Senior Project

Department of Economics

Women's Work and Wealth: Measuring the Impact of Incremental Liberations, 1850-1870

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Spring 2024

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I.   Abstract

Women's work and wealth in the United States has been pivotal in shaping the trajectory of the economy, but historical understanding of their economic contributions remains fragmented. This paper examines the impact of various property and labor rights laws on women's property and income growth as well as their rise in various occupations from 1850 to 1870. This especially focuses on married women's property acts, earnings laws, and sole trader laws on women's economic liberation through this time.

Prior to the 1870s, there is a lack of national data on women's economic status, with existing case studies often limited to specific states or industries. Theoretical discussions clarify the importance of property rights in women's economic participation, with laws enabling women to hold property being directly correlated with increased market engagement. Married women's property acts are predicted to positively influence labor force participation rates by providing greater economic autonomy.

Using a two-way fixed effects difference-in-difference model, this project analyzes data from the IPUMS Full Count census for 1850, 1860, and 1870, encompassing 48 states. Four models assess the impact of property laws on women's real property holdings, labor force participation, household types, and real property values.

By quantifying the impact of various legal reforms on women's economic empowerment, this project fills a gap in the understanding of the intersection between law, society, and women's economic agency during a transformative period in pre-industrial American history. These impacts can implicate the effectiveness of legislative measures in advancing gender equality and economic mobility in the modern day.

Ultimately, my findings showed that none of these laws impacted women's real property values or overall labor force participation rates with statistical significance. Married women's property acts did have significant impacts on overall unemployment, lowering unemployment in states which passed the law. Sole trader laws, similarly, increased the number of women in trade professions in a statistically significant manner in states where the law was passed. States which passed married women's property acts were more likely to have women living in family households and less likely to live in non-family households. States which passed sole trader laws saw the opposite effects in household preferences. Earnings acts were not effective across any models.

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III.   Introduction

Women's work and wealth in the United States is key to the modern economy's function. Without it, the everyday functions that keep the world running would mimic the effect of Iceland's 1975 Women's Day Off strike (Brewer, 2015), a roaring halt. However, this may not have always been the case- the very early years of the United States equated much of women's work to busywork or minor family contributions. This leads to a very unfortunate gap in the knowledge of women's work between where it was unacceptable and societally acknowledged. This gap is most notable in the U.S. Census works, which include a surprise appearance of "Females Engaged in Each Occupation" in the 1870 census (U.S. Census Bureau, 2021). While there is no such aggregated data in any U.S. census prior to this point, this is not due to a lack of women holding occupations.

In fact, there were a series of women's property and labor rights taking place in waves throughout the U.S. leading up to this point (Custer, 2014). Among them were three main types of property laws: property laws (often referred to as married women's property laws), earnings laws, and sole trader laws (Khan, 1996). Property laws were a rejection of coverture, which is the precedent which allowed husbands to control their wives' property (Auchmuty, 2016), and primarily affected married women in their ability to maintain property in their own name instead of their husbands', whether alive or deceased. Earnings laws refer to laws that allowed women to keep incomes and salaries without yielding them to male wards or husbands. Sole trader laws allowed unmarried women and some married women who petitioned to "conduct business as if she were unmarried, in order to earn a livelihood" (Chester County, PA, n.d.). This ostentatious set of laws is credited with the rise of women in gainful occupation, which later led to arguments of taxation without representation, such as a quote from 1837, which reads: "[w]e require

[women] to contribute their share in the way of taxes, to the support of government, but allow them no voice in its direction" (Little, 2005) . Such arguments were the foundations of the Nineteenth Amendment which passed in 1920 (Roberts, 2020), but showed pure acceptance of the fact that was women's existence in U.S. labor. Therefore, during this critical stage with the intertwined passing of key women's and labor rights laws, it is important to determine which of those laws best enabled women, as a whole, to hold and grow their own wealth.

The United States is made up of a polyculture, so often "people do not draw a sharp distinction between law and ethics, running the two together in their minds" when they fail to share common values (Brennan, 2021). Because of this, laws in the U.S. have been shaped over time by public opinion but have also in turn shaped public opinion to view "legal" actions as acceptable. By seeing how much different laws affected women's gainful occupation, the earliest documented evidence of women's economic wealth may help to shape the current understanding of how access and equitability in property law can evolve. Not only that, but it can help historians to identify if policies are reflective of the labor and rights laws that Americans wanted at the time, as "[w]hen institutions perform well, people choose to engage and it sustains democratic processes" (Cohen, 2021), and seeing the entrance of more women into the workforce based on a specific type of law would be a prime example of this principle. It may also be of interest for the modern American woman to see the legacies of "women's work," which were largely a symptom of opportunities and access, in a formative time pre-industrialization and world wars (Dublin, 2012). Beyond the U.S., almost half of all countries in the world house women who "are unable to assert equal land and property rights despite legal protections" (The World Bank, 2019). Being able to prioritize the order in which their rights

should be enacted to provide them the most mobility may be key to the development of women's rights in the twenty-first century.

So, then, in the pre-Suffragette era, what laws surrounding women's wealth and property best enabled women? Due to a lack of aggregated data of women's employment in the 1850 and 1860 censuses, there has been a gap in understanding of women's work in U.S. history from the 1850s through the 1870s. With updated IPUMS Full Count data, there is now an opportunity to measure and quantify impacts on women's personal wealth and property. Wealth of an individual through their personal property, was recorded in the 1850, 1860, and 1870 censuses (U.S. Census Bureau, 1949), which can be measured in addition to how certain laws affected the percentage of women employed in a state which enabled her. This period is key in depicting foundations for individual wealth mobility in conjunction with the Civil War, so seeing how women in states with these personal property rights compared to their peers who were not will be a contribution that can be further expanded with micro-level research in the future.

The remainder of the paper is as follows: Section IV provides context for existing literature areas surrounding this topic; Section V explains the dataset used as well as explanations of the distribution of women and their real property in this timeframe; Section VI ties in economic principles and theories for predictions on results; Section VII explains the process by which results for this project are created; Section VIII details project results and recommendations for future research.

IV.   Literature Review

To determine the research question for this historical analysis, it is necessary to determine what analyses have already taken place regarding women's wealth and personal property during

the 1850-1870 timeframe in the U.S. With that, common themes of research bodies emerge: legal and societal responses to law changes, the transfer of wealth surrounding the civil war and freed black Americans, the impacts of married women's property acts and patents, and women's gainful occupation. What is interesting, and will be touched on throughout this section, is the prevalence of empirical analysis from 1870 onward. Prior to 1870, specifically with regards to women, little can be said at a national level and is often left to case studies to implicate how the greater nation is affected. There is a strong path that historians have tread using specific states or occupations, but there is room for elaboration.

Although overlooked, the body of research surrounding the mix of legal trailblazing and societal impacts is rich with regards to this period for women. During this time, women transferred the idea of ideal womanhood as it morphed into multiple acceptable forms which slowly included labor and higher education (Cruea, 2005). This is partially due to public dialogues and debates taking place regarding women's and slave's rights as equal persons, which disrupted quiet society and led to a raised awareness for silent or "free" labor (Chused, 1983). However, the focus in this legal body remains primarily on inheritance, due to the slow waves in which laws rolled out across various states, particularly with regards to a woman's legal capacity. Gunderson's 1998 case study of New York and Virginia further displayed emphasis on law as a protector for women while avoiding becoming an advocate at this point in history. Altogether, this focus is helpful for understanding the evolution of law in the U.S. during this time but often looks at a small sample of cases or a few states while not being able to connect to larger descriptive statistics.

This new status of the woman intermingled with the Civil War in the U.S. and the discussions that erupted around proper social spheres for Black individuals. Overall, the

literature surrounding this topic notes many instances of the great unrest caused by white women and black men shifting in their due rights and shows a clear parallel in discussions of changes to their perspectives (Berthoff, 1989). Moving closer to the topic of this paper, there is clear evidence surrounding the sudden explosion in wealth transfer that was a result of emancipation in the U.S. (Dupont and Rosenbloom, 2022). However, wealth was often recorded in a subjective manner and later analysis could take that on. Census-based data, especially before 1850, led to a wide disparity in accuracy when compared to wealth that was recorded in probate courts in Shanahan and Correl's 1999 comparison of multiple sources for the same populations. Conversations on this wealth transfer for emancipated or previously freed Black Americans ensured that there is research regarding free black women's property ownership, particularly in the Southern U.S. (Schweninger, 2010). While this research is largely reliant on the discovery of more information surrounding emancipation, it serves as a basis for outlining wealth measurement of peoples as they gain liberation.

The next body of research, inching towards the research question, surrounds women's rights in household labor and intellectual property. In Khan's (1996) analysis of over a thousand patents filed by women and how they related to the distinctive laws in each state, the author draws a clear enablement of innovation as it relates to liberation and self-sufficiency. The legal evolution allowing such instances of intellectual property was related to the dissatisfaction with widower's inheritance laws. Specifically, widows were left in a state of dependency right when their husband and previous social sponsor left them (Bromfield, 1987). A dissatisfaction of these laws, coinciding with the Civil War and sizable percentage of adult male deaths in the U.S., opened a gateway to laws in personal and intellectual property. In fact, many women and slaves noticed a legal contradiction in authorship which posed a challenge for the security of intellectual

property law in the U.S. and led to discussions on copyrights in one's own name rather than that of a husband, which would cause a separation between man and wife legally (Homestead, 2005).

Married women's property acts were passed in various forms across the United States but have largely been observed and reflected on in a state-by-state manner. From these studies there is a clear flip-of-the-switch effect wherein by allowing women to own property even while married, their right to property is something which they seize quickly and swiftly. One notable study of Missouri married women's property acts utilized probate court files to find the patterns of women who were enacting wills of their own, serving as executrixes, contesting wills, suing family members, presenting creditor's claims, and serving in various professional roles in the probate court process (Knaplund, 2018, pg. 229-235). Another, which looks at the thirteen original colonies, that later become states, is able to distinguish between the different types of common law alterations that encompass the various married women's property acts, but does not manage expand these definitions to measure the level of true impact they had on a woman's financial liberation (Bromfield, 1987, pg. 1111). Another focuses solely on the intellectual property of female authors and credits the laws with "provid[ing] married women with some independent means of support" (Homestead, 2005, pg. 43). While each of these texts deliberately credits the various married women's property acts for creating a married woman's legal and financial individualism, they make assumptions about the efficacy with which these laws did so. Most talk in chronological or historical evolutions of the laws, but fail to make any sort of measurements.

Both before and after various property and earnings laws were passed, the primary means through which women gained property in the post-Colonial U.S. were through marriage, widowhood, and divorce. Divorce for women was notably rare, but often provided them the

unique opportunity for alimony and regaining their previously owned property, and so literature regarding divorces initiated by women during this time reflect women's "increasing demands for autonomy" and a sign that women in desperation began to prefer being alone over having husbands (Basch, 1986, pg. 106-107). There is also a reflection that married women's property acts contributed to a rise in divorce rates over time, although they were not the only factor (Shammas, 1994, pg. 25-26). Other literature affirms this effect of the married women's property acts on divorce rates but finds earnings acts to have no long-term effects; this same work also proves that these divorce trends did not exist prior to the passage of these laws (MacDonald & Dildar, 2018). Outside of divorce, there is evidence of wives working to bring in household income prior to earnings act passage by engaging in home-based labor, particularly if they belonged to low-income households (Siegel, 1994, pg. 1086-1089). One study that observed marriage in Massachusetts from 1850 through 1910 was able to measure economic and occupational mobility noted that women's mobility "highly depended on the availability of potential husbands" despite belonging to a state which had higher economic mobility than others (Craig et al., 2019, pg. 16, 21). Cvrek found that from 1880 through 1930 there was an improvement in men's job prospects that offset the negative effects on marriage caused by an increase in women's labor force involvement (2010). Most of the research surrounding these incremental liberations and marriage still seem to focus on divorce rates and probate courts, leaving a wide gap in knowledge surrounding financial changes for women.

The final body of research which encompasses women's work is that of women's labor and their gainful occupation. The percentage of women ages 16 and older in the labor force, increased from 14.8% to 25.3% from 1870 to 1930, according to U.S. censuses (Edwards, 1943, pg. 92). This growth is contributed, in white collar employment particularly, "to certain

inventions and forms of business organization which created major new employment opportunities for women" (Sorkin, 1973, pg. 241), but did not directly observe the pattern of women's work and earnings laws against these trends. For women in particularly harsh industries, like that of milliners and dressmakers in Massachusetts, many married women were at the mercy of their husbands who could opt to interfere in their earnings and business operations, some even stealing the names of their wives' when their own name had been tarnished (Gamber, 1992, pg. 78). This trend follows the literature surrounding the acceptable forms of women's gainful occupation. Another notes the growth of women in clerical work, noting that "[b]efore clerical occupations were opened to women, teaching was virtually the only occupation available to educated women with middle class aspirations" (Rotella, 1979, pg. 332). Another that looks at women in Virginia credits the Civil War and emancipation with the rise in women's labor and that it "did not alter greatly the occupations open to women, it did affect the types of women who performed the jobs which had been done prior to the war" based on new notions of labor need and acceptability (Holmes, 1989, pg. 56). There has been an understanding due to this idea of acceptable work and the invisible labor that resulted from it that "home labourers in the census records has recently been recognized as a problem of under-enumeration" (Walsh, 1997, pg. 570). The census was even updated starting in 1890 to draw a distinction between women keeping house for their own household and women in gainful occupation who were housekeepers, which meant an increase in accuracy later on (Folbre, 1991, pg. 475). This is not to say that all of society looked down upon women in gainful occupations or business. Murphy observes many instances in which recommenders of Midwestern female businesswomen provide stellar accounts of their working ability and financial management and credited them as pillars in local economies (Murphy, 1991, pg. 78-81). Over a longer period of time, it was even found that

women's "relative earnings was associated with an increase in national income that was from 16% to 28% higher than was the increase in male earnings alone" from 1890 through 1980 (Goldin, 1986, pg. 590). While these notions about women's work paint a clear picture of the experiences of women, there is much to be desired in terms of measurable labor force impacts and how these are affected by women's liberation.

V.   Data Overview

The primary dataset for this project is from the IPUMS Full Count data for the 1850, 1860, and 1870 censuses. Each dataset includes information at the individual level about state, gender, the type of household, whether the person is in the labor force, occupation, and real property. There are instances in which women can be found to own homes under type of household, have gainful occupation as marked in occupation, and even have dollar value of real property. Occupations are noted at the individual level from 1860 on for American women, therefore the same can be said for labor participation. Information on sole trader laws (*ST)*, married women's property acts (*MWPA*), and earnings acts (*EA*) are reflected below with *Year (Project)* describing what is used in this project. See Appendix A Table 1: Law Passage by State and Type for complete decision list. Information on sole trader laws, married women's property acts, and earnings laws are occasionally conflicting, and so the earliest noted year of a law passed is used in all cases so that even small liberations can be measured and largely impacts of later laws can still be picked up on.

This project uses five main sources of data in order to run analyses. The first three are the IPUMS 100% census data for the years 1850, 1860, and 1870 respectively. These sources are immense; each individual level piece of data contains demographic, geographic, and financial

information. From these sources, attributes from each individual are utilized. The variables used are *sex*, which states the gender of an individual, *statefips*, which says the state an individual lives in, *occ*, which lists the specific occupation of an individual, *hhtype*, which explains the type of household the individual belonged to and if they were the owner, and *realprop*, which provides a dollar valuation of any land or households within the possession of an individual. The most important of these variables and their implications are occupation, household type, and real property value. Occupation provides the opportunity to determine if there was more engagement in specific industries, which could help to track the movement of women's transition into the labor force. While a more subtle piece of data, household type includes female ownership of the home of residence and can help to track if there is any change in female home or building ownership. The most important in measuring force of laws from this data, real property value manages to delimit dollar valuations which can show fluctuations and monetary impacts of female property holders and the amount of monetary holdings they possessed. The maps below (Figures 1-3) show the shifts in women's average real property value over time in the United States in their original dollar values.

Figure 1: Women's Average Real Property by State, 1850
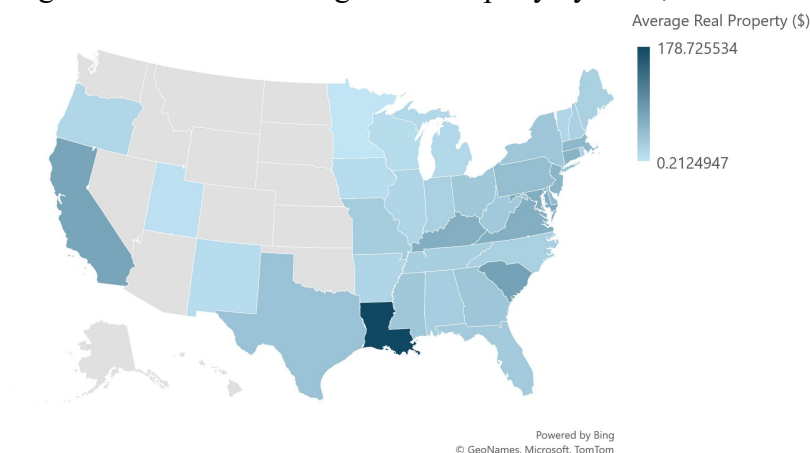
Source: Ruggles et. al (2024)

Note: Dollars shown in 1850 USD.

Figure 2: Women's Average Real Property by State, 1860
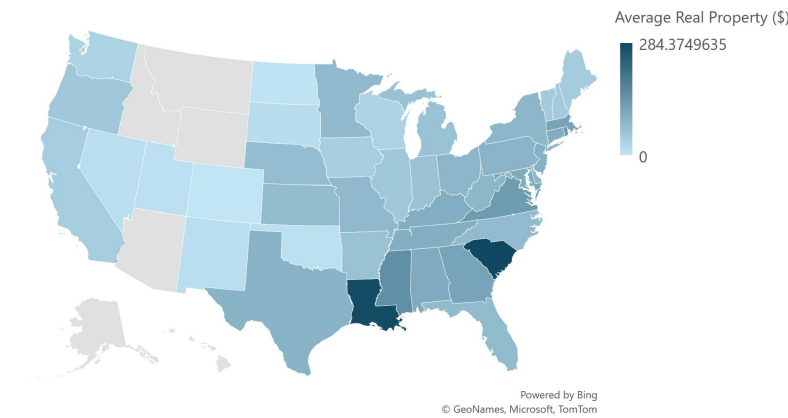
Source: Ruggles et. al (2024)
Note: Dollars shown in 1860 USD.

Figure 3: Women's Average Real Property by State, 1870
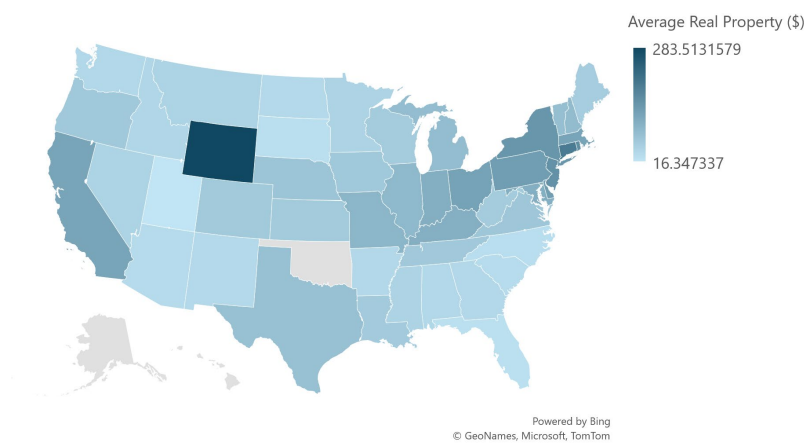
Source: Ruggles et. al (2024)
Note: Dollars shown in 1870 USD. Oklahoma is improperly reflected due to visualization error.

While there was a shift over time in where women held real property on average, there was also a drastically different spread of the U.S. population during this time. The following maps (Figures 4-6) show the population of women across the United States in their respective years. As the United States grew the number of territories that transitioned into commonwealths and states during this time, we see the states which noted women in the census grew in number. Across all three years, New York and Pennsylvania have the largest populations of women.

Figure 4: Where Women in the U.S. Labor Force Lived by State, 1850
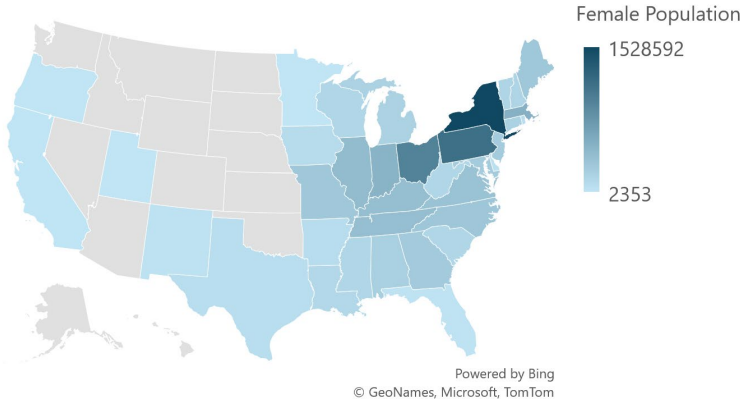
Source: Ruggles et. al (2024)

Figure 5: Where Women in the U.S. Labor Force Lived by State, 1860

Source: Ruggles et. al (2024)

Figure 6: Where Women in the U.S. Labor Force Lived by State, 1870

Source: Ruggles et. al (2024)

Note: Oklahoma is improperly reflected due to visualization error.

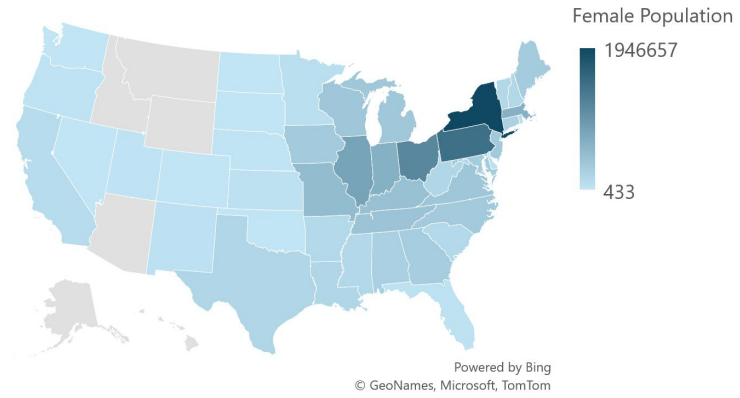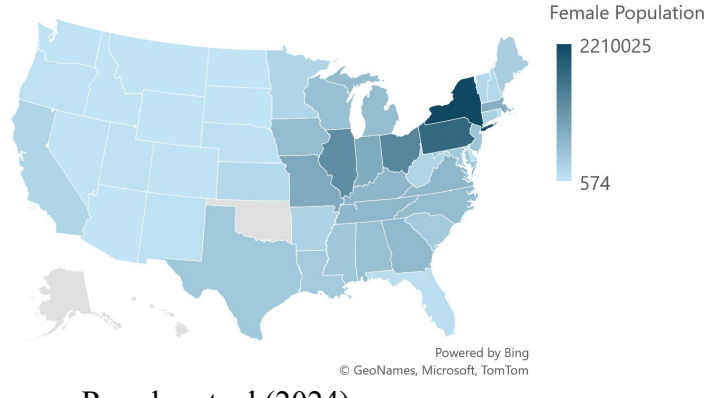Because this data was collected at the individual level, it requires fairly extensive cleaning with regards to aggregation to the state level. Due to limitations in software and storage, only a few states could have their respective individual level data aggregated at one time, creating a time-consuming process. The process also involved removing large swaths of irrelevant data to this project, such as geographical markers, children, and the property of men.

The final two major data sources are those with regards to the passage of laws In such states that are included in this project, those that were included in the 1850 and on (inclusive to California). Khan was able to write about all three types of laws and their passage dates, while Geddes and Tennyson focused primarily on the married women's property act and earnings acts. In times of discrepancy in passing dates, the earlier year is used because it generally includes a smaller liberation that leads to the larger law later on. This list and its determinations can be found in Appendix A Table 1: Law Passage by State and Type.

This list determines the split of the control and treatment groups of states. States which did not experience a change in any women's work or wealth laws between 1850-1870 belong to the control group. Figure 7 reflects this spread of treatment and control states. Control group states are: California, Delaware, Florida, Iowa, Indiana, Oklahoma, Kentucky, Louisiana, Missouri, Mississippi, Pennsylvania, Rhode Island, Tennessee, Texas, Virginia, and Vermont. States which were established after 1850 but were in the treatment group are: Arizona, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Washington. States which do have changes to one or more laws within the 1850 to 1870 timeframe, the treatment group, are: Alabama, Arkansas, Connecticut, Georgia, Illinois, Massachusetts, Maine, Michigan, Minnesota, North Carolina, New Hampshire, New Jersey, New

York, Ohio, South Carolina, and Wisconsin. States which were established after 1850 but were
in the treatment group are: Colorado, Kansas, Minnesota, West Virginia, and Wyoming. Alaska,
Hawaii, and Washington D.C. are not included in this project.

Figure 7: Map of Control and Treatment States
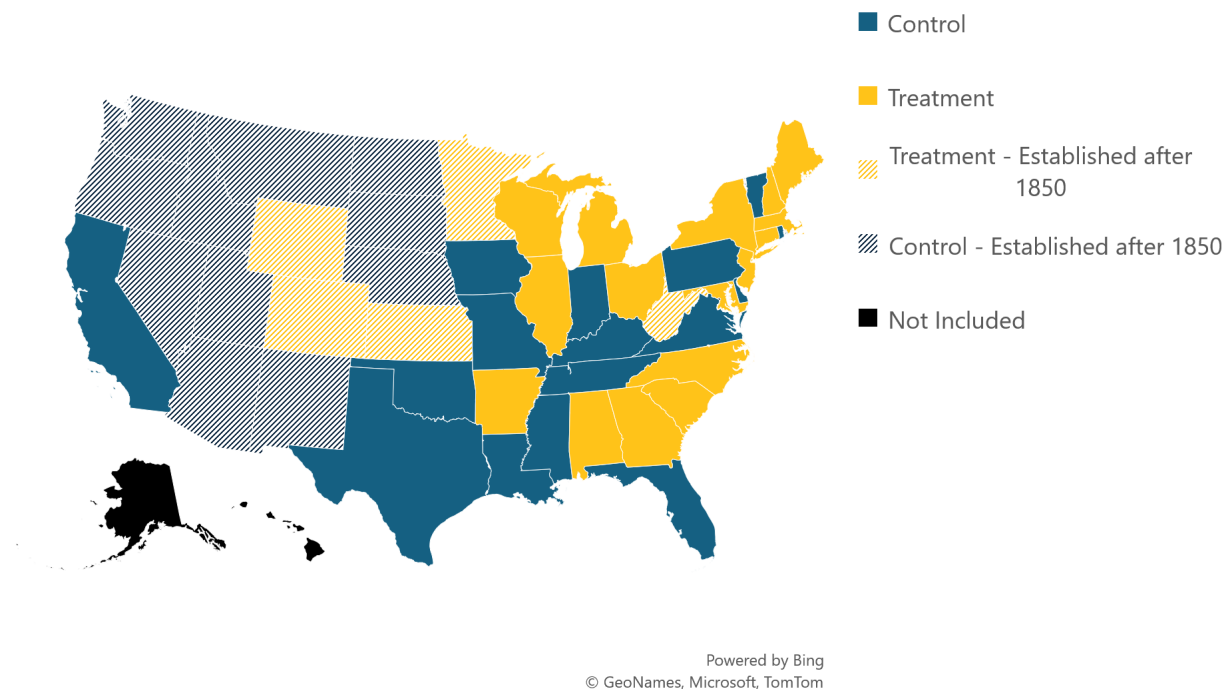
Source: Ruggles et. al (2024)

VI. Theoretical Discussion

In evaluating the value of various property rights laws that are passed throughout the course
of United States history, there are two main bodies of thought which help to describe their
importance. The first body is that of property rights and their exclusive benefits, and the other is
with regards to labor market participation rates and what determinants may cause that to
fluctuate.

Property rights are what allow an individual "to use specified goods and to exchange
them" (Alchian, 2013). They are the foundation with which individuals are motivated, in more

free market leaning economies, to engage in work. When an individual is allowed to hold and own their property with protection from being stripped of it, they are likely to engage in markets and contribute to the society in which they are a part of. In this sense, prior to the passing of married women's property acts, earnings acts, or sole trader laws, women in the United States were without property rights. They could come into possession of property, but only as an intermediary who would later pass it on to the next male who was entitled to it. Essentially, prior to these laws, individual women were unable to truly act as owners of property, whether it be in the form of income, real property, or intellectual property. Providing them the ability to hold property, even if only of one type, allowed women to participate in markets and begin to contribute to their local and national economies. Protection and increased access of intellectual property has been found to correlate to a country's economic growth (Falvey et al., 2006). Of course, at the individual level, protection of property is still important. If a woman were to attain property, if she felt secure in that she may be enabled to invent, invest, or save that property; this level of security could enable her to be freer in her market decisions. She could become a sole trader in some states, but if property rights are not valued, "weak property rights appear to deter entrepreneurs from investing from their retained earnings" (Besley & Ghatak, 2010, pg. 4558). Protecting these individual rights and opening them up to women has the direct potential and likely correlation that it will grow their individual wealth.

Once a woman can hold property, she is then able to enter the labor force not as a piece of property herself but as her own actor. More specifically, "[w]here inequality is low […] females are less likely to be blocked from joining the labor force" (Semyonov, 1980, pg. 546). Therefore, laws which provide liberations, no matter how small or incremental, allow for an increasing number of women to join the labor force. This is not to imply that women had not been working

before these laws were passed, it was simply that their work was not compensated in the same means as their male peers were. Overall, however, including women in the labor force had a similar economic effect to that as an influx of low-skilled immigration would have as the United States during this period has a "very inelastic labor supply function, the increase in female labor force participation rates from 1890 to 1930 […] must have resulted largely from shifts in the labor supply function" (Goldin, 2006, pg. 4). Although this could result in a widening of the wage gap in pay, it ultimately provided access to income for a large population that would recirculate those funds in the greater economy.

With these understandings, I anticipate that passing of any women's liberation laws will have a positive impact on their wealth and labor force participation, but I anticipate that married women's property acts will have the greatest impact as they directly protect real and intellectual property. After that, I believe that the earnings act will have a strong positive impact, especially on labor force participation. As a small change in property rights, I anticipate that sole trader laws will have little to no positive impact on women's wealth or labor.

VII.   Empirical Methodology

This project will use a two-way fixed effects difference-in-difference model. It will have three time periods, 1850, 1860, and 1870, which are consistent across all included states. Because this model relies on fixed entities, states which are founded within or after this timeframe will not be included. This means that there will be 31 states that fix the entities and are included in all censuses. Because the dataset includes information both about gainful occupations held as well as real property, four models will be run.

It is expected that as women are enabled despite marital status to own property or control their own incomes that they will control more real and personal property, but there is very little if no research during a turning point in U.S. economic history as to the effectiveness of individual laws. There is a large amount of social dialogue and legal or philosophical writing, but that cannot answer questions of empiric effects. By isolating the impact of each type of law there will be a clear means of communicating which financial liberation led to the most labor force engagement by women or the most real property holdings by women, and to what degree. There are four models in which this will be measured in this project, one which relies on participation in specific occupations, one which shows general participation in the labor force, one that bases ownership off of household type, and one which shows the impact on real property value in dollars.

$$Y_{st} = B_0 + B_1 ST_{st} + B_2 MWPA_{st} + B_3 EA_{st} + State_s + Year_t + B_4 Controls_{st} + \varepsilon_{st}$$

Within these models, Y is representative of a given outcome variable, which may include *Occupation, Household Type, Labor Force,* and *Real Property Value. Occupation* states the number of women within a particular occupation in state s and year t, *Household Type* relays if a household is rented, male or female owned, and if such an individual lives alone or with others. *Labor Force* represents what percentage of women in a given state and time is a part of the labor force. *Real Property Value* is a continuous variable which shows the dollar amount of an individual's real property or land. *ST* indicates if a sole trader law has been passed, *MWPA* indicates if a married women's property act has been passed, and *EA* indicates if an earnings act has been passed. *State* and *Year* are state and year fixed effects, respectively. ε is for any white noise. *Controls* includes the percentage of white women, the percent of enslaved women, the percentage of women on farms, the percentage of women in urban areas, the percentage of

women in school, the percentage of women who were fully literate, and the percentage of women who were blind or deaf or idiotic or insane (which is combined into a "disabled" percentage), all within a given state and year. *Sex* was used to limit all information to women, but only women are represented in all data within this project.

VIII. Results

Outcomes of this project were measured regarding the statistical significance by having married women's property acts, earnings acts, and/or sole trader laws passed in a given state and year. The outcome variables that were measured were average real property values, labor force rates, occupation type percentages, and household type percentages.

Table 1 shows the impacts on real property value held by women. Ultimately, none of the three women's work and wealth laws that were studied in this project were found to be statistically significant at any significance level. Given that most changes in real property transfer take place in probate courts, it is possible that this timespan was too short to see large swaths of impacts that usually occur following deaths, births, marriages, and divorces. It would require further study on intergenerational impacts beyond this time period in order to determine if these results are representative of larger timeframes. Unfortunately, the U.S. census discontinued real property values after the 1870 census, so these records would have to be sourced in an alternative fashion.

Table 1: Impacts on Women's Real Property, 1850-1870

Dependent Variable	Real Property Value (2023 USD)	Real Property Value (2023 USD)
Married Women's Property Act	-110.18 (251.52)	320.2 (307.05)
Earnings Act	-140.14	109.81

Dependent Variable	Real Property Value (2023 USD)	Real Property Value (2023 USD)
	(254.48)	(296.00)
Sole Trader Law	-293.29	-274.53
	(261.74)	(388.23)
Percentage of women who are white	-351.49	
	(852.75)	
Percent of women who are enslaved	8,012.87***	
	(1,876.75)	
Percentage of women on a farm	-3,186.92**	
	(1,609.54)	
Percentage of women in an urban area	2558.53	
	(1,953.42)	
Percentage of women with some or more education	5,341.14**	
	(2,053.10)	
Percent of women fully literate	1285.49	
	(931.26)	
Percentage of women disabled	-154091	
	(141,367.09)	
Intercept	1,873.58**	1,921.01***
	(720.94)	(188.14)
Controls?	Yes	No
State and year fixed effects?	Yes	Yes
Number of Observations	128	128
Adjusted R-Square	0.3722	-0.01442
Overall Significance	7.46***	0.69

Source: Own calculations.
Notes: Robust standard errors are in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively. Real property values were top coded in 1850, 1860, and 1870 USD respectively to $999,997, which represented any value above that amount.

Table 2 represents the impacts of the various laws as they impacted women's labor force participation. In this case, none of the laws had a statistically significant impact on participation rates of women at any significance level. Given that this project was only able to access 1860 and 1870 labor force data for women, this could be due to the short timeframe in which societal expectations changed. It is logical to assume, in alignment with these results, that women or

families who did not believe in women's gainful occupation would be unlikely to change their

views rapidly throughout the course of their life, and therefore these laws held no major impact.

Table 2: Women's Labor Force Participation Impacts, 1860-1870

Regressors	In Labor Force (With Controls)	In Labor Force (No Controls)
Married Women's Property Act	0.01	0.02
	-0.01	-0.01
Earnings Act	0.00	-0.01
	-0.01	-0.02
Sole Trader Laws	0.01	0.02
	-0.01	-0.02
Percentage of women who are white	-0.07	
	-0.04	
Percent of women who are enslaved	0.09**	
	-0.03	
Percentage of women on a farm	-0.11***	
	-0.04	
Percentage of women in an urban area	0.02	
	-0.04	
Percentage of women with some or more education	-0.07	
	-0.09	
Percent of women fully literate	0.01	
	-0.03	
Percentage of women disabled	7.80	
	-5.80	
Intercept	0.17***	0.07***
	-0.05	-0.01
State and year fixed effects?	Yes	Yes
Controls?	Yes	No
Number of Observations	92	92
Adjusted R-Square	0.3456	0.03247
Overall Significance	8.63***	1.78

Source: Own calculations.
Notes: Robust standard errors are in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively.

Table 3 shows the impacts of women's work and wealth laws on overall employment, unemployment, and specific industries. Holding other factors constant, the married women's property acts were significant at the 10% significance level on the unemployment rate, with a coefficient of -0.0767 implicating that this law was able to decrease the percentage of unemployed women after its passing. The coefficient for the impacts on employment were likely not statistically significant due to clerical errors and discrepancies of the time (eg. if a recorder noted a women in shopkeeping in a family store as a "helper" even if she was gainfully employed).

In this same table, the coefficient for sole trader laws was 0.0008 and statistically significant at the 5% significance level. This shows that the passing of sole trader laws in a given state and time was likely to cause a very slight increase in the number of women within the trade occupations, holding constant other factors included in the analysis. This is interpreted as a strong sign that the law was effective for those women who were already willing and ready to use it but needed legal means to do so.

Table 3: Women's Occupational Impacts, 1860-1870

Regressors	Employed	Unemployed	Trade	Agriculture	Professional Services	Manufacturing
Married Women's Property Act	0.0076 (0.0090)	-0.0767* (0.0415)	-0.0001 (0.0003)	0.0048 (0.0070)	-0.0014 (0.0038)	0.0044 (0.0035)
Earnings Act	0.0029 (0.0140)	0.0664 (0.0421)	0 (0.0003)	0.0069 (0.0109)	0.0001 (0.0038)	-0.0041 (0.0055)
Sole Trader Laws	0.007 -0.0159	-0.0411 -0.054	0.0008** -0.0004	-0.0004 -0.0127	0.0023 -0.0045	0.0042 -0.0061
Percentage of women who are white	-0.1213** (0.0503)	-0.4311 (0.2633)	0.0032 (0.0023)	-0.1457*** (0.0407)	-0.0093 (0.0175)	0.0305*** (0.0103)
Percent of women who are enslaved	0.0537 (0.0383)	-0.7093*** (0.2216)	0.0019 (0.0014)	0.0235 (0.0165)	0.0037 (0.0243)	0.0246* (0.0127)
Percentage of women on a farm	-0.0772** (0.0341)	0.4296 (0.2837)	-0.0061* (0.0033)	0.0227 (0.0247)	-0.0603*** (0.0159)	-0.0335*** (0.0114)
Percentage of women in an urban area	0.0545 (0.0370)	0.1815 (0.2764)	-0.0017 (0.0034)	-0.0064 (0.0179)	0.0114 (0.0193)	0.0511** (0.0243)
Percentage of women with some or more education	-0.132615 (0.0815)	-1.5840*** (0.5535)	-0.0113 (0.0069)	-0.0293 (0.0479)	-0.0107 (0.0395)	-0.0812** (0.0379)
Percent of women fully literate	0.0275 (0.0336)	1.1522*** (0.2306)	0.0067*** (0.0018)	-0.0159 (0.0212)	0.004 (0.0163)	0.0328** (0.0145)
Percentage of women disabled	15.6404*** (5.5814)	93.1366*** (32.6361)	-0.2407 (0.2315)	4.3834 (3.8263)	6.7561** (2.6964)	4.7415** (1.9952)
Intercept	0.1887*** (0.0482)	0.0256 (0.2624)	0.0006 (0.0015)	0.1398*** (0.0420)	0.0665*** (0.0136)	-0.0183* (0.0108)
Number of Observations	92	92	92	92	92	92
Adjusted R-Square	0.5379	0.4942	0.4277	0.5843	0.3821	0.5834
Overall Significance	11.66***	28.76***	11.32***	7.10***	8.88***	9.39***

Source: Own calculations.

Notes: Robust standard errors are in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively.

Table 4 showcases the results for women's work and wealth laws on what types of households women lived in. The married women's property act coefficient for family households is 0.0128 and statistically significant at the 5% significance level, which indicates that women were more likely to belong to family households than nonfamily households when such a law was passed, all other factors held equal and constant. Conversely, the nonfamily coefficient of -0.0056 is also statistically significant at the 5% significance level, all other factors held equal and constant. These two results together would be an indication that married women felt more secure in their financial and marital decisions when their property was protected by these laws.

In regards to the results for sole trader laws, my results show a coefficient of -0.0128 at the 5% significance level for women in family households and the coefficient of 0.0061 at the 10% significance level for women in nonfamily households, all other factors held constant and controls applied. This seems to show that women who were in states which enacted sole trader laws were more likely to become independent of their family households and leave them to enter nonfamily households. This, combined with the 0.0134 coefficient for women in households with a male head that is statistically significant at the 5% significance level, may indicate that women who were hoping to engage in trade occupations left their family households and were able to pursue that option, possibly becoming renters or travelers in the process.

Table 4: Women's Household Type Impacts, 1850-1870

Regressors	Family	Nonfamily	Female Head	Male Head
Married Women's Property Act	0.0128** (0.0050)	-0.0056** (0.0024)	-0.0017 (0.0048)	-0.0044 (0.0038)
Earnings Act	0.0006 (0.0057)	-0.0029 (0.0028)	-0.0039 (0.0055)	-0.0004 (0.0045)
Sole Trader Laws	-0.0128** (0.0063)	0.0061* (0.0036)	0.0089 (0.0070)	0.0134** (0.0053)

Regressors	Family	Nonfamily	Female Head	Male Head
Percentage of women who are white	-0.1494***	0.0665***	-0.0828**	0.1367***
	(0.0267)	(0.0165)	(0.0389)	(0.0337)
Percent of women who are enslaved	0.0332	-0.0063	0.0863***	-0.0522*
	(0.0246)	(0.0108)	(0.0220)	(0.0266)
Percentage of women on a farm	0.1722***	-0.0900***	-0.0730**	-0.0957**
	(0.0274)	(0.0227)	(0.0339)	(0.0394)
Percentage of women in an urban area	0.0928***	-0.0714***	0.0421	-0.0878**
	(0.0288)	(0.0242)	(0.0376)	(0.0401)
Percentage of women with some or more education	0.3475***	-0.2137***	-0.2782***	-0.3410***
	(0.0568)	(0.0439)	(0.0584)	(0.0694)
Percent of women fully literate	-0.0154	0.0435**	-0.0329	-0.0284
	(0.0284)	(0.0182)	(0.0291)	(0.0345)
Percentage of women disabled	-1.0859	-3.339	11.6604***	4.0461
	(3.6472)	(2.1543)	(3.9911)	(3.6775)
Intercept	0.9450***	0.0329**	0.2385***	0.0485**
	(0.0234)	(0.0161)	(0.0335)	(0.0229)
Number of Observations	128	128	128	128
Adjusted R-Square	0.6508	0.549	0.5274	0.5481
Overall Significance	14.01***	9.41***	40.79***	4.08***

Source: Own calculations.
Notes: Robust standard errors are in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively. Family households could include if a woman lived with parents/guardians or with a spouse. Nonfamily households include all other types of households. Male and Female Head indicate the head of household responsible for other family members in the household, often the primary income holder.

Coefficients for earnings acts were not found to have statistically significant impacts across any of the models. More understanding on why this is should be explored in future research, but it is possible that this is tied to the results and lack of change in labor force. If there are no major changes in jobs available to women, their income could not have changed significantly during this time either.

IX. Conclusion

This project helps to define the role of property and labor rights laws in shaping women's economic liberation and participation in pre-industrial America. Using historical census data and

two-way fixed-effects difference-in-difference models, it is clear that legal reforms made by means of married women's property acts and sole trader laws played a significant role in facilitating women's economic liberation in pre-industrial America. Utilizing empirical methodology from most similar research, including a two-way fixed effects difference-in-difference model, this study analyzes data from the IPUMS Full Count census for 1850, 1860, and 1870 across the United States. The impact of work and wealth laws on women's real and personal property holdings, labor force participation, household types, and real property values is meticulously assessed and can now be used to spur further research that may use decision tree models to better determine why these impacts took place at the individual level.

This project shines a light on the importance of property rights in enabling women to actively engage in economic activities, with laws granting them ownership directly tied to their drop in unemployment. As they were better able to hold onto the fruits of their labor, they would be more likely to leave their household duties and use their skillsets for personal benefit. In the modern day this would be called an incentive, but it was a fairly revolutionary concept to reward women for their work at the time.

Unfortunately, despite this result, this project did determine that the earnings acts were not effective in any state which passed it. There are two main reasons I understand this result. The first is due to the results from the lack of impact on the labor force. If there are not many women incentivized to enter the labor force, this likely means that women who were already working needed to out of necessity, regardless of pay value. Secondly, these earnings acts may have been passed without jobs available to women becoming available to them. So while a married woman may suddenly be able to earn her own income, there may not be employers who are willing to hire her.

This is where the efficacy of the sole trader laws becomes key. Because many trade occupations during the time were entrepreneurial in nature, women who were finally legally able to start and conduct their own business were likely willing to do so before they were able. This result in particular speaks to the overall finding of this project that specific or niche laws that incrementally liberate a suppressed group will be more effective than sweeping laws. These niche laws are able to support groups who are otherwise willing to step into their liberated state but need opportunity, while sweeping laws that are passed without societal support will be simply ignored and worked around. Another historical example of this was the widespread retaliation to the now-reversed Eighteenth Amendment which prohibited alcohol sale and consumption in the United States in the early twentieth century. The law was widely ignored and led to unsafe illegal activities across the nation, rather than serving its intended purposes.

By quantifying the effects of legal reforms on women's economic empowerment, this research fills a critical gap in understanding the intricate relationship between law, society, and women's economic liberation during an economic transition in American history. This project has implications for discussions on gender equality and economic mobility, emphasizing the importance of legislative measures in advancing women's rights and promoting inclusive economic growth in the modern era. This project provides valuable empirics surrounding the effectiveness of property and labor rights laws in enhancing women's economic opportunities and preserves the enduring relevance of historical context and analysis in policy debates and promoting gender equality.

Further research should be done especially regarding the results of the sole trader laws to determine at a more specific, even individual, level what it was that made the law so effective. This could require data on the women-owned businesses which were spurred to start as a result

of these laws passing. Ultimately, this may be critical information for women in repressive

nations to tactically enable their advancement for future generations.

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Appendix A: Data Tables

Table 1: Law Passage by State and Type

State	Law	Year (Geddes & Tennyson, 2013)	Year (Khan, 1996)	Year (Project)
AL	ST	-	-	-
AL	MWPA	-	1867	1867
AL	EA	1887	-	1887
AR	ST	-	1868	1868
AR	MWPA	1873	1873	1873
AR	EA	1973	1873	1873
AZ	ST	-	1871	1871
AZ	MWPA	1871	1871	1871
AZ	EA	1973	-	1973
CA	ST	-	1872	1872
CA	MWPA	1872	1872	1872
CA	EA	1872	1872	1872
CO	ST	-	1874	1874
CO	MWPA	1861	1874	1861
CO	EA	1861	1874	1861
CT	MWPA	1877	1856	1856
CT	ST	-	1877	1877
CT	EA	1877	1877	1877
DE	EA	1873	1873	1873
DE	MWPA	1873	1875	1873
DE	ST	-	-	-
FL	ST	-	-	-
FL	MWPA	1943	-	1943
FL	EA	1892	-	1892
GA	MWPA	1873	1873	1873
GA	ST	-	-	-
GA	EA	1861	-	1861
IA	EA	1873	1870	1870
IA	ST	-	1873	1873
IA	MWPA	1873	1873	1873
ID	ST	-	1887	1887
ID	MWPA	1903	1887	1887
ID	EA	1915	-	1915
IL	MWPA	1861	1861	1861
IL	EA	1869	1861	1861

State	Law	Year (Geddes & Tennyson, 2013)	Year (Khan, 1996)	Year (Project)
IL	ST	-	1874	1874
IN	MWPA	1879	1879	1879
IN	EA	1879	1879	1879
IN	ST	-	-	-
KS	ST	-	1868	1868
KS	MWPA	1858	1868	1858
KS	EA	1858	1868	1858
KY	ST	-	1873	1873
KY	EA	1873	1873	1873
KY	MWPA	1894	-	1894
LA	ST	-	1894	1894
LA	MWPA	1916	-	1916
LA	EA	1928	-	1928
MA	MWPA	1855	1845	1845
MA	ST	-	1860	1860
MA	EA	1846	1874	1846
MD	ST	-	1860	1860
MD	MWPA	1860	1860	1860
MD	EA	1842	1860	1842
ME	ST	-	1844	1844
ME	MWPA	1855	1844	1844
ME	EA	1857	1857	1857
MI	MWPA	1855	1855	1855
MI	ST	-	-	-
MI	EA	1911	-	1911
MN	MWPA	1869	1869	1869
MN	ST	-	1874	1874
MN	EA	1869	-	1869
MO	MWPA	1875	1879	1875
MO	EA	1875	1879	1875
MO	ST	-	-	-
MS	ST	-	1871	1871
MS	MWPA	1880	1871	1871
MS	EA	1873	1871	1871
MT	MWPA	1887	1872	1872
MT	ST	-	1874	1874
MT	EA	1887	1874	1874
NC	MWPA	1868	1868	1868
NC	EA	1913	1873	1873

State	Law	Year (Geddes & Tennyson, 2013)	Year (Khan, 1996)	Year (Project)
NC	ST	-	-	-
ND	ST	-	1877	1877
ND	MWPA	1877	1877	1877
ND	EA	-	1877	1877
NE	ST	-	1881	1881
NE	MWPA	1871	1881	1871
NE	EA	1871	1881	1871
NH	MWPA	1860	1867	1860
NH	ST	-	1876	1876
NH	EA	1867	-	1867
NJ	MWPA	1852	1852	1852
NJ	ST	-	1874	1874
NJ	EA	1874	1874	1874
NM	ST	-	-	-
NM	MWPA	1884	-	1884
NM	EA	-	-	-
NV	ST	-	1873	1873
NV	MWPA	1873	1873	1873
NV	EA	1873	1873	1873
NY	MWPA	1848	1845	1845
NY	EA	1860	1860	1860
NY	ST	-	-	-
OH	MWPA	1861	1861	1861
OH	EA	1861	1861	1861
OH	ST	-	-	-
OK	ST	-	-	-
OK	MWPA	1883	-	1883
OK	EA	-	-	-
OR	ST	-	1880	1880
OR	EA	1872	1880	1872
OR	MWPA	1878	-	1878
PA	MWPA	1848	1848	1848
PA	EA	1872	1872	1872
PA	ST	-	-	-
RI	MWPA	1872	1848	1848
RI	EA	1872	1874	1872
RI	ST	-	-	-
SC	ST	-	1870	1870
SC	MWPA	1868	1870	1868

State	Law	Year (Geddes & Tennyson, 2013)	Year (Khan, 1996)	Year (Project)
SC	EA	1887	-	1887
SD	ST	-	1877	1877
SD	MWPA	1877	1877	1877
SD	EA	-	1877	1877
TN	MWPA	1919	1870	1870
TN	ST	-	-	-
TN	EA	1919	-	1919
TX	ST	-	-	-
TX	MWPA	1913	-	1913
TX	EA	1913	-	1913
UT	ST	-	1895	1895
UT	MWPA	1872	1895	1872
UT	EA	1897	1895	1895
VA	MWPA	1877	1878	1877
VA	ST	-	-	-
VA	EA	1888	-	1888
VT	ST	-	1881	1881
VT	MWPA	1881	1881	1881
VT	EA	1888	-	1888
WA	ST	-	1889	1889
WA	MWPA	1881	1889	1881
WA	EA	1881	1889	1881
WI	MWPA	1850	1850	1850
WI	EA	1872	1872	1872
WI	ST	-	-	-
WV	MWPA	1868	1868	1868
WV	ST	-	1893	1893
WV	EA	1893	1893	1893
WY	ST	-	1876	1876
WY	MWPA	1869	1876	1869
WY	EA	1869	1876	1869

Sources: Geddes and Tennyson (2013), Khan (1996), and own determinations.

Notes: ST stands for Sole Trader laws, MWPA for Married Women's Property Acts, and EA for Earnings Acts. "-" denotes no date being listed by source. Earlier listed year for a law passing is used for this project as it provides the earliest known impacts.

Table 2: Real Property Value of Women by State and Year in 2023 USD

Year	State	Average Real Property Value (2023 USD)
1850	Alabama	957.0765152
1850	Arkansas	669.8874745
1850	California	2655.903572
1850	Connecticut	2096.367777
1850	Delaware	1747.195762
1850	Florida	1111.497905
1850	Georgia	1295.110358
1850	Illinois	678.3593345
1850	Indiana	889.7369955
1850	Iowa	363.0917717
1850	Kentucky	2261.301551
1850	Louisiana	6545.643957
1850	Maine	848.5858296
1850	Maryland	2318.982428
1850	Massachusetts	1890.087968
1850	Michigan	545.537923
1850	Minnesota	7.782405893
1850	Mississippi	1231.969707
1850	Missouri	1025.777854
1850	New Hampshire	821.3237481
1850	New Jersey	2008.870393
1850	New Mexico	362.6463542
1850	New York	1274.647083
1850	North Carolina	896.7823654
1850	Ohio	1235.790088
1850	Oregon	638.5536391
1850	Pennsylvania	1642.46342
1850	Rhode Island	757.604661
1850	South Carolina	2800.248256
1850	Tennessee	941.0111302
1850	Texas	1405.376535
1850	Utah	203.2449686
1850	Vermont	641.921421
1850	Virginia	2276.453951
1850	West Virginia	1163.0567
1850	Wisconsin	396.2844691

Year	State	Average Real Property Value (2023 USD)
1860	Alabama	3551.794421
1860	Arkansas	2140.992433
1860	California	1471.015521
1860	Colorado	0
1860	Connecticut	3373.585537
1860	Delaware	2906.995289
1860	Florida	2605.626006
1860	Georgia	3973.647012
1860	Illinois	1771.976991
1860	Indiana	2087.257835
1860	Iowa	1338.851906
1860	Kansas	2528.889777
1860	Kentucky	3416.455943
1860	Louisiana	9423.519075
1860	Maine	1547.505854
1860	Maryland	3579.12948
1860	Massachusetts	4008.740567
1860	Michigan	2177.821388
1860	Minnesota	2615.136418
1860	Minnesota	2615.136418
1860	Mississippi	5278.066834
1860	Missouri	2685.08834
1860	Nebraska	2458.226838
1860	Nevada	401.0512476
1860	New Hampshire	1576.929263
1860	New Jersey	3173.034629
1860	New Mexico	420.3896386
1860	New York	2815.764064
1860	North Carolina	2568.660545
1860	North Dakota	132.2468834
1860	Ohio	2905.486943
1860	Oklahoma	326.9015342
1860	Oregon	1751.749437
1860	Pennsylvania	2980.697633
1860	Rhode Island	4592.07033
1860	South Carolina	9643.470984
1860	South Dakota	509.0582484
1860	Tennessee	3333.213756

Year	State	Average Real Property Value (2023 USD)
1860	Texas	3019.777794
1860	Utah	279.0349259
1860	Vermont	1568.79591
1860	Virginia	4495.862233
1860	Washington	1125.016741
1860	West Virginia	2825.858089
1860	Wisconsin	1104.213576
1870	Alabama	940.4312407
1870	Arizona	784.6190323
1870	Arkansas	910.4239229
1870	California	3006.995943
1870	Colorado	1518.589321
1870	Connecticut	4688.184427
1870	Delaware	3266.96228
1870	Florida	601.1350862
1870	Georgia	911.2650026
1870	Idaho	977.4602467
1870	Illinois	2201.731976
1870	Indiana	2610.865244
1870	Iowa	1540.935543
1870	Kansas	1466.957593
1870	Kentucky	2590.755446
1870	Louisiana	1449.123513
1870	Maine	1370.011082
1870	Maryland	2602.695935
1870	Massachusetts	3026.153415
1870	Michigan	2027.270449
1870	Minnesota	1082.27586
1870	Mississippi	1083.464497
1870	Missouri	2322.887064
1870	Montana	1103.902571
1870	Nebraska	1720.01955
1870	Nevada	1109.275352
1870	New Hampshire	2082.433231
1870	New Jersey	3782.535717
1870	New Mexico	882.1682828
1870	New York	3598.731557
1870	North Carolina	674.030344

Year	State	Average Real Property Value (2023 USD)
1870	North Dakota	873.1193839
1870	Ohio	3106.796386
1870	Oregon	1541.642442
1870	Pennsylvania	3305.093129
1870	Rhode Island	3921.922102
1870	South Carolina	755.1020159
1870	South Dakota	656.0057099
1870	Tennessee	1533.905494
1870	Texas	1885.441151
1870	Utah	393.8847831
1870	Vermont	1963.967682
1870	Virginia	1636.133861
1870	Washington	928.4247899
1870	West Virginia	1423.060775
1870	Wisconsin	1427.284002
1870	Wyoming	6831.174931

Source: Ruggles et. al (2024), *Consumer Price Index, 1800.*, and own calculations.

```
/*Hannah Kelly Aggregation Method*/
/*make sure to change output name and import file*/
proc import
datafile="/home/u62974615/MySAS/Honor Project (HP)/csv files/Controls/18506070slave.csv"
        out=work.slave506070
        dbms=csv
        replace;
    getnames=yes;
run;


/*get data for all categoricals*/
/*make sure to change excel file name and location*/
ods excel
file="/home/u62974615/MySAS/Honor Project (HP)/aggregate data/slave506070.xlsx";
proc freq data=work.slave506070;
tables year*statefip*slavehh / nocum nopercent nocol norow;
run;
ods excel close;


/*get realprop data*/
proc means data=work.EM1870;
var realprop;
class statefip;
run;
ods excel close;



/*Hannah Kelly Honors Project HHTYPE Regressions*/

/*import laws and when they are active or not*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/Law Passage by State and
Year.xlsx"
        out=work.lawpass
        dbms=xlsx
        replace;
sheet="PassagebyState";
getnames=yes;
run;

proc sort data=work.lawpass;
        by Year statefip;
run;
```

```
/*import state level data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/State Level Female
HHTYPE.xlsx"
        out=work.hhtypeaggf
        dbms=xlsx
        replace;
sheet="HHTYPE";
getnames=yes;
run;

proc sort data=work.hhtypeaggf;
        by Year statefip;
run;

data hhtypeaggf2;
        set hhtypeaggf;
        /*married = hhtype1*/
        family=sum(HHTYPE1,HHTYPE2,HHTYPE3);
        nonfamily=sum(HHTYPE4,HHTYPE5,HHTYPE6,HHTYPE7);
        fhouse=sum(HHTYPE3,HHTYPE6,HHTYPE7);
        mhouse=sum(HHTYPE2,HHTYPE4,HHTYPE5);
        unknown=sum(HHTYPE0,HHTYPE9);
run;

/*import control variable data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/aggregate
data/controls506070.xlsx"
        out=work.xcontrols
        dbms=xlsx
        replace;
sheet="xcontrols";
getnames=yes;
run;

data xcontrols2 (drop=statefipCharacter) ;
        set xcontrols (rename=(statefip=statefipCharacter));
    statefip=input(statefipCharacter,10.);
run;

proc sort data=work.hhtypeaggf2;
        by Year statefip;
run;

/*now to combine the two data pieces together via merge (m to 1) (m:1)*/
data lawsandhhtypeaggf2andcontrols;
        merge lawpass hhtypeaggf2 xcontrols2;
```

```
        by Year STATEFIP;
        drop state;
run;



/*MODELS START HERE*/
ods output ParameterEstimates=PEforModel1 DataSummary=ObsModel1
        FitStatistics=AdjRsqModel1 Effects=OverallSigModel1;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
        class statefip Year / ref=first ;
        Model1: model hhtype1 = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel2 DataSummary=ObsModel2
        FitStatistics=AdjRsqModel2 Effects=OverallSigModel2;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
        class statefip Year / ref=first ;
        Model2: model family = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct
litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel3 DataSummary=ObsModel3
        FitStatistics=AdjRsqModel3 Effects=OverallSigModel3;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
        class statefip Year / ref=first ;
        Model3: model nonfamily = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel4 DataSummary=ObsModel4
        FitStatistics=AdjRsqModel4 Effects=OverallSigModel4;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
        class statefip Year / ref=first ;
        Model4: model fhouse = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct
litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel5 DataSummary=ObsModel5
        FitStatistics=AdjRsqModel5 Effects=OverallSigModel5;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
        class statefip Year / ref=first ;
```

Model5: model mhouse = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct litpct disabilitypct /solution adjrsq;
run;

ods output ParameterEstimates=PEforModel6 DataSummary=ObsModel6
    FitStatistics=AdjRsqModel6 Effects=OverallSigModel6;
proc surveyreg data=lawsandhhtypeaggf2andcontrols;
    class statefip Year / ref=first ;
    Model6: model unknown = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct litpct disabilitypct /solution adjrsq;
run;

/*notes: state fixed effects: yes; year fixed effects: yes;*/

Data Table_Long;
    length Model $10; /* Makes sure the variable Model has the right length and its values are not truncated */
    length Parameter $30; /* Makes sure the variable Parameter has the right length and its values are not truncated */
    set PEforModel1 PEforModel2 PEforModel3 PEforModel4 PEforModel5 PEforModel6 indsname=M; /*"indsname" creates an indicator variable (here I call it "M") that tracks the name of databases use in the "set" statement */

    if   M="WORK.PEFORMODEL1" then Model="Model1";
        else if M="WORK.PEFORMODEL2" then Model="Model2";
        else if M="WORK.PEFORMODEL3" then Model="Model3";
        else if M="WORK.PEFORMODEL4" then Model="Model4";
        else if M="WORK.PEFORMODEL5" then Model="Model5";
        else if M="WORK.PEFORMODEL6" then Model="Model6";

        /* implement star method below*/
    length Star $3; /*tells length of variable outputs*/
    if Probt=. then Star="   "; /* need spaces between quotes because first introduction of variable determines length*/
        else if Probt le 0.01 then Star="***";
        else if Probt le 0.05 then Star="**";
        else if Probt le 0.1 then Star="*";
        else Star=""; /*anything else is statistically insignificant*/
    /*star system -> express level of significance -> 1% is ***, 5% is **, 10% is *, 0.1 < P-value fail to reject at conventional sig levels*/

    EditedResults=cats(Put(Estimate,comma16.7),Star);
    output;

```
        EditedResults=cats("(",put(StdErr,comma16.7),")");
        output;

run;

/* We sometimes need this sorting step when we have multiple regression models */
proc sort data=Table_Long out=Table_Long_Sorted;
        by Model Parameter;
run;

/* Step 2: Create separate results columns (in the form of separate databases) corresponding to
each model */
data Model1Results(rename=(EditedResults=Model1)) /*putting this here means it only affects
Model1Results*/
                Model2Results(rename=(EditedResults=Model2))
                Model3Results(rename=(EditedResults=Model3))
                Model4Results(rename=(EditedResults=Model4))
                Model5Results(rename=(EditedResults=Model5))
                Model6Results(rename=(EditedResults=Model6));

        set Table_Long_Sorted;

        if Model="Model1" then output Model1Results;
                else if Model="Model2" then output Model2Results;
                else if Model="Model3" then output Model3Results;
                else if Model="Model4" then output Model4Results;
                else if Model="Model5" then output Model5Results;
                else if Model="Model6" then output Model6Results;


        drop Model;
        keep Parameter EditedResults; /*putting this keep here affects the current and all
following databases*/
run;

/* Step 3: Create the final results table that would include all models side-by-side*/
data Table_Wide;
        merge Model1Results Model2Results Model3Results Model4Results Model5Results
Model6Results ;
        by Parameter;

        if Parameter="MWPA" then Order=1;
                else if Parameter="EA" then Order=2;
                else if Parameter="ST" then Order=3;
                else if Parameter="whitepct" then Order=4;
```

```
              else if Parameter="slaverypct" then Order=5;
              else if Parameter="farmpct" then Order=6;
              else if Parameter="urbanpct" then Order=7;
              else if Parameter="schoolpct" then Order=8;
              else if Parameter="litpct" then Order=9;
              else if Parameter="disabilitypct" then Order=10;


        if mod(_n_,2)=1 then Regressors=Parameter;
run;


/* Order the variables in the results table */
proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
        by Order;
run;

/*Step 4: Create rows for other statistics*/
/*The row for the number of observations*/
data NumofObs;
        merge ObsModel1(rename=(Nvalue1=NVModel1) drop=CValue1)
                ObsModel2(rename=(Nvalue1=NVModel2) drop=CValue1)
                ObsModel3(rename=(Nvalue1=NVModel3) drop=CValue1)
                ObsModel4(rename=(Nvalue1=NVModel4) drop=CValue1)
                ObsModel5(rename=(Nvalue1=NVModel5) drop=CValue1)
                ObsModel6(rename=(Nvalue1=NVModel6) drop=CValue1);
        where Label1="Number of Observations";
        Model1=put(NVModel1, comma16.7);
        Model2=put(NVModel2, comma16.7);
        Model3=put(NVModel3, comma16.7);
        Model4=put(NVModel4, comma16.7);
        Model5=put(NVModel5, comma16.7);
        Model6=put(NVModel6, comma16.7);


        keep Label1 Model1 Model2 Model3 Model4 Model5 Model6 ;
run;
/*The row for adj r sq*/
data AdjRsq;
        merge AdjRsqModel1(rename=(Cvalue1=Model1) drop=NValue1)
                AdjRsqModel2(rename=(Cvalue1=Model2) drop=NValue1)
                AdjRsqModel3(rename=(Cvalue1=Model3) drop=NValue1)
                AdjRsqModel4(rename=(Cvalue1=Model4) drop=NValue1)
                AdjRsqModel5(rename=(Cvalue1=Model5) drop=NValue1)
                AdjRsqModel6(rename=(Cvalue1=Model6) drop=NValue1);
        where Label1="Adjusted R-Square";
```

```
run;
/*The row for overall significance model*/
data OSM1(rename=(EditedValue=Model1)) OSM2(rename=(EditedValue=Model2))
OSM3(rename=(EditedValue=Model3))
OSM4(rename=(EditedValue=Model4)) OSM5(rename=(EditedValue=Model5))
OSM6(rename=(EditedValue=Model6))
;
        set OverallSigModel1-OverallSigModel6 indsname=M;

        where Effect="Model";

        if ProbF=. then Star="   ";
                else if ProbF le 0.01 then Star="***";
                else if ProbF le 0.05 then Star="**";
                else if ProbF le 0.1 then Star="*";
                else Star="";

        ThisIsM=M;

        Label1="Overall Significance";
        EditedValue=cats(put(FValue,comma16.2),Star);

        if M="WORK.OVERALLSIGMODEL1" then output OSM1;
        else if M="WORK.OVERALLSIGMODEL2" then output OSM2;
        else if M="WORK.OVERALLSIGMODEL3" then output OSM3;
        else if M="WORK.OVERALLSIGMODEL4" then output OSM4;
        else if M="WORK.OVERALLSIGMODEL5" then output OSM5;
        else if M="WORK.OVERALLSIGMODEL6" then output OSM6;

        keep Label1 EditedValue; /*Label1 is first because it determines print order*/
run;

data OverallSig;
        merge OSM1-OSM6;
        by Label1;
run;


/*combine all rows for other statistics*/
data OtherStat;
        set NumofObs AdjRsq OverallSig;
        rename Label1=Regressors;
run;

/*add controls for? lines*/
/*data controls;
```

```
        Regressors = "State and year fixed effects?";
        Model1 = "Yes";
        Model2 = "Yes";
        Model3 = "Yes";
        output;

run;*/

/*add rows for other statistics to the table*/
data Table_Wide_Sorted_withStat;
        set Table_Wide_Sorted xcontrols2 OtherStat;
run;

/* create new name for variables in the regression results table through defining a new format*/
proc format;
        value $VariableName(default=50);
run;

/* Print the clean results table */
ods excel file="/home/u62974615/MySAS/Honor Project (HP)/HHTYPEResults.xlsx"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS
folder */
Title "Women's Household Type Impacts, 1850-1870";
footnote1 justify=left "Source: Data provided by [...]";
footnote2 justify=left "Notes: Robust standard errors are in parentheses. *, **, and *** represent
10%, 5%, and 1% significance levels, respectively.";
proc print data=Table_Wide_Sorted_withStat noobs;

        var Regressors ;
        var Model1-Model6 / style(header)={Just=Center} style(data)={Just=Center
/*TAGATTR="type:string*/};
        format Regressors $VariableName.;

run;
ods excel close;

/*Hannah Kelly Honors Project LABFORCE Regressions*/

/*import laws and when they are active or not*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/Law Passage by State and
Year.xlsx"
        out=work.lawpass
        dbms=xlsx
        replace;
sheet="PassagebyState";
getnames=yes;
```

```
run;

proc sort data=work.lawpass;
        by Year statefip;
run;

data lawpass2;
        set lawpass;
        if Year="1850" then delete;
run;

/*import state level data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/State Level Female.xlsx"
        out=work.labforceaggf
        dbms=xlsx
        replace;
sheet="LABFORCE";
getnames=yes;
run;

proc sort data=work.labforceaggf;
        by Year statefip;
run;

data labforceaggf2;
        set labforceaggf;
        if Year="1850" then delete;
        notlabor=sum(LABFORCE0,LABFORCE1);
run;

/*import control variable data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/aggregate
data/controls506070.xlsx"
        out=work.xcontrols
        dbms=xlsx
        replace;
sheet="xcontrols";
getnames=yes;
run;

data xcontrols2 (drop=statefipCharacter) ;
        set xcontrols (rename=(statefip=statefipCharacter));
    statefip=input(statefipCharacter,10.);
    if Year="1850" then delete;
run;
```

```
proc sort data=work.labforceaggf2;
        by Year statefip;
run;



/*now to combine the two data pieces together via merge (m to 1) (m:1)*/
data lawsandlabforceaggf2andcontrols;
        merge lawpass2 labforceaggf2 xcontrols2;
        by Year STATEFIP;
        drop state;
run;

/*proc means data=lawsandoccaggfandcontrols;
        class statefip;
        var majoroccs;
run;*/

/*MODELS START HERE*/
ods output ParameterEstimates=PEforModel1 DataSummary=ObsModel1
        FitStatistics=AdjRsqModel1 Effects=OverallSigModel1;
proc surveyreg data=lawsandlabforceaggf2andcontrols;
        class statefip Year / ref=first ;
        Model1: model LABFORCE2 = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;
/*notes: controls: yes; state fixed effects: yes; year fixed effects: yes;*/

ods output ParameterEstimates=PEforModel2 DataSummary=ObsModel2
        FitStatistics=AdjRsqModel2 Effects=OverallSigModel2;
proc surveyreg data=lawsandlabforceaggf2andcontrols;
        class statefip Year / ref=first ;
        Model2: model LABFORCE2 = MWPA EA ST /solution adjrsq;
run;
/*notes: state fixed effects: yes; year fixed effects: yes;*/

/*ods output ParameterEstimates=PEforModel3 DataSummary=ObsModel3
        FitStatistics=AdjRsqModel3 Effects=OverallSigModel3;
proc surveyreg data=lawsandlabforceaggf2andcontrols;
        class statefip Year / ref=first ;
        Model3: model notlabor = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;

ods output ParameterEstimates=PEforModel4 DataSummary=ObsModel4
        FitStatistics=AdjRsqModel4 Effects=OverallSigModel4;
proc surveyreg data=lawsandlabforceaggf2andcontrols;
```

```
        class statefip Year / ref=first ;
        Model4: model LABFORCE2 = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;*/

/*notes: state fixed effects: yes; year fixed effects: yes;*/

Data Table_Long;
        length Model $10; /* Makes sure the variable Model has the right length and its values
are not truncated */
        length Parameter $30; /* Makes sure the variable Parameter has the right length and its
values are not truncated */
        set PEforModel1 PEforModel2  indsname=M; /*"indsname" creates an indicator variable
(here I call it "M") that tracks the name of databases use in the "set" statement */

        if      M="WORK.PEFORMODEL1" then Model="Model1";
                else if M="WORK.PEFORMODEL2" then Model="Model2";


                /* implement star method below*/
        length Star $3; /*tells length of variable outputs*/
        if Probt=. then Star="   "; /* need spaces between quotes because first introduction of
variable determines length*/
                else if Probt le 0.01 then Star="***";
                else if Probt le 0.05 then Star="**";
                else if Probt le 0.1 then Star="*";
                else Star=""; /*anything else is statistically insignificant*/
        /*star system -> express level of significance -> 1% is ***, 5% is **, 10% is *, 0.1 < P-
value fail to reject at conventional sig levels*/


        EditedResults=cats(Put(Estimate,comma16.7),Star);
        output;

        EditedResults=cats("(",put(StdErr,comma16.7),")");
        output;

run;

/* We sometimes need this sorting step when we have multiple regression models */
proc sort data=Table_Long out=Table_Long_Sorted;
        by Model Parameter;
run;
```

```
/* Step 2: Create separate results columns (in the form of separate databases) corresponding to
each model */
data Model1Results(rename=(EditedResults=Model1)) /*putting this here means it only affects
Model1Results*/
                Model2Results(rename=(EditedResults=Model2));

        set Table_Long_Sorted;

        if Model="Model1" then output Model1Results;
                else if Model="Model2" then output Model2Results;


        drop Model;
        keep Parameter EditedResults; /*putting this keep here affects the current and all
following databases*/
run;



/* Step 3: Create the final results table that would include all models side-by-side*/
data Table_Wide;
        merge Model1Results Model2Results ;
        by Parameter;

        if Parameter="MWPA" then Order=1;
                else if Parameter="EA" then Order=2;
                else if Parameter="ST" then Order=3;
                else if Parameter="whitepct" then Order=4;
                else if Parameter="slaverypct" then Order=5;
                else if Parameter="farmpct" then Order=6;
                else if Parameter="urbanpct" then Order=7;
                else if Parameter="schoolpct" then Order=8;
                else if Parameter="litpct" then Order=9;
                else if Parameter="disabilitypct" then Order=10;
                else if Parameter="Intercept" then Order=11;

        if mod(_n_,2)=1 then Regressors=Parameter;
run;

/* Order the variables in the results table */
proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
        by Order;
run;

/*Step 4: Create rows for other statistics*/
/*The row for the number of observations*/
data NumofObs;
```

```
        merge ObsModel1(rename=(Nvalue1=NVModel1) drop=CValue1)
               ObsModel2(rename=(Nvalue1=NVModel2) drop=CValue1)
               ;
        where Label1="Number of Observations";
        Model1=put(NVModel1, comma16.7);
        Model2=put(NVModel2, comma16.7);

        keep Label1 Model1 Model2;
run;
/*The row for adj r sq*/
data AdjRsq;
        merge AdjRsqModel1(rename=(Cvalue1=Model1) drop=NValue1)
               AdjRsqModel2(rename=(Cvalue1=Model2) drop=NValue1);
        where Label1="Adjusted R-Square";
run;
/*The row for overall significance model*/
data OSM1(rename=(EditedValue=Model1)) OSM2(rename=(EditedValue=Model2))
;
        set OverallSigModel1-OverallSigModel2 indsname=M;

        where Effect="Model";

        if ProbF=. then Star="   ";
               else if ProbF le 0.01 then Star="***";
               else if ProbF le 0.05 then Star="**";
               else if ProbF le 0.1 then Star="*";
               else Star="";

        ThisIsM=M;

        Label1="Overall Significance";
        EditedValue=cats(put(FValue,comma16.2),Star);

        if M="WORK.OVERALLSIGMODEL1" then output OSM1;
        else if M="WORK.OVERALLSIGMODEL2" then output OSM2;

        keep Label1 EditedValue; /*Label1 is first because it determines print order*/
run;

data OverallSig;
        merge OSM1-OSM2;
        by Label1;
run;


/*combine all rows for other statistics*/
```

```
data OtherStat;
        set NumofObs AdjRsq OverallSig;
        rename Label1=Regressors;
run;

/*add controls for? lines*/
data stfe;
        Regressors = "State and year fixed effects?";
        Model1 = "Yes";
        Model2 = "Yes";
        output;
run;

data controls;
        Regressors = "Controls?";
        Model1 = "Yes";
        Model2 = "No";
        output;
run;

/*add rows for other statistics to the table*/
data Table_Wide_Sorted_withStat;
        set Table_Wide_Sorted stfe controls OtherStat;
run;

/* create new name for variables in the regression results table through defining a new format*/
proc format;
        value $VariableName(default=50);
run;

/* Print the clean results table */
ods excel file="/home/u62974615/MySAS/Honor Project (HP)/LABFORCEResults.xlsx"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS
folder */
Title "Women's Labor Force Impacts, 1860-1870";
footnote1 justify=left "Source: Data provided by [...]";
footnote2 justify=left "Notes: Robust standard errors are in parentheses. *, **, and *** represent
10%, 5%, and 1% significance levels, respectively.";
proc print data=Table_Wide_Sorted_withStat noobs;

        var Regressors ;
        var Model1-Model2 / style(header)={Just=Center} style(data)={Just=Center
/*TAGATTR="type:string*/};
        format Regressors $VariableName.;

run;
```

```
ods excel close;

/*Hannah Kelly Honors Project OCC Regressions*/

/*import laws and when they are active or not*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/Law Passage by State and
Year.xlsx"
        out=work.lawpass
        dbms=xlsx
        replace;
sheet="PassagebyState";
getnames=yes;
run;

proc sort data=work.lawpass;
        by Year statefip;
run;

data lawpass2;
        set lawpass;
        if Year="1850" then delete;
run;

/*import state level data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/State Level Female.xlsx"
        out=work.occaggf
        dbms=xlsx
        replace;
sheet="OCC";
getnames=yes;
run;

proc sort data=work.occaggf;
        by Year statefip;
run;

data occaggf2;
        set occaggf;
        if Year="1850" then delete;
        agoccs=sum(OCC1,OCC2,OCC3,OCC4,OCC5,OCC6,OCC7,OCC8,OCC9,OCC10,OCC
11,OCC12);
        prefoccs=sum(OCC13,OCC14,OCC15,OCC16,OCC17,OCC18,OCC19,OCC20,OCC21,
OCC22,OCC23,OCC24,OCC25,OCC26,OCC27,OCC28,OCC29,OCC30,OCC31,OCC32,OCC3
3,OCC34,OCC35,OCC36,OCC37,OCC38,OCC39,OCC40,OCC41,OCC42,OCC43,OCC44,OC
C45,OCC46,OCC47,OCC48,OCC49,OCC50,OCC51,OCC52,OCC53,OCC54,OCC55,OCC56,
OCC57,OCC58);
```

tradeoccs=sum(OCC59,OCC60,OCC61,OCC62,OCC63,OCC64,OCC65,OCC66,OCC67,OCC68,OCC69,OCC70,OCC71,OCC72,OCC73,OCC74,OCC75,OCC76,OCC77,OCC78,OCC79,OCC80,OCC81,OCC82,OCC83,OCC84,OCC85,OCC86,OCC87,OCC88,OCC89,OCC90,OCC91,OCC92,OCC93,OCC94,OCC95,OCC96,OCC97,OCC98,OCC99,OCC100,OCC101,OCC102,OCC103,OCC104,OCC105,OCC106,OCC107,OCC108,OCC109,OCC110,OCC111,OCC112,OCC113,OCC114,OCC115,OCC116,OCC117,OCC118,OCC119,OCC120,OCC121,OCC122,OCC123,OCC124,OCC125,OCC126,OCC127,OCC128,OCC129);

manuoccs=sum(OCC130,OCC131,OCC132,OCC133,OCC134,OCC135,OCC136,OCC137,OCC138,OCC139,OCC140,OCC141,OCC142,OCC143,OCC144,OCC145,OCC146,OCC147,OCC148,OCC149,OCC150,OCC151,OCC152,OCC153,OCC154,OCC155,OCC156,OCC157,OCC158,OCC159,OCC160,OCC161,OCC162,OCC163,OCC164,OCC165,OCC166,OCC167,OCC168,OCC169,OCC170,OCC171,OCC172,OCC173,OCC174,OCC175,OCC176,OCC177,OCC178,OCC179,OCC180,OCC181,OCC182,OCC183,OCC184,OCC185,OCC186,OCC187,OCC188,OCC189,OCC190,OCC191,OCC192,OCC193,OCC194,OCC195,OCC196,OCC197,OCC198,OCC199,OCC200,OCC201,OCC202,OCC203,OCC204,OCC205,OCC206,OCC207,OCC208,OCC209,OCC210,OCC211,OCC212,OCC213,OCC214,OCC215,OCC216,OCC217,OCC218,OCC219,OCC220,OCC221,OCC222,OCC223,OCC224,OCC225,OCC226,OCC227,OCC228,OCC229,OCC230,OCC231,OCC232,OCC233,OCC234,OCC235,OCC236,OCC237,OCC238,OCC239,OCC240,OCC241,OCC242,OCC243,OCC244,OCC245,OCC246,OCC247,OCC248,OCC249,OCC250,OCC251,OCC252,OCC253,OCC254,OCC255,OCC256,OCC257,OCC258,OCC259,OCC260,OCC261,OCC262,OCC263,OCC264,OCC265,OCC266,OCC291);

unemployed=sum(OCC302,OCC303,OCC304,OCC305,OCC306,OCC307,OCC308,OCC309,OCC310);

employed=sum(OCC1,OCC2,OCC3,OCC4,OCC5,OCC6,OCC7,OCC8,OCC9,OCC10,OCC11,OCC12,OCC13,OCC14,OCC15,OCC16,OCC17,OCC18,OCC19,OCC20,OCC21,OCC22,OCC23,OCC24,OCC25,OCC26,OCC27,OCC28,OCC29,OCC30,OCC31,OCC32,OCC33,OCC34,OCC35,OCC36,OCC37,OCC38,OCC39,OCC40,OCC41,OCC42,OCC43,OCC44,OCC45,OCC46,OCC47,OCC48,OCC49,OCC50,OCC51,OCC52,OCC53,OCC54,OCC55,OCC56,OCC57,OCC58,OCC59,OCC60,OCC61,OCC62,OCC63,OCC64,OCC65,OCC66,OCC67,OCC68,OCC69,OCC70,OCC71,OCC72,OCC73,OCC74,OCC75,OCC76,OCC77,OCC78,OCC79,OCC80,OCC81,OCC82,OCC83,OCC84,OCC85,OCC86,OCC87,OCC88,OCC89,OCC90,OCC91,OCC92,OCC93,OCC94,OCC95,OCC96,OCC97,OCC98,OCC99,OCC100,OCC101,OCC102,OCC103,OCC104,OCC105,OCC106,OCC107,OCC108,OCC109,OCC110,OCC111,OCC112,OCC113,OCC114,OCC115,OCC116,OCC117,OCC118,OCC119,OCC120,OCC121,OCC122,OCC123,OCC124,OCC125,OCC126,OCC127,OCC128,OCC129,OCC130,OCC131,OCC132,OCC133,OCC134,OCC135,OCC136,OCC137,OCC138,OCC139,OCC140,OCC141,OCC142,OCC143,OCC144,OCC145,OCC146,OCC147,OCC148,OCC149,OCC150,OCC151,OCC152,OCC153,OCC154,OCC155,OCC156,OCC157,OCC158,OCC159,OCC160,OCC161,OCC162,OCC163,OCC164,OCC165,OCC166,OCC167,OCC168,OCC169,OCC170,OCC171,OCC172,OCC173,OCC174,OCC175,OCC176,OCC177,OCC178,OCC179,OCC180,OCC181,OCC182,OCC183,OCC184,OCC185,OCC186,OCC187,OCC188,OCC189,OCC190,OCC191,OCC192,OCC193,OCC194,OCC195,OCC196,OCC197,OCC198,OCC199,OCC200,OCC201,OCC202,OCC203,OCC204,OCC205,OCC206,OCC207,OCC208,OCC209,OCC210,OCC211,OCC212,OCC213,OCC214,OCC215,OCC216,OCC217,OCC218,OCC219,OCC220,OCC221,OCC222,OCC223,OCC224,OCC225,OCC226,OCC227,OCC228,OCC229,OCC230,OCC231,OCC232,OCC233,OCC234,OCC235,OCC236,OCC237,OCC238,OCC239,OCC240,OCC241,OCC242,OCC243,OCC244,OCC245,OC

```
C246,OCC247,OCC248,OCC249,OCC250,OCC251,OCC252,OCC253,OCC254,OCC255,OCC
256,OCC257,OCC258,OCC259,OCC260,OCC261,OCC262,OCC263,OCC264,OCC265,OCC2
66,OCC291);
run;

/*import control variable data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/aggregate
data/controls506070.xlsx"
        out=work.xcontrols
        dbms=xlsx
        replace;
sheet="xcontrols";
getnames=yes;
run;

data xcontrols2 (drop=statefipCharacter) ;
        set xcontrols (rename=(statefip=statefipCharacter));
    statefip=input(statefipCharacter,10.);
    if Year="1850" then delete;
run;

proc sort data=work.occaggf;
        by Year statefip;
run;

/*now to combine the two data pieces together via merge (m to 1) (m:1)*/
data lawsandoccaggfandcontrols;
        merge lawpass2 occaggf2 xcontrols2;
        by Year STATEFIP;
        drop state;
run;

/*proc means data=lawsandoccaggfandcontrols;
        class statefip;
        var majoroccs;
run;*/

/*MODELS START HERE*/
ods output ParameterEstimates=PEforModel1 DataSummary=ObsModel1
        FitStatistics=AdjRsqModel1 Effects=OverallSigModel1;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model1: model employed = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;
```

```
ods output ParameterEstimates=PEforModel2 DataSummary=ObsModel2
        FitStatistics=AdjRsqModel2 Effects=OverallSigModel2;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model2: model unemployed = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel3 DataSummary=ObsModel3
        FitStatistics=AdjRsqModel3 Effects=OverallSigModel3;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model3: model agoccs = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct
litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel4 DataSummary=ObsModel4
        FitStatistics=AdjRsqModel4 Effects=OverallSigModel4;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model4: model prefoccs = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel5 DataSummary=ObsModel5
        FitStatistics=AdjRsqModel5 Effects=OverallSigModel5;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model5: model tradeoccs = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;


ods output ParameterEstimates=PEforModel6 DataSummary=ObsModel6
        FitStatistics=AdjRsqModel6 Effects=OverallSigModel6;
proc surveyreg data=lawsandoccaggfandcontrols;
        class statefip Year / ref=first ;
        Model6: model manuoccs = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;




/*notes: state fixed effects: yes; year fixed effects: yes;*/

Data Table_Long;
```

length Model $10; /* Makes sure the variable Model has the right length and its values are not truncated */

length Parameter $30; /* Makes sure the variable Parameter has the right length and its values are not truncated */

set PEforModel1 PEforModel2 PEforModel3 PEforModel4 PEforModel5 PEforModel6 indsname=M; /*"indsname" creates an indicator variable (here I call it "M") that tracks the name of databases use in the "set" statement */

```
if      M="WORK.PEFORMODEL1" then Model="Model1";
        else if M="WORK.PEFORMODEL2" then Model="Model2";
        else if M="WORK.PEFORMODEL3" then Model="Model3";
        else if M="WORK.PEFORMODEL4" then Model="Model4";
        else if M="WORK.PEFORMODEL5" then Model="Model5";
        else if M="WORK.PEFORMODEL6" then Model="Model6";
```


```
        /* implement star method below*/
length Star $3; /*tells length of variable outputs*/
if Probt=. then Star="   "; /* need spaces between quotes because first introduction of
```
variable determines length*/
```
        else if Probt le 0.01 then Star="***";
        else if Probt le 0.05 then Star="**";
        else if Probt le 0.1 then Star="*";
        else Star=""; /*anything else is statistically insignificant*/
```
/*star system -> express level of significance -> 1% is ***, 5% is **, 10% is *, 0.1 < P-value fail to reject at conventional sig levels*/


```
        EditedResults=cats(Put(Estimate,comma16.7),Star);
        output;

        EditedResults=cats("(",put(StdErr,comma16.7),")");
        output;
```

run;

/* We sometimes need this sorting step when we have multiple regression models */
proc sort data=Table_Long out=Table_Long_Sorted;
        by Model Parameter;
run;
/* Step 2: Create separate results columns (in the form of separate databases) corresponding to each model */
data Model1Results(rename=(EditedResults=Model1)) /*putting this here means it only affects Model1Results*/
                Model2Results(rename=(EditedResults=Model2))
                Model3Results(rename=(EditedResults=Model3))

```
                    Model4Results(rename=(EditedResults=Model4))
                    Model5Results(rename=(EditedResults=Model5))
                    Model6Results(rename=(EditedResults=Model6));
        set Table_Long_Sorted;
        if Model="Model1" then output Model1Results;
                else if Model="Model2" then output Model2Results;
                else if Model="Model3" then output Model3Results;
                else if Model="Model4" then output Model4Results;
                else if Model="Model5" then output Model5Results;
                else if Model="Model6" then output Model6Results;
        drop Model;
        keep Parameter EditedResults; /*putting this keep here affects the current and all
following databases*/
run;


/* Step 3: Create the final results table that would include all models side-by-side*/
data Table_Wide;
        merge Model1Results Model2Results Model3Results Model4Results Model5Results
Model6Results ;
        by Parameter;

        if Parameter="MWPA" then Order=1;
                else if Parameter="EA" then Order=2;
                else if Parameter="ST" then Order=3;
                else if Parameter="whitepct" then Order=4;
                else if Parameter="slaverypct" then Order=5;
                else if Parameter="farmpct" then Order=6;
                else if Parameter="urbanpct" then Order=7;
                else if Parameter="schoolpct" then Order=8;
                else if Parameter="litpct" then Order=9;
                else if Parameter="disabilitypct" then Order=10;
        if mod(_n_,2)=1 then Regressors=Parameter;
run;


/* Order the variables in the results table */
proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
        by Order;
run;


/*Step 4: Create rows for other statistics*/
/*The row for the number of observations*/
data NumofObs;
        merge ObsModel1(rename=(Nvalue1=NVModel1) drop=CValue1)
                ObsModel2(rename=(Nvalue1=NVModel2) drop=CValue1)
                ObsModel3(rename=(Nvalue1=NVModel3) drop=CValue1)
                ObsModel4(rename=(Nvalue1=NVModel4) drop=CValue1)
```

```
                    ObsModel5(rename=(Nvalue1=NVModel5) drop=CValue1)
                    ObsModel6(rename=(Nvalue1=NVModel6) drop=CValue1);
           where Label1="Number of Observations";
           Model1=put(NVModel1, comma16.7);
           Model2=put(NVModel2, comma16.7);
           Model3=put(NVModel3, comma16.7);
           Model4=put(NVModel4, comma16.7);
           Model5=put(NVModel5, comma16.7);
           Model6=put(NVModel6, comma16.7);


           keep Label1 Model1 Model2 Model3 Model4 Model5 Model6  ;
run;
/*The row for adj r sq*/
data AdjRsq;
           merge AdjRsqModel1(rename=(Cvalue1=Model1) drop=NValue1)
                    AdjRsqModel2(rename=(Cvalue1=Model2) drop=NValue1)
                    AdjRsqModel3(rename=(Cvalue1=Model3) drop=NValue1)
                    AdjRsqModel4(rename=(Cvalue1=Model4) drop=NValue1)
                    AdjRsqModel5(rename=(Cvalue1=Model5) drop=NValue1)
                    AdjRsqModel6(rename=(Cvalue1=Model6) drop=NValue1);
           where Label1="Adjusted R-Square";
run;
/*The row for overall significance model*/
data OSM1(rename=(EditedValue=Model1)) OSM2(rename=(EditedValue=Model2))
OSM3(rename=(EditedValue=Model3))
OSM4(rename=(EditedValue=Model4)) OSM5(rename=(EditedValue=Model5))
OSM6(rename=(EditedValue=Model6))
;
           set OverallSigModel1-OverallSigModel6 indsname=M;

           where Effect="Model";

           if ProbF=. then Star="   ";
                    else if ProbF le 0.01 then Star="***";
                    else if ProbF le 0.05 then Star="**";
                    else if ProbF le 0.1 then Star="*";
                    else Star="";

           ThisIsM=M;

           Label1="Overall Significance";
           EditedValue=cats(put(FValue,comma16.2),Star);

           if M="WORK.OVERALLSIGMODEL1" then output OSM1;
           else if M="WORK.OVERALLSIGMODEL2" then output OSM2;
```

```
            else if M="WORK.OVERALLSIGMODEL3" then output OSM3;
            else if M="WORK.OVERALLSIGMODEL4" then output OSM4;
            else if M="WORK.OVERALLSIGMODEL5" then output OSM5;
            else if M="WORK.OVERALLSIGMODEL6" then output OSM6;

            keep Label1 EditedValue; /*Label1 is first because it determines print order*/
run;

data OverallSig;
        merge OSM1-OSM6;
        by Label1;
run;

/*combine all rows for other statistics*/
data OtherStat;
        set NumofObs AdjRsq OverallSig;
        rename Label1=Regressors;
run;

/*add controls for? lines*/
/*data controls;
        Regressors = "State and year fixed effects?";
        Model1 = "Yes";
        Model2 = "Yes";
        Model3 = "Yes";
        output;

run;*/

/*add rows for other statistics to the table*/
data Table_Wide_Sorted_withStat;
        set Table_Wide_Sorted xcontrols2 OtherStat;
run;

/* create new name for variables in the regression results table through defining a new format*/
proc format;
        value $VariableName(default=50);
run;

/* Print the clean results table */
ods excel file="/home/u62974615/MySAS/Honor Project (HP)/OCCResults.xlsx"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS
folder */
Title "Women's Occupational Impacts, 1860-1870";
footnote1 justify=left "Source: Data provided by [...]";
```

footnote2 justify=left "Notes: Robust standard errors are in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively.";
proc print data=Table_Wide_Sorted_withStat noobs;

        var Regressors ;
        var Model1-Model6 / style(header)={Just=Center} style(data)={Just=Center
/*TAGATTR="type:string*/};
        format Regressors $VariableName.;

run;
ods excel close;

/*Hannah Kelly Honors Project REALPROP Regressions*/

/*import laws and when they are active or not*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/Law Passage by State and Year.xlsx"
        out=work.lawpass
        dbms=xlsx
        replace;
sheet="PassagebyState";
getnames=yes;
run;

proc sort data=work.lawpass;
        by Year statefip;
run;

/*import state level data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/State Level Female.xlsx"
        out=work.realpropaggF
        dbms=xlsx
        replace;
sheet="REALPROPCPIADJ";
getnames=yes;
run;

proc sort data=work.realpropaggF;
        by Year statefip;
run;

/*import control variable data*/
proc import datafile="/home/u62974615/MySAS/Honor Project (HP)/aggregate data/controls506070.xlsx"
        out=work.xcontrols
        dbms=xlsx

```
        replace;
sheet="xcontrols";
getnames=yes;
run;

data xcontrols2 (drop=statefipCharacter) ;
        set xcontrols (rename=(statefip=statefipCharacter));
    statefip=input(statefipCharacter,10.);
run;

proc sort data=work.realpropaggF;
        by Year statefip;
run;

/*now to combine the two data pieces together via merge (m to 1) (m:1)*/
data lawsandrealpropandcontrols;
        merge lawpass realpropaggF xcontrols2;
        by Year statefip;
        drop state;
        logRealProp2023 = log(RealProp2023);
run;

proc means data=lawsandrealpropandcontrols;
        class statefip;
        var RealProp2023;
run;

ods output ParameterEstimates=PEforModel1 DataSummary=ObsModel1
        FitStatistics=AdjRsqModel1 Effects=OverallSigModel1;
proc surveyreg data=lawsandrealpropandcontrols;
        class statefip Year / ref=first ;
        Model1: model RealProp2023 = MWPA EA ST whitepct slaverypct farmpct urbanpct
schoolpct litpct disabilitypct /solution adjrsq;
run;

ods output ParameterEstimates=PEforModel2 DataSummary=ObsModel2
        FitStatistics=AdjRsqModel2 Effects=OverallSigModel2;
proc surveyreg data=lawsandrealpropandcontrols;
        class statefip Year / ref=first ;
        Model2: model RealProp2023 = MWPA EA ST /solution adjrsq;
run;

/*ods output ParameterEstimates=PEforModel3 DataSummary=ObsModel3
        FitStatistics=AdjRsqModel3 Effects=OverallSigModel3;
proc surveyreg data=lawsandrealpropandcontrols;
        class statefip Year / ref=first ;
```

Model3: model logRealProp2023 = MWPA EA ST whitepct slaverypct farmpct urbanpct schoolpct litpct disabilitypct /solution adjrsq;
run;*/

/*notes: state fixed effects: yes; year fixed effects: yes;*/

```
Data Table_Long;
        length Model $10; /* Makes sure the variable Model has the right length and its values
are not truncated */
        length Parameter $30; /* Makes sure the variable Parameter has the right length and its
values are not truncated */
        set PEforModel1 PEforModel2  indsname=M; /*"indsname" creates an indicator variable
(here I call it "M") that tracks the name of databases use in the "set" statement */
        if       M="WORK.PEFORMODEL1" then Model="Model1";
                 else if M="WORK.PEFORMODEL2" then Model="Model2";
                 /* implement star method below*/
        length Star $3; /*tells length of variable outputs*/
        if Probt=. then Star="   "; /* need spaces between quotes because first introduction of
variable determines length*/
                 else if Probt le 0.01 then Star="***";
                 else if Probt le 0.05 then Star="**";
                 else if Probt le 0.1 then Star="*";
                 else Star=""; /*anything else is statistically insignificant*/
        /*star system -> express level of significance -> 1% is ***, 5% is **, 10% is *, 0.1 < P-
value fail to reject at conventional sig levels*/
        EditedResults=cats(Put(Estimate,comma16.2),Star);
        output;
        EditedResults=cats("(",put(StdErr,comma16.2),")");
        output;

run;

/* We sometimes need this sorting step when we have multiple regression models */
proc sort data=Table_Long out=Table_Long_Sorted;
        by Model Parameter;
run;

/* Step 2: Create separate results columns (in the form of separate databases) corresponding to
each model */
```

```
data Model1Results(rename=(EditedResults=Model1)) /*putting this here means it only affects
Model1Results*/
            Model2Results(rename=(EditedResults=Model2));

    set Table_Long_Sorted;

    if Model="Model1" then output Model1Results;
        else if Model="Model2" then output Model2Results;

    drop Model;
    keep Parameter EditedResults; /*putting this keep here affects the current and all
following databases*/
run;


/* Step 3: Create the final results table that would include all models side-by-side*/
data Table_Wide;
    merge Model1Results Model2Results;
    by Parameter;
    if Parameter="MWPA" then Order=1;
        else if Parameter="EA" then Order=2;
        else if Parameter="ST" then Order=3;
        else if Parameter="whitepct" then Order=4;
        else if Parameter="slaverypct" then Order=5;
        else if Parameter="farmpct" then Order=6;
        else if Parameter="urbanpct" then Order=7;
        else if Parameter="schoolpct" then Order=8;
        else if Parameter="litpct" then Order=9;
        else if Parameter="disabilitypct" then Order=10;
        else if Parameter="Intercept" then Order=11;
    if mod(_n_,2)=1 then Regressors=Parameter;

/*      where substr(Parameter,1,6) ne "State "
    and substr(Parameter,1,3) ne "YM "
    and  substr(Parameter,1,9) ne "statefips";*/
run;

/* Order the variables in the results table */
proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
    by Order;
run;

/*Step 4: Create rows for other statistics*/
/*The row for the number of observations*/
data NumofObs;
    merge ObsModel1(rename=(Nvalue1=NVModel1) drop=CValue1)
```

```
                ObsModel2(rename=(Nvalue1=NVModel2) drop=CValue1);
        where Label1="Number of Observations";
        Model1=put(NVModel1, comma16.2);
        Model2=put(NVModel2, comma16.2);

        keep Label1 Model1 Model2;
run;
/*The row for adj r sq*/
data AdjRsq;
        merge AdjRsqModel1(rename=(Cvalue1=Model1) drop=NValue1)
                AdjRsqModel2(rename=(Cvalue1=Model2) drop=NValue1);
        where Label1="Adjusted R-Square";
run;
/*The row for overall significance model*/
data OSM1(rename=(EditedValue=Model1)) OSM2(rename=(EditedValue=Model2));
        set OverallSigModel1 OverallSigModel2 indsname=M;
        where Effect="Model";
        if ProbF=. then Star="   ";
                else if ProbF le 0.01 then Star="***";
                else if ProbF le 0.05 then Star="**";
                else if ProbF le 0.1 then Star="*";
                else Star="";
        ThisIsM=M;
        Label1="Overall Significance";
        EditedValue=cats(put(FValue,comma16.2),Star);
        if M="WORK.OVERALLSIGMODEL1" then output OSM1;
        else if M="WORK.OVERALLSIGMODEL2" then output OSM2;
        keep Label1 EditedValue; /*Label1 is first because it determines print order*/
run;

data OverallSig;
        merge OSM1 OSM2;
        by Label1;
run;

/*combine all rows for other statistics*/
data OtherStat;
        set NumofObs AdjRsq OverallSig;
        rename Label1=Regressors;
run;

/*add controls for? lines*/
data stfe;
        Regressors = "State and year fixed effects?";
        Model1 = "Yes";
        Model2 = "Yes";
```

```
            output;
run;

data controls;
        Regressors = "Controls?";
        Model1 = "Yes";
        Model2 = "No";
        output;
run;

/*add rows for other statistics to the table*/
data Table_Wide_Sorted_withStat;
        set Table_Wide_Sorted controls stfe OtherStat;
run;



/* create new name for variables in the regression results table through defining a new format*/
proc format;
        value $VariableName(default=50);
run;

/* Print the clean results table */
ods excel file="/home/u62974615/MySAS/Honor Project (HP)/RealPropResults.xlsx"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS
folder */
Title "Women's Real Property Impacts, 1850-1870";
footnote1 justify=left "Source: Data provided by [...]";
footnote2 justify=left "Notes: Robust standard errors are in parentheses. *, **, and *** represent
10%, 5%, and 1% significance levels, respectively.";
proc print data=Table_Wide_Sorted_withStat noobs;
        var Regressors ;
        var Model1-Model2 / style(header)={Just=Center} style(data)={Just=Center
/*TAGATTR="type:string*/};
        format Regressors $VariableName.;
run;
ods excel close;
```