Men, Women, and the Ballot. Gender Imbalances and Suffrage Extensions in US States

By Sebastian Braun and Michael Kvasnicka

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Abstract:
Woman suffrage led to one of the greatest enfranchisements in history. Yet, women neither won the right to vote by force, nor did men grant it under the imminent threat of female unrest. These facts are difficult to reconcile with leading political economy theories of suffrage extensions. In this paper, we study suffrage extensions at the level of US states and territories in the late 19th and early 20th centuries to learn about the factors that accelerated, respectively delayed, a jurisdiction's transition to woman suffrage. Our results show that the general scarcity of women in the American West, or a high sex ratio, was the single most important factor behind the region's lead in the enfranchisement of women in the US. High ratios of grantors (men) to grantees (women) of the franchise appear to have promoted earlier suffrage extensions, as these imbalances reduced the political costs and risks for male legislators and electorates. Our finding may provide a more general insight into the economics of voluntary power sharing. All else equal, smaller groups should find it much easier to acquire rights or to get admitted to economic and political clubs.

Keywords: Woman Suffrage; Democratization; Political Economy; Power Sharing; Sex Ratio.

JEL classification: D72, J16, K10, N41, N42.

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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 - a far bigger part in the New England States, for instance, where the females outnumber the males ... than it does in the Mountain States, where the males outnumber the females ...

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

1   Introduction

Voting rights are among the most important and far-reaching rights a group may obtain. In history, these rights have often been won by force, or they were granted by ruling elites because of otherwise imminent threats of revolution and social unrest. Leading political-economic theories on suffrage extensions also stress these push factors and argue that in the past, elites were often forced to extend the franchise in order to quell revolutionary threats from the disenfranchised (see Acemoglu and Robinson, 2000, 2001; Conley and Temimi, 2001). However, several extensions in history clearly cannot be accounted for this way. The most ubiquitous and greatest such extension is the enfranchisement of women: on no occasion did women win the right to vote because they used force or threatened to do so. It was men who gave women the right to vote, yet never to avert revolution or social unrest.[1]

In the history of suffrage extensions, woman suffrage has to be counted one of the most important. Cutting through all social classes, it gave political representation to unprecedented numbers and changed fundamentally the role and understanding of women in societies. By dramatically changing the eligible electorate, woman suffrage also had a sizeable effect on the growth of government and the use of public resources (see Lott and Kenny, 1999 and Miller, 2008 for the US, or Aidt et al., 2006 for European countries). The ubiquity, scale, and consequences of woman suffrage extensions make them a subject of great interest for political economy analyses – and their 'voluntary nature' a prime historical example of political power sharing by choice. Analyses of woman suffrage extensions may not only enhance our understanding of one of the greatest enfranchisements in history. They can also provide valuable insights into the mechanics of political power sharing more generally and thus help to better understand also other voluntary franchise or rights extensions as well as admissions to economic or political clubs in general.

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[1]Reviewing historic suffrage extensions in the UK, Acemoglu and Robinson (2000) in fact acknowledge that threats of revolution did not play any role for the enfranchisement of women in 1918.

In this paper, we study the timing of woman suffrage extensions at the level of US states and territories in the late 19th and early 20th centuries. From a historical perspective, the spread of woman suffrage in the US is of particular interest, as US jurisdictions (i.e., states and territories) rank among the first political entities in modern times that granted women voting rights.[2] Moreover, from an analytical perspective, suffrage extensions in the US exhibit two advantageous features: first, suffrage extensions did not coincide with fundamental changes in the economic and political regime, as has been the case in many European countries after World War I, respectively World War II; second, all jurisdictions already had male suffrage and belonged to one and the same country, which provides for a basic degree of homogeneity in the economic, judicial, and political realm. Compared to a cross-country analysis, both features significantly aid identification. In particular, potentially confounding influences and trends at the national level are of no concern, as they are immaterial for cross-state variations in the extension of the suffrage to women.

Between 1869, when the all-male legislature of Wyoming Territory first granted women the right to vote, and the ratification of the Nineteenth Amendment in 1920, which brought universal woman suffrage, 29 US jurisdictions enfranchised women. Rates of suffrage adoption over this period, however, differed markedly across regions (see Figure 1): of the 12 jurisdictions that granted women access to the ballot by 1914, 10 lie in the West (the two exceptions are Kansas and Illinois); and so do all five jurisdictions that enfranchised women before the turn of the century (Colorado, Idaho, Utah, Washington, and Wyoming). Changes in social values, and possibly other national trends, undoubtedly popularized the woman suffrage cause over time, as evidenced by higher rates of suffrage adoption from 1915 onward. However, such trends cannot possibly explain the marked regional pattern in the timing of suffrage extensions. Region-specific factors, and possibly also state-specific factors must have accelerated, respectively delayed, the transitions of individual jurisdictions to woman suffrage. It is these factors that we seek to unearth and quantify in their importance. To identify these factors and gauge their respective importance, we estimate discrete-time hazard rate models of state and territory transitions to woman suffrage using decennial US census data for the period 1860 to 1920.

Our results provide strong and robust evidence that women obtained the right to vote earlier in US jurisdictions in which they accounted for a smaller share of the adult population. Indeed, sex ratio imbalances

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[2]Nineteenth century pioneers include Wyoming Territory (1869), Utah Territory (1870), Washington (1883), Colorado (1893), and Idaho (1896). Internationally, suffrage states (or subnational jurisdictions) appeared only very late in the nineteenth century. They include the British colony of New Zealand (1893) and the British dominions of South Australia (1894) and Western Australia (1899). The first European countries (and the only ones prior to World War I) to grant women access to the ballot were Finland (1902) and Norway (1913).
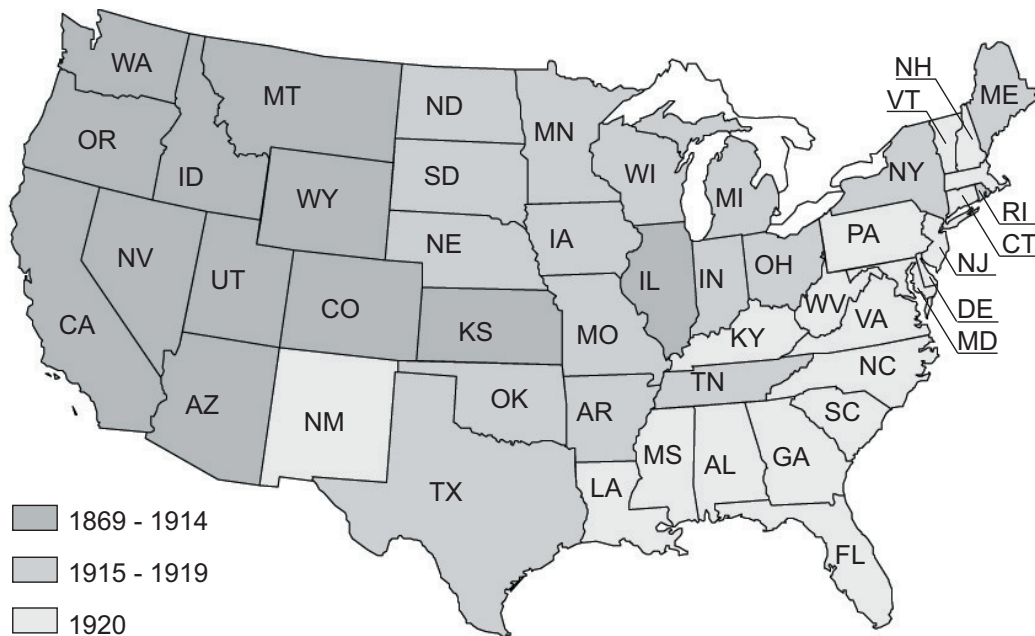
FIG. 1: Woman suffrage adoption by US states, 1869-1920

appear to be the single most important determinant of jurisdictions' transitions to woman suffrage. Very high sex ratios (ratios of men to women) were a distinctive feature of all Western jurisdictions except New Mexico and Utah, and to a lesser extent also of Midwestern jurisdictions,[3] and can thus explain the marked regional pattern documented in Figure 1. The relative scarcity of women in the West, it appears, has fundamentally altered the power calculus for men, the pre-woman-suffrage electorate and potential grantors 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. Woman suffrage also posed much lower risks to political stability in the West, as the already enfranchised male voters by far outnumbered potential female voters.[4]

Women were short in numbers in the American West because of the late and male-dominated settlement of the frontier. High sex ratios in this region were hence not caused by expectations about pending

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[3]According to data from the 1870 census, the ratio of men to women aged 15-49 was 330:100 in the American West. The respective figure for Midwestern states was 126:100, for Northeastern states 95:100, and for Southern states 93:100.

[4]In addition, western legislators might also have viewed woman suffrage as a viable tool to attract more female settlers, to publicize their regions, and, in the case of territories, to gather support for their bid to statehood. However, potentially relevant only for the first transitions to woman suffrage, such sex-ratio related *benefits* to regions and grantors cannot explain the continuing lead of the American West in the enfranchisement of women.

extensions of the suffrage to women. In fact, if women anticipated early extensions of the suffrage in western jurisdictions and based their migration decisions on such anticipations, sex ratio imbalances in the West would have been attenuated, not aggravated. Our estimates of the effect of state sex ratios on state transitions to woman suffrage are hence at worst conservative estimates of the true effect.[5] The composition of settlers, however, is unlikely to have been random. Settlers were predominantly white, adult males. But they were not, in general, more progressive in their social values than residents of states in the American North and East: many jurisdictions in the Northeast granted women property rights much earlier than did jurisdictions in the West;[6] and notions of political equality in the West did not, in general, overcome the barrier of race.[7] In our empirical analysis, we nevertheless control comprehensively for inter-state differences in population composition and economic structures. Our main finding, however, proves robust: the severe differences in the adult sex ratio between jurisdictions were decisive for the very differential rates at which women were granted access to the ballot in the US. In fact, and reassuringly, our estimate of the effect of the adult sex ratio on the hazard of adopting woman suffrage does not decline (it even increases) in magnitude, once we account for other demographic and economic factors in our analysis.

Our main finding is likely to matter beyond the specific suffrage extension considered in this paper. In fact, relative sizes of potential grantors to grantees are likely to matter for all voluntary extensions of rights and also for admissions of new members to political or economic clubs more generally, as they determine in large part the political risks and costs, and in some cases also the benefits, to grantors. This simple, but important, insight 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 or are regionally heavily concentrated. It may also help to understand, at least in part, why the European Union finds it so difficult to grant a large and growing Turkey membership to the Union, or why France in the early 1960s has been so fervently opposed to UK membership in the same organization. Anything else equal, grantors of rights simply relinquish more power and run greater risks when groups of grantees are large.

The paper is structured as follows. The next section briefly discusses the related literature, and Section

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[5]If women correctly anticipated future changes in voting rights and indeed chose to migrate in greater numbers to those states in which early woman suffrage was most likely, state sex ratios and state hazards of adopting woman suffrage would be negatively correlated, not positively.

[6]The expansion of women's economic rights is analyzed by Geddes and Luecke (2002), Doepke and Tertilt (2009), and Fernández (2009).

[7]As a leading historian on the subject noted pointedly: 'If there was such a thing as frontier equalitarianism, [...] it was clearly applicable only to white, adult males' (Grimes, 1967: p. 10).

3 documents the history of woman suffrage in the United States from the mid-nineteenth century to the ratification of the Nineteenth Amendment in 1920. Section 4 considers theoretical arguments on the likely determinants of woman suffrage adoption. Section 5 discusses the econometric method, and Section 6 describes the data and provides descriptive statistics for our estimation sample of US states and territories. Section 7 presents and discusses the empirical results. Finally, Section 8 summarizes our main findings and concludes.

2   Related Literature

The driving forces behind extensions of political rights have recently received considerable attention among economists. Leading political-economic theories argue that ruling elites extended rights under the imminent threat of revolution: Acemoglu and Robinson (2000, 2001), for instance, see franchise extensions as a strategic commitment device of the ruling elite to guarantee re-distribution in the future and thus to prevent widespread social unrest; in a similar vein, Conley and Temimi (2001) argue that disenfranchised groups can impose costs on the ruling elite, in the form of civil unrest or civil disobedience if the franchise is not extended to them. These explanations are well suited to explain transitions from non-democratic (e.g. autocratic regimes or military juntas) to democratic forms of government. They appear less suitable, however, to explain suffrage extensions within otherwise stable democracies; and they are clearly inconsistent with the circumstances under which women got access to the ballot.

Economists have also developed first models of *voluntary* franchise extensions (Lizzeri and Persico, 2004; Llavador and Oxoby, 2005). These models stress conflicting interests among elites to explain extensions of the suffrage. If elites are split along economic interests, so the argument, a ruling party can strategically extend the franchise to gather political support among the newly enfranchised. Suffrage extensions, therefore, are viewed as the result of partisan competition (Llavador and Oxoby, 2005). Extensions of the franchise to women are not explicitly considered in this body of literature; what is more, however, they arguably do not lend themselves readily to such accounts. Woman suffrage, in general, cut through all classes and political leanings. As a consequence, no particular subgroup of men, political or economic, was destined to benefit disproportionately from extending the franchise and hence qualified as a natural advocate of the woman suffrage cause.

Empirically, the determinants of woman suffrage extensions in the US (and other countries) have been

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studied almost exclusively by non-economists, in particular by historians. Many of these scholars (e.g. Beeton, 1986) stress idiosyncratic features of individual jurisdictions to explain their respective timing of adopting woman suffrage. However, by stressing specific rather than common features held by early suffrage states and territories, 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 in the US. The pioneering role and continuing lead of jurisdictions in the American West in the adoption of woman suffrage, however, suggest that common, rather than jurisdiction-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 appears 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 was far less than others organized in terms of coordinated activities for securing the ballot.[8]

To the best of our knowledge, only two economic studies have analyzed the specific driving forces behind woman suffrage extensions. In an unpublished manuscript, Kenny (1999) studies state suffrage extensions in the US between 1890 and 1920.[9] He hypothesizes, just as we do, that '[g]ranting women the right to vote is less costly to men in states where there are fewer women' (Kenny, 1999: p.2) and produces first supportive evidence for his conjecture. Unfortunately, however, his analysis covers only franchise extensions after 1890 and remains confined to states only.[10] Furthermore, the covariates considered by Kenny only relate to a single year (1890) and, being less than a handful in number, account only rudimentarily for state-level differences in population composition that could confound the relationship between state sex ratio imbalances and state transitions to woman suffrage. The second study (Bertocchi, 2007) does not consider sex ratio imbalances. Bertocchi hypothesizes that men gave women the right to vote because human capital accumulation had narrowed the gender wage gap and thus reduced gender differences in the preferred tax rate.[11] Bertocchi tests her model with cross-country data for the period 1870 to 1930, using per capita

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[8]As 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)'.

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

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

[11]In her model, the disenfranchisement of women carries a general cost for society that is related to a country's culture. Consequently, the male median voter will prefer women suffrage if the cost of a higher tax rate, which in the model results from the extension of the franchise to women, is not too high.

income as an inverse proxy for the gender wage gap. In her data, per capita income is indeed positively correlated with woman suffrage. In our analysis of US states and territories, we also find some evidence for a positive effect of per capita wealth on rates of suffrage adoption. However, this effect is clearly secondary in magnitude to the effect that imbalances in the adult sex ratio had on the hazard of adopting woman suffrage.

The consequences of woman suffrage extensions, in particular for the overall size and composition of public spending, have received considerably more attention in the economics literature than their determinants. Lott and Kenny (1999), for instance, find that suffrage laws in US states were followed by an immediate increase in state expenditures. Miller (2008), furthermore, provides evidence that suffrage extensions in US states increased local spending on public health which caused a large decline in child mortality. Aidt et al. (2006), in turn, find a weak positive effect of the spread of female suffrage laws in Western Europe on public spending for health, education and welfare. In this literature, however, extensions of the suffrage to women are assumed to be exogenous events. This identifying assumption appears problematic: in the US, as noted, adoptions of woman suffrage exhibited a marked regional pattern; and in Europe, suffrage extensions by countries clustered significantly in the immediate aftermaths of the two world wars.[12] These systematic patterns cast doubt on the exogeneity of woman suffrage extensions. At the same time, they call for a careful analysis of the potential driving forces behind extensions of the suffrage to women.

A final and recent strand of literature that is also related to our study has investigated the expansion of economic (rather than political) rights of women. Studies in this area all have in common that they stress male self-interest in the expansion of women's economic rights. Geddes and Luecke (2002), for instance, argue that growing returns to human capital increasingly aggravated inefficiencies associated with women's inability to obtain and own property. At some point, it simply was no longer in men's own interest to deny their wives property rights. Doepke and Tertilt (2009) argue that men generally prefer other men's wives (but not their own) to have rights, because men care as fathers for their own daughters, and because an expansion of women rights generally increases investment in child education. Historically, the return to education only had to become sufficiently large for men to support women's economic rights. Closely related, Fernández (2009) argues that men benefited from a patriarchal society as husbands but suffered from

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[12]In 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).

the same as fathers. According to this study, human capital accumulation and declining levels of fertility have finally resolved the conflicting interest of men in favor of their role as fathers and thus induced men to support an expansion of female economic rights. Using data on US states, Geddes and Luecke (2002) and Fernández (2009) find supportive evidence for their theories. Interestingly, the first US jurisdictions to grant women property rights were located on the American East Coast. In contrast, it was states in the West that first enfranchised women. This fact casts doubt on the existence of a generally more equalitarian ethic in the West. It also strongly suggests that other factors must have played a role for the pioneering role and sustained lead of the American West in the enfranchisement of women in the US.

3   Background: The Enfranchisement of Women in the US

In 1848, pioneering suffragists assembled in a landmark convention at Seneca Falls, New York, 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, suffrage movements began to emerge not only in the USA but also in Australia, England, New Zealand, and the Scandinavian countries; and leading intellectuals began to raise their voice demanding full recognition of women's political rights and an end to the long-standing subjugation of women by men.[13] Nationally, early property qualifications for voting 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 setback 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 supporters of the woman suffrage cause, it was this very Fourteenth Amendment that for the first time used a gender-specific description of voting rights and 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

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[13]Forceful articulants included Harriet Taylor in her 1851 article on the enfranchisement of women and John Stuart Mill in his 1869 essay on the subjection of women.

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 the setback in securing universal suffrage for women by way of constitutional amendment, 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.[14] This 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. In fact, any suffragist activity in Wyoming and Utah 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. The Territory of Washington enfranchised its women in 1883, followed by the states of Colorado (1893) and Idaho (1896).[15] They were joined in 1911 by the state of California, in 1912 by the states of Oregon and by Arizona (which had become a state in the same year), and in 1913 by the Territory of Alaska. Also in 1912, and a full 43 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 women (Nevada and Montana), making New Mexico the only non-suffrage state to remain in the American West. A stunning 17 states adopted woman suffrage between 1917 and 1919, most of which were from the Midwest. The remaining 19 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 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.[16]

Other statistics corroborate this view. According to Catt and Shuler (1923), there had been 480 campaigns in 33 jurisdictions between 1870 and 1910 to get state legislatures to submit suffrage amendments to

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[14]Congress, 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 re-instituted in Utah by constitutional referendum when Utah was admitted statehood in 1896.

[15]In Washington Territory, the territorial legislature in fact enacted woman suffrage twice (1883, 1888), but each time the enactment was rescinded, after being declared void by the territorial supreme court. Woman suffrage was finally adopted in Washington in 1910.

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

voters. Although these campaigns resulted in only 17 referendums in 11 states, it is again telling to find that 14 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 on the mind of people also in jurisdictions other than those in the American West. Yet, for reasons that still await explanation, only in the West did the woman suffrage cause amass the support necessary to become a reality.

Some historians see 'frontier egalitarianism' as a major driving factor behind the early suffrage extensions in the American West. According to this view, 'frontier conditions undermined traditional gender roles' (Wheeler, 1995: p. 11) and furthered 'notions of equality and democracy' (Larson, 1970: p. 10) in the West. A second argument holds 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. A third argument points to the importance of procedural reasons that advantaged the adoption of woman suffrage in the territories. In fact, most states needed an amendment to their state constitution that 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 four 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 (and neither can the other three factors).[17] 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 are required if one wants to understand also its persistent lead.

4   Theoretical Considerations: Gender Imbalances and Suffrage Extensions

Any explanation or theorizing on the extension of the suffrage to women in the United States has to honor 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 women in the early 20th century. Second, it was always men, i.e., 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 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* the sustained lead of the American West. The second underscores the need to put male considerations center stage in any such inquiry, i.e., 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, i.e., 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, the threat of violence and revolution is not a factor relevant for the adoption and spread of woman suffrage in the United States.

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 jurisdiction, the votes and hence political influence of men could be significantly devalued (Kenny, 1999). And political and broader societal stability could be put at considerable risk. In fact, the potential risks, both the imminent and the more general, of granting women the right to vote were intensively debated among contemporaries: some feared a

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[17]After the turn of the century, seven states granted women suffrage until 1914. Five of them are located in the American West (Arizona, California, Montana, Oregon, and Nevada).

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. There is ample evidence that considerations of this kind were a concern to contemporaries, as evinced by public deliberations in Congress, in state legislatures, and in the national press. 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 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 strive, bitterness, and heartburnings, wholly unsuited to the womanly character. Women in strife become 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 and hence must have appeared more manageable in the West, as there simply were not many women. According to the 1870 census, the average ratio of men to women aged 15-49 in a state or territory 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. Thus, women in the West were far less numerous to change, if enfranchised, political life significantly and beyond repair. Although sex ratios subsequently converged 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, compared to 104:100 in the Northeast, 102:100 in the South, and 112:100 in the Midwest. In other words, from the restauration period after the Civil War 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.[18]

Although debates surrounding woman suffrage were usually cast in terms of morals and basic rights, contemporaries were well aware of the fact that the political risks involved in granting women access to the ballot would depend on the size of the female population to be enfranchised – and they were also well aware of the sex ratio imbalances in the American West. As noted in a brief comment by *The Nation* on March

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[18]For 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.

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.' Thus, 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. 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 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.'

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 of woman suffrage in the western territories. When the US Congress in the late 1860's considered proposals for extending the franchise to women, some proponents argued that woman suffrage could lessen the twin problems of deficit women in the West and of surplus women in the East by inducing greater numbers of eastern women to follow the trail to the West (see, for example, Larson, 1970).[19] Furthermore, high sex ratios (a male marriage market squeeze), by increasing female bargaining power in the domestic sphere, may have induced men, and in particular male legislators, to more readily grant support for the woman suffrage cause or to oppose the same less vigorously.[20]

As is evident, the relative size of the female to-be-enfranchised population has been a factor in male deliberations about the virtues and costs of granting woman access to the ballot. If gender imbalances indeed affected the timing and spread of woman suffrage across US jurisdictions, then sex ratios and rates

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[19]The shortage of men in the East was a result of the Civil War and the male migration to the West.

[20]A 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 markets, labor markets, and fertility outcomes (see, for example, Angrist, 2002, or Acemoglu et al., 2004).
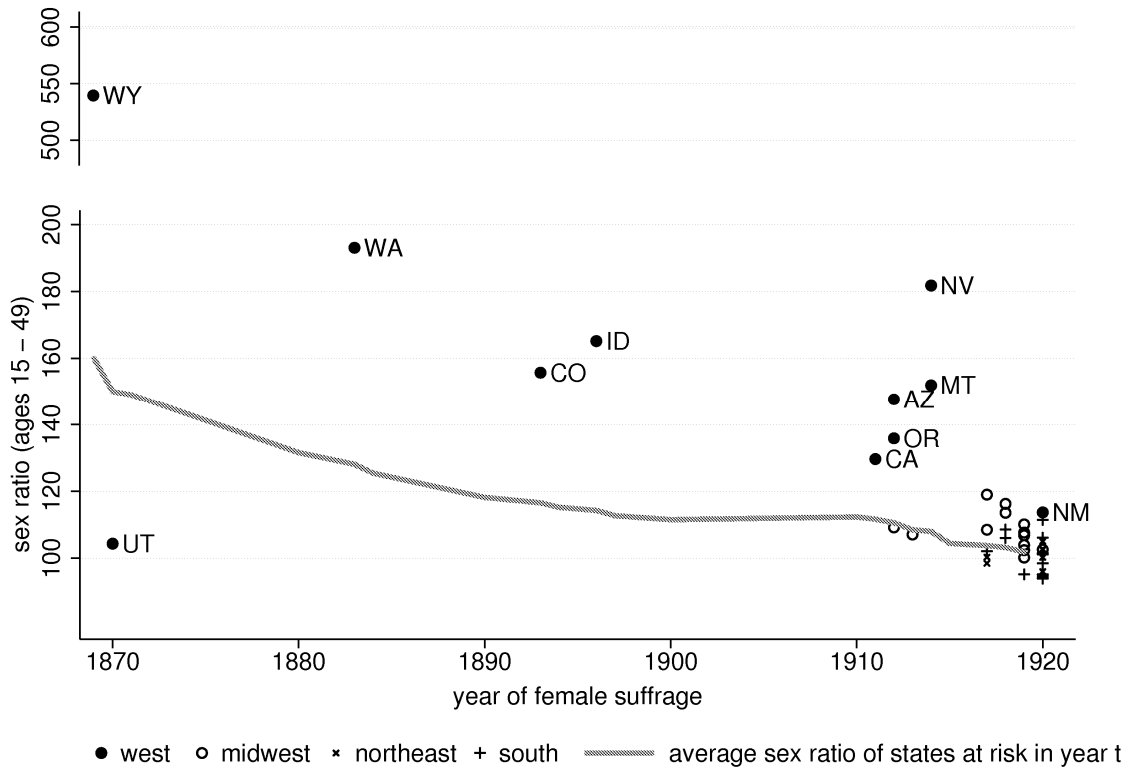
FIG. 2: Woman suffrage adoption by states and state sex ratios, 1869-1920

of woman suffrage adoption should be positively correlated. Figure 2 provides such correlative evidence. It shows that the sex ratio in a state or territory that adopted woman suffrage generally tended to exceed the sex ratios found on average in jurisdictions 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 discernible in later times also for the non-western states and territories, albeit to a somewhat lesser degree: of all 19 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 14 (out of 19).[21] 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 jurisdictions in the US more generally.

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[21]It 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.

Certainly, other factors, often of more idiosyncratic or temporary nature, may have played a role in the decision of individual jurisdictions to extend the franchise to women. In some jurisdictions, 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 Idaho, 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 main driving forces behind woman suffrage extensions in the United States.

5   Econometric Method

Once woman suffrage was adopted in a US state or territory, female voting rights generally remained in place.[22] In other words, the enfranchisement of women is an 'absorbing state' to which a state or territory transits exactly once. We hence estimate discrete time duration models to analyze the driving forces behind the spread of woman suffrage across US jurisdictions (see Allison, 1982, or Jenkins, 1995, for excellent overviews of duration models in discrete time).

Let h_{it} denote the conditional hazard rate of adopting suffrage in state or territory i at time t given that suffrage has not yet been introduced. We choose the following specification for the hazard rate:

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

where α_t is the baseline hazard (common to all jurisdictions) and X_{it} is a vector of covariates. Equation (1)

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[22]There are two exceptions to this rule – but in neither case did the grantors themselves revoke their decision. Congress revoked Utah's woman suffrage law in 1887. And in 1887 and 1888, the Supreme Court of Washington Territory ruled the territory's suffrage laws unconstitutional. In both jurisdictions, woman suffrage laws were later re-enacted. In our empirical analysis, we only consider the first passage of women suffrage laws in a jurisdiction.

can be solved for the complementary log-log function:

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

The complementary log-logistic regression model is widely used in empirical work, as it is the discrete time representation of the underlying continuous time proportional hazard model (see Prentice and Gloeckler, 1978). The (exponentiated) coefficients of the complementary log-logistic regression model can thus be interpreted as hazard ratios.

As a robustness check, we also estimate duration models using a logistic specification of the hazard function. The logistic specification of the hazard function is given by:

$$h_{it} = 1/[1+exp(-\alpha_t - \beta'X_{it})], \tag{3}$$

which can also be written in logit form:

$$log[h_{it}/(1-h_{it})] = \alpha_t + \beta'X_{it}. \tag{4}$$

Our empirical analysis concentrates on explaining the hazard rate of adopting suffrage and thus on the estimation of duration models. However, as a further check of robustness, and to facilitate comparison with the related literature, e.g. on the timing of female property rights (see Fernández, 2009), we also estimate a simple linear probability model (taking as the independent variable a dummy indicating whether or not a state has adopted woman suffrage by time t). Throughout the analysis, we cluster standard errors at the level of jurisdictions to allow for a shared error component.

We consider the (contemporaneous) variation in the sex ratio of jurisdictions, our main explanatory variable of interest, as (largely) exogenous to the adoption of woman suffrage laws, as it was the male-dominated settlement of the frontier – and not the existence or nonexistence of voting rights – that led to 'a general shortage of women in the frontier settlements' (Grimes, 1967, p. VI). Women and men might, of course, have anticipated transitions of individual jurisdictions to woman suffrage; and women, in consequence, might have moved in greater numbers to those jurisdictions most likely to grant them voting rights in the near future, thereby attenuating the respective sex ratios in these states and territories. Such attenuation would introduce a downward bias in our estimate of the effect that the sex ratio exerted on the hazard of

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adopting woman suffrage. If so, our estimate would establish a lower bound, i.e., be a conservative estimate, of the true effect. Nevertheless, we also estimate a simple linear probability model that avoids the use of contemporaneous sex ratios. Specifically, we test if a jurisdiction's sex ratio at the very beginning of our sample period has some power in explaining whether or not a jurisdiction adopted woman suffrage before the ratification of the Nineteenth Amendment in 1920 (and thus by its own will).

6 Data and Descriptive Statistics

6.1 Data

We use annual, state-level data and focus on the time period between 1866 (the first year after the devastating Civil War) and 1919 (the Nineteenth Amendment was ratified in 1920). In all states, broad historical trends, such as the spread of democratic and egalitarian ethic, are likely to have affected the hazard of woman suffrage adoption: for instance, in the years 1897 to 1909 (called also the 'doldrums' of the woman suffrage cause) not a single state enfranchised women; in the second half of the 1910s, in contrast, 17 states adopted woman suffrage (see Figure 2). 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 alternative functional forms for the baseline hazard.

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 previous (third) edition of 1975. The data we use primarily comes from the seven decennial censuses between 1860 and 1920. Values for inter-census years are inferred using linear interpolation.[23] In the analysis, we use only data for the 48 contiguous US states and territories (Alaska and Hawaii are excluded).[24] Overall, our esti-

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[23]Some 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 *extra*polation.

[24]Our empirical analysis includes a jurisdiction from the moment in time that the jurisdiction joined the Union as a state or

mation sample has 2277 jurisdiction-year observations.

Endogenous Variable: Our dichotomous endogenous variable (adoption of woman suffrage in a jurisdiction in calendar year t) is constructed on the basis of information from several sources (for these sources and a complete tabulation of the dates that jurisdictions extended the franchise to women, see Table A-1 in the Appendix). As noted in Section 4, we only consider the first passage of women suffrage laws in a jurisdiction.[25] We hence also ignore any change in the scope of voting rights that was associated with a territory's accession to the Union as a federal state.[26]

Main Explanatory Variable: Our main explanatory variable of interest is the adult sex ratio in a state or territory. In our baseline regressions, we define the sex ratio as the number of men aged 15 to 49 per 100 women in the same age cohort. In other words, we exclude both the very young and older individuals. The former group was too young to vote for years to come if women were granted access to the ballot; and this group was also too young to already influence marriage market conditions. Similarly, older individuals are unlikely to have been of significant importance for marriage markets. In the chosen age bracket sex ratio imbalances, if indeed of relevance for rates of suffrage adoption along the causal pathways suggested (political costs and risks for men, but also potentially enhanced female bargaining power and the motive to attract eastern women), should therefore exert their greatest influence. Specifically, and as argued in Section 4, we expect higher sex ratios to increase the hazard of adopting woman suffrage. As a robustness check, we also consider two other age brackets to construct our sex ratio measure (20-49 years of age; 20 years and older).[27] All three measures, however, are very highly correlated in the data ($r > .98$ for any pair) and lead to virtually identical results in the empirical analysis. Being immaterial for our findings, we chose the first of the three measures for our baseline regressions.

Other Explanatory Variables: In addition to the sex ratio, we control for several factors that have been

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territory. North and South Dakota are considered only after their separation in 1889.

[25]In the territories of Utah and Washington, the first woman suffrage laws had been later rescinded, but in neither case did the grantors themselves revoke their decisions: in Utah, Congress revoked the first woman suffrage law; in Washington, in turn, the territorial supreme court ruled the first law unconstitutional.

[26]Suffrage rights differed between states and territories. In territories, voters could vote for the territorial legislature, but not for the state governor, Congress, or US president.

[27]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 21.

noted in the economic and non-economic literature to be of potential importance for the spread of woman suffrage at particular times or in particular regions. Specifically, we consider four broad categories of variables: (i) measures of the population composition of a jurisdiction, (ii) measures of the economic structure of a jurisdiction and the economic power of women living therein, (iii) a measure of the legislative/procedural difficulty of extending the suffrage (territorial status), and (iv) regional indicators to account for unobserved (and time-invariant) characteristics that may affect rates of woman suffrage adoption at the level of individual jurisdictions.

(i) Population Indices: A first set of covariates captures compositional characteristics of a jurisdiction's population that have been suggested to have potentially affected 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 were 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).[28] A strong German-born minority also arguably diminished the probability of a state or territory to adopt woman suffrage. The suffrage movement was at times intertwined with the prohibition movement that, in turn, 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, which represented brewers' interests, actively fought against prohibition and the woman suffrage cause (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' (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 that records the number of Mormons relative to the total

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[28]The fraction of Irish- and Italian-born residents in a jurisdiction should also be correlated with the percentage of Roman Catholics in a state or territory.

number of individuals that were members of a religious denomination in a jurisdiction.[29] We also control for the urbanization rate of a jurisdiction, i.e., for the percentage of individuals that live in an urban area, and for the population density of a jurisdiction (inhabitants per square mile). Urban areas played a major role in the fight against woman suffrage 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 jurisdictions to enact woman suffrage; and for both advocates and opponents of woman suffrage, organizational costs might have been lower in urban than in rural areas (Stigler, 1971). The expected net effect of urbanization on the timing of woman suffrage is hence 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.

(ii) Economic Structure and Female Empowerment: A second set of covariates relates to the economic structure of a jurisdiction and the empowerment of women living therein. To proxy the overall level of development of a state or territory, we use real taxable wealth per capita deflated into 1982 dollars, a measure also used by Geddes and Lueck (2002) in their study on the expansion of women's economic rights.[30] Taxable wealth includes the value of all private real and personal property but excludes real property exempt from taxation, such as property devoted to governmental, public, or charitable purposes. As a measure of the importance of the agricultural base for a jurisdiction, we include land in farms expressed in per capita terms.[31] We also include as an explanatory variable the percentage of gainful workers aged 10 or above that are engaged in manufacturing, in mechanical, and in mining industries. Manufacturing interests are generally viewed as a main opponent of woman suffrage. In particular, business interests feared that female voters would back more rigid labor legislation in general and more rigid child labor regulation in particular (Flexner, 1975; McDonagh and Price, 1985). A strong manufacturing sector in a jurisdiction can therefore be

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[29]Figures 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 state. Missing values were then inferred by inter- and extrapolation.

[30]We are grateful to Rick Geddes and Dean Lueck for providing us with their wealth data. The variable is constructed from a decennial report on national wealth that presents comparative data for the census years 1850 to 1922.

[31]As an alternative measure, we used the percentage of farm land in the total land area of a state or territory but obtained very similar results.

expected to decrease the hazard of adopting woman suffrage. We also control for the percentage of school-age females attending school[32] and for the percentage of females that is engaged in gainful employment. With females increasingly receiving extensive education and pursuing economic careers, the view among men that women's appropriate place is exclusively in the domestic sphere should arguably have weakened. Furthermore, increasing own economic power may have enhanced the bargaining power of women and thus the ability of would-be female voters to demand their voting rights more forcefully in a jurisdiction.

(iii) Procedural Difficulty of Extending the Suffrage: In the empirical analysis, we also control for the territorial status of a jurisdiction. As noted in Section 3, historians have argued that the West took a lead in the enfranchisement of women partly because many jurisdictions in the West had only territorial status. Underlying this argument are two reasons, one fact and one conjecture. First, barriers for adopting woman suffrage were generally lower in territories than in states (Grimes, 1967). In territories, an approval of the legislature and the territorial governor was sufficient; in states, in contrast, woman suffrage required a constitutional amendment and hence usually had to be approved both by the state legislature and by public referendum. Second, woman suffrage may have been an attractive and low-cost means for territorial legislatures to publicize their jurisdiction and to increase federal support for their bid for statehood. All else equal, therefore, territorial status should have accelerated the transition of a jurisdiction to woman suffrage.

(iv) Time-invariant Regional Characteristics: Finally, we also control for fixed region effects by including dummies for the census regions West, South, and Northeast (the Midwest serves as the reference category).[33] 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 indeed, and generally, further developed in the West than in other parts of the country, this effect on the hazard of adopting woman suffrage should be captured by these census region dummies.

6.2 Descriptive Statistics

Table 1 provides descriptive statistics by census region for selective census years. The table shows that western jurisdictions differed from jurisdictions in other census regions in a number of respects. However,

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[32] Again, we want to thank Rick Geddes and Dean Lueck for providing us also with this data.

[33] As a check of robustness, we also 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, jurisdictions in the Midwest also exhibited comparatively high sex ratios throughout the observation period. However, this change in the classification of the American West left our main results unchanged.

and importantly, several of these differences appear at odds with arguments made in the literature about the likely root causes of the West's pioneering role and sustained lead in the enfranchisement of women in the United States.

First, in 1870, 8 out of the 11 jurisdictions in the West, but only 2 out of the 37 non-western jurisdictions, had territorial status. However, by 1890, most of the Western jurisdictions had been successful in their bid for statehood. Territorial status, therefore, can at best provide a potential explanation only for the pioneering lead of the American West, not for its sustained lead.

Second, the percentage of foreign-born Americans in the West was comparatively high, not low, in 1870 (this differences also largely disappeared in the following years). Furthermore, neither the percentage of Italian-born Americans nor the percentage of Irish- or German-born Americans was exceptionally low in the West. Regional differences in the share of the foreign-born, or in their composition, are thus unlikely to have played an important role for the success of the woman suffrage cause in the American West.

Third, although the share of Mormons was indeed much larger in the West than in the rest of the country, the importance of the Mormon Church differed considerably between jurisdictions in the West. Mormons were the dominant religious denomination only in Utah and Idaho; and they were only weakly represented in California, Colorado, Montana, New Mexico, Oregon, and Washington. The presence of Mormons might therefore well have contributed to the early adoption of woman suffrage laws in Utah and Idaho, but it cannot possibly explain why the West, at large, enfranchised woman earlier than the rest of the country.

Fourth, in 1870, the level of private wealth in Western jurisdictions was, on average, smaller (and not larger) than in the Midwest and Northeast (it increased, however, markedly in the following decades[34]). Moreover, manufacturing and mechanical industries were relatively more important in the West than in the South and Midwest (yet somewhat less important than in the Northeast).

Finally, and for all census years, the percentage of females in gainful employment was relative low both in the West and in the Midwest. In 1870, the West also considerably lagged behind the Northeast and Midwest in terms of female school attendance rates (this gap also narrowed in later decades).

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[34]The relative abundance of men in the West presumably contributed to high per-capita wealth, as the percentage of females in gainful employment was generally low.

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
Jurisdictions:[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
Population indices:[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
% non-white	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	6.8	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
Economic structure and female empowerment:[2]												
per capita wealth (in 1000 1982 dollars)	6.0	25	28	6.9	16	25	11	15	19	3.9	7.6	13
farm land (acres) per capita	10	16	23	12	16	19	6.3	5.2	4.3	15	12	10
% engaged in manuf.	32	27	29	17	19	26	38	41	46	10	13	19
% female gainful empl.	7.9	12	17	7.2	12	17	15	21	26	17	18	29
% female schooling	40	55	68	65	62	68	71	59	65	28	43	59

NOTE: A detailed tabulation of the states and territories in the four census regions is provided in Table A-1 in the appendix. [1] number of jurisdictions in a census region which are states, respectively territories. [2] unweighted averages across jurisdictions in a census region. Data series on per capita wealth and school-age females attending school have been kindly provided by Rick Geddes and Dean Lueck. For a definition of variables, see Section 6.1. Depending on magnitudes, figures are rounded to different decimal points.

The descriptive evidence thus suggests that neither high levels of per capita wealth, the absence of opposing business interests, nor the economic power or education of women are likely to have been crucial factors for the success of women in the West in securing the ballot. High sex ratios, in contrast, were a distinctive feature of most western states and territories (the exceptions are Utah and New Mexico), not only in 1870, but also, albeit to a lesser degree, in later decades. In 1870, the average ratio of men to women (aged 15-49) in Western jurisdiction was 330:100, but only 126:100 in the Midwest, 95:100 in the Northeast, and a mere 93:100 in the South. Although sex ratios declined in later decades in the West, they remained well above the sex ratios found in other census regions. The scarcity of women in the West, therefore, has the potential to explain why the West, at large, assumed both a pioneering role and a sustained lead in the enfranchisement of women in the US. In fact, the descriptive evidence tentatively suggests that it may be the only such factor.

7 Results

7.1 Main Results

We start with estimating a complementary log-logistic regression model that includes as covariates only the sex ratio and period dummies (see Table 2). Our baseline period is 1866-1919. However, we consider also various alternative starting dates to test the importance of the earliest suffrage states, i.e., of Wyoming, Utah, Washington, Colorado and Idaho, for the overall association between the sex ratio in a jurisdiction and the hazard of granting woman the right to vote. Specifically, we consider four sub-periods: 1870-1919, 1880-1919, 1890-1919, and 1900-1919. Regression results for these sub-periods are reported in columns 2 to 5 of Table 2.

In line with our theoretical prediction, the sex ratio in all specifications has a positive sign and is highly statistically significant. The coefficient estimate for the whole sample period (Model 1) 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 percent ($= exp(0.006) - 1$).[35] This coefficient estimate may seem small. However, inter-state differences in the sex ratio were very high. The overall impact of the relative shortage of women in Western jurisdictions on the hazard of adopting suffrage was hence substantial. The coefficient estimates of

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[35]The 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.

TABLE 2: REGRESSION RESULTS I: BASELINE REGRESSIONS

Dependent variable: female suffrage (0/1)					
Covariates	Model 1	Model 2	Model 3	Model 4	Model 5
sex ratio	.006***	.007***	.021***	.032***	.035***
	(.002)	(.003)	(.006)	(.006)	(.007)
Period dummies					
1866-1884	−4.09***	−4.12***	−5.12***	-	-
	(.880)	(1.13)	(1.77)		
1885-1899	−3.66***	−3.68***	−4.30***	−4.27***	-
	(.739)	(.734)	(.830)	(.837)	
1900-1914	−2.33***	−2.34***	−2.55***	−2.82***	−2.92***
	(.402)	(.401)	(.396)	(.434)	(.483)
N obs	2277	2099	1668	1242	801
N states	48	47	46	45	43
year analysis begins	1866	1870	1880	1890	1900

NOTE: Baseline period: 1915-1919. 1919 is the last year considered in all five estimation samples. Model 2 excludes Wyoming, Model 3 Wyoming and Utah, Model 4 Wyoming, Utah, and Washington, and Model 5 Wyoming, Utah, Washington, Colorado and Idaho. *** denote statistical significance at the 1% level. Robust standard errors clustered by jurisdiction are reported in parentheses.

the time period dummies, in turn, suggest that the woman suffrage cause has gained considerable momentum over time. In particular, jurisdictions became much more likely to adopt woman suffrage after the outbreak of World War I. Interestingly, the further is the starting date of the analysis moved forward in time, the larger in magnitude becomes the point estimate of the sex ratio effect; for the latest sub-period considered (1900 to 1919), the coefficient estimate is, in fact, nearly six times larger than our baseline estimate for the unrestricted time period (1866-1919). However, inter-state differences in the sex ratio also become less important over time.

We proceed by adding sequentially further (sets of) covariates to the baseline regression for the unrestricted sample period 1866-1919 (Model 1). The results are provided in Table 3. Model 1 is identical to Model 1 in Table 2, which we report again to ease comparison. In Model A of Table 3, we add population indices, and in Model B covariates that describe the economic structure of a state or territory and the relative empowerment of women living therein. Model C furthermore adds a dummy for territorial status and Model D adds indicators for census regions. In all four models, the sex ratio exerts a robust positive and statistically significant effect on the hazard rate. What is more, its coefficient estimate, rather than declining in magnitude, increases markedly, once we account for state-level differences in population characteristics and, in particular, for differences in female empowerment and economic structures. High sex ratios, therefore, tend to be associated with other characteristics of a state or territory that are not more but less favorable to the

adoption of woman suffrage laws: in the most elaborate model specification (Model D), a one percentage point increase in the sex ratio increases the hazard of adopting woman suffrage by almost four percent.

Regarding the population indices, we find, as expected, a sizeable and statistically significant negative effect of the percentage of non-whites on the probability that a jurisdiction enacts woman suffrage, a correlation arguably driven by the large share of non-whites in the South. The percentage of German- and Irish-born Americans also both enter with the expected negative sign, but their coefficients are only at times statistically significant. Italian immigrants, however, and contrary to expectations, have no statistically significant effect on the hazard of adopting woman suffrage. Our results furthermore show that the urbanization rate exerts a positive influence on the hazard. 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 turn, does not influence the hazard. Finally, the share of Mormons has the expected positive and statistically significant effect in all specifications.

Turning next to the set of variables that describe aspects of the economic structure of a jurisdiction and the empowerment of women living therein, we find a positive effect of per capita wealth on the hazard rate. All else equal, wealthier jurisdictions thus tended to enfranchise women earlier. The effect turns (marginally) insignificant, however, once we include region dummies. Farm land per capita does not exhibit a statistically significant association with the hazard rate. But the percentage of gainful workers in manufacturing exerts a strong and highly significant negative effect on the hazard of adopting woman suffrage. Manufacturing interests hence indeed seem to have been a major impediment to the woman suffrage cause. Finally, and also in line with expectations, we find that the economic power and education of those seeking the franchise increase, all else equal, the probability of a jurisdiction to pass woman suffrage legislation.

The territorial status of a jurisdiction does not 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' 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.

Dependent variable: female suffrage (0/1)					
Covariates	Model 1	Model A	Model B	Model C	Model D
sex ratio	.006*** (.002)	.010** (.004)	.043*** (.011)	.042*** (.012)	.038*** (.014)
Population Indices					
population density	-	−.013 (.011)	−.005 (.004)	−.005 (.004)	−.002 (.004)
% urban	-	.036 (.027)	.124*** (.031)	.125*** (.032)	.084** (.040)
% non-white	-	−.068*** (.024)	−.106** (.048)	−.107** (.049)	−.168** (.076)
% foreign born	-	−.034 (.047)	−.054 (.044)	−.058 (.047)	−.042 (.048)
% Italian	-	.386 (.309)	.166 (.193)	.169 (.195)	.492 (.362)
% Irish	-	−.136 (.502)	−.509 (.325)	−.518 (.337)	−.612* (.319)
% German	-	−.014 (.108)	−.700* (.395)	−.697* (.397)	−.777 (.519)
% Mormons	-	.052*** (.019)	.084*** (.024)	.082*** (.027)	.058** (.026)
Economic Structure & Female Empowerment					
per capita wealth	-	-	.097*** (.037)	.099** (.039)	.060 (.039)
farm land per capita	-	-	−.007 (.026)	−.004 (.028)	−.022 (.037)
% engaged in manufacturing	-	-	−.190*** (.055)	−.188*** (.056)	−.175*** (.066)
% female gainful employment	-	-	.154* (.084)	.162* (.089)	.240* (.126)
% female schooling	-	-	.116*** (.037)	.117*** (.036)	.125*** (.046)
Procedural Difficulty of Extending the Suffrage					
Territory dummy	-	-	-	−.548 (1.95)	−.481 (2.01)
Time-Invariant Regional Characteristics					
West dummy	-	-	-	-	.882 (1.02)
Northeast dummy	-	-	-	-	−2.25* (1.25)
South dummy	-	-	-	-	−.125 (.956)
Period dummies	yes	yes	yes	yes	yes
N obs	2277	2277	2277	2277	2277
N states	48	48	48	48	48
year analysis begins	1866	1866	1866	1866	1866

NOTE: Period of analysis: 1866-1919. Base category: states in the Midwest in the years 1915-1919. For a description of the variables, see Section 6.1. *,**,*** denote statistical significance at the 10%, 5%, and 1% level. Robust standard errors clustered by jurisdiction are reported in parentheses.

Finally, there is some evidence that unobserved time-invariant characteristics shared by jurisdictions within a census region affected the timing of female voting rights. However, and contrary to expectations, the results of Model D suggest that – after controlling for observable characteristics – it was not the Western jurisdictions that were exceptional in the Union, but jurisdictions in the Northeast: only the latter display a statistically significant lower average probability of adopting woman suffrage than the jurisdictions located in the Midwest (the reference category). While the coefficient estimate of the dummy for the American West is positive, it is not significantly different from zero. Given that we also do not find the sparse population density in the West to be an important determinant of the rate at which jurisdictions granted women access to the ballot, our results provide little empirical support for the widely shared belief that frontier egalitarianism in the West was a major factor behind this region's lead in the enfranchisement of women.

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, per capita wealth, and female empowerment. Among the latter are a high percentage of non-whites, of Irish- and German-born Americans, and a high percentage of manufacturing employment in total employment. Most of these factors, however, cannot 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 or a high percentage of school-age females attending school (see Table 1). Likewise, the shares of German-born and of Irish-born Americans, for which we find some evidence that they have delayed woman suffrage adoption, were relatively high in the West, especially at the beginning of our sampling period. Moreover, 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.

While per capita wealth in the West was indeed comparably high over large periods of the sample, Western jurisdictions started from a very low level in 1870. At least the early successes of the suffrage movement are thus not related to high levels of per capita wealth. And for later decades, our coefficient estimates imply that the effect of imbalances in the sex ratio were by far more important than per capita wealth in promoting the woman suffrage cause in the American West (the effect of per capita wealth does also not prove robust to the inclusion of census region dummies). To illustrate the different magnitudes of the contributions of sex ratio imbalances and wealth differences to the victory of the woman suffrage cause

in the West, consider the following back-of-the-envelope calculation. The coefficient estimates of the full-fledged Model 5 imply that an increase in the sex ratio by one percentage point and an increase in per-capita wealth by 1000 USD increases the hazard of adopting woman suffrage by 3.9 and 6.2 percent, respectively (though the latter estimate, as noted, is marginally insignificant). As sex ratio imbalances were very large even for later periods in the sample, however, the *cumulative* effect of sex ratio imbalances on the hazard ratio is significantly higher than the cumulative effect of differences in per capita wealth. For instance, the sex ratio of an average jurisdiction in the West was 64 (38) percentage points higher in 1890 (1910) than in the American Midwest (the census region with the second highest average sex ratio). This compares to an average absolute difference in per-capita wealth of only 9000 (3000) USD in 1890 (1910).[36]

In summary, only the severe imbalances in the ratio of men to women 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 only be part of the explanation, as great numbers of Mormons lived only in Utah and Idaho. In 1870, the average share of Mormons in western jurisdictions was, in fact, no different from the shares found in other census regions, once Utah and Idaho are excluded. 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, i.e., last of all states in the West and a full 51 years after pioneering Wyoming.[37]

7.2 Robustness Checks

We checked the robustness of our results along a number of dimensions taking as the benchmark regression our Model C of Table 3. We use the model without census region dummies as our benchmark, as we are particularly interested in variation *between* census regions. However, all of the robustness checks reported in the following also go through when we add census region dummies.[38]

As a first 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 was arguably driven by

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[36]Note that high per capita wealth in the American West was, to some extent, itself presumably a consequence of high sex ratios, as men were much more likely to be gainfully employed than women. In fact, per capita wealth is significantly, and positively, correlated with the sex ratio of a jurisdiction.

[37]In 1870, New Mexico had a sex ratio of only 107:100 among its residents aged 15-49, second only to Utah where 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.

[38]Results of these regressions can be obtained from the authors upon request.

TABLE 4: ROBUSTNESS CHECKS I - BASELINE HAZARD AND MODEL CHOICE

Dependent variable: female suffrage (0/1)

Covariates	Model C	Model R1	Model R2	Model R3[a]	Model R4[b]
sex ratio	.042*** (.012)	.035*** (.012)	.043*** (.012)	$1.90 \times 10^{-3***}$ $(.689 \times 10^{-3})$	$4.32 \times 10^{-3***}$ (1.40×10^{-3})
Econometric model	Cloglog duration	Cloglog duration	Logit duration	Linear probability	Linear probability
Baseline hazard / time effects	Period dummies	Cubic polynomial	Period dummies	Period dummies	Period dummies
N obs	2277	2277	2277	2520	45
N states	48	48	48	48	45

NOTE: Period of analysis: 1866-1919. Except for the specification of the baseline hazard/time effects, Models R1 to R4 use the same explanatory variables as Model C of Table 3. For a description of the variables, see Section 6.1. *** denote statistical significance at the 1% level. Robust standard errors clustered by jurisdiction are reported in parentheses. [a] Model R3: the dichotomous endogenous variable indicates whether a jurisdictions has adopted woman suffrage by time t; woman suffrage jurisdictions remain in the estimation sample. [b] Model R4; covariate values refer to 1866 and the dichotomous dependent variable indicates whether or not a state has enacted woman suffrage laws before 1920; North and South Dakota and Oklahoma are excluded from the estimation sample.

broader historical forces such as the spread of democratic and egalitarian 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. Results for our main explanatory variable of interest, the sex ratio, are reported for various specifications in Table 4.[39] To ease comparability with our previous results, the benchmark regression (Model C) is reproduced in column 1 of Table 4. Column 2 of Table 4 shows the coefficient estimates of the sex ratio for a specification that parameterizes the baseline hazard as a third-order polynomial of time (Model R1).[40] As is evident, an increase in the sex ratio continues to be associated with a higher hazard rate of adopting woman suffrage even though the coefficient estimate decreases somewhat.

Second, we re-run our regressions using a logistic specification of the hazard function (Model R2). The coefficient estimate of the sex ratio, however, again remains virtually unchanged (see column 3 of Table 4).

As a third robustness check, we estimated a linear probability model instead of a duration model (Model R3). Our dichotomous endogenous variable is now a dummy that indicates whether or not a state has adopted

[39]Complete regression results can be obtained from the authors upon request.

[40]We also used a logarithmic specification of the baseline hazard and thus the discrete-time analogue to the continuous time Weibull model. The sex ratio remains positive and highly statistically significant.

TABLE 5: ROBUSTNESS CHECKS II - OPENNESS OF POLITICAL SYSTEM, CONTAGION EFFECTS, OTHER COVARIATES

Covariates	Model C	Model R5	Model R6	Model R7	Model R8
Dependent variable: female suffrage (0/1)					
sex ratio	.042***	.042***	.038***	.040***	.032***
	(.012)	(.011)	(.011)	(.009)	(.010)
poll tax	-	.462	-	-	-
		(.663)			
literacy test	-	−.193	-	-	-
		(.738)			
secret ballot	-	.585	-	-	-
		(1.46)			
contagion effects	-	-	1.03	-	-
			(.624)		
N obs	2277	2277	2277	2277	2277
N states	48	48	48	48	48

NOTE: Period of analysis: 1866-1919. Model R5 adds three covariates (indicators for the use of poll taxes, literacy tests, and the secret ballot) and Model R6 adds one (an indicator to capture potential contagion effects); Model R7 replaces one covariate (the share of non-whites) with another (share of blacks), and Model R8 drops one variable (share of Mormons in a jurisdiction). Otherwise, all models use the same covariates as Model C of Table 3 and use period dummies to characterize the baseline hazard. For a description of the variables, see Section 6.1. *** denote statistical significance at the 1% level. Robust standard errors clustered by jurisdiction are reported in parentheses.

woman suffrage by time t. In contrast to the duration models, therefore, jurisdictions that have granted women the right to vote in the past now also remain in the estimation sample. While some covariates, such as female schooling or per capita wealth, are no longer statistically significant (not reported in the table), the sex ratio still enters with the expected sign and remains highly statistically significant at the one percent level. The estimate suggests that an increase in the sex ratio by one point increases the probability of a jurisdiction to have suffrage laws in place at any time t by 0.18 percent.

Fourth, we also estimated a simple linear probability model that avoids the use of contemporaneous sex ratios (Model R4 in Table 4). Specifically, we regressed a dummy indicating whether or not a state adopted woman suffrage laws before the passage of the Nineteenth Amendment (and thus by its own will) on the values of our battery of covariates at the beginning of our sample period in 1866, i.e. the first year we consider jurisdictions to be at risk of granting women the right to vote.[41] As is evident from column 5 of Table 4, the sex ratio remains positive and, notwithstanding the small estimation sample, highly statistically significant.

Fifth, we checked the robustness of our results to the inclusion of further explanatory variables (see

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[41]South and North Dakota and Oklahoma are not considered in the regression, as they joined the Union only in 1889 and 1890, respectively.

TABLE 6: ROBUSTNESS CHECKS III - SEX RATIO, ESTIMATION PERIOD, VOLUNTARY TRANSITION

Dependent variable: female suffrage (0/1)					
Covariates	Model C	Model R9	Model R10	Model R11[a]	Model R12[b]
sex ratio	.042*** (.012)	-	-	.051*** (.015)	.036*** (.010)
sex ratio (20-49)	-	.036*** (.010)	-	-	-
sex ratio (20+)	-	-	.037*** (.010)	-	-
N obs	2277	2277	2277	2250	2296
N states	48	48	48	48	48

NOTE: Period of analysis in Models C, R9, and R10: 1866-1919; period of analysis in Model R11: 1866-1918; period of analysis in Model R12: 1866-1920. Except for the alternative sex ratio measures used in Models R9 and R10, all four Models R9-R12 use the same explanatory variables as Model C of Table 3. Period dummies are used to characterize the baseline hazard. Robust standard errors clustered by jurisdiction are reported in parentheses. For a description of the variables, see Section 6.1. *** denote statistical significance at the 1% level. [a] Model R11 restricts the analysis to the period 1866-1918; states that adopted woman suffrage in 1919 are hence now censored (Indiana, Iowa, Maine, Minnesota, Missouri, Ohio, Tennessee, and Wisconsin). [b] Model R12 extends the analysis to include the year 1920; states that ratified the 19th amendment are now treated as voluntary grantors of woman suffrage (Kentucky, Massachusetts, New Hampshire, New Jersey, New Mexico, Pennsylvania, and West Virginia).

Table 5).[42] To proxy for the general openness and accessibility of the political system of a jurisdiction, we added covariates on voting laws and regulations (Model R5 in Table 5). 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 (see Table A-1 in the appendix for the respective dates). 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 (Model R6). Our main finding again proves robust to the inclusion of such proxies. The spill-over dummy enters with the expected positive sign but remains (marginally) statistically insignificant.[43] We also 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 (Model R7) and then dropped the Mormon dummy from the analysis (Model R8). But neither of these changes affected the coefficient estimate of the sex ratio materially or rendered it statistically insignificant.

Sixth, we changed the definition of the sex ratio measure and considered different age brackets. Specif-

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[42]Complete regressions results for these robustness checks and also for those that follow can be obtained from the authors upon request.

[43]Notice that for a significant episode of the sample period, the contagion indicator shows considerable overlap with a dummy for the Western census region. The former indicator may therefore, in part, capture the influence of the latter, rather than pure contagion effects.

ically, we considered the ratios of men to women among those aged 20 to 49 (Model R9) and among those aged 20 or older (Model R10). 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 21. For both measures, however, estimation results are again not very different from those of our baseline regression. This finding comes at little surprise, as the three sex ratio measures are very highly correlated in the data: the correlation coefficients between any pair of the three sex ratio measures all exceed 0.98.

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 (Model R11). And as a second check, we extended the period of analysis to include the year 1920 and denoted those seven states that ratified the Nineteenth Amendment (Kentucky, Massachusetts, New Hampshire, New Jersey, New Mexico, Pennsylvania, and West Virginia) as voluntary grantors of woman suffrage, treating the remaining 12 states that did not ratify the amendment as censored (Model R12). In both cases, the results we obtain are again similar to our baseline findings.

8   Conclusion

Woman suffrage led to one of the greatest enfranchisements in history. Unlike other rights extensions, it was not the result of force or threats thereof by those that sought the right to vote; and neither did it concern a particular social, religious, ethnic, or economic group. These facts are difficult to reconcile with leading political economy theories of suffrage extensions.

In this paper, we have analyzed the driving forces behind the spread of woman suffrage across US jurisdictions between 1866 and 1919. US states and territories were among the first political jurisdictions world-wide to give women the right to vote. Men already had the right to vote and, unlike the case in several European countries, extensions of the suffrage to women were not accompanied by regime change. Male voters and legislators thus granted women access to the ballot amidst neither revolutionary upheavals, nor credible threats by women to demand their political rights by force. For both historical and analytical reasons, therefore, extensions of the suffrage to women in US states and territories provide a very interesting case for researching the economics of voluntary power sharing.

In the US, states and territories in the West were the first to give women access to the ballot; and these jurisdictions also continued to lead the nation in the enfranchisement of women up to the First World War. Throughout this period, states and territories in the West exhibited a pronounced shortfall of women, i.e., a high ratio of potential grantors to grantees of female voting rights, a result of the late and male-dominated settlement of the frontier. Estimating discrete time duration models, and accounting for a wide range of potentially confounding influences suggested in the historical literature, we find the sex ratio in a state or territory to exert a highly significant and positive effect on the hazard of adopting woman suffrage. Indeed, the general scarcity of women in the American West turns out to be single most important factor for explaining why this region has become the champion of the woman suffrage cause.

Our finding of an inverse relation between the size and the likely success of a group that seeks the franchise may provide a general and important insight into the economics of voluntary power sharing. Relative sizes of potential grantors to grantees are likely to matter for all voluntary extensions of rights, and also for admissions of new members to political or economic clubs. Anything else equal, grantors of rights simply relinquish more power and run greater risks when groups of grantees are large. This logic may help to better understand historic incidences of voluntary power sharing and also the at times very unequal fortunes of deprived or disenfranchised groups in their struggle for rights. If a group depends on the goodwill of another in securing rights and privileges that the latter already enjoys, it might by better for the disenfranchised group to be small.

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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. West:						
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 -
II. Midwest:						
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[4]	1889	1917[1]	1891	–	–
Ohio	1787	1803	1919[1]	1891	–	–
South Dakota	1861[4]	1889	1918	1891	–	–
Wisconsin	1836	1848	1919[1]	1894	–	–
III. Northeast:						
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	–	–

Jurisdiction:	Year of admission as:		Changes in voting laws (dates/periods) in 1870-1920:			
	territory	state	woman suffrage	secret ballot	poll tax	literacy test
IV. South:						
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, [4] as part of Dakota Territory. 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).