## THE EFFECT(S) OF EXPANDING WOMEN'S RIGHTS

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Abstract In this paper we study the effects of the expansion of women's rights by examining the impact of the married women's property and earnings acts on female investments in human capital. We develop a model that shows that as married women gain the right to their earnings and to own and control property, the incentive to invest in women's and girls' human capital will rise. This will be observed in increases in the rates of female literacy and schooling, and in the number of years which females attend school. We posit that a state's passage of a married women's property act will lead to an increase in women's (girls') school attendance, with ambiguous immediate effects on labor force participation. We use state level Census data on school attendance to test for these effects, focusing on the period from 1850 to 1920. Our preliminary analysis indicates that state expansions of women's rights lead to higher rates of school attendance by girls. Future analysis will examine the effect on literacy and other choices made by women.

### THE EFFECT(S) OF EXPANDING WOMEN'S RIGHTS

#### I. INTRODUCTION

Throughout history wives have effectively been their husband's property. Only in the past two centuries has this institution broken down in the world's most developed regions. In America and England, the doctrine of coverture (under which a married woman lived under her husband's legal "cover") restricted women's choices in virtually every aspect of their lives until the beginning of the 20<sup>th</sup> century. A married woman -- a *femme covert* -- could not make contracts, buy and sell property, sue or be sued, or draft wills.<sup>1</sup>

Between 1848 and 1920 a series of acts at the state level – called married women's property acts and earnings acts – largely eliminated coverture in the United States. Married women's property acts granted women the right to own and control their real and personal property in their own names. Earnings acts granted married women the right to own their earnings from work outside the home. These acts represent a critical change in married women's property law in the United States.

Legal scholars have examined these acts in detail, typically focusing on the meaning and interpretation of a particular state act.<sup>2</sup> Economists have examined the fundamental forces driving in the passage of these acts.<sup>3</sup> In a 2002 article, Geddes and Lueck use a property rights framework to explain this important change in social institutions. They characterize the decline of coverture as a shift from a regime in which men controlled women and owned their output to a regime in which women own themselves and their output and freely contract with others. They argue that as markets expand the gains from human capital investment will increase, thus increasing the gains

<sup>&</sup>lt;sup>1</sup> The political rights of all women were also virtually nil at this time.

<sup>&</sup>lt;sup>2</sup> See, e.g. Norma Basch, In the Eyes of the Law: Women, Marriage, and Property in Nineteenth-Century New York (Ithaca: Cornell University Press) 1982.

<sup>&</sup>lt;sup>3</sup> See Rick Geddes and Dean Lueck, "The Gains from Self-Ownership and the Expansion of Women's Rights," *American Economic Review* 92:4 (September 2002) 1079-92.

from self-ownership. Using state level data from U.S. Census of 1850 to 1920, they provide evidence that women's rights expand when the gains from human capital are high, providing support for their hypothesis.

There has been relatively little systematic investigation of the effect of passage of these important acts on the choices made by women. The work to date has focused on women's labor force participation, and has found little immediate effect of the laws' passage.<sup>4</sup> However, the incentive effects of lack of self-ownership will operate on work effort, productivity and productivity enhancing investments and not just on entry into work. If women do not have ownership rights to their property and earnings, they are less likely to expend the time and effort necessary to develop and utilize their human capital. As Joel Bishop famously remarked at the time, "..the common law of married women, [which] in so far as it is practically carried out, tends to make wives lazy. Why should they exert themselves when no fruits of their labor are their own?"<sup>5</sup>

In this paper we study the effects of the expansion of women's rights by examining the impact of the married women's property acts on female literacy and schooling, both investments in human capital. We develop a model that shows that as married women gain the right to their earnings and to own and control property, the incentive to invest in women's and girls' human capital will rise. This will be observed in increases in the rates of female literacy and schooling, and in the number of years which females attend school. These increased investment incentives will produce ambiguous immediate effects on labor force participation. We use state level Census data on literacy and schooling to test for these effects, focusing on the period from 1850 to 1920.

<sup>4</sup> Evan Roberts, "Women's Rights and Women's Labor: Married Women's Property Laws and Labor Force Participation, 1860-1900," Paper presented at the Economic History Association annual meeting, Pittsburgh, PA, September, 2006. An earlier paper by Kahn (1996) found that the married women's property acts led to an increase in patenting activity by married women.

<sup>&</sup>lt;sup>5</sup> Joel P. Bishop, Commentaries on the Law of Married Women under the Statutes of the Several States, and at Common Law and in Equity, (Boston: Little, Brown and Company) 1875, p. 681.

#### **II. AN ECONOMIC MODEL OF WOMEN'S RIGHTS**

In this section, we use family economics and property rights economics in order to examine the incentive properties of two polar institutions: coverture and self-ownership. We model coverture in a principal-agent framework in which the husband "owns" the wife and owns the output of all household production.<sup>6</sup> The man not only chooses his own allocation of time, but also implicitly guides the woman's allocation of time. He is constrained in this endeavor by enforcement costs and by legal rules that require him to support his wife. We also examine the case in which a woman has the same rights as a man and is free to allocate her time across market and household activities, as well as to choose her own level of human capital investment. In a marriage under self-ownership, the man and woman freely contract and share the output of household activity and market activity for both men and women. Ultimately, we derive the total value of each regime in terms of indirect objective functions and develop the comparative statics of changes in the property rights of women.<sup>7</sup>

#### A. Property Rights and Household Production

To examine women's rights we use Becker's [1991] household production framework to examine the allocation of human resources within a marriage in which partners produce a composite marital good (z). We restrict our analysis to one-period models in order to focus the analysis on property rights incentives.<sup>8</sup> Similarly, we do not consider altruism, love, or other cases in which the utility of one family member affects that of another.

<sup>&</sup>lt;sup>6</sup> Bargaining theory can also explain a women's position because each party's threat point determines ownership of the household output [e.g., Lundberg and Pollak 1996]. Under coverture, a woman has virtually no options outside marriage so, assuming this "zero threat point" is known by the husband, she is unable to bargain for any fraction of the household output. By contrast, under equal rights (equal threat points for men and women) bargaining and competition will result in an equal division of the household product. Even here the allocation of property rights is crucial in determining the relevant threat points in a bargaining game. "Separate spheres" bargaining is yet another approach we do not consider.

<sup>&</sup>lt;sup>7</sup> There are other possible intermediate regimes we do not consider. For example, by 1900 women had access to some unskilled labor markets but still they could not vote and were still limited from most professions.

<sup>&</sup>lt;sup>8</sup> Others (e.g., Becker 1991, Posner 1992] have recognized long term incentives in a marriage contract.

To begin, let  $z = Z(t_h) + \varepsilon$  where  $t_h$  is household labor time, and Z > 0, Z'' < 0, and  $\varepsilon$  is a random error term with zero mean and constant variance.<sup>9</sup> Uncertainty in the production of z implies that the level of input cannot be inferred by simply observing z, so that moral hazard is present for input suppliers (i.e., husbands and wives). To focus on incentives rather than risk avoidance, we assume that all parties are risk-neutral. This implies that all parties maximize expected utility and, therefore, in the equations that follow the expectations operator is implicit and the  $\varepsilon$  term is suppressed.

In the production of Z each man and woman has two possible uses of his or her time -household labor (h) and market labor (m) which includes human capital investment -- so that the total time constraints for men (M) and women (W), respectively, are  $t^{M} = t_{h}^{M} + t_{m}^{M}$  and  $t^{W} = t_{h}^{W} + t_{m}^{W}$ . Similarly, the total amount of household time is the sum of man's and woman's individual times, so that  $t_{h} = t_{h}^{M} + t_{h}^{W}$ . The total hours of market labor are *not* summed across men and women because they are not allocated to the same activities.

In the market, men and women can earn income (I) from a combination of salary and property income ( $\nu$ ). Each person's salary is  $w'Q'(t_m^i)$ , i = M, W where w' is the hourly market wage and Q' is the individual's labor market production function where Q' is increasing and concave in hours worked.<sup>10</sup> Since  $\nu = rk$ , where r is the rate of interest and k is a fixed stock of household capital (e.g., house and land) the complete market income constraint for each person can now be written as  $I = wQ(t_m) + rk$ .

In general, each person's utility is U = U(C, Z) where C is market good consumption for each person and Z is a composite household or marital good. To simplify and to allow us to consider joint utility maximization problems under different property rights systems we assume

<sup>&</sup>lt;sup>9</sup> We assume that market goods ("x") used in the production of Z are fixed; altering this assumption\_does not generate insights useful for our analysis. See Mokyr [1998] on the changing role of market inputs in household production.
<sup>10</sup> This formulation of market production has diminishing returns to market work. It is straightforward to incorporate human capital investment.

individual utility is the sum of the dollar value of market consumption and household production, so that  $U = C + Z(t_h)$  where Z is the dollar value of the household output and C is the net (consumption) dollar income available. We assume that both men and women separately own their final market goods  $C^M$  and  $C^W$  such as clothes and other personal items. The ability to purchase market goods, however, will depend on one's right to earn a market wage and to participate in the goods market. To generate the specific utility functions for a man and woman in a marriage, we distinguish between male and female household labor time and productivity. Like Becker [1991] we let  $\beta \in (1, \infty)$  be a parameter that distinguishes male and female household productivity.<sup>11</sup> We also denote  $\alpha$  as the share of Z owned by the women (depending on her property rights), so that

(1a) 
$$U^{M} = C^{M} + (1 - \alpha)Z(t_{h}^{M} + \beta t_{h}^{W})$$
; an

(1b)

$$U^{W} = C^{W} + \alpha(t_{h}^{M} + \beta t_{h}^{W}).$$

In any particular situation, a woman's right to participate in labor and goods markets will depend on her legal rights and customary rights.

#### **B.** Marriage Under Coverture

First, because labor (including human capital investment) and goods markets were closed to married women, we assume that  $w^{\mu} = 0$  and  $C^{\mu} = 0$ .<sup>12</sup> The assumption that  $C^{\mu} = 0$  does not mean that the woman's actual consumption is zero (since the husband must provide for her under coverture) but that she has no property rights to market goods. Second, the husband owned all of the household output, chose his own consumption, production, and investment, guided the labor allocation of his wife, and was the sole residual claimant to the marital product. Thus, we assume  $\alpha = 0$  under coverture but that  $\alpha = 0.5$  under self-ownership.

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<sup>&</sup>lt;sup>11</sup> It is reasonable that  $\beta \ge 1$  because females have obvious biological advantages in child-rearing which dominate traditional household work.

<sup>&</sup>lt;sup>12</sup> In principle, markets could be open to women and the husband could simply direct her activities in market work, goods purchase, and human capital investment. In practice, these activities are likely to be more costly for the husband to monitor than time spent at home production. And, in fact, coverture was associated with closed markets for women.

As noted above, under coverture the husband was required to support his wife. Accordingly, we let S be the expected present annuity or one-period value of the married women's "support rights." This support is "paid" out in-kind (this includes food, clothes, shelter, and protection, especially important during pregnancy and nursing) during the husband's life but after his death she gets S explicitly in cash via dower. Let  $\delta \in (0,1)$  be the exogenous share of capital the wife receives under a system that requires support and dower, so that  $\delta k$  is the present value of the wife's share of the assets generating support and  $S = r \delta k$  where r is the appropriate discount rate. Even though the property rights defined by coverture severely limit the wife's choices, she is able to shirk her household duties by allocating some of her time into "leisure" (1) which generates utility h(l), where h' > 0 and h'' < 0. Because monitoring is costly, the husband cannot eliminate shirking (i.e., make l = 0). This means the time constraint becomes  $l = t^{W} - t_{h}^{W} - t_{m}^{W}$ . The husband's wealth is thus diminished by this activity because it directly reduces the wife's household effort and because it reduces the effective stock of capital k = $\overline{k}(1-k(l))$ , where  $\overline{k}$  is initial household capital stock, k' > 0 and  $k'' < 0^{13}$  Together, these features define property rights for men and women under coverture, determine their respective consumption patterns, and imply that their utility functions become:

(2a) 
$$U^{M} = C^{M} + Z(t_{h}^{M} + \beta t_{h}^{W}) - S$$
; and

(2b)

 $U^{W} = S + h(l).$ 

We characterize the husband-wife relationship under coverture as one of principal-agent. The husband is the residual claimant directing the wife who receives a "salary" of S. A woman could, however, remain a single "spinster" living with her parents or relatives but she would face laws, norms, and private restrictions that severely limited her actions outside the home. A spinster could earn some minimal level of income ( $\Omega^{S}$ ) each period by working for her parents or

<sup>13</sup> Our model gives women some *de facto* rights by linking her wealth to household capital.

from a small set of market opportunities. In a competitive equilibrium a married woman under coverture must earn at least this amount each period, so even though  $C^{W} = 0$ , the wife can pick l and she must receive  $S + h(l) \ge \Omega^{S}$  to remain in the marriage. The support constraint acts to curtail her shirking into leisure because it reduces the amount of household capital that provides her support.<sup>14</sup> Because the husband does not choose contract terms, but simply takes coverture as given, our simplest model is slightly different from a standard principal-agent model.

We model the marriage under coverture in two stages. In the first stage, the husband maximizes his utility by choosing his own time allocation, subject to the time allocation chosen by his wife. In the second stage, the wife maximizes her utility by allocating her time between household work and leisure, subject to the rights within the marital regime. Using backward induction we solve the second stage first. After making substitutions for S, k, and l in (2a) the maximization problem for the wife under coverture is:

(3) 
$$\max_{t_{h}^{W}} U^{W} = r \delta[\tilde{k}(1 - k(t^{W} - t_{h}^{W}))] + h(t^{W} - t_{h}^{W}).$$

The solution to this problem is an optimal level of household effort for the wife given by  $t_h^{W} = t^{WC}(r, \delta, \bar{k})$ , where superscript "WC" indicates the woman's optimal time allocation in the coverture regime.<sup>15</sup> Three comparative statics predictions result (see appendix). First, the wife's household effort increases as interest rates (r) increase. Second, the wife's effort increases as her support-dower share ( $\delta$ ) increases. Third, the wife's effort increases as the household's initial wealth ( $\bar{k}$ ) increases. Together these three predictions state that as the value of women's share of household wealth increases she will allocate less time to leisure. It is also easy to generate the prediction that the wife's effort decreases as her marginal utility of leisure (h'(l)) increases.

<sup>&</sup>lt;sup>14</sup> An appropriate analogy is a child, who consumes resources chosen by a parent but has no residual claim and has rights only if parental enforcement is imperfect. The marriage decision problem for a women is:  $max U = max[\Omega^{S}, S+h(l)]$ .

<sup>&</sup>lt;sup>15</sup>-This solution completely rules out market work by the *femme covert* contrary to actual practice. The model can easily be adjusted to accommodate some market work by, for example, including a small but positive market wage for the wife. Such complications, however, are not useful for our questions.

The husband's problem is to maximize his utility, subject to the incentive compatibility and individual rationality constraints of the wife. The husband's utility is the sum of his market goods consumption and the entire value of household production less the support "stipend" paid to his wife. Assuming he has no explicit costs of enforcing the arrangement, his maximization problem becomes:

subject to

 $\max_{t^M} U^M = C^M + Z(t^M_h + \beta t^W_h) - S$ (i)  $C^{M} = w^{M} Q^{M}(t_{m}^{M}) + r[\bar{k}(1-k(t^{W}-t^{WC})]];$ (i)  $t^{M} = t_{h}^{M} + t_{m}^{M}$ ; (ii)  $t_{h}^{W} = t^{WC}(r, \delta, \overline{k}) = \arg \max U^{W}$ ; and (iv)  $S + h(l) = \Omega^{S}$ .

The first constraint is the husband's full income equation. The second is the husband's time constraint. The third is the wife's incentive compatibility constraint. The fourth constraint (individual rationality using an equality) defines the women's income alternative as a spinster. After substituting in the constraints, the husband's objective function can be written in terms of his allocation of household effort  $(t_h^M)$  or:

(5) 
$$\max_{t_h^M} U^M = w^M Q^M (t^M - t_h^M) + r(1 - \delta) [\overline{k} (1 - k(l^C))] + Z(t_h^M + t_h^{WC})$$

The solution to this model implies an optimal level of time allocation for the husband  $t_{h}^{MC}$  and (superscript "C" denotes the coverture regime), all of which depend on  $\phi = (\beta, t_h^{MC}, r, w^{W})$ .<sup>16</sup>

#### C.

#### **Expanding Rights: Marriage under Self-Ownership**

Under self-ownership women, like men, have access to goods markets, can invest in market human capital, and can earn income from the labor market (that is,  $w^{W} > 0$  for women's labor). Both inside and outside of marriage they own their final market goods  $(C^{M}, C^{W})$ . Within

<sup>&</sup>lt;sup>16</sup> It is possible to let  $\alpha$  and  $\delta$  (rights of the *feme covert*) be the husband's choices but this does not alter our conclusions.

a marriage, however, they each own one-half of the household product (Z) and one-half of the shared property income (v = rk).<sup>17</sup> This is captured by assuming that  $\alpha = \frac{1}{2}$ . In addition, women no longer have support-dower rights, so S = 0. Because the wife has access to labor markets and human capital investment, she no longer shirks into household leisure (l = 0). She can however, divert her effort away from the marital good and work in the market and purchase market goods. Accordingly, the capital stock cannot be degraded. The utility functions are now:

(6a) 
$$U^{M} = w^{M} Q^{M} (t_{m}^{M}) + (1/2) [rk + Z(t_{h}^{M} + \beta t_{h}^{W})]; \text{ and}$$
  
(6b) 
$$U^{W} = w^{W} Q^{W} (t_{m}^{W}) + (1/2) [rk + Z(t_{h}^{M} + \beta t_{h}^{W})].$$

Each partner in the marriage chooses his/her optimal allocation of time between market and household work given the terms of the share contract and the behavior of the other partner.<sup>18</sup> Since each partner owns just one-half of the household output, moral hazard ensues for both husband and wife, and the first-best levels of household effort cannot be attained. For example, the women's maximization problem becomes:

(7) 
$$\max_{t_{h}^{W}} U^{W} = w^{W} Q^{W} (t - t_{h}^{W}) + (1/2) [rk + Z(t_{h}^{M} + \beta t_{h}^{W})].$$

The husband's problem is identical except for the household productivity parameter ( $\beta$ ) attached to the woman's household work. The solution (for the woman) is given by the first-order identity:

(8) 
$$-w^{W} \frac{\partial Q}{\partial t_{m}^{W}}(t_{h}^{WS}(\Psi)) - \left(\frac{\beta}{2}\right) \frac{\partial Z}{\partial t_{h}^{W}}(t_{h}^{WS}(\Psi)) \equiv 0.$$

<sup>&</sup>lt;sup>17</sup> Allen [1992] shows that this is the optimal division of household output in a competitive marriage market. See also Becker [1991, p.32] on equal sharing.

<sup>&</sup>lt;sup>18</sup> We could assume equal sharing  $(\alpha = \frac{1}{2})$  of market income  $(w^M Q^M + w^W Q^W)$  as well the marital good (Z) and thus generate an outcome close to first-best, depending on the size of  $\beta$ . Also, the determination of  $\alpha$  could be solved in bargaining framework. For example, the Nash bargaining solution when  $\beta = 1$  is generates first-best equal sharing ( $\alpha^* = \frac{1}{2}$ ) of both market income and the marital good. However, since our approach allows explicit examination of the value of contracts, we find it more appropriate for study of alternative property rights regimes. Moreover, neither of these considerations alters our key predictions.

Equation (8) states that optimal time allocation occurs when the value of the foregone market returns equals one-half of the household marginal product. This solution implies an optimal (second-best) level of time allocation for each partner, given by  $t_h^{MS}$  and  $t_m^{MS}$  (for the man) and  $t_h^{WS}$  and  $t_m^{MS}$  (for the woman) where the superscript "S" denotes the self-ownership regime. The husband's solution is identical when  $\beta = 1$ . These optimal choices all depend on a vector of parameters,  $\psi = (\beta, \overline{k}, r, w^M, w^W)$  and the assumption that the value of marriage for each partner exceeds the value of remaining single.

Several implications of this solution are notable. First, the woman under coverture has no incentive to invest in market-based human capital (i.e., work in the market), while the husband's incentives are strong. On the other hand, in a marriage under self-ownership each person has full ownership of their personal consumption but only one-half ownership of the marital production, so the incentives for household production are weaker. Compared to the first-best time allocation, each partner spends too much time at market work and too little time at household work. As long as  $\beta > 1$ , the woman, even under self-ownership, will work more in the house relative to the man. Moreover, as  $\beta$  increases (decreases) the deadweight loss associated with household shirking into market work increases (decreases). Second, under self-ownership, decreases in  $\beta$  cause the woman to work less in the home and more in the market.

As the Coase Theorem implies, the value of a marital relationship would not depend on the allocation of rights between the husband and wife if property rights were costless to enforce. If this were true, both coverture and self-ownership would generate the identical first-best allocation of time among household and market activities (see appendix). Under coverture, the husband would be able to perfectly enforce his rights to capital, thus eliminating shirking by the *femme covert* (l = 0). He also would be able to direct his wife in the labor market and enforce his claim on all her labor earnings. Similarly, in a share contract under self-ownership, neither the husband nor the wife would be able to shirk their household duties. They would face their full

marginal product of household effort and thus optimally allocate time between market and household work. Ownership of humans cannot be enforced without cost, so alterations in ownership regimes will have allocative effects as well as effects on the total value generated from a marriage.<sup>19</sup>

#### III. EMPIRICAL ANALYSIS

The models of coverture and self-ownership imply that investment in women's human capital will be greater under self-ownership compared to coverture. Investment can be measured in several ways including rates of schooling and literacy among females. By coupling data on such measures of female human capital with data on the women's property regimes in a state we can test this prediction.

We focus on two statutory modifications to the law of coverture which granted married women the right to own and control separate estates and the right to control labor market earnings. Both of these statutory changes increased married women's rights by (partially) abolishing coverture as legal scholars, historians, and economists have noted.<sup>20</sup> In the eight states where community property law (as opposed to common law) holds, the husband and wife hold marital property in equal and undivided interests. Community property law, however, did not give women equal rights since husbands held exclusive control rights to "joint" property and wealth. Indeed, statutory changes through estate and earnings acts were needed to extend equal rights, in the economic sense, to married women.

We have compiled a state-level data set that includes information on whether or not a state granted married women rights to separate property and earnings in a particular year. We use the time period from 1850 to 1920 because this period saw the passage of married women's

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<sup>&</sup>lt;sup>19</sup> Scholars of the time recognized the deleterious effects of coverture on wives' incentives. For example, Bishop [1875, p. 681] states, "... the common law of married women, [which] in so far as it is practically carried out, tends to make wives lazy. Why should they exert themselves when no fruits of their labor are their own?"

 <sup>&</sup>lt;sup>20</sup>See, e.g. Richard C. Chused, "Married Women's Property Law: 1800-1850," *Georgetown Law Journal* 71 (1983): 437-67.

property acts and earnings acts in all but five states. Data on dates of passage of the earnings and estate acts in each state are summarized in Table 1. To provide evidence on the impact of the law changes, we combine these data with data on state characteristics taken from the U.S. Census for 1850-1920. Because the data are obtained from decennial census reports, the data are at the state by year level at ten year intervals.

We conduct simple regression analysis of the effect of the laws on investments in girls' human capital. Our primary measure of human capital investments is school attendance. The specific measure we can obtain from the Census for all years of our sample period is the percent of school-age females attending school in a state and year. To control for important unobservable determinants of school attendance, we compare female school attendance to that of males. The specific dependent variable in our models is the ratio of the percent of school-age females attending school to the percent of school-age males attending school.<sup>21</sup>

Control variables in the models include an indicator variable for whether the state has a compulsory schooling law in a given year, the state average real wealth per capita, the percent of the state population that is male, the percent that is black, and the percent living in urban areas. Because schooling and literacy rates for all segments of the population are trending upward over time, for each state we define a state-specific linear time trend variable (equal to a time trend in the state and equal to 0 in all other states) to control for this effect. State-specific linear time trends are included in all models, and imply that any effects of women's rights expansions are estimated as deviations from existing trends in school attendance. Summary statistics for the variables included in the models are reported in Table 2.

We estimate the effects of women's rights expansions by including an indicator variable of law passage in a state and year. Because passage of property and earnings acts were often highly

<sup>&</sup>lt;sup>21</sup> We formulate the dependent variable as a ratio because concerns about joint determination of male and female school attendance suggest that male school attendance rates may not be a valid right hand side variable. Nonetheless, estimation results are similar when the dependent variable is formulated as the female school attendance rate and male school attendance is included in the model as a control variable.

correlated within a state, we do not include the dates of passage of the acts separately in our models. We estimate models that include only the date of earnings act passage, and models that use the date by which the state had passed both a married women's property act and an earnings act (see Geddes and Leuck, 2002). We also construct a post-law time trend variable for each state, set equal to the number of years the policy has been in force in the state. We construct such a variable relative to the date of passage of an earnings act, and relative to the date of passage of both a property act and an earnings act. Including a post-law time trend in the model incorporates the fact that laws may take some time to affect observed schooling rates.

Because previous research indicates that the dates of passage of the acts are themselves affected by the demand for laws giving women more control over their human capital, the dates of passage are likely to be positively related to contemporaneous female schooling rates in a state. Yet, due to limited variables available in the historical Census files, finding appropriate instruments for passage of the laws is difficult. As an alternative we control for this potential endogeneity problem by using the state law(s) status in the census year previous to the analysis year. One'set of models posits that the current female-male schooling ratio depends on the previous census year value of the women's rights laws in the state. A second set of models assumes that *the change in* the female-male schooling ratio from one census year to the next is a function of the previous census year value of the laws.

Estimation results are reported in Table 3 and Table 4. In all model specifications, we find that the expansion of womens' rights through the passage of earnings acts and property acts significantly increases school attendance among school-age females (relative to attendance by school-age males). These results hold using various definitions of rights expansion, different specifications of the dates of law passage, and under varying assumptions about how the effects of the laws will manifest in schooling rates. Although preliminary, these results suggest that the change in womens' property rights had the effect on human capital investments that we hypothesize.

#### IV. SUMMARY AND CONCLUSION

This paper examines the effects of expanding women's rights on investment in female human capital. We focus on the 19<sup>th</sup> Century United States where individual states adopted laws that brokedown the Common Law doctrine of coverture and gave married women the right to own property and to contract. Using a panel of state level data from 1850 to 1920 we estimate the effect of these acts (which expand women's rights) on one measure of female human capital investment, school attendance. Our preliminary analysis indicates that states' expansions of women's rights increases school attendance among school-age girls, relative to that among school-age males. Future analysis will examine the effect on literacy and other choices made by women.

State	Property	Earnings	State	Property	Earnings
· ·	10.65	1007		1071	1071
AL	1867	1887	NE	1871	1871
AZ	1871	1973	NV	1873	1873
AR	1873	1873	NH	1860	1867
CA	1872	1872	NJ	1852	1874
CO	1868	1868	NM	1884	1920
CT	1877	1877	NY	1848	1860
DE	1873	1873	NC	1868	1873
FL	1943	1892	ND	1877	1877
GA	ד 1873	1873	OH	1861	1861
ID	1887	1915	OK	1910	1910
IL	1861	1869	OR	1878	1872
IN	1879	1879	PA	1848	1872
IA	1873	1870	RI	1848	1872
KS	1858	1858	SC	1868	1887
KY	1873	1873	SD	1877	1877
LA	1916	1980	TN	1919	1919
ME	1855	1857	TX	1913	1913
MD	1860	1842	UT	1895	1897
MA	1845	1846	VT	1881	1888
MI	1855	1911	VA	. 1878	1877 -
MN	1869	- 1869	WA	1889	1881
MS	1871	1871	*WV	1868	1893
МО	1875	1875	WI	1850	1872
MT	1887	1887	WY	1869	1869

Table 1Married Women's Property and Earnings ActsDates of Passage

# Table 2Summary StatisticsState Data 1850-1920

Variable	Observations	Mean	S.D.
Percent school-age females in school	. 358	56.4193	15.5689
Percent school-age males in school	358	57.6224	13.4143
Percent female literacy	360	85.3642	16.2518
Percent male literacy	. 360	87.7080	16.0722
Earnings Act	384	0.5547	0.4976
Property Act	384	0.6458	0.4789
Both Earnings and Property Act	384	0.5443	0.4987
Census years after Earnings Act	384	1.7266	1.9897
Census years after Both Acts	384	1.7135	1.9951
Real wealth per capita	356	917.0805	1260.7790
Percent male population	359	53.2863	6.0501
Percent black population	360	11.9947	17.6811
Percent urban population	360	26.9113	20.9403
Compulsory schooling law	384	0.4401	0.4970
Community property state	384	0.1667	0.3732

# Table 3Regression Estimates of Impact of Acts on Female School EnrollmentState Data 1850-1920

	Ear	Earnings Act			<b>Both Acts</b>			
	Model 1	Model 2	Model	3	Model 4			
Act(s) indicator	0.0331 *	***	0.05	10 ***				
	(3.08)		. (4.5	2)	,			
Years post Act(s) passage		0.0121	***		0.0162	***		
		(2.90)			(3.74)			
Compulsory schooling law	0.0240 *	* 0.0167	** 0.018	33 *	0.0095			
· .	(2.27)	(1.42)	(1.6	9)	(0.78)			
Real per capita wealth	0.0117 *	** 0.0099	** 0.012	21 ***	0.0096	**		
	(2.40)	(2.00)	(2.5)	3)	(1.97)			
Percent male population	0.0508	0.0463	0.043		0.0399			
· · · · · · · · · · · · · · · · · · ·	(0.67)	(0.60)	(0.57	7)	(0.53)			
Percent black population	0.0047	-0.0184	0.002	7	0.0238			
	(-0.13)	(-0.50)	(-0.08	3)	(-0.66)			
Percent urban population	0.0747	0.0775	* 0.050	3	0.0642			
	(1.58)	(1.63)	(1.07	")	(1.36)			
Intercept	0.8748 **	* 0.8884	*** 0.877	9 ***	0.8948	***		
	(19.72)	(19.82)	(20.13	)	(20.11)			
Adjusted R <sup>2</sup>	0.2737	0.2712	0.298	3	0.2841			
Number of Observations	352	352	. 35:	2	352			

Dependent variable is (Percent school-age females in school)/(Percent school-age males in school). All models include state-specific time trends. T-statistic appears in parentheses below the coefficient estimate. \*\*\* indicates significantly different from zero at the 1 percent confidence level; \*\* indicates significantly different from zero at the 5 percent confidence level; \* indicates significantly different from zero at the 10 percent confidence level; all are two-sided tests.

Lable 4						
Regression Estimates of Impact of Acts on Female School Enrollment						
<b>Controlling for Endogeneity of Passage</b>						
State Data 1850-1920						

	Earnings Act			Both Acts				
	Schooling Ratio		Change in Ratio		Schooling Ratio		Change in Ratio	
Lagged Act(s) indicator	0.0288	***	0.0372	***	0.0454	***	0.0627	***
	(3.42)		(3.30)		(5.08)		(5.21)	
Compulsory schooling law	0.0237	*	0.0188	.*	0.0165	**	0.01	
	(2.80)		(1.63)		(1.94)		(0.88)	·
Real per capita wealth	0.0051		0.0207	***	0.0052		0.0203	*** .
	(1.38)		(3.72)		(1.43)		(3.75)	
Percent male population	0.3502	***	0.3208	***	0.3447	***	0.3231	***
	(4.77)		(2.18)		(4.81)	•	(2.26)	. '
Percent black population	0.0578	*	-0.0109		0.0521		-0.0181	
	(1.75)		(-0.25)		(1.62)	·	(-0.42)	
Percent urban population	0,0888	**	0.0667		0.0664	*	0.0398	
	(2.34) ·		(1.23)		(1.77)		(0.75)	
Lagged female/male schooling			-1.3103	***			-1.3438	***
ratio			(-21.62)				(-22.60)	
Intercept	0.7296	***	1.0498	***	0.7353	***	1.0812	***
	(17.11)		(11.74)		(17.66)		(12.41)	
Adjusted R <sup>2</sup>	0.4460		0.6547		0.3809		0.6743	
Number of Observations	. 320 ,	. •	307		32Q		307	

Schooling ratio is (Percent school-age females in school)/(Percent school-age males in school). Growth in schooling ratio is the percentage change in the ratio from one census year to the next. All models include state-specific time trends. T-statistic appears in parentheses below the coefficient estimate. \*\*\* indicates significantly different from zero at the 1 percent confidence level; \*\* indicates significantly different from zero at the 5 percent confidence level; \* indicates significantly different from zero at the 10 percent confidence level; all are two-sided tests.

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