Women's Suffrage and Political Polarization *

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Abstract

The dynamics of political polarization in the US have been extensively discussed in recent years. Despite the emerging literature that attributes the recent increase in polarization to the concurrent change in some socio-economic factors, the forces that could potentially bring it down are not well understood. This paper documents an unobserved fact that links women's suffrage in the US to the drop in polarization in the early 20^{th} century. Using a state-level bi-annual panel data from 1870 to 1940, I find that women's suffrage resulted in the decline of polarization. On average, polarization in states that granted women the voting rights was about 13.5% lower. The result is robust to a variety of checks. By including individual fixed effects, I find that around half of the overall effects come from incumbent politicians changing their behavior in response to suffrage laws. Furthermore, I investigate the heterogeneous effects in parties and chambers. The observed convergence between the two parties was primarily driven by the Democrats acting "more Republican", and the effect was larger for House Representatives than Senators.

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1 Introduction

The dynamics of political polarization in the US have been extensively discussed in recent years. Since the 1970s, the parties have grown increasingly divided on all the major policy dimensions, which weakens the government's policy capabilities (Layman et al., 2006). For example, polarization has been found correlated with political gridlock (Binder, 1999; Jones, 2001), policy stickiness (McCarty, 2007), and social conflict (Esteban and Ray, 2011). In many developing countries, it has been the source of political unrest that lagged the development of the economy. Despite the emerging literature that attributes the recent increase in polarization with the concurrent change in some socio-economic factors, the forces that could potentially bring it down are not well understood.

In this paper, I document an unobserved fact that links women's suffrage in the US to the drop in polarization in the early 20^{th} century. The United States entitled women the rights to vote gradually between 1869 and 1920. By the end of the 19^{th} century, four states granted women the voting rights for different reasons. The 1900s and early 1910s witnessed the rapid expansion of women's suffrage, when 29 out of the 48 states passed women's suffrage laws independently. In June 1919, the Congress passed the 19^{th} Amendment that protects the rights of women to vote in all national and state elections. Seven states ratified the 19^{th} Amendment by August 26, 1920, so that it became a national law and was forced to the rest 12 states.

The variation in timing allows me to causally identify the effects of women's suffrage on political polarization of Congress legislators, measured by the Republican and Democratic Congressmen's average DW-Nominate score difference aggregated to the state level. Using a state-level bi-annual panel data from 1870 to 1940, I compare the averaged difference in nominate score between Republican and Democratic legislators in states that passed the suffrage earlier and those passed late. The differences-in-differences estimator reveals a negative correlation between women's voting rights and polarization: relative to states where women could not vote, polarization in states that granted women the voting rights was about 13.5% lower. The result is robust to various model specifications and control variables.

Women's suffrage law could affect the polarization of politicians through two channels: by selecting different politicians (selection effect) or by changing the behavior of the incumbent politi-

cians (treatment effect). To distinguish between these two channels, I further include individual fixed effects into the baseline specification. It turns out that around half of the overall drop in polarization was due to the within-legislator change of behavior.

How did women's suffrage affect politicians' behavior? The key mechanism I consider in this paper is the shift of the distribution of voters' preference. In a probabilistic voting framework with two parties having their most preferred policies and frictions in voting, there can be no Downsian convergence. In this case, women's suffrage would shift the distribution of voters' preference, which changed the relative probability of being elected. The disadvantaged party whose preferred policy was away from the women's preference would respond by a much milder policy, which would narrow the gap between the two parties. We would also expect a larger effect for the House Representatives than for the Senators because they faced stronger career concern.

I test these predictions to examine the validity of the proposed mechanism. First, I decompose the change in polarization by investigating the behavior of Democratic and Republican legislators separately. It seems that the observed convergence between the two parties was primarily driven by the Democrats acting "more Republican". This is consistent with historical records that women voters were more pro-Republican during the age of suffrage [1]. Second, I study the heterogeneous effects for House Representatives and Senators who differ in their career terms. The findings are consistent with my prediction that the House Representatives who faced stronger career concerns responded more progressively to the presence of women voters.

This paper contributes to the literature on the effects of female suffrage in the United States. Previous work by Miller (2008), Aidt and Dallal (2008) and Lott, Jr. and Kenny (1999) shows that women's suffrage produced significant change in state and local expenditures. Husted and Kenny (1997) find that the enfranchisement led to a rise in welfare spending but no change in other spending. Lott, Jr. and Kenny (1999) show that suffrage laws were coincide with immediate increases in state government expenditures and revenue and more liberal voting patterns for federal representatives. Miller (2008) shows that child mortality was reduced since female suffrage resulted in increasing state level spending on programs related to the health of infants and children. These works focus primarily on the state policy consequences such as government spending and less on

[1] For example, Republicans contributed more in progressing the suffrage, and were more salient in urban areas where women's turnout were higher (Darcy and Schramm, 1977).

partisan polarization. More broadly, this paper is related to how women's empowerment affects economic development (Duflo, 2012; Chattopadhyay and Duflo, 2004). Chattopadhyay and Duflo (2004), for example, study the reservation policy for women in India and find that women as policy maker invest more in programs reflecting development priorities of women.

My work also relates to literature studying the dynamics of political polarization. Many authors attribute the rise of political polarization in recent decades to factors from the social media and internet (Conover et al., 2011; Pariser, 2011; Boxell et al., 2017), partisan media (Prior, 2013), income inequality (Mccarty et al., 2003), changing of political geography (McCarty et al., 2009; Baker et al., 2014; Carson et al., 2007), and policy oriented activists (Layman et al., 2006). For the previous converging trend in the early twentieth century, Campante and Hojman (2013) investigate the effects of introduction of new media. This paper also studies this period, but investigates instead the impact of the enfranchisement of women.

The rest of the paper is organized as follows. The next section presents the background of the political polarization and women's suffrage. Then, Section 3 presents the data and empirical strategy. Section 4 is the results of baseline and robustness checks. Section 5 discusses the possible mechanisms. The conclusion is in Section 6.

2 Background

2.1 Dynamics of Political Polarization

Political polarization refers to a separation of politics into liberal and conservative camps (McCarty et al., 2016). Many political scientists distinguish between elite polarization and mass polarization (e.g., Fiorina and Abrams, 2008; Druckman et al., 2013). Elite polarization occurs when party members grow more internally homogenous on policy positions and more divergent relative to members of other parties. Mass polarization occurs when the electorate's attitudes towards political issues, policies, and people are starkly divided along partisan lines.

Studies of elite polarization in the United States usually focus on Congress than on polarization in the other branches of government or in state governments (McCarty et al., 2016; Layman et al., 2006). Many scholars studying American politics rely on Poole and Rosenthal's DW-

NOMINATE scores (Poole and Rosenthal, 2001), which assign a single liberal-conservative score to each Congress-person, enabling comparisons of members from different Congresses[2]. Figure 1 demonstrates how the Congressional polarization changes over time using DW-NOMINATE scores. The solid line represents the average score of Republican legislators, and the dashed line stands for the average score of Democratic legislators. Therefore the distance between the two lines can be interpreted as the partisan political polarization. The picture shows that after the Civil War polarization increased slowly to about 1910, then it started to decrease. From 1920 to about 1940 polarization declined substantially, followed by a relatively stable period before the 1970s. Since the 1970s polarization has been rising dramatically, especially in the conservative region.

The rise in partisan polarization from the 1970s has been widely discussed by scholars (e.g., Mccarty et al., 2003; Layman et al., 2006; Carson et al., 2007; McCarty et al., 2009; Baker et al., 2014), who have also noted that it follows a substantial drop in the preceding half-century. These dynamics are important because political polarization has substantive policy consequences. Polarization is correlated to increased level of political gridlock (Binder, 1999; Jones, 2001), decreased ability to adapt to changes in economic, social or demographic circumstances and reduced rates of policy innovation (McCarty, 2007). In the current period the parties have grown increasingly divided on all the major policy dimensions in American politics, which makes interaction between the executive and legislative branches highly contentious and hinders government's policy capabilities (Layman et al., 2006). More broadly, political polarization is linked to conflict (Esteban and Ray, 2011).

There is a growing literature on the causes of rising partisan polarization since the 1970s. One closely related issue is the realignment of Southern politics (e.g., Mccarty et al., 2003; Layman et al., 2006; Abramowitz and Saunders, 2008). As southern whites, particularly conservatives, have grown increasingly Republican, conservative southern Democrats have disappeared from Congress, making parties more internally homogeneous. Meanwhile, Southern Republicans tend to be even more conservative than their nonsouthern counterparts. Many other hypotheses to account for increased polarization have been raised and confronted, ranging from changes in political institutions

[2]DW-NOMINATE represents "Dynamic Weighted Nominal Three-step Estimation". The DW-NOMINATE scores are based on roll call voting records and a scaling of Congresses 1-106. The closeness of two legislators' scores shows how similar their voting records are. They can be downloaded at voteview.com.

such as redirecting to socio-economic factors such as inequality (McCarty, 2007). What can explain the movement of polarization remains an open question. However, relatively less attention has been paid to the preceding period of decreasing political polarization, except that Campante and Hojman (2013) show that the introduction of new media in the US affected political polarization. Specifically, the penetration of radio in the 1930s and the introduction of broadcast TV in the post-war period seem to have contributed to the substantial reduction in partisan polarization.

2.2 Women's Suffrage

The Nineteenth Amendment to the Constitution was approved in 1920[3]. It states, "The right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of sex." Between 1869 and the passage of the amendment in June 1919, 29 out of 48 states gave women the right to vote[4]. After seven of the remaining 19 states ratified the 19^{th} Amendment, it became a national law and was forced to the rest 12 states.

Women's Suffrage and Women's Rights Movement Throughout the nineteenth century women participated in politics through organizations that worked to correct what they defined as injustices toward women and children. The ideas and institutions through which women acted changed over time[5][6]. By the mid-nineteenth century, early suffrage organizations insisted on rights for women and the independence to move outside of the women's sphere[7]. Temperance activists and suffragists in the late nineteenth century wanted political equality so that the special qualities of womanhood could be better expressed and exercised: feminity provided a sort of expertise needed in formal

[3]The congress passed the 19^{th} Amendment in June 1919. On August 26, 1920, three quarters of the state legislatures ratified the amendment, and American women won full voting rights.

[4]At different levels, though. 15 states had full suffrage before women's suffrage amendment was passed, and 14 with partial suffrage. For example, in some states, women could vote only in presidential elections.

[5]In the Civil War women served as nurses in army hospitals and continued to serve as nurses (as well as other professions) afterwards. Their roles were moved into the public sphere and they made their most visible public contributions as founders, workers and volunteers in social service organizations (Lebsock, 1985).

[6]The nineteenth century witnessed two important enfranchisements. Voting in the colonial and the early nation period was limited to adult white male property owners in most cases. It was not until 1820s that the property requirements for voting was eliminated. After the Civil War, the Fourteenth Amendment affirmed the new rights of freed women and men in 1868, and declared that all male citizens over twenty-one years old should be able to vote. The Fifteenth Amendment in 1870 specifically prohibited denial of the right to vote on account of race, color, or previous condition of servitude. Thereafter the disfranchisement was based solely on sex.

[7]A notion implying the traditional separation of roles between men and women. Specifically, a woman belonged in the home and a man in the public world. The threat female suffrage posed to the doctrine of separate spheres helps explain why the struggle was so long and bitterly fought (Kerber, 1988; DuBois, 1998).

politics (Baker, 1984).

Early Successes Four states granted women the rights to vote before the twentieth century, for very different reasons. In Wyoming[8], the law was passed in 1869 to attract new settlers, especially women, to gain support for the incumbent party, and to express discontents for extension of voting rights to African Americans[9]. In Utah the law was passed in 1870 to rid the territory of polygamy[10]. Colorado and Idaho granted women voting rights in 1893 and 1896 respectively. While in Idaho the triumph belongs to the women suffrage movement as well as the society's favor for prohibition[11], the victory in Colorado was the result of a sociopolitical movement that originated from the 1870s[12].

Women's Suffrage and the Progressive Era In the late nineteenth century and early twentieth century, federal, state and municipal governments increased their roles in social welfare and economic life. The reform[13] campaigns in this era strengthened the suffrage movement, as it brought a tradition of women's involvement in government to public attention[14]. Moreover, new tactics were employed by women's rights organizations. They implemented a state-by-state strategy, conducted petition campaigns, and held parades and pageants that aimed at gaining publicity and showing that women's suffrage was inevitable. Suffragists began to win broader support from both women and men. Between 1900 to 1919, 25 states passed female suffrage laws, starting from Washington in 1910 and California in 1911. By 1916, six more states granted women voting rights and the issue of female suffrage had become part of the mainstream politics. After U.S. entered World War I in 1917, women assumed duties in the economy previously done by men (Flexner and Fitzpatrick, 1996). These new roles changed attitudes about women's fitness for the public sphere. Towards the end of the war and immediately after, women's suffrage gained more support. Between 1917 and 1919, 17 states enfranchised women. Figure 2 shows the timing of suffrage laws in American

[8]The territory of Wyoming, which joined the union in 1890 as the first state where women could vote in all elections.
[9]http://wyohistory.org
[10]http://historytogo.utah.gov
[11]http://lmtribune.com
[12]http://coloradoencyclopedia.org
[13]Reformers sought to regulate business practices, address health issues, improve working conditions and eliminate corruptions. Policy makers at that time worked to improve schools, hospitals and other public services.
[14]Women had long aimed their effort at matters associated with the well-being of women, children, the home, and the community. They exercised their expertise and gained political influence through institutions like women's clubs. More importantly, the arguments of their opponents started to lose ground: women's involvement in public space enhanced, instead of harmed, the home.

states.

The Geographic Pattern of Women's Suffrage The most salient patterns in Figure 2 are geography related. First, the Western states tend to grant women's suffrage earlier. Some historians suggest that frontier conditions were amenable to women's suffrage because women supported restrictions on common western vices (drunkenness, gambling and prostitution) or because the harsh realities of frontier life made it possible to maintain traditional gender roles separation (Miller, 2008). Some Western states passed women's suffrage apparently for reasons other than women's demands (Baker, 1984). The only robust correlate of suffrage law enactment found in empirical works is the share of women working in nonagricultural occupations (King et al., 2005). Indeed, suffragists gain more support from cities[15] and the women's organisations mainly used cities as platforms. However, the role of women evolved very gradually over time, thus this feature can be distinguished econometrically from abrupt year-to-year legislative changes governing women's right to vote.

Second, among the Eastern states, women in the North could vote earlier than women in the South. This is because the hold of traditional ideas about the relations between the sexes on Southerners was so great, and their commitment to preserving traditional southern values was so strong, that Southern politicians[16] felt they must defy their former hero Wilson[17] and national Democratic leaders and resist the federal amendment until the bitter end (Wheeler, 1993).

Effects of the Suffrage Many historians suggest that women's suffrage had little impact on women or politics[18] (Baker, 1984). Others point out that this argument depends on certain assumptions that may fail (Andersen, 1996).

From the point of view of male political elites, their constituencies had changed substantially

[15]The women's suffrage referendum ran well in cities, especially in certain immigrant wards and places where the Socialist vote was high.

[16]Many Southern politicians agreed with the North Carolina legislator who said the women's suffrage movement originated in the North and "had no place in the sunny South, the land of chivalry and devoted respect for women."

[17]President of the United States from 1913 to 1921.

[18]Women did not vote as a reform bloc as predicted in suffrage campaigns. Dramatic decline in turnout since 1916 was attributed to women's lack of participation. Russell (1924) concluded that women's suffrage was a failure. Chafe and Chafe (1992) states that women's political standing plummeted [in the latter half of the 1920s] because the mass of female citizens failed to act in the cohesive and committed manner which the suffragists had predicted, and claims that women voted according to their social and economic backgrounds and the political preference of their husbands rather than according to their sex.

with the addition of new voters. Recent rich research on electoral accountability suggests that members of Congress think about constituencies and consider how the position they take will impact their chances of re-election. Without any systematic political attitude survey research, politicians in the early twentieth century would probably fear that women would vote in a bloc. Lemons (1969) describes the early successes attributable to women's efforts (The Shepard-Towner Act and the Cable Act) and their later inability to implement change (the failure to renew the Shepard-Towner Act, which died in 1929) and argues that the change throughout the 1920s was due to the fact that men in power realized women were not voting in a bloc and therefore not likely to be able to effectively punish politicians who went against them.

There were also policy consequences at the state level. Evidence has been found that state public health spending and local campaigns that aimed at improving health of infants and children were largely expanded following suffrage laws (Miller, 2008). Lott, Jr. and Kenny (1999) suggest that women's suffrage coincide with immediate expansion of state government spending and revenue. Among a critical mass of women activists, both Democrat and Republican, there was a general consensus on a political agenda which included protective legislation for women and children, women's rights, consumer protection, and industrial health and safety legislation(Andersen, 1996).

3 Data and Empirical Framework

3.1 Data and Measurement

To conduct the empirical analysis, I use a bi-annual panel data set of the DW-NOMINATE scores generated by Poole and Rosenthal (1985, 1991, 2001) spanning the time period 1870-1940. The dataset covers congressmen from 48 states, allowing us to empirically test the effect of women's suffrage on their change of ideology positions.

The DW-NOMINATE scores are the most frequently used measure of Congressional polarization. They assign each legislator a liberal-conservative score based on the whole roll call voting records. This database has been broadly applied to topics from how senators vote (Levitt, 1996; Lee et al., 2004), why the poor do not expropriate the rich (Roemer, 1998), opinion formation subject to persuasion bias (DeMarzo et al., 2003) and why policy uncertainty has risen (Baker et al.,

2014). Alternative measurements include candidate surveys (Ansolabehere et al., 2001; Burden, 2004), textual analysis (Jensen et al., 2012; Laver et al., 2003; Slapin and Proksch, 2008; Monroe and Maeda, 2004) and campaign finance data (Bonica, 2014). But these alternatives do not cover the time period of interest in this paper.

Dependent Variable The dependent variable used in this paper is the average score difference of the two Party Congress legislators who come from the same state. There are two dimensions defined in the original database: the first dimension can be interpreted in most periods as reflecting liberal-conservative in the modern era, and the second dimension reflects the conflict between North and South on slavery before the Civil War and on civil rights for African-Americans from the late 1930s through the mid-1970s. Figure 3 shows the movement of the scores from first and second dimensions respectively. Since the second dimension primarily focuses on affairs related to African Americans, which were irrelevant to the investigated period, this paper uses scores from the first dimension.

Independent Variable The independent variable used in this paper is a dummy variable that equals to 1 if women's voting rights were granted, and 0 otherwise, in a certain state and year. The year in which states granted women the right to vote is obtained from Lott, Jr. and Kenny (1999), Miller (2008) and the National Constitution Center[19].

Control Variables The baseline model uses year and state fixed effect terms to capture the time-invariant states' characteristics and temporal effects. I also include states' characteristics that change over time for robustness check. The chosen variables are income per capita and population. The data are mainly from the U.S. Census Bureau[20], while the per capita income data before 1929 is obtained from Easterlin (1960). Historical state level per capita income data are available for the years 1880, 1890, 1900, 1910, 1920 and annually from 1929 onwards. Therefore, the sample are selected per decade from 1880 to 1940. Table 1 summarizes the descriptive statistics.

[19]https://constitutioncenter.org
[20]https://www.census.gov

3.2 Identification Strategy

Given that I have information on when a state granted women voting rights, I can exploit a standard DID design to examine the effect of women's suffrage on political polarization at the congressional level. I use the following specification:

$$scoredif_{it} = \alpha + \beta W_{it} + state_i + y_t + \varepsilon_{it} \tag{1}$$

where i stands for a state, t stands for a year, and $scoredif_{it}$ stands for the average score difference of two Party Congressmen from state i in year t. The key explanatory variable of interest is W_{it}, a dummy variable that equals to 1 if women's voting right was granted, and 0 otherwise, in state i. The parameter of interest in Equation (1) is thus β, which measures the impact of women's suffrage on the political polarization at Congress level during 1870-1940. As befits a fixed-effect model, $state_i$ captures characteristics of states that do not change over time and may be associated with women's suffrage, whereas y_t controls for the temporal effects in our estimation. Finally, in Equation (1), ε_{it} is the disturbance term.

4 Results

4.1 Baseline Results

Table 2 reports the baseline estimations based on data across 48 states between 1870 and 1940. The dependent variable is the average DW-Nominate score difference of Congress Republicans and Democrats. Column (1) presents the results including state and year fixed effects and column (2) further includes state-year trends due to the possibility that the states may not have common time trend. Because Figure 2 suggests a regional pattern of suffrage laws, column(3) includes the census region $\times$ year fixed effects in Equation 1. Column (4) includes both state year trend and region $\times$ year fixed effects in Equation 1. The standard errors are clustered at the state level. The coefficients of female suffrage dummy are significant at 99% level and can be interpreted as the effect of suffrage laws on the political polarization. Column (1) shows that on average, states that passed suffrage laws had 0.0464 lower score difference relative to those without suffrage laws. This

number accounted for about 13.5% of the total score difference between the two Parties, since the national average during the investigated period was 0.34. In column (2) the number reduced to about 11.0%, implying that part of the effect of suffrage laws on political polarization did come from the states having different time trends. Adding region $\times$ year fixed effects, as displayed in column(3), reduces the number to approximately 10.2%, suggesting that part of the effect of suffrage laws on political polarization came from unobserved regional shocks. Column (4) shows that the estimate is about the same as in column (2) if both state year trend and region $\times$ year fixed effects are included, suggesting that the effects of different time trend and unobservable regional shocks are partly offset by each other.

4.2 Validity and Robustness Checks

In this section I conduct a check on the validity of parallel trend assumption and several robustness checks focusing on concerns about omitted variable bias and sample selection.

4.2.1 Validity of parallel trend assumption

The validity check is performed by coding each time period as being some number of periods away from the suffrage year of a state, where the length of a period is five years. The results are plotted in Figure 4, in which the vertical axis represents the change in DW nominate score differences of the two parties, while horizontal axis measures the number of periods before and after suffrage year (marked by the 0 vertical line). The solid line indicates changes in the political polarization conditional on state and year fixed effects. The dotted lines indicates the 95% confidence intervals. The standard errors are clustered at the state level. Patterns in Figure 4 show that there is not much of a systematic difference in the political polarization trend between the control and treatment states prior to a state's passing women's suffrage laws.

4.2.2 Control for population and income

To address the concern that the estimated effect of suffrage laws on political polarization may be confounded by other factors, Table 3 reports estimates controlling for population and per capita income, each interacted with decade fixed effects, which allows the influence of the additional

control variables to vary flexibly over time. Due to the availability of historical state level per capita income data, the sample is selected per decade from 1880 to 1940. In Column (1), I reproduce the baseline estimates for comparison, and in column(2)-(4), I report the estimates with additional control variables. I find that the estimates of interest remain robust. Thus, it is unlikely that the main results are driven by spurious correlations.

4.2.3 Placebo test with shifted time periods

To test the concern that the observed decrease of political polarization may be the result of other state characteristics such as differences in demographic and income inequality, I use the 1800-1870 and 1940-2010 time periods as placebos to check whether the above findings are specific to female suffrage rather then other omitted variables such as whether certain states were less pro-polarization. The estimates reported in Table 4 suggest that the estimated effect of female suffrage on political polarization is unlikely driven by other omitted state characteristics.

4.2.4 Full suffrage

In the baseline estimates, I define the suffrage year as the first year women could vote. However, as I mentioned in the background, female suffrage in some states before 1920 was partial. Women in these states could not elect Congress delegates directly. The election process of politicians in Congress from these states should not differ from before. Political polarization, on the other hand, is measured at the Congress level. Therefore, neglecting this will bias the main results downward. To address this issue, I conduct a robustness check using the full suffrage dummy, which equals to 1 if women were granted full voting rights and 0 otherwise. The estimates reported in Table 5 confirm that the main results are biased downwards slightly by this issue.

4.2.5 House delegates

Besides, it was not until 1913 that senators were elected by the public instead of state councils. Therefore using sample of both chambers may bias downwards the effect of female suffrage on political polarization. The estimates reported in Table 6 imply that the bias does not substantially threat the main results.

5 Discussion

This section intends to discuss the mechanisms that can explain the link between women's suffrage and political polarization. I will start from decomposing the effect of female suffrage on political polarization, then investigate heterogeneous effects to shed light on the mechanisms driving the results.

5.1 Treatment and Selection Effects

The estimated effect has two potential sources, the treatment and selection effects. The treatment effect comes from incumbent politicians who respond to the change of electorate. The selection effect exists if enfranchised women replaced the incumbent politicians with those better served their political preferences. To investigate how they contribute to the overall effect, I add a politician fixed effect to the baseline specification. Politicians who serve less than 4 years in the sample are dropped. The results are reported in Table 7. In Column (1), I reproduce the baseline estimates for comparison, and in Column (2), the coefficient of female suffrage dummy can be interpreted as the treatment effect. The results imply that about half of the overall change in political polarization comes from the treatment effect. This finding suggests that voters can affect politician' policy choices.

5.2 Heterogeneous Effects

Party Although there are many potential explanations for the relationship between women's suffrage and political polarization, the most natural one is that suffrage laws resulted in changed electorate and overall voter preferences (Miller, 2008; Husted and Kenny, 1997; Lott, Jr. and Kenny, 1999). To test for this mechanism, I compare how the effect differs between the Democratic and Republican Party. The relationship between women and the two parties in the beginning of the twentieth century is very different from nowadays. It is not unreasonable to assume voting women were more pro-Republican than non-voting women. Republicans had a stronger suffrage record

than Democrats[21]. Republicans were stronger in urban areas, Democrats in the rural areas. Urban women would be more likely to vote than rural women (Darcy and Schramm, 1977). Therefore, Republicans would benefit more if women were granted rights to vote. Their probability of being elected was higher[22] and thus would have less intent to change their policy platforms compared to the Democrats. My hypothesis that the effect of female suffrage on political polarization should be higher on Democrats is confirmed in Table 8. In Column (1), I include both Parties, while the second and third Columns report estimates using samples of Democrats and Republicans respectively. The coefficient in Column (2) is large and significant, whereas the coefficient in Column (3) is small and insignificant. The results indicate that female suffrage resulted in the Democrats shifting their policy platform towards that of the Republicans, but not vise versa.

Chamber Next, I examine whether House representatives were more sensitive to the impact of women's suffrage. House delegates face longer career terms compared to Senators, and a responsive democracy result is more likely to hold as repeated elections mitigate the commitment problems of politicians and voters (Duggan et al., 2017). Table 9 reports the estimates using sample of the House and Senate respectively, implying that women's suffrage only had effects on the House delegates.

6 Conclusion

In this paper, I investigate the impact of a historical milestone, the women's suffrage, on the congressional political polarization from 1870 to 1940. The inter-state variance in timing of suffrage laws provides an ideal setting for my research purpose. Using a state-level panel data, I find that women's empowerment resulted in the decline of polarization. On average, the states with suffrage laws were 13.5% less polarized than states without. The result is robust to a variety of checks. By adding politician fixed effects to the baseline specification, I find that around half of the overall

[21]The 19th Amendment was first introduced in 1878 by a California Republican and finally passed four decades later, when the Republicans won landslide victories in the House and the Senate. Till 1887, the Republicans kept introducing the 19th Amendment in Congress every year, but the Democrats were able to keep it bottled up in various committees before allowing either chamber to vote on it. In 1887 it was defeated by a vote of 34 to 16 by the Senate. In 1914 it was once again defeated by Senate Democrats. Nonetheless, the Republicans continued to push even after it was defeated again in 1918.

[22]A clear example would be the 1920 general election of Oklahoma, in which Republicans took control of the state house of representatives, 55 Republicans to 37 Democrats, something they would not repeat until 2004. Actually, except for the three U.S. representatives and a narrow 11-12 loss of state senate seats up for election, the Republicans had a clean sweep (Darcy, 2005).

effects come from the treatment effect. That is, the incumbent politicians respond to the suffrage laws by changing their voting behavior. That the suffrage laws have heterogeneous effects on the two Parties implies that giving women the right to vote increased the probability of winning in elections for one party. The different effects on politicians in the two chambers implies that the House delegates valued being reelected more.

This paper contributes to the literature on the effects of female suffrage in the United States by systematically examining its relationship with shifting political ideology. In addition, my work contributes to the literature on explaining the changing political polarization, adding to our understanding of the long-term dynamics of this issue.

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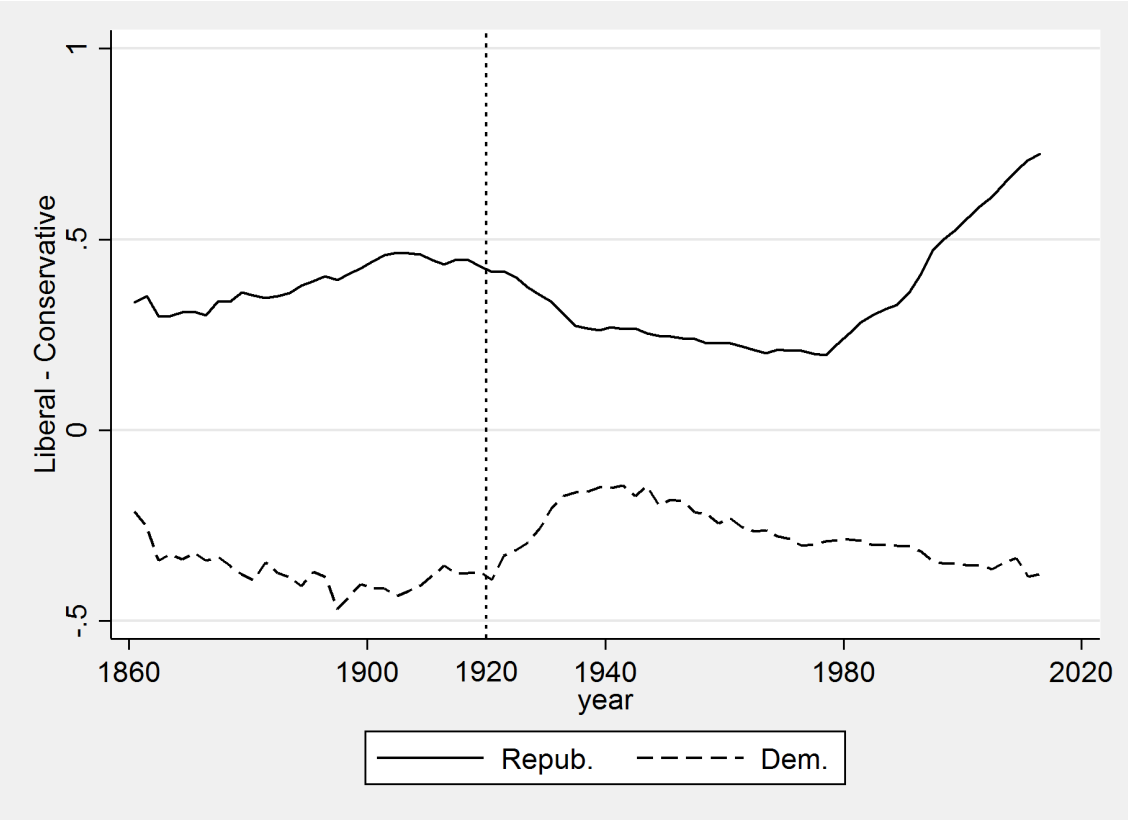

Figure 1: Mean of DW-Nominate Scores for Rep. and Dem. in Congress
Data source: voteview.com

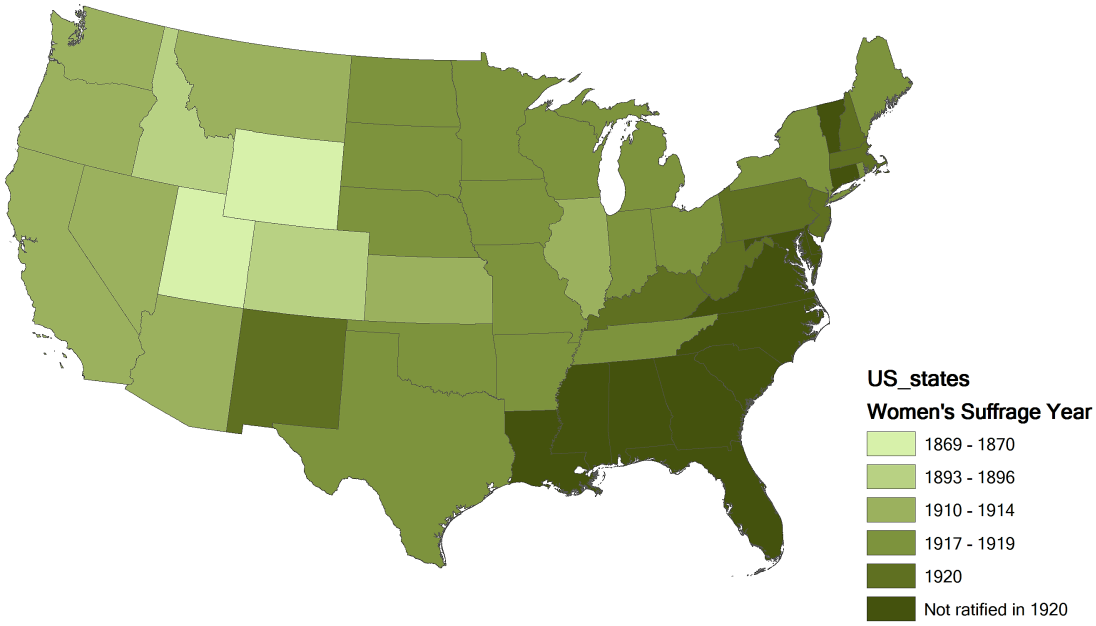

Figure 2: Year of Women's Suffrage Law in U.S. States

Data source: Miller (2008), https://www.nwhm.org

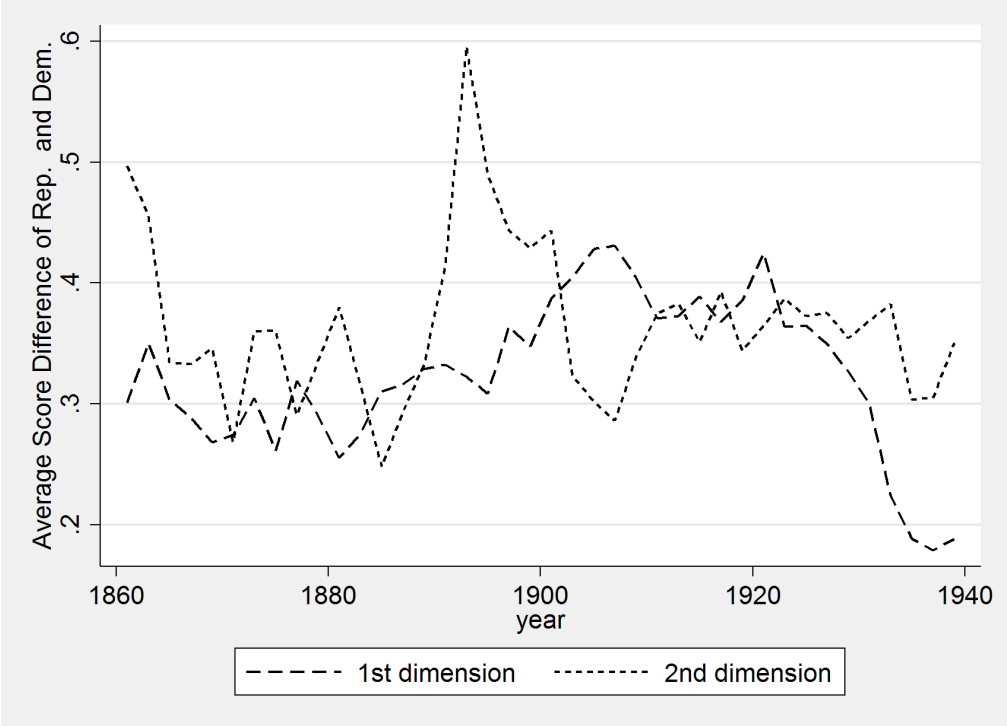

Figure 3: Difference in Average DW-Nominate Scores for Rep. and Dem.

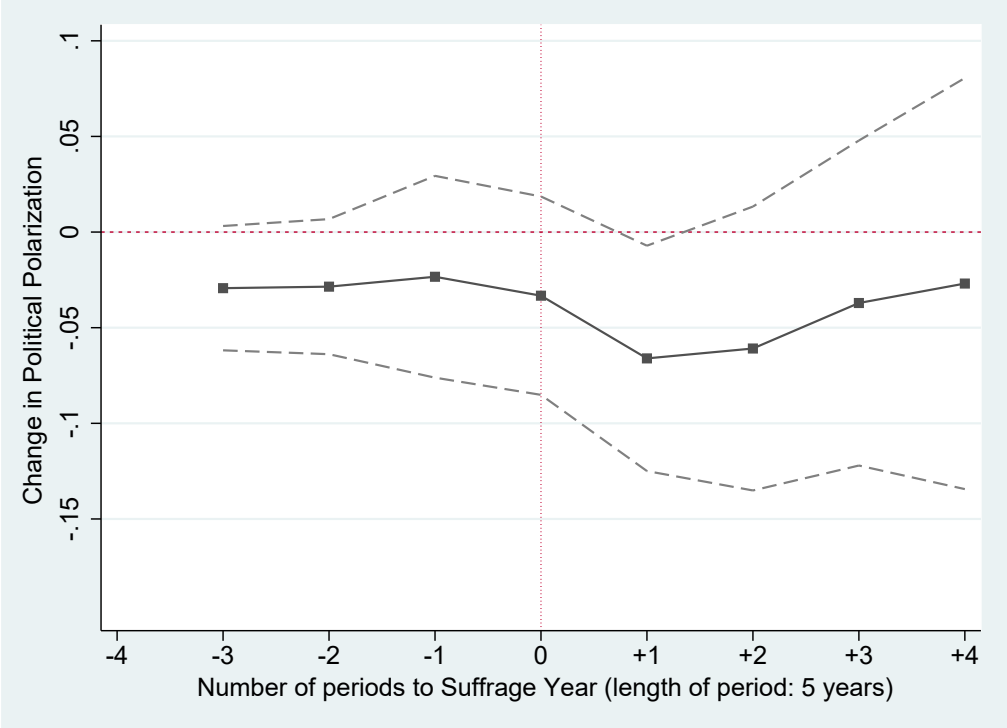

Figure 4: Polarization before and after suffrage laws

Table 1: Descriptive Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) max	(5) min
DW-Nominate Score Gap	1,552	0.349	0.115	0.656	0.00900
Female Suffrage Dummy	1,552	0.380	0.485	1	0
Log(Income per capita)	333	5.537	0.674	6.948	2.197
Log(Population)	333	13.92	1.183	16.42	9.942

Table 2: Female Suffrage and DW-Score Difference

	Dependent Variable: DW-nominate score gap			
	(1)	(2)	(3)	(4)
Female_Suffrage_Dummy	-0.0464***	-0.0375*	-0.0348**	-0.0364*
	(0.0153)	(0.0210)	(0.0156)	(0.0189)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Year Trend	No	Yes	No	Yes
Region*Year FE	No	No	Yes	Yes
Mean of the Dep. Var	0.3419	0.3419	0.3419	0.3419
No. of Observations	1538	1538	1538	1538
No. of States	48	48	48	48
No. of Clusters	48	48	48	48
Adjusted R-squared	0.5578	0.6435	0.6433	0.6907

Note: *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 3: Control for Per Capita Income and Population, 1880 - 1950

	(1) DW-Score Gap	(2) DW-Score Gap	(3) DW-Score Gap	(4) DW-Score Gap
Female Suffrage Dummy	-0.0376*	-0.0355*	-0.0362*	-0.0352*
	(0.0195)	(0.0206)	(0.0209)	(0.0203)
Log(Income per capita)		-0.0407		-0.0469
		(0.0336)		(0.0352)
Log(Population)			0.0037	-0.0522*
			(0.0336)	(0.0275)
State FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Income x Time FE	No	Yes	No	Yes
Population x Time FE	No	No	Yes	Yes
Mean of the Dependent Variable	0.3395	0.3395	0.3395	0.3395
No. of Observations	313	313	313	313
No. of States	48	48	48	48
No. of Clusters	48	48	48	48
Adjusted R-squared	0.6031	0.7260	0.6056	0.7317

Note: Income data is estimated by Easterlin and Klein for 1880-1910, from Cencus record for 1920, and from FRED for 1930-1950. Population data is from U.S. Census Bureau.

*, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 4: Shifting Time Periods as a Placebo

	(1) Baseline: 1870 - 1940	(2) 1800 - 1870	(3) 1940 - 2010
Female Suffrage Dummy	-0.0464***	-0.1137	0.0031
	(0.0153)	(0.0676)	(0.0234)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean of the Dependent Variable	0.3419	0.3425	0.3415
No. of Observations	1538	633	1530
No. of States	48	37	48
No. of Clusters	48	37	48
Adjusted R-squared	0.5578	0.4719	0.6526

Note: The same specification is used but with different time periods. *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 5: Full Suffrage Dummy

	(1) DW-Score Gap	(2) DW-Score Gap	(3) DW-Score Gap	(4) DW-Score Gap
Female Suffrage Dummy	-0.0464***			
	(0.0153)			
Full Suffrage Dummy		-0.0496***	-0.0415*	-0.0485**
		(0.0154)	(0.0213)	(0.0204)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Year Trend	No	No	Yes	Yes
Region*Year FE	No	No	No	Yes
Mean of the Dependent Variable	0.3419	0.3419	0.3419	0.3419
No. of Observations	1538	1538	1538	1538
No. of States	48	48	48	48
No. of Clusters	48	48	48	48
Adjusted R-squared	0.5578	0.5583	0.6440	0.6916

Note: Measure of the female suffrage in this specification is the year when women had full voting rights. *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 6: House Representatives

	Dependent Variable: DW-nominate score gap of House delegates			
	(1)	(2)	(3)	(4)
Female_Suffrage_Dummy	-0.0352**	-0.0246		
	(0.0154)	(0.0183)		
Full_Suffrage_Dummy			-0.0375**	-0.0272
			(0.0160)	(0.0187)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Year Trend	No	Yes	No	Yes
Y mean	0.3434	0.3434	0.3434	0.3434
No. of Observations	1497	1497	1497	1497
No. of States	48	48	48	48
No. of Clusters	48	48	48	48
Adjusted R-squared	0.5543	0.6476	0.5546	0.6478

Note: The dependent variable is the state level average DW-Nominate score difference between the two Parties' house delegates. *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 7: Selection or Treatment Effect?

	(1) DW-Score Gap	(2) DW-Score Gap	(3) DW-Score Gap	(4) DW-Score Gap
Female Suffrage Dummy	-0.0464***	-0.0233***		
	(0.0153)	(0.0080)		
Full Suffrage Dummy			-0.0496***	-0.0229**
			(0.0154)	(0.0096)
Constant	0.3494***	0.1704***	0.3495***	0.1704***
	(0.0136)	(0.0032)	(0.0136)	(0.0032)
Politician FE	No	Yes	No	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mean of the Dependent Variable	0.3419	0.3708	0.3419	0.3708
No. of Observations	1538	8065	1538	8065
No. of States	48	47	48	47
No. of Clusters	48	47	48	47
Adjusted R-squared	0.5578	0.8866	0.5583	0.8865

Note: *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 8: Party Heterogeneity

	(1) Sample-all	(2) Sample-Dem.	(3) Sample-Repub.	(4) Sample-all	(5) Sample-Dem.	(6) Sample-Repub.
Female Suffrage Dummy	-0.0464***	-0.0782***	-0.0193			
	(0.0153)	(0.0252)	(0.0130)			
Full Suffrage Dummy				-0.0496***	-0.0863***	-0.0213
				(0.0154)	(0.0264)	(0.0127)
Constant	0.3494***	0.2498***	0.3926***	0.3495***	0.2502***	0.3927***
	(0.0136)	(0.0196)	(0.0143)	(0.0136)	(0.0196)	(0.0143)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of the Dependent Variable	0.3419	0.3020	0.3706	0.3419	0.3020	0.3706
No. of Observations	1538	1093	1135	1538	1093	1135
No. of States	48	46	47	48	46	47
No. of Clusters	48	46	47	48	46	47
Adjusted R-squared	0.5578	0.6078	0.5471	0.5583	0.6085	0.5473

Note: *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.

Table 9: Chamber Heterogeneity

	Dependent Variable: DW-nominate score gap							
	House				Senator			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female_Suffrage_Dummy	-0.0442***	-0.0370*			-0.0720	-0.0817		
	(0.0153)	(0.0196)			(0.0582)	(0.0723)		
Full_Suffrage_Dummy			-0.0461***	-0.0398*			-0.0914	-0.1123
			(0.0160)	(0.0203)			(0.0654)	(0.0838)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Year Trend	No	Yes	No	Yes	No	Yes	No	Yes
Y mean	0.3513	0.3513	0.3513	0.3513	0.3726	0.3726	0.3726	0.3726
No. of Observations	1497	1497	1497	1497	586	586	586	586
No. of States	48	48	48	48	48	48	48	48
No. of Clusters	48	48	48	48	48	48	48	48
Adjusted R-squared	0.5851	0.6922	0.5853	0.6925	0.6031	0.7481	0.6047	0.7505

Note: *, **, and *** denote significance at the 90%, 95%, and 99% levels respectively. Standard errors in parentheses are clustered at the state level.