

Men, Women, and the Ballot Woman Suffrage in the United States

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Abstract

Woman suffrage led to the greatest enfranchisement in the history of the United States. Before World War I, however, suffrage states remained almost exclusively confined to the American West. The reasons for this pioneering role of the West are still unclear. Studying the timing of woman suffrage adoption at state level, we find that states in which women were scarce (the West) enfranchised their women much earlier than states in which the sex ratio was more balanced (the rest of the country). High sex ratios in the West, that is high ratios of grantors to grantees, reduced the political costs and risks to male electorates and legislators of extending the franchise. They are also likely to have enhanced female bargaining power and may have made woman suffrage more attractive in the eyes of western legislators that sought to attract more women to their states. Our finding of a reduced-form inverse relationship between the relative size of a group and its success in securing the ballot may be of use also for the study of other franchise extensions and for inquiries into the dynamics of political power sharing more generally.

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Sex antagonism ... is sure to be reflected in the political. This factor, however, will play a far bigger part in the East than it does in the West ... where the females outnumber the males.

Journalist George MacAdam on "Obstacles in Path of Nation-wide Suffrage", *The New York Times*, January 27, 1918.

1 Introduction

Woman suffrage in the United States led to the greatest enfranchisement in the country's history. Access to the ballot was first won at state level. Between 1869, when Wyoming Territory first granted its women the right to vote, and the ratification of the Nineteenth Amendment in 1920, which prohibited the federal government and states to deny or abridge in any way the voting rights of citizens on account of their sex, twenty-nine states enfranchised their women. Rates of suffrage adoption over this period, however, differed markedly across regions. In fact, until the outbreak of World War I, woman suffrage remained essentially confined to the American West: of the twelve states that granted women access to the ballot by 1914, ten lie in the West; and so do all five states that enfranchised their women before the turn of the century. The reasons for this pioneering role of the American West are still unclear. Studying the timing of suffrage extensions at the level of US states, this paper seeks to uncover the driving forces that made the American West lead the nation in the enfranchisement of women.

Understanding the extension of the franchise to women is important for several reasons. First, it concerns one of the core decisions a society may take, that is the choice of its eligible electorate. In democracies, electorates determine the political elite and they decide ultimately on the use of public resources. Suffrage extensions change the eligible electorate, which makes them - their causes and consequences - a natural subject for research in political economy. Second, in the history of suffrage extensions, woman suffrage beyond doubt has to be counted the most important. As the most ubiquitous extension of the ballot across countries in history, it gave political representation to unprecedented numbers, and often to the majority of a country's population, changing fundamentally the role and understanding of women in societies. And third, studying the forces that drove the extension of the ballot to women is more than just of pure historical interest. For it involves a more general and timeless, yet little researched issue in economics, the question what factors may induce a ruling group to share power with others, even if the latter do not possess the potential to acquire political access by force or other means, or credibly may threaten to do so if such rights are not granted voluntarily. Understanding woman suffrage extensions may help to shed some light on this important question.

Although a prime area for research in political economy, the driving forces behind woman suffrage in the US and other countries have surprisingly been studied almost exclusively only by non-economists, in particular by historians. Many of these scholars (e.g. Beeton, 1986) have stressed idiosyncratic features of individual states to explain their respective timing of adopting woman suffrage. However, by stressing the specific rather than the common features held by early suffrage states and by focusing heavily on the early period in which first jurisdictions granted women access to the ballot, such approaches cannot explain the marked and sustained regional pattern of state level extensions of the franchise to women. The pioneering role and continuing lead of states in the American West in the adoption of woman suffrage, however, suggest that common, rather than state-specific factors were decisive in driving extensions of the franchise to women. Sociologists, in turn, have focused mostly on the woman suffrage movement in the United States and the importance of its leading national organizations, their activities, and main antagonists (see, for example, McCammon et al., 2001). However, their strong focus on woman suffrage organizations is squarely at odds with the fact that woman suffrage was first won, and continued to be won for decades exclusively in the West, a region that that was far less than others organized in terms of coordinated activities for securing the ballot.

In the economic literature, researchers have concentrated on the consequences of extending the franchise to women, particularly for the overall size of government and for public spending in certain areas (see, for example, Lott and Kenny (1999) and Miller (2008) for the US, and Aidt, Dutta, and Loukoianova (2006) for European countries). Extensions of the suffrage to women in this literature, however, are assumed exogenous events. This appears problematic. In the US, as noted, woman suffrage adoption exhibited a marked regional pattern. And in Europe, suffrage adoption by countries clustered significantly in the immediate aftermaths of the two world wars, systematic patterns that cast doubt on the validity of this identifying assumption.¹ To the best of our knowledge, only one economic study has analysed the driving forces behind woman suffrage extensions (Kenny, 1999).² Kenny studies the timing of state-level extensions of the franchise to women in the United States in the period 1890 to 1920. Although confining his analysis only to a subset of the actual franchise extensions, that is the later ones and those of states but not of territories, Kenny raises an important general point which helps to structure investigations of woman suffrage extensions, a point that is central also to our hypotheses-building and analysis.³ Kenny speculates that states in which the costs of woman suffrage were lower for men should have

¹In 1918, Austria, England, Germany, and Poland granted women access to the ballot, followed by the Netherlands and Luxembourg in 1919, Albania, Belgium, and the Czech Republic in 1920, Sweden in 1921, and Ireland in 1922. After World War II, European countries that joined the rank of woman suffrage states for the first time include France (1944) and Croatia, Italy, Montenegro, and Slovenia (all four in 1945).

²We are grateful to Lawrence W. Kenny for providing us with a copy of his draft version.

³By restricting the analysis to the period 1890-1920 and to suffrage extension by states only, the earliest suffrage extensions in Wyoming (1869), Utah (1870), and Washington (1883) are excluded from the analysis.

tended to enfranchise women earlier and that these costs should be negatively correlated with state sex ratios, as a relative scarcity of women (a high sex ratio) implied a smaller potential change "in the political equilibrium" if women were given the right to vote (Kenny, 1999, p. 8). Using socio-economic data from 1890, which includes a measure of the adult sex ratio (residents aged 21 or older), Kenny finds supportive evidence in his empirical analysis (a Weibull failure time model) for his conjecture that the rate of suffrage adoption is positively associated with the sex ratio. Because of the quite short observation period and the exclusive focus on states in the analysis, however, it is unclear whether this finding for later adopters of woman suffrage generalizes to explain in its entirety patterns of suffrage extensions to women in the United States. Covering both states and territories and expanding the period of analysis and the factors considered that may have influenced men in their decision to grant women access to the ballot, our study addresses this question. Doing so, it provides first evidence on both the early and the later period of suffrage extensions in the United States. Furthermore, by investigating the pioneering and sustained lead of the American West in the enfranchisement of women, it also explores the explanatory power of several leading factors that have been suggested in the non-economic literature to underlie regional patterns of woman suffrage adoption.

Apart from complementing economic studies that have focused on the consequences of woman suffrage, our paper hence contributes in two important ways to the economic literature. Foremost, and extending the analysis of Kenny (1999), we provide a first analysis of the driving forces behind extensions of the suffrage to women in the United States in the period 1869 to 1920, that is from the year Wyoming Territory first enfranchised women to the ratification of the Nineteenth Amendment, an analysis that can account both for the pioneering role of the American West and for its sustained lead in the enfranchisement of women. And second, our analysis complements and enriches the growing body of literature in economics that is concerned with the effects of sex ratio imbalances on marriage, fertility, and labor market outcomes, by investigating a hitherto largely disregarded outcome domain, female political rights.

Corroborating the conjecture and first results of Kenny (1999), our findings show that the adult sex ratio in a jurisdiction exerted a robust and decisive influence on the rate at which women were granted access to the ballot. Specifically, we find high sex ratio jurisdictions, that is jurisdictions in which women (the potential grantees of woman suffrage) were relatively scarce compared to men (the grantors of woman suffrage), to enfranchise their women much earlier than jurisdictions in which the sex ratio was more balanced. As high sex ratio jurisdictions both in the mid to late 19th and early 20th century were predominantly located in the American West, a result of the late and strongly male-biased settlement of the Frontier, high sex ratios can explain the pioneering role of

this region and its sustained lead in the advancement of the woman suffrage cause. Unobserved time invariant factors and female employment levels also appear to have exerted some positive influence on the hazard of a jurisdiction (states and territories) to enfranchise its women. Other factors we find to conducive to woman suffrage include the degree of urbanity and the share of Mormons in a jurisdiction. A higher percentage of nonwhites and a larger manufacturing sector, in contrast, appear to have delayed woman suffrage adoption. Differences in political institutions and in the openness of the political system, however, proved to be immaterial for the speed at which jurisdictions granted women access to the ballot. Neither territorial status, a proxy for the procedural ease of extending the franchise, nor indicators for voting regulations (secret ballot, literacy tests, and voting tax) that we used to proxy for the general openness of a state political body exerted any influence on the rate of suffrage adoption. In summary, therefore, we find several factors to have been influential in either accelerating or delaying woman suffrage adoption in a jurisdiction. Overall, however, our results suggest that the severe imbalances in the adult sex ratio between jurisdictions in the second half of the 19th and early 20th century were decisive for the very differential rates at which women were granted access to the ballot in the United States.

Our findings suggest that woman obtained the right to vote earlier in the American West because they were fewer in relative numbers in this than in other regions of the country. The most likely explanation for this finding is that high sex ratios in the West have altered the power calculus for men, that is the pre-woman-suffrage electorate and potential grantor of voting rights. In the American West, the enfranchisement of few rather than many women carried lower potential costs for men in terms of any devaluation of their own vote and influence than in other parts of the country. At the same time, and also potentially conducive to early woman suffrage, high sex ratios in the American West may have increased the bargaining power of women vis-a-vis men, enabling them to demand more successfully the recognition of their political rights. Furthermore, and complementing these causal pathways, legislators of states in which sex ratios were skewed toward men might have viewed woman suffrage also as a viable tool to attract female settlers to their jurisdictions.

Our main finding of an inverse relationship between the size and likely success of a group that seeks the franchise may prove useful also for the study of other franchise extensions, and for inquiries into the dynamics of political power sharing more generally. It may help to understand, for example, why it took the American South so long to grant its large black population full political rights, or why countries often find it so difficult to grant ethnic minorities greater self-governing powers, when these minorities account for a significant share of their citizens.

The paper is structured as follows. Section 2 documents the history of woman suffrage in the

United States from the mid nineteenth century to the ratification of the Nineteenth Amendment in 1920. It also considers theoretical arguments on the likely determinants of woman suffrage adoption, and reviews the non-economic literature on the subject. Section 3 describes the data and methods used, Section 4 presents and discusses the empirical results, and Section 5 concludes.

2 Background

2.1 The Enfranchisement of Women in the US, 1869-1920

In 1848, at Seneca Falls, New York, pioneering suffragists assembled in a landmark convention to adopt a resolution that called for universal woman suffrage. In light of recent developments both at home and abroad, chances to secure the ballot must have seemed promising at the time. Internationally, similar suffrage movements as the one in the United States began to emerge around the same time in Australia, England, New Zealand, and the Scandinavian countries. And leading intellectuals began to raise their voice demanding full recognition of womens' political rights and an end to the long-standing subjugation of women by men.⁴ Nationally, early property qualifications had been revoked. And suffrage rights had been extended so that a majority of the adult, white, male population by now was eligible to cast their vote. However, as it turned out, Seneca advocates had to wait another three quarters of a century to see their goal finally accomplished in full.

Supportive of the abolitionist cause and involved in other reform movements before and during the Civil War, the woman suffrage movement received its major set back in the second half of the 1860's, just when victory seemed at its closest. First, abolitionist leaders withdrew their support for woman suffrage, as it became clear that continuing public support would be harmful to their own cause. Then, with slavery abolished in 1865, the Fourteenth Amendment in 1868 granted freedman the long-awaited franchise, but made no mention of women rights. Ironically, and bitter for women, it was this very Fourteenth Amendment that first inserted the word "male" into the US Constitution. Ensuing internal quarrels over goals and methods led to a split of the woman suffrage movement in 1869 into the more radical New-York-based National Woman Suffrage Association (NWSA) and the moderate Boston-based American Woman Suffrage Association (AWSA). These two woman suffrage organizations, later merged to form the National American Woman Suffrage Association (NAWSA), further popularized the woman suffrage cause and molded an increasing awareness of the issue both among politicians and among the population at large.

Despite their setback in securing universal suffrage for women by way of constitutional amend-

⁴Forceful articulators include Harriet Taylor in her 1851 article on the enfranchisement of women and John Stuart Mill in his 1869 essay on the subjection of women.

ment, however, suffragists did not have to wait long to see the first women vote in the United States. In 1869, the territorial legislature of remote Wyoming granted its women access to ballot, followed in 1870 by the territorial legislature of neighboring Utah.⁵ These victories were stunning, both for where and how they occurred. It was not New York, nor New England, which housed the headquarters of the two national woman suffrage organizations, that led the nation in first extending the franchise to women. Moreover, any suffragist activity in these two territories had been minor at best. This paradox has bewildered historians. All the more so, since the American West continued to lead the nation in the enfranchisement of women for the following forty plus years.⁶ The Territory of Washington enfranchised its women in 1883, followed by the states of Colorado (1893) and Idaho (1896).⁷ They were joined in 1911 by the state of California, in 1912 by the state of Oregon and Arizona (which became a state in the same year), and in 1913 by the Territory of Alaska. Also in 1912, and a full forty-three years after pioneering Wyoming, the first non-western state (Kansas) adopted woman suffrage, followed in 1913 by yet another (Illinois). In 1914, two more western states enfranchised their women (Nevada and Montana), making New Mexico the only non-suffrage state to remain in the American West. A stunning seventeen states adopted woman suffrage between 1917 and 1919, most of which were from the Midwest. The remaining nineteen non-suffrage states, in the majority from the South and Northeast, were finally forced in 1920, through the ratification by Congress of the Nineteenth Amendment to the US Constitution, to grant their women access to the ballot. As this timeline illustrates, the American West assumed a clear pioneering role in the adoption of woman suffrage in the United States.⁸

Other statistics corroborate this view. According to Catt and Shuler (1923), there had been 480 campaigns in thirty-three states between 1870 and 1910 to get state legislatures to submit suffrage amendments to voters. Although these campaigns resulted in only seventeen referendums in eleven states, it is again telling to find that fourteen of these were held west of the Mississippi, and that the only two ensuing successes occurred in Colorado and Utah (Grimes, 1967). Evidently, woman suffrage was on the political agenda and mind of people also in states other than in the American West in this period. Yet, for reasons that still await explanation, only in the West did it manage to amass the support necessary to become a reality.

Some historians see 'frontier egalitarianism' as a major driving factor. According to this view,

⁵Congress, however, revoked Utah women's right to vote in the Edmunds-Tucker Bill of 1887, as part of an effort to end the practice of polygamy in the Mormon-dominated territory. Woman suffrage was reinstated in Utah by constitutional referendum when Utah was admitted statehood in 1896.

⁶As noted in Miller (2008, p.1292-1293), "the remarkably poor correspondence between suffrage movement strength and the enactment of suffrage laws" is evinced also by "... equivalent suffrage organization membership in the West and the South (where suffrage efforts were most and least successful, respectively)".

⁷In Washington Territory, the territorial legislature in fact enacted woman suffrage twice (1883, 1887), but each time the enactment was rescinded, after being declared void, on technical grounds, by the territorial supreme court. Woman suffrage was finally adopted in Washington in 1910.

⁸See Table A-1 in the appendix for a complete tabulation of the dates at which individual jurisdictions (states and territories) first adopted woman suffrage.

"frontier conditions undermined traditional gender roles" (Wheeler, 1995, p. 11) and furthered "notions of equality and democracy" (Larson, 1970, p. 10) in the West. Others argue that political expediency on the part of territorial legislatures was decisive for the leading role of the American West. Specifically, this view holds that territories saw "woman suffrage as a means to publicize their regions and hopefully attract settlers, investors, and support for their admission to the Union as states" (Beeton, 1995, p. 115). A prime, yet non-representative, example often cited in this context is Mormon-dominated Utah, where woman suffrage allegedly was granted to further the territory's bid for statehood in the face of fierce opposition from Congress to the practice of polygamy. Still other researchers have pointed to the importance of procedural reasons that advantaged the adoption of woman suffrage in the territories. For most states needed an amendment to their state constitution, which required both legislative endorsement and public approval in a referendum. In territories, in contrast, all that was needed to enfranchise women was an enactment of the territorial legislature with the approval of the territorial governor. Finally, it has been argued that safety reasons made the testing of woman suffrage in the territories particularly attractive, as residents in territories could vote neither for their own governor, nor for the president. And Congress, who controlled the territories, could revoke female voting rights at any time if necessary. Hence in territories, neither "the political stability of the established states nor the national political scene would be seriously altered" (Beeton, 1995, p. 102-103), or put at great risk, if women were enfranchised.

While each of these factors may have had its part in making the West, or parts of it, more conducive to the woman suffrage cause at a certain time, it is clear that none of them suffices to account for the pioneering role and sustained lead of the American West in adopting woman suffrage. Three of the four factors are simply too limited in scope: taking reference exclusively to territories, they cannot explain why the first states to introduce woman suffrage are also found in the West (Colorado, Idaho, and California). Frontier egalitarianism, in turn, can hardly qualify as an explanation for the continuing high rates of suffrage adoption in the West in the early 20th century.⁹ And neither can the other three factors. All therefore, at best, provide potential explanations only for the early period of suffrage extensions in the United States. Factors less transient and more characteristic of the West than the ones considered, however, are required if one wants to understand also its persistent lead.

⁹In the decade up to and including 1914, seven states/territories granted women suffrage. Five of them from the West (Arizona, California, Montana, Oregon, and Nevada).

2.2 Theoretical Considerations

Any explanation or theorizing on the extension of the suffrage to women in the United States has to honour three basic facts. First, women in the United States in the 19th century first obtained the right to vote in the American West, and it was states again in the West that also led the nation in first enfranchising their women in the early 20th century. Second, it was always men, that is male electorates and male state legislatures, that granted women access to the ballot. And third, women at no time either had the means, the organizational cohesion, or the will to demand by force or otherwise their political rights against any dedicated opposition of men. These facts are important. The first calls for a thorough inquiry into the factors that account for the pioneering role *and* sustained lead of the American West. The second underscores the need to put male considerations center stage in any such inquiry, that is the incentives and risks faced by the very grantors of woman suffrage. And the third sets clear confines on the scope of factors that may have entered the calculus of male deliberations in favor or against woman suffrage. The latter, in particular, excludes mere female threat potential as a factor, that is the ability of women to revolt, boycott, or obstruct social and economic life on a scale that would secure political concessions. Without doubt important, and often decisive, in many other struggles for political rights in history, such a factor is clearly irrelevant for the adoption and spread of woman suffrage in the United States.¹⁰

Woman suffrage, no doubt, implied a massive extension of the franchise. But as it "cut through all classes, religions, races, and national origins" (Grimes, 1967, p. 4), there were no general subgroups of men to act as natural advocates or opponents of woman suffrage. Men in general, however, had much to lose. Depending on the relative size of the adult female population in a state, the votes and hence political influence of men could be significantly devaluated (Kenny, 1999). And political and broader societal stability could be put at considerable risk. There is ample evidence that considerations of this kind were a concern to contemporaries, as evincend by public deliberations in Congress, in state legislatures, and in the national press. In particular, the risks, both the imminent and the more general, involved in granting women suffrage rights were intensively debated: some feared a de-feminization of women, others a feminization of politics; furthermore, many saw the traditional roles of women and men at stake, both in the domestic and in the economic sphere, should women get access to the ballot; and more than a few men questioned the very capability of women to act as responsible voters. An illustrative and vivid example of such concerns is provided by deliberations of delegates at a meeting in 1894 of the Constitutional Convention of the State of New York, which considered various woman suffrage amendments. As reported in *The New York*

¹⁰Acemoglu and Robinson (2000), for instance, argue that nineteenth century extensions of the franchise to men were concessions on part of the political elite to prevent widespread social unrest and revolution.

Times on August 16, 1894, one delegate at the meeting noted that the "functions of the sexes were different" and that politics "is full of strife, bitterness, and heartburnings, wholly unsuited to the womanly character. Women in strife becomes harsh, hard, and repulsive." Another argued that "evils would results, not only to the State, but to womankind, by conferring suffrage upon females ... which will develop and increase estrangement, separations, infidelity, and divorce, and the consequent destruction of home."

Any such risks, however, were intrinsically smaller in magnitude and hence must have appeared more manageable in the West because there simply were not much women, save in Utah and in New Mexico, to distort political and social life significantly and beyond repair. According to the 1870 census, the ratio of men to women aged 15-49 was 95:100 in the Northeast, 93:100 in the South, and 126:100 in the Midwest, but a stunning 330:100 in the West, a result of the late and strongly male-biased settlement of the frontier. Although ratios subsequently converged between regions in the decades that followed, the American West continued to record a pronounced shortage of women. In 1910, the sex ratio of men to women aged 15-49 was still 150:100 in the West, which compares to 104:100 in the Northeast, 102:100 in the South, and 112:100 in the Midwest. In other words, from the Restauration period to World War I, the American West exhibited a significantly higher ratio of men (potential grantors) to women (potential grantees), an imbalance that insured against too drastic a distortion of political and social life should the experiment of woman suffrage go indeed awry.¹¹

Although debates surrounding woman suffrage were usually cast in terms of morals and basic rights, contemporaries were well aware of the pronounced sex ratio imbalances in the American West and conscious of the fact that the political risks involved in granting women access to the ballot in a constituency would to a significant degree depend on the respective size of the female population to be enfranchised. As noted in a brief comment by *The Nation*, March 3, 1870 on the Wyoming experiment, the political consequences of woman suffrage in this territory were inherently limited and of little information value for other states because "... the women there are but a handful, ... so that their use of the franchise will hardly shed much light on the general question." Nearly fifty years later, in a different context and concerning the east coast, similar thoughts on arithmetics can still be found. In a letter to the editor, published in *The New York Times* on November 3 1917, a man pointed to the risks involved in granting women suffrage in the State of New York for the country's war effort, a risk he deemed particularly high in light of the numbers of women that would be enfranchised: "If at the present time there should be added to the electorate in

¹¹For the subsequent (albeit short) war and post-war period, legal studies of state voting behavior on federal woman suffrage have found correlative evidence in support of the importance of state sex ratios for state support of universal woman suffrage. According to Jones (1991), high sex ratio states in the period 1915-1919 were more likely to vote in favor of federal woman suffrage.

this great State 1,700,000 voters, (an equal number to the male vote cast at the last Presidential election,) untrained to take part in public affairs, unaccustomed to the exercise of the franchise, unaccustomed to think seriously of political problems, ... the movement toward unification of the country in the vigorous effective prosecution of the war [would be] seriously weakened.” Also at federal level, and right after the Civil War, the titled sex ratios in the American West had been linked to the issue of woman suffrage. When the US Congress in the late 1860’s considered proposals for extending the franchise to women, some proponents argued for testing the franchise first in the Western territories. One of the reasons put forward for this scheme was that woman suffrage could lessen the twin problems of deficit women in the West and surplus women in the East (a result of the Civil War and male migration to the West), by inducing greater numbers of eastern women to follow the trail into the West (see, for example, Larson, 1970).

As is evident, the relative size of the female to-be-enfranchised population has been a factor in male deliberations on the virtues and costs of granting woman access to the ballot. And high sex ratios in the West were acknowledged by contemporaries to effectively put a limit on the size of the vote and influence that women could exert. If indeed of consequence for the timing and spread of woman suffrage across US states, then sex ratios and rates of woman suffrage adoption should be positively correlated. Figure 1 provides such correlative evidence. It shows that the sex ratio in a state that adopted woman suffrage generally tended to exceed the sex ratios found on average in states that were at risk of extending the franchise to women in that year of adoption (solid line - plotted until 1919 only). Although this feature is particularly pronounced for the states and territories in the American West, it is clearly discernable in later times also for the non-Western states and territories, albeit to a somewhat lesser degree: of all nineteen non-western states that introduced woman suffrage prior to 1920, twelve had sex ratios in excess of the respective annual average across all states (including those in the West) that were at risk of introducing woman suffrage; if the latter is calculated instead only for non-western states, then this figure increases to fourteen (out of nineteen).¹² State sex ratios hence provide a factor that can potentially explain not only the *early and sustained* lead of the American West in the enfranchisement of women, but *also* the differential rates of suffrage adoption across states in the United States more generally.

High sex ratios may have furthered the adoption of woman suffrage also for other reasons than just a lower perceived risk to political stability and social cohesion. At least in the early years, some state legislators in the West considered woman suffrage also as ”a kind of political bait to lure women from the East” (Grimes, 1967, p. xi), as did some Congressmen who supported the testing

¹²It is also telling that of the 19 states in which women could only vote from 1920, the seven states whose legislatures approved the amendment to the US constitution (Kentucky, Massachusetts, New Hampshire, New Jersey, New Mexico, Pennsylvania, and West Virginia) had an average sex ratio among their 15 to 49 olds of 104:100 in 1920, while those who did not had an average sex ratio of only 99:100.

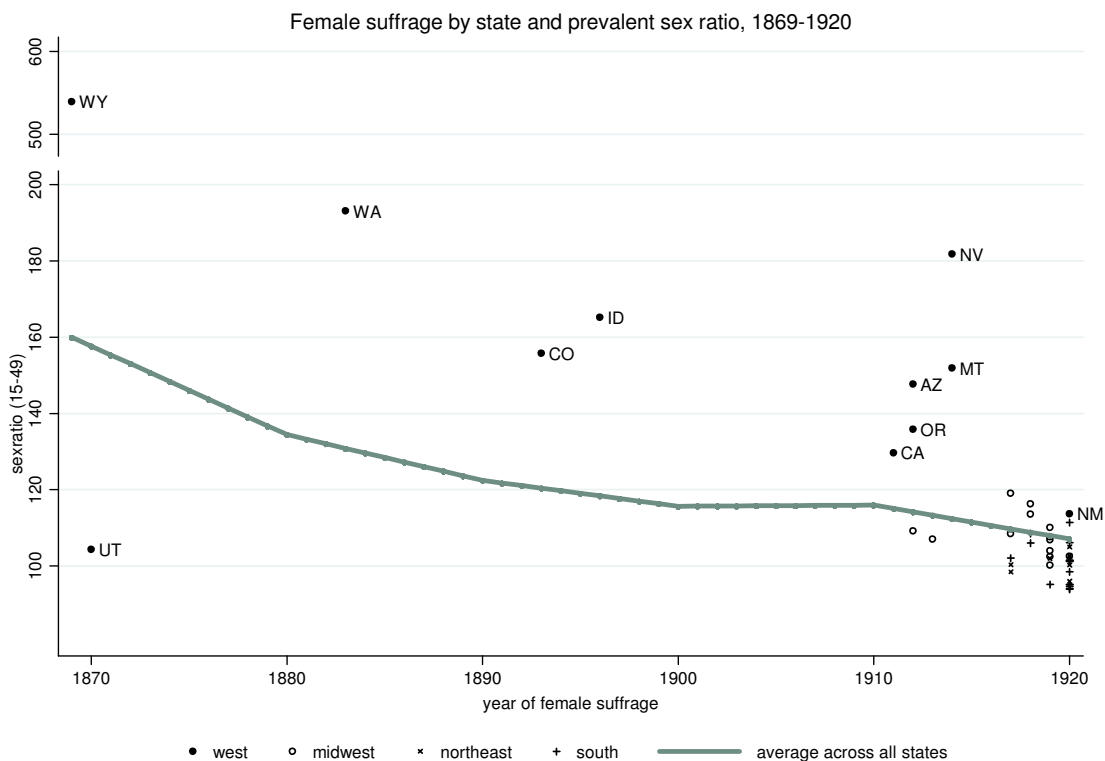


FIG. 1: Woman suffrage adoption by states and state sex ratios, 1869-1920

of woman suffrage in the territories. Furthermore, high sex ratios, by increasing female bargaining power in the domestic sphere, may have induced men, and particular male legislators, to more readily grant support for the woman suffrage cause or to oppose the same less vigorously.¹³ There are several examples which suggest that such a causal pathway may have played a role at times in the struggle for woman suffrage. Council President W. H. Bright of Carter county of the Wyoming territorial legislature who introduced the woman suffrage bill that was to make Wyoming the pioneer of woman suffrage in the United States in 1869, was reportedly strongly influenced in his decision by his wife, which supported woman suffrage (for details of various accounts, see Grimes, 1967, p. 54-55). And in process of ratifying the Nineteenth Amendment, with but one state short of the thirty-six states required for amending the constitution, Tennessee in the summer of 1920 finally tipped the balance, reportedly "... the result of one twenty-four-year-old legislator from the mountains, Harry Burn, changing his vote at the insistance of his elderly mother, Febb King Ensminger Burn..." (Wheeler, 1995, p. 19).

¹³A voluminous literature in economics has explored the importance of sex ratios for the relative bargaining power of men and women, producing evidence in support of their importance for marriage market, labor market, and fertility outcomes (see, for example, Angrist, 2002, or Acemoglu, Autor, and Lyle, 2004). Sex ratios have also been shown to affect electoral outcomes in the US, as voting patterns of man and women diverged in recent decades creating a "political gender gap" (see Edlund and Pande, 2002).

Certainly, other factors, often of more idiosyncratic or temporary nature, may have played a role in the decision of individual states to extend the franchise to women. In some states, strong liquor and brewing interests opposed woman suffrage, and sometimes even organized anti-suffrage campaigns, as women were seen as ardent supporters of prohibition (Grimes, 1967). In others, a strong industrial base at times provided a potent source of opposition. Business interests were generally hostile to woman suffrage for fear that female voters would oppose child labor and more generally back more rigid labor standards (Flexner, 1975, McDonagh and Price, 1985). Alleged potential opponents include also the foreign-born who are reported to often have voted against woman suffrage in public referendums (Anthony and Harper, 1902). Mormons in Utah and Indiana, in turn, may have seen woman suffrage as a means to show to the nation that their women, despite the practice of polygamy, were not suppressed, hoping to thereby pre-empt any potential coercive action by Congress against this practice (Grimes, 1967). These and other factors will need adequate consideration in an empirical analysis that seeks to unearth the driving forces behind woman suffrage in the United States.

3 Econometric Method and Data

To analyze the driving forces behind the spread of woman suffrage across US states, we estimate discrete time duration models (see Allison, 1982 or Jenkins, 1995 for excellent overviews). Let h_{it} denote the conditional hazard rate of adopting suffrage in state i at time t given that suffrage has not yet been introduced. We choose the following specification for the hazard rate:

$$h_{it} = 1 - \exp[-\exp(\alpha_t + \beta' X_{it})], \quad (1)$$

where X_{it} is a vector of covariates. Equation 1 can then be solved for the complementary log-log function:

$$\log[-\log(1 - h_{it})] = \alpha_t + \beta' X_{it}. \quad (2)$$

The complementary log-logistic regression model is widely used in empirical work because it is the discrete time representation of the continuous time proportional hazard model (cf. Prentice and Gloeckler, 1978).¹⁴ Throughout the analysis, we cluster standard errors at the state level to allow for a shared error component.

We use annual, state-level data and focus on the time period between 1866 (the first year after the devastating civil war) and 1919 (when Congress passed the Nineteenth Amendment, ratification took place in 1920). Broad historical trends such as the spread of democratic and equalitarian ethic

¹⁴Alternatively, one could choose a logistic specification of the hazard function. Since results of the two specifications are almost identical, we will only report results for the complementary log-log case.

will affect the hazard of woman suffrage adoption in all states: for instance, the period after the adoption of woman suffrage in Idaho (1896) became known among suffragists as the ‘doldrums’, as not a single state enfranchised its women in the first decade of the 20th century; in contrast, suffrage adoption clustered strikingly in the second half of the 1910s (see Figure 1). Such broad historical trends are empirically captured by changes in the baseline hazard a_t . Since theory offers little guidance on choosing a functional form for a_t , we opt for a semi-parametric approach and assume that the baseline hazard is piecewise constant, i.e. constant within a specified time interval, but do not impose further functional form assumptions. The exact choice of these time intervals should honor broad historical trends. However, at least one change in suffrage status also has to occur within each interval (otherwise, the corresponding period dummy would predict failure perfectly). Given this technical constraint, we choose the following four time intervals for our baseline regressions: 1866-1884, 1885-1899, 1900-1914, 1915-1919. However, we will also test the robustness of our findings to the choice of the baseline hazard’s functional form.

Our dichotomous endogenous variable (woman suffrage) is constructed on the basis of information from several sources (see Table A-1 in the appendix). The explanatory variables (X_{it}) are mainly taken from the five volume publication *The Historical Statistics of the United States* (Carter et al., 2006), which updated and extended the widely used third edition of 1975. The data primarily comes from the seven decennial censuses between 1860 and 1920. Values for inter-census years are inferred using linear interpolation.¹⁵ We use data only for the 48 contiguous US states (i.e. exclude Alaska and Hawaii). Overall, observations in our data total 2297.

Our main explanatory variable of interest is the “adult” sex ratio of a jurisdiction, that is a state or territory, which we define in our baseline regressions as the number of men aged 15-49 per 100 women in the same age cohort. We have chosen to exclude both the very young and the very old: the former, as they were too young to vote for years to come, if women were granted access to the ballot, and because they were also too young to already influence marriage market conditions; and the latter, because they were in all likelihood too old to exert a significant influence on marriage market conditions. In this age bracket, sex ratio imbalances, if indeed of importance for rates of suffrage adoption along the causal pathways suggested (political risk, enhanced female bargaining power, and attracting eastern women), should exert their greatest influence.¹⁶ Specifically, and as argued in Section 2.2, we expect the sex ratio to increase the hazard of adopting woman suffrage.

¹⁵Some of the explanatory variables, especially state-level population figures by gender and age, are only available from 1870 onwards. Values for the time period 1866 to 1869 are obtained by linear *extrapolation*.

¹⁶We conduct various robustness checks, however, in that we use also alternative definitions of the sex ratio that are based on different age brackets.

TABLE 1: SUMMARY STATISTICS BY CENSUS REGION FOR SELECTIVE CENSUS YEARS

Census region:												
west (11 states):			midwest (12 states):			northeast (9 states):			south (16 states.):			
1870	1890	1910	1870	1890	1910	1870	1890	1910	1870	1890	1910	
<i>Jurisdictions:</i> ¹												
states	3	8	9	10	12	12	9	9	9	15	15	16
territories	8	3	2	2	0	0	0	0	0	0	1	0
<i>Voting regulations:</i> ¹												
female suffrage	2	3	5	0	0	0	0	0	0	0	0	0
secret ballot	0	3	10	0	1	12	0	3	8	0	3	12
poll tax	1	1	1	0	0	0	3	2	1	2	4	10
literacy test	0	1	3	0	0	0	2	2	4	0	1	8
<i>Population indices:</i> ²												
sex ratio	330	179	150	126	115	112	95	99	104	93	103	102
pop density	0.7	2.6	5.9	23	35	46	98	144	219	26	36	49
% foreign born	33	23	19	22	21	16	18	22	24	3.6	3.0	2.9
% urban	13	28	37	17	27	37	40	53	64	12	17	24
% nonwhite	7.3	4.6	5.1	2.7	1.6	1.9	1.4	1.4	1.5	35	32	30
% Italian	0.2	0.7	1.4	0.0	0.1	0.5	0.0	0.5	3.1	0.0	0.1	0.4
% Irish	5.9	2.8	1.1	3.6	1.8	0.7	9.0	6.8	3.5	1.2	0.6	0.3
% German	3.7	3.0	1.9	7.4	6.4	4.0	2.4	3.0	2.0	1.3	1.0	0.6
% Mormon	12	18	17	0.1	0.2	0.3	0.0	0.1	0.1	0.0	0.1	0.2
<i>Economic structure:</i> ²												
% land in farms	1.8	5.9	14	42	57	74	63	62	61	51	57	65
land in farms (in acres) per capita	10	16	23	12	16	19	6.3	5.2	4.3	15	12	10
% engaged in manufacturing	32	27	29	17	19	26	38	41	46	10	13	19
% female gainful employment	7.9	12	17	7.2	12	17	15	21	25	17	18	29

NOTE: ¹ number of states in a census region with given feature. ² unweighted averages across states in a census region; rounded figures.

In addition, we control for several factors that have been noted in the (non-economic) literature to be of potential importance for the spread of woman suffrage at particular times or in particular regions. We consider four broad categories of variables: measures of the population composition of a state or territory, measures of the economic structure of a jurisdiction and the economic power of woman living therein, a measure of the legislative/procedural difficulty of extending the suffrage (territorial status), and regional indicators to account for unobserved (and time-invariant) characteristics that may affect rates of woman suffrage adoption at the level of individual jurisdictions (e.g. "western equalitarianism").

Population Indices: A first set of covariates seeks to capture compositional characteristics of a state's population that have been suggested to potentially affect rates of suffrage adoption. Specifically, we control for the percentage of non-white and foreign-born individuals in a state. According to Anthony and Harper (1902), the foreign-born were regularly over-represented among those opposing woman suffrage in public referenda. We also include separate variables for the respective percentages of individuals that are born in Italy, in Ireland, and in Germany. Among Irish- and Italian-born Americans, the traditional view that a woman's appropriate place is in the domestic rather than in the public sphere was particularly pronounced, which made these groups on average less supportive of the woman suffrage cause (McDonagh and Price, 1985).¹⁷ The percentage of Americans born in Germany in a jurisdiction has also been argued to have diminished the probability of a state to adopt woman suffrage. For the suffrage movement was closely intertwined with the prohibition movement, which was fiercely opposed by German-born Americans "for whom successful brewing was a distinctive cultural accomplishment" (Grimes, 1967, p. 116). In Utah, for instance, the German-American Alliance representing brewers' interests actively fought against prohibition and the woman suffrage movement (Harper, 1922). In contrast, Mormons tended to be generally supportive of woman suffrage (McDonagh and Price, 1985). In particular, the very early adoption in 1870 of woman suffrage in Utah has been linked to the local dominance of Mormons. Grimes (1967) argues that the adoption was a calculated move on part of the Mormon hierarchy. "To the Mormons, there could be no better way of proving that their system of polygamy was not degrading to woman [...] than to declare woman suffrage in Utah" (cf. Grimes, 1967, p. 33). Woman suffrage is also said to have protected the power of Mormons against the influx of newly arriving non-Mormon immigrants that were mostly unmarried men. To account for these influences, we include in our regression analysis a covariate which records the relative number of Mormons to the total number of individuals that were members of a religious denomination in a state.¹⁸ We

¹⁷The fraction of Irish- and Italian-born residents in a jurisdiction should also be correlated with the percentage of Roman Catholics in a state.

¹⁸Figures about church membership are only available from the US Census Bureau for the years 1890, 1906, 1916 and 1926. For 1870, we approximated the relative importance of Mormons by their relative number of sittings in a

also control for the urbanization rate of a jurisdiction, i.e. the percentage of individuals that live in an urban area, and for its population density. Urban areas played a major role in the fight against the woman suffrage movement as many of the opposing forces (such as the liquor industry but also foreign-born Americans) gathered in cities (Grimes, 1967). Of course, inhabitants of urban areas may also have been more progressive in terms of their social values and family practices, which *ceteris paribus* should have increased the probability of highly urbanized states to enact woman suffrage. And for both advocates (e.g. women organizations) and opponents of woman suffrage, organizational costs might have been lower in urban than in rural areas (Stigler, 1971), so that the expected net effect of urbanization on the timing of woman suffrage is a priori indeterminate in sign. Population density, in turn, is likely to correlate with other population characteristics that may affect the hazard of adopting woman suffrage, characteristics for which we cannot control directly. In particular, sparsely populated areas are not equally appealing to everyone. Moreover, population density should, at least to some extent, capture the frontier equalitarianism explanation for woman suffrage, according to which nature was the great equalizer in the West.

Economic Structure: A second set of covariates relates to the economic structure of a jurisdiction. We include land in farms expressed both in per-capita terms and as a share in the total area of a state. Both variables measure the importance of the agricultural base for a jurisdiction. The latter variable will also be indicative of the degree to which land has been cultivated in a state and hence may capture in part any potential influence of frontier equalitarianism. We also control for the percentage of gainful workers aged 10 or above that are engaged in manufacturing, in mechanical, and in mining industries. Manufacturing interest are generally viewed as a main opponent of the woman suffrage movement. In particular, business interests feared that female voters would back more rigid labor legislation in general and child labor regulation in particular (Flexner, 1975; McDonagh and Price, 1985). A strong manufacturing sector in a jurisdiction should therefore decrease the hazard of adopting woman suffrage. Finally, we control for the percentage of females (aged 10 or above) that is engaged in gainful employment. This ratio proxies for the economic power of those seeking the ballot and hence for the ability of would-be female voters to demand their voting rights more forcefully in a jurisdiction. Apart from enhancing the bargaining power of women, however, female economic activity may also have undermined the view among men that womens' appropriate place is exclusively in the domestic sphere.

Territorial Status: We include a dummy that indicates whether or not a jurisdiction is a territory. As noted in Section 2, historians have argued that the West took a lead in the enfranchisement of women partly because many Western jurisdictions had only territorial status. On the one hand, the barriers for adopting woman suffrage were generally lower in territories than state. Missing values were then inferred by inter- and extrapolation.

in states (Grimes, 1967). Whereas in states woman suffrage required a constitutional amendment and hence usually had to be approved by the state legislature and in a public referendum, in territories an approval of the legislature and the territorial governor was sufficient. On the other hand, it has been argued that for territorial legislatures woman suffrage was an attractive and low-cost means to publicize their jurisdiction and to increase federal support for their bid for statehood.

Census Region Dummies: Finally, we also control for fixed region effects by including as regressors dummies for the census regions West, Midwest, South, and Northeast (Northeast serves as the reference category). These indicators will capture unobserved time-invariant factors shared by states in a census region. If, as a result of the early frontier conditions, the notion of equality was generally further developed in the West than in the other regions, this effect on the hazard of adopting woman suffrage should be captured by these census region dummies.

Table 1 provides descriptive statistics by census region for selective census years. The table shows that the West differed from the other census regions in several respects. First, in 1870, 8 out of the 11 jurisdictions in the West had territorial status. In contrast, in the same year only 2 of the 37 non-Western contiguous jurisdictions had not yet become a state. By 1890, however, most of the Western jurisdictions had been successful in their bid for statehood.

The population indices, in turn, show that the Western jurisdictions remained sparsely populated even in 1910. Compared to the Midwest and the Northeast, the urbanization rate in the West was relatively low in 1870. However, it caught up quickly and significantly thereafter. The percentage of foreign-born Americans in the West, in turn, was relatively high in 1870 but declined in the following years. The percentage of Italian-, Irish- and German-born Americans, in contrast, was not exceptionally high in the West. But the share of Mormons in Western jurisdictions was far larger. However, the importance of the Mormon church differed considerably between jurisdictions in the West. Mormons were the dominant religious denomination in Utah and Idaho but they were only weakly represented in California, Colorado, Montana, New Mexico, Oregon, and Washington.

Particularly striking are the inter-region differences in the sex ratio. In 1870, the average ratio of men to woman (aged 15-49) in a Western jurisdiction was 330:100. This compares to a ratio of 126:100 in the Midwest, 95:100 in the Northeast and just 93:100 in the South. While the sex ratio in the West declined markedly in later decades, it was still well above those found in the other census regions in 1910. Importantly, and in contrast to the percentage of Mormons, a very high sex ratio was characteristic for all Western jurisdictions except Utah and New Mexico.

Turning to the economic structure variables, it comes as no surprise that the percentage of land in farms was tiny in the West. This mainly reflects the fact that great parts of the West were

still not settled or only sparsely populated. Expressed in per capita terms the agricultural base in the West was comparable to those in the other census regions. Manufacturing and mechanical industries were relatively more important in the West than in the South and in the Midwest, but somewhat less important than in the Northeast. Finally, compared to the Northeast and the South, the percentage of females in gainful employment was relative low in the West (and also in the Midwest). The descriptive evidence hence already suggests tentatively that neither the absence of opposing business interests nor the economic power of women are likely to have been important factors for the success of the woman suffrage movement in the West.

4 Results

4.1 Main Results

We start with estimating a complementary log-logistic regression model that includes as covariates only the sex ratio and the period dummies. The results are shown in Table 2 (Model 1). In line with our theoretical prediction, the sex ratio enters with a positive sign and is highly statistically significant. The coefficient estimate implies that an increase in the sex ratio by one percentage point is associated with an increase in the hazard of adopting woman suffrage of 0.6 per cent ($= \exp(0.006) - 1$).¹⁹ The coefficient estimates of the time period dummies furthermore suggest that the woman suffrage movement has gained momentum over time. In particular, compared to earlier years, jurisdictions were much more likely to enact woman suffrage laws in the years following the outbreak of World War I.

We proceed by adding sequentially further (sets of) covariates to the baseline specification. In Models 2 and 3, we add population indices and covariates that describe the economic structure of a state. And in Models 4 and 5, we further add dummies for territorial status and for census region. In all four models, the sex ratio exerts a robust positive and statistically significant effect on the hazard rate. Its coefficient estimate increases markedly when we account for inter-state differences in population composition and in economic structure. In the most elaborate model specification (Model 5), a one percentage point increase in the sex ratio increases the hazard of adopting woman suffrage by about 2.5 per cent. Regarding the population indices, we find a sizeable and statistically significant negative effect of the percentage of nonwhites on the probability that a state enacts woman suffrage. The percentage of German- and Irish-born Americans also both enter with the expected negative sign. While the effect for the German-born Americans is mostly statistically insignificant, the negative effect of the Irish-born Americans is statistically

¹⁹The complementary log-logistic regression model is the discrete time representation of the continuous time proportional hazard model. The estimated regression coefficients are hence equivalent to the coefficients from the underlying proportional hazard model and the exponentiated coefficients can be interpreted as hazard ratios.

significant once we account for the economic structure of a jurisdiction. There is some evidence for a positive effect of Italian immigrants on the success probability of the woman suffrage cause (Model 5). While this finding is surprising given our (and others') priors, it is consistent with results presented by McDonagh and Price (1985) who do not find Italians to be a major source of opposition in woman suffrage referenda. Our results furthermore show that the urbanization rate has a statistically significant positive effect on the hazard rate. This finding could testify to the conjecture that those living in cities were indeed more progressive in terms of their social values and family practices. The population density of a state, in contrast, does not influence the hazard. Finally, the share of Mormons has the expected positive effect in all specifications.

Turning next to the set of variables which describe aspects of the economic structure of a jurisdiction, we find neither of the two measures of land in farms to exhibit a statistically significant association with the hazard rate. However, the percentage of gainful workers in manufacturing exerts a strong and highly significant negative effect on the hazard of adopting woman suffrage. Manufacturing interests therefore seem to have been a major impediment to the woman suffrage cause. Finally, and in contrast, we find that (potential) economic power of those seeking the franchise, as measured by the percentage of women that is gainfully employed, indeed increases, all else equal, the probability of a jurisdiction to pass woman suffrage legislation.

Territorial status of a jurisdiction does not prove to increase the hazard of adopting woman suffrage. The respective coefficient estimate is even negative but statistically insignificant. We therefore do not find supportive evidence for the hypotheses that greater procedural ease in enacting woman suffrage in territories or territories' alleged deliberate use of woman suffrage as a means to gather support in Washington for their bid for statehood had a positive effect on the rate at which jurisdictions granted women access to the ballot.

Finally, there is evidence that unobserved time-invariant factors shared by jurisdictions within a census region had an affect on the timing of the spread of female voting rights. However, the results of Model 5 suggest that - after controlling for observable characteristics - it was the Northeastern rather than the Western states that were the odd ones out in the Union: the states in the West, in the Midwest, and in the South all display a markedly higher average probability of adopting woman suffrage than those that are located in the Northeast. While the coefficient estimate of the dummy for the American West is somewhat larger than the corresponding estimates for the South and for the Midwest, the differences between these coefficients are not statistically significant. Given that we also find neither the sparse population density nor the low level of land cultivation in the West to be important determinants of the rate at which jurisdictions granted women access to the ballot, our results provide little empirical support to the widely shared belief that frontier equalitarianism

in the West was a major factor behind this region's lead in the enfranchisement of women.

TABLE 2: REGRESSION RESULTS

Dependent variable: female suffrage (0/1)					
Covariates	Model 1	Model 2	Model 3	Model 4	Model 5
sex ratio	.006*** (.002)	.010*** (.004)	.029*** (.008)	.029*** (.008)	.025*** (.009)
<i>Population indices</i>					
population density	-	-.013 (.011)	-.006 (.005)	-.006 (.005)	-.005 (.005)
% urban	-	.036 (.027)	.088*** (.025)	.087*** (.025)	.057** (.023)
% nonwhite	-	-.067*** (.023)	-.141*** (.040)	-.140*** (.040)	-.183*** (.069)
% foreign born	-	-.034 (.046)	-.083*** (.028)	-.078** (.034)	-.070* (.037)
% Italian	-	.389 (.305)	.328 (.212)	.345 (.211)	.651*** (.175)
% Irish	-	-.144 (.467)	-.489** (.229)	-.526** (.259)	-.511** (.259)
% German	-	-.013 (.105)	-.168 (.136)	-.191 (.162)	-.350* (.207)
% Mormons	-	.052*** (.018)	.067*** (.020)	.066*** (.019)	.056*** (.017)
<i>Economic structure</i>					
% land in farms	-	-	-.015 (.010)	-.016 (.010)	-.012 (.011)
land in farms per capita	-	-	.013 (.021)	.010 (.024)	.002 (.031)
% engaged in manufacturing	-	-	-.113*** (.030)	-.115*** (.030)	-.087*** (.033)
% female gainful employment	-	-	.127 (.078)	.116*** (.082)	.215* (.113)
Territory dummy	-	-	-	-.603 (1.52)	-.365 (1.47)
West dummy	-	-	-	-	2.89*** (.970)
Midwest dummy	-	-	-	-	2.74*** (.938)
South dummy	-	-	-	-	2.38* (1.37)
<i>Period Dummies</i>					
1866-1884	-4.12*** (.887)	-4.00** (1.60)	-3.52 (2.16)	-3.28* (1.77)	-2.37 (1.82)
1885-1899	-3.67*** (.739)	-3.64*** (1.33)	-2.94** (1.16)	-2.91** (1.12)	-2.53* (1.37)
1900-1914	-2.33*** (.402)	-2.39*** (.484)	-2.34*** (.450)	-2.32*** (.456)	-2.43*** (.492)
<i>N</i> obs	2297	2277	2277	2277	2277
<i>N</i> states	48	48	48	48	48
year analysis begins	1866	1866	1866	1866	1866

*,**,*** denote statistical significance at the 10%, 5%, and 1% level.

Robust standard errors clustered by jurisdiction are reported in parentheses.

Summarizing the above, we find several factors to have been influential in either accelerating or delaying the adoption of woman suffrage. Among the former factors are the sex ratio, the urbanization rate, the percentage of Mormons, and female gainful employment. Among the latter are a high percentage of non-whites, of foreign borns, and of Irish-born Americans, as well as a high

percentage of manufacturing employment in total employment. Most of these factors, however, can not explain why the American West led the nation in the enfranchisement of women. In particular, the West was neither characterized by a high degree of urbanization (quite to the contrary), nor by a large share of woman in gainful employment. Likewise, the shares of foreign-born and of Irish-born Americans, which we find to have delayed rather than accelerated woman suffrage adoption, was relatively high in the West, especially at the beginning of our sampling period (see Table 1). Furthermore, business interests that may have opposed woman suffrage were anything but absent in the West, as is evident from the comparatively high share of manufacturing employment in the region. In fact, only the Northeastern states excelled the West on this count in any of the three census years tabulated in Table 1 in Section 3. Hence, only the severe imbalances in the ratio of men to woman (grantors to potential grantees of woman suffrage) and the high percentage of Mormons in the West remain as potential candidates for explaining why the West became the champion of woman suffrage. It is clear, however, that the importance of the Mormon church can at the very best be only part of any explanation, as great numbers of Mormons lived only in Utah and Idaho.²⁰ For the sex ratio, however, the case is altogether different, as only two western states had rather balanced numbers of men and women in the observation period: Utah, the Mormon state, and New Mexico which introduced woman suffrage only in 1920, that is last of all states in the West and a full 51 years after pioneering Wyoming.²¹

4.2 Robustness Checks

We checked the robustness of our results along a number of dimensions. As a first check, we varied the starting date of the empirical analysis to test the importance of the earliest suffrage states for our results, that is of Wyoming, Utah, and Washington, and to assess more generally whether the driving forces behind extensions of the franchise to women changed in any significant way over time. Specifically, we considered three subperiods: 1870-1919, 1880-1919, and 1890-1919. Regression results are reported in columns 3 to 5 of Table 3. To ease comparability with our findings reported in the previous section, the results of our fully-fledged model with period dummies for the time period 1866-1919 are reproduced in column 2 of Table 3. For our main variable of interest, that is the sex ratio, we continue to find a consistently positive and statistically significant effect on the probability of a jurisdiction to grant women access to the ballot. For the subperiod 1890-1919, our results therefore corroborate the finding of Kenny (1999) of a positive association of the sex ratio and the rate of suffrage adoption for the more general case of sub-national jurisdictions (states

²⁰In 1870, the average share of Mormons in western jurisdictions is no different from the shares found in other census regions, if Utah and Idaho are excluded.

²¹In 1870, New Mexico had a sex ratio of only 107:100 among its residents aged 15-49. Second only to Utah in which the sex ratio was a even a bit lower, this near balance of the sexes in New Mexico compares to an average figure of 330:100 in the western jurisdictions in the same year.

and territories), and for an analysis that uses both an enlarged set of controls and time varying covariates. Moreover, the further is the starting date of the analysis moved forward in time, the larger in magnitude becomes the point estimate. For the latest subperiod considered (1890 to 1919), the coefficient estimate in fact more than doubles in size compared to our baseline estimate for the unrestricted time period (1866-1919). However, it is also estimated somewhat less precisely. For the other variables, estimated coefficients change little, at least in qualitative terms. A higher degree of urbanization and a higher fraction of Mormons still appear to be promoters of female voting rights. Similarly, the percentage of nonwhites and Irish-born Americans, as well as the fraction of workers that are engaged in manufacturing continue to be associated with a lower hazard rate of adopting woman suffrage in each of the three subperiods considered. And female gainful employment still enters with a positive coefficient, but it is now no longer statistically significant in two of the three subperiods, including the latest (1890-1919). Unobserved time-invariant characteristics of census regions, in turn, appear to have played less of a role in later periods. Estimated coefficients in fact decline in magnitude, the further the starting date of the analysis is moved forward in time. When restricting the estimation sample to the time span between 1890 and 1919 (the latest subperiod considered), none of the census region dummies remains statistically significant. In other words, the Northeast ceases to be the odd region out, and the regional affiliation of a jurisdiction no longer has any predictive power for its rate of adoption of woman suffrage.

As a second robustness check, we changed the functional form of the baseline hazard. As argued in previous sections, the increasing success over time of the woman suffrage movement could have been driven by broader historical forces such as the spread of democratic and equalitarian ethics. The baseline hazard is meant to capture such aggregate time-varying influences that are not specific to particular jurisdictions. In the previous regressions, we adopted a semi-parametric approach and assumed that the baseline hazard is piecewise constant. While such an approach has the distinctive advantage that it does not impose a functional form assumption on the overall shape of the hazard, it requires the baseline hazard to be constant within a specified time interval. As a robustness check we therefore drop this assumption and instead use a parametric approach. Columns 5 and 6 of Table 3 show the estimation results for specifications that parameterizes the baseline hazard respectively as the logarithm of time and as a third-order polynomial of time.²² As is evident, the empirical results are generally robust to these changes in the functional form of the baseline hazard. In particular, an increase in the sex ratio continues to be associated with a higher hazard rate of adopting woman suffrage. Moreover, the estimation results also continue to indicate that the hazard rate is negatively affected by the percentage of nonwhites and by the share of manu-

²²The logarithmic specification of the baseline hazard can be thought of being the discrete-time analogue to the continuous time Weibull model.

TABLE 3: ROBUSTNESS CHECKS

Dep. variable: female suffrage (0/1)		Model 1 ^a	Model 2	Model 3	Model 4	Model 5	Model 6
Covariates							
sex ratio		.025 *** (.009)	.026 * (.014)	.033 * (.018)	.052 ** (.025)	.048 *** (.011)	.021 ** (.010)
<i>Population indices</i>							
population density		-.005 (.005)	-.005 (.005)	-.005 (.005)	-.005 (.005)	-.006 (.006)	-.006 (.006)
% urban		.057 ** (.023)	.082 *** (.029)	.089 *** (.030)	.109 *** (.034)	.127 *** (.034)	.064 ** (.030)
% nonwhite		-.183 *** (.069)	-.144 * (.080)	-.164 ** (.066)	-.146 * (.081)	-.195 ** (.076)	-.132 * (.072)
% foreign born		-.070 * (.037)	-.013 (.071)	-.023 (.054)	-.020 (.075)	-.063 (.046)	-.009 (.051)
% Italian		.651 *** (.175)	.639 *** (.229)	.622 ** (.242)	.557 ** (.240)	.313 (.287)	.492 * (.281)
% Irish		-.511 ** (.259)	-.1.02 *** (.365)	-.987 *** (.332)	-.1.14 *** (.352)	-.368 (.329)	-.111 (.355)
% German		-.350 * (.207)	-.459 * (.273)	-.487 * (.270)	-.569 (.374)	-.672 ** (.335)	-.348 (.234)
% Mormons		.056 *** (.017)	.081 ** (.025)	.076 *** (.021)	.092 *** (.033)	.120 *** (.032)	.077 *** (.022)
<i>Economic structure</i>							
% land in farms		-.012 (.011)	-.002 (.015)	-.001 (.014)	.004 (.018)	-.003 (.016)	-.017 (.016)
land in farms per capita		.002 (.031)	.007 (.037)	.010 (.026)	.013 (.032)	-.006 (.030)	-.041 (.036)
% engaged in manufacturing		-.087 ** (.033)	-.097 ** (.039)	-.109 *** (.039)	-.123 ** (.053)	-.181 *** (.050)	-.158 *** (.037)
% female gainful employment		.215 * (.113)	.148 (.127)	.184 * (.107)	.163 (.130)	.191 * (.111)	.049 (.147)
Territory dummy		-.365 (1.47)	-1.21 (1.72)	- _b	- _b	.788 (.850)	.063 (1.00)
West dummy		2.89 *** (.970)	2.50 ** (1.20)	2.47 * (1.46)	1.56 (1.67)	.926 (1.36)	3.08 ** (1.47)
Midwest dummy		2.74 *** (.938)	1.89 (1.17)	2.00 * (1.14)	1.37 (1.37)	1.94 (1.31)	2.25 ** (1.29)
South dummy		2.38 * (1.37)	1.67 (1.49)	1.87 (1.32)	1.13 (1.63)	1.52 (1.52)	1.82 (1.65)
Functional form	Period dummies	1866	1870	1880	1890	1866	Cubic
baseline hazard	Period dummies	2277	1881	1452	1018	2277	polynomial
year analysis begins	Period dummies	48	46	45	44	48	1866
N obs	Period dummies						2277
N states	Period dummies						48

***, ***, ** denote statistical significance at the 10%, 5%, and 1% level.

Robust standard errors clustered by jurisdiction are reported in parentheses.

^a Model 1 corresponds to Model 5 in Table 2.

^b Variable was excluded since no region with territorial status introduced woman suffrage within the respective observation period.

facturing workers, and positively correlated with the percentage of Mormons in a jurisdiction. However, the results do no longer support the conjecture that the presence of Irish-born Americans in a jurisdiction has tended to delay the adoption of woman suffrage.

Third, we checked the robustness of our results to the inclusion of further explanatory variables.²³ To proxy for the general openness and accessibility of the political system of a jurisdiction, we added covariates on voting laws and regulations. Specifically, we included indicator variables for whether a jurisdiction in a particular year levied poll taxes, made voting conditional on passing a prior literacy test, or used the secret ballot. However, none of these variables proved statistically significant. We also tested for the presence and importance of potential contagion effects by means of a dummy that indicates whether a neighboring jurisdiction in a particular year has already adopted woman suffrage. While we do find some evidence for such positive spill-overs effects, our findings again prove robust to the inclusion of such proxies.²⁴

Fourth, we dropped or replaced some of the explanatory variables and tested the robustness of our results to alternative definitions of the sex ratio. Specifically, we first replaced the share of non-whites as a regressor with the share of blacks and dropped the Mormon dummy from the analysis. But neither of these changes affected the coefficient estimate of the sex ratio materially or rendered it statistically insignificant. Next, we changed the definition of the sex ratio measure used by considering different age brackets. Specifically, we considered the ratios of men to women among those aged 20 to 49 and among those aged 20 or older. The latter age cohort measures more accurately the immediate would-be electorate if women were granted access to the ballot, as the general voting age at the time was twenty-one. For both measures, however, estimation results are again virtually identical to those of our baseline regression. This finding comes at little surprise, as the three sex ratios measures are very highly correlated in the data: the correlation coefficients between any pair of the three sex ratio measures all exceed 0.98.

Fifth, we checked whether our original regional classification of the American West is crucial for our results. Specifically, we combined the eleven states of the census region West and the twelve states of the census region Midwest into one large western region and replaced our two indicator variables for West and Midwest in the regression analysis with an indicator for this broader definition of the American West. Parts of the Midwest were also settled late and exhibited features similar to those found in the West. In particular, as documented in Table 1 in Section 3, the Midwest also exhibited a comparatively high sex ratio throughout the observation period. However, this change in the classification of the American West is without consequence for our

²³The repetitive regression outputs for this and the following robustness checks can be obtained from the authors upon request.

²⁴It has to be noted, however, that the contagion indicator shows considerable overlap with the dummy for the Western census region. The former indicator may therefore in part capture the influence of the latter, rather than pure contagion effects.

results.

Finally, we checked whether the treatment in our analysis of states that granted woman suffrage only in 1919 or 1920 matters for our results. First, we excluded the year 1919 from our analysis, as states which adopted woman suffrage in that year (Indiana, Iowa, Maine, Minnesota, Missouri, Ohio, Tennessee, and Wisconsin) might have in part done so because they anticipated the success of the struggle for universal woman suffrage at the federal level. And as a second check, we extended the period of analysis to include the year 1920 and denoted those seven states that ratified the 19th Amendment (Kentucky, Massachusetts, New Hampshire, New Jersey, New Mexico, Pennsylvania, and West Virginia) as voluntary grantors of woman suffrage, treating the remaining twelve state that did not ratify the amendment as censored. In both cases, the results we obtain are virtually identical to our baseline findings.

5 Conclusion

While the modern woman suffrage movements in the United States came out of the East, it were the Western states that led the nation in the enfranchisement of woman. It was not New York, arena for the Seneca Falls Convention and home of the National Woman Suffrage Association, but remote and sparsely populated Wyoming territory that first adopted woman suffrage. And it was not Massachusetts, where the American Woman Suffrage Association resided, that followed but the Mountain states Utah, Colorado or Idaho. In fact, until the outbreak of World War I, woman suffrage essentially remained a regional phenomenon confined to the American West. In this paper we have argued that the general shortage of woman in the West was decisive for the pioneering role and the continuing lead of the Western states in the adoption of woman suffrage. As the settlement of the Frontier was strongly male-dominated, sex ratios in the West were drastically skewed toward men. And with women being a scarcity, the net benefit of adopting woman suffrage was much higher for the (male) grantors of voting rights in the West: woman suffrage carried lower potential costs to men in terms of risks and any devaluation of their political influence; and for legislators in the West, woman suffrage had the added benefit of potentially attracting female settlers. In addition, the few woman in the West were much sought after and their bargaining power hence in all likelihood higher than in other US regions.

Historical census data strongly support our conjecture. States in which women were scarce enfranchised their women much earlier than states in which the ratio of men to women was more balanced. Estimating discrete time duration models, we found a highly significant and positive effect of the sex ratio on the hazard of adopting woman suffrage. This association is robust both to the inclusion of a wide range of covariates that have been discussed in the relevant historical

literature and to numerous checks, including changes in regression specifications, the use of alternative and additional covariates, or variations in the period of analysis considered. This is not to say that differences in state-level sex ratios were the only driving force behind the spread of woman suffrage across the US. In fact, we find ample evidence that other factors were also influential for the timing of suffrage adoption. Strong business interests, for instance, may in part explain why the mature societies in the East proved to be laggards with respect to woman suffrage. And the early enfranchisement of women in Utah may well have been driven in large part by the local dominance of the Mormon church. We also find compositional characteristics of a state's population to have played a role in the decision to adopt woman suffrage: a high percentage of foreign borns generally tended to delay woman suffrage adoption, as did a high share of Irish-born Americans. However, while these factors certainly played a role in specific states at certain times, only the strong and sustained imbalances in the sex ratio can explain the marked and sustained regional pattern of state level extensions of the franchise to women in the United States.

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TABLE A-1: HISTORICAL DATES FOR CONTIGUOUS US STATES AND TERRITORIES

Jurisdiction:	Year of admission as:		Changes in voting laws (dates/periods) in 1870-1920:			
	territory	state	woman suffrage	secret ballot	poll tax	literacy test
<i>I. West:</i>						
Arizona	1863	1912	1912	1891	–	1912 -
California	–	1850	1911	1891	–	1894 -
Colorado	1861	1876	1893	1891	–	–
Idaho	1863	1890	1896	1891	–	–
Montana	1864	1889	1914	1889	–	–
Nevada	1861	1864	1914	1891	- 1910	–
New Mexico	1850	1912	1920	1912	–	–
Oregon	1848	1859	1912	1891	–	–
Utah	1850	1896	1870 ³	1896	–	–
Washington	1853	1889	1883 ³	1890	–	1896 -
Wyoming	1868	1890	1869	1890	–	1889 -
<i>II. Midwest:</i>						
Illinois	1809	1818	1913 ¹	1891	–	–
Indiana	1800	1816	1919 ¹	1889	–	–
Iowa	1838	1846	1919 ¹	1892	–	–
Kansas	1854	1861	1912	1893	–	–
Michigan	1805	1837	1918	1891	–	–
Minnesota	1849	1858	1919 ¹	1891	–	–
Missouri	1812	1821	1919 ¹	1891	–	–
Nebraska	1854	1867	1917 ¹	1891	–	–
North Dakota	1861	1889	1917 ¹	1891	–	–
Ohio	1787	1803	1919 ¹	1891	–	–
South Dakota	1861	1889	1918	1891	–	–
Wisconsin	1836	1848	1919 ¹	1894	–	–
<i>III. Northeast:</i>						
Connecticut	–	1788	1920	1909	–	throughout
Maine	–	1820	1919 ¹	1891	–	1892 -
Massachusetts	–	1788	1920	1888	- 1891	throughout
New Hampshire	–	1788	1920	1891	–	1902 -
New Jersey	–	1787	1920	1911	–	–
New York	–	1788	1917	1895	–	–
Pennsylvania	–	1787	1920	1891	throughout	–
Rhode Island	–	1790	1917 ¹	1889	- 1888	–
Vermont	–	1791	1920	1890	–	–
<i>IV. South:</i>						
Alabama	1817	1819	1920	1893	1901 -	1901 -
Arkansas	1819	1836	1917 ²	1891	1891 -	–
Delaware	–	1787	1920	1891	- 1907	1897 -
Florida	1822	1845	1920	1895	1889 -	–
Georgia	–	1788	1920	1922	throughout	1908 -
Kentucky	–	1792	1920	1882	–	–
Louisiana	1804	1812	1920	1896	1898 -	1898 -
Maryland	–	1788	1920	–	1892	–
Mississippi	1798	1817	1920	1890	1889 -	1890 -
North Carolina	–	1789	1920	1929	1899 - 1920	1900 -
Oklahoma	1890	1907	1918	1890	–	1912 -
South Carolina	–	1788	1920	1950	1895 -	1895 -
Tennessee	1790	1796	1919 ¹	1921	1870, 1890 -	–
Texas	–	1845	1918 ²	1905	1902 -	–
Virginia	–	1788	1920	1894	1875 - 82, 1902 -	1902 -
West Virginia	–	1863	1920	1891	–	–

NOTE: ¹ presidential suffrage, ² primary suffrage, ³ first year woman suffrage was adopted. In territories, voters could vote for the territorial legislature, but not for the state governor, Congress, or US president. Sources: for dates of admissions, Carter et al. (2006); for woman suffrage dates, Carter et al. (2006), Lott and Kenny (1999), and McCammon et al. (2001); for dates on secret ballot/poll tax/literacy tests, Lott and Kenny (1999).