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AMERICA'S ELECTORAL PROBLEM: THE SHORTCOMINGS OF THE ELECTORAL
COLLEGE IN CONTEMPORARY AMERICAN DEMOCRACY

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Table of Contents

America’s Electoral Problem.....	5
The Perpetual Juxtaposition of Equal and Proportional Representation.....	13
History and Background.....	13
<u>Literature Review</u>	
Statistical Methodologies.....	17
Insufficient Time Parameters for Evaluation.....	23
Failure to Analyze the Electoral College in the Context of our Federal Republic.....	24
Overuse of the Decisive Vote Ideology.....	25
Need for Practical and Scalable Voting Power Models.....	27
The Vision.....	28
A Relative Model for Conceptualizing Individual Voting Power and Representation within the Federal Republic of the United States.....	30
Methods of Analysis.....	36
Analysis of the Mean Voting Surplus.....	36
Penalty versus Premium Analysis of the Voting Surplus.....	40
Analysis of the Voting Surplus in Select States.....	45
Results and Findings of the Voting Surplus Model.....	48
Mean Voting Surplus from Each Election.....	48
Effects of Equal Representation on Individuals.....	58
Raw Population Penalty.....	59
Net Population Penalty.....	61
Marginal Difference between Contemporary Penalty & Historical Baseline.....	62
Analysis of Voting Surplus in Select States.....	65
Future Implications.....	70
Important Conclusions from the Voting Surplus Model.....	71
Conclusion: Abolish the Electoral College.....	74
Appendix.....	80
Bibliography.....	84

Abstract

Our Constitution mandates the president of the United States be elected through the electoral college, a mechanism originally engineered to be a compromise between a popular vote by qualified citizens and a vote by Congress. The electoral college existed without controversy up until the 21st century because it consistently produced a winning candidate which mirrored the popular vote, our contemporary perception of a democratic voting method. The legitimacy of the electoral college in the 21st century, however, has been called into question after two of the last five presidents have failed to win the popular vote. Critics of the institution commonly allege that it is inconsistent with American democratic values because it allows individual votes to hold different weights depending on the voter's state of origin. In this thesis, I construct a statistical model measuring the voting power of individuals in every state to estimate the levels of inequality between individuals in the current electoral college. I apply my model to every election in American history to understand the longitudinal behavior of inequality within the electoral college, and how it has changed over time. My findings indicate that some of level of inequality between individuals can exist and still be consistent with American democracy. The levels of inequality in today's current electoral college, however, fall significantly outside the established parameters for acceptable levels of inequality to persist. Based off these findings, I conclude that the electoral college must be abolished, and that we move towards a presidential election method that reconciles state recognition in federal government within the demographic environment of America in the 21st century.

Chapter 1: America's Electoral Problem

*"I believe strongly that in a democracy, we should respect the will of the people and to me, that means it's time to do away with the Electoral College and move to the popular election of our president. We've moved toward one-person, one-vote, that's how we select winners. I think it needs to be eliminated. I'd like to see us move beyond it"*¹ - Hillary Clinton after the 2016 Presidential Election

The president of the United States of America has become arguably the most powerful individual within our global order. Former President Barack Obama once said, "That's the good thing as a president, I can do whatever I want."² Albeit a sarcastic remark, his comments are not grossly out of proportion with the truth. Serving as a mandatory checkpoint for pending legislation, an originator of international treaties and domestic bureaucratic directives, and the appointer of federal judiciary officials, the president has an immense set of privileges and powers: and this is only naming a few.³ America is certainly not an autocratic society by design. Its formation, in many ways, was inspired by a mass emigration from disgruntled citizens of places where such oppressive structures existed. In fact, the concept of a unitary executive head was only agreed to after significant debate and disagreement amongst the founding fathers, where many were concerned with concentrating too much power in the hands of one individual.⁴ Nevertheless, the contemporary presidency resembles a post with much broader powers and influence than even our constitutional founders would have envisioned.⁵ This evolution is well reflected by public opinion about the presidency, as more than 75% of Americans now oppose further expansion of its powers, underscoring its preexisting systemic importance.⁶ Therefore, it is vitally important to ensure the existence of a fair electoral system to bring this individual to power.

The electoral college serves as the current procedure for achieving this end. Unlike the position it functions to fill, however, its legitimacy is not as widely accepted by the broader public. As of 2018, 55%

¹ Beckwith, Ryan Teague. "Hillary Clinton: It's Time to Abolish the Electoral College." Time. September 14, 2017.

² Wolfgang, Ben. "Obama's New Boast: 'I Can Do Whatever I Want'." Washington Times. February 10, 2014.

³ U.S. Const. art. 2. sec. 2.

⁴ Raphael, Ray. *Mr. President*. New York City, NY: Vintage, 2012.

⁵ Ibid

⁶ Doherty, Carroll. "Key Findings on Americans' Views of the U.S. Political System and Democracy." Pew Research Center. April 26, 2018.

Americans were in favor of abolishing the electoral college through a constitutional amendment in favor of a national popular vote scheme.⁷ In order to address this skepticism, a detailed investigation into the inner workings of this institution is much needed.

In creating the electoral college, our founding fathers wanted to be mindful of American society in the 18th century, and were cognizant of the ways in which a presidential election system should reflect it. Fears of replicating a majoritarian system were at the tops of the minds of many of the constitutional framers, as the impetus for America's creation was largely initiated by the drowning out of minority voices within other colonial regimes. James Madison, a devout Federalist, was particularly concerned about pure democratic regimes, holding that they fostered oppressive tendencies of adversarial viewpoints rather than cooperation.⁸ In this sense, the framers, regardless of divergent feelings towards representation, were very aware of the potential dangers a pure, uncontained democracy could bring. Therefore, a republic with democratic elements was commonly favored over a pure democracy which lacked an adequate buffer between the citizenry and the government. Given the consensus approval for a representative democracy, the question soon became what exact shape the presidency should take.

At the time of the Constitutional Convention there existed considerable population disparities between the original states, which inevitably informed different viewpoints towards representative allocation. Delegates from larger states favored a legislative apportionment scheme based on population, where states would be allocated varying numbers of representatives according to their respective populations. Those from smaller states favored an alternative plan which allocated an equal number of representatives to each state, regardless of differences in population. In sum, it became a question over whether individuals or states held a greater priority in being represented at the federal level. These proposals have become historically known as the Virginia Plan and New Jersey Plan, respectively.⁹ The

⁷ "The Electoral College, Congress and Representation." Pew Research Center. April 26, 2018.

⁸ Alexander Hamilton, *Federalist* No. 10, in *The Federalist Papers*, ed. (New Haven, CT: The Avalon Project, 2008).

⁹ Kuroda, Tadahisa. *The Origins of the Twelfth Amendment*. Westport, CT: Greenwood Press, 1994.

task of creating a unitary legislature which equally prioritized the interests of populations and states was, in many ways, impossible for the framers to achieve. The question over which plan was best often sparked spirited discourse amongst the founding fathers, and highlighted the divergent conceptualizations of equitable and fair representation in early America. After tedious debate failed to produce a consensus for either plan, it was determined that a compromise would be required in order to form a government: enter the Connecticut Plan. Dubbed “The Great Compromise,” the plan proposed a bicameral legislature with one chamber to be allocated representatives based on state population and the other chamber to be populated by an equal number of representatives per state.¹⁰ Now that the founding fathers had constructed a Congress which they felt reasonably addressed the interests of both states and populations, it was time to craft the executive branch and determine its representative identity.

The framers sought to create a form of government which would be the first of its kind, one that would incorporate checks and balances to constrain the power of elected officials. It was determined that a three prong government, one with legislative, executive, and judicial branches, would best achieve this balanced power structure. As for the design of the executive branch, there was initial disagreement over whether there should be a single president, or if the position should be filled by multiple individuals.¹¹ Benjamin Franklin greatly favored the latter scheme, known as a “plural presidency,” much as a result of an underlying fear of the autocratic potential of a single president.¹² After compromising in favor of a single executive, the next question became what this individual’s privileges and responsibilities would be, and how the individual would be elected. For the vast majority of the convention, the framers had proposed an executive without the common powers we associate with the position today, such as the power to appoint federal judges and the power to make foreign treaties.¹³ In many ways, the executive

¹⁰ Longley, Lawrence D., and Neal R. Peirce. *The Electoral College Primer*. New Haven, CT: Yale University Press, 1996.

¹¹ Raphael, Ray. *Mr. President*. New York City, NY: Vintage, 2012.

¹² Hoxie, R. Gordon. “The Presidency in the Constitutional Convention.” *Presidential Studies Quarterly* 15, no. 1 (1985): 25–32.

¹³ Raphael, Ray. *Mr. President*. New York City, NY: Vintage, 2012.

branch was initially designed to be subordinate to the legislature, as the latter was seen as the institution closer to the will of the people.¹⁴ Towards the end of their time in Philadelphia, however, a small group of delegates forged an effort to create a more powerful and independent presidency, where the individual would have appointive powers and unilateral diplomatic privileges. Gouverneur Morris, the leader of this faction, spoke virulently about the legislature and its potential to subvert the interests of the masses in favor of the wealthy. He proclaimed that the president must act as “the great protector of the masses” through a strong and independent executive branch in order to insulate the public from these dangers.¹⁵ In addition, their proposal held that the office be elected by presidential electors, a deviation from the election by Congress model which was currently on the table.¹⁶ This model ultimately prevailed principally because plural presidency models were thought to be too difficult to execute, both financially and logistically. Additionally, the Senate would provide a key check on certain presidential powers to mitigate the risk of a dictatorial chief executive, most notably in its role of confirming judicial and executive appointees.¹⁷ The final version of the executive branch, therefore, diverged quite considerably from its initial blueprint, and established a unitary executive head with a broader set of individual powers than previously conceived. With these expanded powers, the question over where the president fit into the representation puzzle became particularly interesting, as some held the election by Congress model to be less applicable than before. Through its increased independence and responsibility, the president inherently played a more direct role in representing the American public. The office was no longer a creature of Congress: it was becoming something else, more powerful and independent in nature.

Given the increased importance of the executive branch relative to the legislature, it became evident that the president would have a greater ability to exert unilateral influence over the people. In this

¹⁴ Hoxie, R. Gordon. “The Presidency in the Constitutional Convention.” *Presidential Studies Quarterly* 15, no. 1 (1985): 25–32.

¹⁵ Robinson, Donald L. “Gouverneur Morris and the Design of the American Presidency.” *Presidential Studies Quarterly* 17, no. 2 (1987): 319–28.

¹⁶ *Ibid*

¹⁷ *Ibid*

sense, the president's representative obligation to the public had been broadened. Determining an electoral scheme which best reflected the president's role in the government and accountability to the public soon became an important task. The founding fathers were all too familiar with the electoral conundrum posed by the creation of the legislature, which exposed divergent conceptions of equitable representation held by the delegates. Amongst those at the convention, delegates found themselves in split camps regarding which form of election would be the most appropriate. The congressional election model was still respected by some delegates as it had been tentatively approved four times during the convention, while a number of other delegates advocated for a direct election scheme dictated by a public vote.¹⁸ James Madison, a proponent of the latter, decreed "the people at large" to be the "fittest" in electing the president.¹⁹ Seeing little progress in terms of flipping positions, James Wilson proposed an intermediate election plan which combined elements of both schools of thought. He believed this plan would allow presidential electors to select the president, and would be based off congressional apportionment. Each state's presidential electors, and the votes they cast, were to be determined by respective state procedure.²⁰ In the event that the electors collectively failed to produce a majority winner, the House of Representatives would be the institution of final resort for a contingency election. In a sense, the people were closer to the president in that they held the potential to impact the decisions of their state's presidential electors. At the same time, maintaining a contingency election procedure involving Congress also kept a buffer between the public and the president.²¹ In the end, the policy itself was seen as "the second choice of many of the delegates, but the first choice of few."²² The creation of the electoral college embraced the idea that competing foundational beliefs could come together and form one policy, and furthermore embedded this cooperative approach into our institutions.

¹⁸ Longley, Lawrence D., and Neal R. Peirce. *The Electoral College Primer*. New Haven, CT: Yale University Press, 1996.

¹⁹ James Madison, *Federalist* No. 10, in *The Federalist Papers*, ed. (New Haven, CT: The Avalon Project, 2008).

²⁰ Kuroda, Tadahisa. *The Origins of the Twelfth Amendment*. Westport, CT: Greenwood Press, 1994.

²¹ Longley, Lawrence D., and Neal R. Peirce. *The Electoral College Primer*. New Haven, CT: Yale University Press, 1996.

²² *Ibid*

The debates of the founding fathers at the Constitutional Convention collectively indicate an evolving approach to the representation question. There never was, and likely never will be, an end all be all answer to this question. Moreover, popular sentiments and understandings of the idea are impacted by changing societal conditions. This reality can be initially deduced through the delegates' willingness to compromise and package two contradictory models of representation into one policy in the form of a bicameral legislature. Beneath this reality, however, lies an indicator even more telling of a fluid understanding of representation in America. A large motivator for expediency in creating the electoral college was the idea that the decision for president was a forgone conclusion: George Washington was going to be elected, regardless of the system that was agreed upon. The delegates' feelings towards this outcome have been characterized as "assured initial unanimity" by Felix Morley, a Pulitzer prize winning journalist and constitutional scholar.²³ Given the fact that the debates concerning the electoral college arose relatively late in the convention, the delegates also preferred a solution which would require less time and energy to agree upon. Therefore, the proposed electoral college gained majority support without significant resistance due to these motivations. Alexander Hamilton further explains, "The mode of appointment of the chief magistrate of the United States is almost the only part of the system, of any consequence, which has escaped without severe censure...I hesitate not to affirm that if the manner of it be not perfect, it is at least excellent."²⁴ Hamilton's remarks confirm that the framers did not have a complete answer to the representation question. The idea of a forgone conclusion also implicitly suggests that the framers would have approached the electoral college debate more critically if there lacked the presence of an assured outcome. All in all, these realities indicate that even the founding fathers favored a conditional understanding of representation based on circumstantial factors over an abstract idea of the concept.

²³ Ibid

²⁴ Longley, Lawrence D., and Neal R. Peirce. *The Electoral College Primer*. New Haven, CT: Yale University Press, 1996.

In analyzing the electoral college today, I hope to rediscover the idea of democratic representation in the context of contemporary society. Much has changed in America since the time of the convention, technologically and culturally. There are 37 more states than there were in 1787, as well as approximately 322 million more people.²⁵ The voting franchise has substantially expanded from property-holding white males, as women and minorities have a constitutionally guaranteed right to participate in elections. Therefore, it would be an anachronistic fallacy to directly apply sentiments from the 18th century to a debate within our society today simply because our concerns towards the subject are not the same. Accordingly, we require a modern framework for analyzing the extent to which our institutions constitute a representative democracy.

The electoral college is a particularly relevant proxy for representative democracy in America due to its dynamics in recent years. Not only does it foundationally allow for individual votes to hold different weights within its scheme, but it has also failed to mirror the popular majority vote in 2 of the last 5 elections.²⁶ Although the elements of proportional and equal representation are logically incompatible, they have existed in relative harmony in the context of the electoral college because its results have not deviated from the popular vote. This reluctant acceptance can be accredited to a similar feeling the founding fathers had in that different electoral systems were thought to have a high likelihood of producing the same results. So long as the results of the popular vote and the electoral college remained parallel, stakeholders on either side of the debate remained tolerant of the electoral process because it wasn't affecting outcomes. Now, because there have been multiple instances in recent years where the electoral college has failed to reflect the popular vote, the debate around this question has become particularly contentious once again. Hillary Clinton's demands for the abolition of the electoral college

²⁵ U.S. Census Bureau. 2010 Census [table]. 2010.

²⁶ Neale, Thomas H. *"The Electoral College: How It Works in Contemporary Presidential Elections."* Congressional Research Service. May 15, 2017.

coming on the heels of an electoral defeat and a popular vote victory directly exemplify the resurrection and pertinence of this age old debate. In her own words, “it needs to be eliminated.”²⁷

My thesis aims to investigate the compatibility of the electoral college with functionally established understandings of democracy in America. Central to this examination is determining the extent to which equal and proportional representation ideologies are *evenly* represented within the electoral college, and if this balance has changed over time. In order to form a grounded response to this question, I will leverage a longitudinal statistical model which measures individual voting power within each state as compared to the national population. Using individual voting power as a proxy for proportional representation, analysis of its long term patterns and contemporary condition will yield substantive conclusions towards the institution’s compliance with representative democratic ideals. Ultimately, my findings will provide a quantifiable basis for determining whether the electoral college as it currently functions fits that definition.

²⁷ Beckwith, Ryan Teague. "Hillary Clinton: It's Time to Abolish the Electoral College." Time. September 14, 2017.

Chapter 2: The Perpetual Juxtaposition of Equal and Proportional Representation in the Electoral College

History and Background

From its founding, the United States has been a country which collectively upholds two divergent ideals of representation through its governmental institutions. One need not look any further than the Constitutional Convention of 1787 to track the origins of this paradoxical structure. For the founding fathers, the task of pioneering a democratic government within a constitutional republic catalyzed a passionate debate concerning the legal definition of representation, and how it should be reflected within the government itself. Since one of the most prominent differences between early states within the republic was the size of their respective populations, the delegates' views towards representation were predictably correlated to the system that would provide each respective state the most relative power. Smaller states favored **equal representation**, meaning a governmental decision making body comprised of an equal number of representatives from each state, *regardless of* population differences. Under this system, states were the guiding demographic unit of which representation was to be fairly divided amongst. On the other hand, larger states supported **proportional representation**, meaning a governmental decision making body comprised of a proportional number of representatives from each state *relative* to its population. Under this system, individual citizens were the guiding demographic unit of which representation was to be fairly divided amongst. Given the fact that the former plan completely neglected population disparities between states while the latter perfectly controlled for them, these schemes were logically incompatible from the very beginning. The story of their imperfect coexistence within our governmental structures, nevertheless, is essential for understanding the electoral college today.

The historical precursor to the electoral college was the creation of Congress, the chief law-making body of the United States. As discussed in the previous chapter, this Congress was a bicameral

body, comprised of one house for each representation scheme. James Madison and Alexander Hamilton, both ardent Federalists who favored proportional over equal representation, fully recognized the long term implications that such a compromise would have in terms of allowing the latter to co-define representation in America.²⁸ Given the concessions of the Federalists, equal representation held a clear and acknowledged presence at the representation table from a very early stage. As discussed in the previous section, the bicameral legislature that ultimately prevailed was not the first choice of all participants: it was a means of reaching a compromise between the Virginia and New Jersey plans.²⁹ By its very nature, it packaged two contradictory representation models into the legislative process through the House of Representatives and the Senate.³⁰ Therefore, the new constitutional structure created an imperfectly direct, democratic republic, in which the legal definition of representation was grounded in two principles: proportionality and equality. The inevitability of this relationship, however, was that it relied on a certain *balance* of these elements, a balance which has fluctuated over time due to population growth patterns. The Constitution, unfortunately, lacked a legal or quantifiable basis for determining what defined a fair equilibrium in a changing environment. In other words, there was, and still is, a significant amount of ambiguity when it comes to determining what the balance between proportional and equal representation ought to be. Should it be perfectly 50/50, or can it vacillate between a set of wider parameters? Do we institute fixed parameters at all, or should we allow the relationship to evolve and be evaluated on a conditional basis? The founding fathers failed to provide clear answers to these questions, thus underscoring the need for contemporary study into their logical ends.

In 2016, the electoral college is arguably the most salient governmental institution that embodies this ongoing debate about representation. Seeing as though the electoral college directly mirrors the apportionment structure of Congress in allocating electoral votes, it comes as no surprise that it has

²⁸ James Madison, *Federalist* No. 62, in *The Federalist Papers*, ed. (New Haven, CT: The Avalon Project, 2008).

²⁹ Kuroda, Tadahisa. *The Origins of the Twelfth Amendment*. Westport, CT: Greenwood Press, 1994.

³⁰ Longley, Lawrence D., and Neal R. Peirce. *The Electoral College Primer*. New Haven, CT: Yale University Press, 1996.

become a contemporary arena for a centuries-old argument due to its similarity. Proponents and opponents of the institution today routinely employ some of the same core arguments that our founding fathers did more than two centuries ago, merely under different terminology. For example, supporters of retaining the electoral college in its current form often contend that it upholds state's rights and powers which are necessary to resist abusive Majoritarianism: the idea that the preferences of the masses will drown out the voices of the minorities if representation were to be exclusively determined by the population as a whole.³¹ This argument is made most frequently in opposition to reform solutions to the electoral college, such as the National Popular Vote Compact, which directly advocate for presidential elections to be determined exclusively by the preferences of the majority of the total population. In such a system, the potential for smaller states to be ignored would theoretically be heightened, underscoring the need for retaining equal representation of states in the electoral college. Others in the same camp will also regularly argue that the current system is necessary to reflect the states' status as functional, sovereign entities of our republic.³² Underlying each of these arguments is the notion that representation ought to be divided fairly amongst the states to an extent that their respective sovereignties are sufficiently preserved, the exact same argument made by the founding fathers many years ago. In fact, the similarities between contemporary arguments for the electoral college and historical arguments for equal representation are striking: In Federalist 62 James Madison declared, "the equal vote allowed to each state, is at once a constitutional recognition of the portion of sovereignty remaining in the individual states, and an instrument for preserving that residuary sovereignty."³³ Therefore, an argument for keeping the electoral college premised on the notion that it will uphold states' rights is logically equivalent to an argument for retaining a sufficient amount of equal representation within Congress.

³¹ Samples, John. "In Defense of the Electoral College." Cato Institute, November 10, 2000.

³² Lowenstein, Daniel. "5 Reasons to Keep the Electoral College - Daniel Lowenstein." Electoral College / Popular Vote Debate. The Commonwealth Club of California, San Francisco. Accessed March 14, 2019.

³³ James Madison, *Federalist* No. 62, in *The Federalist Papers*, ed. (New Haven, CT: The Avalon Project, 2008).

Similar to the proponents of the electoral college, those calling for its abolition also frequently refer to arguments consistent with the founding fathers. Coming off her recent loss in the 2016 presidential election, Hillary Clinton claimed that the electoral college failed to reflect the “will of the people” in that it allowed a candidate to win the presidency without winning the popular vote.³⁴ John Koza, the founder of the National Popular Vote Compact, contends that the electoral college marginalizes the vast majority of individual voters at the expense of awarding a small group of states disproportionate influence over the electoral process.³⁵ In essence, Koza and Clinton are collectively asserting that equal representation in the electoral college has a propensity to create significant inequalities between individuals of different states in terms of their respective voting power. These arguments for equality across the population in terms of influence any one individual has over the electoral process are essentially identical to the framers arguments for proportional representation. Edmund Randolph, an early proponent of proportional representation, articulated this viewpoint through his proposal of the Virginia plan:

“the right of suffrage in the first branch of the national Legislature ought not to be according to the rule established in the articles of confederation: but according to some equitable ratio of representation — namely, in proportion to the whole number of white and other free citizens and inhabitants of every age, sex, and 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 in each State.”³⁶

Randolph’s description of proportional representation in the context of the Virginia plan demonstrates that even as far back as 1787, a sizeable segment of the political elite was opposed to schemes that based representation on criteria other than equality across the population. At the very root of this plan, therefore, lay the fundamental sentiment that the individual citizens of the country are the sole demographic unit of which representation ought to be divided amongst, regardless of state affiliation.

³⁴ Beckwith, Ryan Teague. "Hillary Clinton: It's Time to Abolish the Electoral College." *Time*. September 14, 2017.

³⁵ Koza, John R. “At the next Presidential Election, the Popular Vote Must Win Out.” *The Guardian*, November 10, 2016.

³⁶ “Our Documents - Transcript of Virginia Plan (1787).”

Making the logical connection between the historical supporters of proportional representation and the contemporary objectors to electoral college, thus, becomes easier to recognize. Consequently, an argument against the electoral college based on the notion that it deprives individuals of fair representation is the same as an argument for proportional representation within our governmental institutions.

Despite the passage of over 230 years since the inception of the electoral college, the arguments made by both sides of the contemporary debate concerning its merit suggest the same fundamental critiques persist. Current day proponents of the electoral college who favor states' rights clearly follow the same logic as those framers who favored equal representation. The same holds true for the critics of the electoral college today, where calls for individual equality derive their logical underpinnings from the founding fathers who lobbied for proportional representation. Taking into account the historical consistency and longevity of these arguments, it is important to understand the extent to which both principles are represented within the electoral college. After all, it is important to realize that this debate is one of relativity, and not one of absolute nature. While the founding fathers held different, and at times, opposing views of representation, America was constitutionally founded as a federal republic which actively combined the rights of the individual with the rights of its collective state units. Modern day arguments often fail to highlight or even mention the presence of this balance in a way which would suggest compromise, or finding a just balance between the two principles. This mode of thinking is not only impractical; it runs inherently against the foundational ethos of the United States itself. Therefore, the fairness of the electoral college must not be understood purely through its binary compliance with one representation scheme at the complete expense of the other: rather, it must be evaluated in terms of the balance between the principles of proportionality and equality, and if such a balance is fair.

Statistical Methodologies

A number of scholars have employed statistical methodologies to study the consistency of individual voting power within the electoral college across state lines, which is directly relevant to our

discussion of proportional and equal representation. Because proportional electoral schemes directly rely on populations of individuals as their primary guide, it is appropriate to consider the data on individual voting power as an accurate proxy for the presence of proportional representation within the electoral college. John Banzhaf, a professor at George Washington University, stands as the seminal scholar for investigating individual voting power in electoral contexts. He defines voting power as the chance of any individual voter to cast a **decisive** vote in an election.³⁷ Instead of measuring the abstract power of individual voters *without* taking into account other voters, Banzhaf measures an individual voter's power based on the number of winning coalitions they can create *with* other voters: in other words, how frequently they tend to be a swing vote within every winning combination of voters that produces an electoral victory.³⁸ In the case of the electoral college, Banzhaf estimates both the extent to which a particular state's electoral votes could be decisive in attaining an electoral majority amongst states, and the extent to which an individual's vote could be decisive in determining which candidate wins that state's electoral votes. Based upon these inputs, Banzhaf finds voters in New York have 3.312 times more influence than voters of the least powerful electoral state, the District of Columbia.³⁹ His data also indicates a relatively wide data distribution, as individual voting power in a number of larger states deviates as much as 97% from the mean.⁴⁰ While his findings may be robust, it should be noted that his study only accounts for the 1968 presidential election, and cannot be reliably applied to the entire system in an unconditional sense. Nevertheless, Banzhaf's findings reveal that significant disparities concerning individual voting power across state lines *can* exist. Furthermore, these results give some credence to the claim that the electoral college has the potential to promote majoritarianism, as certain groups of individuals in larger states are more powerful relative to their counterparts in smaller states.

³⁷ Banzhaf, John F. III. "One Man, 3.312 Votes: A Mathematical Analysis of the Electoral College The Electoral College." *Villanova Law Review* 13 (1968): 304–32.

³⁸ *Ibid*

³⁹ *Ibid*

⁴⁰ *Ibid*

Working off Banzhaf's blueprint, other scholars have attempted to discern whether the individual voting power asymmetries observed across states are statistically significant. Using similar decisive voting methodology based on winning coalitions, Samuel Merrill expanded the parameters of his study to cover the period between 1900 and 1972, which included 18 elections. In this broader time frame, he observed a greater amount of variance than Banzhaf in his results, as his data suggested that 50% of the population possessed 26% of the voting power (as opposed to Banzhaf's finding of 39% in his study).⁴¹ The implication behind Merrill's study is that there exists greater disproportionality between individual voting power across states than previously realized, although he does concede that the heterogeneity of voting populations was the primary driver of his findings. Douglas Blair, author of *Electoral College Reform and the Distribution of Voting Power*, employs longitudinal data to examine individual voting power across demographic groups within the electoral college.⁴² His findings are particularly robust for white suburbanites and black central city dwellers, as the former enjoy significantly greater individual power than the latter. Although his findings are not centrally relevant to our discussion of equal and proportional representation, they demonstrate the propensity of the electoral college to categorically stratify the national population in terms of individual influence. Banzhaf, Merrill, and Blair demonstrate through their studies that the electoral college clearly allows for significant disparities in individual voting power within relatively constrained time parameters.

Despite these contributions, there have been a number of scholars who have challenged Banzhaf's methods in the 21st century. First and foremost, Banzhaf himself recognizes an important shortcoming in his own methodology:

“a critical distinction must be drawn between inequalities in voting power which are built into the system and those which either result from the free choice of citizens as to the use of their voting power or from factors outside the legal rules governing the process...the voting measured here is that inherent in the system.”⁴³

⁴¹ Merrill, Samuel. “Citizen Voting Power Under the Electoral College: A Stochastic Model Based on State Voting Patterns.” *SIAM Journal on Applied Mathematics* 34, no. 2 (1978): 376–90.

⁴² Blair, Douglas H. “Electoral College Reform and the Distribution of Voting Power. *Public Choice* 34, no. 2 (1979): 201–15.

⁴³ Ibid

This is essentially an admission that the Banzhaf power index fails to accurately account for behavioral subjectivity because it relies on abstract, generalized assumptions that are evenly applied to the entire population. Gelman, Katz, and Bafumi criticize Banzhaf's a priori assumptions a bit more extensively in their piece, *Standard Voting Power Indexes Do Not Work: An Empirical Analysis*. They hold the inference of all votes amongst a set of voters as being equally likely (the probability of a vote being decisive in a jurisdiction of n voters) to be erroneous in that it relies on an abstract intuition rather than an empirically sound observation. In their view, assuming that all voting combinations within a set of voters to be equally likely completely ignores variable psychological and behavioral mechanisms that shape voting patterns. When employing historical election data from the United States and Europe and taking into account observable subjective patterns, they conclude that classical voting power indexes make voters in large jurisdictions appear more powerful than they really are.⁴⁴ The logical conclusion of Gelman, Katz, and Bafumi's findings is that the electoral college is not disproportionately skewed towards larger states and populations to the extent that Banzhaf asserts, and that equal representation ideals have a noticeable impact.

More recently in 2015, Nicholas Miller analyzed individual voting power within the electoral college as a product of both the electoral vote scheme within states as well as the federal apportionment technique used to determine congressional delegation amongst the states. While he sides with Banzhaf in his assertion that individuals in larger states stand to benefit more from the electoral college as a whole, he posits that this advantage is at least partially offset by equal representation in the apportionment structure, which favors smaller states.⁴⁵ Nevertheless, working from Banzhaf's theory that the current electoral college unfairly favors individuals in larger states, Miller finds that popular alternatives which utilize different electoral schemes or apportionment techniques would favor individuals in smaller states

⁴⁴ Gelman, Andrew, Jonathan N. Katz, and Joseph Bafumi. "Standard Voting Power Indexes Do Not Work: An Empirical Analysis." *British Journal of Political Science* 34, no. 4 (2004): 657–74.

⁴⁵ Miller, Nicholas R., and George C. Edwards. "Why the Electoral College Is Good for Political Science (and Public Choice)." *Public Choice* 150, no. 1/2 (2012): 1–25.

to an equal degree.⁴⁶ In a comparative analysis of 13 different electoral systems, Miller concludes that a direct popular election would maximize and equalize individual voting power across the country to the greatest extent.⁴⁷ In his piece *A Mathematical One-Man One-Vote Rationale for Madisonian Presidential Voting Based on Maximum Individual Voting Power*, Alan Natapoff mirrors Miller in his postulation that a popular vote would stand to be the most appropriate guide towards achieving an even distribution of individual voting power across states.⁴⁸ Different from Miller, Natapoff's conclusions are not purely guided by subjective, self-determined motives towards finding a just balance between equal and proportional representation in government: rather, his findings are made in an effort to discover what electoral technique comports most closely with the One Person, One Vote criterion, the legal apportionment doctrine outlined in *Baker v. Carr (1962)*.⁴⁹ In this particular case, the Supreme Court ruled that one person's voting power in one legislative district must be roughly equivalent to a person's voting power in another legislative district.⁵⁰ Therefore, if applied to the electoral college, this benchmark more closely resembles a system of strictly proportional representation rather than a balance between equal and proportional ideals. Nevertheless, Miller and Natapoff provide a compelling contemporary case for using the popular vote through proportional representation as a catalyst for achieving an even distribution of individual voting power across the country. Nevertheless, their studies leave much to be desired in terms of discovering a quantifiably equitable balance between equal and proportional representation, and which electoral system would be best suited to accommodate that balance. Because their methodology exclusively examines changes in individual voting power under different systems, the question over how much power states should hold within the electoral college is unaddressed.

⁴⁶ Ibid

⁴⁷ Ibid

⁴⁸ Natapoff, A. "A Mathematical One-Man One-Vote Rationale for Madisonian Presidential Voting Based on Maximum Individual Voting Power." *Public Choice* 88, no. 3/4 (1996): 259–73.

⁴⁹ "Baker v. Carr." Oyez. Accessed March 14, 2019.

⁵⁰ Ibid

More than 50 years after Banzhaf's landmark study, the jury is still out on whether the electoral college favors certain individuals depending on the size of their state to an extent which is unfair. In the context of decisive vote methodologies, a number of scholars surmise that citizens of larger states enjoy disproportionately greater power on an individual basis than their small state counterparts, contrary to popular belief. Others contend that this finding is overly skewed by the generalization that all votes have an equal likelihood of occurring, which fails to account for the variable ways that psychological and behavioral group factors can shape the likelihood of a vote. After controlling for this possibility, they find the large state advantage to be significantly diluted to the point where it lacks statistical significance. Finally, there does appear to be a reasonable level of consensus that a direct popular vote would spread individual voting power more evenly across the population than the electoral college would. The primary reason why this conclusion cannot be transformed into policy, however, is that it completely ignores the idea of a state as a functional unit of electoral importance. While it undoubtedly provides a convincing argument for individuals, it does so without considering the role the states play in presidential elections. The evidence presented in the academic scholarship reviewed above makes one thing is clear: there is a lack of literature which seeks to understand the issue of individual voting power as a collaborative component of the balance between proportional and equal representation ideals. In later chapters, I intend to statistically define constitutes a just balance between equal and proportional representation within the electoral college. Rather than studying individual voting power per se, I will use it as my primary tool of measurement in determining whether the electoral college today reflects the balance set forth by our founding fathers many years ago.

Methodologically, the current literature on individual voting power in the electoral college has a number of structural gaps and weaknesses that must be addressed. Generally speaking, these deficiencies can be categorized into four different critiques.

Insufficient Time Parameters for Evaluation

The bulk of literature on individual voting power in the electoral college is dominated by contemporary evaluations of how it functions in the institution today without paying proper deference to how it functioned historically. Although undoubtedly groundbreaking, the Banzhaf power index only draws upon data from the 1968 presidential election. Despite its anecdotal nature, it has served as a respected blueprint for much of the subsequent academic literature on the subject. Miller employs a similar methodology in his study in that he exclusively relies on data from the 2000 census and the electoral apportionment which immediately followed it to arrive at his conclusions.⁵¹ Pushing back against this notion, I argue that taking observable trends from one isolated election and holding them to be equally applicable to the electoral college in perpetuity to be a cursory claim at best. Given the speed and magnitude of which demographic and societal change occurs in America, the logic behind this sentiment should be obvious. Merrill does study a somewhat wider time frame in examining elections between 1900 and 1972, so one can accept his findings to be marginally more indicative of how the electoral college functions across different times and conditions.⁵² Nevertheless, none of the studies discussed take into account the full evolution of individual voting power within the electoral college over its entire existence. Without comprehensive longitudinal analysis, current theories lack a thorough basis for comparison because their significance cannot be understood without their historical story. More importantly, if one neglects to take into account how individual voting power has changed over time, then their any conclusions will lack a reasonable premise for structural application, making them largely anecdotal in nature. Therefore, any subsequent study of individual voting power within the electoral college must take into account data across a wider time parameter to provide a basis for relativity. My quantitative analysis will consider the entirety of presidential elections to provide a complete time parameter for evaluation

⁵¹ Banzhaf, John F. III. "One Man, 3,312 Votes: A Mathematical Analysis of the Electoral College The Electoral College." *Villanova Law Review* 13 (1968): 304–32.

⁵² Merrill, Samuel. "Citizen Voting Power Under the Electoral College: A Stochastic Model Based on State Voting Patterns." *SIAM Journal on Applied Mathematics* 34, no. 2 (1978): 376–90.

Failure to Analyze the Electoral College within the Context of our Federal Republic

It is important to remember that the United States as a political entity is structurally situated between a national republic with no states and a confederation of states without a national government: it is a federal republic where power is distributed between the nation as a whole and its subsidiary component parts, the states. Proportional representation serves the idea of national identity because it prioritizes population to define fair apportionment, and for this reason it is sufficient to approximate its effect and/or presence by measuring the individual voting power of each citizen within the population. Equal representation, meanwhile, pays greater deference to the state side of the equation because it honors the ideal of equal state sovereignty in defining fair apportionment. Therefore, a study of the electoral mechanisms that operate within this space requires ample consideration of the extent to which they fulfill both ideals in a roughly even manner, or if they tend to favor one over the other. In the literature, individual voting power within the electoral college is studied quite comprehensively as an isolated metric, but its connotations are sparingly discussed in the context of this dynamic. These analytical gaps are also evident within the specific metrics used to estimate individual voting power within the population. The Banzhaf power index, as well as subsequent work that has followed, consistently benchmarks individual voting power for citizens in their respective states against the individual voting power of the least powerful state. Such metrics are useful in determining how much influence a single citizen has relative to the citizens of other states, but they do very little to address how much power the citizens of each state actually have in the context of the republic as a whole. In essence, cross-state voting power methodologies are plentiful and abundant: *cross-jurisdictional analysis* between the national and state level is needed to provide a more comprehensive understanding of voting power in America. We require a voting power statistic which estimates the penalty or premium an individual has simply because they live in a state as opposed to being a citizen within a theoretical stateless republic. Following this logic, individual voting power must not be interpreted as a commoditized ideal to unconditionally maximize, but as a means of measuring the condition of the balance between proportional and equal representation in the United States.

Overuse of the Decisive Vote Ideology

Much of the scholarship on individual voting power is carried out by mathematically-oriented academics who make a commendable attempt to root their measurements in practicality. This process has involved the application of a more nuanced interpretation of voting power than a theoretical understanding based in rudimentary arithmetic necessarily would provide. In their view, individual voting power is a direct function of the extent to which an individual has the ability to cast a *decisive vote*. As explained earlier, a decisive vote is defined as how frequently an individual tends to be a swing vote within every winning combination of voters that can mathematically produce an electoral victory.⁵³ In the eyes of many academics, decisive vote methodologies are more comprehensive than abstract metrics because they take into account how votes must interact with one another in the electoral environment to create certain outcomes. In other words, the power of an individual vote cannot be completely understood without understanding its competitive value in relation to the other voters within the electorate. This reality is evidenced by the work of Banzhaf, as well as a good number of other scholars within the field, who conceptualize voting power through this paradigm. In turn, these individuals hold that abstract metrics do a poor job of measuring how much voting power an individual has in practice, as they measure it in a strictly isolated sense.

Pushing back against these findings, I argue that there are two notable shortcomings of universally applying the decisive vote methodology to individual voting power metrics. At face value, studies which follow this reasoning inherently contradict their fundamental mission of being practical in that they rely on broad generalizations about human behavior. Underlying the Banzhaf power index, as well as most other standard power indices, is the blanket application of the random voting model to generalize electoral behavior amongst the participants in an election.⁵⁴ As previously discussed, this theory asserts that one voter is assumed to be equally likely to choose any of the choices on the ballot as

⁵³ Banzhaf, John F. III. "One Man, 3,312 Votes: A Mathematical Analysis of the Electoral College The Electoral College." *Villanova Law Review* 13 (1968): 304–32.

⁵⁴ Gelman, Andrew, Jonathan N. Katz, and Joseph Bafumi. "Standard Voting Power Indexes Do Not Work: An Empirical Analysis." *British Journal of Political Science* 34, no. 4 (2004): 657–74.

the next voter, all other things equal.⁵⁵ In real terms, this equates voting to a coin flip: Voter A has the same chance of selecting a particular candidate choice as Voter B. The fatal flaw in the random voting model, however, is that all other things *are not* equal. Historical analyses of voter behavior within elections directly indicate that certain voters behave differently than others in the electoral environment because their choices are guided by different functional forces.⁵⁶ For example, a particularly introverted person living in a very isolated environment will likely inform their voting decision through a different process than an extroverted person living in a social environment. This tells us that a 50/50 coin flip for some might be an 80/20 coin flip for others. The only condition under which the random voting model could yield accurate results, therefore, would be if these individual behavioral mechanisms and external environments were perfectly congruent across the entire population, a context which has been empirically disproved.⁵⁷ Consequently, the random voting model which underpins the decisive vote ideology is structurally deficient, and hypocritically employed within the context of a methodological approach which purports to oppose a priori perspectives. So long as decisive vote studies are carried out in this manner, the practicality of their findings will be no greater than raw, isolated voting power metrics.

Perhaps more troubling than its flawed methodology is the fact that the decisive vote doctrine is premised on the argument that the vote was foundationally engineered to be decisive. Banzhaf defends his decision to define voting power in this way through the idea that it measures *critical players* within certain combinations of all other voters' choices. According to this theory, a critical player is a vote which can single handedly swing the outcome of an election depending on how it is cast. Statistically, a voter could have a different amount of raw power without taking into account other voters in the electorate than it would a propensity to be critical within every possible permutation of other voters' choices. Therefore,

⁵⁵ Ibid

⁵⁶ Gelman, Andrew, Jonathan N. Katz, and Joseph Bafumi. "Standard Voting Power Indexes Do Not Work: An Empirical Analysis." *British Journal of Political Science* 34, no. 4 (2004): 657–74.

⁵⁷ Ibid

standard power indices prioritize critical propensity over raw power because it is regarded as a more accurate means of measuring how individuals can actually affect outcomes within the voting landscape.

Embrace of the decisive vote narrative, however, should be questioned because of its lack of historical and institutional validity. In the Declaration of Independence, Thomas Jefferson proclaimed “Governments are instituted among Men, deriving their just Powers from the Consent of the Governed.”⁵⁸ As Jefferson infers through this passage, the individual vote was intended to function as the consent of the governed. The vote itself ensured that individuals who were qualified to vote would all determine by whom they would be governed. Within this process, there was no discernable evidence to suggest that the vote was conceived as a tool to privilege individuals with the ability to change the outcome of elections single-handedly, much less have that ability be uniformly equivalent across the electorate. Legal precedent binding the numerical weight of these individual votes to be equal to one another is a relatively new phenomenon in itself, as the Supreme Court did not rule on the issue until 1962.⁵⁹ Even so, if one were to apply the inconsistent precedent from this case to the electoral college today, it would only mean that all voters must have an equal ability to counted as part of the total: it would not mean that all voters must have an equal ability to be a swing vote in changing the outcome of the election. Therefore, the decisive vote methodology is not only self-contradictory; it is also directly antithetical to the established meaning of a vote within American Democracy.

Need for Practical and Scalable Individual Voting Power Models

Much of the literature that examines individual voting power within the electoral college offers data from either single elections or narrow, fixed time periods. Along with failing to offer a necessary longitudinal dimension, another drawback of these studies is that they cannot be built upon by later generations very easily. Even if one were to concede Banzhaf’s methods as optimal for measuring

⁵⁸ “The Founders and the Vote - Elections - Classroom Presentation | Teacher Resources - Library of Congress.” Webpage. Accessed March 14, 2019.

⁵⁹ “Baker v. Carr.” Oyez. Accessed March 14, 2019.

individual voting power, it would be difficult to add to expand upon his study to include additional elections. Similar logic holds true for other studies like Merrill's that examine the electoral college across a particular time period. Pushing the burden onto future researchers to independently locate the necessary voting history data to carry out these methodologies for a different time period could disincentivize them from selecting individual voting power as a topic worth studying. Not only could the lack of easily accessible data be barrier to future scholarly exploration, but also the sheer mathematical complexity of the methods within the current literature. Standard voting power indices rooted in decisive vote ideology take into account over a hundred trillion possible permutations of voting choices in order to derive their voting power measurements for just one election. If one were to consider the computational power needed to extrapolate this approach to a wider time period, it becomes easy to see how it could be less practical for some researchers to pursue. Thoroughness and precision are undoubtedly important characteristics of any formula which sets out to accurately appraise individual voting power. It is equally important, however, that such a formula can be easily applied and executed by other interested stakeholders to promote increased investigation of the topic at hand. Altogether, increased data accessibility and straightforward methodological approaches would streamline contemporary contributions to individual voting power studies.

The Vision

Taking into account each of these critiques, the need for additional research on individual voting power within the electoral college is an important avenue of research. In this thesis, I seek to fill the remaining gaps in the literature through analysis of a fully longitudinal individual voting power model which measures the evolution of the balance between proportional and equal representation in the electoral college. In this context, voting power will be interpreted on a cross-jurisdictional basis: I compare the amount of individuals who account for one electoral vote on the national level, the national standard divisor, with the amount of individuals who account for one electoral vote within their respective states, the state standard divisor. Methodologically speaking, this structure will fix the national standard

divisor as the perfectly proportional ideal in that it estimates an individual's voting power in a theoretical stateless republic. Through the baseline of a nation without any states to divide representation amongst, I effectively isolate the model in a way that it directly measures changes in equal representation. By comparing each state's respective standard divisor against the national standard divisor, one will gain a quantifiable understanding of the premium or penalty an individual incurs solely based off the state they reside in. Furthermore, by aggregating the data in this manner and examining how it has behaved over time, one can empirically deduce the extent to which equal representation has expanded and contracted within the electoral college. Ultimately, in determining how statistically congruent the current day levels of equal representation are with the benchmark set by the founding fathers 230 years ago, the findings of this study will provide substantive commentary towards the current day validity of the electoral college.

Chapter 3: A Relative Model for Conceptualizing Individual Voting Power and Representation within the Federal Republic of the United States

With the goal of crafting a truly American voting power model, I use the same method for measuring individual voting power that the House of Representatives uses in Congressional apportionment. The centerpiece of this method is the **standard divisor**, which measures the number of people that one electoral vote accounts for. The standard divisor can be computed by dividing the total population by the total number of objects which are to be divided. For example, the national standard divisor for the electoral college in 2016 is 573,876, as the 2010 census states the total population to be 308,745,538 while there are a constant 538 electoral votes.⁶⁰ The standard divisor measures the number of individual votes needed to influence one electoral vote. Its interpretation is fairly straightforward: a smaller standard divisor means one electoral vote is represented by *fewer* individual votes, meaning *greater* individual voting power for those individuals. The relationship holds the same for higher standard divisors as well. Individual voting power, therefore, has a numerically inverse relationship with the standard divisor. In addition to its simple application, the standard divisor has been used as the statistical proxy for individual voting power in every Congressional apportionment scheme in our country's history, underscoring its institutional legitimacy.⁶¹

Congress has used four clear methods to apportion the House of Representatives throughout our country's history with apportionment occurring on a decennial basis following the census. Each method has been fundamentally based on the national standard divisor: Hamilton's Method, Jefferson's Method, Webster's Method and Huntington-Hill's Method.⁶² Each of these procedures utilize the same core formula for determining the number of seats per state, known as the *standard quota*. The standard quota can be computed by dividing a state's population by the standard divisor for the House of Representatives. For example, California's standard quota for the 2016 election cycle was 52.49, as the

⁶⁰ U.S. Census Bureau. 2010 Census [table]. 2010.

⁶¹ Tannenbaum, Peter. "Excursions in Modern Mathematics." Pearson Education, 2006.

⁶² Ibid

standard divisor was 709,759.85 while the state's population was 37,253,958.⁶³ In this example, the standard quota indicates that California should be apportioned 52.49 seats based off the proportion of its population relative to the national population. The standard divisor is arguably the most appropriate statistical metric for estimating individual voting power in America because it is the primary instrument used to apportion the House of Representatives. Seeing that the House of Representatives explicitly represents individual Americans, it only seems appropriate to apply its methodologies to determine how the electoral college represents individual Americans.

In application to the electoral college, the national standard divisor measures the average individual voting power of a citizen within the entire country regardless of state. For the purposes of this model, I employ the same mathematical process to measure the individual voting power of citizens within their respective states. By dividing a state's population by the number of electoral votes that state has, the quotient is the number of people represented by one of that state's electoral votes. I refer to this metric as the **state divisor**. Following the earlier example, California would have a state divisor of 677,344.65 for the 2016 election cycle, because as it has 37,253,956 people and 55 electoral votes.⁶⁴ We use the state divisor because of the electoral college: individual votes are cast within states, not throughout the country as a whole.

Much of the existing literature analyzes individual voting power by computing unique state divisors within the electoral college. Researchers typically compare individual voting power across the country on a cross-state basis by comparing these state divisors against each other. For instance, if we wanted to understand how much voting power citizens in Connecticut have compared to citizens of California, we would divide California's state divisor (677,344) by Connecticut's (510,585). The quotient of this calculation is 1.33, which tells us that individuals in Connecticut have roughly 33% more voting power in the electoral college than individuals in California.⁶⁵ Political commentators often this equation

⁶³ See appendix for calculation

⁶⁴ See appendix for calculation

⁶⁵ See Appendix for calculation

to compare the voting power of individuals between states to illustrate the presence of inequality within the electoral college. For instance, when pundits make a claim like “voters in Wyoming have 3.6 the voting power that I have,” this is the calculation they are referring to.⁶⁶ This pattern does offer substantive insights into voting power in the electoral college on a cross-state basis. It does very little, however, to measure individual voting power in the context of federalism. As stated in the previous chapter, representation in America is collectively determined by proportional and equal ideals. Since studies fail to cross examine state divisors with the national standard divisor, we lack a numerical basis for understanding the extent to which equal representation creates voting power inequality. Therefore, in order to respond to the claim that the electoral college is unfair because it marginalizes the vast majority of individual voters at the expense of a small group of states, it is critical to do two things: Understand whether equal representation is to blame for any significant disproportionality in individual voting power across states, and if certain levels of disproportionality have been historically consistent.

In this model, I address these objectives by benchmarking each state divisor against the national standard divisor for the electoral college. The national standard divisor in this context measures the number of people one electoral vote would be representative of if there were no states, assuming the same number of electoral votes to divide (538). In this model, the national standard divisor acts as a perfectly proportional control in that it measures the number of people one electoral vote would account for if representation was exclusively proportional on a national scale. Methodologically, this fixes proportional representation as the benchmark, and allows us to study the behavior, influence, and effects of equal representation in the electoral college in isolation.⁶⁷

The primary ratio I analyze in my model is the national standard divisor divided by each state divisor, which I refer to as the **voting surplus**. Continuing with the California example for the 2016 election cycle, its voting surplus was 0.847, as the state divisor is 677,344.65 while the national standard

⁶⁶ Petrocelli, William. "Voters In Wyoming Have 3.6 Times The Voting Power That I Have. It's Time To End The Electoral College." Huffington Post. November 10, 2016.

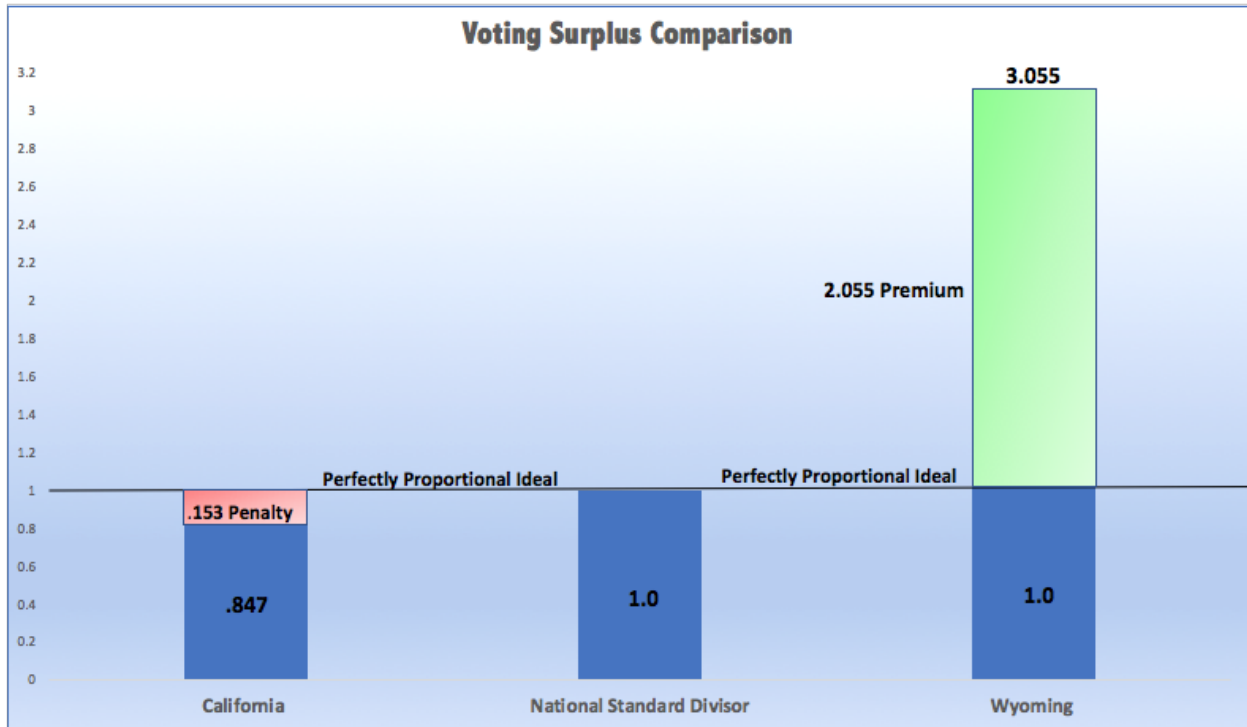
⁶⁷ See appendix for the logical proof of this methodology

divisor is 573,876.46.⁶⁸The voting surplus in this case indicates that citizens of California have 84.7% the amount of voting power they otherwise would have if representation were perfectly proportional. In essence, the only reason the citizens of California have less than 100% of the national average is because of equal representation: we apportion every state two electoral votes regardless of their population size to account for their senatorial delegation. We can be confident in this interpretation due to the fact that the national standard divisor, the constant element of the calculation, theoretically apportions electoral votes strictly based off proportional representation. Any amount that a state's voting surplus deviates from 1, therefore, can be explained by the effects of equal representation.

While the effects of equal representation on electoral vote apportionment hurt individuals in larger states, they can inflate the influence of individuals in smaller states. For comparison, America's smallest state by population, Wyoming, had a voting surplus of 3.055 for the 2016 election.⁶⁹Similar to the California metric, the voting surplus for Wyoming indicates that its citizens have 305.5% the voting power they otherwise would have if electoral votes were apportioned exclusively by proportional representation, or 3.055x as much as they otherwise would. Different from California, small states like Wyoming generally benefit from the effects of equal representation. The chart on the next page highlights how larger states like California are penalized by equal representation in the electoral college while smaller states like Wyoming are awarded a premium, as understood by the voting surplus.

⁶⁸ See appendix for calculation

⁶⁹ See appendix for calculation



This pattern comes as no surprise given the fact that proponents of proportional representation generally came from larger states while those who favored equal representation came from smaller states. In a comparative sense, the voting surplus ratio seeks to understand how much of an advantage or disadvantage equal representation grants to individuals different than what they would have in a perfectly proportional republic. If one were to merely examine this ratio in one single election for every state, however, they would be relatively limited in understanding the significance of their findings.

America was specifically engineered as a federal republic, where members of smaller states were given a bonus in national representation because perfectly proportional schemes were feared to have a greater ability to ignore their interests. Therefore, some degree of deviation away from perfectly proportional representation should be built into our expectations concerning individual voting power across the states. It is not enough for us to say that equal representation is responsible for *some* level of voting power distortion across individuals of different states, therefore making the electoral college unfair. In order to confidently say that the electoral college is unfair, we must demonstrate that equal

representation has distorted individual voting power beyond acceptable levels. Hence, the question this thesis seeks to answer is *what degree* of individual voting power deviation across states should be deemed legitimate and permissible in the context of America's status as a federal republic? And do current levels of individual voting power fall within this parameter? In order to provide a more comprehensive understanding of this question, I performed a comparative, longitudinal analysis of every election in the history of the United States.

Leveraging Archives from the Library of Congress and the United States Census Bureau, I collected population data from every census dating back to 1780, as well as electoral vote totals from every state for every presidential election dating back to 1792.⁷⁰ In addition, I utilized Census projections for 2020 and a Huntington-Hill method calculator to formulate estimates for electoral vote and population totals for the next apportionment cycle. With this data, I computed the voting surplus for every state in every presidential election, organized chronologically. Categorically labeled and organized within an excel workbook, my data can be easily expanded upon and updated at any point in the future. Future researchers only need to input current census data for the national and state populations as well as electoral vote data for the states, as the voting surplus ratio will be automatically computed so long as they are present. With such ease of repeatability, my hope is that my method can provide a blueprint for future study on the electoral college so long as the institution exists.

⁷⁰ U.S. Census Bureau. 2010 Census [table]. 2010.

Specific Methods of Analysis Presented within this Study

Longitudinal Analysis of the Mean Voting Surplus from each Election

The first analytical method I carry out involves taking the mean voting surplus amongst all the states in each presidential election, and charting this metric's behavior across every presidential election since 1792. This data set quantifies the severity to which equal representation dilutes or inflates a state's voting power within the electoral college. Mathematically, I elected to compute the geometric mean of the state voting surplus' for each election instead of the arithmetic mean because it is more resilient to skewing by statistical outliers. The arithmetic mean can be derived simply by summing all the surplus' and dividing by the number of surplus' in that particular election. The geometric mean, alternatively, is calculated by assuming the product of each state voting surplus from the election, and taking the n root of that product (n being the number of state voting surplus' within that particular election). The visual below displays the resiliency of the geometric mean to statistical outliers as compared to the arithmetic mean by examining the mean voting surplus' from the 1820 presidential election.

$N = 24$ (number of state surplus' within the 1820 election)

Arithmetic Mean $\rightarrow .80(SC) + .81(NC) \dots + 7.39(IL) + 10.04(AL) / N = 2.02$

Geometric Mean $\rightarrow \sqrt[N]{.80(SC) \times .81(NC) \dots \times 7.39(IL) \times 10.04(AL)} = 1.44$

In this example, the outlier voting surplus' from Alabama and Illinois skewed the mean to a much greater extent in the arithmetic example than in the geometric one. Extreme statistical irregularities in this model, such as Alabama and Illinois from the 1820 election, are often due to significant geographical changes in state boundaries between censuses, especially for those states who were founded late in a census cycle. In other words, Alabama's borders underwent significant fluctuation until 1820 (it was founded in 1819), meaning the census data on its population for 1810 (prior to it being an official state) was likely

measuring a different geographical area than the 1820 census.⁷¹ The same can be said for Illinois' population data as well, as the state was founded in 1818. The table below highlights the rapid change in population and corresponding behavior of electoral vote apportionment for both states between the 1820 and 1824 presidential election.

	1820 Presidential Election		1824 Presidential Election	
	Population (1810 Census)	Electoral Votes	Population (1820 Census)	Electoral Votes
Alabama	9,046	3	127,901	5
Illinois	12,282	3	55,211	3

To put these population growth patterns into perspective, the United States grew as a whole by 39.3% from the 1810 to the 1820 census as measured by total population: Alabama grew by 1314% and Illinois grew by 350% according to the same sources.⁷² While some of this growth can be attributed to natural interstate migration patterns, a large part of it is likely due to rapidly expanding borders in territories which eventually became states. Due to these fluctuations, one could confidently assert that Alabama was a larger state *geographically* at the time it participated in the 1820 presidential election than it was at the time the 1810 census was taken. While the 1820 census was carried out the same year of this election, Congress did not reapportion electoral votes based on its results until a year later, as has been the standard procedure for electoral apportionment throughout history.⁷³ In reality, this meant that more Alabama voters in the 1820 presidential election (perhaps a number closer to 127,000) likely contributed towards

⁷¹ Forestall, Richard. "Population of States and Counties of the United States: 1790 – 1990." US Department of Commerce Bureau of the Census. March, 1996.

⁷² Ibid

⁷³ "Electoral Votes for President and Vice President 1821-1837." National Archives and Records Administration, Office of the Federal Registrar. 2019.

the outcome of the state's three electoral votes than the model suggests, rendering the voting surplus calculated by 1810 census data less accurate. In this sense, a population estimate from the year Alabama was founded, 1819, may seem like an appropriate remedy to contain the statistical anomaly created by this issue. Such a modification could look like such:

$$AL \text{ Voting Surplus for 1820 Election} \rightarrow (7,113,117/235)/(9,046/3) = \mathbf{10.04}$$

Sample AL Voting Surplus for 1820 Election with Modified Population

$$AL \rightarrow 127,901(1820 \text{ Census}) - 9,046 (1810 \text{ Census}) = 118,855 \text{ pop. growth between 1810 - 1820}$$

$$118,855 / 10 = 11,885.5 \text{ growth per year} \rightarrow 9,046 + 11,885(9) = 116,015 \text{ pop. in 1819}$$

$$US \text{ Tot} \rightarrow 9,455,140 (1820 \text{ Census}) - 6,787,475 (1810 \text{ Census}) = 2,667,665 \text{ pop. growth}$$

$$2,667,665 / 10 = 266,767 \text{ growth per year} \rightarrow 6,787,475 + 266,767(9) = 9,188,378 \text{ pop. in 1819}$$

$$(9,118,378/235)/(116,015/3) = \mathbf{1.01}$$

Clearly, the estimated population method appears to produce a less extreme voting surplus. While it undoubtedly could produce a more even distribution of results, the primary reason why an estimated population metric cannot be used to compute the voting surplus is because it would be methodologically inconsistent.

Following the logic from the previous example, if an estimated population is used *only* for newly added states while decennial census data is used for established ones, then the researcher will inevitably run into the same issue with established states as they did with the newly added ones. At many points in United States history, established states experienced rapid population growth similar to newly added states, albeit largely because of migration patterns instead of border fluctuations. Nevertheless, this means that established states have too experienced the reality of their electoral votes being impacted by a larger number of voters in presidential elections than the number of voters those electoral votes were originally apportioned to represent. Take the example of Illinois once again, this time as an established state.

Ex: Illinois was apportioned 24 electoral votes after the 1890 census, which estimated its total population to be about 3.8 million. The state held 24 electoral votes for the 1892, 1896, and 1900 presidential elections. The 1900 census indicated that the state's population had grown to about 4.8 million, an increase of about 1 million people in the preceding ten year period. This growth trend indicates that Illinois likely had more than 3.8 million individuals for each of these elections, especially 1900. Therefore, the 24 electoral votes apportioned to Illinois based off its 1890 population of 3.8 million were being used to represent closer to 4.8 million people by the 1900 election.

If the goal is to prevent this imperfection from occurring in all cases, then one would need to provide population estimates for **every state in every election** instead of just for newly added states. Unfortunately, this process would be nearly impossible to execute in an accurate way. Unlike decennial census data, state population estimates from non-census years are typically less precise because they rely on different approximation methods than the census. While the national census is well respected in academic circles in terms of its ability to accurately estimate populations, the same cannot be definitively said for state estimations, especially those which date further back in history. For these reasons, the decennial census must be used for the population input of the voting surplus, even if its estimates lag behind current population estimates.

Given the need for methodological consistency and credible population data, the United States census is the only suitable source for state population information in the context of this study. Statistical outliers will inevitably occur when electoral votes are apportioned based on stale census data, especially in the case of newly added states. The geometric mean is an optimal intermediary for addressing this issue, as it fairly accounts for these outliers while it also is not skewed by their disproportionate effects to the same extent as the arithmetic mean. Therefore, the mean voting surplus of each presidential election in this study pertains to the geometric mean of the state surpluses within each presidential election.

In literal terms, the mean voting surplus tells us that the average state enjoyed _____x times the amount of voting power they otherwise would if they were apportioned electoral votes based on perfectly proportional representation. The further the mean voting surplus multiple is from 1, the more the average

state's voting power is inflated or diluted by equal representation. The functional interpretation of this metric, therefore, is the following: the more states with significantly inflated voting power, the more the mean voting surplus will be pushed upwards, away from the perfectly proportional benchmark of 1.

The primary patterns I seek to examine in my analysis of the mean voting surplus are the direction of its trajectory and the magnitude to which it changes between 1792 and current day. Specifically, I am searching for a consistent pattern of growth away from the proportional benchmark of 1 which would suggest that equal representation is becoming *increasingly* distortive of the voting power of states within the electoral college. If the change between now and the early years of our republic is significant, this finding would lend itself to making a stronger argument against the electoral college on the basis that it has demonstrated a consistent and increasing pattern of voting power distortion between the states. If such a trend does not exist, then it becomes more difficult to make the case against the electoral college along these same terms.

Penalty versus Premium Analysis of the Voting Surplus across every Presidential Election

The penalty versus premium analysis of the voting surplus is essentially an aggregate stock of the number of people that have benefitted or been penalized by equal representation in every presidential election. It is a substantive component of this thesis because it quantitatively measures the impact of the electoral college on the total population's voting power, regardless of state affiliation. Recall that the voting surplus measures the extent to which equal representation distorts individual voting power in any given state. A voting surplus greater than 1 indicates that a state and its individuals benefit from the distortion created by equal representation because they have more voting power than they otherwise would under exclusively proportional representation. Conversely, a voting surplus less than 1 indicates that a state and its individuals are harmed by the distortion created by equal representation for the same reason. In this study, I calculate the percentage of individuals that either benefit from or get penalized by

equal representation in every presidential election since 1792.⁷⁴ The visual below provides a generic basis for how I carry out these calculations.

The literal interpretation of these metrics is as follows: if 28.39% of the US population benefited from equal representation in the 2016 election, this means that this percentage of the total population enjoyed more individual voting power than they otherwise would have under perfectly proportional representation. Within this method, I'm particularly interested in analyzing the effects of equal representation on individual Americans, and understanding if its influence has become increasingly uneven over time. In this particular section of analysis, I examine the *net effect* of equal representation towards individuals over each election in order to address this question. For instance, if the number of individuals who benefit from equal representation is roughly equivalent to the number of individuals who are penalized by equal representation on a percentage basis, then the net effect of equal representation is roughly even. Conversely, if the number of individuals who benefit from equal representation is substantially different than the number of individuals who are penalized by it, then the net effect of equal representation is more disproportional. The table below demonstrates how equal representation can have different net effects based off the composition of those it advantages and those it disadvantages.

	% Pop. Advantaged	% Pop. Disadvantaged	Net Benefit
Election A	45%	55%	-10%
Election B	20%	80%	-60%

Evidence of the latter pattern would indicate that equal representation provides an advantage to a small number of people through shortchanging a much larger number of people in terms of individual voting power. This trend would give credence to the popular argument amongst electoral college abolitionists that the current system unfairly advantages a few small states (small total population) at the

⁷⁴ See appendix for calculation

expense of a much larger segment of the country.⁷⁵ It is important to recognize that the gap between the percentage of individuals penalized and the percentage of individuals that benefit functions as a proxy for inequality in the electoral college. Along these lines, the penalty versus premium analysis can tell us how evenly distributed the effects of equal representation are on individual voting power within every election. The wider the *net benefit* is, the more uneven the effects of equal representation are on the population and states. The more uneven these effects are, the more disproportional the electoral college is, hence making it increasingly unfair.

The longitudinal examination of every presidential election dating back to 1792 is central to my thesis for two reasons: demonstrating a steadily increasing pattern (or lack thereof) of distortion over time, and establishing a baseline for the level of distortion that may legitimately function within the electoral college. As previously mentioned, critics of the electoral college argue that the institution is unfair because it inflates the influence of a small group of states while diluting the influence of the vast majority of the population. In order to assess the strength of this claim, however, it is vitally important to determine whether this disproportionality has remained constant over the electoral college's existence, or if it has grown in magnitude. A clear pattern of increasing distortion would indicate not only that the system is empirically disproportional today, but that it is likely to become even more disproportional tomorrow. Such a finding would undoubtedly strengthen the argument against the electoral college on the basis that it will only become more unfair the longer we allow it to function. The question at this point, therefore, becomes what standard of fairness we should use as a benchmark to measure and interpret the distortion caused by equal representation. This analysis cannot be properly contextualized without establishing permissible parameters for voting power distortion to occur within the electoral college.

Recall that the dual presence of equal and proportional representation in the electoral college will inevitably create *some level* of individual voting power distortion across the population. This reality is an inherent truth of the construction of our government, as individual citizens are not the sole entities of

⁷⁵ Koza, John R. "At the next Presidential Election, the Popular Vote Must Win Out." *The Guardian*, November 10, 2016

which representation is divided amongst. Equal voting power across individuals, therefore, is incompatible with the dual mandate of representation to states and individuals as prescribed in the constitution. This does not go to suggest, however, that equal representation may distort individual voting power to an unregulated degree either. Since individual voting power is a product of equal and proportional representation by definition, there must exist a reasonable balance between both schemes in deriving it. Therefore, we must empirically define what constitutes a reasonable balance.

I refer to the geometric mean of the net benefit of equal representation for the first 4 presidential elections (1792-1804) as my baseline for comparison. The primary reason I place such a great amount of emphasis on these early elections is their close proximity to the creation of the Constitution. As stated in the previous chapter, the electoral college was created using the same compromise as the legislature in that it actively combined equal and proportional representation. Implicit in this process was the reality that the compromise was made in the demographic environment of the late 18th century: the founding fathers deemed the balance between equal and proportional representation permissible based on the implications it had on people and states specifically at that point in time. At the very least, if the balance between these two representation schemes was deemed unjustifiable as laid out in the Connecticut Compromise, then the electoral college would not have been created. Therefore, my basis for defining reasonable parameters for inequality to exist in the electoral college is firmly rooted in historical precedent and institutional legitimacy.

Using the equal representation net benefit statistic, I determine whether voting power distortion has been growing steadily over time. I analyze the longitudinal behavior of the absolute value of the net benefit derived from equal representation in order to address whether distortion has, in fact, been increasing since the first presidential election. I use a linear trendline to provide a quantitative estimate of the direction and magnitude of this metric.⁷⁶In answering whether distortion has been steadily increasing over time, I am particularly interested in the value of m : a positive m value indicates that the net benefit

⁷⁶ See appendix for calculation

from equal representation has shown a tendency to increase in the average election, statistical evidence that the effects of equal representation have become more uneven over time. Conversely, a negative m value indicates that the net benefit from equal representation has shown a tendency to decrease in the average election, statistical evidence that the effects of equal representation become more even over time. Additionally, higher absolute values of m indicate that the average change in net benefit of equal representation across each election is greater in magnitude, meaning that the distortion is increasing or decreasing (depending on positive or negative) more quickly. For the purpose of this thesis, a high value positive m would be the strongest indication of steadily increasing voting power distortion in the electoral college.

In addressing whether contemporary levels of distortion are in compliance with historical parameters, I calculate the marginal difference between the net benefit of the 2016 election and the historical baseline net benefit. In other words, the absolute extent to which net benefit from the 2016 election is greater or less than the historical baseline net benefit. I also calculate this metric for every other presidential election since 1804 to determine if distortion levels at any point throughout the electoral college's existence have failed to meet the permissible parameter.⁷⁷The underlying implication of this metric is straightforward: in an election with a higher marginal value, the distortion which occurs from equal representation in that election is further away from acceptable levels as understood by this model. The more elections which demonstrate significantly high marginal values, the greater amount of evidence there is to suggest that the electoral college is distortive towards individuals, and advantages a small group of people at the expense of a much larger group. The fewer elections with high marginal values, the weaker the latter argument becomes. Collectively, the two mathematical methods I have outlined provide substantive means for addressing whether the electoral college will penalize greater proportions of the

⁷⁷ See Appendix for calculations

population in the future, and if the proportion of the population it penalizes today (or at any point in history) falls outside acceptable limits.⁷⁸

Longitudinal Analysis of Voting Surplus in Select States

The final method I use to analyze the voting surplus is a comparative analysis of its behavior in select states. This approach seeks to provide general evidence that individual voting power can vary significantly based off a citizen's state of residence. I select 3 states with unique historical population growth patterns to highlight how this variance has behaved over time at the state level. Each of these states has participated in every presidential election, allowing us to examine their behavior over the full period of time the electoral college has existed.

New York

New York has always had a large state population relative to the entire country, as it has been one of the top 4 most populous states throughout its entire history.⁷⁹ This constant place atop the population totem poll would intuitively spell disaster in terms of individual voting power in the context of the electoral college. Therefore, New York serves as a good example for how individual voting power has behaved over time in a consistently large state.

⁷⁸ *In this calculation, "Percentage Points" refers to the numerical value that B deviates from the permissible parameter, A. Since both A and B are variables which represent percentages of the population, the numerical difference between the two represents a difference in percentage of the population helped/hurt. This method should not be mistaken for percentage increase or decrease, which measures the fractional difference between two variables instead of the numerical difference.*

⁷⁹ Desjardins, Jeff. "Chart: The Population Rank of Every U.S. State Over 100 Years." Visual Capitalist. February 7, 2018.

Delaware

Delaware has always had a small state population relative to the entire country. It currently has the 7th smallest population, but was the smallest state in the 1792 presidential election.⁸⁰ Much different from New York, Delaware's consistently small population has been a benefit for individual voting power in the state. Delaware, therefore, serves as a good example for how individual voting power has behaved over time in a consistently small state.

New Jersey

New Jersey is a hybrid in terms of historical population patterns. At its founding it was the 7th largest state in the country (out of 15 states), landing it close to the middle. In the late nineteenth and early twentieth centuries, however, it experienced rapid population growth, ultimately making it the 11th largest state today (out of 50).⁸¹ Unlike the other two examples where population rank has remained constant relative to other states, New Jersey is a clear example of a state which underwent a significant transformation in the population hierarchy. Therefore, individual voting power has decreased over time. In this light, New Jersey serves as a good example for how individual voting power has behaved in a state which has undergone significant population change.

For each of these states, I chart their respective voting surpluses over time. The results of these charts will demonstrate that state population growth has a negative relationship with individual voting power, both in the current state of the electoral college and throughout history. Furthermore, I examine the extent to which the nation's population is clustered into a small number of states. By examining this on a longitudinal basis, I aim to discover if there exists a correlation between the number of states holding a majority of the population and the severity of voting inequality within states throughout the country. This is relevant towards the select state analysis because it demonstrates the underlying factor that

⁸⁰ Ibid

⁸¹ Desjardins, Jeff. "Chart: The Population Rank of Every U.S. State Over 100 Years." Visual Capitalist. February 7, 2018.

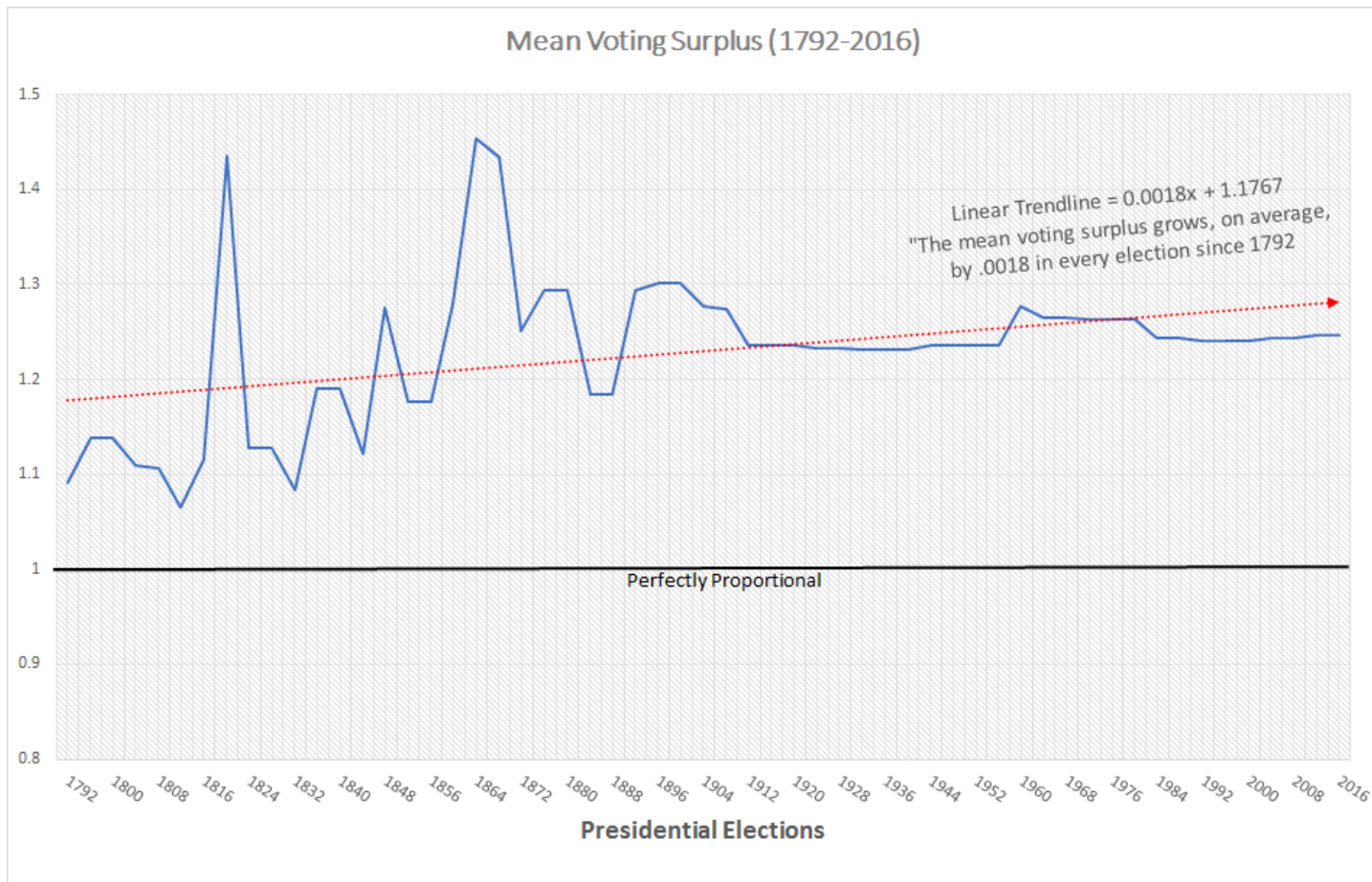
dictates whether a state is “small” or “large”, which in turn determines voting influence. Ultimately, the select states analysis provides a means for understanding the demographic factors within the country which dictate voting power, as well as a tangible framework for predicting how it may behave in the future.

Chapter 4: Results and Findings of the Voting Surplus Model

Mean Voting Surplus from Each Election

General Empirical Observations

Upon initially tabulating the geometric mean of the voting surpluses for each election, it was apparent that the metric had increased between the first election of the study (1792) and the most recent election in 2016. 1792 had a mean voting surplus of 1.09, while 2016 had a mean voting surplus of 1.25. The linear trendline for the entire time period of the study was positive (.0018), indicating a general pattern of positive growth. The behavior of the voting surplus in the elections between, however, was not representative of linear growth. Over the first 29 elections in the study (1792-1908), the mean voting surplus shot as high as 1.45, and as low as 1.06. The linear trendline for this time period was .0071, meaning that it only took an average of 2 elections for the mean voting surplus to rise by more than .01 (1 percentage point). Over the next 27 elections (1912 -2016), the mean voting surplus has consistently been within 1.24 and 1.3. The linear trendline for this time period was .0006, or 8.4% the size of the average growth per election of the mean voting surplus in the previous time period. Conversely, the mean voting surplus ratio required 17 elections during this time period to rise by 1 percentage point. Based off these findings, the mean voting surplus can be best described as initially volatile but ultimately plateauing. The electoral college appears to have the potential to be volatile in terms of its historical effects on state voting power, but its recent track record suggests that it has become more stable. The charts in the coming pages provide a visual of the evolution of the mean voting surplus, highlighting these observations.



The mean voting surplus has grown larger over time in an aggregate sense. This implies that the average state in a presidential election has enjoyed progressively more voting power than it otherwise would under perfectly proportional representation. Because this metric is an average of the voting surpluses from the states in each election, its upward trend over the course of history ultimately means one of two things:

- 1) the number of states with voting surpluses greater than 1 has become continually greater than the number of states with voting surpluses less than 1
- 2) The magnitude of the voting surpluses greater than 1 has become continually greater than the magnitude of the voting surpluses less than 1

It is a mathematical certainty that a balance of statistical outliers (extremely high voting surpluses) and a generally greater volume of positive surpluses (more voting surpluses greater than 1 than less than have pushed this mean upwards over time. Take the example below as evidence of this assertion:

Sample of 5 States from time period "A" to time period "B"

Example 1: "Volume"

Time Period A: .9, .9, 1.1, 1.1, 1.1 → Mean of 1.02

Time Period B: .95, .1.15, 1.15, 1.15, 1.15 → Mean of 1.11

Interpretation: The rise in mean in this example was primarily due to a higher number of states having a positive voting surplus. Statistical outliers didn't play an instrumental role in forcing the mean higher.

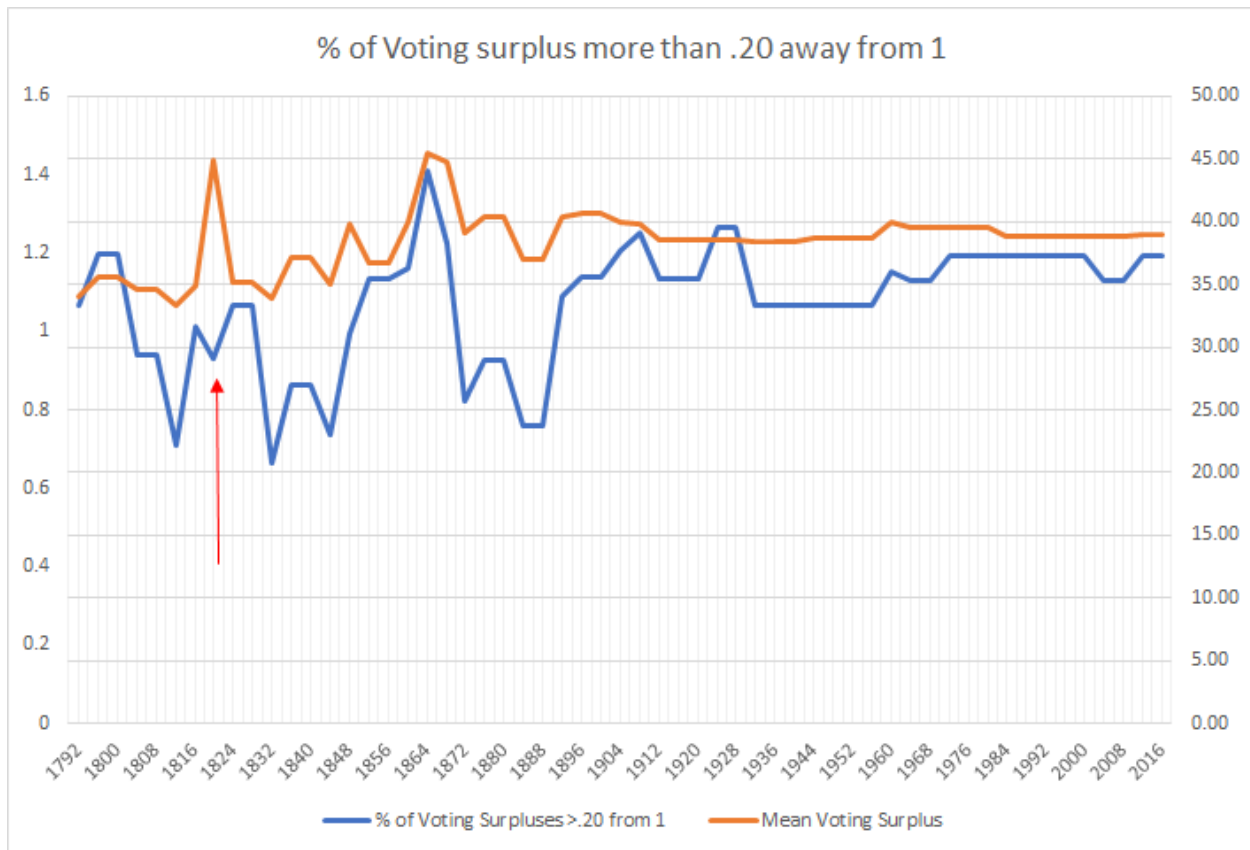
Example 2: "Magnitude"

Time Period A: .9, .9, 1.1, 1.1, 1.1 → Mean of 1.02

Time Period B: .9, .9, 1.1, 1.1, 1.55 → Mean of 1.11

Interpretation: The rise in mean in this example was primarily due to the presence of one statistical outlier rather than a greater number of states having a positive voting surplus. Hence, the number of states having a positive voting surplus did not play an instrumental role in forcing the mean higher.

The question, therefore, becomes whether volume or magnitude has played a greater role in pushing the mean voting surplus higher in the model. This is a very important distinction considering the arguments of contemporary electoral college critics, who allege that a few states have a disproportionately large amount of voting power at the expense of the vast majority of the other states. If magnitude is the culprit for the increase in the mean voting surplus over time, the data would seemingly support this argument. If volume is more to blame, then the argument becomes less empirically justified. In order to provide some insights into this question, I measured the number of statistical outliers in each election as a percentage of the total number of voting surpluses. I then proceeded to chart the behavior of this percentage over the course of every presidential election to determine whether it could potentially be a cause for the increase in the mean voting surplus.



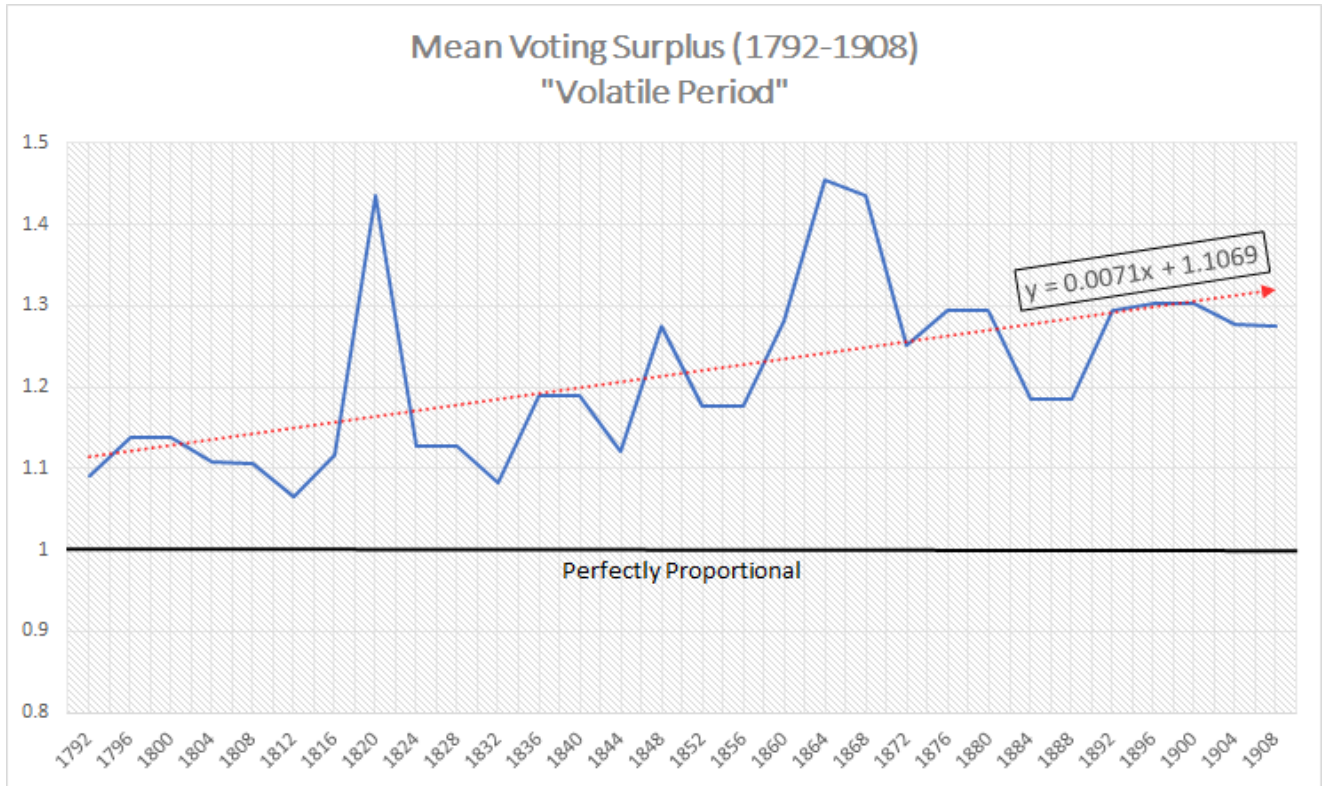
It should be noted that magnitude and volume are not mutually exclusive factors, as they collectively account for any observable rise in the mean voting surplus. The concept of a statistical outlier is also difficult to define without being arbitrary in this example because standard deviations can only be used on an election by election basis, making them somewhat of a moving target. Therefore, the definition of a statistical outlier being more than .20 away from 1 has less to do with numerical precision, and more to do with the function it serves in acting as a proxy for comparatively larger statistical deviations.

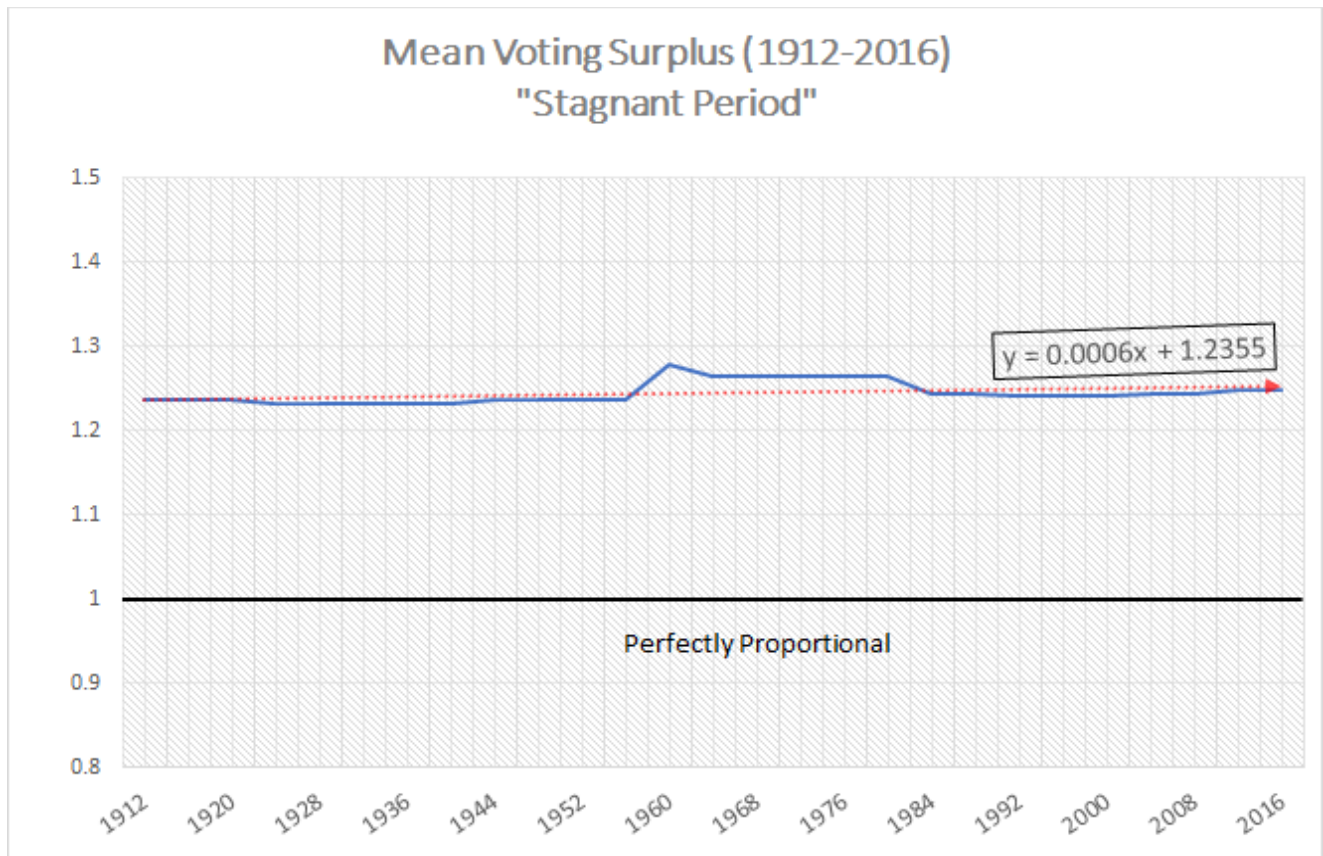
The behavior of the mean voting surplus seems to be heavily impacted by magnitude. For the first 100 years of the study, the percentage of outliers largely trended downward, as the metric only exceeded its 1796 level twice in its first 29 elections (1792-1908). The mean voting surplus, on the other hand, trended consistently upward in the same time period, as it was about 18 percentage points greater in 1908 than 1792. Perhaps the most telling example is the 1820 election: the percentage of outliers decreased by

more than 2 percentage points while the mean voting surplus spiked by more than 30 percentage points. Collectively, this evidence suggests that a few extremely high values were likely the cause for the mean increase, especially considering the general decrease in outliers over its most volatile growth period. For the past 27 elections (1912-2016) both variables have substantially flattened, which is a significant finding in its own right. The percentage of outliers has fallen consistently between 35%-39% in this time period, while the mean voting surplus has remained flat for the better part of the last 50 years. This suggests that statistical outliers are *continually* responsible for the mean voting surplus remaining higher than 1. In essence, extreme values likely built this pattern, and continue to be responsible for its persistence. The *average* state may have a voting surplus higher than 1, but this is due to the fact that a small number of states have voting surpluses significantly higher than 1. The magnitude of these states, rather than the volume of states closer to 1 with positive voting surpluses, is driving the overall growth pattern. Preliminarily, this data suggests that the electoral college is behaving in the exact way its critics allege: **severely advantaging a small number of states at the expense of everybody else.**

It is central towards this thesis to determine whether the extreme values which likely drove the longitudinal growth of the mean voting surplus will continue to push the mean higher in the future. Based on the data analyzed up to this point, further growth of the mean voting surplus would plausibly convey that extreme values are getting even more disproportional, building the case against the electoral college as a ticking time bomb of voting power inequality. We have already stated how mean voting surplus growth over the entire longitudinal time period (1792-2016) has been positive in the aggregate, growing at a rate of .0018 for every election, on average. There are two distinct time inputs feeding into this positive trend, however, rather than one continuous pattern of growth over the entire duration of the study. We have previously mentioned how the behavior of the mean voting surplus within the first 29 elections (1792-1908) was incredibly volatile, while its behavior over the next 27 elections (1912-2016) was much more stagnant. Therefore, it is relevant to determine whether this dynamic has implications on future predictions concerning the growth of the mean voting surplus, and, by extension, inequality within

the electoral college. The graphs below illustrate the differences in behavior of the mean voting surplus between these two time periods.





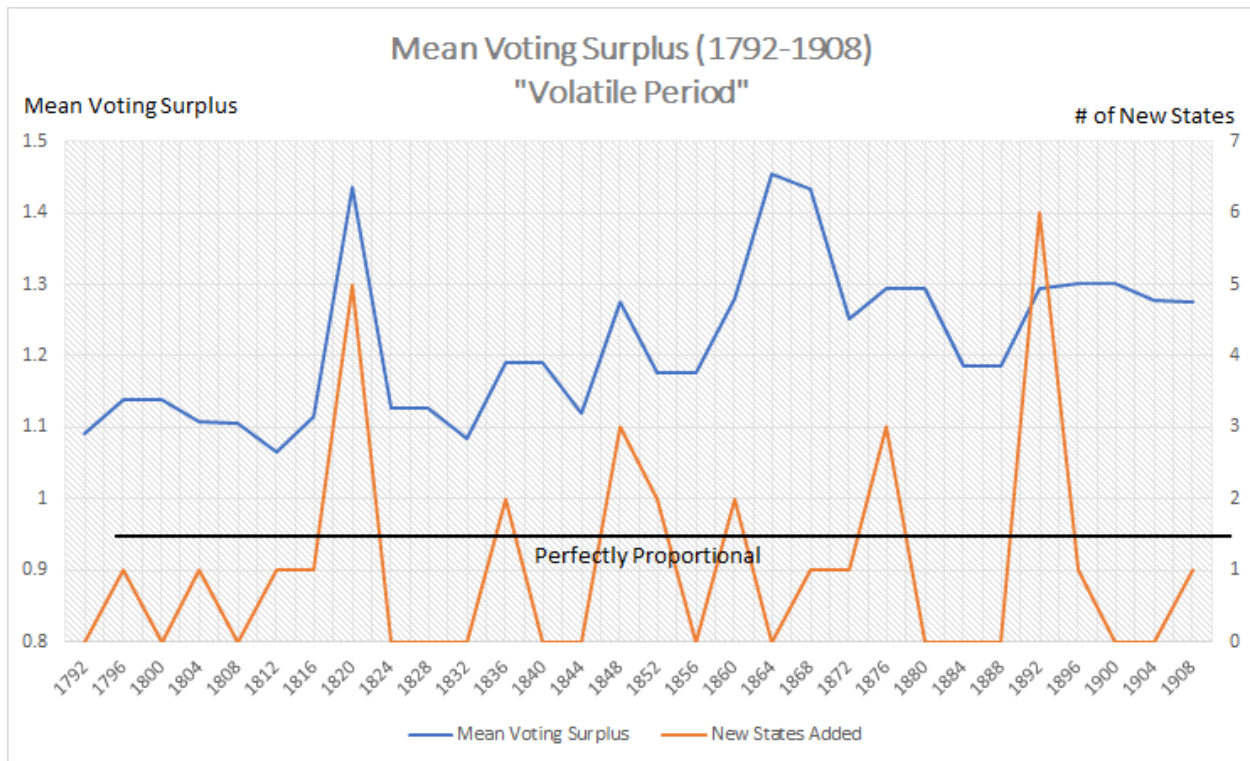
Empirical Analysis of the Volatile versus Stagnant Growth Dynamic

It is evident that the voting power of states was much more volatile in the first half of the electoral college's existence than it has been in the second half. Average growth of the mean voting surplus was greater in the first time period, as the metric grew by .0071 per election as opposed to .0006 in the second time period. The variance, which measures how far each state's voting surplus is, on average, from the mean voting surplus (in a specific election) was particularly high during the first time period as well. Even if we were to disregard the elections between 1864-1872 (unusual conditions due to temporary succession by southern states), the time period still had variances as high as 5.09 (1820), 2.16 (1848), 2.25 (1876 & 1880), and 2.6 (1904). In comparison, the variances from the elections in the second time period have only been above 1.0 six times out of the 27 elections elapsed. Statistical extremes, therefore, appear to be much more replete within the earlier years of the electoral college as opposed to

the last century. Growth away from perfectly proportional is still technically positive, but it is occurring at a significantly lower rate than it was during the earlier time period (8.4% of the growth rate from the first period). Given these differences, it is fair to categorize the behavior of voting power within the history of the electoral college into two distinct eras. The underlying question, therefore, is if there were any intervening variables which made these two eras so different, and if their current effects (or lack thereof) have any impact on the future direction of state voting power within the electoral college.

The Inflationary Impact of New State Accession on Voting Surplus

In the previous chapter, we briefly discussed how the exclusive reliance of congressional apportionment procedure on decennial census data had the potential to create extreme voting surplus outliers in the case of newly added states. This was chiefly due to the fact that census population data in these particular jurisdictions lagged significantly behind the actual population and geographic conditions under which the states were founded. Additionally, many newly established states simply had very small populations in comparison to other states within the country, as people had yet to settle in those places to a significant extent. Lastly, it should be noted that majority of new state accession occurred during a period when electoral votes were rapidly changing because Congress had yet to institute a ceiling on seats within the House of Representatives. This meant that the number of representatives in the House was effectively a moving target in order to account for all the new states. Because electoral votes are partially comprised of a state's House delegation, this dynamic played a part in making the electoral college more volatile during this time period. Collectively, these factors are largely responsible for the volatility present within my voting surplus model. The chart below demonstrates the positive relationship between new state accession and mean voting surplus volatility during the first electoral college era.



Spikes in the mean voting surplus frequently occurred in elections where multiple new states were voting for the first time. The chart above depicts this observation, as high numbers of new states drive the mean voting surplus higher in nearly every case. The elections of 1820, 1836, 1848, 1860, 1876, and 1892 serve as strong empirical evidence of this assertion as well. The table below displays these elections and their effects on the mean voting surplus.

Election	# of New States	Increase from Previous Mean Voting Surplus	% Increase from Previous Mean Voting Surplus
1820	5	.32	28.69%
1836	2	.11	9.78%
1848	3	.15	13.75%
1860	2	.10	8.77%
1876	3	.04	3.4%

1892	6	.11	9.22%
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If we were to remove the 1864 election from this time period (because states existed in that election, they just chose to secede and not participate), the correlation coefficient between the # of new states added and the behavior of the mean voting surplus would be .51, suggesting a moderately positive linear relationship between the two variables. Comparatively, the largest intra-election increase of the mean voting surplus during the contemporary electoral college era (1912-2016), was .04 in 1960, an increase of 3.32% from 1956 as 2 new states were added. Outside of this election, only 3 other new states were added in the contemporary electoral college era, minimizing the potential for significant mean voting surplus growth. Based off these estimates, it is clear that new state accession has historically been the most significant driver of volatility and growth of the mean voting surplus over time.

The significance of this finding is the implication that new states, and hence more electoral votes, must continue to be added to our union in order for the mean voting surplus to continue its ascent. During the first electoral college era (1792-1908), 31 new states were added. In turn, the mean voting surplus increased at an average rate of .0071 per election, advancing from its initial value of 1.09 to as high as 1.43 in 1820. In the second electoral college era (1912-2016), only 5 new states were added. In turn, the mean voting surplus increased at an average rate of .0006 per election, a measly 8.4% the average growth rate of the previous period. The mean voting surplus statistically flatlined in the most recent time period, as its value today is roughly equivalent to its value a little more than a century ago (1.25 and 1.24, respectively). It should also be noted that the House of Representatives has been held constant at a fixed number of seats since 1929. Without a growing number of seats to apportion or a variable number of house seats to apportion, this factor has also played into the decrease in volatility in the second electoral college era. It appears that without the accession of a sufficient number of new states, the mean voting surplus lacked the necessary force to continue moving upward. This inherently means that the statistical extremes pushing the mean above 1 in 2016 are likely no greater, and could plausibly be less than, the statistical extremes which drove it there in the first place.

Conclusions from the Mean Voting Surplus Data

Because further growth of the mean voting surplus is primarily contingent on the increasing magnitude of statistical outliers which arise through the accession of new states, we can say with confidence that it will likely stagnate for the foreseeable future. The United States has not added a new state since 1964 (when Washington DC gained recognition in the electoral college), and does not appear likely to add one anytime soon. The mean voting surplus did show a susceptibility to spike to particularly disproportionate levels in the first 29 elections, but this volatility has since subsided due to the lack of new state accession. The mean voting surplus, in turn, has decreased from this earlier period and remained more consistent over the last 100 years. Despite the likelihood that the mean voting surplus will not grow substantially in the future, statistical outliers appear poised to persist. This assertion is justified by the consistent percentages of voting surpluses greater than .20 from 1, and the consistency of the mean voting surplus itself at a level significantly above 1. Even in 2016, statistical outliers such as Wyoming (voting surplus of 3.05), Vermont (2.75), Washington DC (2.86), and North Dakota (2.56) continue to keep the mean voting surplus well above the proportional benchmark of 1. It should be noted that the voting power inflation occurring in each of these states is greater than any state in the first 4 elections (1792-1804). In this sense, the current electoral college is more advantageous towards a small number of states than it was during the age of our founding fathers. Even if these statistical outliers fail to grow any larger in the future, they are still empirically greater in severity than any state during the time our founding fathers crafted the institution. For these reasons, the magnitude to which the voting influence of these states is inflated past historical parameters provides a plausible basis for questioning the compatibility of the electoral college with American democratic ideals.

The Effects of Equal Representation on Individuals

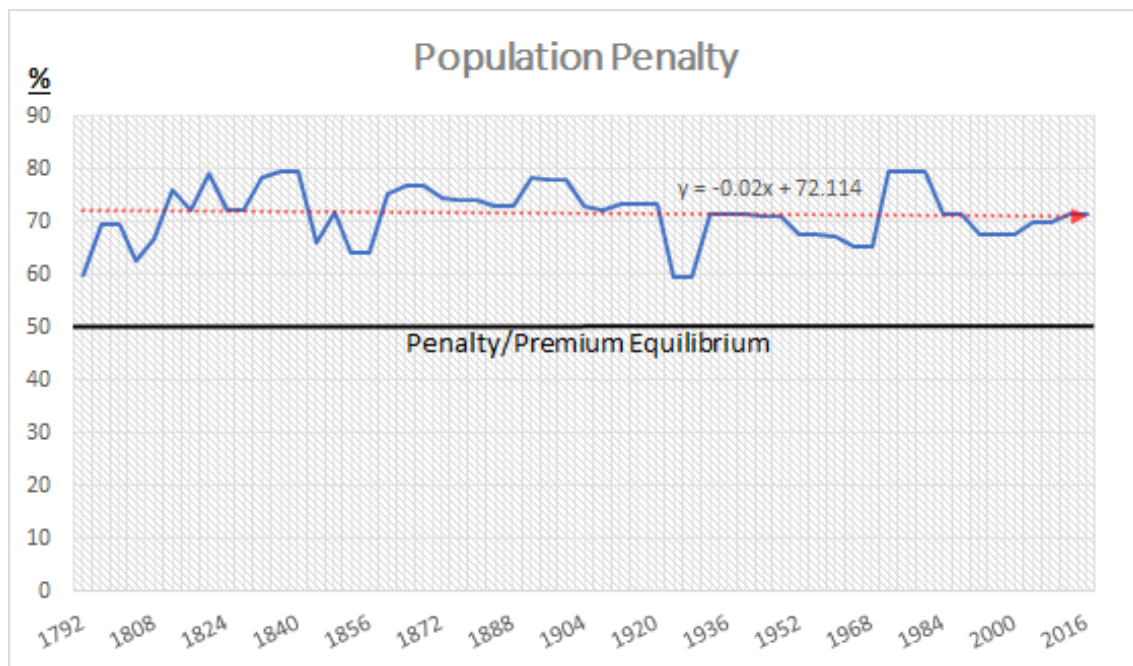
General Empirical Observations

In every election of our country's history, equal representation within the electoral college has hurt more of the citizen population than it has helped as compared to a hypothetical system based on

exclusively proportional representation. In terms of proportions, it has hurt as little as 59% of the population (1924 & 1928), and as much as 80% of the population (1972 & 1976). With the exception of the 1812 election, equal representation has helped more states than it has hurt in comparison to the same hypothetical scenario. It has advantaged as few as 52% of states (1816 & 1892), and as many as 71% of states (1964 & 1968). Equal representation also appears to be operating outside of its permissible parameters as defined by the effects it had on the first four elections (1792-1804). In the most recent election in 2016, it hurt 71% of the population, 6% higher than the permissible parameter. In the same election, it helped 64% of states, 5% higher than the permissible parameter. Based off the consistency of these findings, it is evident that there exists a strong inverse relationship between states and individuals as it relates to the advantage they gain through equal representation. Furthermore, through analyzing the effects of equal representation on these demographics, levels of inequality between states and individuals are greater today than they were at the time the electoral college was founded.

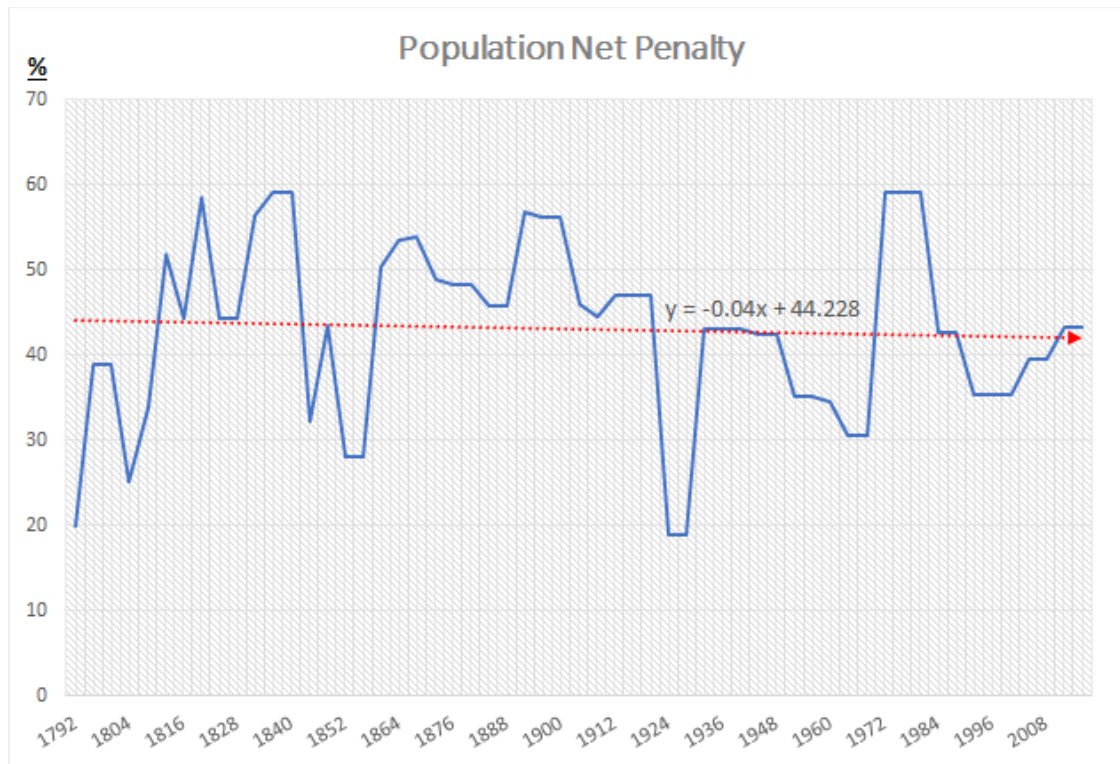
The Penalty Imposed by Equal Representation on Individual Citizens

Raw Population Penalty



The population penalty statistic measures the percentage of the total United States population living in a state with a voting surplus less than 1 in every election. It should be noted that the metric does not account for the severity of which an individual is disadvantaged, or, how much greater their state's voting surplus is than 1: it simply measures the presence of any level of disadvantage created by equal representation (counts 1.01 and 3.01 the same). Despite the failure to account for severity, this measurement is substantive because it tells us how many individuals in the country have less voting power than they otherwise would under perfectly proportional representation. The chart above indicates that the electoral college has **always** disadvantaged more individuals than it has advantaged through equal representation. Over the course of every presidential election, the electoral college disadvantages 71.5% of the population on average, a proportion which has fluctuated between 59% and 80%. The behavior of this statistic has been relatively consistent, as the slope of the linear trendline is -0.02. For comparative reference, this would mean that it would take 50 elections (200 years) for the percentage of people disadvantaged by equal representation to decrease by 1 percent, on average. Given this data, it is evident that equal representation has hurt a significant majority of the country's population in comparison to a perfectly proportional alternative, and will continue to do so for the foreseeable future.

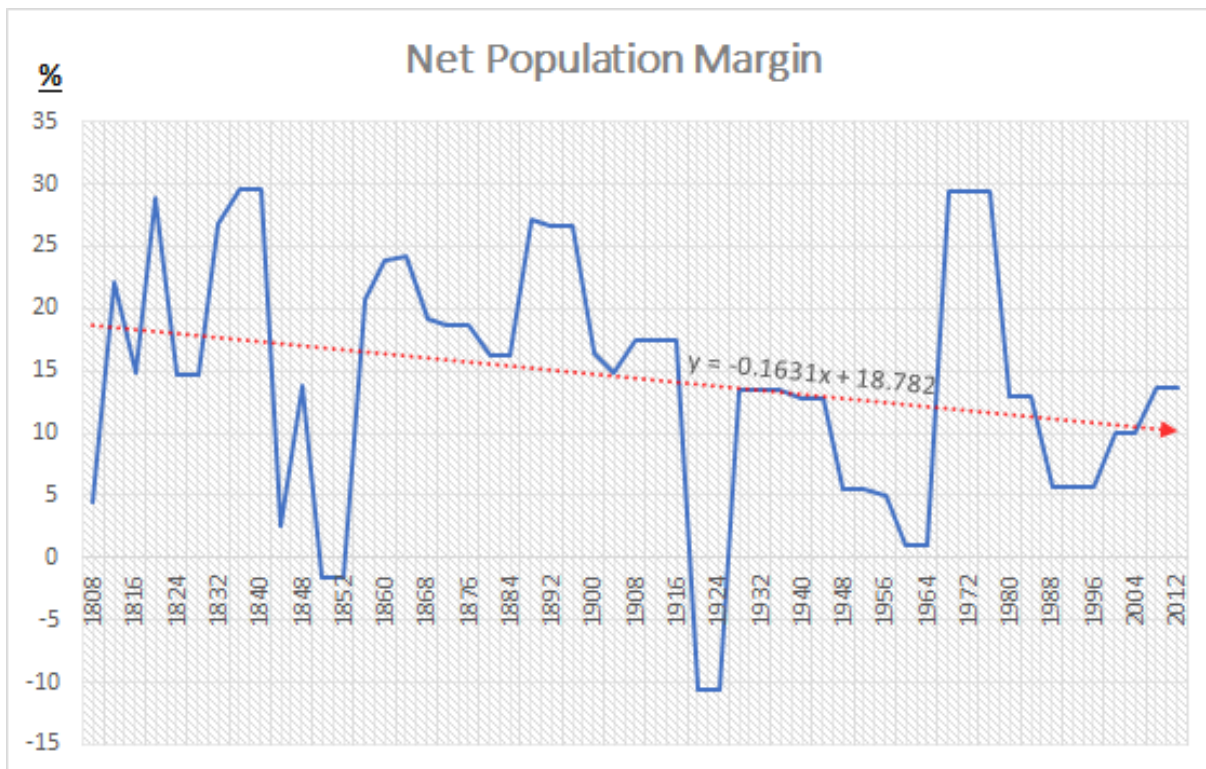
Net Population Penalty (expressed in negative percentages)



The population net penalty statistic measures the spread between those disadvantaged and those advantaged from equal representation. Specifically, it measures the difference between the percentage of the population residing in states with voting surpluses greater than 1 and the percentage of the population residing in states with voting surpluses less than 1. The margin between the advantaged group and the disadvantaged group is important to this thesis because it directly measures the equality of equal representation towards individuals: the wider the spread, the more unequal equal representation is on an individual basis. Over the course of every presidential election, the average spread between those advantaged and those disadvantaged has been 43%, as the spread has fluctuated between 19% and 59%. This means that throughout American history, the electoral college has consistently hurt at least 19% more of the population than it has helped at the very minimum. Similar to the raw population penalty, the behavior of the net population penalty has been consistently even, as it has a linear trendline of -0.04. For

reference, this means that it would take approximately 25 elections (100 years) for the spread to decrease 1%. Given these measurements, it becomes clear that the effects of equal representation have **always** been uneven towards individuals: the number of individuals disadvantaged by equal representation has never been equal to the number of individuals advantaged by equal representation, and has historically exceeded it. In a collective sense, both the net and raw penalty statistics support the argument that the electoral college has historically, and will continue to have an overall negative effect on individual citizens in an aggregate sense.

Marginal Difference between Contemporary Penalty Levels and the Historical Baseline



The marginal difference calculation measures the numerical deviation between the permissible parameter for which equal representation may be distortive and the actual amount of distortion occurring in a given election. It is substantive towards this thesis because it gives us a sense for considering how closely contemporary levels of inequality amongst individuals comport with acceptable guidelines

established by historical precedent. The chart above indicates that the spread between the penalized group and the advantaged group has actually become more compliant with historical precedent over time, as the linear trendline for elections after the historical baseline (1808-2016) is -0.16. This means that it would take 7 elections (28 years) for the spread between these groups to move 1% closer to the permissible parameter, on average.

Despite the general longitudinal trajectory towards the historical baseline for the gap between the advantaged and disadvantaged groups, there have been a number of statistical outliers in recent elections which bring the strength of this pattern into question. Most notably, the spread in the 1972, 1976, and 1980 presidential elections (59%) was 29 percentage points higher than the permissible parameter established by the historical baseline (30%). In contrast, the linear trendline would have projected the spread in these years to be approximately 12 percentage points higher than the permissible parameter, significantly lower than the disparity which actually occurred. Spread levels from the most recent election in 2016 also bolster skepticism about the apparent advantage and disadvantage gap contraction. In this election, the gap was 14 percentage points higher than the permissible parameter, whereas the linear trendline projected the gap to be only 10 percentage points higher. Taking these examples into account, two realities become likely:

1. The current level of inequality amongst individuals in the electoral college is noticeably higher than the acceptable limit intuited by our founding fathers
2. The electoral college remains susceptible to extreme inequalities amongst individuals even in an environment where inequality is longitudinally contracting

Conclusions from the Equal Representation Data

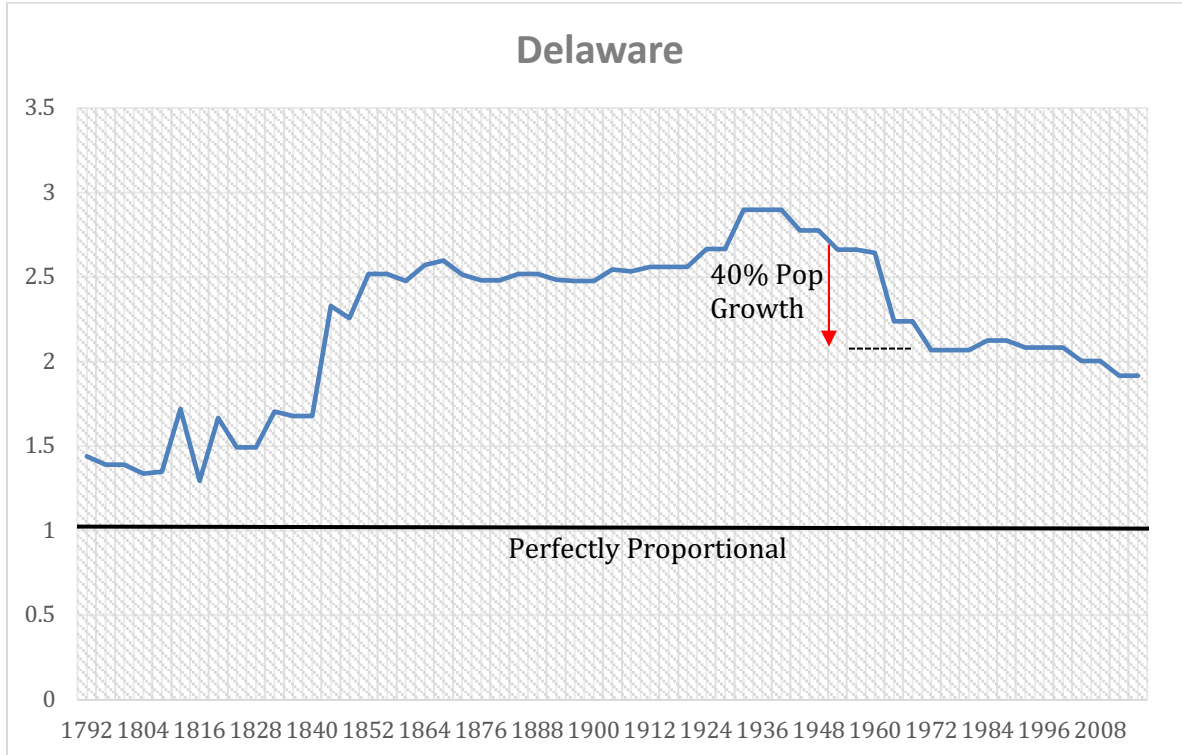
We can be reasonably confident that 60-80% of the population will have less voting power in future presidential elections under the electoral college system than they would have under a perfectly proportional system. This range is unlikely to change in future elections, as every value throughout history has fallen within its parameters. It is improbable, therefore, that individual voting power distortion will become more severe than it has already been in years to come. Despite the plateau in the growth of distortion severity, contemporary levels of distortion fall outside of the acceptable limit established by the founding fathers. Just as recently as 40 years ago, individual voting power distortion was nearly 30% higher than the acceptable limit, while today it stands 14% higher. Even though the longitudinal pattern suggests distortion levels will become more compliant with this limit in the future, these recent examples serve as clear reminders that the system can still produce inequalities well beyond excusable parameters. We can conclude that the electoral college has the potential to be reasonably fair towards individuals in producing compliant levels of distortion in certain instances. Despite this potential, however, the institution has been, and will continue to be, vulnerable to distorting the voting power of individuals significantly beyond tolerable boundaries in *any* given election. The empirical volatility of individual inequality in the electoral college, therefore, is a plausible reason to question the legitimacy of the institution moving forward.

Longitudinal Analysis of Voting Surplus in Select States

General Empirical Observations

The longitudinal evolution of the voting surplus in Delaware, New York, and New Jersey revealed a clear negative relationship between state population size and individual voting power. Delaware, consistently one of the smallest states in the country by population (currently 7th), has always had a voting surplus greater than 1. New York, consistently one of the largest states in the country (currently 3rd) has always had a voting surplus less than 1. Individuals in these states have always incurred a benefit or a penalty from the electoral college due to the polarity of their state populations relative to the country as a whole. New Jersey, a state which was originally smaller but has since undergone significant growth, has seen its voting surplus change from greater than 1 to less than 1. Decennial intrastate population growth and the accession of new states with small populations were the drivers of the outcome in New Jersey, as well as fluctuations which took place in Delaware and New York. These findings indicate that the electoral college empirically penalizes individuals for residing in large states and states experiencing rapid population growth. Furthermore, they show that the electoral college also impacts individuals based on their relativity to other states: if other state populations decrease but a given state stays the same, the voting power of its individuals will still decrease due to it gaining an increased relative proportion of the total population in the country. The implication of this reality is clear: the more state populations deviate from one another, the more inequality the electoral college will produce amongst individuals. Seeing that over 50% of America's current population is concentrated in just 9 states, the potential for future distortion of individual voting power in the electoral college is very apparent.

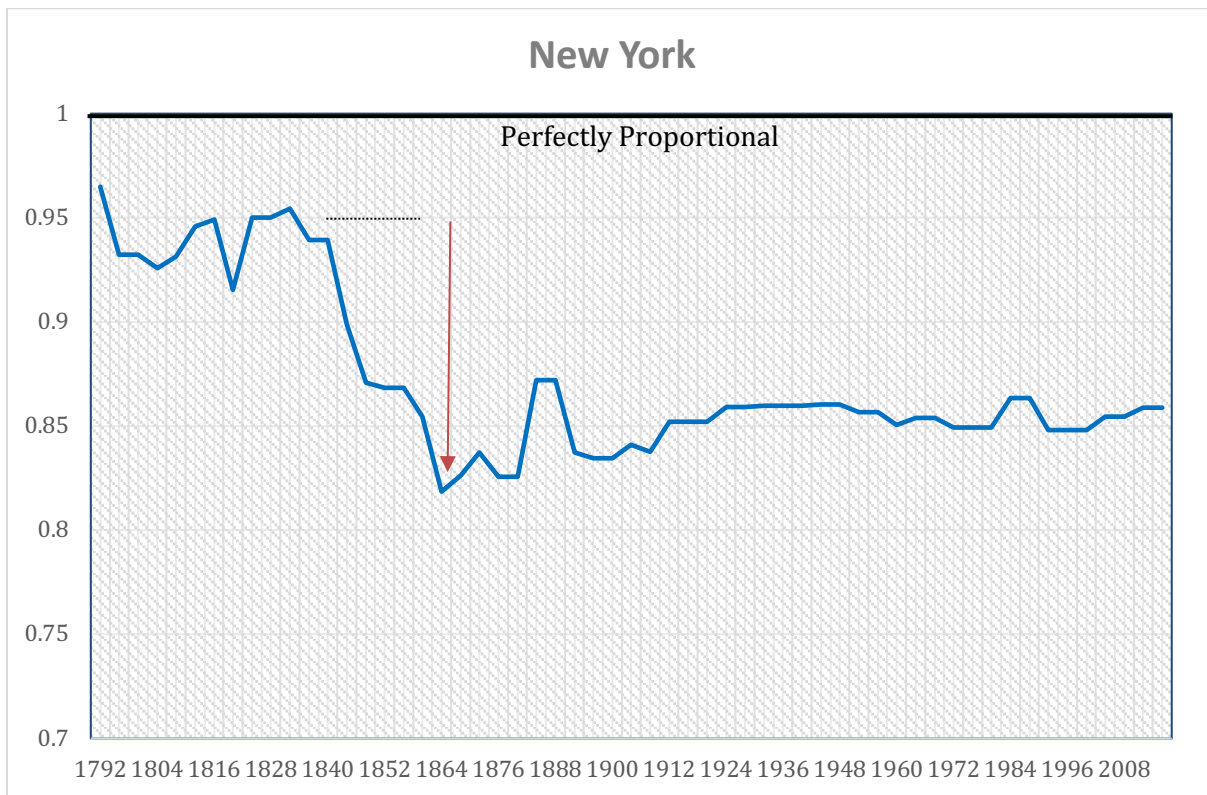
Delaware



Individuals in Delaware have always had more voting power in the electoral college than they would theoretically have in a proportional representation system. Since 1792, voters within the state have enjoyed an average voting surplus of 2.16, a premium which has fluctuated between 1.3 and 2.9. Even though residents of Delaware have consistently had more voting power than individuals in most other states, the magnitude of their advantage has changed over time. The most notable fluctuation occurred between 1952 and the 1964, when the voting surplus dropped from 2.66 to 2.24 (a 16% decrease). Increased population growth within the state drove this change: in 1952, the state's population grew by 19% from the previous census. By 1964, this rate more than doubled, as the state's population grew by 40% in the preceding census period. The opposite pattern can be observed on the graph in the mid 19th century, when the voting surplus increased because state population growth had stagnated. Through this example, it is clear that the electoral college rewards stagnant population growth by inflating the voting power of individuals within a state. On the other side of the coin, however, it also penalizes rapid

population growth by diluting the voting power of individuals within a state. The case of Delaware provides evidence that this dynamic occurs even in historically small states where individuals have always held a relative voting power advantage over the majority of the country's population. Delaware remains low in both total population and relative growth rate, meaning that the voting power of its individuals will remain inflated for years to come.

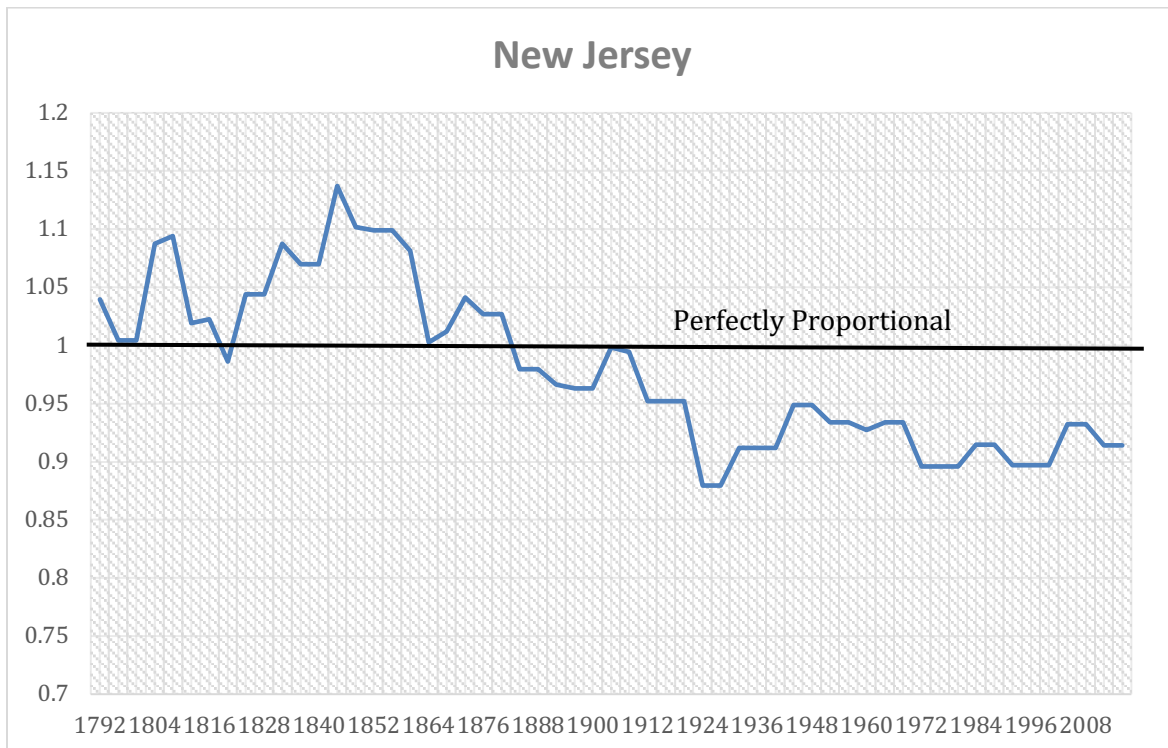
New York



On the other end of the spectrum, the electoral college has always diluted the voting power of individuals in New York, as the state's voting surplus has always been below 1. New Yorkers have held an average voting surplus of .87, which has fluctuated between .96 and .82. In literal terms, residents of New York have had 87% of the voting power they otherwise would have under proportional representation throughout the entire history of the electoral college. New York has always been a large

state relative to the rest of the country, but there are some notable flashpoints in its history where voters experienced acute levels of voting power dilution. Between 1844 and 1864, New York's voting surplus decreased from .89 to .82 (an 8% change). Ironically, intrastate population growth slightly decreased in the time period from 27% to 25%. For a state of New York's size, however, 25% growth accounted for many more people than the same percentage growth in a smaller sized state. New York's decreasing percentage population growth disguises the fact that the state was still growing at a much faster pace than most states in the country. Accelerated intrastate population growth, therefore, still accounts for much of the dilution of individual voting power that New Yorker's suffered. In the most recent census, New York had the 3rd largest population. New York's large population size and consistent growth collectively mean that individuals in the state will continue to have their voting power diluted for years to come.

New Jersey

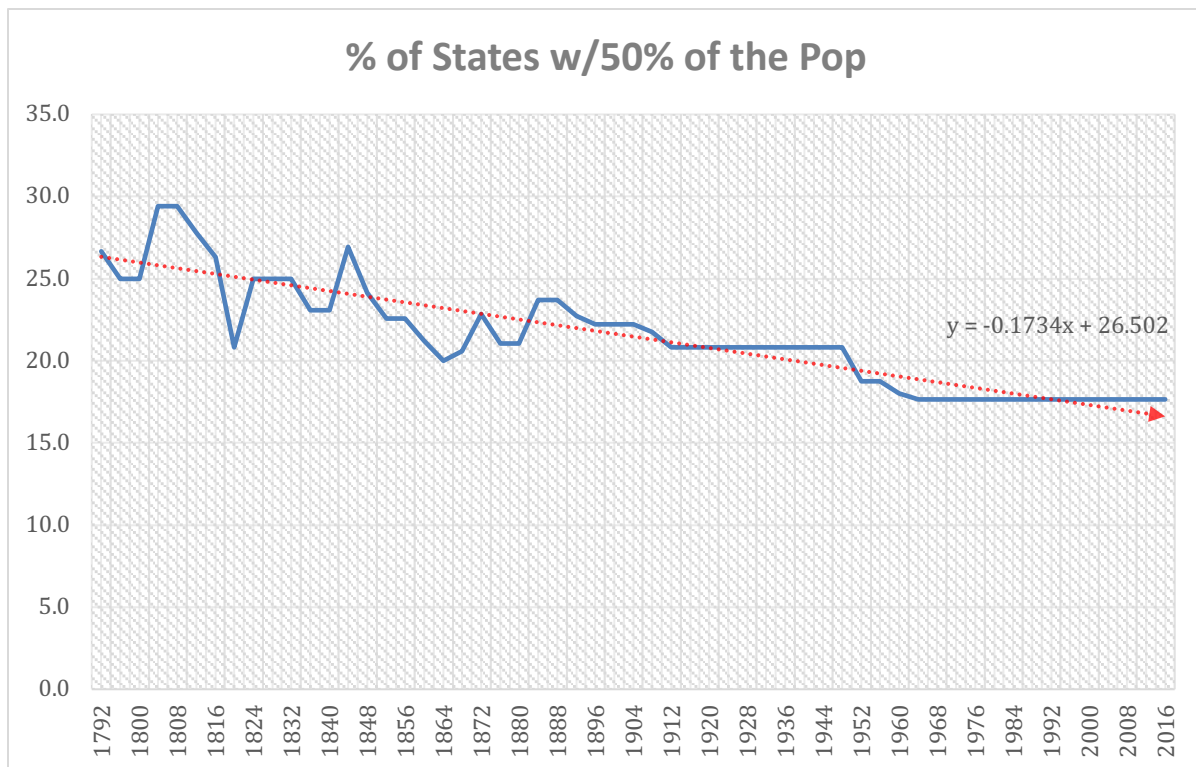


Different from the previous two examples, the electoral college's effects on voting power in New Jersey have not been absolute. The electoral college inflated the voting power of New Jersey natives for the better part of the 19th century. From 1792 to 1880, the state's voting surplus fell between 1.04 and 1.14. After the 1880 census, however, the inflationary effects of the electoral college transformed into dilution. From 1884 to 2016, the state's voting surplus has fallen between .99 and .88. This change from inflation to dilution was caused by an increase in population growth and the addition of 7 new states in the late 19th and early 20th century. Ever since this time, voters in New Jersey have been penalized by the electoral college in terms of their voting power.

The case of New Jersey is similar to Delaware and New York because it demonstrates how changes in the rate of population growth can inflate or dilute individual voting power. It is unique from the previous two examples, however, in that it shows the electoral college's absolute effects on a state can change over time: if the citizens ultimately derive a penalty or a premium from the electoral college as compared to proportional representation. This is a substantive finding because it demonstrates that individual benefit from the structure of the electoral college is highly subject to change, and should not be considered a static privilege just because a state is small at one point in time. A state's population size and growth rate are not the only factors determining whether or not its citizens are benefitted or penalized by the electoral college: the population size and growth rate of other states within the country are equally important in determining this outcome. Hence, New Jersey's was transformed into a "large state" by the compound effects of increased population growth within its borders and the accession of a significant number of small new states throughout the rest of the country. The takeaway from this example is that equality of individual voting power across states is heavily contingent on the congruency of populations and growth rates across states. The more divergent these numbers become, as seen in New Jersey, the more voting power inequality there will be.

Future Implications of the Select State Data

The examples presented within this section provide clear and compelling evidence that the electoral college benefits individuals in smaller states and penalizes individuals in larger states. “Small” and “large” states, however, are relative concepts: states are only considered small insofar as they have smaller populations than the other states around them. When new states were added in the 19th and 20th century, they effectively widened the parameter of state populations within the country as a whole, making previously “small” states larger in relativity, thereby diluting their voting power. This process inherently expanded the gap between small and large states, which inevitably had adverse effects on the equality of voting power across the entire country. Today, we see this process unfolding through a different mechanism: majorities of the population clustering in a small number of states. In 2016, more than 50% of the nation’s population resides in just 9 states (17.6% of all states). In 1792, this number was 27%, a full 10% higher.



Historically speaking, the data indicates that progressively greater numbers of people have been settling in fewer states over time. Because larger states are becoming even larger, this means that small states are becoming smaller in relativity. The wider this gap becomes between large and small states, therefore, the more voting power inequality there will be amongst individuals within the electoral college. Interstate population divergence and further concentration of the population in few states stand as the greatest threats towards further voting power inequality within the electoral college. Seeing that this pattern has been consistently occurring for the last 200 years, it is very plausible that the electoral college will become more unequal towards individuals in years to come.

Important Conclusions from the Analysis of the Relative Voting Power Model

The Electoral College allows a small number of states to have a disproportionate amount of influence relative to other states

The mean voting surplus data reveals that statistically extreme voting surpluses (voting surpluses >1.2) are replete throughout the history of the electoral college. The most egregious examples of state voting power inflation occurred in the 19th century when new states were being founded very frequently. Some particularly noteworthy examples are Nevada 1892 (8.85), Iowa 1848 (5.45) and Alabama 1820 (10.04). Even though outliers today aren't quite to this extreme, they're still persistent well beyond the standard established by the first 4 elections. Some notably high voting surpluses today are Wyoming (3.05), Alaska (2.42), District of Columbia (2.86), North Dakota (2.56) Vermont (2.75), and Rhode Island (2.18). No state in the first 4 elections had a voting surplus as high as any of these. The implication of these findings is clear: the 2016 electoral college is more disproportional than the original electoral college regarding the amount of voting power it allocates to a small number of states. Today, therefore, there are significantly greater amounts of voting power inequality between states than there were at the time the electoral college was founded. In this respect, equal representation has become more dominant in comparison to proportional representation over time, thus making the electoral college today inherently more unfair.

The Electoral College today dilutes a greater amount of the population's voting power than it did when it was created

The population margin analysis indicates that the electoral college dilutes 71.6% of the population's voting power in 2016, while it diluted 65.3% of the population's voting power during its first 4 elections (the historical baseline). To put these percentages in perspective, 221,092,680 Americans today have less voting power in the electoral college than they would have under proportional representation. If we were to apply the proportion of individuals who experienced voting power dilution during the first four elections to our population today, 201,518,213 Americans would have less voting power in the electoral college than under proportional representation. Controlling for population discrepancies, this means that the electoral college today dilutes the voting power of nearly 20 million more Americans than it did when the founding fathers created it. America's population will inevitably continue to grow, meaning this difference will only become even more profound for years to come. As stated throughout this thesis, some amount of individual inequality should be baked into our expectations concerning the dilution and inflation of voting power amongst individuals. These findings indicate that the amount of individual inequality in today's electoral college, however, is significantly greater than any reasonable understanding of an acceptable amount of inequality within the institution. Thereby, the contemporary iteration of the electoral college is unfair towards the population as a whole.

The Electoral College could become more inequitable in the future if Americans continue to cluster in a small number of states

The select state analysis demonstrated the negative relationship between state population size and individual voting power. By this logic, larger population differences between states will inevitably produce greater inequality of individual voting power across the population. In 2016, the majority of Americans lived in 9 states, a proportion which was 10% higher at the time the electoral college was created. Over time, the concentration of greater percentages of the population into a smaller number of

states has tracked the rise of individual voting power inequality across the population. Given this reality, the electoral college undoubtedly has the potential to become more inequitable in the future. When evaluating the legitimacy of the electoral college today, therefore, we must also consider how it will operate in years to come.

Conclusion: Abolish the Electoral College

The purpose of this thesis was to determine whether the mechanism we use to elect our president comports with the notion of fair democratic representation. In order to answer this question, we must return our attention to the foundational construction of American Democracy. The United States of America is a federal republic: individuals live in 50 states, where each state retains partial sovereignty over its own matters. Each of these states is collectively incorporated into a federation, where a central government exercises sovereignty over shared matters amongst the states. Because states are different in size from one another, larger states inherently have more to gain through a central government where representation is exclusively determined through share of the total population. The reasoning behind this assertion is straightforward: more representation in the central government would allow larger states to enact policies tailored towards their particular needs at the expense of the preferences of smaller states. Our founding fathers reconciled this power dilemma by creating a bicameral legislative branch which combined the ideals of proportionality and equality. The House of Representatives is based on the principle of proportionality because delegates are allocated to states according to a formula that weighs their populations relative to the national population as a whole. The Senate follows equality principle because a fixed number of delegates are allocated to states regardless of population size. Equal representation is designed to give all states an equal say in the central government, regardless of their population. In practice, this means giving smaller states a guaranteed amount of representation to ensure their preferences are not completely subsumed by the dominant voices of larger states. Hence, representation of American citizens in Congress is the dual product of the proportionality and equality principles, which were debated at the Constitutional Convention and during ratification.

The structure of Congressional representation for American citizens is intrinsically connected to the structure of Presidential representation for American citizens through the electoral college. States are allocated electoral votes equal to the number of representatives and senators they have in Congress. These electoral votes signify how much influence a particular state has over the outcome of the election, and symbolically the extent to which the president represents that state. Because the votes of individual

citizens only go towards affecting the outcome of the electoral votes within their state, the voting power they possess within the country as a whole is directly linked to their state's Congressional delegation. Since every state's congressional delegation is a dual product of proportionality and equality, so too is the voting power of their citizens within the electoral college. Therefore, the voting power of individuals under the electoral college scheme, and the representation they have through the president, are derived through a constitutionally-sanctioned mixture of proportionality and equality.

Fair democratic representation in America does not equate to strict proportional representation. We have shown how individual voting power would be equivalent across states in a strictly proportional system. Because our country combines proportionality and equality to construct representation, deviations of voting power between individuals in different states will naturally arise due to the varying effects of equality. Individual voting power between citizens of different states can be asymmetrical and still comply with the constitutional notion of American democracy. In this respect, those who say the electoral college is undemocratic because the votes of every individual count unequally in the election of the president are making a normative, moral argument that is unsubstantiated by our Constitution. Simply stating that there exists some degree of inequality between individuals in terms of their voting power within the electoral college is not a legitimate reason to say the institution must be abolished. The more relevant question, therefore, is whether voting power inequality can exist to any degree and still be consistent with just democratic representation. Can voting power inequality persist to any degree without constraint? Or must it operate within a reasonable set of parameters in order to be considered democratic? The founding fathers failed to provide explicit answers to these questions, leaving modern day researchers the burden of determining their logical ends.

I premise my conclusions on a preponderance of evidence that the founding fathers intimated an implicit standard by which voting power inequality within the electoral college can be considered legitimate and compliant with democratic representation. When the electoral college was agreed upon, the founding fathers knew it would create some level of inequality between individuals in different states because it mirrored Congressional apportionment. Their decision to ratify the electoral college in spite of

this reality indicates that the level of inequality they felt it would create was sufficiently compatible with American democratic ideals, or else they would not have accepted it. I assert that it is more likely than not that the founding fathers were considering the levels of inequality the system created in the demographic environment of the late 18th century when they rendered this judgment, and had no way of imagining the demographic changes that could arise in later generations. Although the founding fathers had undeniable foresight in crafting institutions capable of withstanding significant societal transformation, their understanding was constrained by their own lived experiences. Therefore, I compare my findings in this thesis against the level of voting inequality that existed during the first 4 elections (1792-1804) under the assumption that it represents the standard by which voting power inequality may occur within the electoral college and be considered democratic.

Because this notion of a permissible level of inequality is interpretive, however, I cannot simply state that the electoral college is undemocratic only because it nominally exceeds this benchmark. In order for me to be thorough in my evaluation of the institution's adherence to democratic ideals, I must situate the inequality that exists within a historical context. America's constitutional standing as a federal republic is a recognition that states have distinct interests that must be adequately represented by the federal government, and those who lead it. The inclusion of equal representation in Congress' apportionment framework was made to ensure the federal government has a greater ability to serve all states fairly, regardless of their size relative to one another. The inequality which stems from equal representation, therefore, is essentially risk mitigation against the possibility that a Congress apportioned through strict proportionality would overlook the preferences of the citizens in smaller states. The electoral college is intrinsically linked to Congress by Article II, Section I of the Constitution, which allocates states presidential electors directly equivalent to their respective Congressional delegations.⁸² Therefore, the presidency was constructed with the same concerns in mind as far as representing all states fairly. This means inflating the influence of less populated states to make the president feel less

⁸² U.S. Const. art. 2. sec. 1.

compelled to overlook their interests than he or she otherwise would. The ultimate desired effect of these individual distortions is to create a system which provides as close to net even incentives as possible for the president to be representative of all individuals throughout the country. In this study, I use the inequality which persisted in the first four elections to contextualize my understanding of net even incentives.

In my judgment, the levels of inequality which exist in the electoral college today can no longer be justified in the interest of preventing abusive Majoritarianism, the reason inequality was deemed permissible in the first place. In 2016, the electoral college dilutes the voting power of 21 million more people than it did when it was founded. It inflates the voting power of 6 states (WY, DC, ND, RI, VT, and WY) to a greater extent than **any** state within the first four elections. Within these states, more than 3 million Americans cumulatively possess greater amounts of individual voting power than **any** American during the first four elections. These increased levels of inequality amongst voters are a direct result of the interstate clustering of the majority of the population into a smaller number of states. The proportion of states holding at least 50% of the population has decreased from 27% to 17%, and has shown consistent decline since the founding of the electoral college. While increasing inequality has arguably maintained the Federal Government's ability to serve all states in an era of population clustering, it has done so at the expense of adequately serving the broader population. As a country, we must ask ourselves whether levels of inequality that are empirically divergent by millions of Americans from the standard on which our country was founded are still compatible with American democratic ideals. We must ask ourselves whether the threat of have one's preferences overlooked in federal government still justifies inequality amongst individuals when the severity of that inequality is substantially greater than it was when originally deemed democratic. I assert that these levels of inequality are simply too large in magnitude to be rationally considered democratic under the functional understanding I have outlined. For this reason, the electoral college does not adhere to democratic standards as understood by the United States Constitution, and is not a suitable mechanism for electing the president of the United States at this time.

The true straw that breaks the camel's back for the electoral college is not exclusively the rising levels of inequality within it, but the growing population to which those levels apply. When the founding fathers created the electoral college, America was a country of approximately 3.5 million people and 15 states. Even if we were to apply today's levels of inequality to this population, the electoral college would dilute the voting power of about 2.5 million people. America's population today is about 308 million according to the 2010 census, and is projected to grow to over 330 million by 2020. Following the same percentage of inequality applied to the historical population figures, the electoral college dilutes the voting power of 221 million people. This demonstrates that even if proportions of inequality were to remain equivalent over time, their effects would continue to become more and more distortive so long as the population continues to grow. Each percentage of inequality is inherently more significant the larger the population becomes in terms of the raw number of votes it dilutes or inflates. Even if proportions of inequality were to decrease from historical levels, the electoral college would likely still dilute more votes in the aggregate than at the time it was founded. For these reasons, the electoral college is not suited towards maintaining an acceptable balance of inequality because the population is simply too large, and will only grow larger.

The conclusions of this thesis should it make it very clear that presidential election systems should not be conceptualized as statically optimal institutions, no matter how logically sound their foundations may be. Election methods must be critically analyzed and modified on a regular basis to ensure adherence to American democratic ideals, meaning they must be tailored to the particular demographic environment in which they operate. For the United States, this means crafting a system that upholds its constitutional status as a federal republic while acknowledging the fact that America is roughly 100 times larger in population than when it was founded, while the majority of its population lives in fewer states. The purpose of this thesis is not to explicitly suggest an alternative mechanism for executing presidential elections. It does, however, offer clear and convincing evidence that unconditional support of governmental structures and institutions in perpetuity actually has the potential to erode democracy in the long run, even if these very institutions were resoundingly democratic when they were

created. While the foundational pillars of American democracy should undoubtedly remain constant, their function in our government should be engineered to represent the societal conditions of today, and not those of the past. For these reasons, we must follow a fluid application of American democratic ideals to fairly represent the rights and preferences of all Americans today and in the future.

Appendix

61.

308,745,538 Total Population / 538 Total Electoral Votes = 573,876 People per Electoral Vote

64.

*308,745,538 USA Pop. / 435 Tot. House Seats = 709,759.857 People per House Seat (**Standard Divisor**)*

*37,253,958 California Pop. / 709,759.857 Standard Divisor = 52.49 (**Standard Quota**)*

65.

37,253,956 St. Pop. / 55 St. Electoral Votes = 677,344.65 People per State Electoral Vote (State Divisor)

66.

677,344.65 CA Div. / 510,585.29 CT Div. = 1.33X Individual Voting Power than CA

68.

1. If Electoral Votes were apportioned to states strictly based on proportional representation → then their state divisors would be roughly equivalent to the national standard divisor - take CA for example

Nat SD = 573,876 (amount of people per one Electoral Vote under strictly proportional representation)

CA Electoral Votes IF strictly prop. representation → 37,253,956 Pop / 573,876 = 64.92 EV

CA State Divisor IF strictly prop. representation = 37,253,956 Pop / 64.92 St. EV = 573,876 = Nat SD

***There could be some minor deviations in the State SD and Nat. SD based on the rounding technique used to apportion electoral votes in whole numbers → ex. If we round 64.92 to 65 → 37,253,956 Pop / 65 St. EV = 573,137.79 State Divisor. Some incremental part of the disparity between the state and national divisors, therefore, must be accredited to this in every comparison and taken into account when cross analyzing.*

2. Electoral Votes in reality are apportioned to states based on their respective Congressional delegations - which are a certain number of representatives based on proportional representation and a fixed number of two representatives based on equal representation → Continuing the CA example

CA Electoral Votes with Prop. and Eq. Representation = 55 (53 representatives and 2 senators)

CA State Divisor with Prop. and Eq. Representation = 37,253,956 Pop / 55 St. EV = 677,344.655

CA State Divisor w/Prop. And Eq. Rep. is greater than CA State Divisor w/only Prop. Rep. → 677,344.655 (Proportional & Equal) > 573,876 (Proportional)

3. *Equal Representation, therefore, is the sole factor responsible for any amount that the State Divisor deviates from the National Standard Divisor. We can be confident in this interpretation because we have already shown that the State Divisor would be roughly equivalent to the National Standard Divisor if electoral votes were apportioned only using proportional representation through step 1.*

CA State Div. (only prop.) → 573,876

CA State Div. (prop. & eq.) → 677,344.655

4. *If expressed in a ratio, any deviation away from 1 indicates a distortion created by equal representation*

National Standard Divisor (573,876) / CA State Div. only prop. (573,876) = 1

National Standard Divisor (573,876) / CA State Div. REAL (677,344.655) = .847

1 - .847 = .153 → amount of deviation away from perfectly proportional that equal representation is responsible for

5. *Through this construct, the impact of equal representation on individual voting power can be studied in isolation.*

69.

573,876.46 Nat. Standard Divisor / 677,344.65 St. Divisor = .847 Voting Surplus

70.

573,876.46 Nat. Standard Divisor / 187,875.33 St. Divisor = 3.055 Voting Surplus

75.

$N = \text{Total US Population}$

$\% \text{ of US Pop. Penalized (2016 election)} \rightarrow 6,346,105 \text{ (TN)} \dots + 37,253,956 \text{ (CA)} / N$

$221,080,170 / 308,745,538 = .7161 \times 100 = 71.61\% \text{ of the US Pop. was Penalized by Eq. Rep. in the 2016}$

Election

77.

Equal Representation Net Benefit Linear Trendline

$Y = \text{Value of Equal Representation Net Benefit in a given presidential election}$

$m = \text{Slope} = \text{the amount and direction that Equal Representation Net Benefit changes in an average election}$

$X = \text{number of elections since 1792}$

$B = y - \text{intercept}$

$$Y = mX + B$$

Interpretation: "For every x number of elections since 1792, equal representation net benefit changes by m"

78.

Marginal Difference:

Equal Representation Net Benefit baseline (1792-1804): A

Equal Representation Net Benefit 2016 (or any particular) Election: B

|C| = Amount of Percentage Points that Equal Rep. exceeds (or falls underneath) the permissible parameter

$$B - A = |C|$$

Interpretation: The net benefit from equal representation in the 2016 election was C percentage points greater than the permissible parameter

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