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**"Political Polarization and Social Inequalities: an empirical application of  
Bonica's PAC-Nominate model on the ideology of Congress members in the  
United States"**

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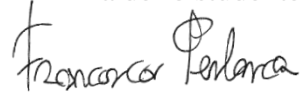
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# 1. Introduction

The increasingly divided political climate in the United States is behind some of the fundamental changes happening at a societal and political elite level. In the recent decade, many authors delved deep into the various reasons for this phenomenon: "political polarization." The implications over the socio-economic environment are vast and are quickly changing the perspective of both political and economic actors during the election period. Recent years have seen an increase in the intertwining between firms and political stances to capture the value from affective polarization and brand loyalty. Furthermore, the distance between the two parties in the US is nothing but the more observable and visible change that affects virtually every democracy's political landscape. Understanding the causes and consequences of this phenomenon is fundamental to ensure that the political elites could avoid further damage to the democratic process's stability, which could damage the economic landscape irreparably. Our analysis focuses on the US Congress for mainly two reasons: the availability of data and the excellent base of previous research on the topic. The more developed countries that could be analyzed through a political lens, such as the European ones, contain complicated parliamentary systems and different parties that fragment their votes. Also, big tent parties are definitively more common, and it is difficult to assess a real connection between ideological position and politicians belonging to those parties. While we could suggest that recent elections in several European countries could show symptoms of powerful elites' polarization, American politics is a more straightforward two-party system, with just a handful of independent outliers. Most elections never really see the influence of third-party candidates since they rarely obtain a single seat in the Congress (the most recent example is Senator James M. Jeffords from Vermont that decided to caucus with Democrats in 2001 and changed the Senate equilibrium). For this reason, the United States Congress is a perfect example of a two-party political competition that allows for a complete examination of the political polarization process.

Furthermore, the United States' relevance in the global economy, the previous research on the topic, and the somewhat larger population sample pointed towards the United States' choice as our benchmark. The preceding three decades of outstanding research over causes, consequences, and political polarization measurements are the rich framework we need to start our hypothesis and confirm it through empirical proof. Rather than merely acknowledging political polarization and exploring the degree in the two different chambers, which has been previously thoroughly discussed, we used the DIME database to prove a hypothesis frequently

presented in the topic's literature. The Database on Ideology, Money in Politics, and Elections (DIME) is a resource for the study of campaign finance and ideology in American politics, developed by Bonica (2014) as part of his project: "*Ideology in the Political Marketplace*," an on-going effort to perform a comprehensive ideological mapping of political elites, interest groups, and donors using the common-space CF-score scaling methodology. The database collects contributions made by individuals and organizations for local, state, and federal election candidates. Additional information about state and federal candidates and the measurement of their ideology are also made available, and we will discuss it in the next chapters.

We wanted to demonstrate that variation in income inequality is causing an increase or a decrease in political polarization. Our results show that the increasing inequality measured through the Gini Index is causing an increase in political polarization.

The paper is organized as follows.

The second chapter will introduce the topic and give a comprehensive summary of the literature regarding political polarization and its first measurement. We will observe the values across the recent decades and analyze their consequences, such as affective polarization and gridlock in the legislative process, expanding over the implications that the rich literature individuated in the economic landscape. We will then summarize the main topics of interest for our analysis before examining the methodology and the different political polarization measures and ideal points that have been constructed during the years. We will focus on Professor Bonica's work, which will be the common ground for our investigation over the relationship between income inequality and extremism in Congress.

In the third chapter, we will introduce our empiric analysis, describing the process of data gathering and the research we made through the DIME database. We will also explain the type of instruments used and our method's choice, motivating the choice of Fixed Effects regression and Instrumental Variables. By organizing the results of our regressions in the tables, we will show that the results confirm our previous hypothesis. Our findings will also be supported by several variables that are meant to assess the correctness of the results based on the previous empirical and theoretical papers from several authors. We will conclude the chapter with a summary of our findings, explaining the heavy impact of social and income inequality on political extremism and the necessity for a developed country to counterbalance this process to preserve the democratic system in which they live.



We will end the thesis by presenting different policy suggestions based on our results, and acknowledging our work's limitations, highlighting the direction for future research that could expand these obtained results.



## **2. Literature review**

Since the 1970s, the polarization of congressional candidates in the US has affected the political arena. This phenomenon is strictly linked to social and behavioral changes in the United States society and affects citizens' everyday lives. To begin our analysis, we want to define this thesis's main topic, starting from the different definitions introduced by previous authors.

### **2.1 Definition of political polarization and spatial theory**

The term “polarization” describes the increasing ideological gap between candidates of the opposite parties, Democrats and Republicans, which has been growing explicitly in the last twenty years. Throughout the United States history, parties have been competing to gain control of the government, but they rarely showed differences along with their whole political agenda. Most of their conflict was related to a single major agenda issue, such as social welfare during the 1930s. Instead, especially inside the Congress, parties are each growing more homogeneous in their policy positions. The differences between the two parties’ stands on main policy issues are expanding, following a division over the conservative-liberal axis (Layman, 2006). We have proof that this ideological polarization is something that has not been a part of American politics for all its history; in fact, the empirical findings by Poole and Rosenthal (1997) confirm that the trends mentioned above began only in the 1970s. Before that date, many people involved in American politics lamented the difficulty in understanding the real differences between the two parties’ as well synthesized by George Wallace’s quote in 1968, “there’s not a dime’s worth of differences” between the two parties. This change in elite ideology is new to the American political system: it also sparked intense debate in spatial theory and two-party competition. The literature on the best approach for winning an election on a two-party system - that began with Downs (1957) – is the main theoretical base for political competition and ideology distribution. Downs theories stated that ideological convergence to the center was natural and the optimal strategy to achieve a victory in electoral competition. This result was the conclusion of his ideological proximity model, which he derived from the research of Hotelling on the spatial competition of two firms in 1929. Hotelling’s initial work put the two competitors in a space segment and explained how their competition for customers worked. Of length  $n$ , this segment

was populated by “customers” uniformly distributed along its length, and the two firms needed to position themselves in a specific point of the segment. Customers would then choose one of the two firms depending on their distance from the firms (choosing, of course, the less distant firm). Hotelling’s model suggested that the firms could obtain optimal results when they both placed themselves in the center of the segment ( $n/2$ ) so they would receive half of the available customers each. Several authors later used this model in other dimensions of research, such as political analysis. Intuitively, the length of the segment would signify the distribution of the voters on an ideological basis.

Thus, Downs affirmed that every representative democracy could be analyzed by observing its voters’ ideological distribution and the peaks corresponding to ideology’s clustering. Most of his analysis was based on the historical situation while he was writing his essays and the relevant convergence towards a moderate position of both Republicans and Democrats. However, he also elaborated a two-peak model that explained a significant divergence on two parties’ voters on the liberal-conservative axis, imagining a distribution with voters clustered towards the ideological distribution line’s edges.

While examining such possibility, Downs expressed his doubt over certain downsides related to an ideology distribution towards the edges. A political consensus/equilibrium would be complicated to attain because voters would penalize legislators of each party if they would attempt to achieve an agreement with the other, more ideologically distant, party for policies that could have been considered centrist. His hypothesis is the basis on which the theories on the political market and political polarization began to develop. In particular, the situation depicted above is the exact snapshot of modern US politics, in which Democrats and Republicans are ideologically too distant to agree on a common ground for consensus on policies.

Downs’ theory has been opposed, especially concerning his criticism of a two-party system and his statement that parties in a two-party system deliberately change their platform so they can resemble one another. Nonetheless, it is also worth noting that candidates’ distribution depends on the electorate’s median position. Hence, a polarization towards the extreme edges (represented on the left to right scale) is possible and well sustained by the theory. Most of the literature on political polarization is concentrated on the polarization at the Congress level due to the easiness of observations of such changes and the relatively greater importance of Congress compared to State legislators.

Since our thesis is also related to Congress's political extremism, it is now essential to explain the roots of Congress's political polarization. The literature explains this ideological gap by defining two distinct variables that are at the roots of the issue:

- replacement of older and more moderate members by newer and more extreme members,

and

- ideological migration is the moderate members' movement toward their respective parties' wings throughout their careers (Bonica, Cox, 2017).

Member replacement has always been the center of the discussion around Congress polarization since the earlier theories from Price (2002) and Poole (2007). The latter is regarded with Rosenthal as the creator of the analytical model D-NOMINATE and DW-NOMINATE. He affirms that members adopt a consistent ideological position and maintain it over time once elected to Congress in his theoretical works. Indeed, Member replacement simply means the substitution of members of Congress with new, more extreme legislators. There are several reasons for the replacement of moderate members, such as death, retirement, defeat in an election, or the decision to run for a higher office. On the other hand, ideological migration is more difficult to investigate thoroughly since the real reason behind this reason is still a source of discussion in the literature. Several authors point out that this movement towards the party's wings is causing affective polarization and division inside the American voters. In contrast, others affirm that the elite polarization merely follows the already existing "divided America" and helps candidates obtain an electoral advantage over moderate candidates. While this discussion is outside the scope of my thesis, I will analyze at the end of this chapter the difference between perceived and real affective polarization at the citizen level thanks to newly acquired investigations and data gathered.

Both member replacement and ideological migration have been influential in the history of Congress. Still, it is only thanks to a subsequent exploration of the data gathered that we might divide US congress's ideological polarization into two distinct phases (Bonica, 2014). The impact of the two polarizing agents varied throughout the fifty years examined. As Theriault (2006) explained, the effect of replacement is generally more significant in creating ideological polarization, while ideological migration accounts for slightly more than one-third of the polarization effect. Theriault's analysis starts from 1972, which is usually considered the turning point for Congress polarization and studies the replacement variable with a specific focus on Southern democrats replaced by conservative Republicans.

Indeed, empirical findings show that until the 101st Congress (1989-1990), ideological migration played a less significant role, while after the 105th Congress (1997-1998), it became the main driver of ideological polarization, also in the light of the limited effect of replacement in the 21st century.

For this reason, we formally divide the political polarization trend into two different periods: the first, from 1972 to 1996, is defined by member replacement, the primary motivation for which is the partisan realignment in the Southern states. The so-called Southern realignment is the most extensive example of Congress members' replacement. During that period, the strong grasp of the Democrat party was broken, and the drive towards conservatism of the Republicans was met with a powerful and favorable reaction from the Southern states. Due to an increasing Republican population in the mountain regions and newly developing urban centers, the Democrats became a dying breed, especially in the Deep South. Furthermore, the South's identification with the Democratic Party was not related to shared beliefs and values but rather to its land history. The Republican party was still connected to Lincoln's Republican Party, which fought a war against the South and brought those states in the hated period of Reconstruction. It was only natural that new generations, which understood more and more where their allegiance stood, moved from the Democrat to the Republican party to ensure the alignment between values and ideas between voters and party. These states quickly replaced the moderate Democrats with more conservative Republicans. In some cases, this even drove some party composition changes when Democrats left their party to become Republicans and fully embrace their more conservative positions.

From 1996 onwards, the second phase was characterized by ideological migration, which means the shift of a sitting member ideology towards more extreme positions during its permanence in Congress as an incumbent.

## **2.2 Causes and consequences of political polarization**

While we have seen two main drivers of political polarization, we need to explain the plausible causes of this divergence between the two parties. Since the analysis of such reasons is beyond this work's scope, we will only briefly describe the most representative literature's significant point of view.

The literature introduces several reasons to explain this increase in political polarization, which can be divided into two broad categories, as well explicated by Barber and McCarty (2013) in a publication by the American Political Science Association. These two categories are the “external” and “internal” causes, as briefly depicted in the following paragraphs.

### *External causes*

The first category is related to “*changes in the external environment of Congress*” (Levenduski, 2008, pg. 174). The polarization of Congress members, which are becoming more extreme in their political views and more clearly identify themselves with one of the two parties, is often driven by voter polarization.

A comprehensive analysis of the individual-level preference shift has been performed by Levenduski (2008), who demonstrated that through tiny steps - that could be mistaken for measurement errors - Democrats are becoming more liberal and Republicans more conservative. These changes contribute to long-term aggregate polarization. Abramowitz and Saunders made a similar argument in 2008, debunking a widespread criticism of ideological polarization theory, that it was more than a myth than a reality for the typical American citizen. Not only has this been proven incorrect, but results were shown that “*the high level of ideological polarization evident among political elites in the United States reflects real divisions within the American electorate*” (Abramowitz, Saunders, 2008, pg. 554). The division along the lines of states and districts is something that is not relegated only to the small handful of hardcore political followers, but it instead stimulates participation and turnout among the electorate.

Counter argumentations to this theory have been made by Fiorina (2008), together with Pope, one of the original critics of the idea that political polarization was increasing and there is still division in the literature regarding the real extent of voter-policy polarization. While there is a consensus that an evident voter sorting has occurred (Levenduski 2008), the most supported opinion is that American voters remain moderate in their position (Ansolabehere, Rodden, Snyder 2006; Clinton, 2006; Bafumi and Herron 2010) and that representatives maintain more extreme ideological positions than their voters. Nonetheless, it is possible to assume that, dynamically, the emerging divergence between the two parties’ elites makes sorting more

straightforward, and the two parties will concentrate on maintaining the trust and the votes of the members of their party, disregarding the chance to “steal” voters from the opposing party. Therefore, the two parties would concentrate on maintaining the polarization acquired and attracting people towards their ideological edge.

Other external reasons widely considered a cause of this ideological polarization are increasing income inequality and gerrymandering. With our work, we are effectively trying to prove that rising economic inequality is causing an increase in political extremism, and we are going to describe this issue separately at the end of this chapter. We are just going to introduce the subject by mentioning the extensive work made by McCarty, Poole, and Rosenthal (2003 and 2006), who built a model based on income inequality and the polarization of the voter throughout the last decades of the 20th century and observed a strong correlation between the two variables. McCarty, Poole, and Rosenthal (2007) also analyzed the phenomenon of gerrymandering. Gerrymandering is defined as the practice to manipulate district boundaries to obtain an unfair political advantage, a technique that is generally applied only in a plurality voting system where the candidate that receives more votes win. Its name comes from one of the first to implement it, American politician Elbridge Gerry who signed a bill that created a partisan district in the Boston area in 1812, whose shape was similar to a mythological salamander. It is generally a term with negative connotations since it is seen as a failure of the democratic process and a symptom of the politicians’ corruption. It inverts the democratic process since politicians can, through studies, surveys, and polls, pick their voters and secure their nominations. Most of the time, this technique is used to protect incumbents from the risk of not being re-elected and to hinder specific demographics based on racial, linguistic, religious, or class discrimination. There may be two different types of gerrymandering applied in the political landscape: first, legislators could shape districts to dilute the voting power of the opposing party’s supporters across many districts; or again, they could shape those districts to concentrate the opposing party’s voting power in one district to reduce their voting power in others.

Surprisingly, by using randomly generated districts, McCarthy, Poole, and Rosenthal (2007) demonstrated that gerrymandering is not at the root of ideological polarization since the political advantage of creating these ad hoc districts is ultimately denied when the demographics change or the political perception of the area steers towards the opposing party. McCarthy, Poole, and Rosenthal also link the increasing polarization to the ease of re-election; the limited incumbents’ defeats ratio, due to the little competition, could lead to a lower interest in obtaining the votes from moderates. Lastly, between the external causes,



political sciences include the possible influence of the US's private funding method for their candidates. It is necessary to distinguish between donations made by individuals, increasing sharply in the recent period thanks to the easier forms of crowdfunding and the donation made by PACs (Political Action Committees). While PACs' level of contributions is greater than that of the individuals, we can observe several other differences between these two main funding groups. Bonica (2013) and Barber (2013) observed that ideology is more important for individual contributors than for PACs. The latter is more interested in the desired policy outcomes - something that requires and implies access and connection to the Congress members themselves, not adherence to an ideology.

Consequently, individual donors are more ideologically extreme, and this could push the parties for a swift change in their policies to attract funding from more radicalized voters (Ensley, 2009).

Moreover, Gimpel (2006) observed an increase in out-of-state donors, which are believed to be ideologically motivated. Funds received from out of state generally serve to pursue extreme policies and are given as support to a generally more polarized candidate. From that point, Gimpel elaborated that this geographical distribution of the donations could be increasing political polarization. He reinforced the idea that geography is fundamental to understand the impact and the pattern of contributions across the nation. While the GOP uses a more dispersed network to raise funds and the Democrats benefit from large social networks inside the bigger cities, both raise funds in the same city blocks without caring about the general geographic ideology. When comparing the map of the electoral results and the map of the origins of campaign contributions, the difference is noticeable, since Republicans are raising funds in metropolitan areas such as Boston and San Francisco and, on the other side, Democrats are doing the same in cities such as Houston or Dallas. The author found out that *"neighborhoods that give more to one party tend also, to give more to the other party, even after controlling for variation in wealth, other political resources, and incentives to contribute"* (Gimpel. 2006, pg.637). This finding is definitely important to understand the extent of the impact of fundraising on a candidate's success and to investigate the effect that the geography of social networks has on the electoral results. Through the different organizations and interest groups' support, the parties can maintain their electoral base; the key to winning an election is how the party manages its connection with its contributors. The political polarization is undoubtedly affected by this mechanism since the reduced variety of political positions inside candidates from the same party (that aggregates closer to the party means than they did 20 years ago) is also caused by the party's direction at a national level through their inter-state donations.

### *Internal causes*

The second main group of causes, which are the internal ones, includes both the party behavior and Congress's rules variation during recent years. Regarding the latter, Hetherington (2009) affirms that polarization inside Congress is a direct consequence of certain developments designed to enhance party leadership's power. This increased institutional power to control the legislative procedure limits the alternatives Congress members can vote on. This gives an advantage to the alternatives proposed by the majority-party leadership and contributes to nudge the representatives towards voting against or for a specific version of the bill. This way, outcomes are closer to the party's median position, which many authors such as Bonica, McCarthy, and Cox have estimated empirically to be different from the ideological center. Party pressures also translate into a more robust party agenda through the guidance and the increased power granted to the respective leaders (Cox and McCubbins 2005). When using the word "*stronger*," we refer to the possibility of creating a more precise and defined identity of the party. By eliminating doubts over the party's real ideology, party leaders would increase adherence to the party's general ideology. Party members would face more pressure to accommodate the agenda proposed by party leaders, which of course, express an ideology that indeed deviates from any type of centrist position.

Nonetheless, most of these rules and agenda changes are just starting in the Senate, given the lower number of members and the different legislative processes it serves. These explanations would then be valid only for the House's polarization, in which these rules have been implemented with success since the last two decades. However, McCarty, Poole, and Rosenthal (2006) contested that polarization measures are robust to any change brought by an enhanced agenda control and that the House polarization was not a product of this change. They express their doubts over a relation between the increased political polarization and the artificial extremism brought by the enhanced partisan agenda; in fact, this does not prove that this phenomenon does not inflate the level of polarization, but "*it casts grave doubts on the role of artificial extremism in the increase in polarization*" (McCarty, Poole, Rosenthal, 2006, pg.37).

## *Consequences of political extremism*

While many causes for the ideological and partisan polarization have been identified, this phenomenon's consequences are more difficult to describe but are nonetheless as crucial as their causes. Considering a macroeconomic environment, it is not easy to separate a State's politics and legislative procedure from an economic perspective. From a business point of view, the political aspect has always been one of the main variables to be examined (Aguilar, 1967) in light of its repercussions on business strategy, its power to modify regulations, and – in most recent times – to start litigations for social and environmental issues. More recent studies observed that different majorities inside Congress have different effects on the economic markets. Snowberg, Wolfers, and Zitzewitz (2006) empirically tested different markets and their reactions to midterms and presidential elections, finding a connection between the elections' results and the financial price variations of goods such as equity, bond, or oil. Moreover, while many of the assumptions and models that will be here presented may be applied with slight modifications to other democratic nations, the case of the United States of America is the most relevant for the global economy, since they still are the center of economic and technological innovation and are still guiding most political discussions at world level.

To delve further into the real consequences, we need to observe Congress's legislative role and see how its members' extremism affects the vote decision, the legislative process, and the necessary times to pass specific bills. Firstly, while many people assume that ideological divergence and partisan polarization have only downsides, we need to consider that, given the Hotelling model's assumption, a polarized Congress can indeed represent with more precision a larger number of voters, compared to centrist bipartisanship. In fact, with the candidates near the ideological center of a hypothetical spatial representation of the liberal/conservative axis (it may help to imagine it from -1 to 1), most of the voters that maintain extreme ideas on both sides are far more distant than those that are closer to the central position. On the other hand, if the two parties position themselves closer to half of the left or right segment (-0.5 and 0.5, if we continue with the previous numerical example), they can satisfy the needs of a higher number of voters. The distance between the center and the extreme ideology would be equal, and we would observe higher representation for every type of voter.

Furthermore, Layman, Carsey, and Horowitz (2006) underline the importance of polarization to obtain votes based on facts and future prospected policy decisions, rather than based on the personal preferences and likeability of a candidate - features that could be prevalent in a less

divided scenario. Lastly, Epstein and Graham (2007) affirm that “*when parties and politicians take clear stances on issues, it is easier for media professionals and interest groups to inform voters—sometimes quickly—as to whether elected officials are delivering on their pledges*” (Epstein, Graham, 2007, pg.16). It is nonetheless challenging to understand the real extent of the increased representation because, while more options are presented to the general public, and there may be candidates that adhere better to the ideology of a specific group of voters, the final decision over the candidates is made for several different reasons. Personal preferences, religious beliefs, and family background can shift voters’ preferences towards a candidate based on their opinion over a single policy, such as pro-life/pro-choice.

On the other hand, it is also true that, as seen by Bafumi and Herron (2010), the legislators are taking more extreme positions than their voters, creating an ambiguous interpretation of these results. It is still not clear if the appearance of more extreme legislators is a consequence of a polarized electorate or if the electorate is instead becoming more polarized due to the replacement of older members and the ideological migration towards extreme positions. Due to the literature cited and the results of the empirical analysis, we suggest that the causal effect was from the legislators towards the electorate, but it reversed in 1996, following the increasing importance of ideological migration. We will discuss the implication of these findings in the third chapter of this work.

By recalling the “checks and balances” system created by the Founding Fathers, certain authors affirm that political polarization is just a product of our time. Not only could it be controlled, but it also stimulates an intense political discussion. Iyengar and Krupenkin (2018) demonstrate that hostility towards the opposing party stimulates political participation but at the same time becomes more important than the party’s ideology itself and the affection towards the members of one’s group. While it could indeed be seen as a way to stimulate political debate, it is also creating far more negative consequences that need to be addressed. The first and preeminent, given the number of studies, is the legislative gridlock. In this context, a “gridlock” means a political stalemate, where, due to the House and Senate system, the ratio between bills passed and the political agenda of the majority party declines, actively reducing the efficiency of the legislative process. Gridlock is defined by Binder (2000) as the “*share of salient issues on the nation’s agenda left in limbo at the close of each Congress*” (Binder. 2000, pg.370). The author also recognizes the significant change in the political environment that led to the political center’s disappearance in favor of ideological polarization.

The influence of polarization is evident: due to losing the centrist members, bridges between the two political parties no longer exist, and bills that need a larger majority are no longer

achievable through an agreement between the two parties. The same author (Binder, 1999) also recognized that even the division between House and Senate (meaning the distance between their respective median position) influences the gridlock since a conflictual Congress hinders the legislative process. By identifying in bicameralism one of the roots of gridlock, the author correctly predicted that House and Senate's skewed control would have led to fewer and fewer bills passed over time due to partisan polarization. Other authors built empirical models to demonstrate the link between the growth of polarization on one side, and the increase in the gridlock effects, on the other (Lapinski, 2008). There are theories (Hacker and Pierson, 2010) about an ideological bias directly connected to the gridlock that would create a conservative impact on social policy. However, these theories have been criticized and are yet to be proven since the ideological effect seems to vary from policy to policy.

Certainly, while we can surely observe an increment in legislative inefficiency, we need to understand what legislations are being passed and their quality to assess the impact of this phenomenon. And while the legislative process does not have a conservative bias, it is unguided and tends to maintain the status quo, leaving the government unable to keep track of the modifying conditions of the general American population. As observed by Barber and McCarty (2013), public policy is not adjusting to changing economic and demographic circumstances. On that note, Lee (2015) affirms that "*the contemporary environment of intense party competition for institutional control may well foster a more irresponsible party system*" (Lee, 2015, pg.276) since parties will shift their focus towards getting re-elected and gaining an even more significant advantage in the next electoral cycle, postponing challenging and sometimes urgent decisions. Furthermore, McCoy, Rahman, and Somer (2018) give a fresh perspective on how the legislative gridlock and the democratic careening have impacted the Obama and Trump administration. In the two terms with President Obama, "*Republicans carried out an explicit obstructionist strategy against the Obama administration, and Obama made use of unilateral executive orders to implement policy change*" (McCoy, Rahman, Somer, 2018, pg.30). In contrast, the Trump administration was ready to implement changes to undo most of the previous president's achievements. So, as we have seen, the study of the ideological polarization has a substantial impact on the future evolution of the legislative process, which seems to be not able to change and adapt to the most recent social and economic crisis, lowering the trust in the government (Pew Research Center, 2019) and creating new implications for business and political experts.

## *Citizen and firm-level consequences*

There are certainly possibilities for corporations and high-net-worth individuals to influence the outcome of the election and obtain economic advantages through enacting specific laws regarding their businesses. Those economic actors should evaluate such occasions on a cost-opportunity basis, given the case-by-case consideration needed. The rising political polarization creates both a problem and an opportunity for many small and medium enterprises. Since they lack the necessary financial power and influence to create political pressure over Congress, they cannot participate in the decisional process. Still, they are more flexible and could adapt better to legislative changes, such as environmental or taxation laws. It is not possible to conduct a single analysis for the entire national economic framework since the actual consequences of legislative decisions vary from industry to industry. Nonetheless, one sector shall be thoroughly examined, given its relevance over the information processing of voters; we are talking about the mass media, information, and communication industry.

In recent years, we have seen an increasingly divided political climate, where the common mentality has become more close-minded, reinforcing an “*Us versus Them*” rhetoric (McCoy, Raman, Somer, 2018). It is common knowledge that, while a rational and constructive political debate can be useful and surely interesting for many, most prefer to converse with people who share a similar opinion and have shared knowledge, beliefs, and cultural background. Körösényi (2013) describes this phenomenon in his analysis of the Hungarian political climate during the democratic transition, as a “*camp-mentality*,” affirming that “*the stronger the camp-mentality, the more biased citizens’ information and the less objective their picture of political reality becomes*” (Körösényi, 2013, pg.20). The term “camp” here is a heritage of a long-lasting tradition of political sciences commentary originated by Schumpeter’s work in 1942, describing one of the obstacles to the perfect functioning of democracy in the camp-mentality. In his theory, people behaved in a tribalistic way, reinforcing each other beliefs and supporting only candidates and members of their own “camp.”

This camp-mentality leads to a confirmation bias around the sources of information acquired by the polarized electors, who constantly absorb information from the same environment, shaping their opinion around the products that mass media offers them.

While previous authors have considered this as a source of masses disinformation that led to a lower understanding of the political mechanism and to a lower level of functioning democracy, cable tv news, social media platforms, and other types of mass media communication need to

be attentive to this quick shift in the partisan ideology. Some of them are already doing it. Mass media's polarization is happening both at a cable news level and at an online level, where blogs and political influencers are promoting radical and extreme ideas during the electoral period. Thanks to the rising political polarization, the United States has observed an increased reliance of many politically attentive Americans on partisan sites and media channels. This trend is not exactly a novelty inside the political arena. Since the beginning of the fragmentation of news sources, with different broadcasting services and newspapers, people were already self-selecting the information they wanted to receive by choosing to devote their time to a specific "brand." This process is referred to as "*partisan selective exposure*" and is directly related to political polarization (Stroud, 2010). Defined by sociology and psychology studies as "*biases in the composition of voluntary audiences to mass communication*" (Sears and Freedman, 1967, pg.197), it has been linked to the increasing polarization, even if more recent researches suggest a possible reverse causal effect.

Selective exposure exists because it makes it easier to "*preempts cognitive dissonance, creates a favorable bias toward information from pro-attitudinal sources, fills a need to draw conclusions that fit with individuals' worldviews, and lessens the cognitive resources needed to understand or rationalize the information gathered*" (Anspach, 2017, pg.592).

From the first decades after the Second World War, the ways to communicate in politics has changed, and newswires and online news sites of traditional media outlets became influential agenda builders during election times (Feldbauer, Matthes, 2018), but selective exposure has only increased thanks to the increasing fragmentation of the information sources. Daily broadcasts, dedicated channels, and social networks fill voters every day with thousands of different information, so it is only natural that they will choose to self-select the information they want to consume. Even if taking a political stance can be the end of many business enterprises due to the risk of backlash from the opposing party, a clear ideology behind the news shown can help television, radio, and blog host to better target their public and create a specific niche of public (or diversifying towards a more extreme electorate).

While it falls outside of this thesis's scope to elaborate on the relationship between social media (and all media in general) usage and political polarization, it is worth introducing the term "*echo-chamber*," frequently used in the recent political analysis. The term describes a situation in which an individual is exposed to ideas and opinions that strongly align with his own, and the communication circulates in a closed system, where individuals are insulated from different views and direct confrontation, thus developing tunnel vision. For instance, due to how many social networks' algorithms, such as Facebook or Twitter, work, people are exposed to public

opinions that are similar to their own, and they decide to consume mass media television conformed to their ideology (e.g., Fox News and CNN, followed and taken as the primary source by, respectively, Republicans and Democrats). The media industry should carefully study the phenomenon of ideological polarization to assess the more profitable choice for their business: being able to ride the polarization wave during these years is the equivalent of breakthrough innovation in other industries.

Furthermore, the elite polarization is also influencing citizens beside their consumption habits as they are becoming more and more politically driven in their personal choices. Several studies (Iyengar, 2019) have highlighted marked differences in relationships, friendships, and even workspace interaction between Democrats and Republicans; the two parties are growing more and more distant from one another, and the behavior of their electors reflects it. From a business point of view, this will impact the Human Resources function, which will have to consider the necessary adjustment in its workforce to ensure a respectful and productive environment, expand conflict resolution methods, and select new employees more carefully. More important than ever at a decisional level, contrasts between managers hired and other employees can cause thousands of dollars in damages, and the risk is increased the more visibility the person hired has. The employees' values and beliefs could become harmful to the company's well-being and even damage their reputation with customers and suppliers.

Even from the employee point of view, the polarization effect is crucial since Gift and Gift (2015) observed that partisan affiliation inside the resume meant an increased call-back ratio in counties where the same party – respectively Democrat or Republican - were predominantly dominant. While for many medium and large firms, this phenomenon is simply a nuisance to which they have to adapt, smaller businesses, due to their flexibility, can quickly take advantage by adapting their products and services to cater to a more radicalized public.

Lastly, elite polarization contributes to the narrative of a “divided America”: numerous sources show that the American electorate is increasingly partisan and is heavily critical of its opposed party. Iyengar and its colleagues (2019) used data from the American National Election Study (ANES) to show trends in average feeling for the party participants identify with (in-party) and for the opposing party (out-party). The in-party feeling has been decreasing in recent years as a side effect of the reduced trust in politicians by ordinary citizens, regardless of their party affiliation. The out-party feeling generates the incredible growth of affective polarization; indeed, from a middle-ground point in 1980, the out-party feeling decreased dramatically and highlighted that it is the animus towards people belonging to different parties that drives the division between American voters. Levenduski (2018) analyzed the partisanship and the



patriotism of American citizens from the polarization perspective and affirms that the president, Congress members, and even state legislators are nowadays seen as partisan in their public conferences. For that reason, the increasingly polarized elites could lead to a distrust of politicians from the other party and the rejection of a call for American unity, aside from exceptional cases (such as the Twin Tower attack). This means that the consequences of political polarization could even impact the foundations of one of the greatest democracies in the world.

### **2.3 Income inequality and its effects**

It is worth introducing some of the general trends around income inequality in the United States due to this variable's centrality in our analysis. Several authors have already explored the changes in income distribution inside the American society, and many reports concentrate their attention on the dissolution of America's middle class. Indeed, the accumulation of financial resources by the top income earners dominated most of the last decade's political debates. Several practitioners point out that "*the rich become richer and the poorer become poorer*" (Reich, 2008, pg. 14), and that is certainly the case given the rising Gini index. The top 1% is taking higher and higher shares of the total income while part of the American middle class is being pushed towards the bottom income group. But why do we observe such a shift? Is it due to political changes or due to the increasing competition from foreign markets?

There are no clear answers to these questions, and authors still have to agree on the primary variable influencing this trend. Income inequality is intuitively connected to the middle class's disappearance, especially if we look at how the Gini index is constructed. There are several ties among the middle class, income inequality, and extremism, and it is fundamental to acknowledge the importance of this phenomenon in the elite polarization era.

Before introducing the discussion over the different factors influencing ideology in Congress, we need to define the process that emptied the middle class during the last decades, called the "*hollowing*" process by several authors (Alichi et al., 2017; Schettino, Khan, 2020). We define hollowing as the mechanism that moves people away from the median household income linked to the middle class, mainly towards the bottom income group, while a smaller number of people move towards the upper-middle class. This mechanism is worthy of great attention because it is generally skewed towards the lower income in developed countries. This means that an

important share of citizens is living below the median level household, which in turn means a higher poverty rate, and it is a symptom of strong social inequalities.

We also need to define the term “*class*” to avoid misunderstanding. As shown by the Current Population Survey, the Census Bureau distributes every household inside income brackets that do not strictly define its class in a sociological meaning but only concerning its economic status. Several studies revealed that since the so-called Reaganomics era (1981-1989), the country’s middle class had been slowly falling towards the bottom income group, while a small number of individuals accumulated financial resources. As explained by the literature, “*the overall effect over time has been a movement of the majority of the population towards lower levels of income and a concentration of historically very high incomes at the top*” (Schettino and Khan, 2017, pg.156-157).

A report by the Pew Research Center (2016) shows that middle-income households’ share is declining in many metropolitan areas, while its members move to expand the top or bottom income group. In their research, “middle-income” Americans are defined as adults whose annual household income is two-thirds to double the national median after such incomes have been adjusted for household size. While the disappearance of the middle class had been already studied also by the Pew Research Center before – in 2015 when it measured that the difference between 1971 and 2015 in terms of size of the middle class was an astonishing 11% -, the focus on metropolitan areas allowed the authors to delve into the core of America’s problem with income inequality. Data gathered by their research suggested that, from 2000 to 2014, “*the middle-class share decreased more in areas with a greater increase in income inequality*” (Pew Research Center, 2015). The authors at Pew Research Center also suggest that a struggling middle class could be holding back the potential for future economic growth. The correlation between middle-class hollowing and income inequality measurements is intuitive, but we need to investigate further the reasons associated with this phenomenon.

With this regard, Alichì (2017) proposes to divide the possible causes of income inequality that led to the disappearance of the middle class in the United States into two main subgroups. These causes also help us understand how income inequality could be reduced through government actions and will guide our policy suggestions at the end of the thesis.

First, the author talks about job characteristics, a topic that includes data regarding employment, type of job, and task assignments. It is crucial to understand the percentage of skilled workers and the availability of jobs for non-skilled workers inside a country. The main driver of income inequality related to the job market is globalization. It is known that increasing international

trade, lower barriers to entry, and lower salary wages in other countries, paired with the increased automation and job specialization for the inside-US job market, is disrupting a relatively stable environment.

All these factors are quickly eliminating the need for specific jobs or reducing them to lower-paid ones. The more workplaces a firm can cancel in favor of “*offshoring*” the activity, the more the increase in income inequality given the job loss and the rise in unemployment.

Simultaneously, with the advanced technology used by many multinational companies, the standardization of work duties is reducing the need for specialized workers. Many workers have become nothing more than commodities for companies, given the low level of skills required for their job. Since the competition from other countries and foreigners working inside the States (and generally accepting lower payment for their work) is increasing, the wages need to be competitive and are not following the economy’s growth, moving people downwards in the economic ladder. Furthermore, there may be other job characteristics that remain hidden but generate income inequality that leads to political polarization. Several jobs are associated with progressive environments (such as the ones related to new technologies and the media industry), while others are tendentially connected to conservative ones (such as agriculture, mining, and farming). This reinforces the geographical division between cities and countryside, highlighting another main characteristic of the states, which is very interesting to observe. Martin and Webster (2020) shed light on the importance of residential sorting for the partisan identity and the political affiliation of an individual, while Rodden (2010) confirms that population density is correlated with political polarization and party affiliation since more and more citizens living in highly populated areas vote for Democrats in comparison with the countryside.

Bonica (2014) also offered a visual comparison for political ideology between industries as an experiment with his new polarization measurement method, the CF-Scores. As seen in [Figure 1](#), the ideology of contributors to political candidates highlights a strong relationship between industry (and job) characteristics and ideology since several industries are clearly leaning towards one side of the conservative-liberal spectrum. For different industries and occupations, we can see, distributed in the domain [-2; +2], the number of donors ideologically identified that contributed to a political campaign. These examples provide a graphical explanation of certain distributions of political commitment that we found normal and natural in our everyday life and that the contribution data can prove. Academics and Entertainment industries are liberal, while Banking & Finance, Agriculture, and Real Estate are right-leaning. There may seem to be a clear connection between the characteristics of the work environment and political affiliation.

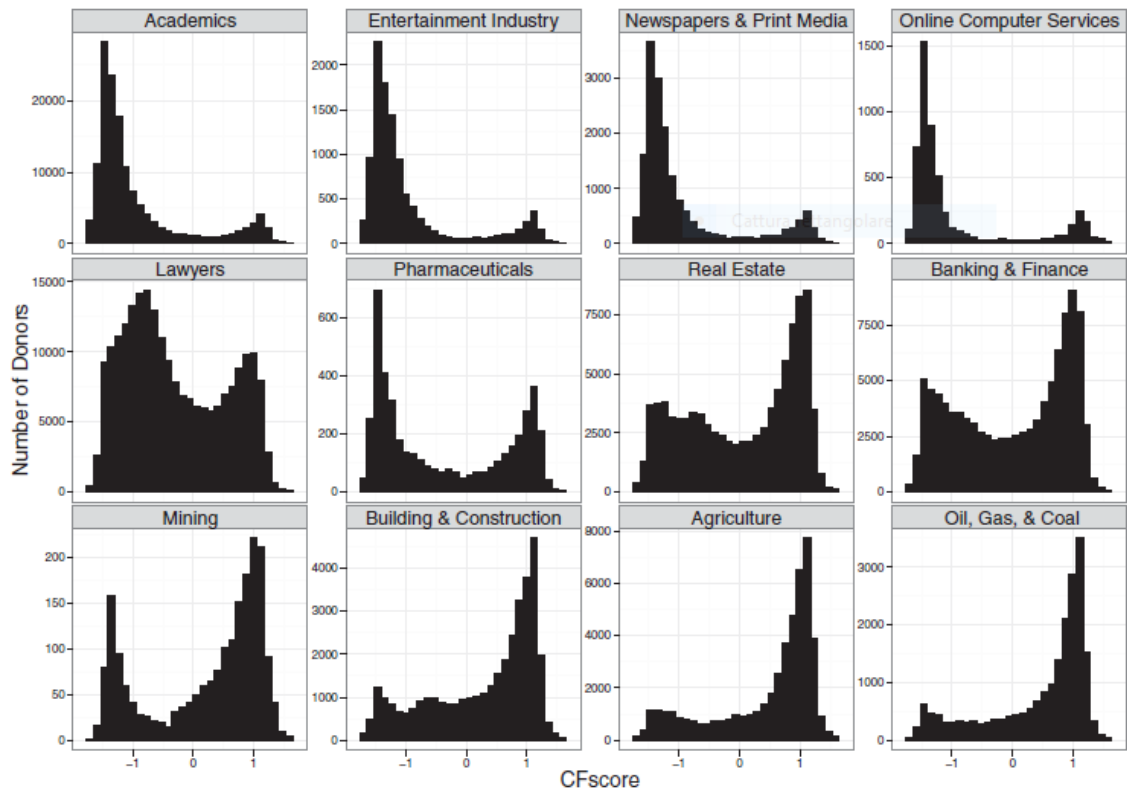


Figure 1, *Ideological distribution of industries/occupations*, taken from Bonica, 2014, *Mapping the Ideological Marketplace*

The second variable that Alichy (2017) uses is personal characteristics, such as age, education, and other similar socio-economic factors. We will concentrate our efforts on this group of variables during the data gathering part since our instruments for the Instrumental Variable method needed a relation with the income inequality, but not with our measure of political extremism.

The rate of children born to unmarried mothers is generally considered a proxy for family stability, one core information needed to observe the troubles that the next generation will face. In fact, “*children in lower-income, single-parent families face the most significant barriers to success in school and the workforce*” (Mather, 2010). One of the state-level information recovered, which was then deemed unfit to be used as an instrument, was an index regarding the citizens of a State’s education level. The two facts that are well documented regarding educated people (which generally mean whoever obtained a college degree) are that they are more likely to receive higher income and tend to be more moderate in their political opinions. For this reason, we could not use it as a proxy for income inequality since it would have also been correlated with the dependent variable.

Several authors have talked about how education impacts the income level in every country around the world (De Gregorio, Lee, 2002). Due to the lack of a family to support its needs, child poverty increases the probability of high school dropouts or failure to obtain a college degree. While there are people who strive even in dire conditions, data shows that single-mother families are less likely to be able to provide a successful transition for their child into adulthood (Mather, 2010). The level of healthcare has also been proven to influence income inequality since health is one of the few components of the family budget that gets more easily cut when other primary needs necessitate more attention.

### *The movement from the middle class*

To correctly understand the real impact of income inequality, we also need to divide and analyze separately the two movements that contribute to the “hollowing” of the middle class. There are indeed confounding factors related to the analysis of middle-class composition and income inequality that we need to address. The movement of middle-income households and individuals can direct itself towards the bottom-income or top-income groups. This movement is a dependent function of the job and personal characteristics, as described above since they determine the effects inside the job market and, consequently, the state’s political polarization.

The downward movement has some intuitive components such as the level of job standardization, the possibility of offshoring the jobs in a specific state, and the upward effect is mainly driven by age (and experience obtained) and by the attained level of education. Alichì (2017) also finds that richer states (those with higher median income) are also the ones with a larger middle-income class and a lower polarization level. The latter finding is of the utmost importance because the level of polarization has always been historically correlated to a country’s richness, with wealthier states having a lower income inequality level.

Milanovic (2012) explains, using household data of more than half the countries of the world, that higher median income means a lower level of income inequality by comparing BRICS countries (Brazil, Russia, India, China, and South Africa) both with the United States and major European countries.

Kenworthy (2013) suggests that the world’s richest democracies have experienced a rising income inequality due to the concentration of income share in the top income group. At the

same time, the top-level income inequality is not a very good predictor of growth (decrease) in middle-class incomes. While other effects influence that measurement, the income inequality distributed towards the top income groups is worrying, such as the middle class's dispersion. The impact of income inequality has been "*overshadowed by the impact of economic growth and of changes in net government transfers*" (Kenworthy, 2013, pg.112), but it is not something that will be balanced in the future decades. The downward spiral could continue for years and contribute to creating a very stratified society, bringing advanced countries back and raising a wall between the top and bottom income that will not be quickly passed. These findings contradict the followers of Reagan's policies and the trickle-down economics, suggesting that the difference in growth between the net worth of the 1% versus the average citizen, while not modifying the percentage of middle-class citizens, is creating a less equal society.

The rising income inequality has some implications in the socio-political environment. Changes in the electorate composition can influence how politicians present themselves to the American public and how they position themselves on the ideology axis. While it is undoubtedly true that there is some self-segmentation of the electorate after the positioning of Congress candidates, we have seen that most of the political polarization in the last decades, compared to the Reaganomics era, has been driven by ideology migration. As we will see in the next chapter, the extremism measure we identified was stronger during election years and slightly lower (relatively to the period-growth) during non-presidential-election years, signaling a strong effect of the party affiliation during the moment that tends to unite in two different blocks the citizen of the country.

Nonetheless, the growth in extremism of congress members initially trailed income inequality and now is rising faster, connected to the middle-class disappearance. The shift in the electoral composition also has consequences on politician ideologies and agendas, which need to be adapted to new situations to maintain the seat. The most recent example is the wave of radical democrats affiliated with Bernie Sanders that gained a massive amount of support during the 2016 and 2018 House elections. Their strength comes from the ability to connect with groups of electors that, due to the socio-economic environment, do not feel in touch with the already existing position of both parties' candidates.

Our analysis will try to prove the causality between income inequality and polarization. Still, the consensus is that the income inequality's sharp increase started at the end of the Reaganomics era (1981-1989). Many suggest that to be the result of President Reagan's failing economic measure and, later, President Bush. But the complex growth of political

polarization in the American public is not following precisely the trend of income inequality, which slowed down its growth curve during the late 1990s to then increase again after the last economic crisis due to the Lehman Brothers' bankruptcy. The political polarization grew more and more during the recent decade, and it has spilled over the everyday life of citizens.

Having assessed the increasing divergence between the top and bottom income group is related to the disappearance of the middle class, and that there is a downward spiral related to intersectionality creating a vicious negative cycle for those more disadvantaged (Schettino, Khan, 2020), we need to address the consequences of income inequality in the economic landscape. Several authors (Furman, 1998; Dabla-Norris, 2015; Rozer and Volker, 2016; Oishi, Kesebir, Diener, 2011) have observed that rising economic inequality can lead to several social costs.

First, inequality is creating credit constraints for the bottom-income population and thus impacting their choices of investment. Poorer citizens may choose not to pursue investment in education or small and medium-sized enterprises since the perceived risk is too high. Even with the availability of loans to support their financial needs, they prefer to deviate their funds towards fulfilling other primary needs (such as housing). Furthermore, when inequality persists for a more extended period in an advanced economy, it can foster a crisis period by intensifying leverage, overextension of credit, and relaxation in mortgage-underwriting standards.

Second, several macro-economic growth drivers are impacted by economic inequality, and higher percentages of national income in the hands of the top-income earners slow down a country's growth. This skewed distribution of incomes could remove the ability of lower-income households to accumulate physical and human capital. As mentioned above, due to the increased risk adversity of bottom-income households, we will observe a lower investment in education, lower investment in health, and a greater reliance on the parents' earnings, reducing generational mobility.

Third, income inequality also has a direct impact on citizens' wellbeing. Higher-income inequality is associated with ill health between adolescents and young adults, and while Rozer and Volker (2016) find no evidence of an impact of income inequality on the health of older citizens, they suggest that the effects of lower health during development years bear a risk over the wellbeing of the individual. Lastly, income inequality created a lack of trust and perception of unfairness in the bottom-income earners, making those people less happy than top-income earners.

## 2.4 Measuring political polarization

Having explained the process at the roots of ideological polarization and its consequences, we will now introduce the most preeminent polarization measurements present in literature to create a common framework on which this work is built on. Most of the studies on the issue use a framework that was first introduced by Poole and Rosenthal (1985, 1991) and later perfected by the same authors in 1997 with Nolan McCarty's help. This method, called NOMINATE, allows the researcher to use the roll-call voting records to "recover the ideal point estimates of legislators" (Bonica, 2014). From that moment on, the ideal point estimation and NOMINATE use have been central to the theoretical discussion around the roll-call voting analysis. Several later authors found it useful to insert other variables of interest in the study of the political positions, as we will see with more precision in the below. NOMINATE starts from two simple premises to then apply the multidimensional scaling techniques to political data:

- First, it projects the voting choices on a simple Euclidean space (with generally two variables);
- Second, it assigns each individual a utility function that is normally distributed and is maximized in their ideal point.

With this method, since individuals most desire outcomes closest to their ideal point and tend to vote for the closest outcome, we can probabilistically determine their vote. The dimensions most frequently used are those that shape the vote of the Congress members and are the liberal-conservative spectrum on economic matters, which roughly can describe some of the parties' position over this topic, and the attitude on the issue to be discussed and that needs to be voted for or against. To understand how the model works, we can help ourselves with the first researches on spatial models for politics that originated in the second half of the 20th century. We can imagine political choices as described by MacRae (1958). He suggests that an analyst who wants to account for political choices can imagine that each chooser (or voter) occupies a fixed position in a space of one or more dimensions. From his point, every choice that he has to face is a choice between two points in the defined space. In its statement, MacRae was



suggesting that we should consider the matrix space as the result of two different sets of variables - an ideal point for each legislator that represents his or her vote preference or ideology, and separate “*yea*” and “*nay*” locations for each roll call. Legislators are assumed to have an ideal point on each dimension, along with single-peaked and symmetric preferences. The maximization of the legislator’s utility function is done by voting for the bill that minimizes the distances between their ideal point (the top of the bell-shaped utility function) and their “*yea*” or “*nay*” locations. This type of spatial analysis has also been used alongside Poole and Rosenthal’s model to expand on the geographical breakdown of polarization (Walter, Wing, 2010). A model with two variables is also easier to represent graphically and highlight the trends and divergence points. Generally, a graphical representation is used to show the results of the NOMINATE application and cluster the results on a -1 to 1 axis, where -1 is liberal, 1 is conservative, and 0 is the definition of moderate. This method has evolved over the years, and with the appearance of new and more advanced computing techniques, the W-NOMINATE and the DW-NOMINATE (which stands for dynamic weighted) are currently used in many different forms alongside different variables. Numerous authors have used W-NOMINATE (McCarty, Poole, and Rosenthal, 2006) or DW-NOMINATE (Hetherington, 2001; Theriault, 2006) to study the phenomenon of polarization of the US politics empirically, and it has been useful to determine trends and variations during the different legislatures.

W-NOMINATE scores are based on the spatial model of voting, and those scores are obtained thanks to a Weighted Nominal Three-step Estimation. It is a scaling procedure that performs parametric unfolding of binary choice data. Given a matrix of binary choices by individuals (in our example, the “*yay*” or “*nay*” choice) over a series of Parliamentary votes, W-NOMINATE produces a configuration of legislators and outcome points for the Yea and Nay alternatives for each roll call using a probabilistic model of choice, predicting the ideological position of each legislator. Between the different applications of these multidimensional scaling techniques, one issue has been considered with particular attention from US experts: the impact of candidates’ contributions on polarization. While money and politics have always been related, it is essential to understand the extent of the effect of PACs’ contributions on the different choices made by, respectively, the voters and the political establishment, both in terms of incumbents and of new candidates. The relevance of contributions has increased due to the highly motivated interest groups’ donations with moderate use of newly allowed instruments for campaign donations, such as crowdfunding, that eliminate part of the leverage argument over the fundraising campaigns.

To get a better understanding of the impact of this dimension and acknowledge the demographic and main political interests of the contemporary donor, we can quickly review the analysis made by Hill and Huber (2017), which allows us to evaluate the motivation of donors by matching two different variables considered: the contribution and the voting pattern. Their research states that “*donors are less demographically diverse, older, wealthier, and better educated than their fellow partisans.*” (Hill, Huber, 2017, pg.25). This confirms a pattern that had been previously established (Ensley 2009; Bafumi and Herron 2010) by analyzing the ideology of donors; the authors add the following finding “*furthermore, they participate at higher rates and hold more extreme policy views*” (Hill, Huber, 2017, pg.25). Lastly, donors decide to contribute not based on their ideological proximity but by looking at the dynamic of a two-party system competition. They are using their contributions as complements to participation in elections. These conclusions do not coincide with other donor analyses, such as the one made by Barber, Canes-Wrone, and Thrower (2017); the latter authors found out that it is the parallelism between a senator roll-calls and the donors’ ideology that influences the contributions. Furthermore, there is a special interest for Senators involved in a committee that is legislating over matters that are strictly related to the donors’ day-by-day activity/work. As Hill and Huber do, this difference in the results can be explained by the different methodologies used during the two studies. In particular, Hill and Huber’s research is articulated around donors’ decision to contribute to a specific candidate and, vice-versa, for non-donors to abstain from this contribution. For this reason, both studies are valid for the observation of the contribution pattern and can shed light on the two main issues regarding donors that need to be examined in future studies on the topic. First, we need to acknowledge the more ideologically extreme donors as the status quo and understand two implications of this statement: why centrists are not involved in the fundraising for candidates in the same measure as the ideologically extreme individuals and how is the behavior of the candidates for Congress modified by the impact of donors. Centrist reluctance to give money to candidates that diverge from their position could be explained by simple spatial models obtained from the earlier Downs theory on the political competition. Due to the increased polarization of the political elite, the classical model in which the centripetal force prevails is now obsolete, and we could imagine the current political climate in the US as a two-curve function, clustered around the Republican and the Democratic ideology in terms of economic policy. Given the prevalence of the centrifugal force, we could speculate if this polarization is the cause for the ideologically extreme donors or if, vice-versa, it is just an effect of the relevance that fundraising has always had on the electoral race.

This brings us to the second and most important point; we know that these findings have potential implications for congressional members' incentives, but we still have to understand the full extent of this influence. Bafumi and Herron (2010) recognized that ideological donors are even more extreme than partisan voters, and we acknowledge that incumbents desire to remain seated and would like to obtain the necessary funding from these high-net-worth individuals or politically oriented committees. To solve this complex dilemma, we need to obtain a measure of the contributions to candidates which is deeply connected with the ideology of both the candidate (it does not matter if we are talking about an incumbent or not since both have to begin in most cases a fundraising campaign) and of the donors. The first example of a similar model is the one made by McCarty and Poole (1998). In their paper, they built a simple spatial model that has been the basis for the subsequent analysis of the contribution for candidates. By connecting the previously seen NOMINATE model with the database for the Political Action Committees and the tracking of their donation, the authors further modified their measurement of ideology by creating a model called PAC-NOMINATE, based on three different phases for the estimation of the parameters that, as in the NOMINATE model by Poole and Rosenthal, are such a large number that the simultaneous estimation would be too difficult. This model was an innovation in the field, one of the first retooling of the original NOMINATE model. It has been the prominent model for estimating PACs' contribution to the first decade of the 21st century. By slightly modifying NOMINATE with certain simple variations, the authors were able to create a model that mirrors the roll-call voting data; they solved the choice of donors by creating a series of binary votes between incumbent-challenger pairs, and in this way, "*they were able to scale PAC contributions*" (Bonica, 2014, pg.368). Nonetheless, the estimation of the ideal PAC-NOMINATE point has been criticized by literature for certain doubts about the measure validity. The binary choice presented by the PAC model has been useful only in electoral competitions where there has been somewhat intense competition and, since most of the incumbents generally face small competition with lower finance requirements and fundraisings commitment, the model has not been able to assess with precision the ideal point for all the other electoral races, which cannot be considered just outliers of the model since they have been the majority in the last election cycles.

Bonica (2013) analyzed the 2008 House elections to determine the extent of the divergence between PAC-NOMINATE precision and the real contributions to the single candidates. Just 139 House incumbents (a mere 32%) faced a real competition, which was deemed so by observing challengers that raised more than \$ 100,000 for their campaign. At the same time, the average amount of funds raised by unchallenged incumbents was 83% of the money raised

by incumbents that faced more vigorous competition. These points raised some serious questions about the methodology applied for PAC-NOMINATE and stimulated the literature to find an alternative to enhance their tools' precision. On these conclusions, Bonica elaborated his theory between 2013 and 2014 and built a new model to estimate the ideal points and the contribution finance scores for donors.

For this analysis, we will focus on the data collected and used by Bonica in 2014 and on his innovative measure of campaign finance scores, so we will briefly explain how he changed the viewpoint on donors and their ideology by introducing a new framework to observe them.

### *Bonica's contribution to the theoretical framework*

Starting in 2013, with his paper "*Ideology and interests in the political marketplace*," Professor Bonica used a generalized IRT (Item Response Theory) to estimate ideal points from contribution data. This innovative approach had three main benefits over previous models. First, it changed the pair composition from the PAC-NOMINATE incumbent-challenger to arrive at the contributor-candidate level. This allowed for the analysis of the outliers mentioned above, all those candidates that were not enclosed in the previous model, such as "*safe incumbents who do not face serious challengers and losing candidates in competitive primaries who do not continue on to the general election*" (Bonica, 2013, pg.295). Second, by using the contribution measure and not just the binary vote decision, Bonica enhanced the ideal point estimates' precision. Third, the IRT framework, initially developed for the educational testing literature, could accommodate non-spatial covariates. The importance of this last benefit is not to be downplayed since it is known that there are numerous variables, such as committee assignments and incumbency status, that are known to influence contribution patterns.

While NOMINATE has been a revolution for analyzing legislative behavior, this approach is innovative for the analysis of the contribution behavior. The substitution of the roll-call measures in favor of the Campaign Finance scores changes the perspective and allows a more comprehensive approach concerning the candidate's ideology. In fact, "*contribution decisions reflect the many ways in which candidates express their ideology beyond how they vote*" (Bonica, 2013, pg.308).

This contribution approach's relevance is increased when we think that, while the analysis of roll call votes is limited to the legislatures, money permeates all the American (and non-American) politics. This means that every author could use the IRT equation derived by Bonica to determine the ideology of candidates and political actors at the state level.

In 2014, Bonica acknowledged that he would need a different methodology to analyze larger data sets. The newly created method, while in general similar to his previously developed IRT equation, could scale a comprehensive database of contributions. The author started his research with a simple and generalized assumption that has been stable in the spatial models applied to politics: the ideological proximity hypothesis. Based on this statement, contributors will finance the candidate closer to their ideological position and distribute funds according to the candidate's ideology.

Bonica introduces a new term to indicate the ideal point estimates derived from his ideology measurement, called "*common-space campaign finance scores*" (CF scores). He achieved the objective laid down as one of the critical advantages of the contribution analysis: the creation of a unified framework for measuring the ideology of political actors engaged in American politics. Furthermore, not only he created a common space to place every stakeholder in the political market in the US, but it opened new research areas over the ideological preferences of the different donors intervening in political campaigns (interest groups, corporations, high net worth individuals).

In the opinion of the author, the common-space campaign finance scores represent a "*breakthrough in our ability to empirically test theoretical models of legislative and judicial behavior, electoral competition, and interacting institutions*" (Bonica, 2014, pg.383).

While the possible fields of research that could benefit from this approach are several, in this work, we want to focus on Bonica's method implication on the analysis of ideological polarization. First of all, by creating a common benchmark to evaluate the position of different state and federal level political actors, it allows subsequent research on the trend and ideology pattern throughout the years. Then, by offering a method that applies to extensive datasets, it provides the opportunity to study different levels of American politics and identify with higher precision the recursive action of specific stakeholders in the political market. Indeed, many corporations and interest groups continue in their donors' actions to certain types of candidates through decades, allowing better identification of these entities' scope and the effect of their donations on American politics. Most importantly, the ideal points are also recovered for the non-winning challengers, which is the key to resolving the "*missing centrist*" dilemma.

While many theories (well summarized by Barber and McCarty (2013)) have explored the external and internal reason for the disappearance of moderates from the Congress, little to no research considered whether there is, or not, a specific reason for why no new moderates have been substituting the existing members of the Congress and the analysis of candidates that did not obtain a seat is critical for this aspect.

### **3 Empirical analysis**

This section presents an empirical analysis based on the CF-Scores of the candidates elected in the election cycles between 2000 and 2012 to assess causality between the rising income inequality and the increasing extremism of Congress members. Our work will complement previous author exploration of the topic by connecting extremism of the single Congress member to income inequality in their electoral base. Through this process, we intend to link a specific measurement of social inequality to candidate extremism, and we will be able to suggest different policies through which the government could tackle income inequality and, consequently, political polarization at the Congress level. In order to do so:

- First, we will explain the theoretical background on which we lay down our assumptions and hypothesis;
- Next, we will introduce a linear model with the use of Instrumental Variables (IV), explaining how we built it, and we will perform the necessary tests to confirm our initial hypothesis;
- Lastly, after having verified that our assumptions are correct, we will present a swift summary of the empirical results.

#### **3.1 Data collection**

Data comes from three extensive databases that contain all the information regarding the Congress members across the years and the corresponding socio-economic indicators inside this timeframe. We will use the DIME database, which is the Database on Ideology, Money in Politics, and Elections, to extract information about the political ideology of a Congress member (which means his positions on the liberal/conservative spectrum), his incumbency status across the electoral cycles and other information regarding the contribution received during his or her campaigns. This collection of measures over the candidates and the contributors both at a state and at a national level was the necessary complement to Bonica's paper "*Ideology in the Political Marketplace*" (2014) and is a great resource to investigate campaign finance and ideology in American politics. By mapping the candidates through the CF-scores, Bonica gave a numerical value to the candidates' extremism. We will apply that measure inside our model, remembering that negative numbers reflect liberal positions while positive numbers indicate conservative positions. We will then use the database "Historical

Congressional Legislation and District Demographics 1972-2014” recovered on Harvard dataverse and made available by Foster-Molina (2017) to retrieve information over the income inequality associated with each electoral district. The dataset provided the income distribution for different brackets of the electoral district voters and the corresponding Gini index, which we will use as our proxy for income inequality. Lastly, we will obtain the necessary information on family ad health from the CDC (Center for Disease Control and prevention) publications that have occurred monthly and yearly since the first year of the period considered. Lastly, we used the official government websites to recover additional information needed to understand Congress elections’ processes.

First, we created a subset of the information given by Bonica (2014) and Foster-Molina (2017) to obtain only the data that we need for our analysis. We chose to focus on Congress members’ analysis to concentrate our effort on the second phase of political polarization. The literature already detected two different drivers, and we want to explore the connection between ideological migration and rising income inequality. Not only this period has not been thoroughly examined by the literature due to the lag between election cycles and the necessary data-gathering period, but it will also strengthen the connection made by several authors that connects the aftermath of Reagan and Bush economic policies to the rise of both political extremism and income inequality.

We decided to study a reduced form model to observe how our predetermined variables (such as the Gini coefficient) influence Congress members’ polarization. Our choice reflects the interest in explaining how polarization trends at the elite level differs from mass polarization. We are indirectly examining a variable that is unobserved and less explored by the literature: the voters’ ideology. Indeed, most authors concentrated their efforts over the identification of pattern and causes of elite polarization, due to the difficulty of analyzing a very heterogeneous population. Inter-state mobility, the high influence of independent or unregistered voters and the prevalence of single-issue voters complicate the process of data collection and analysis. While our thesis is also focused on elite polarization, we chose to analysis the winners of Congress races to investigate further the pattern for voters’ preference in terms of ideology across the years. Indeed, Congress members reflect the vote of the American citizen, and we are expecting a vast influence of income inequality on our extremism measure. Several authors have underlined that extremist wings of parties observe growth in popularity and following during a period of economic instability and rising inequality (McCarty, Poole, Rosenthal, 2006; Garand, 2010; Dorn, Fuest, Immel, 2018; Engler, Weisstanner, 2020). The causes of this voters polarization are still being discussed, but the widely accepted opinion (Bullocks, Williams,

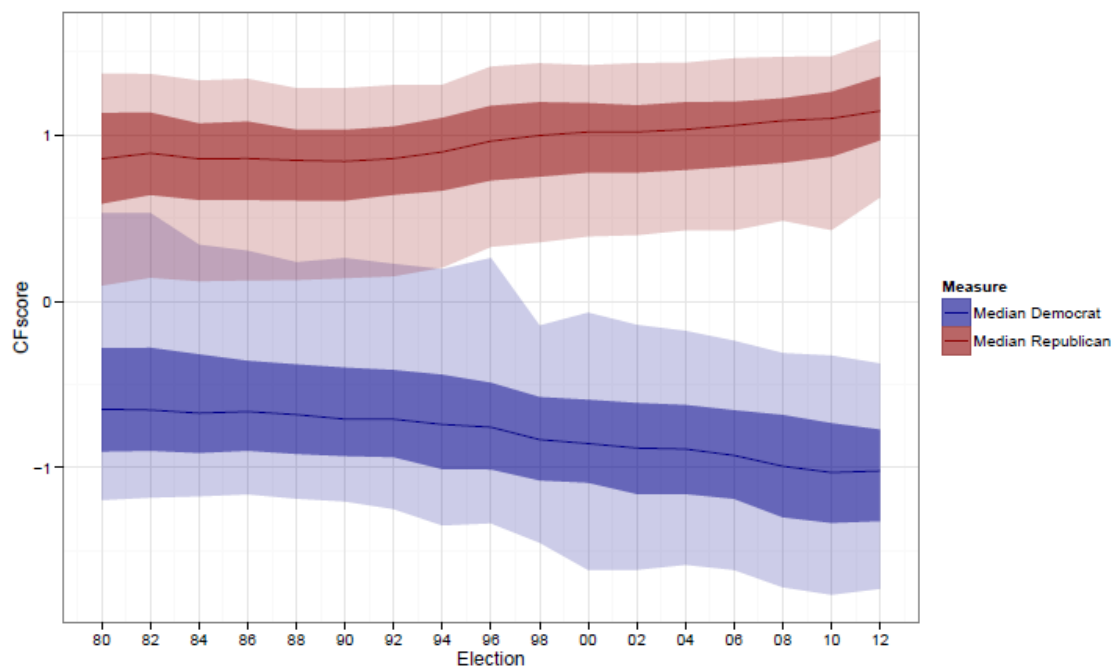


Limbert, 2003) is that voters react towards perceived income inequality by looking for a political position that expands social and welfare policies (which are generally positioned at the extreme of the right-left spectrum). For that reason, we considered only the ideology of the Congress members elected through the Federal Elections for the Senate and the House of Representatives.

Every two years, US citizens vote to elect all the 435 members in the Chamber of Representatives and roughly a third of those of the Senate (since every Senate member is elected in classes and remains in a seat for six years). It is important to remember that, while every State has two Senators to represent itself in the Senate, the House of Representatives follows a different procedure. Every State has at least one Representative, but every ten years, based on the Census of Population, every State is divided into districts based on its population, and it will elect a number of Representatives proportional to its population. So, inside the House, there is a strong imbalance between larger States (such as California or Texas) and smaller States (such as Wyoming or Vermont). We reduced the vast information on every candidate only to the seat's winners from the DIME database, and we included the data from the other two datasets. By removing four outliers from independent parties over the years and the non-voting representatives elected by the permanently inhabited territories of the United States (which are Puerto Rico, U.S. Virgin Islands, Guam, Northern Mariana Islands, and American Samoa) and from the District of Columbia, we obtained 3273 ideal points distributed along the seven electoral cycles included in our analysis (from the 107th Congress to the 113th Congress). Every ideal point is also connected to a set of information such as the State and party they belong to, the incumbent or challenger position, the party it originally belonged to, and several other characteristics. By using the dynamic CF-scores, we will consider only period-specific ideal point estimates, and we will obtain a more precise measurement of the effect of social inequalities on Congress members' political extremism.

To define a dependent variable for our analysis, we will adopt a definition of political extremism to measure the divergence from a centrist position. As the CF-scores vary between the liberal and conservative positions, represented respectively by the -2 and the +2, the extremism measure will simply be the absolute value of the distance between the ideal point and the centrist position. In this case, the center is represented by 0, so the process is even more straightforward. By using an absolute value, our model will not suffer from the sudden shift from a very liberal to a very conservative candidate. We will only measure the change from a centrist position and not the distance on the liberal-conservative axis, which could be a source of misinterpretation of how elites are becoming more extreme.

Unlike previous authors (Voorheis et al., 2015), we do not directly compare the two main parties and their respective polarization trends. For this reason, we are not applying a measurement of inter-party polarization, which is the distance between the median Republican and the median Democrat in each electoral year. The main reason for this choice is to avoid any distortion caused by the relative stability of a party's ideology position compared to the other's movement, leading to the false conviction that both parties are polarizing themselves. Furthermore, this allows us to look at the extremism in Congress issue through a different lens and not by merely comparing the two parties' medians, a quick and simple analysis already done by Bonica (2014) and shown in [Figure 2](#). This graph shows both the median position of Democrat and Republicans and the distribution of ideology around that median Representative, which represents partisan affection and the radicalization of Congress members. As we see, the two parties diverged from the beginning of the 1980s, and the variation of the ideal points, represented by the two ribbon bars plotted at 25th and 75th percentile, has reduced. From the mid of the 1990s, nearly no Congress member from both sides held a position too close to the ideological center.



[Figure 2](#), *Party Medians and Distribution for Members of Congress*, taken from Bonica A, 2014, *Supplemental Materials*, downloaded from < <https://doi.org/10.7910/DVN/UQLKRY>>

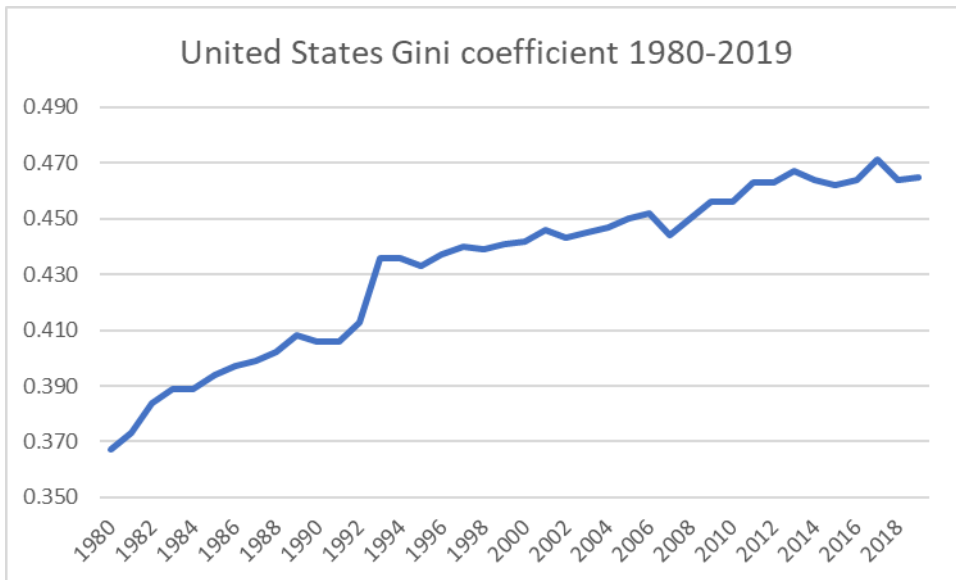
To test our hypothesis of a correlation between income inequality and Congress extremism, we had to look for a representative and widely applied variable in the literature. The obvious choice was the Gini index constructed by the Census Bureau through the answers collected from their

surveys (mainly the Current Population Surveys). The Gini index obtained from the Census Bureau is nationally representative of the entire US population and is the most efficient way to recover an estimate of income inequality in the population of all income earners.

The Gini index is a measure that is old but still widely used by several authors in the literature about income inequality, given the easiness of interpretation of the results just from a first glance.

Firstly introduced in 1912 by Corrado Gini in his work "*Variabilità e mutabilità*", the Gini coefficient, also referred to as the "Gini index," was used to measure the income distribution between families. A Gini coefficient of 1 (practically impossible to achieve) would mean that a single-family earns all the income, while every other family in the economy does not have any. A Gini coefficient of 0, on the other hand, would mean perfect equality in the distribution of income among all families in the economy. This means that the higher the Gini coefficient, the greater the income inequality among families in the economy concerned. The Gini coefficient is generally defined through the Lorenz curve, an economic instrument defined in 1905 by Lorenz that plots the proportion of the total income of the population that is cumulatively earned by the bottom  $x$  of the population. It is a probability plot and, by changing the axis variables, could be used to calculate other measures of inequality in the distribution of a parameter. The Gini coefficient is an easily interpretable measurement; it still bears some complications when comparing countries with different demographic patterns. Indeed, baby booms or aging populations increase the pre-tax Gini coefficient but do not actually impact working adults' real income, leading to misinterpreted results.

The Gini coefficient also has some limitations. First, it has a downward bias for small populations and is significantly influenced by the granularity of measurements. Second, its accuracy is limited when considering an economy with benefits and income coming from an informal economy. It cannot capture the value of those goods that are subsidized by the state, such as housing, medical care, education, or other such services, and it needs to rely on subjective assumptions that may or may not be correct. The Gini coefficient has been steadily growing inside the United States. While different States and districts have different growth patterns, the increase seems to be consistent over the years. We can see in [Figure 3](#) the pattern of growth at a national level through the years.



**Figure 3.** *United States Gini coefficient 1980-2019.* Extract from Table A-5. “*Selected Measures of Equivalence-Adjusted Income Dispersion*” made available by the Census Bureau on its website, 2020.

There is an endogeneity issue related to our Gini coefficient that we need to mention. While we want to demonstrate the causality between income inequality and political extremism, we cannot exclude that at the same time, the more extreme legislators are contributing to the increase of income inequality in the United States. Indeed, previous findings of different authors suggested that there could be bi-directional feedback between income inequality and political polarization (Bartels, 2008; Duca, Saving, 2016). Examples such as the New Deal (Duca and Saving, 2016, pg. 447) are brought as possible interaction between federal policies and inequality. We are in the presence of one case of endogeneity in our model: simultaneity. Simultaneity is where the explanatory variable is jointly determined with the dependent variable. If simultaneity exists, estimating our model with ordinary least squares (OLS) would produce biased and inconsistent estimates. Given the credible source of endogeneity in the Gini coefficient we are using, we introduce here two different variables that we will use as

instruments in an Instrumental Variable regression. Both these variables will be examined and studied under a theoretical lens in this chapter before being applied in the next one.

We focused our analysis on the health and family area for three main reasons:

1. An individual's health and well-being (partially correlated to the family status) are strongly linked to the income level available.
2. The household, the family status, and the stability of relationships are all related to the income distribution between individuals.
3. There is not a clear connection between family composition, health, and extremism. At the same time, other variables may directly impact our response variable Y (the extremism measure) and not interact with it only through our explanatory variable X (the Gini coefficient).

While we explored possible variables, we managed to avoid some pitfalls related to our instruments' choice. We decided not to consider any information that was related, directly or indirectly, to the job market or the citizen's primary occupation in the area. As Bonica (2014) and other authors noticed, there is a pattern between occupation and political ideology, so we avoided socio-economic measures connected to that field. By applying a larger framework and looking for data beyond the basic economic ones, we can identify areas that are strongly influenced by the level of income but cannot be traced back to the political ideology.

For our first instrument, we investigated the data regarding the health and well-being of American citizens. The discussion around healthcare and the comparisons between European and American models have been the main staple in the United States citizens' everyday lives and the Congress debates of the last 20 years. It is also a topic that has been discussed in the literature by many authors (Kaplan et al., 1996; Kawachi et al., 1994; Kawachi, Kennedy, 1997), who have talked about the relationship between health and rising income inequality and found an association between these two variables. The relation between income inequality and health seemed very clear in the first years of the 21st century: higher income inequality meant worse health indicators in the overall United States population. Our choice of instrument in this field was guided by the necessity of avoiding any possible ambiguity in the relationship between income distribution and our chosen health indicator. We started by looking at variables that could not reflect personal or religious choice but were instead the product of the income group

the citizen belongs to. One clear example of an adequate indicator is given by the mortality indexes, already proven to be correlated to income inequality in the past (Kennedy et al., 1996).

We chose a well-documented and renowned index for our instrument, the IMR (Infant Mortality Rate). This index is expressed as a ratio between the number of deaths of children with less than one year and 1.000 live births. While in the past different authors (Wilkinson, Pickett, 2008; Olson et al., 2010) found proofs about the positive correlation between income inequality and Infant Mortality Rate, more recent findings (Siddiqi et al., 2015; Siddiqi et al., 2016) actually contradict those results and observe a negative relation between Infant Mortality Rate and income inequality. This finding is undoubtedly more in line with the data trends regarding income inequality (that has been rising for the previous 30-35 years) and Infant Mortality Rate (which, in contrast, has been steadily declining). This surprising result is actually obtained by analyzing the previously unobserved effect of income inequality over this indicator.

Indeed, previous authors focused on the effect that a lower financial availability had on several factors that affected the first year of a children's life. The lack of access to high-quality facilities for giving birth, the lack of education in the parents, and the limited support during the first year of life of the baby lead towards a sharp increase of this value, in their opinion. In turn, Siddiqi (2015,2016) explored other potential consequences of income inequality, given that previous authors (Coburn, 2000) reinforced the idea that the influence of income inequality on health parameters was dependent on societal conditions, such as social and welfare policies. Not only are there determinants in the population's characteristics and the improved social policies of the United States that invert the expected influence of income inequality on IMR, but there may be other causes at the societal level that Siddiqi suggests. Indeed, in many cases, income inequality pushes people in the bottom income group to wait to have their first child (or to have more) until their financial situation becomes more sustainable. In that way, rising income inequality has a lagged negative effect on Infant Mortality Rate by reducing the fertility rate and guaranteeing that parents are more prepared for their child's birth. This result is counterintuitive since we generally expect a higher income inequality to be associated with worse health parameters. Nonetheless, both the last 30 years trend and the empirical analysis of the interaction between the two variables confirm a negative correlation. We identify the reason in the reduced impact of income inequality on health, compared to the impact on other social variables. As we mentioned before, income inequality contributes to postponing the decision to have children. It does influence the preparation of future parents, allowing them to collect the

necessary means to raise their children in a safer and more protected environment. This decision also influences hospital choices and preliminary appointments before giving birth.

Given this evident negative influence of income inequality on the IMR, we are sure that this variable could be our first exogenous instrument for our Instrumental Variable regression. Every year's IMR was recovered from the Monthly Vital Statistics Report published by the CDC, specifically from the Advanced Report of Final Mortality Statistics every year from 1979 and 1994. We recovered later years from the Federal online system Wonder.

The second variable we obtain is derived from the broad field of family statistics published by the CDC. These data help us understand family stability and the trends related to household composition. It is proved that there is a positive relationship between the increase in income inequality and the decrease in marriages (or, more generally, the changing attitude towards family and household). In the United States, since the beginning of the 1970s, practitioners have observed a decrease in households composed of marriage and one or more children. Instead, different family structures emerged as single-mother households or non-married couples, which, while already existing, became more and more noticeable. The change in family structure is related to the rising income inequality in several ways, and thus, we select a parameter that is indicative of this relation. After exploring the literature on the topic, we decided to use it as a proxy for family stability and changes in family and household composition the birth to unmarried mothers.

Back in 1996, Lerman observed for the first time the effect of this dissolution of the traditional family household: a sudden spike in children's income inequality and childhood poverty. While several authors investigated this relationship, the most extensive research on the topic was made by McLanahan and Percheski (2008), who gathered an ample amount of information and previous research on income inequality and family structure. The authors clearly stated that there was a deep correlation between the two variables, and both influenced each other through different means. Income inequality affected marriages and childbearing since lower financial availability delayed marriages for both advantaged and disadvantaged women. Instead, childbearing was not postponed for disadvantaged women, resulting in a separation of marriage and childbearing in their income group.

Most importantly, the change in family structure and the increase in single parenthood affected children's life chances and intergenerational class mobility. Other findings followed their paper and confirmed their theories. Indeed, authors such as Kearney and Levine (2011, 2014) pointed

out that, everything else equal, the wider the gap between income groups, the higher the probability of an early birth before marriage. Furthermore, the literature also affirms that *“greater income inequality is associated with a reduced likelihood of transitioning to marriage prior to a first birth for both women and men”* (Cherlin et al., 2016, pg.749). While these references may hint at causation between the increase in inequality and the increase in birth to unmarried mothers, the conclusions also point towards the opposite; the impact is just visible after a few years. Disadvantaged backgrounds and lower financial availability reduce the child’s possibility of accessing higher education, better healthcare, and thus contribute to widening the gap between top and bottom income groups. This measure is also not correlated to the extremism measure as it does not influence in any way the political view of the individual nor its preferences. There is no impact of the mother’s marital status on the donations made to a candidate, and it is not something that is directly referred to during political campaigns, as the myth of the nuclear family is still a milestone for the majority of American voters. We recovered these data from the Monthly Vital Statistics Report and, since 1995, from the National Vital Statistics Report. All the data are collected and presented in a table format in the annual report called Final Natality Statistics.

Beyond the described instruments, we also recovered information around important events that happened during the period considered to control for unexplained variance in the political extremism. While several factors could increase the degree of political polarization depending on the federal government’s policies, only the main changes were deemed important enough to be inserted in the model. Due to the increased participation and fierce competition during the presidential election years, we created a dummy variable to use in our model. Similarly, due to the effect on income inequality of financial crisis, the year of the global recession was deemed very important, and we considered it in our calculation. While the results are dependent on the different income inequality measure used (Smeeding, 2012), the Great Recession certainly influenced both income and earnings inequality, and future researches, with a more extensive time considered, should be able to assess the long-term effect of the recession on income inequality beyond the short-term effects here presented.

To complete the data analysis, we present the summary table of the variables we will apply in the model considered.



**Table 1**  
Descriptive statistics for Congress members (2000-2012)

Descriptive statistics					
Variable	Observations	Mean	SD	Min	Max
Mothers	3273	37.272	5.766	17.000	55.050
Infancy	3273	6.649	1.282	4.230	10.995
Gini	3273	0.477	0.032	0.370	0.6080
Party	3273	0.503	0.500	0	1
Incumbent	3273	0.851	0.356	0	1
Preselection	3273	0.570	0.495	0	1
Recession	3273	0.143	0.350	0	1
InStateContrib	3273	0.723	0.192	0	1

In the next part, we will explain how we built the model and how we solved the endogeneity problem mentioned during the introduction of our inequality measurement.

### 3.2. Methodology

At the end of our data collection, we obtained a panel data composed of several different variables that span over seven electoral cycles. Panel data contains units (individuals, firms, countries, etc.) observed over a long period of time. Units are usually denoted by  $i = 1, 2, \dots, n$  and  $T_i$  is the number of time periods for which unit  $i$  is observed. When the data were available for each year, we opted for an average of two years to reconstruct the pattern to the electoral period's results. We then used Stata to examine our model and understand the relation between the chosen variables. From the summary of Table 1, we here present the model, which includes,

beyond the Gini coefficient, several other control variables to confirm the hypothesis already present in the literature and help us understand the results we obtain. Our model is estimated through Equation 2.

$$(2) |E_{jdt}| = \beta_1 G_{dt} + \beta_2 R_j + \beta_3 I_{jt} + \beta_4 P_t + \beta_5 N_t + \beta_6 S_{jt} + \alpha_j + \epsilon_{jdt}$$

Where  $E_{jdt}$  is the extremism measure, calculated as the absolute value of the corresponding CF-scores, for each House member  $j$  in the district  $d$  at time  $t$ ;  $G_{dt}$  is the Gini coefficient;  $R_j$  is a variable that identifies the party to which the House member belongs to;  $I_{jt}$  is a variable that express the incumbent advantage of the Congress member with a dummy variable;  $P_t$  identify if the congress vote was influenced by the presidential race, with a dummy variable that assume the value of 1 in case of a presidential election year;  $N_t$  account for the influence of the 2008 recession; lastly,  $S_{jt}$  is the percentage of funds raised inside the state by Congress member  $j$  during the cycle  $t$ .  $\alpha_j$  is the candidate fixed-effect, while  $\epsilon_{jdt}$  is the error term.

We expect to obtain a positive coefficient for our income inequality measure since our analysis is focused on testing for the existence of a positive relationship between income inequality and political extremism. The other variables control for variability across time influencing the candidate (such as the incumbency status, the party he or she belongs to, and the percentage of funds raised inside its State for the electoral campaign) or to specific shocks that happened during the timeframe considered (such as presidential elections and the 2008 recession). Several authors have always seen the incumbency status as an advantage over challengers, and in our analysis, we want to assess the effect on the candidate's ideal point.

We will start to examine the model with a simple pooled OLS regression, but we know that we need to account for a probable endogeneity of the model, given that numerous factors can influence the ideal point of a Congress member beyond the variables we specified. We propose a method to eliminate the endogeneity contained in the model. We define endogeneity in a variable as the correlation between that explanatory variable and the error term. There are different reasons for endogeneity in a model, with the most important coming from confounding uncontrolled variables. This leads to the omitted variable bias that can create misleading results and invalidate the conclusions and policy suggestions. These variables are used to eliminate the time-variant endogeneity after applying the standard OLS regression and the fixed effect model. These instruments need to be exogenous, which means that they are determined outside of the model, applied over the framework, and thus are not correlated to the error term  $\epsilon$ .

There are two ways to investigate the individual-specific effect and how it shapes our results. It all depends on whether these individual-specific effects are correlated or not correlated with the independent variables. To assess our model's underlying assumptions, we need to apply both frameworks on our regression and then utilize a statistical hypothesis test called the Durbin-Wu-Hausman test (or only Hausman specification test) to choose between the fixed or random effects estimator.

First, we are going to apply a fixed-effects model over our equation to account for individual heterogeneity. The fixed-effects model controls all time-invariant differences between the individuals, so the fixed-effects models' estimated coefficients cannot be biased because of omitted time-invariant characteristics. To control that the variation across individuals is related to these time-invariant characteristics, we also obtain one regression with the opposite assumption through a random effects panel data regression. The rationale behind the random-effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. We will then use the Hausman test to choose between the random and the fixed effect estimator. The null hypothesis  $H_0$  of the Hausman test is that both estimators are consistent, but the random effect estimator is efficient. The alternative hypothesis  $H_1$  instead says that the fixed effect estimator is consistent while the random effects estimator is not. We will conclude our analysis after we also account for time-variant endogeneity through the instruments we chose before. We will obtain more precise results, and we will also directly verify our hypothesis of causality between income inequality and political extremism. We will examine the presence of a strong first stage, one of the two conditions for applying Instrumental Variables in a two-step least squares estimation. Indeed, to conduct Instrumental Variables estimation, we need instruments that are not correlated with the error term and sufficiently strongly correlated with our explanatory variables after controlling for all the other independent variables. We will assess differences in our variables' coefficients and address the consistency of our instruments by a weak instruments test.

In the next part, we will present our analysis results in tables, and we will give a brief comment related to our previous hypothesis.

### 3.3. Results

The results shown in Table 2 refer to the OLS regression and the estimation through respectively fixed and random effects. The hypotheses we want to verify in this model are three. First, we expect a positive relationship between our measure of inequality (the Gini coefficient) and political extremism. Second, we expect an inverse relationship between incumbency status and political extremism. Incumbents are generally moderates compared to challengers. The literature offers different explanations for this fact; the primary argument relates to the need to expand their electoral base beyond the already established followers. For that reason, an incumbent would move towards the ideological center to attract independent or centrist citizens, following the theory of competition originated by Downs (1957). Third, we expect that the amount of money raised inside the State by the candidate is positively related to their extremism. The percentage of funds raised by the candidate inside the State is another pattern related to the contribution mechanism that has always influenced candidates' degree of polarization. We assume before the calculation that the higher the percentage of funds raised inside the State, the higher the extremism. This hypothesis states that out-of-state donations are generally ideologically driven by members of the party who want to impose a moderate and more uniform ideology across the States. Candidates that recover funds from their electoral base are generally more prone to assume extremist positions since in-state Interest Groups directly influence them.

We can observe that in all three cases, the preliminary assumptions are respected since the Gini coefficient is positive and significative as well as the variable identifying the out-of-state donations. Lastly, the incumbent advantage is negatively correlated with extremism. All the regressions are significant, and only the OLS regression shows some non-significant coefficient for the two variables controlling for specific shocks (Recession and Preselection). We also performed the Hausman test after having obtained the estimates for the random and fixed effects model. With this test, we can decide which is the best estimator for our model because it tests whether the unique errors ( $ui$ ) are correlated with the regressors, with the null hypothesis being that they are not. Just through a quick glance at the table, the coefficient seems different, and the Hausman test confirm our reasoning since we obtain a value of 144.930 (with 5 degrees of freedom) and a p-value of 0.000, so we reject the null hypothesis and maintain the Fixed Effects for the introduction of the Instrumental Variables two-stage regressions.

**Table 2**

Congress members' ideological extremism (2000-2012)

	Pooled OLS	RE regression	FE regression
	(1)	(2)	(3)
Constant	0.520*** (0.080)	0.591*** (0.067)	0.521*** (0.078)
Gini	0.633*** (0.163)	0.420*** (0.133)	0.302** (0.144)
Party	0.124*** (0.010)	0.128*** (0.018)	0.315*** (0.063)
Incumbent	-0.238*** (0.014)	-0.114*** (0.006)	-0.098*** (0.007)
Preselection	0.010 (0.011)	0.010** (0.004)	0.009** (0.003)
Recession	0.006 (0.015)	-0.022*** (0.006)	-0.023*** (0.006)
InStateContrib	0.129*** (0.027)	0.062*** (0.018)	0.055*** (0.020)
F test	42.960***		42.110***
Wald chi2		377.850***	
Observations	3273	3273	3273

*Notes:* The table reports the results of our analysis on the Congress members, with respect to the reaction of their ideological extremism given the effect of income inequality and other chosen variables. Column 1 shows the result of a pooled OLS regression, while Column 2 and Column 3 introduce respectively Random Effect and Fixed Effects (within) panel regression. Significant at \* 10%, \*\* 5%, \*\*\* 1%.

In Table 3, we can instead observe the estimates of a fixed effects model with a possibly endogenous regressor, using an Instrumental Variables regression. The first column gives the second stage estimates when we instrument the Gini coefficient with the percentage of births from unmarried mothers. In column 2, we instrumented our inequality measure with the Infant Mortality Rate. Lastly, in column 3, we considered both instruments simultaneously. We immediately see that each regression and each coefficient is significant at 1% and that our previous expectations are maintained. Our second-stage results confirm the presence of a positive relationship between income inequality and political extremism. Furthermore, while they are characterized by a larger standard error, our estimates are consistent with the result of our OLS regression.

One significant result in this table comes from the p-value of the Sargan test. The Sargan's J test is a statistical test used for testing over-identifying restrictions in a statistical model. The test statistic is computed from our Instrumental Variables regression residuals by building a quadratic form based on the cross-product of the residuals and exogenous variables. The statistic is then distributed as a chi-square variable with  $(m - k)$  degrees of freedom where  $m$  is the number of instruments and  $k$  is the number of endogenous variables. The value obtained is definitely higher than the significant p-value, so we accept the null hypothesis that the instruments are uncorrelated with the error term and thus are valid. We also test for weak instruments, and the results obtained are well above the rule of thumb of 10, so the instruments we used are not weak.

Another piece of information that confirms our instrument's validity is the similarity between coefficients in columns 1 to 3. The small variation between the estimates in columns 1 to 3 indicates that both our instruments have a strong relationship with the Gini coefficient and are a good fit for the model we are studying. The most important results are, in fact, the coefficients of our income inequality measure. Not only is that coefficient positive, but it is also different in magnitude from the previous FE regression, being nearly eight times greater than the coefficient obtained through the Fixed Effect regression. To assess our instruments' validity, we also include in Table 4 our first-stage IV estimates. In line with the previous findings of the literature on non-marital births, infant mortality rate, and income inequality, we observe a negative coefficient for the Infant Mortality Rate and a positive coefficient for the percentage of children born outside of marriage. In all three columns, the coefficients for our instruments are significant and, by looking at the F-statistics, we can say that both instruments are strongly correlated with the Gini coefficient.

**Table 3**

Congress members' ideological extremism (2000-2012)

	IV-FE (II stage)		
	Mothers	Infancy	Both
	(1)	(2)	(3)
Gini	2.497*** (0.439)	2.346*** (0.622)	2.474*** (0.431)
Party	0.300*** (0.066)	0.301*** (0.066)	0.300*** (0.066)
Incumbent	-0.115*** (0.008)	-0.114*** (0.008)	-0.115*** (0.008)
Preselection	0.018*** (0.004)	0.017*** (0.005)	0.018*** (0.004)
Recession	-0.038*** (0.007)	-0.036*** (0.007)	-0.037*** (0.006)
InStateContrib	0.098*** (0.022)	0.095*** (0.023)	0.097*** (0.022)
Cragg Donald F stat	42.960***	40.410***	43.130***
Sargan p-value			0.777
Observations	3273	3273	3273

*Notes:* The table reports the results of our analysis on the Congress members, with respect to the reaction of their ideological extremism given the effect of income inequality and other chosen variables. Columns 1 to 3 show the second-stage IV estimates obtained by using our instrumental variables. Significant at \* 10%, \*\* 5%, \*\*\* 1%.

**Table 4**

First-stage IV estimates

	Mothers	Infancy	Both
	(1)	(2)	(3)
Mothers	0.002*** (0.000)		0.002*** (0.001)
Infancy		-0.009*** (0.001)	-0.003*** (0.001)
Constant	0.412*** (0.006)	0.537*** (0.007)	0.438*** (0.010)
Party	-0.004 (0.009)	0.005 (0.009)	-0.003 (0.009)
Incumbent	0.003*** (0.001)	0.005*** (0.001)	0.003*** (0.001)
Preselection	-0.002*** (0.001)	-0.004*** (0.001)	-0.002*** (0.000)
Recession	-0.000 (0.001)	0.007*** (0.001)	0.001 (0.001)
InStateContrib	-0.005* (0.003)	-0.012*** (0.003)	-0.050* (0.003)
First stage F test	88.450***	58.390***	77.740***
Observations	3273	3273	3273

*Notes:* This table contains the first stage coefficients of our IV estimates reported in Table 3. Columns 1-3 refer to Columns 1-3 of Table 3, respectively. Significant at \*10%; \*\*5%; \*\*\*1%.



With this two tables, we conclude our empirical analysis. We demonstrated that there is a causal and positive relation between the increase in income inequality and the increase in extremism inside the US Congress. The effect of an increase of 1% in income inequality is roughly a 2,5% increase in political extremism at the Congress level. While the Gini coefficient is bounded between 0 and 1, so a continuous growth of the income inequality is mathematically impossible, there are several negative consequences of an increased extremism that would accumulate across the years, if the upward trend is not contrasted in any way. It is our opinion that a sustained high-level income inequality would make filling the gap between the two parties impossible for the new generations. The federal government has several possibilities to change the course of this trend and in the next chapter, before the conclusion, we will suggest two types of policies through which the government could tackle income inequality and, consequently, political extremism in Congress.



## 4. Policy implications

While investigating the process leading towards political polarization and extremism in Congress, we reviewed the history of literature on the topic, exploring causes and consequences through an in-depth analysis of the last four decades. The empiric analysis of Bonica's DIME database is rewarding proof of the causality between income inequality and political polarization. Given this finding, we can suggest two types of policies that the federal government could try to implement to reduce this ideological gap between Congress members.

We have observed three main determinants of income inequality in the longer period: the opportunity of obtaining higher education, the family status, and the support for single-mother households. To impact income inequality and reduce it, Congress should enact policies to achieve social outcomes such as employment for disadvantaged groups, childcare supports, and in-work benefits. Cingano (2014) suggests that "*redistribution policies via taxes and transfers are a key tool to ensure the benefits of growth are more broadly distributed*" (Cingano, 2014, pg.6), and through empirical tests, he concludes that those measures should not impact economic growth. Furthermore, he also accentuates the necessity of promoting equal access to higher education. Providing better opportunities for children coming from disadvantaged backgrounds would mean a lower high school dropout rate, higher college degree attainment, and increase the moderate point of view inside the American landscape. Caminada and Goudswaard (2001) previously monitored social policy developments in the OECD area and observed an increase in income inequality when the state benefits are reduced and thus find a negative correlation between the level of social security and level of income inequality. This finding means that if bills increase the social security level, income inequality will diminish.

The Federal Government also can influence income inequality at a national and state level: through the Federal Reserve System. The Fed could implement an expansionary monetary policy in four different ways. The most common is the open market operations, through which it buys Treasury notes from the member banks. It can also reduce the Fed funds rate, pushing banks towards lowering their interest rates. It can also reduce the discount rate, which actually diminishes when the Fed lowers the funds rate. Lastly, it can lower the reserve requirement, generating liquidity immediately, but requiring new policies and decisions for its member banks. Furceri, Loungani, and Zdzienicka (2018) proved that expansionary monetary actions reduce income inequality. In their observations on 32 advanced and developing economies, by "*using unexpected changes in monetary policy rates that are orthogonal to innovations in*

*economic activity, we find that an unexpected decrease of 100 basis points in the policy rate reduces inequality by about 1¼ per-cent in the short term and by about 2¼ percent in the medium term”* (Furceri, Loungani, Zdzienicka, 2018, pg.20). Those results are also more significant if we consider that positive monetary policy shocks during expansions have even larger effects. This effect is also confirmed by Samarina and Nguyen’s (2019) research, which proves that expansionary monetary policy reduces inequality, mostly thanks to the macroeconomic channel. In fact, *“the macroeconomic channel enhances redistributive effects of monetary policy”* (Samarina, Nguyen, 2019, pg.26), reacting with an increase in employment and wages. More people employment and higher median wages tend to increase household median income, and so it will have a countereffect towards the hollowing of the middle class, that is, instead, reducing the median salary relatively.

The findings of this work could be perfected in several ways. First, new data on the polarization will become available in the next years that comprehend the election from the 114th to the 117th Congress of the United States. Given the divided climate that is at least perceived during Donald Trump’s presidency, there is no doubt that political and affective polarization has increased once again. The literature will need to investigate the second decade of the 21st century with great care.

Second, the quality of the data gathered by the CDC regarding the Vital Statistics increased, especially at the beginning of the 21st century. As a result, with a larger number of electoral periods available, the CDC data could be used to measure different effects over income inequality and polarization. The interaction between ethnicity and measurement of health statistics could be fascinating since several research pieces have already shown higher in-come inequality in specific States that could be caused by discrimination and biases at a governmental level. The tables provided in the Natality Statistics, as an example, are more than four times as much detailed, containing birth rates to unmarried divided by year, age of the mother, race of the mother, and geographical characteristics. Such a rich database could sparkle new and exciting points of view over the topic and facilitate practitioners’ work since most of the data is already available in practical data form through their website.

Lastly, while far from over, the Coronavirus pandemic will also influence future political discussions and is already shaping the political discourse over a form of centralized and national healthcare. We cannot predict the effect of the pandemic nor when the economy will recover, but the shock it brought inside our society is something extraordinary, and that needs to be studied carefully to help reconstruct a country that, as every country that was touched by the pandemic, has been torn into pieces. So, further information in the following years will be able

to address the potential consequences of the global pandemic on the political views of the American citizens. While desperate times would call for social measures at a national level, it is also true that it could be perceived as a reason to reinforce the entry barriers and isolate America from the world. The effects of the pandemic on the economy of the United States is still under investigation, but it indeed changed the lifestyle of many American citizens and their consumer behavior (Mason, Narkum, and Mason, 2020) since they now rely more on online shopping and delivery. Furthermore, the recession caused reductions in employment and earnings, increased early Social Security claiming, reduced retirement savings, and increased poverty at old ages (Bui, Button, Picciotti, 2020). For these reasons, experts cannot measure the pandemic's effect yet, and we will need at least a couple of years to weigh its results.



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