. Unlike the version frequently described by D'Hondt in the 1870s, the method practiced by Congress started by agreeing on a divisor, that is, the denominator in the ratio of representation. It then divided each state's population by that divisor and assigned each state the representatives equal to the whole number of the state's quotient. Fractional remainders were discarded, no matter how large. Hence, a state with a quotient of 2.99 would receive two seats, as would a state with a quotient of 2.01. The size of the House was then determined by adding up the seats assigned to each state.

After the drama in 1792, controversies over apportionment seemed to settle down. In 1802 Congress chose to maintain the ratio of one representative for every 33,000 people, but due to increases in the population, the size of the House increased to 142 seats (Annals, c. 7, Senate, s. 1, 46).[8] In 1811 Congress set the ratio at one representative for every 35,000 people, creating a House with 181 seats (Annals, c. 12, House, s. 1, 558–59). In 1822 Congress increased the ratio to one representative for every 40,000 people, which created a House with 213 seats.

The Apportionment Act of 1822

State interests lurked behind all these decisions. A deep dive into the Apportionment Act of 1822 shows that even though early reapportion-

6. According to Jefferson, Washington said if Jefferson, Madison, and the attorney general, Edmund Randolph, all concurred, he would allow the three of them to draw up the veto message and he would sign, which they did (Boyd and Lester 1950–2021, 23:258–65).

7. *National Gazette*, April 16, 1792, 1(49): 193.

8. *National Intelligencer*, January 13, 1802, 2.

ment acts may appear uncontroversial on the surface, at least one of them was contentious.[9]

The Apportionment Act of 1822 provides an excellent setting to study decisions over the distribution of seats because power was decentralized, as a theory of pure majority voting might assume. Congress had not yet established procedures for expediting proposals made by a committee nor procedures for protecting committee proposals from amendments (Jenkins and Stewart 2013). Furthermore, the Seventeenth Congress met during the height of the Era of Good Feelings, in which only one party dominated national politics. It is unlikely that partisanship affected reapportionment decisions that year. Instead, the decentralized House had room for pluralistic majorities to appear on the floor, with coalitions changing as state interests on each vote changed.

The Speaker of the House, Philip Barbour (R-VA), was elected after twelve ballots, reflecting divisions over House control. He was bookended on both sides by one of the most effective Speakers in US history, Henry Clay, who controlled the Speakership from the Twelfth to the Sixteenth Congresses, before Barbour, and in the Eighteenth Congress, after Barbour. Clay prevented dilatory tactics by frequently using the tool of calling the question (Jenkins and Stewart 2013). Barbour took a more conciliatory approach. He staffed standing committees in an evenhanded manner and deferred to a majority of the House on most issues.

History of the Act

In December 1821, Barbour introduced a bill that would change the ratio of representation and limit the number of representatives in the House (Annals,

9. When Congress reapportioned the House in 1822, the census returns from Alabama and South Carolina were incomplete (Annals, c. 17, s. 1, 209–12, 708, 709, 937–38). Accordingly, the census figures and apportionment figures differ for these two states, with the census figures for Alabama smaller than its apportionment figures. Instead of using the apportionment figures for Alabama and South Carolina as done in other parts of the book, for 1822 the three-fifths populations of these two states were inferred using the seats and unrepresented fractions in the Congressional Record, that is, the data used by Congress (Annals, c. 17, s. 1, 917; also see the figures on pp. 908–9 which provide almost identical inferences). Interestingly, the inferred figures differed from the 1820 census by only 190 inhabitants for Alabama and by 7 inhabitants for South Carolina, with differences of no more than 2 inhabitants for each of the remaining states, except Pennsylvania, which differed by 61, and Virginia, which differed by 15. The *apportionment* data differed by larger amounts: more than 14,000 inhabitants for Alabama and more than 9,700 inhabitants for South Carolina, which is part of the reason why the apportionment population was not used for 1822. The results in this section can be reproduced by using census data for Alabama and South Carolina, rather than the inferred figures, and by using census data in place of apportionment data for all states.

c. 17, Senate, s. 1, 28–32).[10] In a speech before the Senate, he said that the House should choose the ratio but stressed that the number picked "should be fixed by the Constitution; it should not be the result of conflict every ten years" (Annals, c. 17, Senate, s. 1, 31). To start the discussion, he laid out arguments for and against different-sized divisors. The status quo was based on the 1810 census with a divisor of 35,000.

The bill was assigned to the House Judiciary Committee, which proposed 40,000 for the divisor. It also worded the bill as an act, contrary to Barbour's desire for a Constitutional amendment (Annals, c. 17, Senate, s. 1, 643–44).[11]

The House then met as a Committee of the Whole to consider the proposal. Immediately it entertained 19 different divisors to replace 40,000. Those proposals are listed in table 4.1, along with 5 additional proposals that were made later in debate. The first 19 were listed in the Annals of Congress, as if members were oddly allowed to make their proposals so they could be read into the record before debate began (Annals, c. 17, Senate, s. 1, 734–35).[12] Those divisors ranged from the extremes of 35,000 to 75,000.

Arguments about the proper divisor centered on the size of the House, unrepresented fractions, the quality of representation, and the interests of particular states. The first idea was simple. For any two divisors, the smaller of the two divisors would divide each state's population among a greater number of representatives and create more members for the House. Hence, smaller divisors meant more members (or possibly the same number if the divisors were roughly the same) and larger divisors meant fewer members.

"Unrepresented fractions," as representatives dramatically called them, were the number of constituents that remained after a state's population was partitioned by the divisor. For example, if a divisor of 40,000 were chosen, a state with 320,000 people would be entitled to eight seats with zero people remaining (8 = [320,000/40,000]). The state would not have an unrepresented fraction. In contrast, a state with 79,000 people would be entitled to one seat with 39,000 people remaining. For that state, the unrepresented fraction would be 49 percent (= 39,000 / 79,000). For several members the challenge was to find a ratio that minimized differences in the unrepresented fractions.

The unrepresented fractions argument was often used to protect the interests of some of the smallest states. John Reed (MA) thought members of Congress should try to make the unrepresented fractions as equal as possible. "Arguments of accommodation, convenience, and inconvenience should

10. *National Intelligencer*, December 20, 1821, 1.
11. *National Intelligencer*, January 8, 1822, 2.
12. *National Intelligencer*, January 19, 1822, 1–4.

TABLE 4.1. Divisors for Ratio of Representation Proposed, 1822

Ratio	Proposer	State	Ratio	Proposer	State
30,000	Randolph[a]	VA	42,000	Edwards	NC
35,000	Baldwin	PA	43,000	Gebhard	NY
36,000	Farrelly	PA	44,000	Barber	OH
37,000	Baylies	MA	45,000	Wood	NY
37,500	Ball[b]	VA	46,000	Abbot	GA
38,000	Tucker	VA	47,000	Mallary	VT
38,500	Rhea[c]	TN	48,000	Upham	NH
39,000	Gist	SC	49,000	Williams	NC
39,900	Tucker[d]	VA	50,000	Tracy	NY
40,000	Rochester	NY	52,000	Morgan	NY
41,000	Ross	OH	55,000	Van Wyck	NY
41,500	Trimble[e]	OH	75,000	Keyes	VT

Note: Unless otherwise noted, proposals were recorded January 17, 1822 (Annals, c. 17, House, s. 1, 734–35).

[a] January 30, 1822 (Annals, c. 17, House, s. 1, 847).

[b] February 4 (Annals, c. 17, House, s. 1, 906).

[c] February 5 (Annals, c. 17, House, s. 1, 919).

[d] February 4 (Annals, c. 17, House, s. 1, 908).

[e] February 1 (Annals, c. 17, House, s. 1, 872).

have little weight" (Annals, c. 17, House, s. 1, 855). He then introduced some data and argued that large divisors would allow inhabitants of larger states more representatives per person than the inhabitants of smaller states (i.e., larger states would have smaller unrepresented fractions). Lewis Condict (NJ) thought unrepresented fractions were most important for small states, like New Jersey. For example, changing the divisor from 40,000 to 42,000 would cut the representation of Rhode Island in half but have very little impact on New York. "What is a fraction of thirty-eight or thirty-nine thousand to New York, or Pennsylvania, or Virginia?" Condict asked. "A mere drop in the bucket. . . . But to the little State of Delaware such a fraction exceeds one-half her population, and takes one-half of her representation from this House" (Annals, c. 17, House, s. 1, 891).[13]

Other arguments for a small divisor included the classic argument that each representative should know their constituents. If a politician represented too many people they could not maintain a two-way relationship between elected official and constituent. In laying out the pros and cons of each side of the argument, Barbour noted that increasing the ratio too much would attract candidates that were only known for their distinguished talents or patriotism (Annals, c. 17, House, s. 1, 31).

13. *National Intelligencer*, February 12, 1822, 3.

In contrast, arguments for a large divisor centered around the inefficiency of a chamber with too many members. Elias Keyes (VT) spelled out three reasons that members favored a large divisor. First, he said "Each member would admit that his voice was not loud enough to be heard in the various parts of this Hall. Where business is to be done, it was expedient that those who should do it should be heard" (Annals, c. 17, House, s. 1, 736). Second, he claimed "in so numerous a body, it was next to impossible for the Speaker to preserve that order which was requisite" for business (Annals, c. 17, House, s. 1, 736). Third, Keyes thought that a smaller body would "reduce the expenditures upon the civil list, and would be a great saving to the nation" (Annals, c. 17, House, s. 1, 736). Smyth (VA) estimated a savings of $135,000 annually, which he thought amounted to $1.35 million before the next census (Annals, c. 17, House, s. 1, 893).[14]

Other politicians described smaller divisors as advantaging smaller states, because small divisors gave small states a greater number of raw seats. If representatives cared solely about the number of seats assigned to their state, then this would certainly mean that smaller states should prefer smaller divisors. The ratio of representation is weakly monotonic with the number of representatives.

But if representatives cared about their state's relative share of the seats, because a larger share often represents a greater say in the chamber, then small states may or may not prefer smaller divisors. Small states can and did get a greater proportion of seats with some larger divisors.

Readers who think that representatives from small states always preferred smaller divisors might be surprised to find that the largest divisor proposed in 1822, 75,000, was proposed by a representative from one of the smallest states, Vermont. Meanwhile, the three smallest divisors proposed, 30,000, 35,000, and 36,000, were proposed by representatives from two of the largest states, Virginia and Pennsylvania.

Keyes claimed that he proposed 75,000 because it would be easier to conduct business in a smaller House and it would decrease the cost of running the federal legislature. What he did not mention was that 75,000 created the largest seat share for his state (0.028) among all of the 24 divisors proposed, tied only with 47,000, which was proposed by his colleague Rollin Mallary, also from Vermont. Perhaps the two representatives proposed different divisors because they did not know which one would appeal to more members. Meanwhile, Virginia received a larger seat share from the smaller divisors of 37,000 and 38,000 than from the larger divisor of 75,000, contrary to stereotypes about large states preferring larger divisors. By looking at seats, these propos-

14. *National Intelligencer*, February 7, 1822, 1.

als might seem out of place. By looking at seat shares one can see exactly why these representatives made their proposals.

It is unclear whether statements about being able to hear other members or find sufficient seats were rhetoric tacked on after a state's interests were inferred, or were accurate descriptions of what motivated a representative. What is clear is that several representatives outright declared their interest in protecting the representation of their states. John Randolph (VA) "rose to say, in a single word, that he could not consent to vote for any number which would take a representative from [his] State" (Annals, c. 17, House, s. 1, 863). Josiah Butler (NH) supported a particular ratio because "frankly . . . it was favorable to the State he had the honor, in part, to represent" (Annals, c. 17, House, s. 1, 922–23). Cadwallader Colden made a similar claim about his votes for New York (Annals, c. 17, House, s. 1, 899).[15]

Samuel Smith (MD) blamed representatives like Randolph, Butler, and Colden for failing to act "upon any principles of comity, or on any other principles [other] than those which regarded the interests of the States they respectively represented" (Annals, c. 17, House, s. 1, 872). And "when gentleman had been induced to yield for the purpose of benefitting the state of Rhode Island and Louisiana, that those States," Rhode Island and Louisiana, "manifest[ed] an inclination to subserve their own interests" at the expense of the speakers who had yielded (Annals, c. 17, House, s. 1, 872).

Proceedings

The House Judiciary Committee was assigned the reapportionment bill. Among the 24 divisors proposed, 35,000 was a weak Condorcet loser among members of the committee. The other divisors were in a top cycle, meaning that no divisor was a Condorcet winner in the committee. Nevertheless, 40,000 was the closest thing to it. Only 41,000 strictly dominated 40,000 in the committee. The problem with 41,000 is that another 8 divisors dominated it.

The Judiciary Committee initially recommended a divisor of 40,000 on January 7, 1822 (Annals, c. 17, House, s. 1, 643–44). Ten days later, the Committee of the Whole took up the committee's recommendation. After 19 proposals and 11 teller votes on divisors to replace 40,000, the Committee of the Whole finally agreed to replace 40,000 with 42,000 in a teller vote of 81-73 (Annals, c. 17, House, s. 1, 737).[16]

When the full chamber considered the issue on January 28, its first vote

15. *National Intelligencer*, January 31, 1822, 4; February 12, 1822, 2.

16. A teller vote is one in which representatives who want to vote yea walk past a person designated to record yea votes, while representatives who want to vote nay walk past a teller recording

was to concur with the 42,000 that they agreed upon in the Committee of the Whole. Ironically, this failed in a narrow roll call vote of 88-83 with 13 representatives either abstaining or not attending (Annals, c. 17, House, s. 1, 823–24).[17] This meant that 40,000 was the divisor to beat. Many representatives worried that 40,000 would "deprive Rhode Island, not only of one Representative, but one-half of her representation" (Annals, c. 17, House, s. 1, 884). That is when the House considered smaller ratios such as 39,000 and 38,500, unusual figures when taken out of context.

Ultimately, the full chamber considered many different divisors, voted on nine of them in teller votes, and voted on another nine in roll call votes. Altogether, 14 unique divisors were voted on as substitutes for 40,000 by the floor. On February 2, Henry Warfield (MD), noted that "every attempt to fix on any number between thirty thousand and forty thousand has been defeated, and that every effort to fix on a number between forty and forty-five thousand, has met with a similar fate" (Annals, c. 17, House, s. 1, 884).[18] On February 6, the House passed the reapportionment bill to the Senate with 40,000 as the divisor (Annals, c. 17, House, s. 1, 947).

The Senate took up the bill on February 15 and passed it back to the House five days later. During that time, the Senate entertained several different divisors as well, none of which displaced 40,000. Several thought it was better to accept the ratio adopted by the House than to "set the whole subject afloat again" (Annals, c. 17, Senate, s. 1, 206).[19] The bill was sent back to the House with language accommodating Alabama, which had not yet received census figures from six of its counties. The House then passed the Senate version on March 1, 1822 (Annals, c. 17, House, s. 1, 1171–72).[20]

Switching Positions

The first vote to replace the divisor of 40,000 with 42,000 was a teller vote on January 17 in the Committee of the Whole. Unfortunately, without the votes of individual representatives, little is known about this vote other than that

nay votes. The vote of individual representatives are not recorded. A vote is described as a teller vote if the method of tallying is unspecified. *National Intelligencer*, January 19, 1822, 1, 4.

17. The *National Intelligencer* reports a tally of 82 to 90 (January 29, 1822, 2).

18. *National Intelligencer*, February 7, 1822, 2.

19. *National Intelligencer*, February 16, 1822, 3.

20. *National Intelligencer*, March 2, 1822, 3.

42,000 passed by eight votes, with 81 individuals in favor, 73 against, and 32 abstaining or not attending.[21]

Fortunately, the vote to concur with the Committee of the Whole's proposal of replacing 40,000 with 42,000 was a recorded vote nine days later (Annals, c. 17, House, s. 1, 823–24). The critical change between the first two votes appears to have been 17 new voters on January 28 who had abstained on January 17. Those voters were enough to account for the 15 additional votes against 42,000. Nevertheless, it is unclear whether the 17 new voters changed the outcome or other voters switched their positions.

A more careful comparison of vote switching can be made by comparing the January 28 vote to concur with the Committee of the Whole (Annals, c. 17, s. 1, 823–24) and the February 6 vote to replace 40,000 with 42,000 after engrossment. Both were recorded votes (Annals, c. 17, s. 1, 925–26). The latter failed 106-58, with 20 representatives either abstaining or not attending. Thirty-two representatives switched from voting in favor of 42,000 on January 28 to either a vote in favor of 40,000 or to abstention on February 6, while only 11 switched in the opposite direction (i.e., from 40,000 to 42,000 or to abstention). Furthermore, most of those who abstained on January 28 also defended 40,000 on February 6.

On average the 24 representatives who switched from 42,000 to 40,000 gave up 0.002 less seat shares than the 51 representatives who supported 42,000 during both votes, a difference that is significant at the .001 level. Those who switched endured a smaller cost than those who did not switch. Nevertheless, most of those who switched to 40,000 surrendered their state's seat share by switching. Among the 24 members who switched from 42,000 to 40,000, 15 members gave up a larger seat share for a smaller one (58 percent). Among the 8 individuals who switched from 42,000 to abstention, 6 gave up their state's position (75 percent). Clearly, most representatives surrendered the interest of their state, but why?

Only one of the switchers explained their motivation. Joshua Cushman (ME), who switched from 42,000 to abstention, said, "The vote of yesterday . . . sufficiently indicates the sense of this House. On principles of accommodation I voted both for a higher and a lower ratio than that which the committee reported; but forty thousand [*sic*] seems to be the favorite number, and to this I am inclined for the present to adhere." Cushman thought a larger ratio benefited

21. The closest roll call or quorum call to this vote occurred nine days later, too distant to be used to speculate about who attended on January 17.

his state. "But this number had been rejected, and it is my duty to acquiesce." Although the reasons why other representatives switched sides is unknown, for a vast number of representatives the switch was consistent with Cushman's position. Perhaps representatives acquiesced because they thought the outcome had enough support from the chamber to resolve the issue, and they wanted to display at least partial comity over any issue redistributing power.

Dominance

One might think that 40,000 was a Condorcet winner in the House, like the median ideal point in a single-dimensional voting model, because almost no other divisor could defeat it and it was near the middle of the sequence of divisors. In terms of seat shares, however, this was simply not the case.

Dominance relationships in the House among the 24 divisors proposed are displayed in figure 4.1. The label for each node is a proposed divisor in thousands. What is most interesting about the figure is that with the exception of 30,000, all of the divisors are in a top cycle. Thirty thousand is a strict Condorcet *loser* and the only divisor that pure majority rule voting should clearly reject on the floor. All the other divisors are dominated by at least one other divisor, meaning that no divisor can be considered best in terms of the dominance relationships.

The network is fairly dense. With the exception of 30,000, it takes an average of 1.6 votes to get from any apportionment to any other. There are many three-tuples in cycles, including ($75{,}000 \succ 45{,}000 \succ 36{,}000 \succ 75{,}000$) and ($49{,}000 \succ 47{,}000 \succ 50{,}000 \succ 49{,}000$). These two triplets illustrate that cycles can exist among dissimilar divisors as well as similar ones.

Note that all but three of the divisors dominated 35,000, which was the value used in the previous reapportionment. The exceptions are 55,000, 39,000, and the Condorcet loser of 30,000. It seemed that the House was likely to pick a new divisor rather than reapportion using the same divisor and new census figures.

It is also useful to note that six divisors dominated 40,000 directly. This includes 41,000, 42,000, 44,000, 47,000, 49,000, and 52,000. Furthermore, seven divisors directly dominated 42,000, which was the recommendation of the Committee of the Whole: 37,500, 38,000, 43,000, 44,000, 47,000, 50,000, and 52,000. Hence, the success of the latter two divisors cannot be explained solely by the majority preference relation.

Applying the analysis to voting in the Senate, which means allowing states two votes each, produces a similar result. For the Senate, all the proposed ratios are in a top cycle, there is no Condorcet winner and no Condorcet loser.

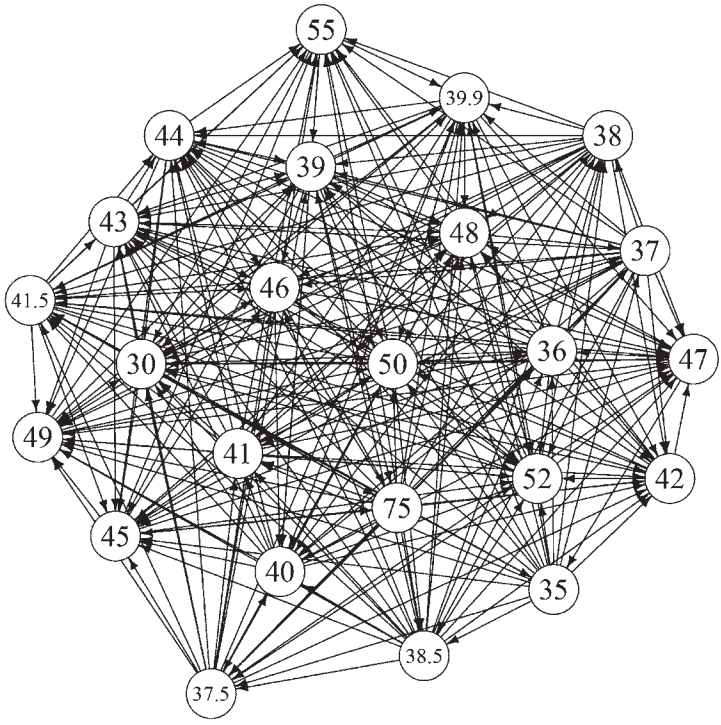


Fig. 4.1. Dominance Relationships among Ratios of Representation, 1822

Furthermore, the divisor of 40,000 is directly dominated by twelve other divisors; 42,000 is directly dominated by nine.

Explaining 40,000

There are several potential explanations for why an assembly would choose a particular alternative from a set of alternatives in a cycle. One idea is the uncovered set (Shepsle and Weingast 1984). The uncovered set makes predictions in cases in which the agenda tree is known or it is not known. It is the set of alternatives that are not covered.

Definition 1. y covers x if and only if y dominates x, and for any alternative z that dominates y, z also dominates x.[22]

22. See Penn for a discussion of three slightly different versions of covered alternatives. Penn shows the three are equivalent if preferences are strict.

Although most applications of the uncovered set are spatial (e.g., Bianco and Sened 2005; Kam et al. 2010), Miller (1980) has shown that the uncovered set always exists, even in nonspatial settings, the set of uncovered alternatives is a subset of the Pareto set, and the uncovered set contains only the Condorcet winner if a Condorcet winner exists. McKelvey (1986) further showed that sophisticated voters will choose an uncovered alternative in cases in which the agenda is determined endogenously, regardless of whether individuals know which proposals will come up for a vote. An endogenous agenda refers to a situation in which the order of votes is unknown before voting begins. Experimental evidence shows that humans vote in much the same way, selecting uncovered outcomes in an endogenous agenda, even though they are not aware of the concept of uncovered outcomes (Bianco et al. 2006, 2008). The uncovered set provides some interesting predictions for 1822, particularly because the agenda tree was so unstructured.[23]

The House entertained 19 proposals on the very first day. Additional divisors could be considered later and were introduced later, with Barbour giving no clues about the order in which they would vote. Voting on the apportionment bill of 1822 proceeded with the introduction of the committee proposal followed by proposals to overturn the idea from any member on the floor. If a substitution was made, another divisor could always be proposed to replace the substitute, making the agenda tree almost entirely unpredictable other than an amended version running in a final passage vote at the end.

Determining whether a proposal was uncovered requires a set of feasible alternatives; these were generated by calculating seat shares for 451 divisors ranging from 30,000 to 70,000, in increments of 100. The range spans the divisors proposed. Because the list is discrete, the uncovered alternatives reported are approximations of the true uncovered alternatives. They are not an exact list. This approximation converges to the true set of uncovered alternatives as increments in the divisor become small enough to capture perceptible differences between any two divisors in terms of seat shares, that is, at least one state having a seat share difference at least as great as .001.

The list of 451 divisors includes the 24 divisors actually proposed. To identify uncovered alternatives, an R script was written. For each of the alternatives proposed, x, the script compares x to the other 450 divisors, y. If a y dominates x, then for all possible third divisors z (449 possible), z is compared

23. The uncovered set did not predict well for the 1920s. In December 1920, the House Census Committee proposed a 483-member House, which the House floor modified to 435 members. Both were covered in the chamber. In January 1929, the House passed a reapportionment bill with a 435-member House, a size that was covered using both 1920 and 1930 census data.

to y and z is compared to x. If every z that dominates y also dominates x, then x is covered by y. Alternative x is considered uncovered only if there does not exist a y among the other 450 divisors that covers it. The goal is not to recover the entire uncovered set. The goal is simply to determine which of the 24 divisors proposed were covered.

Interestingly, 35,000, the number used in 1811, was covered. Hence, one would expect the House of Representatives to choose another divisor. In contrast, both the proposal made by the Committee of the Whole, 42,000, and the proposal made by the Judiciary Committee, 40,000, were uncovered. That means there was not a simple two-step agenda that would produce another uncovered alternative from one of the two alternatives. Formal theorists would predict that either of them could have been chosen. Even though the Committee of the Whole recommended 42,000, the proposal of the House Judiciary Committee, 40,000, still had to be beaten on the floor, which gave it some advantage.

Votes on 14 different divisors were conducted under the rules of the full House. With the exception of replacing 40,000 with 42,000 by the Committee of the Whole, all the proposed changes were lost, as were most of the attempts to recommit the bill to the originating committee. So why did 40,000 prevail?

As shown in table 4.2, 40,000 was dominated by only six apportionments, those listed in the first column of the table. One would expect 40,000 to lose to any of those divisors in a sincere vote. Among those six divisors, however, only two were paired against 40,000 in a vote of the full House: 41,000 and 42,000 listed in the second column of table 4.2. Among those two divisors, 41,000 was covered. That means it may have been quickly replaced if the House adopted it as a substitute.

Showing signs of this type of fear, Job Durfee (RI) would not support a vote to send the bill back to committee, "not because no better ratio could be found, but because he was averse to cut loose from the anchorage where they were moored" (Annals, c. 17, House, s. 1, 903).

TABLE 4.2. Divisors against 40k on the Floor

Dominates 40k	Voted against 40k	Uncovered
41k	41k	
42k	42k	42k
44k		
47k		
49k		
52k		

This leaves 42,000 as the only proposal left unexplained. It dominated 40,000, passed the Committee of the Whole, and was uncovered, making it a bit of a mystery why it was not chosen over 40,000. Perhaps the reason is idiosyncratic. The vote to replace 40,000 with 42,000 came after the House had voted down eight other substitutes, 40,000 was printed, read a third time, and engrossed. After engrossment, only proposals to correct the language of a bill are typically entertained. That norm, combined with the lateness of the vote, may have helped to hold 40,000 in place. As Grofman and Uhlaner (1985, 35) point out: "An outcome of a social choice mechanism is said to be stable if, whenever a result is announced, voters accept it as binding, even if there may be alternatives which they prefer over that which was adopted."

Perhaps some members of the House acquiesced because 40,000 had gained enough support within the chamber to warrant acceptance according to a norm of civility. That civility would provide a limited consensus and signal to members that they could continue to transact future business with each other rather than continue bartering after a series of votes came to a close.

Interlude, 1830–1850

The Ratio of Representation

In 1832, Congress entertained 21 different divisors ranging from 30,000, proposed by Senator Daniel Webster, to 60,000, proposed by Representative Richard Henry Wilde (GA). Interestingly, the dominance relationships among those divisors created a partial cycle among members of the House, with 30,000 the Condorcet loser and 60,000 the Condorcet winner. Most of the remaining divisors cycled in between. In the Senate, all the proposed divisors were in a top cycle.

The House adopted a divisor of 47,700 to replace 44,300 on that day, consistent with the dominance relationship between that pair (Register, c. 22, s. 1, 1815–17).[24] The 47,700 divisor was proposed by a representative from Tennessee and future president of the United States, James Polk. Exactly why 60,000 did not pass in the House when it was paired against 44,300 on February 14, 1832, is worthy of further investigation (Register, c. 22, s. 1, 1814).

In 1842, a total of 64 divisors were proposed for the ratio of representation ranging from 30,000, as proposed by Representatives Richard Davis (D-NY)

24. *National Intelligencer*, February 16, 1832, 2.

and Robert McClellan (D-NY), to 141,000, as proposed by a Representative Joseph Underwood (W-KY) (Globe, c. 27, s. 2, 436).[25] Congress chose among those divisors and agreed that districts should be contiguous and elect no more than one representative (Quitt 2008).

Furthermore, in 1842 Congress adopted the Webster method for the first time (Globe, c. 27, s. 2, 496).[26] In this version, a divisor would be determined, quotients would be naturally rounded to the nearest integer, and the seats assigned to a state would equal the quotients after rounding. The size of the House would be then derived by summing the resulting number of seats. With all eyes on the divisor and the new provision for districts, almost nothing was said about Webster's method (see Globe, c. 27, s. 2, 532–33 for the few exceptions). Eventually Senator Alexander Barrow (W-LA) proposed a divisor of 70,680, which created a House with 223 seats, 19 fewer than the previous House (Globe, c. 27, s. 2, 546, 550, 614).[27] The bill was signed into law by President John Tyler on June 25.

New Methods of Apportionment

By 1832 support for Jefferson's method had started to fade. Evidence had mounted that Jefferson's method favored larger states. For example, Delaware had an ideal quota of 1.786 in the 1800 census and was assigned one seat, while Pennsylvania had ideal quota of 17.385, but was assigned 18 seats.

To correct these inequities, some members of Congress recommended new methods of apportionment. John Quincy Adams, a representative from Massachusetts and former president of the United States, offered the Adams method in response to an apportionment that favored the South under the Jefferson method. Recall that the Adams method proceeded like Jefferson's, but after each state's population was divided by a divisor, each state's quotient was rounded up rather than down. Hence, a state with a quotient of 2.99 would receive three seats, as would a state with a quotient of 2.01. Adams had the early version in mind: pick a divisor, round quotients up, then determine the size of the House from the resulting quotients.

Adams justified his new procedure based on Article 1, Section 2 of the Constitution, which apportioned the House based on the *whole* number of inhabitants as defined by the Three-Fifths Clause. He thought the fractional remainder from the Jefferson method left people unrepresented and concluded that "Every apportionment therefore which leaves a portion of the People totally

25. *National Intelligencer*, April 23, 1842, 4.
26. *National Intelligencer*, May 14, 1842, 2.
27. *National Intelligencer*, June 11, 1842, 1, 2.

unrepresented fails to carry into effect the prescription of the Constitution" (From John Qunicy Adams, February 28, 1832, Wiltse 1977, 3:155). The net effect of Adams's approach was that Massachusetts would retain its seat from the previous apportionment and New England would receive three more seats than they would from Jefferson's method.

Webster, an eloquent politician who later participated in the infamous Webster-Hayne debate, considered the issue in a different form. As chairman of the Senate committee studying apportionment, Webster rose before the Senate floor on April 5, 1832, and recommended the Webster method (Register, c. 22, s. 1, 640–41, appendix 92–99). Rather than truncating each state's quotient, as done by the Jefferson method, or rounding each state's quotient up to the nearest integer, as proposed by Adams, Webster proposed that each state's quota be naturally rounded. Hence, a state with a quotient between 2.50 and 3.00 would receive three seats, and a state with a quotient between 2.00 and 2.49 would receive two seats. Webster preferred this method because the Constitution required "the apportionment of Representatives among the several States according to their respective numbers, *as near as may be*" (Webster 1903, 6:108, emphasis in original).

Other methods were also considered. A decade earlier, Representative William Lowndes of South Carolina recommended that each state receive the whole number of its quotient, just like the Hamilton method, but rather than assign extra seats based on the largest remainder, Lowndes recommended that they be assigned based on the largest average constituency (Annals, c. 17, House, s. 1, 871).[28] For example, in 1820 New York had a population of 1,368,777 and an ideal quota of 32.502. Hence, the average constituency size for New York was 42,144 = 1,368,777 / 32.502. According to Lowndes, states with the largest average constituency should receive the extra seats.

Before Webster proposed his method in 1830, James Dean, a professor of mathematics and natural philosophy at the University of Vermont, wrote Webster with a fourth idea. He recommended that they allocate seats based on the difference between the average constituency size and the proposed divisor. Balinski and Young explain this method using an example. In 1830 the population of Massachusetts was 610,408 and its ideal quota was 12.279.

> [If Massachusetts] received 12 seats, its average constituency size would be 50,867 (610,408 divided by 12); if it received 13 it would be 46,954. So, if the divisor were 47,700 as Polk proposed, Massachusetts

28. *National Intelligencer*, February 5, 1822, 4.

> should receive 13 seats because 46,954 is closer to 47,000 than is 50,867. (Balinski and Young 2001, 29)[29]

Balinski and Young (2001) provide several examples that show that the Lowndes method and the Dean method can produce different results than the methods of Hamilton, Jefferson, Webster, and Adams.

Conclusion

Earlier work by Balinski and Young (2001) made it clear that the method of converting seat shares (rational numbers) into seats (integers) can affect the apportionment of Congress. This chapter shows that the same was true for the ratio of representation. Moreover, if representatives had an interest in maximizing their state's proportion of the seats, then voting over various divisors could easily turn into a divide-the-dollar game, with majority cycles over various divisors and creative attempts to solve the dilemma in one's favor.

The proposal made by the Judiciary Committee was stable, not because a floor leader manipulated the agenda. The proposal prevailed largely because it was uncovered and it came first in an endogenous agenda. Its initial position privileged 40,000 in the debate.

For the next three decades Congress struggled to find a divisor that a majority of its members favored. For reasons similar to the ones stated here, every divisor that a majority favored was dominated by another divisor that another majority favored. Furthermore, many Northerners became fed up with the Three-Fifths compromise and its implications for Southern representation in the House. As we shall see in the next chapter, that metric was eventually overturned despite the supermajority requirement for Constitutional amendments that had held it in place.

APPENDIX

What follows (table 4.3) are the seat shares associated with each divisor proposed in the House in 1822, based on the population of each state as defined by the Three-Fifths Clause. Data comes from the fourth census (Manson et al. 2019).

29. The Dean method is a divisor method. If the seats do not sum to the total number of seats in the chamber, the divisor is then adjusted until it does.

TABLE 4.3. Seat Shares from Various Divisors, 1822

(A. Divisors from 30,000–41,500)

State	Population	30,000	35,000	36,000	37,000	37,500	38,000	38,500	39,000	39,900	40,000	41,000	41,500
AL	111,149	0.010	0.012	0.013	0.013	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.010
CT	275,083	0.031	0.029	0.029	0.030	0.031	0.031	0.031	0.032	0.028	0.028	0.029	0.030
DE	70,945	0.007	0.008	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005
GA	281,123	0.031	0.033	0.029	0.030	0.031	0.031	0.031	0.032	0.033	0.033	0.029	0.030
IL	54,795	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005
IN	147,102	0.014	0.016	0.017	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015
KY	513,442	0.059	0.058	0.059	0.057	0.058	0.058	0.058	0.059	0.056	0.057	0.059	0.059
LA	125,297	0.014	0.012	0.013	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015
ME	298,269	0.031	0.033	0.034	0.035	0.031	0.031	0.031	0.032	0.033	0.033	0.034	0.034
MD	364,391	0.042	0.041	0.042	0.039	0.040	0.040	0.040	0.041	0.042	0.042	0.039	0.039
MA	523,159	0.059	0.058	0.059	0.061	0.058	0.058	0.058	0.059	0.061	0.061	0.059	0.059
MS	62,322	0.007	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005
MO	62,468	0.007	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005
NH	244,022	0.028	0.025	0.025	0.026	0.027	0.027	0.027	0.027	0.028	0.028	0.024	0.025
NJ	274,403	0.031	0.029	0.029	0.030	0.031	0.031	0.031	0.032	0.028	0.028	0.029	0.030
NY	1,368,056	0.156	0.160	0.160	0.157	0.161	0.161	0.157	0.159	0.160	0.160	0.161	0.158
NC	556,822	0.063	0.062	0.063	0.065	0.063	0.063	0.063	0.064	0.061	0.061	0.063	0.064
OH	581,295	0.066	0.066	0.067	0.065	0.067	0.067	0.067	0.064	0.066	0.066	0.068	0.069
PA	1,047,423	0.118	0.119	0.122	0.122	0.121	0.121	0.121	0.118	0.122	0.123	0.122	0.123
RI	82,996	0.007	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.005
SC	399,351	0.045	0.045	0.046	0.043	0.045	0.045	0.045	0.045	0.047	0.042	0.044	0.044
TN	390,718	0.045	0.045	0.042	0.043	0.045	0.045	0.045	0.045	0.042	0.042	0.044	0.044
VT	235,749	0.024	0.025	0.025	0.026	0.027	0.027	0.027	0.027	0.023	0.024	0.024	0.025
VA	895,055	0.101	0.103	0.101	0.104	0.103	0.103	0.103	0.100	0.103	0.104	0.102	0.103

(B. Divisors from 42,000–75,000)

State	42,000	43,000	44,000	45,000	46,000	47,000	48,000	49,000	50,000	52,000	55,000	75,000
AL	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.009
CT	0.030	0.031	0.031	0.032	0.027	0.028	0.029	0.029	0.030	0.031	0.032	0.028
DE	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.009
GA	0.030	0.031	0.031	0.032	0.033	0.028	0.029	0.029	0.030	0.031	0.032	0.028
IL	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.009
IN	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.018	0.012	0.012	0.013	0.009
KY	0.060	0.056	0.057	0.059	0.060	0.056	0.057	0.058	0.060	0.055	0.058	0.056
LA	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.009
ME	0.035	0.031	0.031	0.032	0.033	0.033	0.034	0.035	0.030	0.031	0.032	0.028
MD	0.040	0.041	0.042	0.043	0.038	0.039	0.040	0.041	0.042	0.043	0.039	0.037
MA	0.060	0.062	0.057	0.059	0.060	0.061	0.057	0.058	0.060	0.061	0.058	0.056
MS	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.009
MO	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.009
NH	0.025	0.026	0.026	0.027	0.027	0.028	0.029	0.023	0.024	0.025	0.026	0.028
NJ	0.030	0.031	0.031	0.032	0.027	0.028	0.029	0.029	0.030	0.031	0.026	0.028
NY	0.160	0.159	0.161	0.160	0.158	0.161	0.160	0.158	0.163	0.160	0.155	0.167
NC	0.065	0.062	0.063	0.064	0.066	0.061	0.063	0.064	0.066	0.061	0.065	0.065
OH	0.065	0.067	0.068	0.064	0.066	0.067	0.069	0.064	0.066	0.067	0.065	0.065
PA	0.120	0.123	0.120	0.122	0.120	0.122	0.120	0.123	0.120	0.123	0.123	0.120
RI	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.009
SC	0.045	0.046	0.047	0.043	0.044	0.044	0.046	0.047	0.042	0.043	0.045	0.046
TN	0.045	0.046	0.042	0.043	0.044	0.044	0.046	0.041	0.042	0.043	0.045	0.046
VT	0.025	0.026	0.026	0.027	0.027	0.028	0.023	0.023	0.024	0.025	0.026	0.028
VA	0.105	0.103	0.104	0.101	0.104	0.106	0.103	0.105	0.102	0.104	0.103	0.102

FIVE

The Fourteenth Amendment

Theoretically the infamous Three-Fifths Clause could have been replaced by any alternative metric. But Congress focused on population-based apportionments which included total population, citizens, or even the narrower notion of electors. The latter were the number of people allowed to vote. Congress considered those three proposals, along with five additional ideas, after the Civil War.

Congress took up the idea as part of the Fourteenth Amendment. The issue was so important for decision makers that they considered it first before any other item in the amendment (Graber 2023). It was written up as section 2 in the final form:

> Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice-President of the United States, Representatives in Congress, the Executive and Judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male inhabitants of such State, being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion, or other crime, the basis of repre-

Large parts of this chapter are based on a coauthored article by Keith L. Dougherty and Grace Pittman, "Congressional Apportionment and the Fourteenth Amendment," *Public Choice* 192, nos. 1–2 (2022): 115–26.

> sentation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such State. (Fourteenth Amendment, section 2)

Although Constitutional amendments require the assent of two-thirds of both chambers for proposal, the markup and content of Constitutional amendments are determined by simple majority rule. This chapter provides at least three insights into the adoption of a new metric of apportionment in 1866. First, it shows that if voters pursued state interests, then a majority cycle would exist among all 36 states in the nation over eight of the nine metrics of apportionment. The ninth proposal would be a weak Condorcet winner. Second, the weak Condorcet winner was not chosen by Congress. Third, because representatives from the Southern states were not seated in Congress, metric shares would produce different orderings for both chambers of Congress than they did for the nation as a whole, with a different Condorcet winner dominating those chambers. Yet the Condorcet winner in the House and Senate was not chosen either.

The chapter provides an explanation for why Congress failed to select either the weak Condorcet winner among all states or the strict Condorcet winner in both chambers of Congress. While nineteenth-century congressional leaders may have not known about vote cycles, they believed that if they lost control of the agenda, extensive pairwise voting could produce undesirable results. As such, they limited voting and failed to reach an outcome that made a majority of states, including some of their own states, better off in terms of metric shares. Small differences in the metric shares associated with each proposal contributed to their failure. With small differences, members may have been nearly indifferent among apportionments and motivated by gaining Black suffrage and providing text consistent with the Thirteenth Amendment.

The chapter begins with an interlude about the history of apportionment between 1850 and the Civil War, followed by a brief examination of the metrics of apportionment proposed for the Fourteenth Amendment. It then examines dominance relationships among all states in the union. Next, it shows the Condorcet orderings that existed in both chambers of Congress and describe how an alternative that was not the Condorcet winner in either chamber nor the nation as a whole managed to pass Congress and ultimately be ratified by the states. The chapter concludes with a few thoughts about what would happen if members were motivated by the desire to enfranchise former slaves, reunite

the nation, or maximize their party's seats. It also considers what would happen if they made their decision based on future demographics rather than current ones.

Interlude: 1850–1865

A Fixed House Size

In 1850, two years before Congress typically addressed reapportionment, Samuel Vinton, a Representative from Ohio, rose in the House to propose two amendments to the apportionment bill they were considering. First, he proposed that the House be permanently set at 200 members. This would change the method of apportionment from the early version to the textbook version. Second, he proposed that the Census Bureau be given the authority to apportion the House decennially using a method identical to Hamilton's.

Vinton offered several reasons for the permanent size. Most notably, Congress would no longer have to make reapportionment decisions. If the size of the House and the method of apportionment did not change, the executive branch could reapportion the House in its place. Without such a reform, Vinton believed interests might prevent Congress from reapportioning and "by such an omission" there would be no apportionment of representatives and "the House would be dissolved and the Government in fact unhinged" (Globe, c. 31, s. 1, 862).[1] He also believed that fixing the size of the House and the apportionment method would free up valuable time in Congress and make it more efficient. Of course, Vinton's motives may not have been entirely pure. The Hamilton/Vinton method advantaged larger states, and Vinton, who represented the third largest state of Ohio, may have proposed it for that reason.

Charles Sweetster, a Democrat from Ohio, opposed Vinton's idea because he did not want to "bind down a future Congress to any proposition that this Congress might think proper to adopt" (Globe, c. 31, s. 1, 925). Thaddeus Stevens, a Whig from Pennsylvania, and Abraham Venable, a Democrat from North Carolina, agreed (Globe, c. 31, s. 1, 925, 927). Others opposed Vinton's amendment because they thought it would kill the reapportionment bill.

The version enacted on May 23, 1850, provided for a 233-member House apportioned using the Hamilton/Vinton method (Globe, c. 31, s. 1, 1028). For

1. *National Intelligencer*, May 9, 1850, 3.

the first time since apportionment was attempted in 1792, Congress set the size of the House before applying a method of apportionment. It continues that practice today. The bill instructed the Department of Interior to send future Congresses and the executives of each state both population figures and the apportionment of a 233-member House under the Hamilton/Vinton method (Act of May 23, 1850, ch. 11, 9 Stat. 428). But it did not provide for the implementation of that apportionment if Congress failed to act. Such a provision would have to wait until 1929.

Sectional Balance

While both the ratio of representation and the method of apportionment were being crafted in ways that advantaged certain states, the Three-Fifths compromise immediately made slaves a powerful political factor in the United States.

Northerners often treated the bonus of Southern seats resulting from the Three-Fifths compromise as a central grievance because it enabled the South to exert disproportionate political influence over national affairs. When Thomas Jefferson defeated John Adams in the election of 1800, New Englanders quickly attributed Jefferson's success to the Three-Fifths Clause. The *Columbian Centinel* claimed that "There are 500,000 negro slaves in the United States, who have no more voice in the Election of President and Vice-President of the United States than 500,000 New England horses, hogs, and oxen. Yet those 500,000 slaves . . . chose 15 Electors of the President of the United States!" The *Mercury and New-England Palladium* famously declared that Jefferson and Burr "ride into the TEMPLE OF LIBERTY, upon the shoulders of slaves." In 1846, the *National Anti-Slavery Standard* maintained that the Three-Fifths Clause was the "most objectionable feature" of the proslavery Constitution because it bound slaves to the Constitution with no right to pervert the institution itself.[2]

Rather than seek a completely new metric of apportionment, Northerners consistently favored simply striking the Three-Fifths Clause. The idea gave their demand more moral force rather than making it look like a maneuver for more Northern power. Prior to 1830, most Northerners would have claimed that free population should be the basis of apportionment. After 1830, a slowly increasing number of Northerners would have also promoted abolishing slavery and supporting Black suffrage. Eventually, the latter issue could not be set aside.

2. "A Plain Case Stated," *Columbian Centinel*, December 24, 1800, 20; "For the Palladium. A Plain Fact," *The Mercury and New-England Palladium*, January 20, 1801, 1–2; "The Rights of the Free States Subverted," *National Anti-Slavery Standard*, January 22, 1846, 11.

After the election of 1800, Northern opposition to the clause "increased enormously," and slave representation became the central element in the sectional contest over the balance of power (Simpson 1941, 321). Radical Federalists such as Timothy Pickering argued that the North should secede from the union and create a new confederacy "exempt from the corrupt and corrupting influence and oppression of the aristocratic Democrats of the South" (Pickering to Stephen Higginson, December 4, 1803, Lodge 1878, 441–42).

In 1814, the Massachusetts legislature called on the New England states to meet to discuss their grievances with the union. A convention met in Hartford from late 1814 to early 1815 for this purpose. Many believed the convention would propose secession for the New England states (McDonald 2000). The moderate Federalists who attended the convention, however, worked diligently to prevent such measures and ultimately succeeded. Nevertheless, the convention proposed several amendments to the Constitution. Among them was a provision to remove the Three-Fifths Clause that advantaged the South, and to require a two-thirds majority of Congress for the admission of new states. Both were attempts to address the presumed inequities of the "slave vote" controlled by Southerners. The slave vote referred to the additional representatives in Congress that Southern states gained because of slavery.

After the convention, Massachusetts sent commissioners to Washington to negotiate their terms. In 1815, Senator Samuel Dana (CT) introduced the Resolutions of the Hartford Convention in the US Senate (Annals, Senate, c. 13, s. 3, 280–81). Congress did not act on his proposal, but it did hear requests to reapportion the House using free population. The Virginia legislature formerly rejected the convention's resolves in 1816 (Annals, Senate, c. 14 s. 1, 337).[3]

If a simple majority of both chambers were required to change the metric of apportionment, the three-fifths bonus might have been disposed of in 1815. In that year, a majority of states received larger metric shares from free population than from the Three-Fifths Clause, and a majority of representatives in the House represented states with larger metric shares from free population as well. But the Three-Fifths compromise was kept in place not by Congress, but by the supermajority requirement for Constitutional amendments, a threshold Northerners did not control in either chamber. The proposal would also fail to attain the assent of three-quarters of the states needed for ratification. Perhaps

3. Thomas Ritchie expressed the Southern reaction to the rumors of disunion in the Richmond Enquirer: "No man, no association of men, no state or set of states has a right to withdraw itself from the Union of its own accord" (*Richmond Enquirer*, November 1, 1814, quoted in Fehrenbacher 2001, 43). The position was ironic for someone from a future Confederate state.

this is why congressional leaders silently ignored the proposal made by the Hartford Convention. It was doomed from the start.

What was also obvious was that partitioning states, for example creating Kentucky from part of Virginia, and the admission of new states, such as Louisiana's admission in 1812, affected the apportionment of Congress. Adding a state, either by breaking up an old one or granting a territory statehood, increased the number of senators by two, thereby reducing the percentage of seats controlled by existing states. Adding new states also added members to the House. For example, with Tennessee and Ohio's admission to the union in 1796 and 1803, respectively, Tennessee was assigned three seats and Ohio one. Everything else equal, as new states emerged the proportion of seats controlled by the original thirteen states decreased.

Whether a new state was a friend or a foe became integral to the decision to support or oppose new states. As sectional differences between the North and South widened, friend and foe largely depended upon whether a state abolished or allowed slavery. That one policy determined a large part of a state's economic interests as well as their position on key social issues.

Population trends made it clear that even if the South clung to a strategy of sectional solidarity, the South would remain a political minority in the House of Representatives, even with the Three-Fifths Clause. Well aware of the trend, and well aware that Northerners wanted to pass tariffs, antislavery laws, and other measures that would hinder the South, Southerners turned their attention toward the Senate, where they might maintain a balance with the North. If the South could maintain at least half of the states in the union, it could rely on the Senate for a critical veto of Northern acts.

Both sections agreed to several institutional devices that maintained the balance, the most important of which was the Missouri Compromise of 1820. The Missouri Compromise admitted Missouri as a slave state and Maine as a free state. More importantly, it required the admission of a Northern and a Southern state in pairs, with slave states limited to the area below the 36°30′ parallel. Such pairing would assure that the North and South had the same number of seats in the Senate. If the vice president voted with the South or the South obtained the support of one senator from the North, no antislavery legislation would pass, regardless of the decisions made by the House or the president. The balance gave each section a veto in the Senate, allowing each side the power to prevent national policies they deemed onerous.

Democrats contributed to the sectional balance with a rule they adopted for their presidential nominees. To keep slavery and other sectional issues out of the party platform, the Democratic Party adopted a two-thirds requirement

in 1832 for the election of nominees. This prevented antislavery coalitions from forming in the Democratic Party because antislavery delegates did not constitute two-thirds of the delegates at the Democratic national convention. The only candidates that could typically win under such a rule were moderates who chose to remain silent on the issue. Martin Van Buren proposed the rule to maintain party unity. Because few policies could muster two-thirds support, the rule also left major policies to the states, allowing slavery to continue to thrive in the South. As long as the Democrats dominated presidential elections, slave politics would be kept under the rug.[4]

When Texas applied for admission to the union in 1836, members worried that admitting Texas would upset the balance of the Missouri Compromise because Texas would be admitted as a slave state without a pair. In 1844, Senator Thomas Hart Benton introduced a bill to preserve the compromise. He proposed to divide Texas into four states, two of which would be free states and two of which would be slaves states. The proposal would upset the 36°30′ line established in the Missouri Compromise, but it also would have preserved the balance in the Senate. After some maneuvering, Texas was admitted as a slave state in 1845. Its pair was Wisconsin, which was not admitted as a free state for another three years.

Worried that the South would gain from the territory acquired during the war with Mexico, the House passed the Wilmot Proviso in 1846, which challenged the 36°30′ line yet again. The proviso declared that none of the territory gained from the Mexican-American War would be slave territory. Although the measure was blocked in the Senate, it inflamed a growing controversy over slavery and helped spawn the Republican Party in 1854.

Congress passed the Kansas-Nebraska Act that year. The act was the first to successfully violate the sectional balance created by the Missouri Compromise. When California was admitted as a free state in 1850, the Democrats promised Southerners that the next state would be slave. In an attempt to keep their promise, they overturned the 36°30′ line by creating two new territories, Kansas and Nebraska, which were north of 36°30′. Rather than declare these territories free (or slave), Congress allowed their slavery status to be

4. The House of Representatives also introduced a series of "gag rules," starting in 1835, which forebade the House from considering antislavery petitions. Speaker James Polk (TN) proposed the gag rule to prevent petitions from tying up floor debate for weeks. The special committee to which he assigned the issue, chaired by Henry Pinckney (SC), recommended that all petitions, memorials, or resolutions regarding slavery should be automatically tabled and that no further action should be taken upon them. John Quincy Adams (MA) opposed the measure, claiming it was a direct violation of the freedom of speech. The House continually reintroduced opposition to the gag rule until 1844 when Adams finally mustered enough votes to defeat it.

determined by the citizens in each territory. Settlers both for and against slavery flooded into Kansas after the bill was passed to establish their beliefs on slavery in the new territory. The rush led to a series of armed conflicts known as "Bloody Kansas." In 1858, Democrats attempted to admit Kansas as the sixteenth slave state in the union.

Three months after the passage of the Kansas-Nebraska Act, Secretary of State William Marcy instructed the American ministers to Spain, Britain, and France to formulate a policy for the acquisition of Cuba from Spain. The manifesto they created declared that "obtaining Cuba was indispensable for the security of slavery" (McDonald 2000, 169). If Spain refused to sell it, the manifesto declared that the United States should seize it by force. The federal government did not act on the manifesto, but the creation of the manifesto confirmed Northern fears about the intensity of Southern interest in the expansion of slave territory.

With the compromise gone and tempers flared, the nation marched toward civil war. Institutional rules, like the Missouri Compromise, could no longer bottle up sectional tensions between the North and South. In the eyes of some abolitionists, the Three-Fifths compromise and the other slavery clauses in the Constitution were too much. On July 4, 1854, the abolitionists William Lloyd Garrison hailed the Declaration of Independence for recognizing the equal rights of all men, but held up a copy of the Constitution and declared it "a covenant with death, and an agreement with hell" (*The Liberator*, July 7, 1854, 106). A new metric of apportionment was thumping on the door.

From 1861 to 1865, the North and South fought the American Civil War, resulting in roughly 620,000 military fatalities and 50,000 civilian fatalities, the deadliest conflict in American history. The Union victory over the South led to the abolishment of slavery, the preservation of the United States as a unified nation, and a series of profound political changes during a period called Reconstruction. Three Constitutional amendments were enacted during that period. The Thirteenth Amendment abolished slavery, the Fourteenth Amendment granted citizenship and equal protection under the law to all citizens, and the Fifteenth Amendment prohibited states from denying voting rights to males of any race, color, or previous condition of servitude. Congress also established the Freedmen's Bureau to provide assistance to newly freed slaves and impoverished Whites. The Freedmen's Bureau implemented Reconstruction Acts, which aimed to reintegrate Southern states into the Union, enforced civil rights for former slaves, and tried to ensure that all voting-age men were enfranchised.

Preferences

When Congress took up the Fourteenth Amendment in 1865, it did not start with the lofty ideals of Section 1. It started with a new metric of apportionment for the House that later became Section 2.

The recently enacted Thirteenth Amendment had freed the slaves, making total population, except Native Americans untaxed, the metric of apportionment. The change threatened to increase the South's representation "in the House . . . and Electoral College . . . [despite] *losing* the war" (Smith 1970, 832). Rewarding former slave states with additional seats did not sit well with the Radical Republicans (Foner 2019; Graber 2023).

One solution was to leave the metric the same but to require former Confederate states to enfranchise those who were previously enslaved and other racial minorities (Maltz 2015). That would have pleased Radical Republicans, but it required Northern states to enfranchise Black freemen, which many Northerners were not ready to support. Furthermore, it directly confronted states' rights because states at the time retained almost complete control over suffrage.

Seeing the potential problem, House Republicans opted for a different approach. They considered several proposals for apportioning the House but added penalties for states that did not enfranchise Black males. That partly addressed the states' rights issue because it gave states a choice between enfranchising Black males in order to increase their metric share or to leave Black males disenfranchised and forgo potential seats. It also addressed the problem of rewarding the slaveocracy with additional seats for being forced to free their slaves.

Nevertheless, penalties for failing to enfranchise former slaves do not explain why total population *reduced by the number of male citizens at least 21 years of age who were disenfranchised* made it through the House, while total population reduced by the *ratio* of disenfranchised voting age males—a harsher penalty—did not. Those penalties could have been applied to a variety of metrics.

Members officially proposed nine different ideas. Table 5.1 summarizes the metrics they proposed in the order in which they were first presented in 1865 and 1866. The status quo apportionment (Q) was based on each state's free population and three fifths of its slaves. With the slaves freed, this simply meant each state's population. In contrast, P1 was each state's population *reduced by the number of male citizens at least 21 years of age who were disenfranchised*. The difference was a penalty on any state that did not allow voting-age males

TABLE 5.1. Apportionments Proposed in the 39th Congress

Date	Label	Metric	Proposer	Source
1865	Q	population (status quo)		
Dec. 5	EL	electors	Stevens (PA)	10
Jan. 8	P1	population minus those disenfranchised due to race	Blaine (ME)	136
Jan. 9	C2	male citizens at least 21	Conkling (NY)	K, 41
Jan. 9	C3	male citizens at least 21 who can read and write	Morrill (VT)	K, 41
Jan. 12	C1	citizens at least 21	Conkling (NY)	K, 44
March 12	P2	population reduced by the ratio of those disenfranchised to male citizens at least 21	Grimes (IA)	1320
March 12	CR	male citizens at least 21, excluding participants in the rebellion	Wilson (MA)	1321
June 4	3f	three-fifths clause (after slaves were freed)	Hendricks (IN)	2940

Note: Apportionments are presented in the order in which they were first proposed in the 39th Congress (1865–1866). Sources with a "K" indicate page numbers from Kendrick (1914). All other sources refer to page numbers from the *Congressional Globe*, 39th Congress, Session 1.

to vote, most notably former slaves. P1 ultimately became the language of the Fourteenth Amendment.

P2 reduced total population by the *ratio* of disenfranchised voting age citizens, a harsher penalty for failing to enfranchise. EL apportioned the House by the number of qualified electors (i.e., those allowed to vote by state electoral law). It differed from P1 by focusing on voting-age males rather than the full population. EL was generally favored by Northern Democrats and some conservative Republicans because it did not include language to force enfranchisement. C1, C2, and C3 were three citizen-based apportionments. C1 was the number of citizens at least 21 years of age, C2 was the number of *male* citizens at least 21 years of age, and C3 was the number of *literate male* citizens at least 21 years of age. CR was the same as C2 but it reduced male voting-age citizens by the number of men who participated in the rebellion from a state, a strong penalty on Southern states that slowly relaxed as former Confederates passed away. Finally, 3f reapplied the Three-Fifths Clause in an attempt to keep the South in its prewar condition by excluding "two fifths of such persons as have been discharged from involuntary service" from the apportionment (Globe, c. 39, s. 1, 2940).

To measure each state's metric share from the nine metrics considered, Dougherty and Pittman (2022) use state electoral laws from 1866 and data from the 1860 census. See the chapter appendix for metric shares, a descrip-

tion of how metric shares were constructed, and the corresponding distributions of seats in a House with 242 members apportioned using the Hamilton/Vinton method.

More than one representative complained that members wanted to protect their state's interests. For example, Representative Samuel Randall (D-PA) said to Representative Thaddeus Stevens (R-PA), "I know the scope of it, so far as Pennsylvania is concerned. I know that it will reduce her representation on this floor, and as a Pennsylvanian, I am against it or any similar proposition" (Globe, c. 39, s. 1, 351). Similarly, Representative Godlove Orth (R-IN) regarded a proposal made by a representative from New England "injurious to the State which I have the honor to represent, giving to Massachusetts a power upon this floor of which my State is deprived" (Globe, c. 39, s. 1, 380). "If I had time," he later claimed, "I could run through these census tables and show that the white males under the age of twenty-one largely predominate in my State and throughout the West" (Globe, c. 39, s. 1, 380).

There is one clear reason to focus on metric shares rather than seat shares in 1866. The Hamilton/Vinton method, which was ultimately applied, had been applied only once before, when representatives from the South were seated. Members of Congress had no reason to assume that it would be used again or that the size of the House would remain constant.[5]

A Nation in Cycle

The dominance relationships among the nation's 36 states (Northern, Border, and Southern states) are displayed in figure 5.1, assuming each state has one vote. An arrow from B to A in the figure indicates that A dominates B. A curved, dashed line indicates a tie in the majority-rule relationship. Ties in the figure include (P2, C1), (P1, EL), and (P1, 3f).

Among all states, P2 is a weak Condorcet winner. It ties C1 but strictly dominates the other seven metrics of apportionment. The remaining eight alternatives form a weak bottom cycle. In the cycle are several three-tuples also in cycle. They include (C1 $\succ$ EL $\succ$ C2 $\succ$ C1), (C2 $\succ$ 3f $\succ$ EL $\succ$ C2), and (3f $\succ$ EL $\sim$ P1 $\sim$ 3f), where $A \sim B$ indicates a tie between A and B in the majority relation.

Figure 5.2 presents an example of a cycle with three elements: the status quo apportionment (Q), the apportionment reinstating the Three-Fifths Clause (3f), and the apportionment based on citizens at least 21 years of age (C1).

5. The House had 242 members in 1866: the 241 seats from the 1860 census and one seat from the new state of Nevada. Fifty members were added after the 1870 census.

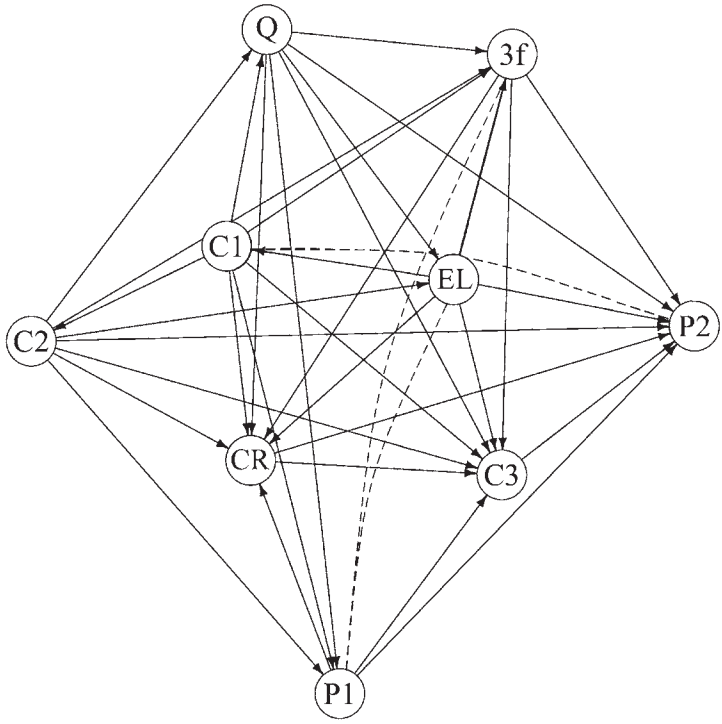


Fig. 5.1. Dominance Relationships among All States, 1866

Map A in figure 5.2 depicts the 14 states that received greater metric shares from 3f than from Q in dark gray, the 13 states that received greater metric shares from Q than 3f in stripes, and the 9 states that received roughly the same metric shares from 3f and Q in light gray, that is, the difference in metric shares is less than 0.001. Territories and the District of Columbia did not vote, so they are marked in white. Because more states received larger metric shares from 3f than from Q, 3f dominates Q in frame A, which favored the North at the expense of the South.

In map B, 13 states receive greater metric shares from Q than from C1, 11 states receive greater metric shares from C1 than from Q, and 12 states receive roughly the same metric shares from the two metrics. In this case, Q dominates C1. More states in the nation received a greater metric share from the status quo than from voting-age citizens.

One might think that if 3f dominates Q, and Q dominates C1, then 3f dominates C1. This, however, is not the case. As shown in frame C, C1 dominates

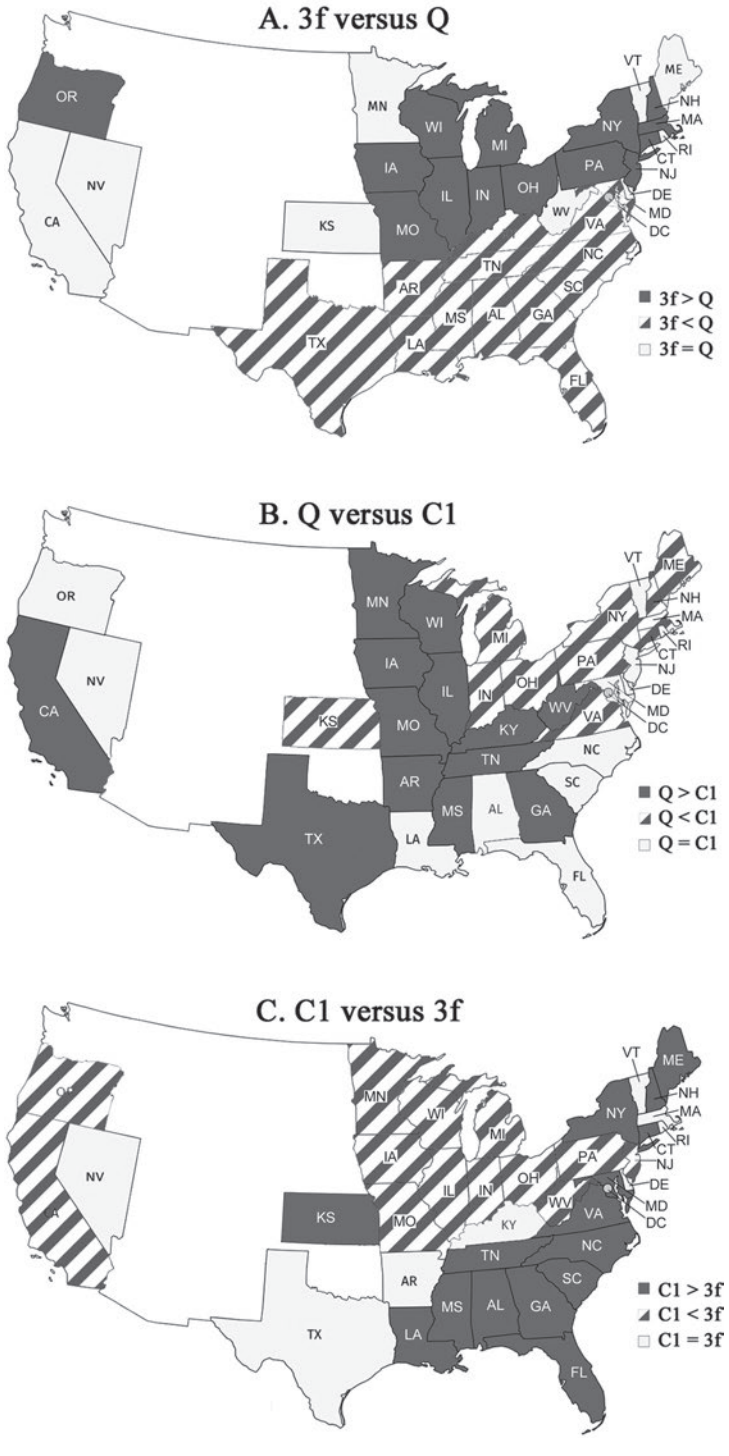


Fig. 5.2. A Cycle Among States, 1866

3f. This is because 15 states receive greater metric shares from C1 than from 3f, while 13 states receive greater metric shares from 3f than from Q, giving C1 the majority. More states receive greater metric shares from voting-age citizens than from reinstating the Three-Fifths Clause.

The result is a majority cycle: 3f $\succ$ Q $\succ$ C1 $\succ$ 3f. Majority rule produces an inconsistency. For each division, a majority of states attain a greater metric share from another division, leaving room for a savvy agenda setter to manipulate the outcome.

Nevertheless, figure 5.1 depicts a more pertinent relationship for our story. The apportionment adopted by Congress, P1, is not the same as the weak Condorcet winner among all the states, P2. P1 is directly dominated by P2, as well as C3 and CR. Hence, dominance among all of the states cannot explain why P1 was chosen. If the nation chose according to these dominance relationships, P2 should have succeeded instead.[6]

Why P1 was proposed and ultimately survived the legislative process is the story of the remainder of this chapter.

Congress

In December 1863, the Republican caucus chose Schuyler Colfax (R-IN) as the next Speaker of the House without dissent (Jenkins and Stewart 2013). Colfax was later elected with the support of every member of his party as well as some Unionists. Colfax assigned committee chairs among competing interests in his party and rewarded those who supported him, including Unionists, with better committee assignments. He also set up a process of addressing policy differences in the Republican caucus before they were seen on the floor. With Colfax's leadership, the Republicans acted in a more unified fashion than the Democratic-Republicans had forty years before.

When the Confederate states withdrew from Congress in 1861, the number of Democrats in both chambers of Congress decreased. The departure helped Republicans solidify their control of Congress, but it did not allow them to gain the two-thirds majority needed to propose amendments until 1865, after the Union army produced a series of victories that led the Republicans to sweep congressional elections in the North (Jenkins and Stewart 2013). Republicans controlled at least 70 percent of both chambers from 1865 to 1871 but were often divided. Moderate Republicans, such as senators Wil-

6. P1 is in the cycle P1 $\succ$ C2 $\succ$ 3f $\sim$ P1.

liam Fessenden (ME) and Lyman Trumbull (IL), outnumbered the Radical Republicans, such as Representative Thaddeus Stevens and Senator Charles Sumner (MA). It was the Radical Republicans, however, who proposed many of the Reconstruction policies hailed today. There were also at least nine conservative Republicans who frequently allied with the Democrats (Smith 1970).

The Joint Committee on Reconstruction

Any story about how P1 passed the House should begin with Stevens. Stevens proposed the Joint Committee on Reconstruction (JCR) and cochaired the committee with Senator Fessenden. In the mid-1800s, the chairman of the committee that originated a bill also served as the informal leader of the bill on the House floor. Historians describe Stevens as "the dictator of the House and the major architect of Reconstruction" (Foner 1974, 156), with powers like an agenda setter described by Riker (1986, 1988). "And yet if Stevens was a political 'dictator,'" Foner reflects, "his power was strangely limited" (Foner 1974, 156).[7]

Stevens argued that if the basis of apportionment went unchanged, the eighty-three members from the South and Democrats from the North would always have a majority in Congress and the Electoral College. Assumption of the rebel debt or repudiation of the federal debt would follow, freedmen might be oppressed, and slavery might be re-established (Globe, c. 39, s. 1, 74). Rather than proposing population reduced by the number of disenfranchised voting-age males as the metric of apportionment, Stevens initially proposed electors (EL) (Globe, c. 39, s. 1, 10).

The JCR considered P1, C1, C2, C3, and Q as well (Kendrick 1914). James Blaine (R-ME) countered with P1, that is, representation based on population, reduced by the number of people whose "political rights or privileges are denied or abridged by the constitution or laws of any State on account of race or color" (Globe, c. 39, s. 1, 136). Blaine maintained that if Congress used electors, as Stevens initially suggested, power would shift from the eastern states to the western states, where men accounted for a greater percentage of the population and were more likely to vote. He also argued that an apportionment based on electors would ignite an "unseemly scramble" to enfranchise voters. The argument persuaded many Republicans (Foner 2019, 61), but it did not persuade Stevens, at least not at first. Stevens would have welcomed a scramble to enfranchise former slaves and stuck with electors for several days.

7. Neither Stevens nor Fessenden had the power to appoint members to committee, like a modern Speaker of the House, nor did they have the power to organize systematic vote trades, like a modern party whip.

When the JCR first met, Stevens officially proposed electors to the committee. Representative Roscoe Conkling (R-NY) quickly responded with *male* citizens at least 21 years of age (C2), which passed. Representative Justin Morrill (R-VT) further suggested male citizens at least 21 years of age "who could read or write" (C3), which failed, leaving C2 as the metric temporarily accepted by the committee. After that, the committee voted much less frequently.

After some debate, Morrill moved to Blaine's idea of P1, and Senator George Williams (R-OR) gave notice that he would propose similar language at the appropriate time. Both were signaling their preference for a population-based apportionment over a citizen-based one. In contrast, Conkling and George Boutwell (R-MA) gave notice that they would later propose "the whole number of *citizens*" (C1) (Kendrick 1914, 44).

At this point, five ideas had been vetted: P1, C1, C2, C3, and EL. None of them had been paired against the status quo in a vote. Only EL and C2 had been paired, as had C2 and C3. The committee treated the five proposals as possible alternatives to Q.

If members of the committee voted for the apportionment that gave their state the largest metric share, the Condorcet ordering among members of the JCR would be:

$$C3 \succ EL \succ C1 \succ P\,1 \succ Q \succ C2.$$

Except for C2, any one of the proposals considered by the JCR could have defeated the status quo apportionment that benefited the South. Similarly, a majority of members would have favored C3, EL, or C1 over the committee's eventual proposal of P1. Clearly, change would come, but why did the committee choose P1?

A vote between electors (EL) and the status quo (Q) was then taken. Electors lost in an 8 to 6 vote with one member not voting (Kendrick 1914, 45). Stevens voted for electors, consistent with his state's interest, but some members appear to have voted more sophisticatedly, withholding their support for electors in order to get a more preferred metric for their states. Both Morrill and Williams, who announced their support for P1, represented states that received greater metric shares from E than from Q, as did Conkling and Boutwell, who announced their support for C1. Nevertheless, all four voted against E. That subtle bit of sophisticated voting may have prevented the committee from sending electors to the floor.

The discord led Morrill to propose a subcommittee of five members to determine the metric that would replace the status quo. Fessenden picked Stevens, Conkling, Representative John Bingham (R-OH), and Senator

Jacob Howard (R-MI) to sit with him on the subcommittee (Kendrick 1914, 45–47). If members of the subcommittee were committed to their state's metric share, all five would have preferred C1, C3, and E more than P1. On January 20, however, the subcommittee reported two versions of P1 that differed only in terms of the qualifier. Fessenden supported the first qualifier, which made it illegal to disenfranchise based on race or color. Stevens moved to adopt the second qualifier, which reduced a state's apportionment by the number of people disenfranchised due to race or color. According to one of his biographers, "Stevens, who would have preferred the first version, nevertheless moved to accept the second" because he was "anxious to retain the confidence of the committee" (Trefousse 1997, 179). The JCR then adopted the second qualifier in an 11 to 3 vote with one member not voting.

Howard later explained that the JRC accepted the second version because "[i]t was our opinion that three fourths of the States of this Union could not be induced to vote to grant the right of suffrage . . . to the colored race" (Globe, c. 39, s. 1, 2766). According to Howard, reducing a population-based apportionment by the number of disenfranchised males was the next best thing. It gave states incentive to enfranchise people of color while leaving the decision to do so with the states.

After several Republicans on the committee revealed a strong preference for P1, P1 became the committee's choice. From that point forward, Stevens championed P1 as the best method of apportionment. He would later proclaim that P1 neither "grants a privilege [to disenfranchise] or takes away a privilege from any State on that subject. It does, however, punish the abuse of that privilege if it exists" (Globe, c. 39, s. 1, 536). On January 22, 1866, the JCR recommended P1 to the House. Stevens's subsequent support for P1 set the agenda and largely determined what ultimately succeeded on the floor.

The House of Representatives

There are two reasons to expect the dominance relationships to differ in the House from the nation as a whole. First, some states had more representatives than others in the House. Second, former Confederate states were not seated in Congress. Because states had a different number of representatives in the House than they had in the JCR (most being unrepresented in the JCR), the dominance relationships should differ between the House and the originating committee as well.

The Condorcet ordering in the House was:

$$C3 \succ P\,2 \succ EL \succ CR \succ C1 \succ 3f \succ P\,1 \succ Q \succ C2.$$

Here, C3 was the Condorcet winner, which differed from the weak Condorcet winner among all states, P2, but was the same as the Condorcet winner from the JCR. With the exception of C2 and Q, all the proposals listed in table 5.1 dominated P1 in the House, making it odd that the House coalesced around a metric of apportionment that was suboptimal in terms of the majority preference relation.

Members of Congress appeared to be aware of at least part of these relationships. They knew the metric of apportionment that advantaged their state in any given vote. The 1860 census was distributed to members, read into the Congressional Record, and relied on frequently to establish how much one state would gain from a proposal and how much another state would lose (Globe, c. 39, s. 1, 358, 380, 382, 403). It was not clear, though, whether members understood which of the nine apportionments advantaged a *majority* of the members, at least not for each of the 36 pairwise comparisons. Members were provided with enough information to make such comparisons, but determining the majority's interest on all pairs would have been arduous.

Managing House votes without knowing what would be proposed next or which apportionments were favored by which majorities worked in favor of the committee's proposal. If Stevens allowed votes on every counterproposal, he knew he might lose control of the decision and attain a less desirable outcome for himself, the committee, and the union. "Allowing a general running debate," as he put it, "would be a sure way to defeat [P1] by amendment" (Globe, c. 39, s. 1, 352). As a result, he rallied behind P1 and limited voting on all types of proposals.

The day after the House received the report from the JCR, which contained only the proposed metric of apportionment, Stevens stressed his desire to pass the committee's proposal quickly while the state legislatures were still in session. He then called the question, ensuring that P1 would receive first consideration and preventing votes on alternative proposals.

Thomas Jenckes (R-RI) then asked for a clarification, which started a lengthy debate. During that debate Ithamar Sloan (R-WI) proposed EL (Globe, c. 39, s. 1, 352) and Orth proposed C2 (Globe, c. 39, s. 1, 380–81). The House did not vote on either metric at this juncture. If it voted on EL versus P1, leaders may have found that a majority of members represented states with larger metric shares from EL than from either the status quo or the version they were protecting, P1.

The House sent the report back to the JCR for revision without instruc-

tions, and the JCR separated the apportionment of taxation from the rule of legislative apportionment (Globe, c. 39, s. 1, 535; Kendrick 1914, 58). After Stevens read the revised report on the floor, he again called the question, but temporarily withdrew his demand so that Robert Schenck (R-OH) could introduce C2 as a substitute. When Ralph Hill (R-IN) attempted to make another substitute, Stevens said, "I cannot yield for any more proposals" (Globe, c. 39, s. 1, 535). Instead the House voted on C2 (Schenck's substitute) versus P1, which failed (Globe, c. 39, s. 1, 538). That series of events is most ironic because if members voted to maximize their state's metric shares sincerely, C2 would have been the only proposal that would lose to P1 (other than Q). Other proposals gave more members of the House greater metric shares than P1, but, intentionally or not, Stevens never allowed votes on those metrics. Hence, the majority's preference for other metrics of apportionment were never revealed.

Later that day, P1 passed by a two-thirds majority (Globe, c. 39, s. 1, 538) consistent with the dominance relationship on the P1-Q pair. At this juncture the proposal did not include other provisions of the Fourteenth Amendment that might have muddied the incentives to vote for a larger metric share for one's state.

Consistent with our story, two-thirds of the members of the House represented states with larger metric shares from P1 than from Q. If representatives were committed to expanding their state's voice, however, any of the top six apportionments in the House ordering would have also passed by a two-thirds vote. Steven's ability to limit pairwise voting got P1 through the House but to the detriment of his own state of Pennsylvania, which would have done better with EL or C3.

The Senate

With only Northern and Border states seated, the Condorcet winner in the Senate was the same as that in the House, but there were now three ties in the Condorcet ordering:

$$C3 \succ P\,2 \sim EL \succ CR \succ C1 \sim 3f \succ P\,1 \succ Q \sim C2.$$

Again, the Condorcet winner, C3, differed from the Condorcet winner among all 36 states, P2.

Unlike Stevens, Fessenden could not control the agenda in the Senate. Instead, repeated delays in the Senate seemed to have exhausted senators, leading them to back to the proposal made by the House, P1.

When the Senate took up the issue on February 6, James Doolittle (R-WI) immediately proposed EL as a substitute for P1, which sparked a month-long debate. During that debate, Fessenden repeatedly urged the Senate to move toward a vote. When a motion was made to enter an executive session, a tool the Senate used to postpone debate, Fessenden replied, "[I]f we go on making one speech a day on the subject, and then going into executive session or doing something else, it is not very likely that we shall act on the resolution until the Legislatures of the several States have adjourned" (Globe, c. 39, s. 1, 742). As the weeks drew on, multiple senators would engage in lengthy and heated debates over the language of Section 2, and Fessenden could only stress the importance of voting "pretty soon" (Globe, c. 39, s. 1, 1203).

Finally, on March 9, the Senate voted on different metric shares in two recorded votes. The first was to maintain the metric of apportionment stated in Article 1, Section 2 of the Constitution, but to grant civil rights for all races everywhere. In an odd way this vote asked senators to replace P1, proposed by the House, with the status quo apportionment, Q. The proposal failed 39-8. The second was a final passage vote, P1 versus Q. Although a majority of members voted in favor of P1 over Q, P1 failed to meet the two-thirds requirement for a Constitutional amendment.

Three days later, Senator James Grimes (R-IA) proposed P2, a population-based apportionment reduced by the "proportion" of disenfranchised males older than twenty-one (Globe, c. 39, s. 1, 1320). The Senate did not consider the ratio version in a recorded vote until June 6. On March 12, Henry Wilson (R-MA) proposed CR, a more radical version of C2 that excluded participants in the rebellion from state citizenship counts (Globe, c. 39, s. 1, 1321).

The Senate eventually recommitted P1 to the JCR, whose third version now included other parts of the Fourteenth Amendment and changed Section 2 only mildly. Rather than reducing representation by the number of disenfranchised nonwhites, the proposal reduced representation by the number of adult male citizen denied access to the ballot (Maltz 2015). The House passed the third version on May 10 (Globe, c. 39, s. 1, 2545).

The Senate did not engage in another debate on the issue until May 23rd. At that point, all five sections of the Fourteenth Amendment had been drafted. In June, Thomas Hendricks (D-IN) proposed 3f, which excluded "all two-fifths of such persons as having been discharged from involuntary servitude by any proclamation of the president or Constitution since 1861" (Globe, c. 39, s. 1, 2942). This left "the representation of the southern State just where it was before the war" (Globe, c. 39, s. 1, 2942). His idea was rejected without a vote.

By June 4, senators began to openly express their irritation with the protracted debate. In response to Doolittle's last-ditch defense of EL, George

Edmunds (R-VT) explained that he "knew how impatient the Senate [was], and without entering at large upon this . . . topic," he simply declared that Doolittle's proposal was "full of inherent error," signaling that he would vote against it (Globe, c. 39, s. 1, 2944).

Two days later, EL was paired against P1 and lost in a 31-7 vote consistent with Edmunds's irritation (Globe, c. 39, s. 1, 2986). John Sherman (R-OH) remained convinced that C2 should be the metric, but he said that he voted against it "to [bring] an end to this controversy" (Globe, c. 39, s. 1, 2986). Daniel Clark (R-NH) echoed the sentiment of those who hoped to schedule a final passage vote as soon as possible. He declared "all Senators [would] bear witness that [they] have never been so much behind in matters before the Senate at any session as [they were] now" (Globe, c. 39, s. 1, 2993).

With all the frustration, it must have been a surprise that on June 8, a majority of senators voted 31-11 to replace P1 with P2 (Globe, c. 39, s. 1, 3041). The proposed change was sent back to the JCR, which ignored it. After the JCR made minor changes to Sections 1, 2, and 3, the Senate passed the Fourteenth Amendment on June 13, 1866, with P1 as the metric of apportionment, the metric matching the one passed by the House (Globe, c. 39, s. 1, 3149).

Ratification

Republicans had good reason to fear that the Fourteenth Amendment would not be ratified with or without its other sections. Three-fourths of all states did not gain larger metric shares from P1 than from Q, nor did three-fourths of the Northern and Border states alone. In fact, based on metric shares, none of the proposed apportionments would defeat Q by the three-fourths rule with the South included in the vote.

On June 16, 1866, the amendment was sent to the states for ratification. With the exception of Tennessee, the legislature of every former Confederate state refused to ratify the Fourteenth Amendment. This refusal led to the passage of the Reconstruction Acts, which imposed military governments in the South until new civil governments were established and the Fourteenth Amendment was ratified. It also prompted Congress in March 1867 to pass a plan that required former Confederate states to ratify the Fourteenth Amendment before they would be seated in Congress. Under duress, all the former Confederate states eventually ratified the amendment, leading to its adoption on July 9, 1868.

Historical Rebuttals

Reasonable scholars might respond that the analysis ignores other motivations, including the desire to enfranchise newly freed slaves, restore the union, and maximize Republican control of the House, the party that controlled both chambers. They might also claim that future demographic changes were also ignored. This subsection addresses those concerns.

If a majority wanted to properly incentivize enfranchisement while restoring the union, then they might not take EL, 3f, or CR seriously. EL may have not had proper incentives for enfranchisement and 3f, and CR seemed unfair to the South. With these three alternatives off the table, there remains another three alternatives left unexplained: C3, C1, and P2. All three provided greater metric shares for a majority of the members of the JCR, the House, and the Senate. Furthermore, P2 was the weak Condorcet winner among all the states. The qualifier on the bottom of Section 2 of the Fourteenth Amendment, which reduced a state's apportionment by the number of unenfranchised voting-age males, could have been easily applied to any of the citizen-based apportionments, and it was already in P2. Hence, the desire to incentivize enfranchisement or restore the union alone cannot fully explain why P1 was chosen.

If, in contrast, Republicans simply wanted to maximize their party's share of the apportionment instead, then they would prefer the metrics proposed in the following order: C3 $\succ$ EL $\succ$ P 2 $\succ$ CR $\succ$ C1 $\succ$ 3f $\succ$ P 1 $\succ$ C2 $\succ$ Q. See the chapter appendix. Again, the majority party should prefer any one of the eight proposals to Q. They should not try to enact P1 from that list.

To account for the possibility that future demographics could affect the long-term interests of each state, the analysis was repeated using data from the 1870 and 1880 censuses, separately. See the chapter appendix for the results. The Condorcet orderings, and general conclusions, are surprisingly similar with data from the two future decades.[8]

Conclusion

Since a majority of states received greater metric shares in the House of Representatives from the population-based apportionment adopted by Congress

8. The analysis does not extend beyond the 1880 census for three reasons: the effect of demographic differences 24 years into the future should have minor effects on decision making in 1866; demographic figures more than two decades into the future would have been poorly estimated by decision makers; and citizenship estimates for 1880 are extrapolated from a question asked in the 1870 census. Using 1870 figures to extrapolate citizens in 1890 is likely to create inaccuracies.

than from the status quo, it is easy to imagine that a majority of states welcomed Congress's proposal, end of story. Among all 36 states in the union, however, more states would have gained larger metric shares from a population-based apportionment reduced by the *ratio* of disenfranchised voting-age citizens than the metric Congress adopted. Furthermore, if members of the House or Senate were committed to getting the largest possible metric share for their states, a majority of both chambers would have preferred six different proposals to the one adopted, including literate, voting-age, male citizens, which was the Condorcet winner in both chambers.

There appears to be at least two reasons why Congress chose a Condorcet-inferior result. The first reason is that leaders got behind the originating committee's proposal and did not allow votes on alternative proposals. Stevens, who managed debate in the House, appears to have prevented voting altogether because experience had taught him to fear amendments. Fessenden managed to avoid votes in the Senate because senators became weary of a protracted debate and did not want to waste time calling roll call votes on different versions of the bill. Successful revisions would have to be reintroduced in the House, creating further delays. Ironically, the limits imposed on voting produced an outcome that was suboptimal for both leaders, for a majority of each chamber, and for a majority of the Republican Party. It was a blunder similar to the one later made by Adam Powell (R-NY) in 1956 when he introduced the infamous Powell amendment for the school aid bill. Both Stevens and Fessenden on the one hand, and Powell on the other, took actions that produced outcomes they appear to have preferred less.

The second reason that Congress passed a Condorcet-inferior result is that the differences between metric shares were typically quite small, leaving any member who cared about the metric share relatively indifferent. Other priorities, such as party interests, differences in the disqualifying language attached to a specific proposal, and punishments for Confederate states might garner a member's attention, even if such ulterior motivations were not always systematic. Alternative motivations simply had to be enough to distract members from the small differences in metric shares among the ideas they were considering.

Failure to select one of the Condorcet winners, either as a whole nation or among members of Congress, had significant consequences. Northerners had the opportunity to create a metric of apportionment that produced more seats for the North and more seats for the Republican Party, but they did not do so. That failure reduced the potential number of Republicans elected to Congress and made the party less capable of pursuing its Reconstruction efforts, including enforcement of the disenfranchise clause of Section 2. When Republicans

lost control of both chambers in 1875, Reconstruction petered out, and Jim Crow rose in its place.

Population continues to be the metric of apportionment used to apportion the House in modern days. But that has not prevented members of Congress from proposing citizen-based apportionments for the House. It also has not prevented them from tinkering with the size of the House in a way that benefited their state. Those factors were manipulated to advantage key states until 1929, the year the size of the House was fixed at 435 members, and the administration of reapportionment was delegated to the executive branch.

APPENDIX

Calculating Metric Shares

Table 5.2 lists the metric shares associated with the metrics of apportionment proposed in the Thirty-Ninth Congress using data from the 1860 census (Manson et al. 2019) and the electoral laws that were active in each state in 1866 (Thorpe 1909). Because West Virginia was part of Virginia in the 1860 census, figures for West Virginia and Virginia were determined by county. In 1866, all states required electors to be males at least twenty-one years of age (Keyssar 2009).[9] No attempt was made to remove the insane, paupers, or criminals who were disenfranchised by some states, nor to adjust for taxpaying requirements.[10] Obviously, population figures included recent immigrants.

Q is the total population in each state from the 1860 census (respectively, 1870 and 1880 censuses). During these years the census excludes Native Americans not taxed.

EL is the number of individuals eligible to vote in a state, as determined by the state's constitution and electoral laws in 1866. Figures vary by race.

9. The West Virginia constitution of 1861–1863 prohibited "minors" from voting without defining a minor. After 1867, when West Virginia became a state, the age requirement was treated as twenty-one, which was the age requirement in other states. Only two territories, Utah and Wyoming, enfranchised women by 1866. The first state to grant universal woman's suffrage was Wyoming in 1890.

10. Delaware, Georgia, Massachusetts, North Carolina, Rhode Island, and Pennsylvania required different subsets of voting-age males to pay taxes in order to be eligible to vote. Such taxpaying requirements differ from poll taxes because poll taxes are accessed on the act of voting and not adjusted for income. Taxpaying requirements were not included because data for those adjustments are unavailable and their independent effect on eligible voters appears to have been small (Ratcliffe 2013, 245; McCormick 1959, 405).

TABLE 5.2. Metric Shares from the 1860 Census

State	Q	EL	P1	C1	C2	C3	P2	CR	3f
AL	0.031	0.018	0.029	0.025	0.030	0.018	0.020	0.024	0.027
AR	0.014	0.011	0.014	0.012	0.013	0.011	0.012	0.010	0.013
CA	0.012	0.026	0.011	0.013	0.020	0.023	0.011	0.022	0.013
CT	0.015	0.019	0.015	0.018	0.016	0.019	0.017	0.017	0.016
DE	0.004	0.003	0.004	0.004	0.004	0.003	0.003	0.004	0.004
FL	0.005	0.003	0.004	0.004	0.005	0.003	0.003	0.004	0.004
GA	0.034	0.020	0.032	0.028	0.032	0.020	0.023	0.023	0.029
IL	0.055	0.066	0.057	0.055	0.054	0.063	0.063	0.060	0.058
IN	0.043	0.047	0.045	0.046	0.044	0.049	0.050	0.049	0.046
IA	0.022	0.022	0.022	0.021	0.021	0.024	0.025	0.023	0.023
KS	0.003	0.005	0.004	0.004	0.004	0.005	0.004	0.005	0.004
KY	0.037	0.032	0.037	0.035	0.037	0.032	0.035	0.038	0.036
LA	0.023	0.015	0.020	0.020	0.026	0.015	0.013	0.022	0.019
ME	0.020	0.023	0.021	0.024	0.021	0.026	0.023	0.024	0.021
MD	0.022	0.019	0.022	0.021	0.022	0.021	0.020	0.022	0.022
MA	0.040	0.040	0.041	0.044	0.038	0.044	0.046	0.042	0.042
MI	0.024	0.030	0.025	0.025	0.025	0.029	0.028	0.028	0.025
MN	0.006	0.005	0.006	0.004	0.005	0.005	0.006	0.005	0.006
MS	0.025	0.013	0.023	0.020	0.026	0.013	0.013	0.019	0.021
MO	0.038	0.040	0.038	0.037	0.038	0.039	0.040	0.039	0.038
NV	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.000
NH	0.010	0.014	0.011	0.014	0.012	0.014	0.012	0.013	0.011
NJ	0.022	0.022	0.022	0.023	0.021	0.024	0.025	0.023	0.023
NY	0.125	0.154	0.129	0.139	0.125	0.145	0.144	0.138	0.131
NC	0.032	0.021	0.030	0.029	0.030	0.021	0.024	0.021	0.029
OH	0.075	0.084	0.077	0.080	0.075	0.087	0.085	0.083	0.079
OR	0.002	0.003	0.002	0.002	0.002	0.003	0.002	0.002	0.002
PA	0.093	0.104	0.096	0.100	0.091	0.106	0.106	0.101	0.098
RI	0.006	0.005	0.006	0.006	0.005	0.006	0.006	0.006	0.006
SC	0.023	0.010	0.020	0.018	0.022	0.011	0.011	0.018	0.018
TN	0.036	0.028	0.035	0.033	0.034	0.028	0.032	0.026	0.034
TX	0.019	0.022	0.019	0.016	0.019	0.016	0.017	0.016	0.018
VT	0.010	0.013	0.010	0.011	0.010	0.012	0.012	0.011	0.011
VA	0.039	0.025	0.036	0.035	0.040	0.026	0.026	0.027	0.035
WV	0.012	0.010	0.012	0.012	0.012	0.012	0.013	0.011	0.012
WI	0.025	0.030	0.026	0.023	0.022	0.026	0.029	0.025	0.026
North	0.721	0.817	0.739	0.761	0.725	0.818	0.805	0.792	0.753
South	0.281	0.186	0.262	0.240	0.277	0.182	0.194	0.210	0.247

Note: The South includes the eleven states of the Confederacy. The North includes both Northern and Border states.

P1 is the state's total population minus males of various races that were disenfranchised in 1866 by the state's electoral laws.

C1 includes both male and female citizens at least 21 years of age. The 1860 and 1880 censuses did not ask questions about citizenship, but the 1870 census did for males. Male citizens at least 21 in 1860 (respectively, 1880) were calculated as the number of males at least 21 in 1860 (respectively, 1880) times the 1870 ratio of (male *citizens* at least 21) to (males at least 21). Female citizens at least 21 years old were calculated as women at least 21 times the 1870 ratio of (male *citizens* at least 21) to (males at least 21). Both ratios and figures vary by state. Since most states did not provide a citizenship status for women prior to the Fourteenth Amendment, figures should be considered the proportion of citizens at least 21 years of age *if* women were given the same citizenship status as men.

C2 is the number of male citizens at least 21 years of age. These figures were reported in the 1870 census. For the 1860 census (respectively, 1880 census) they were calculated as the number of males at least 21 in 1860 (respectively, 1880) times the ratio of male *citizens* at least 21 to males at least 21 from the 1870 census.

C3 is the number the male citizens at least 21 years of age who could both read and write. For the 1870 census, figures were drawn from the 100 percent sample (Ruggles et al. 2020). For the 1860 census (respectively, 1880 census), they were calculated as the number of literate males at least 21 times the ratio of (male *citizens* at least 21 in 1870) to (males at least 21 in 1870).

P2 is $p(1 - (d/m))$, where p is the state's population, d is the number of individuals that would have been disenfranchised by the state's 1866 electoral laws, and m is the number of male citizens at least 21.

CR is the state's male citizens at least 21 excluding participants in the rebellion, calculated as C2 minus Confederate veterans in the state. For 1860 and 1870, Confederate veterans were estimated by subtracting the state's Confederate casualties (United States, National Parks Service 2015) from the men it furnished to the Confederate military (Dyer 1979, 11; Selcer 2006, 213), assuming casualties were uniform across the Confederate states. For 1880, Confederate veterans were reduced annually from the 1870 figures by the state's mortality rate (Manson et al. 2019).

3f is the proposal to renew the Three-Fifths Clause, calculated for 1860 as the state's free population plus three-fifths of its slave popula-

tion. Figures for 1870 (respectively, 1880) were estimated using the proportion of the population that was slave in 1860 times the total population in 1870 (respectively, 1880).

House Seats

Table 5.3 lists the number of seats assigned to each state using a 242-member House (the size of the Thirty-Ninth House with Southerners seated), the Hamilton/Vinton method, and the nine metrics proposed in the Thirty-Ninth Congress. Clearly, the different metrics of apportionment produced different distributions of seats.

The 1870 and 1880 Censuses

Tables 5.4 and 5.5 list the metric share associated with each metric of apportionment using data from the 1870 and 1880 censuses, respectively.

If data from the 1870 census were used, among all 36 states in the nation C3, CR, and P2 would be in a top cycle, those three metrics would weakly dominate the remaining six, and the six remaining would be in a bottom cycle. P1 would be directly dominated by four metrics of apportionment. For the House, majority rule would produce the Condorcet ordering:

$$\text{EL} \succ \text{C3} \succ \text{P2} \succ \text{CR} \succ \text{3f} \succ \text{C1} \succ \text{P1} \succ \text{C2} \succ \text{Q}.$$

For the Senate, it would produce:

$$\text{C3} \succ \text{EL} \succeq \text{P2} \succ \text{CR} \succ \text{3f} \succ \text{C2} \sim \text{P1} \succ \text{C1} \succ \text{Q}.$$

If data from the 1880 census were used instead, among all 36 states in the nation C3 would be the strict Condorcet winner, C1 would be the weak Condorcet loser, and the remaining metrics would be in various cycles. For the House, the Condorcet ordering would be the same as that for the 1870 House with C1 moved up two positions. For the Senate, the Condorcet ordering would be:

$$\text{C3} \succ \text{EL} \succ \text{P2} \succ \text{CR} \succ \text{C1} \succ \text{C2} \succ \text{3f} \succ \text{P1} \succ \text{Q}.$$

In all cases P1 would remain low in the ranking.

TABLE 5.3. House Seats (1860 census data)

State	Q	EL	P1	C1	C2	C3	P2	CR	3f
AL	7	4	7	6	7	4	5	6	6
AR	3	3	3	3	3	3	3	2	3
CA	3	6	3	3	5	5	3	5	3
CT	4	5	4	4	4	4	4	4	4
DE	1	1	1	1	1	1	1	1	1
FL	1	1	1	1	1	1	1	1	1
GA	8	5	8	7	8	5	5	6	7
IL	13	16	14	13	13	15	15	14	14
IN	10	11	11	11	11	12	12	12	11
IA	5	5	5	5	5	6	6	6	6
KS	1	1	1	1	1	1	1	1	1
KY	9	8	9	8	9	8	8	9	9
LA	6	4	5	5	6	4	3	5	5
ME	5	6	5	6	5	6	5	6	5
MD	5	5	5	5	5	5	5	5	5
MA	10	10	10	11	9	11	11	10	10
MI	6	7	6	6	6	7	7	7	6
MN	1	1	1	1	1	1	1	1	1
MS	6	3	5	5	6	3	3	5	5
MO	9	10	9	9	9	9	10	9	9
NV	1	1	1	1	1	1	1	1	1
NH	2	3	3	3	3	3	3	3	3
NJ	5	5	5	6	5	6	6	6	6
NY	30	37	31	34	30	35	35	33	32
NC	8	5	7	7	7	5	6	5	7
OH	18	20	19	19	18	21	20	20	19
OR	1	1	1	1	1	1	1	1	1
PA	23	25	23	24	22	26	26	24	24
RI	1	1	1	1	1	1	1	1	1
SC	6	2	5	4	5	3	3	4	4
TN	9	7	8	8	8	7	8	6	8
TX	5	5	5	4	5	4	4	4	4
VT	2	3	2	3	3	3	3	3	3
VA	9	6	9	8	10	6	6	7	8
WV	3	2	3	3	3	3	3	3	3
WI	6	7	6	5	5	6	7	6	6
North	174	197	179	184	176	197	195	191	184
South	68	45	63	58	66	45	47	51	58

Note: The South includes the eleven states of the Confederacy. The North includes both the Northern and Border states.

TABLE 5.4. Metric Shares from the 1870 Census

State	Q	EL	P1	C1	C2	C3	P2	CR	3f
AL	0.026	0.013	0.024	0.026	0.024	0.013	0.016	0.019	0.023
AR	0.013	0.010	0.012	0.012	0.012	0.009	0.011	0.009	0.012
CA	0.015	0.023	0.014	0.014	0.018	0.021	0.014	0.019	0.015
CT	0.014	0.018	0.014	0.016	0.015	0.018	0.016	0.017	0.015
DE	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.003
FL	0.005	0.003	0.005	0.005	0.005	0.002	0.003	0.004	0.004
GA	0.031	0.016	0.029	0.030	0.028	0.017	0.019	0.021	0.027
IL	0.067	0.078	0.069	0.063	0.066	0.074	0.076	0.072	0.070
IN	0.044	0.048	0.045	0.045	0.046	0.050	0.050	0.050	0.046
IA	0.031	0.032	0.032	0.029	0.031	0.035	0.036	0.034	0.033
KS	0.010	0.013	0.010	0.011	0.012	0.013	0.010	0.013	0.010
KY	0.035	0.031	0.035	0.034	0.034	0.030	0.034	0.035	0.034
LA	0.019	0.011	0.017	0.019	0.019	0.011	0.011	0.015	0.016
ME	0.017	0.019	0.017	0.019	0.019	0.022	0.019	0.020	0.017
MD	0.021	0.018	0.020	0.021	0.021	0.019	0.018	0.021	0.020
MA	0.038	0.039	0.039	0.040	0.038	0.045	0.044	0.041	0.040
MI	0.031	0.040	0.032	0.032	0.033	0.039	0.036	0.036	0.033
MN	0.012	0.009	0.012	0.008	0.009	0.010	0.013	0.010	0.012
MS	0.022	0.011	0.020	0.021	0.021	0.012	0.012	0.014	0.018
MO	0.045	0.048	0.046	0.044	0.046	0.048	0.049	0.047	0.046
NV	0.001	0.003	0.001	0.001	0.002	0.003	0.001	0.002	0.001
NH	0.008	0.011	0.009	0.011	0.010	0.012	0.010	0.011	0.009
NJ	0.024	0.024	0.025	0.024	0.023	0.027	0.027	0.026	0.025
NY	0.115	0.145	0.119	0.122	0.119	0.134	0.131	0.129	0.121
NC	0.028	0.017	0.027	0.028	0.026	0.017	0.021	0.018	0.026
OH	0.070	0.078	0.072	0.072	0.072	0.081	0.078	0.078	0.073
OR	0.002	0.003	0.002	0.002	0.003	0.004	0.002	0.003	0.003
PA	0.093	0.106	0.095	0.095	0.094	0.105	0.104	0.102	0.097
RI	0.006	0.006	0.006	0.006	0.005	0.006	0.007	0.006	0.006
SC	0.019	0.008	0.017	0.019	0.018	0.009	0.009	0.014	0.015
TN	0.033	0.025	0.032	0.032	0.031	0.024	0.029	0.024	0.031
TX	0.022	0.017	0.021	0.020	0.020	0.016	0.018	0.018	0.020
VT	0.009	0.011	0.009	0.009	0.009	0.011	0.010	0.010	0.009
VA	0.032	0.020	0.030	0.034	0.032	0.021	0.022	0.020	0.029
WV	0.012	0.010	0.012	0.011	0.011	0.011	0.013	0.011	0.012
WI	0.028	0.032	0.029	0.024	0.025	0.028	0.032	0.027	0.029
North	0.751	0.848	0.767	0.756	0.764	0.849	0.833	0.824	0.779
South	0.250	0.151	0.234	0.246	0.236	0.151	0.171	0.176	0.221

Note: The South includes the eleven states of the Confederacy. The North includes both Northern and Border states.

TABLE 5.5. Metric Shares from the 1880 Census

State	Q	EL	P1	C1	C2	C3	P2	CR	3f
AL	0.026	0.013	0.024	0.026	0.023	0.015	0.015	0.019	0.023
AR	0.016	0.013	0.016	0.014	0.016	0.013	0.014	0.014	0.016
CA	0.018	0.024	0.017	0.015	0.019	0.020	0.017	0.020	0.018
CT	0.013	0.016	0.013	0.015	0.013	0.015	0.014	0.014	0.013
DE	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
FL	0.005	0.003	0.005	0.004	0.005	0.004	0.003	0.005	0.005
GA	0.031	0.016	0.029	0.025	0.028	0.018	0.019	0.023	0.028
IL	0.062	0.074	0.064	0.063	0.062	0.068	0.072	0.065	0.065
IN	0.040	0.045	0.041	0.045	0.043	0.047	0.045	0.045	0.042
IA	0.033	0.034	0.034	0.033	0.033	0.037	0.038	0.034	0.034
KS	0.020	0.024	0.021	0.021	0.022	0.025	0.022	0.023	0.021
KY	0.033	0.029	0.033	0.032	0.033	0.029	0.032	0.033	0.032
LA	0.019	0.010	0.017	0.014	0.018	0.011	0.011	0.015	0.017
ME	0.013	0.016	0.014	0.016	0.015	0.017	0.015	0.016	0.014
MD	0.019	0.017	0.018	0.019	0.019	0.018	0.017	0.019	0.019
MA	0.036	0.036	0.037	0.040	0.035	0.039	0.042	0.037	0.037
MI	0.033	0.043	0.034	0.036	0.036	0.040	0.038	0.038	0.034
MN	0.016	0.013	0.016	0.012	0.012	0.014	0.018	0.013	0.016
MS	0.023	0.010	0.021	0.016	0.021	0.013	0.011	0.017	0.020
MO	0.044	0.047	0.045	0.044	0.045	0.047	0.047	0.046	0.044
NV	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.001
NH	0.007	0.010	0.007	0.010	0.009	0.010	0.008	0.009	0.007
NJ	0.023	0.023	0.024	0.024	0.022	0.025	0.026	0.024	0.024
NY	0.103	0.13	0.106	0.116	0.106	0.119	0.118	0.112	0.107
NC	0.028	0.018	0.027	0.024	0.026	0.018	0.020	0.021	0.026
OH	0.065	0.074	0.066	0.072	0.068	0.076	0.073	0.072	0.067
OR	0.004	0.005	0.004	0.004	0.005	0.005	0.004	0.005	0.004
PA	0.087	0.099	0.089	0.094	0.087	0.097	0.098	0.092	0.090
RI	0.006	0.005	0.006	0.006	0.005	0.005	0.006	0.005	0.006
SC	0.02	0.008	0.018	0.014	0.018	0.010	0.009	0.016	0.018
TN	0.031	0.023	0.03	0.028	0.029	0.023	0.027	0.024	0.030
TX	0.032	0.027	0.031	0.027	0.031	0.028	0.028	0.030	0.031
VT	0.007	0.009	0.007	0.008	0.007	0.008	0.008	0.007	0.007
VA	0.031	0.019	0.029	0.026	0.029	0.021	0.021	0.022	0.028
WV	0.013	0.011	0.013	0.013	0.012	0.012	0.014	0.012	0.013
WI	0.027	0.031	0.027	0.025	0.024	0.027	0.031	0.025	0.028
North	0.726	0.82	0.74	0.767	0.737	0.805	0.807	0.771	0.746
South	0.262	0.16	0.247	0.218	0.244	0.174	0.178	0.206	0.242

Note: The South includes the eleven states of the Confederacy. The North includes both Northern and Border states.

Party Shares

This section describes how Republican shares were derived from a metric of apportionment, using a hypothetical example based on population. State *i*'s contribution to a party's share is calculated as the product of state *i*'s metric share under apportionment *j* and the proportion of seats the party controls from state *i*, summed for all *i*. For example, in table 5.6, State 1's contribution to the Republican share is 0.161 = 0.460(0.350), where 0.460 would come from the equivalent of table 5.2 and 0.350 is the proportion of State 1's seats controlled by the Republicans. Applying similar logic to State 2 and State 3, then summing across all states, produces the Republican's share of 0.501.

Since the Republicans controlled majorities in both chambers as well as the JCR, dominance relationships based on party would always favor the metric that gave the Republicans more seats in each pairwise comparison. Hence, there is no need to calculate shares for the other parties.

The critical component for constructing party shares is estimating the proportion of seats a party should expect from each state (the column marked "Proportion of Seats Republican" in table 5.6). To estimate this proportion, Dougherty and Pittman (2022) determine the proportion of Republican seats in the US House of Representatives from each state in the Thirty-Sixth, Thirty-Ninth, Forty-Second, and Forty-Third Congresses, then created a weighted average of the proportions using the weights (0.23, 0.34, 0.23, 0.20), respectively. The rationale for this set of weights is to reduce each weight by 10 percent for every Congress away from the Thirty-Ninth Congress, then to rescale the weights so they sum to one. The Thirty-Seventh and Thirty-Eighth Congresses are omitted because Southern states were not seated during those Congresses. The Fortieth and Forty-First Congresses were omitted because the North occupied the South during those two Congresses, allowing Republicans to artificially control Southern seats. Because Nebraska, West Virginia, and Nevada were not in the Thirty-Sixth Congress, their averages were based on the Thirty-Ninth, Forty-Second, and Forty-Third Congresses weighted (0.45, 0.30, 0.25), respectively.

Based on party shares, the Condorcet ordering for the JCR, House, and Senate was

$$C3 \succ EL \succ P\,2 \succ CR \succ C1 \succ 3f \succ P\,1 \succ C2 \succ Q.$$

The result is fairly robust. The same pairwise relationships are obtained if the Thirty-Ninth, Forty-Second, and Forty-Third Congresses are considered

TABLE 5.6. Party Shares

State	Metric Shares (Population)	Proportion of Seats Republican	Republican Shares
State 1	0.460	0.350	0.161
State 2	0.500	0.600	0.300
State 3	0.040	1.000	0.040
Total	**1.000**		**0.501**

alone, weighted (0.45, 0.30, 0.25), or if the four Congresses (or the three Congresses) are averaged using equal weights. Using the Thirty-Ninth Congress alone produces the same pairwise relationships except C3 and EL are switched in the ordering.

SIX

Stalemate in the 1920s

In every decade prior to 1920, Congress had picked the method of apportionment and the size of the House after census figures were released. With one exception, Congress consistently increased the size of the House. Between 1870 and 1920, it even made the increase large enough to assure that no state would lose a seat after the House was reapportioned, a courtesy for existing members.

The reapportionment act of 1911 created a House with 433 members because that number was the smallest that would protect every incumbent's seat under the Webster method. The act also provided for an increase to 435 members if New Mexico and Arizona became states within the decade, which they did (Act of August 8, 1911, ch. 5, 37 Stat. 13).

Everyone expected the 1920s to be similar, but it was not. The House passed a reapportionment bill in early 1921 that the Senate rejected. Reapportionment then stalled for seven years until 1928, when Congress started to make progress again. When Congress finally passed a bill in 1929, it created guidelines for reapportionment that applied to the 1930 and subsequent censuses. It provided language guaranteeing reapportionment based on the method currently practiced and the current size of the House if Congress failed to overtly pass another reapportionment bill. The size of the House has been kept at 435 members ever since.

This chapter examines state interests in different sizes of the House and different apportionment methods in the 1920s. It explains the stalling of reapportionment in the early 1920s, the decision to fix the House at 435 members, and the creation of the "automatic" reapportionment process used today.

In a nutshell, rapid changes in demographics concentrated the potential gains from reapportionment in a few states and left a large number of states favoring the status quo. Members representing states that benefited from the status quo had no interest in a new apportionment and derailed early attempts to reapportion the House. In addition, various complications slowed the progress of reapportionment and threatened to derail almost any version of a reapportionment bill. These included calls for the enforcement of the Fourteenth Amendment against states that disenfranchised voters, demands to exclude aliens from population counts, arguments over whether the Webster or Hill-Huntington method should be used, and attempts to change the size of the House, either to prevent current members from losing their seats, which required a larger House, or to heed to demands for a more efficient, smaller House.

The impasse ended in the 70th Congress when membership on the House Commerce Committee changed from opponents to proponents, the media pushed for reapportionment, and congressional leaders prohibited the complications that had derailed previous versions of the bill. One of those complications was changing the size of the House. Disallowing potential killer amendments helped the reapportionment act of 1929 stay on track and was the key reason why the size of the House was fixed at 435 members. Leadership made representatives focus exclusively on the morals of failing to use current census figures by refusing to entertain any other complication, including a different size of the House. To avoid future impasses, the bill also included language that instructed the executive to automatically reapportion the House using the current method and size if Congress did not enact alternative guidelines before the next census report.

Interlude, 1850–1920

Congress started using the Hamilton/Vinton method after the 1850 census, but Vinton's proposal was never strictly followed. In 1852, it gave an additional seat to California to account for its rapid growth (Balinski and Young 2001, 37). In 1862, 233 seats were first allocated to the House, then excuses were found to give Northern states eight more seats. In 1872, Congress first apportioned the House with 283 seats, because the Hamilton/Vinton and Webster methods agreed with that number. Several months later Congress added an additional nine seats to various states. The result was an apportionment that did not comport with either the Hamilton/Vinton or the Webster methods for a House with 292 members.

In 1891 the House Select Committee on Apportionment examined apportionments for all House sizes between 332 and 375 members under the Hamilton/Vinton method. They settled on 356 because it was the size that assured no member would lose their seat without losing a major fraction (Balinski and Young 2001, 40).

In 1901, the House Select Committee on the Twelfth Census reported apportionments for all House sizes between 350 and 400 members and found that the representation of some states bounced up and down as the size of the House increased (Balinski and Young 2001, 40). Congress eventually apportioned a 384-member House using the Hamilton method with "variations in detail." Those variations were to give one extra seat to Nebraska and Virginia each, raising the total to 386 members. The Senate Committee on the Census supported the approach based on the precedent established in 1872, which gave additional seats to any state with a majority fraction that did not get at least one additional seat under the new apportionment (Apportionment Bill, Senate Report 1840, c. 56, s. 2, January 11, 1901, 2).[1]

Literature

The dominant explanation for Congress's failure to reapportion in the 1920s was the rapid urbanization of the American population (Karlan 2018; Harden 2011; McLawhorn 2010). For the first time in American history, most Americans lived in urban places. Industrialization and the mechanization of agriculture moved large swaths of people from the country to the cities. Veterans of World War I contributed to that trend by entering cities when they returned from Europe. Some thought they would remain in cities only temporarily, which created a distortion in census figures that would naturally correct itself after they returned to their farms.

A Gini coefficient on the population differences between censuses reveals that population growth between 1910 and 1920 was the most inequitable among the states since the Mexican-American War. Despite restrictions on

1. Act of Jan. 16, 1901, ch. 93, 31 Stat. 733. Balinski and Young (2001, 42, 184 n. 11) claim that in 1901 the Webster method was used on a 386-member House contrary to claims made by the Census Bureau. They do not cite a source supporting their claim. Contrary to their claim, the Senate report cited here shows that the Census Bureau was in fact correct about the use of Hamilton's method; Balinski and Young just missed the ad hoc way in which it was applied. This study reproduced the 1901 apportionment following the process described by the Senate Committee on the Census, but it could not reproduce it following the descriptions of Balinski and Young.

immigration, the American population was growing, and it was growing unevenly. Between 1910 and 1920, the United States population grew by 14 million people, but the nation also experienced a decline in its rural population by 5 million people. This meant that a substantial amount of its urban growth was due to internal migration from rural to urban areas (Balinski and Young 2001, 51). A Gini coefficient for population growth between 1910 and 1920 was 11 percent larger than the same measure between 2010 and 2020.[2]

Eagles (1990) questioned whether the rapid urbanization really affected apportionment votes. He used eight roll calls to examine the relationship between a House member's votes on reapportionment and an urban/rural categorization of their state. He also examined the relationship between a member's votes and their political party. He concluded that "the urban-rural thesis would seem discredited" (Eagles 1990, 95) and that "no strong partisan divisions distinguish the voting on reapportionment" (Eagles 1990, 94). Instead of an urban-rural divide, "[s]elf-interest on each side provides the obvious explanation" (Eagles 1990, 98). That self-interest occasionally intertwined with demographics and led "rural Democrats" to supply "the bulk of the opposition to reapportionment" (Eagles 1990, 111). Roberts (2022) and Napolio and Jenkins (2023) later concurred. Using multiple regression analysis, Napolio and Jenkins concluded that "What mattered most on average for individual members' votes to reapportion was their own political self-interest" as measured by whether their state gained or lost seats from a reapportionment (Napolio and Jenkins 2023, 112). Rural-urban differences did not have a significant effect.

Regardless, those who stood to lose from reapportionment, for whatever reason, clung to their seats and strove to prevent the erosion of their power either by increasing the size of the House to maintain their seats or by blocking any reapportionment, particularly one that maintained 435 members.

History of Apportionment

The 64th House rebelled against the tyranny of Republican Speaker Joseph Cannon and reduced the position of Speaker to "virtual insignificance" (Bacon 1998, 120). Democrats controlled the House in the next Congress. When the Republicans returned to power in the Sixty-Sixth Congress

2. Gini coefficients were calculated by determining the population growth between two decades, increasing growth rates by the absolute value of the smallest growth rate to avoid negative values, and calculating the Gini coefficient on the modified values.

(1919–21) they elected Frederick Gillett (R-MA) as their Speaker, a post he held until 1925. Gillett was more of a pro forma Speaker than was Cannon. The majority leader, steering committee, and Committee on Committees were more powerful than Speaker Gillett (Jenkins and Stewart 2013, 284). Committee chairs controlled business within their own jurisdictions and the Republican agenda began to stall.

Part of the problem was that Republicans were not unified. Western Republicans believed that their party's misfortunes in the 1922 midterm elections stemmed from the residue of centralized House rules. Furthermore, farm organizations had convinced them, and some Southern Democrats, that farm organizations accurately expressed the views of their constituents (Hansen 1991). The desire to protect farmers from excessive competition became a shared interest for factions in both parties. Western Republicans began cooperating with liberal Democrats on House votes and demanded changes to the House rules that would distribute power across the chamber more evenly.

When the Sixty-Eighth Congress opened in 1923, the progressives broke from the Republican ranks and prevented the election of Speaker Gillett. After two days of haggling and multiple ballots for Speaker, the Republican leadership backed down. They allowed rules from the previous Congress to be adopted for one month and allowed debate on the merits of those rules at the same time. Afterward the House would adopt any rule favored by a majority of the chamber. Progressive Republicans agreed to the terms and supported Gillett. A number of rule changes were then made a month later, including the development of a discharge rule that would allow legislation to be drawn out of committee and the elimination of the pocket veto, which committee chairs previously used to stifle their committees (Jenkins and Stewart 2013).

The insurrectionists won a short victory, but their transgression did not go unpunished. After the 1924 elections, the Republican majority in the House increased from 225 to 247 members. The progressives were no longer needed to organize Congress nor to pass partisan bills. In February 1925, Majority Leader Nicholas Longworth (R-OH) announced that thirteen of the progressives who had worked against the election of Calvin Coolidge, the Republican president, would no longer be allowed to participate in the party's caucus. With the progressives barred from the caucus, Longworth was elected Speaker of the 69th House on the first ballot. He quickly brought back stronger rules.

Reapportionment paralleled those changes. In 1920–21 the House passed an apportionment bill, but the Senate rejected it. In 1922–27 Congress took little action. And in 1928–29, Congress managed to pass a reapportionment bill after Longworth pledged his support (Eagles 1990).

1920–1921

In December 1920, the House Census Committee began hearings on a new apportionment bill. Isaac Siegel (R-NY), who chaired the committee, noted that the House needed more seats to maintain its practice of protecting current members. If the House remained at 435 seats, Republican states such as Indiana, Iowa, Kansas, Maine, and Vermont would lose seats, as would Democratic states such as Kentucky, Louisiana, Mississippi, Missouri, and Nebraska. Other states like California, Michigan, and Ohio would gain.

Siegel proposed a House with 483 members apportioned according to the Webster method. The size provided one representative for every 219,000 people (Congressional Record, c. 66, House, s. 3, 10). It was also the smallest size for which no state would allegedly lose a representative.[3] Twenty-five states would gain seats under his plan, including California, which would receive five more seats. Michigan, New York, Ohio, and Pennsylvania would receive four more each. No state, Siegel claimed, would lose a seat.

The Republican caucus acceded to Siegel's analysis. By a vote of 106 to 61 the caucus voted to increase the size of the House from 435 to 483 members. Even though roughly a third of the party did not participate in the vote, the vote signaled that most of the majority party wanted a larger House.[4]

At the same time, Speaker Gillett opposed increasing the size of the House for practical reasons. The House was so crowded that members no longer had their own desks. He believed any increase in the number of members would decrease the chamber's efficiency. Gillett told the *New York Times*, "I will use my utmost influence to prevent any further increase" (*New York Times*, December 4, 1920, 11). Two former Speakers of the House, Joseph Cannon and Champ Clark, publicly declared in favor of a smaller House as well.[5] Clearly, the Speaker of the House was out of sync with the chair of the relevant committee.

To make matters worse, representatives from rapidly growing states, such as California and Michigan, were outnumbered on the House Census Com-

3. In the summer of 1920, Siegel claimed that 60 additional seats, a total of 495, would be required to assure that no state would lose a seat (*New York Times*, July 26, 1920, 7; Eagles 1990, 33). According to my calculations, with 483 members Arizona would have two seats (one more than its 1911 apportionment) and Maine would have three seats (one fewer than its 1911 apportionment). The smallest House needed to assure that no state lost a seat under the Webster method would be 485, which is greater than the 483 minimum he claimed in the winter and smaller than the 495 minimum he claimed in the summer. The smallest size at which Maine retains its four-seat allotment is 485 seats.

4. *New York Times*, December 18, 1920, 1.

5. *New York Times*, October 9, 1920, 11; *New Republic*, October 20, 1920, 177.

mittee by representatives from states with little or no growth, such as Indiana, Iowa, Kentucky, Missouri, Maine, and Mississippi. That meant a majority of members on the committee leaned toward the status quo, that is, they preferred no reapportionment bill at all.

Because discussions ranged from a House with roughly 300 members to one with roughly 500 members, this span defines the set of potential House sizes analyzed throughout this chapter. At various junctures, seat shares associated with each of those sizes will be compared against the status quo.

To make sure that members understood the ramifications of each size, they were each given tables showing the number of seats each state would receive for every House size between 435 and 483 using the Webster method (House Committee on the Census, Hearings on HR 14498, 15021, 15158, 15217, c. 66, s. 3, 4–23). Such tables were also reported to the full chamber. The 1911 apportionment gave a majority of its members greater seat shares than almost any of those sizes, including a 435-member chamber reapportioned based on the 1920 census.[6]

The House Census Committee entertained four different proposals for reapportionment, the first two of which were motioned by a member of the committee. Siegel proposed 483 members and Henry Barbour (R-CA) proposed 435 members. Two Texas Democrats, Thomas Blanton and Eugene Black, proposed 304 and 437 members, respectively. In each case, the proposal used the Webster method or the method of apportionment was not specified. Given that each of the four sizes proposed by the committee were dominated by the status quo among members of the committee, it is remarkable that the committee passed any proposal at all.

On January 8, 1921, the Census Committee referred Seigel's bill for 483 members to the Committee of the Whole House. The proposal passed out of committee in a narrow vote of 8 to 6. The opponents represented states that would lose by the proposed size. Ten days later, the Committee of the Whole debated Seigel's proposal.

The argument for 483 members was clear. Members believed 483 was the smallest size of the House that would preserve the seats held by current members. Siegel further argued that the number would bring members closer to their constituents, make them more capable of serving constituencies after the recent enfranchisement of women, and would produce a ratio of representation that was more in line with those found in Europe. Siegel warned that

6. A majority of the House Census Committee represented states that received larger seat shares from the status quo than from any of the House sizes between 300 and 500 under the Webster method, except for House sizes between 319 and 324 inclusive.

smaller sizes would "strike at those States where the farmers predominate" (Congressional Record, c. 66, House, s. 3, 1627–28).

Speaking on behalf of the minority of the committee, Louis Fairfield (R-IN), who preferred a 435-member House, claimed that an increase in membership would make the House "unwieldy" and "difficult to organize for purposes of efficient legislation" (Congressional Record, c. 66, House, s. 3, 1629). It would require the needless expenses of increasing the seating capacity of the House as well as the size of the House Office Building and the support staff. As for the claim that Congress should increase the size of the House so that no member would lose their seat, he added, "The fortunes of any man in political life are not important enough to justify legislation having such far-reaching consequences upon the country" (Congressional Record, c. 66, House, s. 3, 1628). Predictably, Fairfield's state received a greater share from the status quo than from a 483-member House.

Speaking for the majority of the committee, James Ashwell (D-LA), countered that "some gentlemen claim the House is too large and unwieldy, but every experienced Member here knows that whether the membership be 300 or 500, it will not affect the efficiency of this body, for about 40 Members do most of the talking" (Congressional Record, c. 66, House, s. 3, 1629).

Attempts to reapportion the House were further complicated by the disenfranchisement of Blacks in the South. The Fourteenth Amendment mandated that each state's apportionment be reduced by the number of male citizens who were disenfranchised. With enactment of the Nineteenth Amendment, that mandate extended to women as well. In the 1920s, several representatives demanded that the clause be enforced and written into any reapportionment bill. Siegel himself was sympathetic to the idea, but it was representative George Tinkham (R-MA) who led the charge (Eagles 1990, 34). Tinkham demanded language that would enforce the Fourteenth Amendment on every reapportionment bill (House Committee on the Census, Hearings on HR 14498, 15021, 15158, 15217, c. 66, s. 3, 97–115; Congressional Record, c. 66, House, s. 3, 1682–85). He envisioned an enforcement that would be applied to the laws enacted rather than to their administration. He said:

> [T]he two laws, as I understand, that disfranchise the largest numbers and that apply to certain States in the North as well as to nearly all or most all of the States in the South, are laws in relation to payment of poll tax, whether that tax is cumulative or not, and the so-called literacy test. If [the federal government] finds in a State that a poll tax is required and that a literacy test is required, then it seems to me that the

> committee should adopt some rule of action, and that rule should be based, in Case of a literacy test, upon the findings of the Census Bureau as to the number of illiterates 21 years of age and over. (Hearings, 110)

The state's apportionment population would be reduced proportionately.

Southern representatives objected. William Larsen (D-GA) denied that the penalty would have any effect. He claimed that Blacks had the same freedom to vote in the South as they did in the North and that election officials in the South would not tolerate discrimination. He further claimed that Blacks did not bother voting for the Republican Party in Georgia because the party did not have enough strength to win (Hearings, 35, 38, 56).

Even though enforcement of the Fourteenth Amendment was just, the Republican caucus and the House Census Committee knew that Southern representatives would not support reapportionment if the language proposed by Tinkham was included. So they severely limited Tinkham's speeches on the floor and continually objected that his motions were not germane.

Another complication that threatened to derail the reapportionment bill was an argument that aliens should be excluded from population figures. The argument was first raised in the fall of 1921. It was based on the idea that noncitizens bloated the apportionment populations of some states but not of others. In later Congresses, representative William Vaile (R-CO) noticed that eight states would lose representation in the House if it were reapportioned with 435 members. He claimed, "the 8 States named which would lose representation by a membership of 435 in the next House have a foreign-born population of 5.9 per cent, while the 38 States which would lose no seats on this basis have a foreign-born population of 14.8 per cent" (Congressional Record, c. 67, House, s. 1, 6339). In other words, he thought there were about two and a half times as many noncitizens in states gaining or maintaining their seats under the new apportionment than in states losing some seats. Vaile claimed that if the authors of the Fourteenth Amendment "could have foreseen that many States would have a materially larger representation in Congress because that representation was based on many hundreds of thousands of people who had not acquired the right to vote . . . , [then] it is probable that they would have based representation on [the] number of citizens instead of [the] number of people" (Congressional Record, c. 67, House, s. 1, 6339). Representative Homer Hoch (R-KA) and senators Thaddeus Caraway (D-AR), James Thomas Heflin (D-AL), Kenneth McKellar (D-TN), and Arthur Capper (R-KS) had

similar views (Congressional Record, c. 70, House, s. 2, 699, 702–5; Congressional Record, c. 71, Senate, s. 1, 1962, 1967, 1975, 1978, 2053–55).[7]

A third complication was a question about the best method of apportionment. In the early 1900s, Walter F. Wilcox, a young professor in the philosophy department at Cornell University, began studying apportionment as a mathematical problem. Wilcox, who was later a president of the American Economic Association, the American Statistical Association, and the American Sociological Association, sent a letter to the chairman of the House Committee on the Census recommending Webster's method, which he called the "method of major fractions" (Balinski and Young 2001, 46–47). He also included tables that showed the division of seats resulting from Webster's method for every size of the House between 390 and 440 members. The 1911 apportionment bill used the Webster method.

Meanwhile, Joseph A. Hill, chief statistician of the Division of Revision and Results at the Census Bureau, was advancing a different method. He argued that the ratio of representatives per inhabitant should be as close to uniform as possible. Rather than measuring those differences in absolute terms, as the Webster method does, he argued that the differences should be measured in relative terms (Balinski and Young 2001). For example, if state A has an average constituency of 100,000 and state B an average constituency of 50,000, then the absolute inequality is 50,000 (Joseph A. Hill to William C Huston, Chairman of the House Committee on the Census, April 25, 1911, Apportionment of Representatives, Senate Report, July 6, 1911, 94, c. 62, s. 1, 48). Similarly, if A has an average constituency of 75,000 and B an average constituency of 25,000, then the absolute inequality would be the same 50,000, but their relative inequalities would differ. Hill believed the second comparison was more out of proportion than the first because 75,000 was 200 percent larger than 25,000, while 100,000 was 100 percent larger than 50,000. He wanted a method that accounted for relative differences, not absolute differences.

In 1921 Edward Huntington, a professor of mechanics and mathematics at Harvard and a former classmate of Hill's, started working on Hill's apportionment problem. Hill originally suggested a method that did not always mini-

7. McKellar would later claim that excluding aliens did not require a constitutional amendment because a strict reading of Article 1, Section 2 of the Constitution did not include people temporarily living within a state (Congressional Record, c. 71, Senate, s. 1, 1962). Other members of Congress disagreed.

mize the relative difference in the ratio of representatives per inhabitant, as he had wanted. Huntington showed a correct way to find such an apportionment and called it the "method of equal proportions." Today the method is known as the Hill-Huntington method. In January 1921, Huntington sent a letter to the chairman of the House Committee on the Census advocating his method. He noted the different number of seats that would result from his and Webster's method based on the 1920 census and 435 seats. The letter was read into the Congressional Record on January 19, 1921 (Congressional Record, c. 66, House, s. 3, 1678–79.) Three states would receive one more representative under the Hill-Huntington method than under the Webster method (Rhode Island, New Mexico, and Vermont), while three other states would receive one fewer (New York, North Carolina, and Virginia). The Hill-Huntington method slightly favored the smaller states because it ascribed more weight to the fractions of smaller states than to the fractions of larger states (Balinski and Young 2001, 51). Interestingly, the Webster method was more in line with each state's ideal quota than the Hill-Huntington method at the time, and Siegel's home state of New York benefited from the Webster method. Siegel recognized this fact before the House floor (Congressional Record, c. 66, House, s. 3, 1679). Since the floor was entertaining 483 members for its new apportionment—a size that allegedly prevented any state from losing a seat—it largely ignored the debate about apportionment methods among the mathematicians. The House remained loyal to the Webster method even though the Senate would soon recommend the Hill-Huntington method.

Across two contentious days of debate, January 18 and 19, dozens of representatives voiced their concerns about the effect of a new apportionment on their ability to represent constituents, added costs, efficient business, and the losses implied for specific states. On January 19, 1921, Barbour, who voted with the minority on the committee, proposed to substitute 435 members in place of 483 (Congressional Record, c. 66, House, s. 3, 1679). Burton Sweet (R-IA) then proposed 460 as a substitute for 435 and John M. Jones (D-TX) proposed 307 as a substitute for 460 (Congressional Record, c. 66, House, s. 3, 1679–80). Later that day the Committee of the Whole passed Barbour's substitute in a roll call vote 269-76 (Congressional Record, c. 66, House, s. 3, 1693–94). Consistent with that vote, a majority of members represented states that received larger seat shares from 435 than from 483. That version passed the House by a standing vote without tally (Congressional Record, c. 66, House, s. 3, 1694). As one might predict, 435 dominated the status quo in seat shares.

The *Literary Digest* praised the decision to keep the House at its current size, primarily because it saved taxpayers from an unnecessary expense. It

reported that "*The Republican*, the *New York World*, and, in fact, every journal that has come to our attention looks upon the action of the House as a real victory for common sense" ("Quality, not Quantity, in the House," *Literary Digest*, February 5, 1921, 14).

The Senate allowed the bill to die in committee before the end of the 66th Congress. The Senate Census Committee, which was assigned the bill, did not even hold hearings on reapportionment during the six weeks between its passage in the House and the end of 66th Congress, an omission that signaled either that the committee wanted to kill the bill or that it found the bill a low priority. A majority of members on the committee represented states that received greater seat shares from twenty-two different sizes of the House, ranging from 313 to 434, than they would from a House with 435 members. A 435-member House did not suit the chairperson's home state of West Virginia either. One hundred different House sizes between 300 and 500 produced a larger seat share for West Virginia than did 435. Consistent with these facts, the *New York Times* reported that senators who stood to lose representatives under the reapportionment worked with other senators to prevent Congress from taking action (January 23, 1921, 3).

The Senate committee did take one significant action however. Before the close of Congress, it requested a committee made up of members from the American Statistical Association and the American Economic Association to study various methods of reapportionment and to make a recommendation. In December 1921, the academic committee announced its preference for Hill-Huntington over Webster. The key part of their reasoning was that nearness should be measured on a relative scale rather than an absolute scale. The verdict may have resolved the technical debate among academics, but it did not persuade many members of Congress, particularly those in the House.

With the reapportionment bill clearly defeated in the 66th Congress, the House Census Committee had to propose a bill again if it wanted to move forward. It restarted hearings in the summer of 1921. Representatives in the 67th Congress repeated many of the same arguments, but now they found a new reason to delay.

Ira Hersey (R-ME) noted that if the committee passed an apportionment bill, several state legislatures would have to call a special session to redistrict their states before the next election. If they delayed instead, those states would redistrict during their regular sessions. Delaying reapportionment would be "simply a silent consent of Congress that they are satisfied with the present apportionment" (Subcommittee of the House Committee on the Census, Hearings, June 27–29, 1921, c. 67, s. 1, 28).

James Strong (R-KS) thought they should delay because the 1920 census was inaccurate. "To pass an apportionment bill based on a census taken when our boys were away seems to me to be very unfair" (Subcommittee of the House Committee on the Census, Hearings, June 27–29, 1921, c. 67, s. 1, 55).

Siegel, who continued to chair the House committee, now proposed a House with 460 members. With that number, sixteen states would gain seats while only two states, Maine and Missouri, would lose a seat each. With 460 members, the Webster and Hill-Huntington methods agreed on the distribution of seats, sidelining a potential disagreement. On October 14, William Larsen (D-GA) reported that the committee was deadlocked. Half the members of the committee wanted to increase the size of the House to 460 and half wanted to keep it at 435. To break the impasse, two members who opposed the increase switched sides, allowing the bill onto the floor (Congressional Record, c. 67, s. 1, 6312–13).

When the House debated the proposal, Carroll Beedy (R-ME), a member of the Census Committee, accused his fellow members of trying to protect their own seats. Beedy suggested that if the committee thought they should increase the size of the House, they should have proposed 483 members, the number that guaranteed that each state would maintain its membership, including his home state of Maine (Congressional Record, c. 67, s. 1, 6320). "By what process of ratiocination," he asked, "did the committee conclude to increase the membership of the House but to put on the brakes at 460?" (Congressional Record, c. 67, s. 1, 6321). According to Beedy, 460 was chosen because it protected the interest of two powerful members of the committee: John Langley (R-KY), who chaired the Committee on Public Buildings and Grounds, and Horace Towner (R-IA), who led the Republican Conference and chaired the Committee on Insular Affairs. With 458 members, Kentucky would have ten seats, but with 459 members, Kentucky would have eleven seats. Similarly, with 459 members, Iowa would have ten seats, but with 460 members, it would have eleven seats. Hence, a deal for 460 resulted. A 460-member House was "conceived in a spirit of petty politics and wrapped about with a cloak of party service," Beedy declared. "It is dedicated to the proposition that else we save a Congressman for both Kentucky and Iowa our great party and the Nation itself is eternally damned" (Congressional Record, c. 67, s. 1, 6321). The House erupted with a "prolonged" applause.

John Nelson (R-WI) later added that it was not just the representatives from Kentucky, Iowa, and Maine who were maneuvering for their state's interests. He claimed almost all the representatives from states that were expected to lose seats would "generally group themselves together . . . to

evade the Constitution by increasing their membership" (Congressional Record, c. 67, s. 1, 6328).

On October 14, 1921, the bill came to a vote. Before the House voted on Seigel's proposal for a 460-member House, Barbour proposed to amend the size of the House to 435 again (Congressional Record, c. 67, s. 1, 6337–38). The House accepted his amendment in the previous Congress, but now it rejected it in a teller vote of 140-123 (Congressional Record, c. 67, s. 1, 6340). Seigel's bill was engrossed and read a third time, but before the House could vote on it, Fairfield, who had proposed 435 members nine months earlier, proposed to recommit the bill to the Census Committee, a common maneuver for killing a bill that also may have been an attempt to replace 460 with 435. By a narrow vote of 146-142, with 3 voting present and 140 not voting, the House approved Fairfield's motion to recommit (Congressional Record, c. 67, s. 1, 6348). More on this vote in the book appendix.

The Associated Press reported that there was no party divide in the vote.[8] Two members of the Census Committee, Siegel and Larsen, pleaded for the bill with 460 seats, while two other members, Fairfield and Rankin, led the charge against it. The *Washington Post* added that "recommittal of a bill usually is regarded as tantamount to defeat, but since the vote on the Siegel bill was very close . . . it is possible that it may be revived and put through" (October 16, 1921, 24).

The Census Committee let the bill die. Rejection of the Seigel bill ended the first phase of struggle over reapportionment in the 1920s. Previous Congresses had passed their reapportionment bills within months of the decennial census report, but by the fall of 1921, Congress had not created a bill that could pass. Bitterness over the dispute would carry over to the next few Congresses, which would stall, delay, and allow reapportionment to die in committee again.

1922–1927

For the next two Congresses, the House Census Committee did not report any reapportionment bill. In the 68th Congress, chairman Charles Faust (R-MO) did not even arrange hearings. Meanwhile, the Senate waited for the House, which was supposedly the custom.

In the 68th Congress, only four members of the House Census Committee

8. *Washington Post*, October 15, 1921, 4; *Atlanta Constitution*, October 15, 1921, 1.

had served previously. Three of the four that remained had openly opposed reapportionment: Faust, Fairfield, and Rankin. Faust, who represented a state poised to lose seats with any reapportionment, was the most senior member of the majority party, so he became chair. Three of the four veterans represented states that received larger seat shares from the status quo than from any apportionment between 300 and 500 members. The fourth, John Rankin, represented a state that received a greater seat share from the status quo apportionment than from 98 percent of the House sizes between 300 and 500 members.

The new members of the House Census Committee largely favored the status quo as well. Even though three-quarters of the members were new, a majority of the committee, nine out of seventeen, represented states that received larger seat shares from the status quo than from any size between 300 and 500. In other words, a majority of the committee would have opposed any reapportionment if members voted solely for their state's seat share. All but one of the new Democrats appointed to the committee had that interest. The two most senior members of the majority party and the senior member of the minority party did so as well. With these personnel, it should be no surprise that the committee did not act.

Why was such a committee created? During this period representatives typically petitioned their party's Committee on Committees for their assignments. A typical member might value the Judiciary, Banking and Currency, or Foreign Affairs committees more than they valued the Census Committee. A member might, however, value the Census Committee if they thought their state would lose substantially from reapportionment. Representatives from states like Kentucky, Missouri, Indiana, and Virginia, which stood to lose from any reapportionment, had such an interest and were well-represented on the committee.

The Republican Committee on Committees appointed a mixture of opponents and proponents to the Census Committee, while the Democratic Committee on Committees filled all their party's vacancies, except one, with those opposed to reapportionment. The Republican Committee on Committees was made up of one representative from each state that had at least one Republican representative (Masters 1961). That representative, usually the most senior member of the state's delegation, voted in the Committee on Committees in proportion to the number of Republican representatives from their state. Hence big states, with large concentrations of Republicans, such as New York, Pennsylvania, and Illinois, had more say on the committee than small states with few Republicans, like Maine.

The Democratic Committee on Committees was made up of the Demo-

cratic members of the House Ways and Means Committee (Masters 1961).[9] Each member of that committee was responsible for suggesting appointments from a small geographic region of the country that they represented. Recommendations were usually made in consultation with the most senior member of a state's delegation. The committee then voted on the vacancies, and the nominee with the most votes won the position.

Clearly, the Republican Committee on Committees gave greater say to larger states than the Democratic Committee on Committees. With several Democratic states having a strong interest in opposing reapportionment, the minority party interested in obstruction, and a mechanism that allowed smaller states to get their preferred assignments, the Democrats appointed mostly obstructionists.

On March 8, 1924, the Census Committee formally announced that it would not report a reapportionment bill during the current session. Barbour, a former member of the committee, viewed the omission as a dereliction of the committee's duty. He objected to the delay and charged that "No matter at what number the membership of the House might be fixed, there are States today enjoying a relative representation in this House to which they are not entitled, while other States are deprived of their just representation in this body. . . . The last census showed that the population of California was 22,806 more than that of the State of Missouri, yet today Missouri has 16 Representatives in Congress while the State of California has but 11" (Congressional Record, c. 68, s. 1, 4181).

When the 69th Congress began its first session in 1925, Nicholas Longworth (R-OH) became the new Speaker of the House. He took control of the Republican steering committee and the Committee on Committees. He also placed his lieutenants on the Rules Committee, which determined the conditions under which a bill would come before the House (Bacon 1998, 120). Longworth's leadership would later aid reapportionment but only when it became a priority for him.

For the time being membership in the new Census Committee remained mixed. Hart Fenn (R-CT) chaired the committee and clearly desired reapportionment. Nevertheless, a majority of the committee continued to represent states that received larger seat shares from the status quo apportionment than from a House reapportioned with 435 members.

Fenn managed to arrange hearings on four reapportionment bills in February and March of 1926. By a vote of 9 to 4, the House Census Committee

9. *New York Times*, April 10, 1921, 20.

voted to table all four bills.[10] Several Republicans thought it was a poor time to reapportion because there was only a short window for 1920 figures to go into effect. With primaries starting a year before the election and the 1930 census possibly released during the 71st Congress, an apportionment based on 1920 figures might only apply to the 71st Congress.

Many believed there was plenty of time to create a bill based on figures from the 1930 census (House Committee on the Census, Hearings on HR 111, 398, 413, 3808, c. 69, s. 1, 54–60). As Lloyd Thurston (R-IA), claimed, "Inasmuch as we are very closely approaching another enumeration or another census, I do not believe there is a general demand throughout the country for a reapportionment" (House Committee on the Census, Hearings on HR 111, 398, 413, 3808, c. 69, s. 1, 62). Representatives Arthur Greenwood (D-IN), Lozier (D-MO), and Rankin (D-MS) echoed his sentiment (House Committee on the Census, Hearings on HR 111, 398, 413, 3808, c. 69, s. 1, 58).

Barbour objected from the floor again. When a Democrat from New York claimed that the Constitution does not say that Congress must reapportion by 1926, Barbour snapped back, "The gentleman from New York falls into the same fallacy that the rest of them do, that the House is powerless, and that a committee of Congress is more powerful than the Constitution of the United States itself" (Congressional Record, c. 69, s. 1, 7141). Barbour proposed to discharge a reapportionment bill from the committee based on constitutional privilege, but the chairman of the House Rules Committee, Betrand Snell (R-NY), denied his request (Eagles 1990, 56).

For the first time in years, the press condemned Congress for the delay. In an article titled "Our Delinquent Congress," Ray Tucker claimed:

> It would be an epic tale, inspiring and refreshing, to write that the House boldly threw the Constitution out the window in blocking reapportionment; that, at least if done in the grand manner, would have required some courage. But the Constitution did not enter their heads; it was their own political skins they were thinking of most. (*The New Republic*, May 26, 1926, 11)

Trying again, Fenn proposed another reapportionment bill in December of 1926 that authorized the secretary of commerce to use the Hill-Huntington method to reapportion the House with 435 seats immediately after the 1930 census. For the first time, the House Census Committee confronted the math-

10. *New York Times*, April 5, 1926, 14.

ematical controversy over Webster versus Hill-Huntington (Eagles 1990, 59–61). Members heard from both sides. Although neither method took hold, the debate helped justify Fenn's use of the Hill-Huntington method, which was previously endorsed by the Senate Commerce Committee.

In early 1927, the *New York Times* reported that Speaker Longworth, Chairman of the House Rules Committee Snell, and Majority Leader John Tilson (R-CT) all agreed to allow a discharge of Fenn's bill if the committee would not pass its own version.[11] The Census Committee refused to budge. On March 2, 1927, Fenn proposed that the House floor suspend its rules to accept his bill for a 435-member House without the assent of the committee (Congressional Record, c. 69, s. 2, 5414–15). After a brief debate, the House voted against the suspension in a vote of 197-183, with 52 not voting (Congressional Record, c. 69, s. 2, 5427–28). With the press criticizing the delay and House leadership permitting the discharge petition, reapportionment did not pass. It was, however, gaining momentum.

1928–1929

Reapportionment gained greater support in the 70th Congress, which began in March 1927 under the same Republican leadership.

In that year, twelve of the seventeen members of the House Census Committee retained their seats. To muffle dissent, House leaders added four new seats to the committee and filled those vacancies with moderates. Fenn remained the chair, and the committee now had more members from New York, Michigan, Wisconsin, and Washington—states that would gain from reapportionment—to support him.

Using 1920 census figures and the Webster method, a majority of the committee still received larger seat shares from the status quo than from a reapportioned House with the same number of members. But a majority of members in the House itself had the opposite interest. They received greater seat shares from a reapportioned House with 435 members. Furthermore, reapportionment now had the added support of the Republican leadership.

In March 1928, Fenn switched back to the Webster method "for unknown reasons" (Eagles 1990, 64; A bill for the apportionment of Representatives in Congress, HR 11725, c. 70, s. 1, 1–4). Walter Wilcox had argued that the committee should retain the Webster method until the committee was "satisfied

11. *New York Times*, January 28, 1927, 7; February 6, 1927, 18.

beyond a reasonable doubt that the traditional method should be changed for some new method like the method of equal proportions" (House Committee on the Census, Hearings, February 14–15, 20–21, 1928, c. 70, s. 1, 88). With 1920 figures or 1930 figures, a 435-member House would give a majority of members on the committee greater shares from Webster's method than from Hill-Huntington's.

Fenn proposed to use the Webster method on a 435-member House and to allow the secretary of commerce to automatically reapportion the House based on figures from the 1930 census and every subsequent census if Congress failed to reapportion (A bill for the apportionment of Representatives in Congress, HR 11725, c. 70, s. 1, 1–4). He also included language requiring congressional districts to be contiguous, compact, and as nearly equal in population as practicable to make redistricting more fair. There was no mention of enforcing the Fourteenth Amendment, removing aliens from the census, nor which states would gain or lose a seat under a particular size. The language was streamlined so that the entire issue rested on whether a member wanted the apportionment to be based on the next census or on 1910 figures. Phrased that way, the bill was more difficult to reject.

In early March 1928 the Census Committee approved Fenn's bill, and the House steering committee called on the Rules Committee to give it preferential status. Speaker Longworth and Majority Leader Tilson also endorsed it. The House debated the bill for two days in April. The bill faced strong opposition from those who wanted to continue making the decision with census figures before them. On April 18, Rankin attempted to kill the bill using a motion to recommit, which passed 186-164, with one member voting present and 80 not voting (Congressional Record, c. 70, s. 1, 9106).

A professor of politics from Princeton University warned that "the failure of the successive Congresses since 1920 to reapportion the membership of the House of Representatives will vitally increase or decrease the legitimate power and influence of many of our States in the election of next November" (Myers 1928, 386). This included the presidential election. Because the number of electors assigned to a state equals the number of representatives and senators assigned to a state, the professor worried that the Democrat Al Smith might win the 1928 election using the 1911 apportionment, even though the Republican Herbert Hoover would deserve to win using updated figures. A *New York Times* editor noticed the same possibility (*New York Times*, December 16, 1928, E1). It turned out that Hoover would have gained three more electors from a 435-member House reapportioned using 1920 census figures

than from the 435-member House apportioned in 1911.[12] Fortunately, malapportionment did not determine the winner. Hoover won in a landslide, avoiding any popular crisis over failing to reapportion.

When the second session of the Seventieth Congress began, Speaker Longworth, Majority Leader Tilson, and Chairman of the Rules Committee Snell all announced their support for the Fenn bill and promised to act on it. A young senator named Arthur Vandenberg (R-MI) also promised to support automatic reapportionment in his campaign. He introduced such a bill in the Senate in May 1928, declared inaction "a gross contempt of the Constitution," and announced in a radio interview that "32 million people were virtually disenfranchised by the failure to reapportion" (Eagles 1990, 69). Vandenberg's actions drew attention to the issue and seemed to energize the House.

On January 5, 1929, the House Census Committee met again and managed to pass the Fenn bill in a narrow 7-6 vote, divided largely along party lines.[13] Tilson helped the bill out of the committee by threatening to have the sergeant at arms round up absent members. Later he announced a special rule for the floor that would allow a roll-call vote within a week. He also promised President Calvin Coolidge a passed reapportionment bill before the end of the session.[14]

When the House considered Fenn's bill on January 10, it appeared more likely to pass. The Pennsylvania and Maine delegations both decided to support it even though Maine would lose one seat (Eagles 1990, 71). Many of the old issues were raised again. Lester Dickinson (R-IA) proposed to replace Webster's method with Hill-Huntington, Hoch proposed a constitutional amendment to exclude aliens, and Tinkham proposed language enforcing the Fourteenth Amendment (Congressional Record, c. 70, s. 2, 1591, 698, 1592, 1597–98). The House rejected all these ideas to keep the bill streamlined and to improve its chances of success.

"In an inexplicable move at the end of the debate," Fenn successfully proposed to remove the third, fourth, and fifth sections of his bill (Eagles 1990,

12. These figures are based on a comparison of seats from the 1911 apportionment and a 435-member House reapportioned using 1920 population data and the Webster method. Using 1920 figures, the Democratic states of Louisiana, Mississippi, and Rhode Island would lose one elector each, while various Republicans states would gain and lose electors. The largest gains would have been from California (three electors) and from Michigan and Ohio (two electors each). Failure to reapportion had no effect on the total number of Democratic and Republican electors in 1924.

13. *New York Times*, January 5, 1929, 8; *Washington Post*, January 5, 1929, 10.

14. *New York Times*, January 4, 1929, 9.

72). Section 3 required contiguous and compact districts, roughly equal in size. Removal of this clause allowed for greater gerrymandering (Karlan 2018). Sections 4 and 5 allowed states that gained or lost seats to temporarily allow at-large elections until their state legislatures had a chance to redistrict. Eagles suggests that the removal of the three clauses resulted from some "behind-the-scenes compromises" (Eagles 1990, 72), which would allow state legislatures to retain anyone who lost a seat. The House approved the deletions without debate (Congressional Record, c. 70, s. 2, 1591, 698, 1592, 1604). Rankin proposed to recommit Fenn's bill, which failed this time in a vote of 227-135 (Congressional Record, c. 70, s. 2, 1604–5). Fenn's amended bill then passed by a voice vote (Congressional Record, c. 70, s. 2, 1605).

Majority Leader Tilson appealed to the public for aid. Writing in the *New York Times*, he urged the Senate to pass the bill and "hoped that sufficient interest will be aroused throughout the country to impress upon that body the grave importance of enacting this bill into law before the end of the present Congress" (*New York Times*, February 3, 1929, 51).

The press tended to react positively. The *Literary Digest* wrote, "the press considers it great news that the House of Representatives has voted to obey the Constitution" ("Congressmen Vote to Obey the Constitution," *Literary Digest*, January 26, 1929). The *Philadelphia Record* added that the Senate "better follow the example of the House," while the *Richmond Times Dispatch* thought that the Senate should "kill the 'pernicious' Fenn bill, because it delegates the plain duty of Congress to a coordinate branch of the Government" ("Congressmen Vote to Obey the Constitution," *Literary Digest*, January 26, 1929).

The Senate had two months to act before the Seventieth Congress expired. Vandenberg took personal responsibility for steering Fenn's bill through the Senate (Congressional Record, c. 70, s. 2, 1711, 2172–77). The Senate Commerce Committee reported Fenn's bill without hearings. During the floor debate on January 24, Vandenberg refused to "follow detours into irrelevant matters" such as the difference between citizens and people, enforcement of the Fourteenth amendment, and which states might gain or lose a seat under various House sizes (Congressional Record, c. 70, s. 2, 2177). Instead, he wanted senators to focus on the injustice of a House apportioned using nearly twenty-year-old figures and thought that would settle the issue "without complication" (Congressional Record, c. 70, s. 2, 2177, 2178–2179).[15] At the end of the session Pat Harrison (D-MS) and others threatened a filibuster, which prompted Vandenberg to propose recommitting the bill after he received

15. *New York Times*, January 25, 1929, 4.

assurances that it would be considered again in a special session of Congress (Congressional Record, c. 70, s. 2, 4551–52).

Newly elected president Herbert Hoover called for reapportionment in his message to the special session of the Seventy-First Congress. Two days later Vandenberg reintroduced his bill in the Senate with three important changes.[16] The bill assigned the administration of reapportionment to the president rather than the secretary of commerce, it replaced a 435-member House with "the existing number," and it replaced the Webster method with "the method used in the last preceding apportionment" (Congressional Record, c. 70, s. 2, 108). Vandenberg argued that its purpose was to "cure a basic default in a fundamental constitutional process" (Congressional Record, c. 70, s. 2, 108). The default that needed a cure was the absence of reapportionment if Congress could not decide. The Senate Commerce Committee approved the bill on April 20.

The Senate thoroughly debated the bill for five weeks and addressed many of the same points raised by previous Congresses. The Senate rejected proposals to exclude aliens and to remove the executive branch from the process of reapportionment, but it did agree to an amendment that required the president to report results from both the Webster and Hill-Huntington methods in addition to the "current" method. On May 29, 1929, the Senate passed the apportionment bill in a vote of 57-26 (Congressional Record, c. 71, s. 1, 1321–36, 1840–66, 2065–82, 2148–53, 2154–60).

The House took up the bill on June 3, 1929. On the second day of debate, the House temporarily adopted an amendment requiring census takers to list names and addresses of all aliens, an amendment proposed by Hoch to exclude aliens. It also temporarily adopted an amendment proposed by Tinkham to exclude disenfranchised voters from the apportionment population (Congressional Record, c. 71, s. 1, 2338–48, 2359–65). Republican leaders decided that the only way to defeat the riders was to combine them. On June 6, majority leader Tilson offered an amendment that combined and struck all the amendments. His proposal passed overwhelmingly (Congressional Record, c. 71, s. 1, 2448–58). The House then approved the apportionment bill 271-104 (Congressional Record, c. 71, s. 1, 2458).

Because the House and Senate versions did not match, each chamber named five members to a conference committee to settle their differences

16. *New York Times*, April 17, 1929, 1; "A bill to provide for the fifteenth and subsequent decennial censuses and to provide for apportionments of Representatives in Congress," S. 312, c. 71, s. 1; Congressional Record, c. 71, s. 1, 107–8.

(Congressional Record, c. 71, s. 1, 2531).[17] For proponents of reapportionment, those members were chosen well. The two ranking Democrats from the House, John Rankin (D-MS) and Ralph F. Lozier (D-MO), who opposed reapportionment, were offset by six members, Fenn (R-CT) and Clarence McLeod (R-MI) from the House, and Vandenberg (R-MI), Duncan Fletcher (D-FL), Morris Sheppard (D-TX), and Hiram Johnson (R-CA) from the Senate. Those six members represented states that would receive larger seat shares from any reapportionment between 300 and 500 members than from the status quo, using 1930 census figures and either the Webster or Hill-Huntington methods. For five of the six members, excluding Fletcher, the same could be said using 1920 figures. The two remaining members, Representative Carl Chindblom (R-IL) and Senator Wesley Jones (R-WA), represented states with more middling interests, but their states were advantaged by reapportionment as well. Combined the status quo was a strict Condorcet loser among the ten members of the conference committee.

After agreeing on 435 members and the executive administration of apportionment, one of the remaining issues for the conference committee was the method of reapportionment. The Senate version listed "the method used in the last preceding apportionment." The House version requested apportionments based on both the Webster and Hill-Huntington methods. On June 8, the conference committee agreed that the Census Bureau would report results from all three methods of apportionment: Webster, Hill-Huntington, and the previous method employed (Congressional Record, c. 71, s. 1, 2608–9). If Congress failed to pass a reapportionment in the Congress that received the census report, the administration would apply the new census figures to the most recent method employed and current size of the House. The compromise passed 8 to 2, with Rankin and Lozier objecting.

The House passed the revised bill on June 11 (Congressional Record, c. 71, s. 1, 2676), the Senate passed it two days later, and President Hoover signed it into law on June 18, 1929. The final version required the president, during the first week of the second session of Congress, to send a census report to Congress that included (1) the population of each state excluding Indians not taxed, (2) the number of representatives each state would receive under the Webster and Hill-Huntington methods, (3) and the number of representatives each state would receive under the last method and House size used. If Congress failed to reapportion itself during that Congress, either because the Speaker did not schedule a bill or members favored the status quo, then each

17. *Washington Post*, June 8, 1929, 2.

state would be entitled to the number of representatives reported using the method and House size applied in the previous apportionment (Act of June 18, 1929, ch. 28, 46 Stat. 21).

Fortunately, in 1930 the Webster and Hill-Huntington methods produced the same distribution of seats, alleviating any controversy over method. Members of Congress became acclimated to a House with 435 members, and, for a short time, they were satisfied with the Webster method.

Summary

Reapportionment failed in 1920 and 1921 because key members of the House Census Committee wanted more seats, even though House leadership and the House floor wanted the same number of seats or fewer seats, which pulled the issue in separate directions. Because it was seen as a constitutional mandate, a reapportionment bill that preserved each member's seat managed to get out of the House, but when the bill died in the Senate, members of both chambers began openly questioning whether they needed to reapportion the House at all. After they found rationales for delay, subsequent Congresses simply let the issue die in committee. Those committees were largely filled with members who represented states favoring the status quo.

Congress succeeded in enacting a reapportionment bill only after "the scandal had become too notorious" (*New Republic*, June 19, 1929). In 1928 and 1929 the personnel on the committee initiating reapportionment changed, stronger leaders in the House backed reapportionment, and the press began pressing for the reform. Focusing on the question of whether Congress would use 1910 or 1930 figures fueled public sentiment in favor of reapportionment. By the end of the decade most people believed that a House apportioned on twenty-year-old figures was absurd.

Leadership was able to focus public attention on the outdated figures by preventing the issues of different House sizes, enforcement of the Fourteenth amendment, or the exclusion of aliens from entering the bill. The only difference remaining was the injustice of using outdated figures. The discussion of the Webster versus Hill-Huntington methods was set aside because with 435 seats both methods produced the same apportionment. With those distractions removed, discussion focused on the ethics of continuing with outdated figures. This is why the House got stuck at 435 members. The size had to be fixed, along with other matters, to get the bill passed.

The Apportionment Act of 1929 is now known as the "permanent" or

"automatic" apportionment act of 1929. It contains a self-activating reapportionment that not only prevents members of Congress from tinkering with the distribution of seats, but also removes their temptation to add enough seats to prevent current members from losing their own seat. Unless Congress passes an overt act to the contrary, the responsibility of apportioning a House with 435 members is left to the executive branch. Congress requested the change because its leaders knew that there was too much chaos in allowing their members to vote on the division of power among themselves.

The new policy did not come without its failures. The law failed to reinstate or repeal requirements of earlier apportionment laws, including the requirement that congressional districts be contiguous, compact, and contain roughly equal populations. It was simply silent on the issue. The law also did not provide specific guidelines for how states should redistrict, which led many states to create districts with controversial shapes and sizes. Some states reserved seats for at-large districts, rather than tying them to a specific geographic area within a state. In this sense, the act redirected the political spotlight away from congressional reapportionment toward the redistricting efforts within each state. State legislatures grossly gerrymandered their congressional districts for the next three decades (Karlan 2018). Such policies became the norm until the 1960s, when Supreme Court provided guidelines for redistricting and required single-member districts (*Baker v. Carr*, 369 U.S. 186 (1962); *Wesberry v. Sanders*, 376 U.S. 1 (1964); *Reynolds v. Sims*, 377 U.S. 533 (1964)). While those guidelines have been credited for curtailing the politics of gerrymandering, they certainly did not end the practice.

Conclusion

The Constitution explicitly states that "[r]epresentatives and direct Taxes shall be apportioned among the several States . . . according to their respective Numbers," and that the "actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct" (Art 1, Sec. 2). No serious reader of that passage would conclude that the Constitution does not require Congress to reapportion the House every decade. Nevertheless, in the 1920s, some members of Congress took that very position. With enough strategic maneuvering in the House, they managed to maintain the 1911 apportionment for two decades.

When the results of the 1930 census were reported, the malapportionment of the 1920s became transparent. More than 70 percent of the states had gained or lost seats. Twenty-one states had lost at least one seat, with Georgia, Iowa, Kentucky, Missouri, and Pennsylvania losing at least two. Thirteen states had gained seats, with California gaining nine, almost twice its previous representation.

The distortion placed the 71st and 72nd Congresses (1929–1933) among the most malapportioned Congresses in US history (Roberts 2022). Malapportionment meant that some people were overrepresented while others were underrepresented during a period when Congress was struggling with tariff reform, a Red Scare, and the greatest stock market crash in US history.

Clearly, the words of the Constitution were not enough to bind politicians to reapportionment. Instead, the success of reapportionment depended on the interests of key political actors and whether those interests were strong enough to make members obey the Constitution itself. Apportionment decisions were unstable in previous decades because various metrics or ratios of representation were in a cycle, producing a persistent temptation to reapportion. After 1921, reapportionment failed because a majority of members on the Census Committee, and many members throughout Congress, preferred the status quo to almost any reapportionment that could be proposed. Rather than enter a sea of uncertainty about which apportionment might pass, many preferred to not try at all, creating a different type of failure than the one expected from cycles . . . an entrenched status quo.

To help explain why such tinkering has always been important for the nation as a whole, the next chapter examines how apportionment decisions have affected the party controlling a majority of the House and winners of US presidential elections. Both affect the distribution of power in Washington.

SEVEN

Parties in Congress and Presidential Elections

Previous chapters have shown how actors might choose a metric, method, ratio, or size of the House based on their state's allocation of seats. This chapter shows how such allocations can alter, and have altered, the partisan composition of Congress, the electors assigned to a state, and potentially the winner of the Electoral College. With support for candidates fixed, a different "metric" or a different "method" can affect the relative strength of the parties in Congress and which candidate wins the presidency.

In particular, this chapter examines the effect of five apportionment methods on the partisan composition of the US House and the outcome of US presidential elections from 1792 to 2024. It then investigates similar effects from using free population in place of the Three-Fifths Clause from 1792 to 1863, and voting-age citizens in place of population from 1876 to 2024.

Although various methods and metrics regularly affect the distribution of seats, my general finding is that they rarely affected which party controlled a majority of the House or which candidate won the presidency. From 1792 to 2023, the method of apportionment would have changed the majority party only once, and it would have affected the outcome of only 2 of the 59 presidential elections studied. The majority coalition in Congress would have changed once if the three-fifths population was replaced by free population, but replacing the three-fifths population with free population would not have changed the winner of any presidential election. From 1872 to 2023, apportionment by voting-age citizens would have changed the majority party in Congress one more time, and it would have changed the winner of two presidential elections.

The effects are modest but perhaps not a surprise. The party composition of the House must be close for any method or metric to alter the party in control. And the method or metric has to give substantially more seats to one party than the other for it to have that effect. The same is true for the distribution of electors affecting the presidency. For this reason, it is unlikely that apportionment of the House would tip the majority party in Congress or alter the outcome of a presidential election. The fact that it did a few times in American history might be the surprise.

Background

Because the electors assigned to a state are based on the number of representatives the state has in the House and the Senate, the apportionment of the House can affect the electors assigned to a state and potentially the outcome of the Electoral College. How this can happen is illustrated using a hypothetical example. In this example, three states want to apportion their 40-seat House using the figures in table 7.1. They are deciding whether to base their apportionment either on population (the top half of the table) or on citizens (the bottom half of the table). They will use the Hamilton/Vinton method in both cases. Recall that under this method, each state's ideal quota is determined, states receive the number of seats equal to the whole number of their ideal quotas, then any remaining seats are assigned to the state(s) with the largest remainders.

With population, the whole number of the ideal quotas sum to 38 seats. Connecticut and Plymouth have the largest remainders, so they get one additional seat each. Massachusetts Bay is assigned 20 seats, Connecticut 18, and Plymouth 2. If all representatives from Massachusetts Bay were Republican, while all representatives from Connecticut and Plymouth were Democrats, neither party would control a majority of the chamber.

If, however, the exact same procedure had been used but the House were apportioned based on citizens, as shown in the bottom half of the table, Connecticut and Plymouth would each lose a seat to Massachusetts Bay. This is because Massachusetts Bay has a greater proportion of citizens in its population and it receives the one extra seat for having the largest remainder. Massachusetts Bay is assigned 22 seats, Connecticut 17, and Plymouth 1. If all representatives from Massachusetts Bay continued to be Republican, the Republicans would control 22 of the 40 seats, a majority of the hypothetical House. The metric of apportionment alone would have altered the party controlling the chamber.

TABLE 7.1. The Effect of the Metric of Apportionment on the Electoral College

Population				
State	Population	Ideal Quota	Seats	Electors
Mass Bay	10,800	20.571	20	22
Connecticut	9,300	17.714	18	20
Plymouth	900	1.714	2	4
Total	**21,000**	**40.000**	**40**	**46**
Citizens				
State	Citizens	Ideal Quota	Seats	Electors
Mass Bay	10,800	21.600	22	24
Connecticut	8,700	17.400	17	19
Plymouth	500	1.000	1	3
Total	**20,000**	**40.000**	**40**	**46**

Note: Seats are apportioned for a hypothetical legislature with three states and forty seats using the Hamilton/Vinton method.

If states were assigned electors equal to the sum of those numbers and two senators, then with the population as the metric Massachusetts Bay would receive 22 electors, Connecticut 20, and Plymouth 4, listed in the top half of table 7.1. A candidate would need a majority of the electors to become president. If no candidate wins a majority, the Constitution requires the US House of Representatives, voting in state blocs, to choose the president from the three candidates with the most electoral votes. Since there are 46 electors, a candidate would need 24 electoral votes to win a majority of the Electoral College.[1]

Suppose all three states maintained the practice of assigning all of their electors to the candidate receiving the most votes in their state. If candidate Jones received the most votes in Massachusetts Bay, while candidate Smith received the most votes in Connecticut and Plymouth, Jones would receive 22 electoral votes while Smith would receive 24. Smith would win the Electoral College with population as the metric of apportionment.

But if the states based their apportionment on citizens, Massachusetts Bay would receive 24 electors, Connecticut 19, and Plymouth 3, listed in the bot-

1. The Twenty-Third Amendment of the US Constitution, which was enacted in 1961, provides electors for the District of Columbia, but the number of those electors cannot exceed the number of electors assigned to the least populous state. Hence, with the current 435 members in the House and 100 members in the Senate, there are 538 electors (538 = 435 representatives + 100 senators + 3 for DC). A candidate needs a majority of those electors, namely 270, to win the Electoral College.

tom half of the table. Assuming that each state continued to assign electors the same way, Jones would win the Electoral College 24 electors to 22. The difference is not due to a change in procedure or a change in the popular vote. It is entirely due to the effects of the metric of apportionment on the distribution of electors, which moves electors from states favoring Smith to states favoring Jones.

The Effect of the Apportionment Method

Consider the effects of the method of apportionment on the partisan composition of the House and on the outcome of presidential elections from 1792 to 2024. For this study everything remains the same as observed historically, except the textbook version will be used to make the results comparable across time (i.e., the size of the House will be fixed to its historical size).[2] To make these calculations, assume that a party gains or loses seats in proportion to the partisan composition of its state delegation. See the chapter appendix for details.

From 1850 to 1900, Congress apportioned a smaller House using the Hamilton/Vinton method, then gave some states additional seats ad hoc. For a proper comparison, the results are based on an application of the method of apportionment to the size observed after the ad hoc adjustment.[3] Hence, for 1850 to 1900 the results from the Hamilton/Vinton method may differ from historical figures.

Congress

Figure 7.1 displays the percent of House seats controlled by Anti-Administration representatives (1793), Democratic-Republicans (1803–1823), Jacksonians (1833), or Democrats (1843–2023) in the first Congress after reapportionment for five different methods of apportionment. The dashed line through 50 indicates a bare majority. Democrats, and their predecessors, would control a majority of the House for any marker above that line.

The large swings in the graph reflect changes in the popularity of various

2. Similar results are produced from 1793 to 1843 if the Jefferson, Adams, and Webster methods are calculated using the early version, that is, with the divisor chosen first and the size of the House derived.

3. This analysis was able to reproduce all the apportionments from 1850 to 1900 using the ad hoc method. They were not reported because it is not clear whether Congress would have made the same ad hoc adjustments if it used a different method of apportionment.

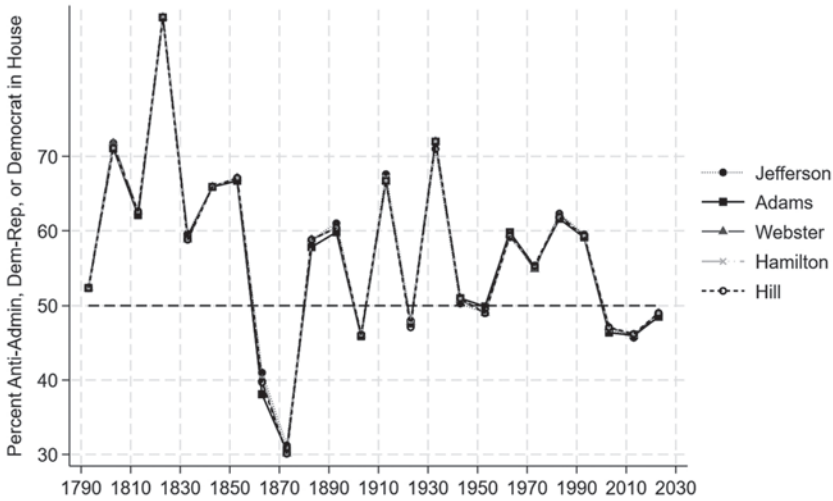


Fig. 7.1. The Effect of Five Apportionment Methods
Note: This figure reports the percentage of House seats controlled by Anti-Administration representatives (1793), Democratic-Republicans (1803–1823), Jacksonians (1833), or Democrats (1843–2023). Democrats, and their earlier counterparts, control a majority of seats when the marker is above the red, dashed line at 50.

parties. It is more important to focus on the differences between markers in the same year. Those differences indicate the effect of at least one of the five methods of apportionment on party composition in the House.

The first thing to notice is that for any given year the differences between apportionment methods are quite small. The greatest differences are between the methods of Jefferson and Adams, with the former favoring large states, and often the Democrats, and the latter favoring small states, and often the Republicans. The largest difference between the two methods is in 1863, when the Jefferson method would have produced 2.9 percentage points more seats for the Democrats than would the Adams method. The Democrats were far from having a majority that year. Hence, changing the method of apportionment would not have changed the party controlling the House.

There is only one year in which the method of apportionment altered the majority party. In 1953, Congress used the Hill-Huntington method to apportion the US House. Republicans controlled 221 seats at the beginning of that Congress (50.8 percent), while the Democrats controlled 213 seats (49 percent). There was also a single independent.[4] If the Adams method were used instead of Hill-Huntington, and the partisan composition of each state's del-

4. At the beginning of the Eighty-Third Congress two of the Democratic seats were vacant.

egation remained the same, then both the Republicans and the Democrats would control 217 seats (49.9 percent). Everything else equal, the Republicans would have lost their majority if Congress apportioned the House using the Adams method rather than the Hill-Huntington method.

Presidential Elections

What if Stephen Douglas had won the 1860 presidential election rather than Abraham Lincoln? What if John F. Kennedy had failed to defeat Richard Nixon in 1960 because the apportionment method gave fewer electors to states like Texas and New York but more electors to states like California and Ohio? In both cases, the result would be surprising.

Apportionment methods can fail to affect the partisan composition of the House but still affect the outcome of a presidential election. To see this, consider the effect of the five methods of apportionment on the results of the Electoral College from 1792 to 2020 using the textbook version of each method.[5] Overall, the choice of apportionment method appears to have had little impact on the winner of a presidential election. Among the 59 elections studied, only 2 elections (3.4 percent) would have produced a different winner under one or more of the five apportionment methods. Those two were the elections of 1876 and 2000.

Other close elections, such as the election of 1824 between Andrew Jackson and John Quincy Adams and the election of 1888 between Benjamin Harrison and Grover Cleveland, were not affected by the method of apportionment. The number of electors assigned to each candidate changed, but the election of 1824 had so many candidates in the race that no candidate would have received a majority of the electors under any of the five apportionment methods, throwing the decision to the House in each case. In 1888, Cleveland won the popular vote while Harrison won the Electoral College, but the Electoral College vote was never close, which meant that Harrison would have won the 1888 election under all five methods. Similar patterns occurred in other races.[6]

5. With one exception, similar results are produced from 1792 to 1840 by applying the early versions of the Jefferson, Adams, or Webster methods, that is, with the divisor chosen first. The exception is the election of 1800. If the Adams method was used in place of the Jefferson method that year, Burr would have won 81 electors while Jefferson would have one only 79. Both would have been considered majorities prior to the Twelfth Amendment, but Jefferson would have won because he had more electors than Burr.

6. In 1864 none of the Confederate states were seated in Congress. In 1868 seats assigned to Mississippi, Texas, and Virginia were still vacant. In 1872, Congress did not count the six electors

The Election of 2000

The presidential election of 2000 was a close race between George W. Bush (R) and Al Gore (D) (Ceaser and Busch 2001). Bush won the Electoral College by five electoral votes, while Gore won the popular vote by a half a percentage point. Bush was a former governor of Texas and the eldest son of George H. W. Bush, the 41st president. Gore was the incumbent vice president under Bill Clinton and former representative from Tennessee. Both campaigned on the budget, tax relief, and social security reform.

Returns were so close that on the night of the election no one knew who had won. A single state, Florida, controlled enough electors to determine the outcome of the election, and the vote in Florida was so close that a mandatory statewide recount went into effect. Election officials argued over the meaning of hanging chads, that is, paper ballots that were incompletely punched, and which candidate was selected on butterfly ballots, that is, ballots that had names down both sides of a card with a single column of punch holes in the middle. After a month of legal challenges, the US Supreme Court ruled in a 5-4 decision that a constitutional recount could not be conducted by the December 18 deadline. That allowed the previous certification by the Florida canvassing board to stand, granting Bush Florida's 25 electors and the victory. Bush won the Electoral College 271 to 266.

Bush's victory under the Hill-Huntington method is shown in the Hill column of table 7.2. The table also displays the results from the four other methods of apportionment. Gaines and Jenkins (2009) calculate similar results using the pledged vote tally rather than the actual vote tally displayed here.

For the states appearing in the table, the number of electors assigned to each state differs under at least one of the five methods. The total electors from those states are labeled "Remaining Democratic States" and "Remaining Republican States," respectively. For the remaining states, the number of electors assigned are the same across all five methods. The number of electors won by Gore are the sum of select democratic states and remaining Democratic states. Those for Bush are added similarly.

If the House had been apportioned using either the Adams or Webster method, Bush would have won the election, as he did under the Hill-Huntington method, albeit by a different electoral margin. If, however, the Jefferson method had been used in place of the Hill-Huntington method, large

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from Arizona and eight electors from Louisiana because of allegations of election fraud (Senate Journal, c. 42, s. 3, 340–45). In each case electors from those states were treated as abstentions.

TABLE 7.2. The Effect of Five Apportionment Methods on the 2000 Presidential Election

State	Jefferson	Adams	Webster	Hamilton	Hill
Select Democratic States					
California	56	52	54	54	54
New York	35	32	33	33	33
Illinois	23	21	22	22	22
Pennsylvania	23	22	23	23	23
Michigan	19	18	18	18	18
New Jersey	16	15	15	16	15
Massachusetts	13	12	13	13	12
Washington	10	11	11	11	11
Wisconsin	10	11	11	11	11
Maine	4	5	4	4	4
New Mexico	4	5	5	5	5
Delaware	3	4	3	3	3
Rhode Island	3	4	4	4	4
Remaining Democratic States	51	51	51	51	51
Select Republican States					
Texas	33	31	32	32	32
Florida	25	24	25	25	25
Ohio	21	20	21	21	21
North Carolina	14	13	14	14	14
Tennessee	10	11	11	11	11
Louisiana	9	10	9	9	9
Arizona	8	9	8	8	8
Kentucky	8	9	8	8	8
Oklahoma	7	8	7	7	8
Kansas	6	7	6	6	6
Mississippi	6	7	7	6	7
Nebraska	4	5	5	5	5
Idaho	3	4	4	4	4
Montana	3	4	3	3	3
North Dakota	3	4	3	3	3
South Dakota	3	4	3	3	3
Remaining Republican States	104	104	104	104	104
Gore (D) Electors	270	263	267	268	266
Bush (R) Electors	267	274	270	269	271
Total Electors	537	537	537	537	537

Note: The table shows the number of electors assigned to each state for each of the apportionment methods listed. Electors sum to 537 because one elector from the District of Columbia abstained.

states like California, New York, and Texas would have been assigned more seats in the House, while small states such as Rhode Island and Idaho would have been assigned fewer seats. The net change would have taken electors from the Republicans and given them to the Democrats.[7] Under Jefferson's method, Gore would have won the 270 electors needed to win the presidency. Florida may have continued to argue over hanging chads, but its electors would not have been enough to determine the outcome.

If Hamilton's method had been used instead, some of the larger states would have been assigned the same number of electors as they were assigned under the Hill-Huntington method, but two Democratic states, New Jersey and Massachusetts, would have gained one representative each, while two Republican states, Oklahoma and Mississippi, would have lost one representative each. The shift among the four electors would have produced a third result for the Electoral College, namely, neither Bush nor Gore would have a majority of electors. The US House of Representatives would have decided the outcome instead.

It is hard to predict who would have won the election in the House. If representatives voted by party, Bush would have received support from 25 state blocs, one short of the requisite majority, while Gore would have received support from 20 state blocs. In four of the five remaining states the parties were evenly divided: Arkansas, Illinois, Maryland, and Nevada. The fifth state, Vermont, was represented by a single independent, Bernie Sanders. Although Bush might have been favored to win such a contested election, the decision in the House could have gone either way. The results show that the method of apportionment can affect the winner of a presidential election, even if it does not do so often.

The Election of 1876

The method of apportionment also affected the winner of the 1876 election. To understand why, one has to understand what happened four years earlier. In February 1872, Congress apportioned the House based on 283 seats using the Hamilton/Vinton method. Congress chose 283 in part because the distribution of seats under the Hamilton/Vinton and Webster methods were the same. Three months later, Congress passed another act which gave one additional seat to each of nine states: Alabama, Florida, Indiana, Louisiana, New Hampshire, New York, Pennsylvania, Tennessee, and Vermont. This produced an ad hoc allocation that could not be reproduced by either the Hamilton/Vinton or the Webster methods.[8]

7. Neither Maine nor Nebraska split their electoral votes in 2000.

8. The Republicans controlled a majority in both chambers, but three of the nine states to which they gave seats were controlled by Democrats, while another two were evenly divided between the two parties. Hence, it is unlikely that the seats were allocated for purely partisan reasons.

TABLE 7.3. The Effect of Six Apportionment Methods on the 1876 Presidential Election

State	Observed	Jefferson	Adams	Webster	Hamilton	Hill
Select Democratic States						
New York	35	37	34	36	36	36
Missouri	15	16	15	15	15	15
Indiana	15	15	14	15	15	15
Tennessee	12	12	11	12	12	12
Virginia	11	12	11	11	11	11
Arkansas	6	5	6	6	6	6
West Virginia	5	5	6	5	5	5
Remaining Democratic States	85	85	85	85	85	85
Select Republican States						
Pennsylvania	29	30	28	29	29	29
Ohio	22	23	22	22	22	22
Illinois	21	22	21	22	22	21
Louisiana	8	7	8	8	8	8
South Carolina	7	7	8	7	7	7
California	6	6	7	6	6	6
Minnesota	5	5	6	5	5	5
Kansas	5	4	5	5	5	5
New Hampshire	5	4	5	4	4	4
Vermont	5	4	5	5	5	5
Florida	4	3	4	3	3	4
Rhode Island	4	3	4	4	4	4
Remaining Republican States	64	64	64	64	64	64
Tilden (D) Electors	184	187	182	185	185	185
Hayes (R) Electors	185	182	187	184	184	184
Total Electors	369	369	369	369	369	369

Note: The table shows the number of electors assigned to each state for each of the apportionment methods listed. Observed electors are based on a House with 283 seats apportioned according to the Hamilton method, with an additional seat given to nine different states. Figures in the remaining columns are derived from a House with 292 seats. In all six cases, Colorado, which entered the union in August 1876, was assigned one seat (i.e., three electors) after apportionment.

The ad hoc apportionment affected the election of 1876, which was a showdown between Rutherford Hayes (R) and Samuel Tilden (D) (Holt 2008). Hayes was the governor of Ohio and a staunch abolitionist. He received 4,034,142 popular votes, while Tilden, a governor of New York and a protégé of Martin Van Buren, received 4,286,808 popular votes. Even though Tilden received more popular votes than Hayes, Hayes won the Electoral College 185 to 184, as shown in the "Observed" column of table 7.3. Had the Hamilton/Vinton method been applied to the 292 members of the House, as required by law, Tilden would have won the election instead. A proper application of the Hamilton/Vinton method would give two additional seats to New York

and one to Illinois rather than one each to New Hampshire, Florida, and New York. This would have changed the outcome to 185 electors for Tilden and 184 electors for Hayes, as shown in the "Hamilton" column. Interestingly, both the Webster and the Hill-Huntington methods would have produced the same result, even though both would have produced slightly different allocations of seats.

Jefferson's method would have allocated more seats to large states like New York, leading Tilden to a more decisive victory of 187 to 182 than the Hamilton, Webster, or Hill methods. That may have silenced some of the post-election engineering over disputed votes. In contrast, Adams's method would have had the opposite effect. It would have allocated more seats to smaller states than Jefferson's and assigned 187 electoral votes to Hayes and 182 electoral votes to Tilden. Even with fixed votes, the reallocation of only a few seats would have had profound effects on the election of 1876.

The Effect of Free Population vs. the Three-Fifths Clause

The Three-Fifths Clause was one of the most dehumanizing clauses in the Constitution. It counted enslaved people as three-fifths of a person for the purposes of representation and for taxation. It perpetuated the notion that some humans were not equal to others, reduced slaves to a fractional worth, and helped entrench slavery by giving slaveholding states a larger voice in the House.

Even after the importation of slaves had formally ended in 1808, the American slave population expanded. "Decennial census data available to Jackson conclusively proved that slavery was not withering away as initially hoped" (Amar 2021, 597). In 1800, the country had 0.9 million slaves; in 1820, it had 1.5 million; in 1840, 2.5 million; and in 1860, it had 4 million. Even though the "percentage" of Americans living in bondage was shrinking, the percentage was shrinking at a funeral's pace from 17.1 percent in 1800 to 15.6 percent in 1820, 14.7 percent in 1840, and 12.9 percent in 1860.

Congress

The Three-Fifths compromise gave the South an advantage in the US House of Representatives throughout the Antebellum period. Contrary to popular opinion, however, the South never maintained a majority of House seats. As time progressed, the Northern population grew more rapidly than the South-

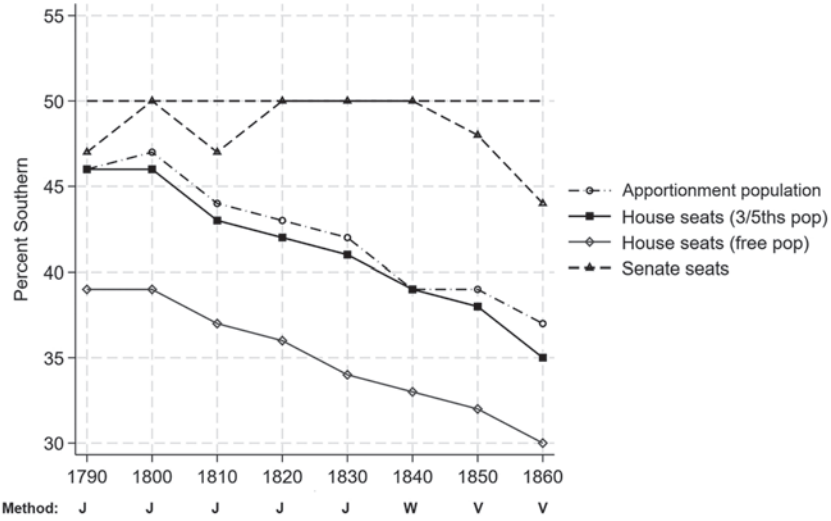


Fig. 7.2. Southern Control of the House and Senate
Note: This figure depicts the percentage of seats controlled by the South in the two chambers respectively. Southern states include the eleven states of the Confederacy as well as Delaware and Maryland. The apportionment population is the percentage of the three-fifths population controlled by those states. The method beneath the x-axis indicates the method applied to the listed census: Jefferson (J), Webster (W), and Hamilton/Vinton (V).

ern population, causing the number of Southern seats to decline, with or without the Three-Fifths compromise. As shown in figure 7.2, the South's relative population under the Three-Fifths compromise peaked at 47 percent of the nation's population in 1800 and steadily declined to 37 percent on the eve of the Civil War. Its share of House seats steadily declined with it. If the House had been apportioned based on free population alone, the South would have controlled fewer seats, roughly five to seven percentage points fewer. The difference is shown by comparing the dark line with square markers to the lighter line with hollow-diamond markers.

Removal of the Three-Fifths Clause would have given Northern representatives greater control of the House. With additional seats from the North, the House may have prohibited slavery in any new state joining the union, it may have blocked broad interpretations of the fugitive slave clause, and it may have had enough votes to attempt to end slavery by constitutional amendment. With the slave vote, the process of amending the Constitution, outlined in Article V, protected the institution of slavery by making the Constitution functionally impossible to amend without support of the South.

Humes et al. (2002) identify a list of prominent roll call votes that would have failed if the House had been apportioned based on free population rather than the Three-Fifths Clause. Striking the Three-Fifths Clause would have resulted in the defeat of the Judiciary Act of 1801, which reduced the number of Supreme Court justices from six to five, increased the number of district courts, and established six circuit courts. The Cumberland Road Act of 1806 would have also been defeated. The act funded the first federal highway and created one of the most important routes for immigration into the Northwest prior to 1840. The charter establishing the second bank of the United States would have failed in 1816 during a period of financial instability after the War of 1812. And the Indian Removal Act of 1830 would have failed. That act arranged for the removal of Native Americans to lands west of the Mississippi and led to what is commonly known as the "Trail of Tears." Even the infamous tariff of abominations of 1832 would have failed without the Southern slave vote. The act was supposed to appease the antiprotectionists in the South, but it eventually led to the Nullification Crisis and President Jackson's call for a "force bill" to compel South Carolina to comply. Finally, Congress would not have passed the Texas and New Mexico Act, which was a key part of the Compromise of 1850 that transferred land from Texas to the federal government in exchange for the assumption of Texas state debt.

The list goes on. Without the South's three-fifths bonus for slaves, some desirable legislation and some undesirable legislation may have died in the House. The point is not to find a perfectly accurate and exhaustive list. It is to illustrate that just because the South never controlled a majority of the House does not mean its additional slave votes did not affect legislation.

With one exception, the Three-Fifths compromise did not affect the party that controlled a majority of the House. This can be seen in figure 7.3. The figure compares the percent of House seats controlled by Anti-Administration representatives (1793), Democratic-Republicans (1803–1823), Jacksonians (1833), or Democrats (1843–1863) with the three-fifths population or free population as the metric of apportionment. In each case, the size of the House is kept fixed at historical levels and the textbook version of the historical method is applied. Similar results are produced if divisors are fixed at historical levels and House sizes are derived using the early method.

Typically Democrats, and their earlier counterparts, would have received fewer seats without the slave vote. The greatest loss to the Democrats would have been in 1793, when the Anti-Administration representatives would have lost 4.8 percentage points of the seats. Compare that to 1853, when Democrats would have lost only 2.1 percentage points of seats.

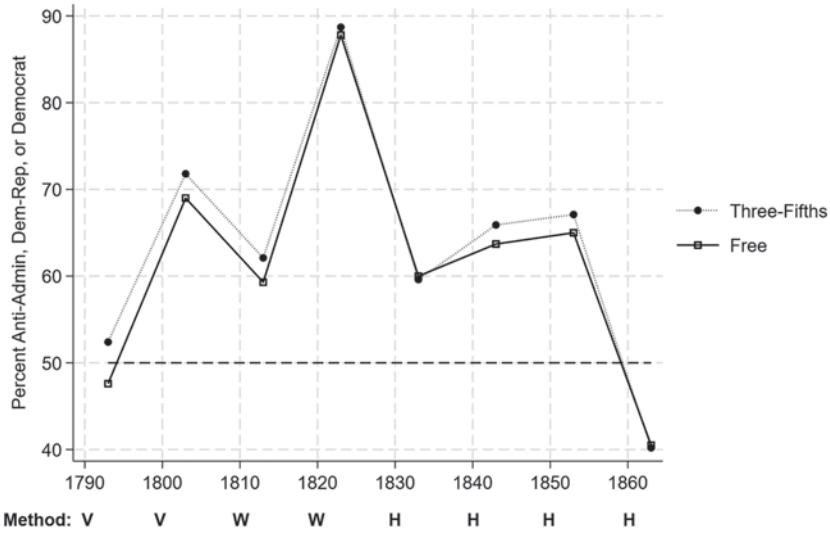


Fig. 7.3. The Effect of Three-Fifths Clause on Party Composition of the House
Note: The apportionment method used appears beneath the graph: Jefferson (J), Webster (W), and Hamilton/Vinton (V). Prior to 1850 divisors were fixed and House sizes were allowed to vary. From 1850 forward, House sizes were fixed using the textbook version.

The loss in 1793 would have been enough to alter the faction controlling the House. Under the Three-Fifths compromise, the Anti-Administration representatives controlled 55 seats, while the pro-administration representatives controlled 50 seats. This gave the Anti-Administration representatives enough seats to block some of the controversial acts proposed by the Washington administration, including some of the remaining parts of Hamilton's plan for protecting manufactured goods. With free population, the roles would be reversed. The pro-administration representatives would have controlled 55 seats and the Anti-Administration representatives would have controlled 50 seats (52.4 percent and 47.6 percent respectively). Although loyalties to each faction were not as strong as they are today, the change might have been enough to enact the remaining parts of Hamilton's plan and promote trade with Great Britain, contrary to the interests of the Jeffersonians.

The loss of seats in other years would not have changed the party controlling the House, because the Democrats, or an earlier counterpart, maintained a large majority for the years studied prior to the Civil War, while the combination of Republicans and various unionists controlled a sizable majority during the war.

What is more interesting is that there are two years in which free population would actually increase the percentage of Democratic seats: 1833 and 1863. The 1833 case is easier to understand. Free population would have netted one more seat for Jackson than he had under the three-fifths population, partly because he had a large number of supporters in New York and Pennsylvania, states that had gained from an apportionment without slaves. Moreover, free population would have taken three seats from South Carolina, whose representatives were all from the Nullifier Party. With the size of the House kept the same in both cases, the percentage of Jackson supporters in the House would increase by a small amount.[9]

Southerners were always advantaged by the Three-Fifths Clause, but sometimes Democrats, and their predecessors, were not. The extra seats in the House gained by the South from the Three-Fifths Clause were never enough to allow the South to control a majority of that chamber. But it did give the South a louder voice.

Presidential Elections

Similarly, removing the Three-Fifths Clause in favor of free population would have changed the outcome of one, possibly two, presidential elections between 1792 and 1860: the elections of 1800 and 1824.

Prior to the Twelfth Amendment, each elector cast two votes, without distinction for whether their vote was for president or vice president. Thus, more than one candidate could achieve a majority of the "appointed" electors, even though in the traditional sense only one candidate could win a majority of the electoral "votes." For example, in the election of 1800, there were 138 electors appointed, making the majority 70. With each elector casting two votes, up to three candidates could have a majority of the appointed electors. According to Article 2, Section 1 of the Constitution if a candidate had a majority of appointed electors and more electoral votes than any other candidate, then that candidate would be president. If a candidate had a majority of appointed electors but the same number as another candidate, or candidates, then the

9. In 1863 the Confederate states were not seated in Congress, so all the significant differences resulting from using free population versus the three-fifths population would have come from the Northern and Border states. Free population would have increased the seats for Northern states with sizeable numbers of Democrats, like Indiana, Illinois, and Ohio. It would have decreased seats for the Unionists in Kentucky. As a result, the percentage of Democrats would have increased by less than three-tenths of a percentage point if the House was apportioned using the free population rather than the three-fifths population.

House would determine who would be president among those tied. And if no candidate had a majority, then the House would choose among the five candidates with the most electoral votes.

In 1800, Thomas Jefferson and his running mate, Aaron Burr, received the same number of electoral votes, 73, which was a majority of the appointed electors. Adams received 65 electoral votes, his running mate Charles Pinckney received 64, and John Jay received 1. The tie between Jefferson and Burr, who both secured a majority, meant that the House of Representatives decided which of the two candidates became president. After a 35-ballot deadlock, Jefferson defeated Burr when a group of House Federalists, influenced by Alexander Hamilton, abstained from voting.

If Congress kept the divisor it adopted in 1792 but apportioned the House based on free population, then the size of the House would have declined almost entirely among the Southern states of Georgia, Kentucky, North Carolina, South Carolina, and Virginia, which largely supported Jefferson and Burr. Adams would receive 63 electors, one more than Jefferson, Burr, and Pinckney, each of whom would receive 62. Because 63 electors is a majority of the 125 electors assigned, Adams would have won the election outright without consulting the House.[10]

Contrast this with a similar claim made by Akil Amar (2005): "Had the electoral college been apportioned based on free population—with no three-fifths bonus—Jefferson would have ended up with about four electoral votes less than Adams rather than eight votes more" (Amar 2005, 345–46). Amar cites Wills (2003) who cites Freehling (1990) for the figure. Freehling appears to derive his conclusion by subtracting 12 slave-based electors from Jefferson's 73 electoral votes, while leaving Adams's electors the same.[11] This is not the proper way to calculate the effect of the Three-Fifths Clause. A proper calculation reapportions the House based on free population and the divisor used in 1792. That process affects the number of electors assigned to all candidates, not just Jefferson, and produces a much closer result.[12] Clearly, the slave vote mattered, but its affects may have been milder than previously claimed.

Jefferson appointed three Supreme Court justices during his two presi-

10. If the textbook version of each method was used instead, Adams would receive 70 electoral votes, Jefferson 69, Burr 69, and Pinckney 67 based on free population. Because 70 would be a majority of the appointed electors, Adams would win outright again.

11. Freehling (1990, 147) does not explain how he came up with the 12 electors attributable to slaves who also supported Jefferson. The figure matches the total loss of electors among all Southern states (Delaware southward). Two of those states, however, split their electoral votes between Jackson and Adams.

12. Humes et al. (2002) produce estimates closer to mine.

dential terms, all of whom owned slaves. The first, William Johnson, was appointed during his first term and openly opposed the abolition of any slave. Ironically, the additional slave votes from the Three-Fifths Clause helped put a justice in office that wanted to perpetuate slavery.

In 1824, Andrew Jackson won a plurality of the Electoral College and a plurality of the popular vote, but no candidate won a majority of the Electoral College. Hence the decision was made by the House. After some deliberation, John Quincy Adams was chosen over Jackson and William Crawford. Speaker of the House Henry Clay was also in the running, but he was not considered by the House because he had the fourth most Electoral College votes, and the Twelfth Amendment established that the House would only consider the top three candidates.

Removing the slave vote from the apportionment would not have altered the winner and runner-up. Jackson would still have won a plurality of the Electoral College, and Adams still would have placed second. But the third candidate forwarded to the House would have been Clay rather than Crawford. With his own presidential ambitions, Clay could have easily stayed in the race, resisting pressures to concede his House supporters to Adams. Thus Clay may have split the vote that went to Adams in the actual election and unintentionally helped Jackson secure the presidency.[13]

The reason why the Three-Fifths compromise had little effect on other presidential elections during the pre–Civil War period is clear. A Northerner that won an election with the Three-Fifths Clause would win by a greater margin with free population. For example, the election of 1796 was won by John Adams, a Northerner. Apportioning the House according to free population would only give Adams a greater percentage of seats than his Southern rival, Thomas Jefferson.

Other elections were out of Northern reach. For example, from 1808 to 1820 Madison, and subsequently Monroe, won by large margins, so large that an apportionment based on free population would not prevent them from winning. The same is true for Andrew Jackson in 1828 and Zachary Taylor in 1848. A third set of elections contained either all Northern candidates or all Southern candidates, such as the elections of 1832, 1840, and 1844. The metric of apportionment affected the distribution of electors among those candidates, but with free population largely transferring votes from the South to the North, they would not change the winner.

13. Humes et al. (2002) derive the same conclusion. For a historical argument that Adams won the presidency because of a corrupt bargain between Adams and Clay, see Remini (1991). For an interesting argument against the corrupt bargain, see Jenkins and Sala (1998).

The Effect of Population vs. Voting-Age Citizens

A citizen-based apportionment is closer to the notion of "one man, one vote" than is population.[14] When Congress proposed a new metric of apportionment in 1866, it considered changing it to the number of voting-age citizens in each state, rather than each state's population. Initially, a citizen-based apportionment meant *male*, voting-age citizens, but with the enactment of the Nineteenth Amendment in 1919, any serious proposal would have included women.

Congress

Figure 7.4 displays the percentage of House seats controlled by the Democrats in the first Congress after reapportionment using the method historically applied. From 1873 to 1913 voting-age citizens were males, while from 1923 to 2023 voting-age citizens included both sexes. Again, the large swings in the graph are not the focus of the study. The key thing to notice is the differences in the percentage of seats controlled by the Democrats under a citizen-based apportionment, indicated by the solid line with hollow-square markers, versus a population-based apportionment, indicated by the dashed line with circle markers.

The effect of a citizen-based apportionment on Democratic control is typically small, but in a few cases the differences are noticeable, with citizens consistently favoring Republicans. In 1913, the Democrats maintained 66.7 percent of the 433 seats. With everything else equal they would have lost 3.3 percentage points of the seats if the House were appointed by voting-age citizens instead.

The greatest difference was in 1923, when Congress was struggling with the issue of apportionment and never passed a reapportionment bill. If Congress had reapportioned the House during this period, the Democrats would have maintained 47.4 percent of the 435 seats with population as the metric, but they would have maintained only 42.1 percent of the 435 seats with voting-age citizens as the metric, a 5.3-percentage-point difference. That particularly large difference is interesting because members of both parties argued for a citizen-based reapportionment that decade.

In 1943, a citizen-based apportionment would have taken five seats from the Democrats. That would have been enough to prevent the Democrats from

14. The phrase "one man, one vote" surged in English speaking countries around 1880, thanks in part to British trade unionist George Howell who used the phrase in his political pamphlets (Howell 1889).



Fig. 7.4. The Effect of Citizenship on Party Composition of the House
Note: From 1873 to 1913, citizens in the figure are male, voting-age citizens. From 1923 to 2023 they are voting-age citizens of both genders. Calculations for 1883, 1893, and 1960 are missing due to missing data on citizenship. The apportionment method used appears beneath the graph: Hamilton/Vinton (V), 1870–1900; Webster (W), 1910–1930; and Hill-Huntington (H), 1940–2020. In each case, House sizes are fixed.

taking a majority. Under a population-based apportionment, the Democrats controlled 222 seats and the Republicans 209. Under a citizen-based apportionment, the Democrats would have control of 217 seats and the Republicans 214. With third parties taking four seats, neither of the two major parties would control a majority of the House under a citizen-based apportionment. The Democrats, or Republicans, would have likely formed a coalition with one or more of the third parties to attain a majority. The move would have required compromise and would likely have produced different types of legislation.

That Congress passed a law allowing Chinese immigration for the first time since 1882 (the Magnuson Act of 1943), an act establishing the federal government's authority to quarantine (the Public Service Act of 1944), and an act authorizing the construction of numerous dams and levees (the Pick-Sloan Flood Control Act of 1944). Democratic leadership helped pass those bills. Without a clear majority controlling the House, it is unclear whether such laws would have been weakened to accommodate third parties or those crossing the aisle.

One could argue that a citizen-based apportionment would have had a greater effect on the Democrats, and their predecessors, than did the Three-

Fifths Clause, even though the effects were small in both cases. The Republicans would have largely benefited from a citizen-based apportionment because the foreign-born populations of Democratic states like California, New York, and Illinois tend to be larger than the foreign-born populations of Republican states like Texas and Florida. Whether a citizen-based apportionment would have affected the outcome of the Electoral College is a separate question.

Presidential Elections

Replacing population with voting-age citizens would have had a noticeable effect on the Electoral College, particularly during the turn of the century. Among the seven elections between 1872 and 1916 in which the Census Bureau collected data on male, voting-age citizens, the metric of apportionment would have changed the winners of two of those races, 1876 and 1916, more than one-quarter of the cases. There would have been no effect on the winner of the 1912 election, in which Teddy Roosevelt ran as the Bull Moose candidate, because the Democratic candidate, Woodrow Wilson, won by a large margin.

The Election of 1916

Consider the 1916 election between incumbent Woodrow Wilson (D) and challenger Charles Hughes (R) (Gould 2016; Rosin 2013). Before he was elected president in 1912, Wilson was both the president of Princeton and a governor of New Jersey. Hughes was an associate justice of the Supreme Court and a governor of New York. Although Hughes was viewed as the favorite, Wilson won 277 electors to 254 for Hughes. Electors were based on population, the Webster method, and 433 seats. Arizona and New Mexico became states after the apportionment of 1911 and would have been assigned three electors each, regardless of the metric of apportionment.

The distribution of electors from the population-based apportionment are presented in table 7.4. The apportionment based on male, voting-age citizens is displayed to its right. With the exception of West Virginia, which split its electors in 1916, all the states explicitly listed in the table would have received a different number of electors under male, voting-age citizens than they did under population. Those grouped under "Remaining Democratic States" and "Remaining Republican States" would receive the same number of electors from both metrics.

States that had more seats using male, voting-age citizens tended to be from the West or Midwest, because the early years of the Great Migration moved working-age males from the South to the industrial belt without mov-

TABLE 7.4. The Effect of Male, Voting-Age Citizens on the 1916 Presidential Election

State	Population	Male, Voting-Age Citizens
Select Democratic States		
Ohio	24	29
Texas	20	18
Missouri	18	20
Georgia	14	9
California	13	16
Alabama	12	8
North Carolina	12	10
Tennessee	12	11
Virginia	12	10
Kansas	10	12
Louisiana	10	7
Mississippi	10	6
Arkansas	9	8
South Carolina	9	5
Nebraska	8	9
Washington	7	9
Colorado	6	7
Florida	6	4
West Virginia	1	1
Remaining Democratic States	64	64
Select Republican States		
New York	45	46
Pennsylvania	38	39
Illinois	29	32
Indiana	15	18
Michigan	15	17
Iowa	13	15
Wisconsin	13	14
Minnesota	12	13
Oregon	5	6
Rhode Island	5	4
West Virginia	7	7
Remaining Republican States	57	57
Wilson (D) Electors	277	263
Hughes (R) Electors	254	268
Total Electors	531	531

Note: The table lists the number of electors assigned to each state for the two metrics listed. West Virginia split its electors, seven for Hughes and one for Wilson.

ing their families. For example, male, voting-age citizens were 27 percent of the population of Ohio, 28 percent of the population of Indiana, and 29 percent of the population of California, which was greater than the national average of 23 percent (Manson et al. 2019). Newer states, like Nevada, Wyoming, and Montana, had even greater percentages, but those states were so small that both metrics only gave them three electors.

While most of the states won by Hughes had at least as many seats under the citizen-based apportionment as under the population-based one, those won by Wilson were more mixed. As a result, Hughes would have won more electors under the citizen-based apportionment. With everything else equal, he would have won the Electoral College 268 to 263. Had the Fourteenth Amendment enumerated male, voting-age citizens as the metric of apportionment as both chambers may have desired, the winner of the 1916 presidential election would differ. Wilson would have been a lame duck while the country prepared to declare war on Germany. Hughes may have executed America's efforts in World War I differently.

Elections from 1920 to the Present

Reapportioning the House by the number of voting-age citizens in each state, *of either gender*, would not have changed the winner of any of the 25 presidential elections studied between 1920 and 2024.[15] Recent attempts to push the country toward a citizenship-based apportionment in an effort to change the winner of a presidential election would have been unproductive.

To emphasize that point, consider what would occur if citizens, without qualifications for sex or age, were used in place of population in the 2020 presidential election, an idea advocated by Donald Trump. The 2020 election pitted former senator and vice president Joe Biden (D) against the incumbent president and businessman Donald Trump (R) (Jacobson 2021). Voter turnout for the election was exceptionally high, with 67 percent of eligible voters casting ballots. Issues in the election included public health concerns over the COVID-19 pandemic, civil unrest in response to the police murder of George Floyd, and the contentious use of executive orders for border security, appropriations, and civil rights.

Despite Trump's attempts to replace population with a citizen-based apportionment, a citizen-based apportionment would have had little effect on the number of electors won by the two candidates. Democratic states such as Cali-

15. In 1960, the Census Bureau stopped asking questions about citizenship and later gathered the data in the American Community Survey. That gap in the date prevented the 1964 and 1968 elections from being included in the study.

TABLE 7.5. The Effect of Citizens on the 2020 Presidential Election

State	Population	Citizens
Select Democratic States		
California	55	50
New York	29	28
Pennsylvania	20	21
Michigan	16	17
Washington	12	11
Remaining Democratic States	174	174
Select Republican States		
Texas	38	36
Florida	29	28
Ohio	18	19
North Carolina	15	16
Indiana	11	12
Missouri	10	11
Louisiana	8	9
Oklahoma	7	8
Iowa	6	7
Montana	3	4
Remaining Republican States	87	87
Biden (D) Electors	306	301
Trump (R) Electors	232	237
Total Electors	538	538

Note: The table lists the number of electors assigned to each state for the two metrics listed.

fornia and New York would have lost seats under a citizen-based apportionment, while Republican states such as Ohio, Indiana, and Montana would have gained seats (see table 7.5). A citizen-based apportionment would have had the opposite effect in other states, however. Two Democratic states, Pennsylvania and Michigan, would have gained seats under a citizen-based apportionment, while two Republican states, Texas and Florida, would have lost seats. A citizen-based apportionment would thus have a muted effect on the 2020 presidential election. Trump would have received five more electoral votes under a citizen-based apportionment than a population-based one. Nevertheless, Biden would have still won the Electoral College by a margin of 64 electors.

In 2024, Trump would have extended his lead over Kamala Harris (D) under a citizen-based apportionment by four electors. Interestingly, he would have gained electors in Pennsylvania, Michigan, Ohio, Missouri, Florida, and West Virginia, but he would have lost three electors in Texas.

Conclusion

In general, changing the metric or method of apportionment would have had few effects on the partisan composition of the House or the winner of a presidential election. Everything else being equal, changing the method of apportionment to one of four contenders between 1792 and 2023 would have changed the majority party in the House only once and it would have changed the outcome of a presidential election only twice.

Changing the three-fifths population to free population from 1792 to 1863 would have affected the coalition in control of the US House in the Third Congress, allowed Adams to win the election of 1800, and possibly affected the election of 1824.

Changing a population-based apportionment to a citizen-based one from 1873 to 2024, would have had slightly larger effects. It would cause the Democrats to lose more than five percentage points of their seats in 1923 (if the House had been reapportioned that year), and it would have changed the majority party in 1943. It also would have changed the outcome of two presidential elections, 1876 and 1916.

The limited effects do not mean that metrics and methods are not important. Apportionment can double the voice of a small state in the House. But in order for an apportionment method, or metric, to change the party in the majority, the partisan division in the House needs to be close. Furthermore, the new apportionment has to systematically favor one party over the other. Similar conditions are required for a metric or method to affect the winner of the Electoral College.

Among the 24 Houses examined, only 9 had a party within five percentage points of a majority. Changing the method of apportionment, or the metric of apportionment, in those 9 cases would alter the majority three times, one-third of the cases.

Among the 58 presidential elections examined, only 8 had a candidate win by less than five percentage points of the electors. Changing the metric or method in those cases would have altered the winner of a presidential election three times, 37.5 percent of the cases. In this sense, the method and metric of apportionment have a sizeable effect, but only if conditions are ripe.

Methods of apportionment are increasingly taught in mathematics, economics, and political science. The increased promotion of these ideas creates new claims about how they can affect parties in Congress and winners of presidential elections. Finding that those effects are limited simply because the parties are not always evenly divided helps that study grow. It allows researchers to focus on additional implications of these institutions, such as their effect

on individual votes, the relative power of various regions, and the power of individual states.

APPENDIX

This appendix describes the assumptions used to calculate the results presented in this chapter, as well as sources of the data. Results were calculated computationally using R.

Congress

A critical assumption in determining the partisan composition of the House under any counterfactual situation is how partisanship is assigned to new members representing states that gain seats and how it is removed from a state delegation when a state loses seats. Two methods were considered but only the first was reported in the text because the results were similar.

The ***House Delegation Method*** (HDM) increases or decreases a state delegation in proportion to the current party composition of the delegation in the House. Any time a rounding error leads to an extra seat, the method adds the seat to the largest party in the delegation. If it loses a seat, the method takes the seat from the largest party in the delegation. For example, if state *i* currently has four seats in the House, three of which are Democrat and one of which is Republican, and it is assigned six seats under a new rule, the state initially gets 4.5 Democratic seats (= 6×0.75) and 1.5 Republican seats (= 6×0.25), rounded to 5 and 2, respectively. Since there are now seven seats assigned to a delegation that is supposed to have six, the extra seat is removed from the largest party in the delegation. The Republicans would be assigned four seats and the Democrats two.

The proportions used for these calculations are the state's party composition in the House in years ending with a "3" (i.e., the first year after a newly reapportioned Congress). Party compositions are evaluated the day after a new Congress starts with representatives who have not arrived yet included.[16]

The ***State Party Method*** (SPM) increases or decreases a state delegation

16. Data for the party and district of each representative came from the member ideology pages on voteview (Lewis et. al 2023), with arrival and departure dates determined by the respective Wikipedia page for a United States Congress. Various adjustments were made to the data from the Eighteenth Congress to make the voteview data match data on parties in the House. Jackson Republicans, Crawford Republicans, and Adams-Clay Republicans were recoded as Democratic-Republicans, while Jackson Federalists, Crawford Federalists, and Adams-Clay Federalists were recoded as Federalists. For the Thirty-Eighth Congress, the union parties were assigned a common code. Finally, for the Eighteenth Congress the Bucktails of New York and the Toleration Party of Connecticut were coded as Democratic-Republicans in the state party data.

in favor of the party controlling a majority of both chambers of the state's legislature. If new seats are added, the party assigned to the new seat(s) is the same as the state majority party. For example, suppose a state has four seats in the House, three of which are Democrat and one of which is Republican. A majority of the state legislature is Republican. If the state were assigned six seats under a reapportionment, they would be assigned three Democratic and three Republican seats, because all the new seats would be from the party controlling the state legislature. The other seats would remain the same. If seats are removed, they would come from a party other than the state majority party first, randomly selecting among the minority parties in the state delegation. For cases in which either a state legislature is divided, all of the representatives are elected at large,[17] or data on the partisan composition of a state legislature are unavailable, the HDM method is used instead.[18]

SPM recognizes a party's power to gerrymander congressional districts in its favor. It is more applicable to the Congress immediately following a reapportionment than to a Congress nine years later because voter preferences for parties can change in nine years, not to mention that the majority party controlling a state can change as well. Hence, SPM is limited to the first year after reapportionment.

HDM does not have the same limitations, but it is limited to the same years to make the results comparable.

There are two additional complications in determining the partisan composition of the House. First, there are states that were admitted after a congressional reapportionment but before the first newly reapportioned Congress. Representatives from those states were added using their observed numbers and party identifications. For example, Ohio was admitted to the union in March 1803. It was not included in the reapportionment of 1802, but one Democratic-Republican representing Ohio joined Congress in 1803, so one Democratic-Republican was included in 1803 regardless of the counterfactual condition applied.[19]

Second, there are states included in a reapportionment that do not have members in the House. For example, in 1863 some Confederate states (Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, South Caro-

17. There is a distinction between all representatives elected at large and some representatives elected at large. In the latter case, at-large districts are treated like any other district because the at-large districts could have been reformulated into individual districts that advantaged the majority party.

18. Data on the party controlling each state legislature came from Dubin (2007) for 1791–1933; Klarner (2013) for 1937–2010; and The National Council of State Legislatures (2023) for 2011–2023.

19. Five states were treated similarly: Louisiana in 1813; West Virginia in 1863; Nevada in 1864; Arizona in 1913; and New Mexico in 1913.

lina, and Texas) were part of the reapportionment of 1862, but they did not send representatives to Congress. Hence the party affiliations for those representatives could not be determined and the partisan composition of the House excluded Confederate states.

HDM results are reported in the text because the differences between the HDM results and the SPM results are small. Consider the results presented in figure 7.1. If SPM were used in place of HDM, the Jefferson and Adams methods would differ by 1.2 percentage points in 1863 using SPM, while they differed by 2.9 percentage points using HDM. For 1953, the year the majority party changed using HDM, the Republicans would maintain a bare majority of the House using SPM, regardless of the apportionment method.[20]

For the effect of the Three-Fifths compromise on the party composition of the House, the Anti-Administration representatives would have lost their majority in 1793 using SMP if the House had been apportioned based on free population rather than the Three-Fifths Clause, and the Democratic-Republicans would have suffered the same losses in 1803 and 1813. Those results would be the same, but the anomalies of 1833 and 1863 would go away. Jackson supporters would lose a small percentage in 1833 and the percentage of Democratic seats would remain unchanged in 1863 using SPM.

For the effect of voting-age citizens on party composition of the House, Democrats would lose 3.9 percentage points of seats in 1913, 5.1 percentage points of seats in 1923, and 7.6 percentage points of seats in 1933 with voting-age citizens and SPM. Only the 1933 loss is noticeably larger using SPM than using HDM. In 1943, the Democrats would only lose 4 seats under SPM, rather than 5 seats under HDM, giving them the bare majority of 218 seats needed to organize the House.

Presidential Elections

The HDM and SPM assumptions were not used for the Electoral College. For effects on the Electoral College, the script apportions the House under one of the five methods of apportionment, adds two senators to get the state's number of electors, then assigns electoral votes based on observed votes. A key

20. Between 1790 and 2023, 15.2 percent of the possible majority party codes for the state legislatures are missing. To see if this affected the SPM results (it cannot affect the HDM results), the analysis was repeated with missing values filled in using each state's Wikipedia page for political party strength, for example, https://en.wikipedia.org/wiki/Political_party_strength_in_Nebraska. With those additional codes only 3.6 percent of the possible majority party codes are missing. Even though this reduced the missing values by more than 11 percentage points, the results were similar. Results without the additional data are reported because these Wiki pages do not document their sources.

part of that script distributes each state's electoral votes among the candidates in proportion to how the state distributed its electors historically.[21] If a state assigned all its electors to one candidate, that candidate would receive all the state's electoral votes regardless of the number of electors apportioned to the state. If a state split its electors among two or more candidates, or its electors abstained or were unfaithful, then electors are distributed among the candidates in proportion to the observed split. For example, in 2016 Maine split its four electors, three for Hillary Clinton and one for Donald Trump. If a different apportionment gave Maine three electors rather than four, the script would distribute the electors $(3/4) \times 3 = 2.25$ for Clinton and $(1/4) \times 3 = .75$ for Trump. After rounding, Clinton would have received two electors, and Trump would have received one.[22]

States that enter the union between censuses are assigned electors after an apportionment. For example, Colorado entered the union in August 1876, after the 1870 census was apportioned but before the 1876 election. Hence, Colorado is added with the number of representatives historically assigned (one in this case) for the 1876 and 1880 elections. For those years, the number of electors assigned to Colorado are not affected by the apportionment method nor by the metric of apportionment. In contrast, faithless electors, who do not vote for the candidate to whom they pledged, are counted toward the total number of electors (and the requisite majority of electors), but their votes are not counted toward their pledged candidates.[23]

21. Electoral votes came from David Liep's election atlas: https://uselectionatlas.org

22. If, after rounding, the total number of electors distributed to state *i* differs from the number assigned to state *i*, the additional elector is taken out of (or added to) the candidate receiving the most electors from state *i*. If more than one candidate ties for the most electors, then the candidate getting the additional elector is chosen randomly among candidates receiving the most electors from state *i*.

23. A major candidate is anyone who received a vote from at least one elector pledged to a candidate. As history would have it, no faithless elector has ever voted for a major candidate. They have either abstained or voted for a nonmajor candidate, such as a person not on the ballot. The identities of such people are irrelevant because they would not have enough votes to win any election.

EIGHT

Conclusion

To make his plan for a strong national government work, James Madison wanted both chambers of the national legislature apportioned according to the size of each state. He thought this would advantage a majority of the states and attract the larger states to his plan. The smaller states would acquiesce.

In making such a proposal, Madison clearly recognized that states had strong interests in the apportionment of the national legislature, and he wanted to take advantage of those interests. Those representing large states, or states that were expected to be large, might go so far as to surrender some powers to the national government if their state was given enough say in national affairs.

He also knew that state interests in apportionment could run amuck. When debating reapportionment in the first Congress:

> Mr. Madison insisted on the propriety of providing beforehand for the census which is next to take place, in such manner, as to render it impossible for local calculations to intrude on the business. If the principle of equality was of one tenth part of the importance that some gentlemen contended for, surely some precautions ought to be taken to guard against those inequalities that will every day take place, and will by far exceed those which have already agitated the house so much. (Hutchinson and Rachel 1962–1989, January 24, 1792, 14: 198–99)

Although Madison realized that state interests in apportionment could be intense and that reasonable metrics and methods of apportionment could

be deposed, he may not have realized that for every proposed distribution of seats, a majority of states would receive greater shares from another distribution. Heading into the convention, the larger states would prefer an apportionment based on their size. That was for sure. But Madison may not have realized that a majority of states would prefer an apportionment based on the quota of contribution to one based on free inhabitants, an apportionment based on free inhabitants to one based on the Three-Fifths Clause, and an apportionment based on the Three-Fifths Clause to one based on the quota of contribution. In other words, it is unlikely that Madison recognized majority cycles and that cycles were typical for apportionment decisions. It was bad enough that representatives had to push for their state's particular interest rather than common state interests, but it was worse that pursuit of self-interest implied no equilibrium, no stability in the decision made. Every metric proposed could be dislodged by a future proposal.

Ironically, even though Madison was likely unaware of the full nature of the problem, late in his life he provided two ingenious solutions. He thought "The right of suffrage & the rule of apportionment of representatives" were so "fundamental in a free Government," that they "ought *not* to be submitted to Legislative discretion" (emphasis added, James Madison to Philip Doddridge, June 6, 1832, Madison 1865, 4:221–22).[1] To prevent representatives from pursuing their particular interests in apportionment, he thought the ratio of representation and the rule of apportionment should be fixed by the Constitution. This would prevent representatives from manipulating apportionment bills to the advantage of their states, even though it would not address the problem of redistricting.

Barring that, Madison thought the ratio of representation and the rule of apportionment should be changed only with the assent of two-thirds of both chambers of Congress. "I proposed, in our late Convention," he wrote, "authorizing the Legislature, two thirds of each house concurring, to reapportion the Representation as inequalities might from time to time require" (James Madison to Philip Doddridge, 6 June 1832, Madison 1865, 4:221–22). Supermajority rules were his second solution to the problem. They ameliorated majority cycles by creating an equilibrium on the status quo apportionment. That equilibrium is stable whether the apportionment is fair or not.

Interestingly, America's politicians followed Madison's advice, though it took them some time to implement both ideas.

1. Also see James Madison, Autobiography, December 1830, Founders Online, National Archives, https://founders.archives.gov/documents/Madison/99-02-02-2226

Congress initially settled on an equal apportionment among the states, not because everyone agreed it was the fairest, but because they did not have adequate surveys to apportion Congress based on size. A majority of states temporarily accepted the idea while the Revolutionary War took priority. After the war, the large states pushed for a metric based on state size.

They partly attained their goal at the Constitutional Convention of 1787 by apportioning one chamber using the Three-Fifths Clause. The victory was gained not because the small states were convinced, but because two small states did not participate in the decision.

The compromise included the infamous three-fifths apportionment for the House and equal apportionment for the Senate. After 1789 both were preserved by the supermajority of states required for an amendment to the Constitution. A majority of states could no longer overturn the division of seats implied by the metric of apportionment. Instead, two-thirds of both chambers of Congress (or two-thirds of state legislatures requesting a national convention) and three-fourths of the state legislatures (or three-fourths of the state conventions) would be needed to dislodge the Three-Fifths Clause for the House and equal apportionment for the Senate.[2] That supermajority requirement kept both apportionments in place. Though everyone today finds the Three-Fifths Clause heinous, it was not until the slaves were freed and the South was sitting out that Congress had the votes needed to amend the Constitution and change the abominable clause.

While supermajority rules kept the metric of apportionment in place, the ratio of representation, the size of the House, and the method of apportionment were still being determined by a majority of members. Long debates and unexpected conclusions were the norm for most of the reapportionment acts proposed between 1791 and 1911 because those decisions were still being made by a majority of the representatives of the states.

In 1822 Congress proposed twenty-four ratios of representation for the House. The interests of a majority cycled over those ratios. The ratio of one representative for every 40,000 constituents may have passed after ten votes because of a historical contingency that protected a bill after a third reading. It was not a preordained result of majority rule.

It was not until the stalemate in the 1920s over reapportionment that Congress finally fixed the size of the House and transferred the administration of reapportionment to the executive branch, Madison's first solution to the prob-

2. Equal apportionment in the Senate is further held in place by Article 5 of the Constitution, which asserts that "no state, without its Consent, shall be deprived of its equal Suffrage in the Senate."

lem. Congress arrived at this decision only after it had made a mockery of reapportionment. During the 1920s, members of Congress became so enamored with protecting their state's interest that leaders eventually decided to take the size of the House and the method of apportionment off the table. They proposed a bill that matched the previous size and method to make members vote for or against an apportionment based on current or twenty-year-old data.

Prior to that decision, members of Congress often voted on reapportionment with tables in front of them showing the consequences of each decision for their respective states. The decision to transfer the administration of reapportionment ended that practice. The apportionment method and the size of the House would be based on previous practices unless a majority overtly agreed to steer a new course. Thus outdated apportionments could not be maintained by killing a bill in committee or by failing to schedule reapportionment in one of the chambers. After automatic reapportionment was put in place, the strain largely abated.

Midcentury Developments

The administrative process of reapportionment was partially stabilized, but questions about who would be included in the apportionment population still arose. For instance, two decades later Native Americans were formally included in the apportionment population. In 1924 President Calvin Coolidge signed the Indian Citizenship Act, which declared that all Native Americans born in the United States were citizens, but there were still ambiguities about whether some Native Americans were not taxed, a group explicitly excluded from the apportionment population by Article 1, Section 2 of the Constitution (Putzi 1972). In 1940, Nathan R. Margold, solicitor for the Department of the Interior, declared that "Since all Indians are today subject to taxation by the Federal Government (Superintendent v. Commissioner, 295 U.S. 418), there are no longer Indians not subject to taxation" (United States, Department of Interior 1979, 1:998). When Margold's assessment was taken before Congress, Congress technically demurred on the question of Native Americans not taxed to the representative of each state in question. Because "each state wanted to count as many people as possible, to maintain apportionment power," Margold's position "became a practical reality" (Martin 2021, 12). By giving each representative the power to declare whether untaxed Native Americans existed in their own state, each representative had an incentive to declare that their state had none, ending distinctions for Native Americans but showing

yet another instance of representatives voting for the interests of their states.

In 1941, the problem with reapportionment rose again. President Roosevelt reported census results derived by the Webster and the Hill-Huntington methods side by side, as required by the Permanent Apportionment Act of 1929 (Congressional Record, 1941, c. 77, s. 1, appendix, 645). With two exceptions, the allocations were identical. Arkansas, a consistently Democratic state, would receive one more seat under the Hill-Huntington method than it would under the Webster method. Michigan, a largely Republican state, would receive one fewer. Representative E. C. Gathings (D-AR) wasted no time proposing that Congress switch from the Webster to the Hill-Huntington method, which gave his state one more representative. With both chambers of Congress and the presidency controlled by Democrats, switching to the Hill-Huntington method easily passed (Congressional Record, c. 77, s. 1, 1129–30). Every Democrat, except those from Michigan, voted for the proposal, while every Republican voted against. As Balinski and Young (2001, 58) note: "The merits of the case that gave the Congress the excuse to choose Hill's method are not clear. Not one of the participants in the controversy over bias had made precise what is meant by saying a method is biased or unbiased." Instead, the majority simply made the decision based on political expediency. As a Republican representing Michigan declared, "you are acting here on this bill, which involves a constitutional question, with the idea of an immediate party advantage, with little regard for principle. . . . You know what is going to happen. You are going to skin us, are you not? And we have no way to prevent it" (Congressional Record, c. 77, House, s. 1, 1126). With full knowledge of what the decision implied, the majority skinned Michigan of its seat.

Today, the secretary of commerce only reports state population figures and the number of seats allocated under the Hill-Huntington method to the president (Eckman 2021).[3]

Throughout US history, the metric of apportionment and method of apportionment have rarely changed the party controlling Congress or the candidate who won the Electoral College. Those limitations do not mean that metrics and methods are not important. It simply means that for the rules of apportionment to affect the majority party in the House, the partisan divide must be close and the reapportionment has to systematically favor one party over the other. Similar conditions are needed to alter the winner of the Electoral College. Even though metric, method, and size rarely change the party in control, they regularly affect that governing party's strength and its capacity to

3. The Reapportionment Act of 1941 ended the requirement that the Census Bureau report figures under the previous method, the Webster method, and the Hill-Huntington method (Act of November 15, 1941, Pub. L. No. 77-291, § 22, 55 Stat. 761).

enact policy or propose constitutional amendments. Representatives claw and cajole for a greater share of the legislative pie because increasing or decreasing their voice gives them greater control over policies, spending, and taxation. Small changes matter, even if they do not change the party in control or the candidate winning the presidency.

Apportionment Today

Apportionment issues are still alive today. In 2021 the Census Bureau reported the latest apportionment for the House of Representatives, as shown in figure 8.1. The states with stripes lost one representative each, while the states in solid gray gained one representative each, two for the state of Texas. Montana, which doubled its representatives to two, sustained the greatest gain in share.

A cursory view might suggest that Democrats largely lost from the 2020 census. But setting aside the swings states of North Carolina, Michigan, and Pennsylvania, which had divided governments in 2022, reapportionment appears to have favored the Democrats, netting them at least three seats. Democrats gained two seats in the predominantly Democratic states of Colorado and Oregon, while Republicans gained four seats in the predominantly Republican states of Florida, Montana, and Texas. Redistricting plans ensured such changes. But redistricting plans also assured that the predominantly Democratic states of California, Illinois, and New York would each remove a Republican seat, while the predominantly Republican state of Ohio mistakenly redistricted in favor of the Democrats, shifting another seat. Finally, the predominantly Republican state of West Virginia had to sacrifice one Republican seat. Hence what may seem like a net loss for the Democrats after the 2021 reapportionment was actually a gain.

Recently, several scholars have recommended increasing the size of the House. Some have proposed following the cubed root rule, which suggests that the size of a legislature should be the cube root of its population. Taagepera (1972) originally discovered the regularity in international data, which he thought reflected a manageable number of communication channels between representatives and their constituents and among the representatives themselves. Frederick (2010) and DiDomenico (2022) argue that the cubed root rule should be applied to the US House. Using 2020 census figures, that would produce a House with 692 members. If the idea was applied to Congress as a whole, as advocated by Kane et al. (2020), the House would increase to 592 members, with the other 100 members remaining in the Senate.

Others have proposed increasing the size of the House based on the Wyo-

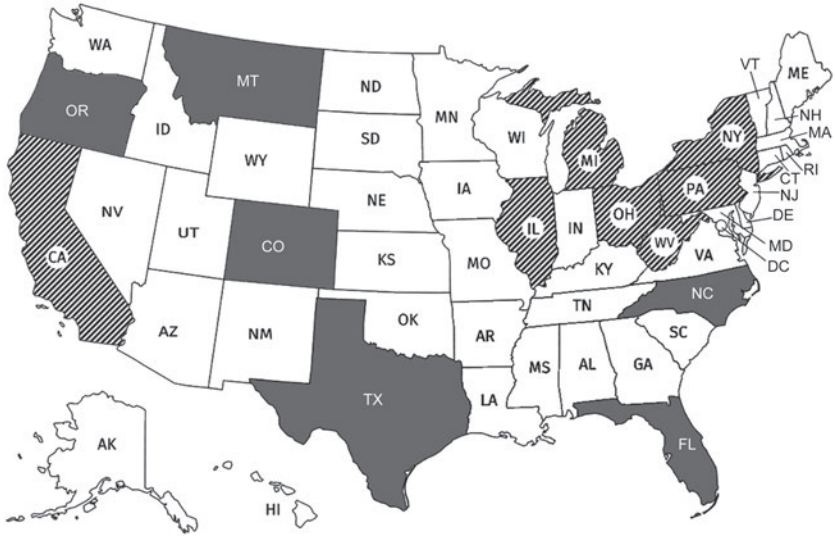


Fig. 8.1. Reapportionment of the US House of Representatives, 2020
Note: After the 2020 census, six states gained seats: Texas (2), Colorado (1), Florida (1), Montana (1), North Carolina (1), and Oregon (1). Seven states lost seats: California (1), Illinois (1), Michigan (1), New York (1), Ohio (1), Pennsylvania (1), and West Virginia (1).

ming rule (Taylor 2010), that is, to make the size of a House district equal to the population of the smallest state then determine the total number of districts by dividing the nation's population by that size. Based on the 2020 census, this would produce a House with 573 members. Advocates claim the Wyoming rule produces more equitable districts across states, ending the overrepresentation of small states like Wyoming. Critics note that the size of the House would have to continually change as the size of the smallest state changed.

Other sizes have been proposed (Ladewig 2011; Rothfus 2021). For example, Drutman et al. (2021, 17) propose a House with 585 members because that number restores "the representation that has been lost over the last ninety years," that is, the number of representatives lost by various states. To derive that number Drutman et al. identify 149 seats that have shifted between states from 1930 to 2020 through reapportionment, then add one seat to keep the size of the chamber odd. They claim that expanding the House by 150 seats would improve the chamber's representation.

Expanding the size of the House of Representatives to 692, 573, or 585 members presents a political challenge, as the resulting distribution of seats would differ significantly from the current 435-member chamber. All three proposals increase seat shares for the large states of New York, Florida, and Texas, while

reducing seat shares for some mid-sized states such as Minnesota, Colorado, and Wisconsin. Generally, New England states would lose under the 573- or 585-member plans, while Southern states would gain. The effect on small states would not be uniform. All three proposals would increase seat shares for Delaware and South Dakota, but they would decrease seat shares for Maine, Montana, New Hampshire, and Rhode Island. Given that different House sizes produce distinct distributions, representatives are likely to fight for the size that advantages their state and potentially usher in a pattern of politics not seen since the 1920s. Scholars who advocate increasing the size of the House might consider the apportionment game before solidifying their positions.

The distribution of power is also at the heart of decisions to grant statehood to the District of Columbia and permanently inhabited territories, like Puerto Rico. Adding states to the union may disrupt the sound of fifty states, but territorial status was never meant to be permanent. The best legal argument against DC statehood is that granting statehood might conflict with the Twenty-Third Amendment, which gives a specific number of electors to the district. Puerto Ricans are divided about whether they want statehood. Nevertheless, statehood is resisted outside these places because it reduces the voice of existing states and gives advantages to one of the major political parties.

This is why proposals for statehood for DC, a predominantly Democratic city, have been paired with proposals to give additional House seats to Utah, a predominantly Republican state (Homeland Security and Governmental Affairs 2009). It should be no surprise that in 2021 a Democrat-controlled House passed a bill to make the District of Columbia the fifty-first state, without the Utah pairing (State of Washington, DC 2022). It should also be no surprise that the Republican-controlled Senate rejected the same measure.

The number of representatives assigned to each state could also change if Congress were apportioned by voting-age citizens or by citizens of any age. Basing apportionment on either factor is closer to the principle of "one person, one vote" than population. Population-based apportionment seems closer to the principle that elected officials should represent their entire community, not just eligible voters. The reason that a citizen-based apportionment does not pass appears to have more to do with gainers and losers, and supermajority requirements in the Constitution, than it has to do with the persuasiveness of one of the two principles. In 2023, six states would gain or lose seats if the House were apportioned using voting-age citizens rather than population. In net the Republicans would take one seat from the Democrats. In 2013, the Republicans would have taken six seats from the Democrats. Those differences are large enough to produce partisan divides and fights for and against the reform.

Apportioning the Senate equally among the states has implications of its

own. An equally apportioned Senate may have sounded reasonable at the time of the founding, but it violates the principle of "one person, one vote." Currently, a majority of Americans live in 9 states, meaning that a majority of the population is represented by only 18 percent of the Senate. The remaining 41-state minority enjoys 82 percent of the Senate's votes, giving land mass greater representation in the Senate than population (Levinson 2019; Griffin 2006). Hence, the weight of a person's vote in the national legislature is profoundly affected by where they live.

The challenge of fair and stable representation is not unique to the American experience. Indeed, apportionment problems extend beyond the United States. Countries around the world have experienced malapportionment in their legislatures regardless of who oversees the process. In some nations, like Argentina and Brazil, the national legislature itself is responsible for reapportionment; in others, such as Canada, India, and Japan, the decision rests with an executive commission or an individual.

In Antigua and Barbuda, Kiribati, and St. Vincent malapportionment benefits the smaller islands at the expense of the larger ones, despite constitutional protections for equal representation of all people (Lublin 2014). In Argentina, Brazil, France, Liberia, India, and Japan, malapportionment favors rural provinces at the expense of urban ones (Handley and Grofman 2008), largely because those countries failed to reapportion the lower chamber of their national legislature after a large population shift. Political elites in Argentina and Brazil prevented reapportionment after large migrations from rural to urban areas because they wanted to build legislative coalitions around rural politics (Snyder and Samuels 2004). Japan failed to reapportion as well, but for years the practice was widely viewed as an acceptable way to protect farmers from change. Today it is widely seen as a way to protect the Liberal Democratic Party (Thies 1998). In India, malapportionment has led to the overrepresentation of northern Hindi-speaking states at the expense of southern, non-Hindi-speaking states (McMillan 2008; Bhavnani 2018). In almost all these cases, malapportionment affects the type of legislation passed, just as equal apportionment in the US Senate has affected the policies passed in the United States (Lee and Oppenheimer 1999; Lee 2000).

The Challenge

The apportionment problem is general, and it continues today. This persistent challenge underscores why Madison's dual solutions of a supermajority rule requirements and taking apportionment decisions away from the legislature

are only partially helpful. Supermajority rules prevent cycling, but they also protect the status quo. For most people that is only acceptable if the status quo apportionment is desirable. Taking apportionment powers away from a legislature makes sense when there is another institution of government that can reapportion objectively without applying personal or partisan interests. Without clear guidelines, reasonable apportionments are subject to the mercy and impartiality of decision makers in the executive branch, independent commission, or other institution, which may have motives of their own.

Overall majority voting for apportionment is inherently unstable. It can leave society without a clear decision and can make people doubt the fairness of democratic decision making. When there are majority cycles, the outcome of a series of votes can be influenced by the order of voting. The winner can change if the same set of options are considered in a different sequence, raising questions about who controls that sequence and the fairness of the result. Cycles also make majority rule more susceptible to sophisticated voting, where individuals cast their votes not based on their true preferences but on calculations of how to maximize their chances of attaining a preferred outcome.

Contrast this with the typical, unidimensional characterization of American politics described by Poole and Rosenthal (1997). Poole and Rosenthal provide evidence that decision making in the American political system is single-dimensional. Their evidence is based on roll call voting in the US Congress. If American politics is single-dimensional, majority cycles are impossible and decisions should be stable. Politics should be less susceptible to manipulation than this book has described.

But even if American politics is largely single-dimensional, not all issues have to be single-dimensional. Decisions over apportionment are infrequent but they are also inherently multidimensional because they are zero sum. If institutions are not enacted to address their inherent instability, some group or some person will fill the gap and take advantage of the instability, easily manipulating majority rule to their advantage.

The apportionment dilemmas detailed in this work are not merely historical footnotes. They remain acutely relevant today, fueled by narrow partisan divides in Congress and ongoing debates over House size and statehood. While citizens shape the balance of power in Washington through the ballot box, the often unforeseen rules of apportionment determine the weight of their votes. Which constituencies hold sway may be determined by shifting seats in Congress.

Appendix

This appendix presents three empirical findings. First, representatives from the same state voted similarly on apportionment during all four periods. Such behavior is necessary for representatives to vote in favor of their state's interests. Second, representatives voted for the metric of apportionment (respectively, ratio of representation or House size) that gave their state a greater metric share (respectively, seat share), with much weaker evidence in 1866 than in the other three periods. This suggests that voting was largely sincere. Third, representatives were motivated by seat shares, not just seats.

It also provides evidence for a sophisticated vote over the proper size of the House in 1921. It concludes with an examination of two formal theories that could explain behavior across all four periods and why those potential theories did not fit particularly well.

Sincere Versus Sophisticated Voting

Even if members wanted the metric, divisor, or House size that gave their state the greatest metric share, they would not be expected to vote for the metric, divisor, or House size that advantaged their state in every vote. The distinction between sincere and sophisticated voting demonstrates why.

Sincere voting occurs when an individual casts a vote for the alternative they prefer at every step in a sequence of votes, regardless of its effects on the outcome. Sophisticated voting occurs when they do not vote for their favorite

Coalition 1 (25%)	Coalition 2 (35%)	Coalition 3 (40%)
A	B	C
B	C	A
C	A	B

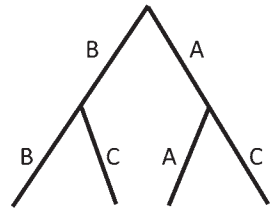


Fig. A1. Sincere versus Sophisticated Voting

alternative in at least one step in order to attain a more favorable outcome at the end of the sequence.

To illustrate the difference, consider the two-stage voting game listed in figure A1 with votes conducted using majority rule. The table on the left of the figure lists the preferences of three coalitions. Each coalition's most preferred alternative is listed at the top of the table, and their least preferred alternatives is listed at the bottom. The size of each coalition is shown in parentheses. For example, the first coalition accounts for 25 percent of the voters and prefers A to B to C.

If individuals voted sincerely, A would beat B in the first round of voting because both the first and third coalitions would support A over B (65 percent of the voters) while only the second coalition would support B over A (35 percent of the voters). In the second round, C would beat A because the second and third coalitions prefer C to A (75 percent of the voters). C would be chosen at the end of the sequence of the votes. By voting sincerely, the first coalition attained its least preferred alternative.

The first coalition could do better if it voted sophisticatedly. Recognizing that the vote of A versus C in the second round produces C, it would be rational for members of the first coalition to vote for B in the first round contrary to their preferences. B would then defeat A in the first round 60 percent to 40 percent. In the second round, B would defeat C 60 percent to 40 percent, making B the outcome. By voting sophisticatedly in the first round, the first coalition attains a better outcome for themselves. B would also win if everyone voted sophisticatedly.[1]

1. A simple method for determining the outcome expected if everyone votes sophisticatedly is to use backward induction. Starting at the back of the tree, B defeats C 60 percent to 40 percent and C defeats A 75 percent to 25 percent. Hence, a vote for B in the first round produces B as the winner and a vote for A in the first round produces C as the winner. Knowing this, everyone would vote for B and A in the first round as if it were a vote between B and C. Because a majority prefer B to C (60 percent to 40 percent), B should win both the first and second rounds, making it the winner of a sophisticated voting game.

If representatives want the greatest metric share (respectively, seat share) for their state and voted *sincerely*, two behaviors should occur.

1. Representatives from the same state should vote the same, and
2. Representatives should vote for the metric that gave their state a larger metric share (respectively, seat share) in each pairwise vote.

In contrast, if representatives wanted the greatest metric share (or seat share) for their state and they voted *sophisticatedly*, then representatives from the same state would still vote together but they would not always vote for the metric, divisor, or House size that gave their state a greater metric share (respectively, seat share), that is, behavior 1 would occur but behavior 2 may or may not occur.

Krehbiel and Rivers (1990) argue that even if members of Congress want to vote sophisticatedly and have the mental capacity to do so, congressional rules can prevent the revelation of strategic behavior. Most notably the lack of a preidentified amendment tree can conceal sophisticated voting. Without such a tree, it is difficult for members to anticipate the proposals that will be made before they start voting. In such cases, sophisticated voting often appears like sincere voting. This might explain why large data studies suggest that sophisticated voting is infrequent in Congress (Poole and Rosenthal 1997; Wilkerson 1999; and Ladha 1994).

Of course, those studies focus on all types of votes. Apportionment votes are different because they are inherently zero sum. Therefore, sophisticated voting may be more frequent in apportionment votes than it is in typical votes.

Furthermore, it can be rational for some representatives to vote sincerely while other representatives vote sophisticatedly on a single roll call (Denzau, Riker, and Shepsle 1985; Groseclose and Milyo 2010). If a representative is unlikely to alter the outcome of a vote, perhaps because he or she operates independent of other legislators, then sincere voting should be the norm. But legislators may break from that norm and vote sophisticatedly if sophisticated voting increases their chances of attaining a preferred outcome that is important to their constituents.

Voting Similarly

Whether representatives from the same state voted together on apportionment is determined by examining votes on metric shares during the prefederal period, on divisors in 1822, on metric shares in 1866, and on House sizes in the 1920s.

The Prefederal Metric of Apportionment

There were twelve recorded votes during the prefederal period pitting one metric of apportionment against another (see table A1). The first four were from the Articles of Confederation and the remaining eight were from the Constitutional Convention. To the best of my knowledge these are the only recorded votes that compared two metrics between 1775 and 1789. The table lists the vote number in the original source, the date of the vote, the metrics compared in the vote (with the currently accept metric on the left and the proposed metric on the right), and the source. Note the Three-Fifths Clause passed in vote 39, which is why most of the subsequent status quos are 3f. Votes 136 and 147 are similar to final passage votes.

For the four votes conducted on October 7, 1777, the secretary recorded the votes of individual delegates, which provided at least 26 delegate positions per motion. The unity of state delegations in these votes is evaluated.

Across the four votes on the apportionment of Congress under the Articles of Confederation, 34 delegations had at least two delegates voting. On average, 90 percent of each state's delegation voted in agreement on those votes.[2] Furthermore, 25 of the 34 state delegation votes were unanimous (74 percent). Such percentages provide clear evidence that representatives from the same state had a common interest on these votes and voted together.

At the Constitutional Convention of 1787, the secretary was instructed not to record the votes of delegates in order to promote candid discussion. Dougherty and Heckelman (2012) inferred delegate positions from the statements they made in debate and their state's recorded votes (Dougherty et al. 2012). Their data include 96 delegate positions across the eight Constitutional Convention votes listed in table A1, an average of 12 yea-nay positions per vote, too few to be included in a study of the unity of state delegations. That Constitutional Convention data, however, will be included in a pooled regression presented later in this appendix.

The 1822 Ratio of Representation

In 1822 the House conducted nine roll call votes asking members to choose between divisors in the ratio of representation, the ninth of which was a final passage vote on 40,000. See table A2. Votes listed in the table were recorded directly from the Annals of Congress, then checked against the voteview dataset. The codebook for that dataset describes vote 14 as a vote between 44,000

2. Non-voting members were excluded from the counts.

TABLE A1. Eleven Prefederal Votes

#	Date	Description	Compare	Source
16	10/7/1777	One delegate for every 50,000 white inhabitants	E, H1	*JCC* 9:779–80
17	10/7/1777	One delegate for every 30,000 inhabitants	E, H2	*JCC* 9:780–81
18	10/7/1777	Representation in proportion to taxes paid	E, Co	*JCC* 9:781
19	10/7/1777	To adopt an equal apportionment	E, E	*JCC* 9:781–82
39	6/11/1787	free population & three-fifths slaves	E, 3f	Farrand 1:195, 201
40	6/11/1787	Equal representation in the Senate	3f, E	Farrand 1:195, 201
114	7/5/1787	Representation in proportion to taxes paid, rather than one rep for every 40,000 people	H3, Co	Farrand 1:525, 534
120	7/7/1787	Equal representation in the Senate	3f, E	Farrand 1:549–551
132	7/11/1787	Total population (free & slave)	3f, P	Farrand 1:577, 581
136	7/11/1787	free population & three-fifths slaves	E, 3f	Farrand 1:577, 588
145	7/12/1787	Total population (free & slave)	3f, P	Farrand 1:591, 596
147	7/12/1787	free population & three-fifths slaves	E, 3f	Farrand 1:591, 597

Note: Apportionments are presented in the order in which they were proposed. "Compare" lists the metrics compared in the vote, with the status quo metric on the left (either adopted or in a report) and the proposed metric on the right. Vote 19, from the Articles of Confederation, is a final passage vote on equal apportionment. For vote 114, from the Constitutional Convention, "people" refers to the number of people under the Three-Fifths Clause. A *JCC* vote is for the Articles of Confederation from Ford (1904–37). A Farrand vote comes from the Constitutional Convention (Farrand 1966).

and 50,000, which is an error. It appears to be a vote to replace 40,000 with 42,000 instead.[3]

3. On February 6, John Tod (DR-PA) proposed to recommit the apportionment bill with instructions to strike 40,000 and replace it with 50,000 (Annals, c. 17, House, s. 1, 925). Before Tod's motion was put to a vote "Mr. T modified his said motion by substituting 'forty-four thousand' in lieu of 'fifty thousand,' as originally proposed by him" (Annals, c. 17, House, s. 1, 938). The voteview codebook interprets this as vote 14 even though Tod's original motion of 50,000 was never voted upon nor passed. Because the annals further reports that vote 14 was "taken on the motion by Mr. Tod *as modified*" (emphasis added, Annals, c. 17, House, s. 1, 938), it means Tod modified his proposal before the House voted on his modified proposal against the current position, making vote 14 a proposal to replace 40,000 with 44,000.

The analysis excludes votes 12 and 13 from the voteview dataset because there are errors for vote 12 in the voteview dataset and possibly errors for vote 13 in the annals. For vote 12, David Woodcock (DR-NY) moved to recommit with instructions to insert 38,000 in place of 42,000 (February 4, Annals, c. 17, House, s. 1, 906). But when the recorded vote was taken, "the question was taken simply on recommitting, (leaving the number to be agreed on afterwards)" (Annals, c. 17, House, s. 1, 907). The voteview codebook describes this as a vote to recommit with instructions to replace 42,000 with 39,900, which is clearly wrong. "The vote to recommit by inserting 39,900 instead of 42,000 . . . was determined in the negative without division" prior to the roll call (Annals, c. 17, House, s. 1, 907).

For vote 13, the clerk recorded that the reapportionment bill had a divisor of 40,000 on Febru-

TABLE A2. Nine Roll-Call Votes, 1822

#	Date	Tally	Description	Compare	Source
2	1/28	83–88	to concur with Committee of the Whole on the divisor	40k, 42k	823–24
3	1/29	61–118	to replace 40k with 45k	40k, 45k	845–46
4	1/30	56–120	to replace 40k with 39k	40k, 39k	846–47
5	1/31	49–126	to replace 40k with 41k	40k, 41k	863–64
6	1/31	50–126	to replace 40k with 38k	40k, 38k	865–66
7	2/1	64–114	to replace 40k with 41.5k	40k, 41.5k	874
10	2/2	63–111	to recommit with instructions to replace divisor	40k, 38k	890–91
14	2/6	61–104	to recommit with instructions to replace divisor	40k, 44k	938–39
16	2/6	100–58	to pass bill with 40k	Q, 40k	947

Note: Vote numbers came from https://legacy.voteview.com/house17.htm. Tallies are yeas-nays. Sources are page numbers from the Annals of Congress, 17th Congress, House, session 1.

On average, members of states with at least two representatives agreed 84 percent of the time across the nine roll calls, ranging from the Vermont delegation, which agreed 72 percent of the time, to the Rhode Island delegations, which agreed 100 percent of the time. Furthermore, one-third to one-half of the 151 state roll calls with at least two representatives were unanimous, suggesting that representatives from the same state tended to vote together. This was slightly greater than the rate at which state delegations agreed upon the other 31 substantive roll calls conducted in the House that year, which was 81 percent.

The 1866 Metric of Apportionment

There were six recorded votes in 1866 that pitted one metric of apportionment against another. Two were taken in the House and four were taken in the Senate. See table A3.[4]

ary 4 (Annals, c. 17, House, s. 1, 910). Two days later, John Long (DR-NC) proposed to recommit the bill with hope that the House would have the opportunity to vote on 42,000 versus 40,000 when the bill was re-reported (Annals, c. 17, House, s. 1, 924). "As soon as the motion was so varied," the annals reports, "Mr. Long moved to amend the proposed instruction by striking out 50,000 and inserting 42,000" (Annals, c. 17, House, s. 1, 924). It is difficult to see where 50,000 came from because 50,000 was never proposed between the time that the clerk declared 40,000 was the present form of the bill (Annals, c. 17, House, s. 1, 910) and the vote on Long's motion (Annals, c. 17, House, s. 1, 924). It was only after vote 13 that John Tod (DR-PA) moved to strike 40,000 and replace it with 50,000 (Annals, c. 17, House, s. 1, 925). The discrepancy may simply result from an error in the annals, which were not published contemporaneously. They were compiled between 1834 and 1856 using newspaper accounts.

4. In the Globe, House vote 52, a vote to amend P1, came before House vote 51, a vote to pass P1. The voteview dataset numbers them in opposite order. They are listed in the order taken here.

TABLE A3. Six Roll-Call Votes, 1866

#	Date	Chamber	Tally	Description	Compare	Source
H52	1/31	House	29–131	To substitute P1 with C2	P1, C2	538
H51	1/31	House	120–46	To pass P1	Q, P1	538
S51	3/9	Senate	8–39	To maintain metric but grant civil rights everywhere	P1, Q	1287
S56	3/9	Senate	25–22	To pass P1	Q, P1	1289
S148	6/6	Senate	7–31	To substitute P1 with EL	P1, EL	2986
S151	6/8	Senate	31–11	To substitute P1 with P2	P1, P2	3041

Note: Tallies are yeas-nays. "Compare" lists the metrics compared in the vote, with the metric adopted (temporarily in Congress or permanently in law) on the left and the proposed metric on the right. Source is a page number from the *Congressional Globe*, 39th Congress, session 1. Q is population (the status quo metric). P1 is population minus those disenfranchised due to race. C2 is male citizens at least 21 years old. EL is eligible electors. P2 is population reduced by the "ratio" of those disenfranchised to male citizens at least 21.

To make the analysis of state bloc voting comparable to earlier and later figures, focus on the two votes in the House. Votes in the Senate, along with those from the House, will be included in a regression analysis later in this appendix.

On average, members of states with at least two representatives in the House agreed 86 percent of the time across the two roll calls, ranging from the Indiana delegation, which agreed 65 percent of the time, to the California, Connecticut, Iowa, Michigan, Minnesota, New Hampshire, and Vermont delegations, which agreed 100 percent of the time. Furthermore, 11 of the 21 states with at least two representatives were unanimous on House vote 52, while 8 were unanimous on House vote 51. Among substantive votes that were not on apportionment, House delegations agreed 83 percent of the time, which suggests high rates of delegation agreement in 1866.

The 1920s Size of the House

Table A4 lists seven roll calls that compared two different House sizes in the 1920s. Vote numbers come from Eagles (1990), while the source of the vote is the Congressional Record.[5]

5. Eagles (1990) included an additional vote on whether the House should form into the Committee of the Whole to consider reapportionment, which he labeled vote 6. That vote is excluded because it does not compare two House sizes.

Eagles (1990), and subsequently Napolio and Jenkins (2023), appear to have misinterpreted vote 1 as a final passage vote. Vote 1 is actually a vote on Barbour's amendment to replace a 483-member House with a 435-member House (Congressional Record, c. 66, s. 3, 1679, 1693–94). The final passage vote was a voice vote shortly thereafter that reads: "The SPEAKER. The question is on the passage of the bill. The question was taken, and the Speaker announced that the ayes seemed to have it" (Congressional Record, c. 66, s. 3, 1679, 1694).

TABLE A4. Seven Roll-Call Votes, the 1920s

#	Date	Tally	Description	Source
1	1/19/1921	269–76	To substitute a 483-member House with a reapportioned 435-member House	c. 66, s. 3, 1693–94
2	10/14/1921	146–142	To recommit a bill with a 460-member House	c. 67, s. 1, 6348–49
3	4/28/1926	87–265	To discharge a bill with a reapportioned 435-member House	c. 69, s. 1, 7148–49
4	3/2/1927	183–197	To suspend rules and pass a bill with a 435-member House using 1930 census	c. 69, s. 2, 5427–28
5	5/18/1928	186–164	To recommit a bill with a 435-member House using 1930 census	c. 70, s. 1, 9106
6	1/11/1929	135–227	To recommit a bill with a 435-member House using 1930 census	c. 70, s. 2, 1604–5
7	6/6/29	271–104	To pass a bill with 435-member House using 1930 census	c. 71, s. 1, 2458

Note: Vote numbers come from Eagles (1990, 92). Tallies are yeas-nays, excluding paired votes. The source is the Congressional Record with the Congress, session, and page numbers indicated.

On average, members of states with at least two representatives agreed 90 percent of the time across the seven roll calls, ranging from the sixteen Missouri representatives, who agreed 72 percent of the time, to the Arkansas, Delaware, Idaho, Montana, Nevada, South Carolina, Vermont, and Wyoming delegations, which agreed 100 percent of the time. The later delegations were small. Furthermore, 26 of the 43 delegations with at least two voters were unanimous (60 percent). Compare this to other substantive votes. On average, members within House delegations agreed 88 percent of the time in 1921 and 87 percent of the time in 1929, slightly lower numbers with statistically insignificant differences. Clearly, representatives from the same state largely voted together in the 1920s, which suggests that they may have had state interests in mind.

During all four periods, state delegations exhibited high levels of agreement, which suggests that representatives from the same state likely had state interest in mind rather than the type of personal or district-centered interest that divides delegations.

Representatives Vote Sincerely

Evaluating whether representatives tended to vote sincerely for their states' metric share (respectively, seat share) requires a more elaborate set up. For

each period of voting, the votes from the period are pooled and evaluated using regression analysis.

The Prefederal Metric of Apportionment

The claim that delegates in the prefederal period voted for the metric of apportionment that gave their state a greater metric share can be evaluated by pooling the votes around two themes. These themes require different subsets of votes with dependent variables that line up with the control variables in consistent ways.

The first theme pools the votes so that the dependent variable, DV_e, is coded 0 for a vote in favor of equal apportionment and 1 for a vote in favor of a proportional apportionment. Yeas on votes 16, 17, 18, 39, 136, and 147 are coded 1 in the dependent variable, while yeas for votes 40 and 120 are coded 0. Nays are coded in the opposite direction. This pool was used in chapter 2.

The second theme compares metrics of apportionment that have fewer slaves to metrics that have more slaves. The dependent variable, DV_s, is coded 1 for more slaves in the apportionment and 0 for fewer slaves. Yeas on votes 17, 39, 132, 136, 145, and 147 are coded 1, while yeas on votes 40, 114, and 120 are coded 0. Nays are coded in the opposite direction.

The prefederal regressions include data from the Congress of the Confederation and the Constitutional Convention. The results of individual regressions are not reported because they have too few degrees of freedom and most have an independent variable that perfectly predicts the dependent variable.

The key independent variable is the difference in metric shares, which varies depending on which of the two dependent variables are used. For DV_e, the difference in metric shares is the share from the proportional apportionment minus the share from the equal apportionment. For DV_s, the difference is the metric share from more slaves minus the metric share from fewer slaves. For example, on vote 39, the metric share difference is the state's metric share from 3f minus its metric share from E for both pools. Metric share differences are expected be positive and significant in both cases.

For the model with DV_e as the dependent variable, the control variables include whether the delegate studied law, whether the delegate attended college abroad, and the delegate's region.[6]

6. For 1777, studying law and attending college abroad was coded using Library of Congress (2024) and Garraty and Carnes (1999). For 1787, both variables came from McGuire (2003). Mid-Atlantic states include New York, New Jersey, Pennsylvania, and Delaware. Southern states include Maryland southward.

Delegates who studied law would have been exposed to the writings of William Blackstone, Edward Coke, Montesquieu, and Samuel von Pufendorf, among others. Those scholars did not describe how national legislatures ought to be apportioned, but Blackstone and Pufendorf did believe that government derived its authority from the consent of the governed (Paley 2016; Barbeyrac 2005). Delegates studying such works may have been more likely to favor proportional apportionments over equal ones because proportionality was more in line with popular representation than equal apportionment. The relationship is expected to be positive and significant.

Delegates who attended college abroad were more exposed to the various governments in Europe than those who went to college in the states or were not college educated. Thus they may have been more likely to support a proportional apportionment because they were more exposed to the idea. The coefficient is expected be positive and significant.

The regression also includes indicator variables for the mid-Atlantic and the South to account for possible regional differences.

For the DV_s regression, the control variables include whether the delegate studied law, whether he owned slaves, and the delegate's region.[7]

Delegates who opposed slavery often worried that including more slaves in an apportionment would encourage the slave trade (Farrand 1966, 1:588). Everything else being equal, those delegates would oppose a greater number of slaves in the apportionment. Their counterparts, delegates who owned slaves, might be more likely to favor such an apportionment. Hence, slave ownership is expected to be positive and significant.

Table A5 presents regression results estimated using logit. The first column is for the pool of equal versus proportional apportionment. The second column is for the pool of fewer slaves versus more slaves. Both regressions include dummy variables for each motion (not shown).

The metric share difference is positive and significant in both cases, as expected. With other factors controlled, delegates were more likely to vote in favor of the apportionment that gave their state a larger metric share.

In column (1), increasing the metric share difference from 0.0 to 0.05, with other variables held at their means (or modes for dichotomous variables), increases the probability that a delegate voted for the more proportional apportionment by 26.6 percentage points. Decreasing the metric share difference from 0.0 to −0.05 decreases the probability that a delegate voted for the more proportional apportionment by 14.0 percentage points. Since the metric

7. For 1777 delegates, whether a delegate owned slaves was coded from Garraty and Carnes (1999), the delegate's Wiki page, and *Washington Post* (2022). For 1787, slave ownership came from McGuire (2003).

TABLE A5. Analysis of Prefederal Votes

	(1) DV_e	(2) DV_s
metric share difference (proportional – equal)	24.373*** (4.735)	
metric share difference (more slaves – less slaves)		15.256* (6.835)
studied law	0.999 (0.541)	1.200* (0.557)
college abroad	1.047 (0.568)	
owned slaves		−1.434* (0.729)
mid-Atlantic	1.132 (0.935)	0.146 (0.604)
south	2.611** (0.818)	2.632*** (0.785)
constant	−2.296* (0.997)	−1.492 (0.894)
N	137	127
Log-likelihood	−55.01	−65.54

Note: Robust standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

share difference ranges from −0.077 to 0.211, both are relatively large effects. The asymmetry of the relationship is due to the nonlinearity of logit models.

In column (2), increasing the metric share difference from 0.0 to 0.05, while holding other variables held at their means (or modes for dichotomous variables), increases the probability that a delegate voted for the apportionment with the greater number of slaves by 18.8 percentage points. Decreasing the metric share difference from 0.0 to −0.05 decreases the probability that a delegate voted for the apportionment with greater slaves by 16.9 percentage points.[8] Regardless of the coding, delegates typically voted for the metric of apportionment that gave their state a greater proportion of the national legislature, consistent with the sincere voting hypothesis.

Similar results are produced if all the other independent variables are removed except the vote dummies. If Maryland is coded as a mid-Atlantic state rather than a Southern state, the sign and significance of all variables remain the same with one exception. Slave ownership is insignificant in the second regression with Maryland recoded.[9]

8. The metric share difference for model (2) in table A5 ranges from −0.104 to 0.147.

9. A variable indicating whether a delegate had a college education in Scotland was also considered for the regression marked (2) in table A5. A Scottish education would have given the delegate

The 1822 Ratio of Representation

The claim that representatives from the Seventeenth Congress voted for the ratio of representation that gave their state a greater seat share can be evaluated similarly. All of the divisor votes pitted 40,000 against an alternative divisor, except for vote 16, which paired the apportionment passed in 1811 against 40,000. Hence, with the exception of vote 16, a yea will be coded 1 in the dependent variable and a nay will be coded 0. Votes are pooled based on this theme. For vote 16 the coding switches.

For all of the votes, except vote 16, the seat share difference is the proportion of seats controlled by a state from an alternative divisor minus the proportion of seats controlled by a state from a divisor with 40,000 seats. For vote 16, the difference is reversed. If the sincere hypothesis is correct, the coefficient for seat share difference should be positive and significant.

Control variables include an indicator for whether a delegate was a Federalist, the number of years since the member first entered Congress, and whether the member represented a Southern state.

At the beginning of the Seventeenth Congress, Democratic-Republicans controlled 83 percent of the seats in the House. Even though parties were not unified during this period, it is possible that the Federalists, a minority party, voted against the majority and its eventual support for 40,000 as the divisor.

Because more senior members of Congress might be more likely to defer to the committee that wrote bills on apportionment than those with fewer years, a control variable for the number of years since the representative first entered Congress is included. Years in Congress is expected to be negative and significant.

All Southern states, except Georgia, received greater seat shares from an alternative divisor than from 40,000. As such, the coefficient for the South is expected to be positive and significant.[10]

Table A6 presents regression results using logit. The first nine columns dis-

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greater exposure to the Enlightenment and may have made him more opposed to slaves in the apportionment. Ironically, that variable was "positive" and significant at the .05 level. Including it did not affect the sign or significance of the other variables. Variables indicating whether a delegate was trained in theology or medicine were also considered, but they had no significant effect individually nor jointly in either regression. Dougherty and Heckelman (2008) controlled for whether a delegate practiced an abolitionist religion (i.e., Quaker, Methodist, or Shaker). That variable could not be used here because none of the delegates with a yea-nay position in the Dougherty-Heckelman (2012) data came from such an abolitionist religion.

10. Southern states were coded following the ICPSR with codes at least as great as 40 considered the South.

TABLE A6. Analysis of the 1822 Roll-Call Votes

	v2 40 to 42	v3 40 to 45	v4 40 to 39	v5 40 to 41	v6 40 to 38	v7 40 to 41.5	v10 40 to 38	v14 40 to 50	v16 (Q to 40)	pool
seat share	609.517***	172.796*	390.929***	632.754***	129.842	525.202***	304.331***	182.100*	44.648*	145.582***
difference	(100.837)	(83.136)	(90.752)	(168.194)	(88.790)	(97.303)	(89.331)	(77.311)	(17.947)	(23.565)
federalist	−0.964	0.503	1.057*	−0.007	0.868	0.157	0.076	−0.620	−1.797*	−0.109
	(0.729)	(0.418)	(0.523)	(0.490)	(0.465)	(0.552)	(0.541)	(0.538)	(0.714)	(0.171)
years in	−0.077*	−0.031	−0.107	−0.138*	−0.005	−0.057	−0.012	−0.062	−0.026	−0.047***
Congress	(0.034)	(0.033)	(0.085)	(0.065)	(0.037)	(0.043)	(0.032)	(0.033)	(0.034)	(0.012)
south	2.353***	−1.547***	−1.262**	−1.446**	−0.289	0.611	0.516	−0.622	0.669	−0.022
	(0.481)	(0.390)	(0.446)	(0.507)	(0.378)	(0.371)	(0.340)	(0.367)	(0.399)	(0.116)
Constant	−0.565	−0.065	0.125	−0.115	−0.958***	−0.633	−0.818**	0.106	−0.688*	−0.804***
	(0.306)	(0.261)	(0.380)	(0.299)	(0.272)	(0.326)	(0.273)	(0.269)	(0.286)	(0.162)
N	173	180	178	175	179	180	178	169	162	1,574
log-likelihood	−68.65	−101.92	−89.65	−81.14	−103.19	−93.43	−107.72	−104.57	−93.04	−953.86

Note: Though the precise language of a proposal is important, X to Y in a column header means that Y was proposed as a replacement for X, stated in thousands. Parentheses around X to Y indicate the relationship was reversed for the dependent variable and the seat share difference. Q is the status quo apportionment from 1811. The pooled regression includes fixed effects for each roll call (not shown). Robust standard errors appear in parentheses.

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

play the results for individual votes, while the last column displays the results of the pool.

The seat share difference is positive and significant for the pool and for each vote, except for the vote 6 regression for which it is positive but insignificant. Such results are consistent with the sincere voting hypothesis. With other variables are held at their means (or modes for dichotomous variables), increasing the seat share difference from 0.0 to 0.05 in the pool of votes increases the predicted probability that a delegate voted for the divisor giving their state a larger seat share by 73.5 percentage points. Decreasing the seat share difference from 0.0 to –0.05 decreases the predicted probability by 26.3 percentage points. Considering that the observed values range from –0.034 to 0.019, the effect is more modest than it may appear. A one standard deviation increase in the seat share difference increases the predicted probability by only 14.4 percentage points, a smaller but still noticeable effect.

Similar results occurred if some of the control variables were excluded. With all of the control variables excluded, the sign and significance of the seat share difference remains the same, except it is insignificant in the regressions for vote 3 and vote 6.[11]

Before moving on, the analysis considers whether representatives were actually concerned about seat shares rather than raw seats.

To answer this question, table A7 compares the fit of the pooled seat share model to the fit of the same model with the difference in seat shares replaced by the difference in seats. All the variables in table A6 are included even though they do not appear in table A7.

To determine whether seat shares or seats better explain the data, their fit is compared using the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). Both measure how well a model reduces the data. Everything else equal, the model with the smaller AIC and the smaller BIC fit the data better.

In this case, the AIC and BIC are smaller for the seat share model than for the seat model (shown in the last two rows of table A7), indicating that the seat share model is a better predictor of voting behavior. More conservatively, the comparison provides no reason to abandon seat shares in favor of seats.

11. If vote 14 is coded as a vote between 44,000 and 50,000, as claimed by the voteview dataset, the seat share difference for vote 14 is negative and insignificant.

TABLE A7. Comparing the Model Fit of Seat Shares versus Seats, 1822

	Pooled Regression	
	Seat Share Model	Seat Model
seat share difference	145.582***	—
	(23.565)	
seat difference	—	0.138**
		(0.044)
N	1,574	1,574
AIC	1,931.715	2,009.181
BIC	1,996.051	2,073.517

Note: The table compares the model fit of two logit regressions estimated using the difference in seat shares and the difference in seats. Models include control variables and roll call fixed effects. Only the coefficient (and standard error) for the differing variable appear in the table.

** $p < 0.01$, *** $p < 0.001$.

The 1866 Metric of Apportionment

To pool the 1866 votes listed in table A3, the dependent variable is coded 0 for a vote in favor of P1—population reduced by those disenfranchised due to race—and 1 for a vote to replace P1 with another metric. Hence, yeas on votes H52, S51, S148, and S151 are coded 1, while yeas on H51 and S56 are coded 0. Nays are coded in the opposite direction.

The metric share difference is coded as the metric share from the proposed deviation minus the metric share from P1. The coefficient for the metric share difference is expected to be positive and significant in all regressions.

Control variables include separate indicators for whether the member was a Republican, a Unionist, a Radical Republican, a member of the Joint Committee on Reconstruction (JCR), attended college, and represented a border state.

Republicans controlled both houses of Congress in 1866 and may have supported P1 because it was proposed by the Joint Committee on Reconstruction. As a result, a negative and significant relationship is expected.[12]

Since Unionists and Unconditional Unionists often supported the Republican agenda, the two parties were combined into a single variable, called unionist.[13] Its coefficient is expected to be negative and significant.

12. Party identification came from https://legacy.voteview.com/house39.htm and https://legacy.voteview.com/senate39.htm

13. There were 14 Unconditional Unionists in the House and 3 in the Senate, and there were 5 Unionists in the House and 1 in the Senate.

TABLE A8. Analysis of the 1866 Roll-Call Votes

	(1) H52 P1 to C2	(2) H51 (Q to P1)	(3) House pool	(4) Senate pool	(5) combined pool
metric share	−16.026	−90.227	30.327	11.941	68.795*
difference	(81.207)	(316.385)	(85.252)	(38.320)	(33.850)
republican	0.824	−6.397***	−2.102***	−0.295	−1.529***
	(0.662)	(1.031)	(0.351)	(0.532)	(0.275)
unionist	−0.445	−3.144	−0.906	−1.094	−1.207*
	(1.261)	(2.654)	(0.660)	(1.015)	(0.542)
radical republican	−0.326	*-omit-*	−0.788	0.276	0.459
	(1.123)		(1.083)	(0.379)	(0.320)
jcr	*-omit-*	−0.445	−0.925	−0.645	−0.656
		(1.182)	(0.769)	(0.513)	(0.414)
college	0.018	0.230	−0.010	0.684*	0.377
	(0.412)	(0.671)	(0.295)	(0.348)	(0.216)
border	0.510	0.185	0.066	1.185*	0.528
	(0.802)	(2.524)	(0.557)	(0.556)	(0.367)
constant	−2.154**	3.250**	0.306	−0.799	−0.033
	(0.693)	(1.047)	(0.385)	(0.544)	(0.274)
N	151	156	326	174	500
Log-likelihood	−72.66	−34.47	−148.75	−110.08	−271.96

Note: X to Y in the header indicates that Y was proposed as a replacement for X. Parentheses around X to Y indicate the relationship was reversed for both the dependent variable and the metric share difference. Robust standard errors appear in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The Radical Republicans openly opposed slavery, fought for basic civil rights for Blacks, and had strong opinions on postwar Reconstruction. A list of notable Radical Republicans was used to code the Radical Republican variable.[14] Although the list appears to be partial, the variable is expected to be negative and significant.

The Joint Committee on Reconstruction (JCR) was made up of nine members from the House and six members from the Senate. Since members of the JCR proposed P1, the variable indicating membership on the JCR should be negative and significant.

College indicates whether a member attended college, as coded by Swift et al. (2009). If those with a college education were more likely to break from the Republican agenda, its coefficient should be positive and significant.

Table A8 presents the results. The first column displays results for House vote 52, which is a vote to replace population reduced by the number of disen-

14. The list of Radical Republicans came from https://en.wikipedia.org/wiki/Radical Republicans, accessed May 1, 2024.

franchised males (P1) with male, voting-age citizens (C2). The second column displays results for House vote 51, which is a vote to pass P1. The coding of the dependent variable and the metric share difference are reversed in the latter case. The third column pools the two votes. The fourth column pools the four Senate votes. The fifth displays results for a pool combined from both chambers.

The Senate votes are not displayed individually because votes 51 and 148 were lopsided and would not converge. Furthermore, several variables perfectly predicted a value of the dependent variable in the Senate votes. For example, being a Republican, or a unionist, perfectly predicted opposition to vote 148.

The metric share difference is negative and insignificant for both the vote 52 and vote 51 regressions in the House, contrary to my hypothesis. In the House pool the sign is positive as the sincere voting hypothesis would predict, but the relationship remains insignificant. The pool of Senate votes produces a positive and insignificant relationship as well.

It is not until both the House and Senate votes are pooled together that the relationship between the dependent variable and the metric share difference is positive and significant as expected. In that specification, increasing the metric share difference from 0.0 to 0.05 increases the predicted probability that a delegate will vote for the metric that gives their state a larger share by 58.2 percentage points with other variables held at their modes. Decreasing the share difference from 0.0 to −0.05 decreases the predicted probability by 20.4 percentage points. While those effects appear large, it is important to keep in mind that the observed metric share differences ranges from −0.008 to 0.029. Because those differences are so small, the effect is small as well. For a one standard deviation increase in the metric share difference, the predicted probability of favoring an alternative over P1 increases by only 9.4 percentage points.

With the exception of the variable indicating Republicans, the control variables faced similar fates. They remained largely insignificant in the individual regressions but gained expected signs and significance in some of the pools.[15]

Similar results were produced with different specifications. For example, if Radical Republican and JCR were excluded from the regressions, then the sign

15. Unionist was not significant in any of the regressions except for the combined pool. In that case, Unionists were more likely to support P1 than an alternative metric, as hypothesized. Radical Republican was omitted from the regression for House vote 51 because all the Radical Republicans supported P1 over Q. It was insignificant in all of the other regressions, perhaps because the list used to measure Radical Republicans was incomplete. JCR was omitted from the specification for House vote 52 because membership on that committee perfectly predicted opposition to switching from P1 to C2.

and significance of all the variables remained the same except college, which was significant at the weaker .10 level in the Senate pool.

Including a variable indicating whether a member represented his birth state or was born abroad had no effect on the sign or significance of the other variables.[16]

Another measure for Radical Republican is whether a representative voted to impeach Andrew Johnson on January 7, 1867, a year before Congress had a successful impeachment vote. The measure could only be used for the House because the Senate did not vote on impeachment that year, and when the Senate did vote to impeach Johnson in the next Congress, it voted on the eleven articles of impeachment individually.

With the impeachment variable used in place of Radical Republican, the impeachment variable was negative for the House vote 52 regression (H52), the House vote 51 regression (H51), and the regression on the pool of House votes, but it was only significant in column (2) and column (3). Representatives who were radical enough to vote for the impeachment of the president at an early stage were also more likely to vote to protect P1 in those cases.[17]

Other specifications were also considered but none changed the sign and significance of the metric share difference in the expected way.

The relatively poor performance of the theory in 1866 is easy to explain. Unlike the prefederal period, the metric share differences associated with the 1866 votes were relatively small because they pitted similar metrics against each other, like population against voting-age citizens. The prefederal votes pitted radically different metrics against each other, like equal apportionment against the taxes paid by each state. In other words, more was at stake in the prefederal period. With small differences in 1866, members of Congress could easily direct their attention to other concerns and seem to ignore their state's metric share.

One of those concerns was the interest of a member's political party. Consider House vote 52. The Republican majority voted nay on the proposal to replace P1 with C2, as did all of the Republicans from Connecticut and New Hampshire, even though both states would have received slightly larger metric shares from C2 than from P1. California had a larger metric share difference than either of those two states, but instead of voting for C2, three of the four California Republicans voted against C2. The other abstained. Perhaps those members were putting party before state.[18]

16. Representing a birth state and being born abroad were insignificant at traditional levels.

17. In all three cases, replacing Radical Republican with the impeachment variable made the metric share difference positive, but never significant.

18. Recoding the Republican nay votes from any two of those three states with a yea vote would make the metric share difference in the H52 regression positive and significant as hypothesized.

The relationship is even stronger in the regression for House vote 51. Vote 51 was almost a straight party-line vote with the Republicans voting for P1 and the Democrats voting against. Indiana and New York both received greater metric shares from P1 than from Q. Nevertheless, all three Democrats from Indiana and all seven voting Democrats from New York voted against P1, seemingly putting party before state.[19]

Clearly, metric shares mattered and those representing a state tried to make them larger. But metric shares were not the only thing that mattered. When the difference between two metrics were small, members of Congress listened to their party.

The 1920s Size of the House

The methodology employed to evaluate whether representatives voted for the House size that gave their states greater seat shares in the 1920s differs from Roberts (2022) and Napolio and Jenkins (2023). Specifically, it utilized a different set of roll call votes and control variables because the objective is to compare votes on House sizes, rather than votes in favor of a reapportionment agenda.

To assure that the control variables line up with the dependent variable consistently, the dependent variable is coded 1 if the representative voted in favor of a reapportioned 435-member House or if they voted in favor of reapportionment for vote 2. The dependent variable was coded 0 if the representative voted against a reapportioned 435-member House or against reapportionment for vote 2. Eagles (1990), Napolio and Jenkins (2023), and Roberts (2022) use the same coding. Hence, yeas on votes 1, 3, 4, and 8 are coded 1 in the dependent variables, while yeas on votes 2, 5 and 7 are coded 0. Nays are coded in the opposite direction.

For votes 1, 3, 4, and 8 the seat share difference is the state's seat share from the proposal minus the state's seat share from failing to pass the proposal, which often meant the 1911 apportionment. For votes 2, 5, and 7 the difference is reversed. If representatives voted sincerely in favor of the apportionment that provided a larger shares for their states, the effect should be positive and significant.[20]

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19. If the voting Democrats from New York were recoded as voting in favor of P1, consistent with their state's metric share, then the metric share difference in the H51 regression would be positive and significant at the .10 level.

20. Seat shares were calculated using 1920 census data for votes 1–4 and 1930 census data for votes 5, 7, and 8. Similar results are produced if all codes are based on 1920 data (described below). Eagles (1990) and Napolio and Jenkins (2023) use an indicator for whether a representative's state

Control variables include an indicator for whether the representative was a Republican,[21] the percentage of rural population in a member's state, whether they came from a different party than the one controlling their state legislature, and whether they represented a Southern state.

The percentage of a state's population that is rural is the percentage of the population living in an area with fewer than 2,500 inhabitants, as measured by the 1920 census and provided by Manson et al. (2019). Scholars hypothesized that representatives from states with greater rural populations were more likely to oppose reapportionment than representatives from urban states. The coefficient for percentage rural is thus expected to be negative and significant.

Engstrom (2013) shows that state legislatures in the 1920s were very effective at drawing districts that increased their party's seats. Aware of this fact, a representative might be more wary of losing their seat if a majority of their state legislature was controlled by another party. Such representatives would be more likely to vote against reapportionment than a typical member. To control for such an effect, an indicator variable was created that equaled 1 if the party controlling a majority of both chambers in the state legislature differed from the representative's party. The variable was coded 0 if the member was from the same party, different parties controlled different chambers, or no party controlled a majority. The variable is expected to be negative and significant.[22]

Regression results appear in table A9. The first seven columns are from individual regressions on the respective roll calls, while the last column is from a pool of the votes. The pooled regression includes roll-call fixed effects, which do not appear in the table.

Our primary variable of interest is the difference in seat shares. With the exception of vote 2, the seat share difference is positive and significant in every case. Representatives were more likely to vote in favor of proposals giving their state a larger share difference with other variables held constant. Consider the pooled regression in the last column. With other variables held at their means

gained or lost seats by reapportionment. There are three important differences between their measure and mine. First, an indicator variable does not differentiate a gain in one seat from a gain in multiple seats, while a difference in seat shares does. Second, in cases in which different-sized Houses are compared, states that do not gain or lose seats can experience gains or losses in seat shares. Third, seat shares capture gains or losses relative to the size of the House. A seat change does not.

21. Party identifications came from voteview.com

22. Data on the party composition of state chambers came from Burnham (1992). The source differs from that in chapter 7 because only years ending with 2 or 3 were gathered for the study in chapter 7.

TABLE A9. Analysis of the 1920s Roll-Call Votes

	v1 483 to 435	v2 (460 to Q)	v3 Q to 435	v4 Q to 435	v5 (435 to Q)	v7 (435 to Q)	v8 Q to 435	pool
seat share	890.050***	−262.362***	634.431***	825.649***	326.731***	362.927***	246.745***	272.752***
difference	(180.692)	(68.652)	(82.474)	(120.924)	(45.282)	(57.525)	(55.043)	(20.676)
republican	−0.899*	2.204**	−0.194	2.502***	1.089*	1.587***	0.361	0.885***
	(0.417)	(0.674)	(0.667)	(0.490)	(0.492)	(0.458)	(0.406)	(0.154)
percent rural	−2.790**	0.412	1.164	−2.198*	−1.253	−5.888***	−8.532***	−2.267***
	(0.948)	(0.821)	(0.952)	(0.896)	(0.800)	(1.086)	(1.389)	(0.320)
state party differs	−1.182*	2.121*	−1.270	0.263	−0.625	−0.405	−0.213	−0.290
	(0.460)	(0.976)	(0.749)	(0.517)	(0.545)	(0.544)	(0.481)	(0.171)
south	0.600	0.670	−1.414	−0.544	−0.426	0.133	0.068	−0.112
	(0.471)	(0.711)	(0.728)	(0.560)	(0.539)	(0.541)	(0.500)	(0.181)
constant	3.307***	−2.089**	−1.390	−0.442	0.162	3.213***	6.078***	2.045***
	(0.640)	(0.755)	(0.793)	(0.615)	(0.601)	(0.686)	(0.890)	(0.250)
N	346	287	352	378	350	362	375	2,450
log-likelihood	−154.96	−173.01	−146.31	−144.88	−169.52	−135.02	−135.15	−1,236.16

Note: Though the precise language of a proposal is important, X to Y in a column header means that Y was proposed as a replacement for X. Parentheses around X to Y indicate the relationship was reversed for the dependent variable and the seat share difference. The pooled regression includes fixed effects for each roll call (not shown). Standard errors appear in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

(or modes for dichotomous variables), increasing a state's seat share difference from 0.0 to 0.05 increased the probability that the state's representative voted in favor of the larger reapportionment by 14.4 percentage points, a noticeable effect. Decreasing a state's difference from 0.0 to −0.05 decreased the probability that the state's representative voted in favor of the larger apportionment by 85.6 percentage points.[23]

As a robustness check, the analysis was repeated with paired votes included. This increased the number of observations in each column but had almost no effect on the sign or the significance of the results.[24]

As another robustness check, the seat share differences for votes 5, 7, and 8 were coded using 1920 census data rather than 1930 census data. Those three votes clearly specified the use of data from 1930, but a reader might prefer this coding if they believe representatives could only act on published population figures. The change had no effect on the sign or significance of the seat share difference, but it did effect some of the control variables.[25]

To determine whether representatives were more interested in seats than in seat shares, the fit of a model with seat share differences was compared to the fit of a model with seat differences. This was done for votes 1 and 2 only because seat share differences and seat differences are isomorphic for any case in which the size of the House remains the same.

Table A10 presents those results. Both models contain the same dependent and control variables that appear in table A9. For vote 1, the raw seat difference is not statistically significant at traditional levels. The hypothesis that a difference in *seats* has no effect on roll call 1 cannot be rejected given these controls. For vote 2, the difference in raw seats is negative and significant at the .05 level.

To determine whether seat shares or seats explain the data better, consider the AIC and BIC at the bottom of table A10. Both are smaller for the seat share model than for the seat model, indicating that the difference in seat shares is a better predictor of voting behavior than the difference in seats. More conservatively, there is no reason to favor seats over seat shares.

23. Keep in mind that the difference in seat shares for this regression ranges from −.007 to .021 with a mean of 0.0002.

24. Including paired votes affected the sign and significance of only two coefficients in table A9. For the vote 2 regression, Republican was significant at the stronger .001 level; for the vote 3 regression, South was significant at the .05 level.

25. With the new coding, the sign and significance of only two coefficients changed. For vote 5, Republican remained positive, but it was insignificant at the .05 level; and for vote 7, hailing from a party that differed from the party controlling a majority of the state legislature was negative rather than positive, but still insignificant. As a third robustness check, the analysis in table A9 was conducted with each state's percentage of rural population based on 1930 data. This did not affect the sign nor the significance of any of the coefficients in the table.

TABLE A10. Comparing Model Fit of Seat Shares versus Seats, 1920s

	Vote 1		Vote 2	
	Seat Share Model	Seat Model	Seat Share Model	Seat Model
seat share difference	890.050***	—	−262.362***	—
	(180.692)		(68.652)	
seat difference	—	−0.061	—	−0.335*
		(0.165)		(0.130)
N	346	346	287	287
AIC	321.971	350.084	358.019	368.494
BIC	345.049	373.162	379.976	390.451

Note: The table compares the model fit of regressions estimated using the difference in seat shares and the difference in seats. Models are estimated using logit with the dependent variable and control variables appearing in table A9. Only the coefficient (and standard error) for the difference variable appear in the table.
* $p < 0.05$, *** $p < 0.001$.

Although tables A9 and A10 clearly show that representatives in the 1920s voted for the House size that created greater seat shares for their state, there is an anomaly in the data. Even after adjusting for the direction of the dependent variable and the direction of the seat share difference, the seat share difference for vote 2 is negative, while it is positive for all of the other regressions. A possible explanation is widespread sophisticated voting.

Sophisticated Voting

Even though a vote to recommit typically kills a bill, it is possible that vote 2 was actually an attempt to propose a 435-member House in place of a 460-member House. Eagles argued for this interpretation. He thought those supporting reapportionment favored recommittal on vote 2 "because they still hoped to repass the bill for a 435-member House that had been approved earlier in the year" (1990, 92). Roberts echoes the claim, adding that "Republican leaders urged members to vote for recommittal because they feared that the bill with a 460 member House would pass if the bill were taken to final passage at that time" (2022, 13). A vote to recommit would have been sincere if a representative preferred the status quo to a 460-member House. It would have been sophisticated if they voted to recommit in order to attain a 435-member House at the end of voting.

Prima facie vote 2 (roll call 111 from the Sixty-Seventh Congress) has many characteristics of a sophisticated vote. First, the remaining steps in the House agenda tree would have been well known, allowing sincere and strategic

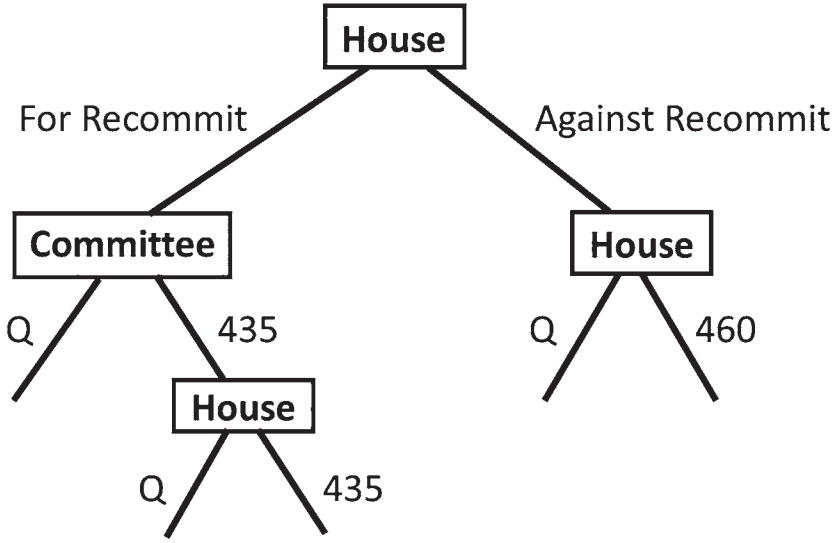


Fig. A2. The Vote to Recommit, Full Game

behavior to be observationally distinct. Second, across the 43 votes to recommit in the Sixty-Seventh Congress, an average of 16 percent of voting Republicans voted against their party. On vote 2, 42 percent of voting Republicans voted against their party, roughly two standard deviations above the mean for votes to recommit. Third, the cut line for the roll call correctly classified only 0.66 percent of the votes, well below the 0.89 percent correctly classified across all recorded votes in the Sixty-Seventh Congress.[26]

In all, the latent factors that explain voting patterns across the Sixty-Seventh Congress do not explain vote 2 very well.[27] Even Louis Fairfield (R-IN), who made the motion to recommit, is misclassified by the vote. He voted contrary to what his NOMINATE score and the cut line would predict. Perhaps he did so because he supported a 435-member House previously and wanted to do so again. Based on seat shares, a majority of members in the House preferred $435 \succ Q \succ 460$, suggesting that a majority of members may have been interested in the sophisticated vote claimed by Eagles (1990).

Although some representatives should be expected to vote sincerely while others vote sophisticatedly (Denzau et al. 1985), this study compares what

26. Data came from https://voteview.com/rollcall/RH0670111

27. The proportionate reduction of error for the vote is 0.32, while the aggregate proportionate reduction of error for the 67th Congress is 0.62.

would have happened if everyone voted sincerely to what would happen if everyone voted sophisticatedly to simplify the analysis.

Figure A2 depicts the amendment tree. The game starts with a decision by the House to recommit. If the House chooses to recommit, the game will proceed down the left side of the tree (L). If the House chooses not to recommit, the game will proceed down the right side of the tree (R). A successful recommitment (L) means that the decision goes back to the House Census Committee, which either decides not to propose a bill, thereby maintaining the status quo, Q, or to propose a bill of 435 members. Of course, the committee could have proposed other sizes, but Eagles (1990) and Roberts (2022) claim the maneuver was for 435. If the committee proposed a 435-member House, that proposal would be subject to a House vote, which could end with Q or with passage.

If the vote to recommit failed (R), the House still had to vote for passage of a 460-member House, which could leave members with Q again, in other words, the 1911 distribution. With rapid population growth in some states but not in others, several states stood to gain from maintaining Q.

With the assumption that representatives preferred the apportionment that gave their state a larger seat share, one can determine the preferences of representatives for the three alternatives: Q, 435, and 460. These are depicted in table A11. The first line in the table indicates the number of members that have the preferences listed beneath. Preferences are ordered from most preferred in the first row to least preferred in the bottom row. Sizes on the same row indicate that the state receives the same seat shares from the alternatives on that row. States with the specified preference order appear at the bottom of the table. For example, as shown in column (1), 83 members, representing twelve different states, would be indifferent between all three apportionments: Q, 435, and 460. As shown in column (2), another 146 members, representing fourteen different states, would be indifferent between Q and 435 and prefer both to 460. The total number of members sum to 430 because five seats were vacant during the vote.

What is interesting is that among the states with at least one strict preference, that is, an alternative on at least two rows, the status quo is the most frequent first preference (236 members), a 435-member House is the second most frequent (218 members), and a 460-member House is the third most frequent (54 members). The status quo might do well in such a setting.

If representatives voted sincerely, they would vote for their most preferred apportionment at every stage of the game. This allows for a prediction about how they would vote on vote 2 in the row marked "sincere." In the

TABLE A11. The Vote to Recommit, Preferences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
# Members	83	146	3	70	60	24	17	12	15
Preferences	Q, 435, 460	Q, 435 460	Q, 460 435	Q 460 435	435 460 Q	460 435 Q	Q 435, 460	435, 460 Q	460 Q, 435
Sincere:	L,R	L	L,R	L	R	R	L	R	R
Sophisticated:	L,R	L,R	R	R	L	L	R	L	L,R
Voted L:	37	57	0	5	39	12	6	8	8
Voted R:	27	45	3	59	8	7	11	1	6
States:	AZ, CO, DE, FL, GA, MA, ND, NV, OR, PA, SD, WY	AL, ID, IL, MD, MN, MT, NH, NY, SC, TN, UT, VA, WI, WV	RI	IA, KS, KY, LA, MO, MS, NE, VT	CT, NC, OH, TX, WA	CA, MI	IN, ME	NJ	AR, NM, OK

Note: Preferences are based on each state's seat share from three apportionments: the status quo (Q), a reapportioned 435-member House (435), and a reapportioned 460-member House (460).

opening vote for and against recommittal, members representing states that received a larger seat share from Q than from a 460-member House would vote for recommittal (L), while members representing states that received a smaller seat share from Q than from a 460-member House would vote against recommittal (R). The predicted vote for each group of states is easily determined from the preference lists on the top of the table. The 83 members in column (1) and the 3 members in column (3) are indifferent between Q and 460. Hence there would be no clear prediction for them. The table lists L,R to indicate their indifference. In contrast, the 223 members in columns (2), (4), and (7) all prefer Q to 460. Hence they should have voted for recommitting 460 if they voted sincerely and are assigned an L in the sincere row. The remaining 111 members in columns (5), (6), (8), and (9) all prefer 460 to Q. Hence they should have voted against recommittal if they voted sincerely. If everyone voted sincerely, there would be 233 votes for recommittal (L) and 111 votes against recommittal (R). Even if all 86 members who were indifferent voted against recommittal, perhaps because of some secondary interest, the motion to recommit would pass, which it did.

If representatives voted sophisticatedly, they would consider the implications of supporting L and R, then reason backward. For a complete information game, starting at the end of the game and reasoning backward determines the rational choice at each stage of the game if individuals anticipate the effects of future actions (theirs and others). Game theorists use this method to find subgame-perfect equilibria.

Because sophisticated voting at the end of the game is identical to sincere voting, sincere preferences for the vote between Q and a 435 and between Q and a 460 can be used in the final stage of the game. A 435-member House would pass in the first case and the status quo would pass in the second case. Sophisticated voters should recognize this in the penultimate stage of voting.

If the Census Committee knew that a 435-member House would pass if they proposed it, their choice would be between not proposing a bill (Q) and proposing a successful 435-member House that the Senate would later consider. There were 16 members on the Census Committee. Four members represented states with a larger seat share from a 435-member House than from the status quo. Six members represented states with a larger seat share from the status quo than from a 435-member House. And six members received the same seat share from the two alternatives. Hence a majority of the committee could have voted either way depending how the six indifferent members were persuaded.

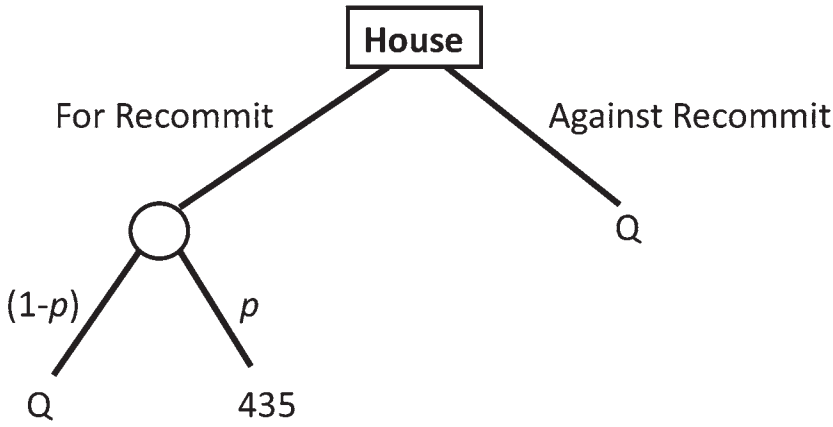


Fig. A3. The Vote to Recommit, Reduced Game

This leads to the reduced form of the game appearing in figure A3. A vote for recommittal (L) would lead to a chance node in which the committee proposed a 435-member House with probability of p and it would let the bill die with a probability of $(1 - p)$. The chance node is indicated by the hollow circle. A vote against recommittal (R) would ultimately lead to the status quo (Q).

Based on this reasoning, a prediction about how members would vote on vote 2 if they voted sophisticatedly can now be made. As long as $p > 0$, members who preferred a 435-member House would vote L, while members who preferred the status quo would vote R. Those who were indifferent would go either way. This leads to the predictions listed in table A11 in the row marked "sophisticated." The 244 members in columns (1), (2), and (9) would be indifferent between a 435-member House and Q, indicated by L,R. The 90 members in columns (3), (4), and (7) all prefer Q to a 435-member House. Hence, they are marked R for their sophisticated choice. Finally, the 96 members of columns (5), (6), and (8) all prefer a 435-member House to Q. Hence, they are marked L for their sophisticated choice.

With the exception of cases with indifference, the sincere and sophisticated predictions differ in every case. Those predictions can be compared to the actual number of votes listed in the rows marked "voted L" and "voted R." Note: Not all the members voted. Some voted in pairs with designated positions, others voted in pairs with undesignated positions, and some did not vote. Both the yeas and nays and the designated pairs are included in the table.

There are no clear predictions for the representatives in columns (1), (2),

(3), or (9) because one of the models predicts indifference in those cases. The remaining columns, (4) through (8), however, provide clear predictions.

Surprisingly, the sophisticated model outperforms the sincere model in each of those cases. A majority of members from each group in columns (4) through (8) voted sophisticatedly. Combined, 83 percent of the members who voted in columns (4) through (8), voted consistent with the sophisticated model, providing evidence for sophisticated voting on vote 2. In some cases, such as columns (4), (5), and (8), the margins are quite large. Such voting explains why the sign of the coefficient for the seat share difference is backward in table A9.

Among the 129 representatives who should have voted sophisticatedly in table A11, 74 of them (57 percent) were on the wrong side of the cutline, meaning that most voted against their latent voting pattern. The proportion is greater than 0.5 at the .05 level of significance.

The incentives can be seen by examining three specific states more carefully. Recall that 16 states would gain seats from a 460-member House rather than the status quo, while only 2 states, Maine and Missouri, would each lose a seat.

Maine would receive a larger seat share from the status quo than from a 435-member House or from a 460-member House. All four of Maine's representatives voted to recommit on vote 2. In other words, all four voted sincerely on vote 2, perhaps because such a vote was watched carefully by their constituents.

In contrast, all but one of the sixteen representatives from Missouri voted against recommittal (one of which voted in a pair). In other words, almost all the Missouri representatives voted consistent with a sophisticated vote on vote 2, perhaps because they realized that a maneuver to maintain the status quo was worth the risk of losing support from constituents who might judge their sophisticated vote poorly. The one representative who voted contrary to other representatives from their state, William Rucker, was the sole Democrat among the Missouri voters. He may have voted sincerely on vote 2 because he believed Democratic constituents were watching him more carefully than they were watching his Republican counterparts.[28]

A third state, Texas, had 18 seats under the current apportionment. It expected 19 seats from a reapportioned 435-member House and 20 seats from a 460-member House. Nevertheless, it had a larger seat share from 435 mem-

28. The representative who voted in the pair appears to have created his pair before the motion was raised.

bers than from 460 members. The status quo produced the smallest seat share for Texas. Interestingly, all but one of the Texas representatives who participated in the vote voted for recommittal. Such behavior was consistent with a sophisticated vote. By voting for recommittal, Texas had a shot of attaining a 435-member House, which would give their state the largest seat share among the three alternatives. Had the Texas representatives voted sincerely, in terms of seat shares or seats, they should have voted against recommittal.[29]

Formal Theories

Is there a single theory that can explain the apportionments chosen by Congress throughout US history? Formal theorists have developed a variety of theories that might be candidates. Two of the most applicable theories are structure-induced equilibria (Shepsle and Weingast 1981) and legislative bargaining models (Baron and Ferejohn 1989).

Structurally induced equilibria are the outcomes produced by the institutions of the legislative process, such as a backward agenda in the modern US Congress. In a backward agenda, any differences in a bill are voted on pairwise until a final vote, in which the bill, as amended, is paired against the status quo. If the agenda is fixed and information is complete, rational voters can predict the winners of the early stages and which alternative would win a series of votes. Researchers can then apply backward induction to determine what would happen if they voted sophisticatedly.

The problem with applying backward induction to the four case studies in this book is that the agenda was almost entirely unstructured until final passage in all four cases. Hence it would have been difficult for voters to anticipate the proposals that would be considered in future stages of the game and even more difficult for researchers to predict which outcome would win at the end of voting. Structure-induced equilibria helps, but only in isolated cases such as vote 2 from the 1920s. In that case, the agenda tree was short and widely known.

29. As was the case with Missouri, the representative from Texas who voted against recommittal was the sole member of the minority party. The Wisconsin Republicans, who led the progressive wing of the party, all voted in favor of recommittal, against the majority of their party but consistent with their state's interest. Although table A11 does not make a clear prediction for the representatives from Wisconsin, recommittal would produce either the status quo apportionment or a reapportioned House with 435 members, both of which gave Wisconsin a greater seat share than the 460-member House being considered.

The second formal theory, a legislative bargaining model, does not require full knowledge of the agenda tree. In the canonical model, each member i is randomly recognized with a probability of $p_i = 1/n$. When recognized, the member proposes a division of the seats $x = (x_1, \ldots, x_n)$ such that each individual j is assigned $0 \leq x_j \leq 1$ and $\sum_{j=1}^{n} x_j = 1$. Members, including the proposer, then vote to continue the game or to move to a final passage vote between the proposal and the status quo. If a majority chooses final passage, members vote on the proposal versus the status quo, the winner is the outcome, and the game ends. If a majority chooses to continue the game, another proposer is randomly recognized with a probability $p_i = 1/n$ and the game repeats itself with payoffs discounted by $\delta_i \in [0, 1]$. The game continues until a proposed distribution is supported by a majority, which rationally occurs quickly in these types of games.

The problem with legislative bargaining models is that they typically allow too many equilibria. For many sets of preferences, representatives can propose their first or second preference, which will be accepted in equilibria if the discount factor is sufficiently low. Hence both historical outcomes and nonhistorical outcomes are predicted, making them less useful.

To see if such a model fits our cases, a modified version of the Baron-Ferejohn (1989) bargaining model was applied to the 1822 and 1920s decisions for a finite set of feasible distributions.[30] For 1822, all divisors between 30,000 and 75,000 were considered feasible. For the 1920s, all House sizes between 300 and 500 were considered feasible. Both reflect the range of proposals discussed in Congress. To derive the stationary strategy equilibria, the author wrote a computer script that assumes that the disagreement value for each state i was $Q_i - c$, where Q_i is state i's observed seat share from the status quo apportionment and $0 \leq c < 1$ is an additional, unobserved cost of failing to reach an agreement, such as reputational costs for not making a timely decision.

The script first determines the proposal set, that is, the set of alternatives that dominate the status quo apportionment Q based on the adjusted values $Q_i - c$. It then calculates the undiscounted continuation values, v_s for each state s, by assuming $v_s = \sum_{j=1}^{n} p_j x_{s,j}$, where p_j is the probability that a member from state j is recognized and $x_{s,j}$ is the value of apportionment x to state s from the allocation proposed by j.

Initially, the script assumes each member proposes the apportionment in

30. The model was not applied to the 1787 and 1866 cases because, beyond the observed proposals, the set of feasible alternatives are unknown.

the proposal set that gave their state the greatest seat share. The script then compares each state's value from the proposal to their discounted continuation value, assuming states discount by the same amount δ. If a majority of states valued the proposal more than their discounted continuation values, that proposal would pass. If they did not, the proposal would fail and in the next iteration of the script state *j* would propose the member's next favorite alternative in the proposal set, continuation values would be recalculated for *all* proposals, including those that previously passed, and the votes on each proposal would be recalculated. The process repeats until the full set of proposals passed or a proposer no longer has an alternative to propose within the proposal set. In the former case, the set of proposals are considered in equilibria for the $(p_1, p_2, \ldots p_n)$, δ, and *c* assigned. In the latter case, the script does not find a stationary strategy equilibrium for the parameter values.

For 1822 the status quo apportionment was the Condorcet winner if $c = 0$, which was not the historical outcome. If $c \geq 0.01$, the proposal set contained all feasible alternatives, many of which were rational proposals. The divisor of 40,000, which was adopted in 1822, was not among them. Smaller *c* produced similar results.

Modifying the script so that the originating committee would be recognized with probability *p* and noncommittee members would be recognized with probability $1/n\,(1 - p)$ makes the model predict too well. Just about any alternative proposed by the originating committee would be in equilibrium for $\delta \leq 0.95$ and $c \geq 0.005$.

For the 1920s, $\delta \leq 0.95$, $c \geq 0$, and $p \geq 0$, equilibria exists in which representatives propose their state's most preferred alternative from the proposal set and the originating committee makes almost any proposal.

Neither structurally induced equilibria nor legislative bargaining models explain the history of US apportionment decisions very well. By focusing instead on how historical actors navigated these dilemmas, this book has provided new insights into how power is redistributed in practice.

Summary

In each period there is strong evidence that representatives from the same state typically voted together on apportionment, a necessary behavior for widespread pursuit of state interests.

With two exceptions, there is also fairly strong evidence that representatives voted for their state's metric shares or seat shares, that is, they voted

observationally sincere. The first exception is in 1866, for which there is only weak evidence that legislators voted to maximize their state's metric share. The weak evidence is likely due to the small differences in the metric shares among the metrics considered. The second exception is for a single roll call considered in the 1920s. In that case, most representatives voted against their sincere interest in what appears to have been a widespread sophisticated vote. The reader can decide whether some representatives voted sophisticatedly on other votes. There is also evidence that representatives voted for greater seat shares, not just raw seats.

Showing that representatives attempted to increase their state's share of the legislature indicates that those interests motivated the typical representative, at least in part. The finding enables research to reconstruct interests based on metrics, ratios of representation, and House sizes that were not subject to a vote. It further allows for the determination of a majority of interests in a variety of cases and whether there were equilibria.

Finding evidence of widespread sophisticated voting in at least one vote lays open the possibility that members wanted to vote sophisticatedly on other votes. They may have thought strategically even if they were not given the opportunity to exercise their strategies in a typical roll call vote. Leaders may have purposefully limited votes on the floor to avoid such behavior.

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