

The Impact of Local Labor Demand Shocks on Gender Attitudes

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Abstract

I examine the effects of labor market conditions on gender attitudes in the U.S. between 1977 and 2016. Existing research indicates that attitudes on gender roles can influence women and families in myriad ways. Therefore, a clear understanding of the factors that shape attitudes on gender roles is valuable. I estimate the effects of labor market conditions using Bartik shocks to obtain a measure of predicted labor demand. I document that a better labor market demand lowers adherence to traditional views on working of women outside of home. I find no evidence that a better labor demand affects views toward emotional suitability of women for politics. I also find suggestive evidence that the responsiveness of gender attitudes to the overall labor demand vary by gender and education. Furthermore, I estimate the sensitivity of the effects of labor demand on gender attitudes by measuring changes in attitudes of gender and education subgroups to changes to own group specific Bartik shocks. Notably, I find that the least educated men are more likely than other groups to adopt egalitarian gender views as their own labor market conditions improve.

Keywords: Gender attitudes, Labor market demand, Bartik shocks

JEL Classifications: J01, J16, J21, J22, J23, Z10

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1 Introduction

Over the past several decades, the civilian labor force participation of women in the United States has increased, while the labor force participation of men has declined. Gender attitudes toward the appropriate role of women in society have not correspondingly changed. In spite of the compositional change in the labor force, there is no change in the share of sex discrimination lawsuits filed with the U.S. Equal Employment Opportunity Commission (EEOC) as the shares have remained at a nontrivial rate of 30% between 1997-2017 fiscal years. Aside from discrimination, traditional views on gender roles have the potential to affect women and families in a multitude of ways, by changing women's optimal choices about schooling, work, occupation, and ages of marriage and childbearing and ultimately women's earnings and authority both in and out of home (Scott, 2004; Goldin, 2006; Buchmann, DiPrete, and McDaniel, 2008; Bertrand, Kamenica, and Pan, 2015; Charles, Guryan, and Pan, 2018).

I study how labor market conditions affect gender attitudes toward the appropriate role of women in society. I focus on understanding how state-level changes in employment and labor demand influence changes in gender attitudes. Understanding the impacts of labor market conditions on gender attitudes is particularly policy relevant, given the 2018 gender equality budget enactment in Canada that requires the Canadian government to promote gender equality in society or the G7 Advisory Council 2019 call on enacting and implementing progressive legislative frameworks that advance gender equality. Identifying changes in gender attitudes that are explained by changes in labor market conditions provides a reference point for evaluating the role of governments in shaping views about the appropriate role of women in society and for deciding if better employment opportunities and labor demand would help or hinder these policies.

While interdisciplinary studies have established the potential consequences of traditional gender attitudes, the determinants of gender attitudes are not fully understood. Contraceptive pills (Goldin, 2006), the AIDS epidemics (Fortin, 2015), childhood experiences and cultural backgrounds (Vella, 1994; Fernandez et al. 2004; Farre and Vella, 2007; Fernandez and Fogli, 2009), single-sex and co-ed schooling and college environments (Maccoby, 1990, 1998; Lee and Marks, 1990; Dasgupta and Asgari, 2004) are among the known factors that determine gender attitudes. This paper advances the literature by examining a novel determinant of gender attitudes, the labor market conditions.

Labor market conditions could affect gender attitude in two conflicting ways. First, changes in labor market conditions may reshape the traditional structure of households and threaten the position of men as sole income providers by enabling more women to share the provider role with men¹. Becker (1981) argues that a gender-role specialization can maximize a joint household utility. While in Becker's model women have a comparative advantage in home production and men's comparative advantage is outside of home, changes in labor market conditions can alter these comparative advantages. If a local labor market changes in such a way that male-dominated industries decline or industries with higher concentration of women prosper, then the income contribution of women to households might increase. This resultant sharing of breadwinner status may lead men to resist adopting egalitarian gender roles and adhere more strongly to traditional attitudes. Second, more lucrative employment opportunities for women at the same time may increase the cost of believing in traditional gender roles as the household and men can benefit materially from the financial contributions of women. However, without empirical

¹ Ruggles (2016) shows a rapid rise of roughly 25 percentage points in the employment shares of married women.

analysis, the relative importance of these competing theoretical effects of labor market conditions is ambiguous.

I examine the effects of labor market conditions on gender attitudes using nationally representative survey data. I measure labor market conditions using data from the U.S. decennial Census and the American Community Survey (ACS). I measure gender attitudes by utilizing data from the General Social Survey (GSS) and focus on two questions: “Is it better for everyone involved, if men work outside the home and women tend home?” and “Are men better suited emotionally for politics than women?” Each question captures a different aspect of attitudes toward gender roles and was asked regularly between 1977 and 2016. While the former refers to appropriateness of women working outside of home, the later refers to women’s capabilities. However, unlike previous work that measures gender attitudes by combining various gender questions and form an index (Charles et al., 2018), I use each question as a separate measure of gender attitudes. By not constructing an index, I allow for differences in responses to each question as labor market conditions change. I identify declines in adherence to traditional views on working of women outside of home in response to better labor market condition and find no evidence of responsiveness of attitudes toward emotional suitability of women for politics to labor market conditions.

Studying the effects of labor market conditions on gender attitudes is not an easy task. The heart of the difficulty lies in the simultaneity between labor market conditions and gender attitudes. This simultaneous relationship has been more extensively studied in the context of developing countries and the evidence of either direction is more limited in the U.S². Market conditions are

² See Duflo (2012) for a review of evidence on both sides in developing countries. In the U.S. a large literature documents traditional gender attitudes, manifested in the form of discrimination, as the underlying reason behind differences in wages of otherwise identical men and women (Blau and Kahn, 2006b). More recently, Charles et al.

determined by a series of government policies and labor demand and supply factors that are susceptible to the influence of gender attitudes. As noted, traditional gender attitudes may affect both labor demand and labor supply of women. Despite laws prohibiting sex discrimination and as evident from the persistent sex discrimination lawsuits filed to EEOC, traditional attitudes toward gender roles may still manifest in the form of sex discrimination and limit demand for female workers. On the other hand, traditional attitudes on gender roles may affect childhood education and subsequently labor supply of women by lowering parents' and teachers' investment in girls. Such attitudes may also affect the labor supply of women directly through a self-fulfilling prophecy. That is, women are less prepared for the workforce and therefore get paid less or enter into lower paying jobs. With a positive wage elasticity, lower wages lead to lower labor supply for women and confirming prior traditional expectation on appropriate role of women in society (McCaffery, 1993).

I address the simultaneity discussed above by estimating predicted labor demand following Bartik (1991). The predicted labor demand or, Bartik shocks, isolate the effects of changes in labor demand on gender attitudes and are calculated by interacting state level industry shares with national average growth rates for each industry. By conditioning on industry-specific equilibrium levels of employment in a base year and replacing national industry growth for local growth, Bartik shocks isolate exogenous variation in labor demand. Consistent with previous work, each state is excluded from contributing to national industry growth calculations of its Bartik shocks, which further weakens the link between local gender attitudes and predicted employment changes. I

in 2018 show that gender attitudes deemed as sexism in a woman's state of birth (background sexism) and a state she resides as an adult (residential sexism) both lower women's wages, labor force participation, and age of marriage and childbearing.

emphasize state-level impacts of changes over time in labor market conditions on gender attitudes using state fixed effects specifications to account for fixed differences across states.

Another important issue is the appropriate specification of the dynamics of the evolution of gender attitudes. If gender attitudes gradually change over time because for example, older cohorts exit and new cohorts enter the data, then without a lagged dependent variable, the relationship between gender attitudes and labor market conditions would be mis-specified. To allow for gender attitude dynamics and to test the sensitivity of the relationship between labor market conditions and gender attitudes to the inclusion of lagged gender attitudes, in some specification I include a lagged dependent variable. However, including a lagged dependent variable with state fixed effects introduces an endogeneity that I address using an instrumental variable approach.

I find significant declines in adherence to traditional gender attitudes on working of women outside of home in response to better predicted changes in labor demand. Specifically, I find that a one percent increase in predicted labor demand lowers adherence between 0.6 to 0.8 percentage points. I provide evidence that without accounting for reverse effects of gender attitudes on labor market conditions, these estimates would suffer from a downward bias. On the other hand, I find noisy estimates that are not statistically distinguishable from zero for the effects of better predicted changes in labor demand on share of traditional attitudes toward emotional suitability of women in politics. Therefore, I find no evidence of responsiveness of latter attitudes to labor market conditions. Given that the true nature of the relationship between labor market conditions and attitudes toward emotional suitability of women is not clear, and it could be the opposite of the relationship with attitudes on working of women outside of home, my choice to forgo creating a gender attitude index and to analyze each measure separately is reinforced.

I next explore heterogeneity by gender and education in the responses to labor market demand changes. I find suggestive evidence that men with mid-level education are most likely to adopt egalitarian gender attitudes as a result of better labor demand. Finally, I examine the sensitivity of the estimated results to gender and education specific measurements of changes in labor demand. I find suggestive evidence that men and especially lower educated men are more responsive to own labor market demand than other gender and education subgroups. I find no evidence of corresponding declines in traditional gender attitudes among women.

This paper extends the previous literature and enhances our understanding of the determinants of gender norms by presenting evidence on a novel determinant, namely, the labor market conditions. As previously discussed, changes in labor market conditions may create competition between men and women for the breadwinner status in households, while, at the same time, increasing households' dependence on income contribution of women. The additional evidence on the impacts of gender and education on the relationship between labor market conditions and gender attitudes can be used to evaluate existing employment policies to achieve the desired gender attitudes in society

2 Data and Descriptive Analysis

I use three nationally representative surveys. The data to measure gender attitudes come from the General Social Survey (GSS), while the data to estimate labor market conditions come from the decennial Census and the American Community Survey (ACS).

2.1 The GSS

The GSS is administered by National Opinion Research Center (NORC) and from 1972 to 1994, was mostly conducted annually with a target sample size of 1500³. Since 1994, the survey has been conducted biennially in two samples, each with a target size of 1500. In 2006, a third sample of 4510 was added. The GSS oversamples adults in small households and since 2004, the GSS also oversamples non-responders⁴. Given that the GSS is nationally representative, but is not representative at the state level, I only use the survey sampling weights for national statistics⁵.

The GSS collects information on demographics, social attitudes, and special interest topics. For the purposes of this analysis, I focus on two questions that are directly about the appropriateness of women's engagement in the labor market, and women's leadership abilities in public sphere⁶. In the first question, the survey participants are read the statement: "it is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family" and are asked to indicate whether they strongly agree, agree, disagree, or strongly disagree with the statement. In the second question, survey participants are only asked to indicate whether they agree or disagree with the statement: "Most men are better suited emotionally for politics than are most women." The potential response options for each statement are consistent across survey years and include an option of "don't know" or "not sure." I create

³ The GSS is not conducted in 1979, 1981, and 1992 for funding limitations.

⁴ The oversampling of adults in small households occur because the GSS only interviews one adult per household and the probability of being selected for the interview declines in larger households. Moreover, in a two-stage subsampling design, the GSS subsamples no response cases from the first stage and focuses resources on gaining responses from this subset.

⁵ During the time period of interest for this paper, the number of states administered in the survey ranges from 33 in 1977 to 44 in 1985 or 1986.

⁶ These questions have the least overlap with other facets of gender attitudes involving motherhood, abortion, and women in religion to name a few, and are administered regularly.

binary responses that indicate agreement in 1977, 1990, 2000, 2010, and 2016⁷. For whether women should tend home, I keep binary responses for agree or strongly agree options. For whether men are better suited for politics, I keep binary responses for the agree option because there is no strongly agree.

Figure 1 shows the share of agreements (traditional gender attitudes) and disagreements (egalitarian gender attitudes) to working of women outside of home and their emotional suitability for politics from 1977 to 2016. Panel (a) shows that the prevalence of views against working of women outside of home in 1977 was high at 65 percent and experienced a sharp decline of 27 percentage points until 1990. The momentum slowed down and even reversed by 1 percentage point between 1990 and 2000. The decline started again in 2000 and continued to 2016. On the other hand, Panel (b) shows a more consistent pattern of decline in the prevalence of traditional views with regard to emotional suitability of women for politics. Between 1977 and 2016, the share of respondents that considered women not suitable for politics dropped by 30 percentage points from 48 percent to 18 percent. Notably, in 1977, almost half of the respondents held traditional views on suitability of women for politics and the other half disagreed, whereas about two thirds of respondents held traditional views about working of women outside of home. The differences in patterns of decline is another reminder that each question captures a different aspect of attitudes on gender roles. Despite the significant drops in the share of traditional attitudes on gender roles over the past several decades, still in 2016, nontrivial shares of 27 and 18 percent

⁷ These years were chosen based on data availability and considerations for period length needed for measuring changes. To increase the number of observations for the empirical analysis, I pool 1978 with 1977 observations, 1986 with 1985, and 2014 with 2016 observations. It is unlikely that attitudes change much over a year or two-year period and therefore, this pooling should not affect the results.

continue to believe that women should tend home or that women are not emotionally suited for politics.

Figure 2 shows the share of traditional attitudes toward working of women outside of home (Panel (a)) and the emotional suitability of women for politics (Panel (b)) separately by gender. Each panel displays a similar pattern of decline in adherence to traditional views among both men and women. However, in Panel (a), female respondents consistently show a lower likelihood of disagreeing with working of women outside of home than men. Between 1977 and 1990, women were 6 and 7 percentage points less likely to oppose to working of women than men. This gap narrowed temporarily in 2000 to only a 3-percentage point difference and went up again to 7 percentage points in 2010. In a surprising reversal in 2016, women were a 1-percentage point more likely than men to oppose working of women outside of home. On the other hand, in panel (b), not only the gap between men and women in disagreeing with suitability of women for politics is less pronounced, but also women display a stronger opposition in 1977. However, since 1977 and until 2016, women remained 3 to 4 percentage points less likely than men to oppose suitability of women for politics. In 2016, women became 4 percentage points more inclined than men to adhere to traditional views regarding suitability of women for politics. Therefore, while women are generally less traditional than men with regard to gender roles, some inconsistencies are observed, especially for attitudes toward emotional suitability of women for politics.

Attitudes on gender roles vary considerably by education levels, as I document in Figure 3. Panels (a) and (b) show the share of traditional views on working of women outside of home and emotional suitability of women for politics, respectively for three education groups: less than or equal to eleven years of schooling, between twelve to fifteen years of schooling, and at least 16 years of schooling. Both panels show that in every period, adherence to traditional gender roles is

most common among the lower educated groups, followed by the middle and then the higher educated groups. In Panel (a), 78 percent of respondents with less than or equal to eleven years of schooling (with less than a high school degree) agreed or strongly agreed that women should tend home in 1977, compared to 60 percent of respondents with twelve to fifteen years of schooling (high school degree or some college) and 47 percent of respondents with at least sixteen years of schooling (a baccalaureate or more). Panel (b) shows similar level differences to Panel (a). It shows that the levels of adherence to traditional views on emotional suitability of women for politics drops with increases in education levels.

Although in Panel (a), within all education groups, the overall prevalence of tradition views on working of women declines, the decline is only continuous among the most educated groups. However, barring a temporary increase (a slight increase of 1 percentage points for the lower educated group between 2000 and 2010, and a larger increase of 5 percentage points for the middle educated group between 1990 and 2000), the lower and middle educated groups display large long-term declines of 36 and 32 percentage points, respectively. By contrast, the long-term decline among the higher educated group is only 30 percentage points. Panel (b) also shows that between 1977 and 2016, the lower educated group has the largest drop of 33 percentage points followed by 26 percentage points drop for the middle-educated group and then a 22-percentage point decrease among the higher educated group. The short-term reversal of declines in traditional views is also observed among the lower and middle educated groups in Panel (b), albeit at later periods than observed in Panel (a).

The empirical methodology used in this paper depends upon substantial variation across states in the evolution of gender attitudes over time. Figures 4 and 5 depict share of traditional attitudes toward working of women outside of home (Figure 4) and emotional suitability of women

for politics (Figure 5) by state for the years 1977 in Panel (a), 1990 in Panel (b), 2000 in Panel (c), 2010 in Panel (d) and 2016 in Panel (d). Both figures illustrate differential cross-state variation across periods. Using a few states as examples. I highlight this variation below from Figure 4.

In 1977, an equal share of respondents, 67 percent, in Illinois and Minnesota agreed or strongly agreed that women should tend home. By 1990, these shares significantly declined. However, in 1990, the share of traditional-minded respondents was 9 percentage points higher in Illinois than Minnesota. By 2000, the state-level declines in traditional attitudes continued, yet the gap across the two states remained at 9 percentage points. By 2010, in a reversal from previously observed state-level declines in share of traditional attitudes, Illinois and Minnesota saw an increase in shares of respondents who viewed the appropriate role for women as tending home; the gap between the states widened to 15 percentage points and Illinois remained the more traditional of the two. By 2016, the shares declined again, and Illinois had a higher share of traditional views than Minnesota by 7 percentage points.

Similar to Illinois and Minnesota, in 1997, Florida and Texas both had the same share of traditional views on working of women, 49 percent. By 1990, both states experienced roughly halved shares and a small gap of 3 percentage points was observed. By 2000, the shares continued to fall in Texas, while they rose in Florida. Yet, the gap between Florida and Texas stayed at 3 percentage points. Just as with Illinois and Minnesota, by 2010, in a reversal of trends, the shares rose in Texas, while this time they fell in Florida and the gap widened to 5 percentage points. Texas had a larger share of traditional responses. By 2016, as traditional shares increased in Texas and declined in Florida, the gap between the two states increased to 7 percentage points.

Missouri and Oklahoma too, are observed with almost the same share of traditional responses (54 and 53 percent) in 1977. By 1990, due to the differential rate of decline between the

two states, Oklahoma had a 14-percentage point higher share of traditional responses than Missouri. The share of traditional responses continued to fall in both states, however, by 2000, the gap almost entirely disappeared, and Missouri had a one-percentage point higher share. In a reversal, the shares increased for both states in 2010 and the gap widened to 9 percentage points with Missouri becoming the more traditional of the two. By 2016, the shares had declined again, and this time Oklahoma was 5 percentage points more traditional.

Similar patterns of change are observed in Figure 5⁸.

2.2 The Census and the ACS

I use individual-level decennial Census extracts that correspond to one percent of the population in 1970 and five percent of the population in 1980, 1990, and 2000 and single-year ACS data in 2010 and 2016 available at the Integrated Public Use Microsamples (IPUMS) database (Ruggles et al., 2004). The baseline data are restricted to non-institutionalized civilian adults living in U.S. states. Both the decennial Census and the single-year ACS data are nationally representative and contain information on employment status, industry, and demographics such as sex, age, and education. An important advantage of the large samples available in the Census and the ACS data is the possibility of creating reliable measures of state-level changes in employment that can be disaggregated by gender and education levels. To match data availability in the GSS, I anchor the industry share component of Bartik shocks in 1977 and use linear interpolation of employment numbers by industry from the 1970 to 1980 censuses. To ensure that no one industry drives national industry growths in local labor demand shocks (more on this in the next section), I define 14 broad industry categories based on 3-digit industry schemes in 1990⁹.

⁸ The variation in both figures is persistent and stable. Similar variation is observed in progressive gender attitudes.

⁹ The set of industries include: 1. Agriculture, 2. Mining, 3. Construction, 4. Manufacturing, 5. Transportation, 6. Communication, Utilities and Sanitation, 7. Wholesale Trade, 8. Retail Trade, 9. Finance, Insurance, and Real

3 Empirical Framework

Estimating the causal effect of labor market conditions on gender attitudes is difficult. The difficulty is rooted in the simultaneity between measures of labor demand and gender attitudes and the dynamics of gender attitudes. Employment and the employment to population ratio are determined by a combination of government policies and supply and demand factors, all of which could be affected by prevailing gender attitudes, hampering efforts to isolate exogeneous variation in labor market conditions. Also, if gender attitudes are dynamic and a function of prior attitudes, omission of a lagged dependent variable in a statistical model would lead to a specification error. However, the inclusion of a lagged dependent variable in a fixed effects model, introduces a mechanical endogeneity. The two primary difficulties of estimating the causal effect (the simultaneity between labor market and gender attitudes, and the dynamics of attitudes) are now discussed in detail.

3.1 Simultaneity

There are many ways gender attitudes could affect labor supply and demand decisions. Traditional gender views may discourage some women from working outside of the home as they try to align their actions with society's beliefs, encountered in both adulthood and childhood (Charles et al., 2018). Traditional views may also shape upbringing and teaching practices used by parents and teachers who try to prepare girls to meet society's expectations. If not through this self-fulfilling prophecy, gender attitudes could also restrict labor supply of women by increasing the cost of supply for women relative to men. The prevalence of unfavorable views toward working of women outside of home, may require women to invest in more skills in order to compete with men. Gender

Estate, 10. Business and Repair Services, 11. Personal Services, 12. Entertainment and Recreation, 13. Professional and Related Services, 14. Public Administration.

attitudes could also affect labor demand decisions. Traditional views may result in prejudice and discrimination against women in hiring practices, despite anti-discrimination laws. Such gender attitude factors among others affecting labor market conditions impede estimating exogenous variation in labor market conditions that would allow identification of causal effects on gender attitudes.

3.1.1 Exogenous Variation in Labor Demand Using Bartik Shocks

Following a widely used practice across different fields, I address the simultaneity between labor market conditions and gender attitudes by estimating predicted local labor demand or Bartik shocks based on Bartik (1991)¹⁰. Bartik shocks are calculated by interacting a state's industry shares with national average industry growth rates. The identifying assumption is that local factors such as gender attitudes that could affect labor market conditions are orthogonal to Bartik shocks. Because Bartik shocks use local industry composition in a base year, and national industry growth rates, they are reasonably unaffected by factors that shift local supply and local demand. Moreover, since I estimate Bartik shocks using leave-one-out national employment growth (own-state is excluded from national industry-specific employment growth calculations), following previous work (Autor and Duggan, 2003; Charles et al., 2012; Chauvin, 2017), the link between Bartik shocks and local labor demand factors is even further weakened.

Formally, I calculate Bartik shocks as follows:

$$Bartik_{gest_0-t} = \left[\sum_j \frac{EMP_{jgest_0}}{EMP_{gest_0}} * \left(\frac{EMP_{-sjget} - EMP_{-sjget_0}}{EMP_{-sjget_0}} \right) \right] \quad (1)$$

where $Bartik_{gest_0-t}$ represents exogenous demand-driven employment growth between base year $t_0 = 1977$ and end year $t = \{1990, 2000, 2010, 2016\}$ in state s , for gender $g = \{\text{female, male, all}\}$

¹⁰ See Goldsmith-Pinkham et al. (2016) for a list of paper that have used Bartik shocks.

and education group $e = \{\leq 11, 12-15, \geq 16 \text{ years of schooling, all}\}^{11}$. The first component of the interaction term $\frac{EMP_{jgest_0}}{EMP_{gest_0}}$ represents employment share of industry j in state s , at base year t_0 for gender g , and education group e . The second component of the interaction $\frac{EMP_{-sjget} - EMP_{-sjget_0}}{EMP_{-sjget_0}}$ represents the national employment growth of gender g and education group e , in industry j between $t - t_0$ that excludes state s .

An emerging literature (Goldsmith-Pinkham et al., 2019; Borusyak et al., 2018) has highlighted concerns regarding the exogeneity of Bartik shocks. Goldsmith-Pinkham et al. (2019) emphasize that the likely exogeneity of Bartik shocks depend not on the correlation of baseline industry shares with levels of the dependent variable, but rather with changes in the outcome. I pay close attention to their concern in my empirical specifications. The state fixed effects take out any time-invariant state characteristics that might lead to level correlations between industry shares in the base year and levels of gender attitudes. I also control for observables characteristics, such as share of survey respondents by gender and education, and state population, that are correlated with both industry shares and changes in gender attitudes. Conditioned on these observables, it is reasonable to assume that baseline industry shares in a state are uncorrelated with changes in gender attitudes in that state.

To gain a better understanding of the magnitude of the effects of Bartik shocks on employment, I estimate the following first-stage relationship between Bartik shocks and changes in employment, while controlling for state (λ_s) and year (γ_t) fixed effects:

¹¹ When Bartik shocks are for the entire local population, $g = \text{all}$ and $e = \text{all}$. For sex-specific shocks, g is either female or male, and $e = \text{all}$. For education-specific shocks, $g = \text{all}$ and e is either education levels less than high school, high school or some college, or with at least a baccalaureate.

$$\ln(\text{employment})_{st} = \alpha + \beta \text{Bartik}_{st} + \lambda_s + \gamma_t + \epsilon_{st} \quad (2)$$

3.2 Gender Attitude Dynamics

There are many reasons to think gender attitudes evolve over time. For one, attitudes are learned beliefs through socialization and interactions with others. For two, older cohorts are replaced by younger cohorts. As such, even though Bartik shocks are exogenous, the failure to appropriately account for dynamics would introduce bias in the presence of state effects. However, including a lagged gender attitude with state fixed effects introduces a mechanical relationship between the demeaned lagged variable and demeaned error term as shown by Nickell (1981).

I include lagged gender attitudes in some specifications and examine the sensitivity of results. Following Wooldridge (2006), I address this endogeneity using an instrumental variable approach that is described in detail below.

3.3 Empirical Models of the Effects of Labor Market Conditions

In this section, I describe my approach to estimating the effects of labor market conditions on gender attitudes and address complications introduced by simultaneity and dynamics discussed above. Using panel data, I estimate fixed effects, dynamic fixed effects, and dynamic fixed effects with instrumental variables models.

Equation (3) is the baseline regression specification for estimating the impact of changes in local labor market conditions on changes in gender attitudes. Here, share of specific gender attitudes (Y) for agreeing or strongly agreeing (disagree or strongly disagreeing) that women should tend home or agreeing (disagreeing) that women are not suited for politics in state s at time t is modeled as a function of labor market, respondents, and state characteristics, and time trends:

$$Y_{st} = \alpha_1 + \beta T + \delta X_{st} + \lambda_s + \gamma_t + \epsilon_{st} \quad (3)$$

where T represent one of the following treatment variables: employment to population ratio, natural log of employment, or Bartik shocks anchored in 1977. λ_s and γ_t are state and year fixed effects, respectively. X_{st} is a vector of respondent or state s characteristics in year t , and includes shares of respondents to gender attitude questions who are female, respondents who have ≤ 11 years of schooling, respondents who have 12-15 years of schooling, and natural log of population when the treatment variable is not employment to population ratio. ϵ_{st} is the error term.

Equation (3) highlights a key identification concern regarding the dynamics of gender attitudes. If gender attitudes evolve over time, it is important to account for the dynamics. Equation (4) expands equation (3) by including the lagged dependent variable:

$$Y_{st} = \alpha_1 + \beta T + \theta Y_{st-1} + \delta X_{st} + \lambda_s + \gamma_t + \epsilon_{st} \quad (4)$$

Where Y_{st} , T , and X_{st} are dependent, treatment and control variables as defined in equation (3). Y_{st-1} is the lagged share of gender attitudes in state s and lagged year $t-1$. When t is 2000, the lagged year is 1990; when t is 2010, the lagged year is 2000, and when t is 2016, the lagged year is 2010.

The lagged dependent variable allows for gender attitudes to change with less than 100 percent persistence. Imperfect persistence in gender attitudes is reasonable given that survey population is aging, and attitudes evolve over time. Older cohorts exit and are replaced by younger cohorts with different gender views. Because of the complications introduced by the inclusion of a lagged dependent variable in fixed effects models, I follow Wooldridge (2006) and instrument for a lagged dependent variable using a twice-lagged dependent variable:

$$Y_{st} = \alpha_1 + \beta T + \theta Y_{st-1} + \delta X_{st} + \lambda_s + \gamma_t + \epsilon_{st} \quad (5a)$$

where the first-stage equation is:

$$Y_{st-1} = \alpha_2 + \theta Z_{st} + \beta_2 T + \delta_2 X_{st} + \lambda_s + \gamma_t + \nu_{st} \quad (5b)$$

Y_{st-1} is the lagged share of respondents with a specific gender attitude that is instrumented for by a twice-lagged share of gender attitudes $Z_{st} = Y_{st-2}$. All other terms are as defined previously.

4 Results

This section reports the results of regressions discussed in the previous section on the effects of labor market conditions on gender attitudes. Specifications differ on whether they measure labor market conditions with natural log of employment, the employment to population ratio or Bartik shocks to illuminate the importance of properly accounting for the reverse effects of gender attitudes on labor market conditions. Specifications also differ on whether they include a lagged dependent variable, and on whether the approach includes an instrumental variable. The inclusion of prior gender attitudes in some specifications provides information about the dynamics of gender attitudes. All specifications are weighted by the number of survey participants per state, so states with higher number of observations contribute more to the estimates. All specifications also control for shares of survey respondents who are female, shares with less than or equal to 11 years of schooling, shares with 12-15 years of schooling, and natural log of population. To assess the sensitivity of estimated effects to possible correlations of unobservable state-level characteristics over time, results with clustered standard errors at state level are reported in the appendix.

Table 1 presents coefficients that capture the effects of labor market conditions (β) on share of traditional views (agree or strongly agree) that women should tend home, estimated separately by natural log of employment, the employment to population ratio, and Bartik shocks, for a series of different specifications. Estimates in columns (1)-(3) are from a basic specification without

controlling for prior gender attitudes; columns (4)-(6) control for prior gender attitudes by including a lagged dependent variable; columns (7)-(9) instrument for last period's gender attitudes using gender attitudes in two periods ago. All columns include state and year fixed effects to deal with time-invariant state-specific characteristics and aggregate time-series trends that might influence both labor market conditions and gender attitudes.

Column (1) of Table 1 shows the effect of natural log of employment on share of traditional views that women should tend home and I find an effect of -0.63. This implies that a 1 percent change in natural log of employment leads to a 0.63 percentage point decline in the probability of agreeing or strongly agreeing that women should tend home. Although a useful starting point, the effect of natural log of employment on gender attitudes could reflect both exit from the labor market and unemployment. To distinguish between these possibilities, in Column (2) I change the independent variable of interest to employment to population ratio. The coefficient is -1, implying that a 1 percent change in employment to population ratio lowers the adherence to traditional views by 1 percentage point.

An important limitation of employment and employment to population ratio as measures of labor market conditions is that they are driven by both supply and demand forces. To address this concern, Column (3) studies the effect of Bartik shocks. One important conceptual point to keep in mind when interpreting the coefficient on the Bartik shock is that changes in predicted employment do not map 1 to 1 to actual changes in employment. Thus, the effect of a 1-unit change in a Bartik shock is not the same as a 1-unit change in employment, although it is fairly similar. To help make comparisons across employment and Bartik shock estimates, appendix Table A1 shows that a 1 percent increase in Bartik shocks increases the natural log of employment by 0.92 percentage points. This suggests that estimates are comparable in terms of magnitude.

Column (3) of Table 1 shows that the coefficient on the Bartik shock is -0.58. This implies that a 1 percent increase in a Bartik shock leads to a 58-percentage point decline in the share of traditional attitudes. To compare to the employment coefficient if one is willing to maintain the exclusion restriction, the Bartik coefficient is larger indicating that a failure to isolate the effects of demand shocks biases downward the magnitude of the effect. Perhaps fewer women choose to work in the presence of a higher prevalence of negative attitudes about women working.

Although, the estimated coefficients on the natural log of employment and the employment to population ratio when a lagged dependent variable is included in the regressions (Columns (4) and (5)), and when the lagged dependent variable is instrumented (Columns (7) and (8)), are noisy, the negative signs on the coefficients are consistent with statistically significant coefficients of Columns (1) and (2). Comparisons across the columns reveal stable estimates even following the inclusion of the lagged dependent variable, suggesting only a small Nickell bias. Overall, the point estimates throughout Table 1 indicate that better labor market conditions lower adherence to traditional views that women should tend home.

Table 2 presents coefficients of labor market conditions (β) on share of traditional views (agree) that women are not suited for politics, where the table has the same structure as Table 1. In contrast with the estimates reported in Table 1, the estimated effects in Table 2 are mostly larger but consistent in sign. Columns (3), and (6) and (9) show that a 1 percent increase in Bartik shocks reduce adherence to views that women are not emotionally suitable for politics by 28 and 18 percentage points, although imprecise. The increase in the size of standard errors in Table 2 means that the true impacts of better labor market conditions on traditional views that women are not emotionally suited for politics are unclear. In fact, when instrumenting for the lagged dependent variable in Column (9), the effects of Bartik shocks on the share of traditional attitudes become

positive, although still not statistically distinguishable from zero. However, taking the point estimates as the best guess of labor market conditions on traditional views on suitability of women for politics, the increase in the estimated effects of Bartik shocks after controlling for a lagged dependent variable suggests a downward biasing Nickell bias consistent with the finding in Table 1. Nevertheless, without knowing the true relationship between different aspects of gender attitudes with labor market conditions, creating an attitude index could underestimate the impacts on gender attitudes.

5 Heterogeneity Analysis

Recall from Figures 2 and 3 that women and respondents with higher educational levels are generally less traditional in their views on gender roles than others. In particular, not only education affects levels of traditional attitudes held, but also the rate of adherence over time. Although, it makes sense that gender and education may affect attitudes on gender roles, but they may also potentially affect the responsiveness of attitudes to labor market conditions because of how gender and education shape labor market experiences of subgroups. For that, I examine whether certain gender and education subgroups are more responsive to own labor market conditions. I also examine whether common labor market conditions would differentially influence gender attitudes of certain groups. The first analysis allows for variation in the effects of labor market conditions on gender attitudes. The second only allows for variation in gender attitudes by gender and education and not labor market conditions.

Table 3 divides the sample by gender and education. It consists of 3 panels and 6 columns. Panel (A) reports the estimated effects of Bartik shocks from a regression without a lagged

dependent variable; Panel (B) reports the effects when a lagged dependent variable is included in the regression and Panel (C) reports the effects when a lagged dependent variable is instrumented with a twice lagged dependent variable. The first three columns of Table 3 report the estimated effects of Bartik shocks from each panel on traditional gender attitudes of men with less than or equal to eleven years of schooling (Columns (1)), men between twelve to fifteen years of schooling (Column (2)) and men with at least sixteen years of schooling (Column (3)). The last three columns report the effects on the share of traditional attitudes held by women across the same three education groups.

The results in Table 3 show that gender attitudes of some groups are more responsiveness to own labor market conditions than the overall performance of the labor market. In fact, the estimated coefficients of Bartik shocks for men with less than a high school education and for men with high school or some college education are substantially larger in absolute values and more negative than the corresponding estimates from Table 1. Column (1) shows that a 1 percent increase in Bartik shocks lowers the adherence to traditional views that women should tend home among men with less than a high school degree by 4.79, 9.65, and 9.30 percentage points across Panels (A)-(C). Column (2) shows that 1 percent increase in Bartik shocks lead to declines of 0.89, 1.38, and 1.03 percentage points in traditional views held among men with middle education levels. These estimates are significantly smaller than the corresponding effects of 0.58, 0.83, and 0.64 percentage points in Table 1. In contrast, I find no evidence of differential responsiveness to own labor market conditions among women as these estimates are noticeably less precise.

Table 4 presents the estimates that permit gender attitudes to vary by gender and education, but not the labor market conditions. More specifically, Table 4 reports responses to overall labor demand changes, which are different from gender and education specific labor demand shocks of

Table 3. Table 4 consists of 2 panels and 9 columns. The 9 columns across Panel A report the estimated effects of Bartik shocks on traditional views on working of women outside of home for men with less than or equal to eleven years of schooling (Columns (1)-(3)), with between twelve to fifteen years of schooling (Columns (4)-(6)) and with at least sixteen years of schooling (Columns (7)-(9)). Columns (1), (4) and (7) report estimates without a lagged dependent variable; Columns (2), (5) and (8) report estimates with a lagged dependent variable and Columns (3), (6) and (9) report estimates with an instrumented lagged dependent variable.

Although the estimates in Table 4 are noisy, they are consistent with the previously reported patterns of decline in Table 1. Despite the large standard errors for coefficients on women's attitudes, the estimated responsiveness of women to changes in predicted labor demand is much smaller than the corresponding effects on men. Columns (4)-(6) of Panel (A) show statistically significant declines of 1.16, 2, and 1.60 percentage points in adherence of men with middle education levels. These estimates are larger and more negative than estimated effects among the other two education groups for men in Panel (A) and the entire Panel (B). Therefore, I find suggestive evidence that common shocks lower the adherence to traditional views regarding working of women outside of home among high school graduated men more than other groups.

6 Conclusion

The difficulty of isolating the effects of labor market conditions on gender attitudes lies in the simultaneity between the two. The interrelated government policies, and demand and supply factors that determine labor market conditions are likely influenced by prevailing gender attitudes. Gender attitudes could influence early childhood education, subsequent levels of human capital

investments, women's decision to join the labor force, and employers' decisions to hire women, which complicates the identification of any causal effects of labor market conditions. However, by using a framework that estimates local employment growth based on only the initial local industry distribution and national growth, I effectively overcome the simultaneity concern between labor market conditions and gender attitudes

One of the components of the analysis that facilitates the robustness of the results is controlling for systematic time-invariant differences across states that would affect the local industry distributions as well as local attitudes. A second component is controlling for variables that would plausibly affect both national employment growth trends and local gender attitudes such as changes in population, or gender and education characteristics of survey respondents. A third component is recognizing the dynamics of gender attitudes and measuring current gender attitudes as a function of prior attitudes. A fourth component is overcoming the endogeneity introduced when controlling for both gender dynamics and state fixed effects by using an instrumental variable approach.

I establish a statistically significant causal effect of state-level labor market conditions on attitudes toward working of women outside of home. I find that better labor market conditions lower adherence to traditional attitudes that women should not work. Although I find noisy estimates for the impacts of labor market conditions on attitudes toward emotional suitability of women for politics, and cannot identify the true effects, the estimated coefficients suggest that better labor market conditions also lower traditional attitudes on suitability of women.

Moreover, I document suggestive evidence of differential responsiveness to the effects of labor market demand along the gender and education dimensions. Specifically, I find that men with twelve to fifteen years of education are more likely than other groups to lower their adherence

to traditional gender roles in response to common labor demand shocks. One possibility is that gender and education affect attitudes. Another possibility is that gender and education affect labor market experiences. As such, I also examine the attitude responsiveness of gender and education subgroups to own-group labor market demand shocks. I find suggestive evidence that men and especially lower educated men are more responsive to own labor market demand than other gender and education subgroups. I find no evidence of corresponding declines in traditional gender attitudes among women.

This paper's findings suggest that the material benefits of increased financial contribution of women to households rather than the threat of sharing the breadwinner role is the driving mechanism behind the impacts of labor market conditions on gender attitudes. This is particularly striking in the case of less-educated men who face the most difficult labor market overall and relative to their wives. Discussing these possible channels are important for implementing policies that will achieve the desired gender attitudes in society. If the threat to the primary income provider role was the driving mechanism for the effects of labor market conditions on gender attitudes, then job expansion for those who are laid off or unemployed could potentially mitigate the traditional gender attitude consequences of labor market conditions.

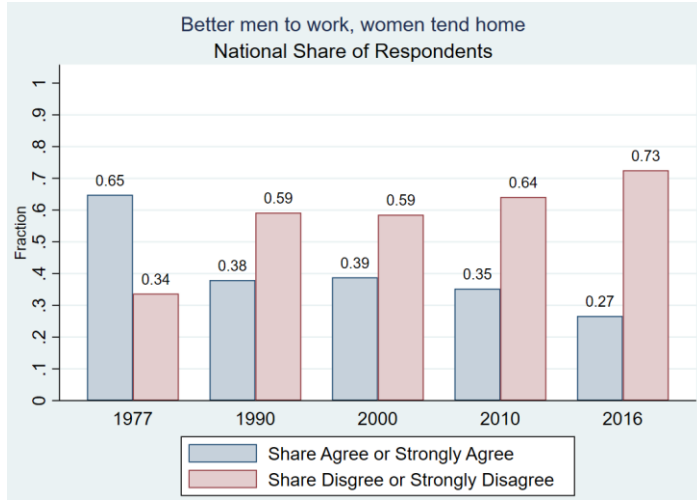
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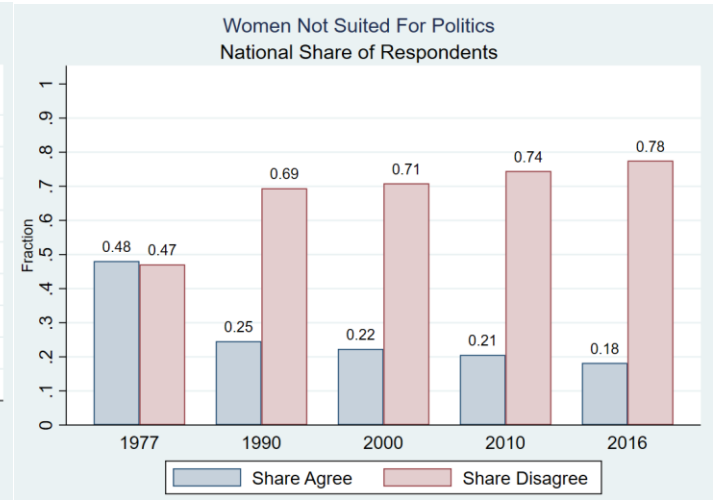
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Figure 1: Changes in gender attitudes in the U.S. over time

Panel (a)



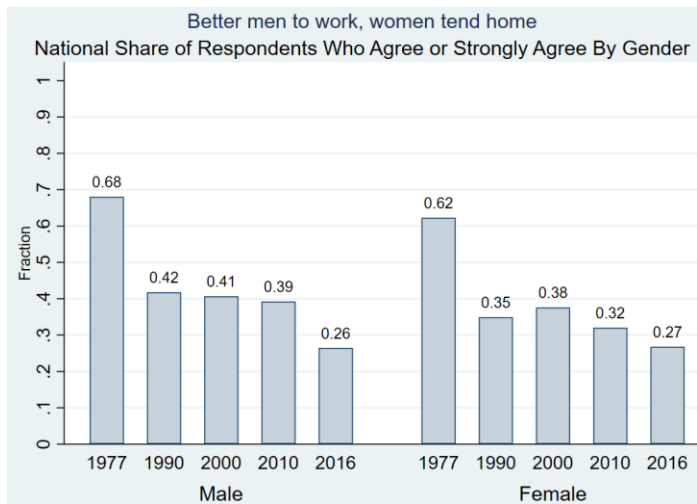
Panel (b)



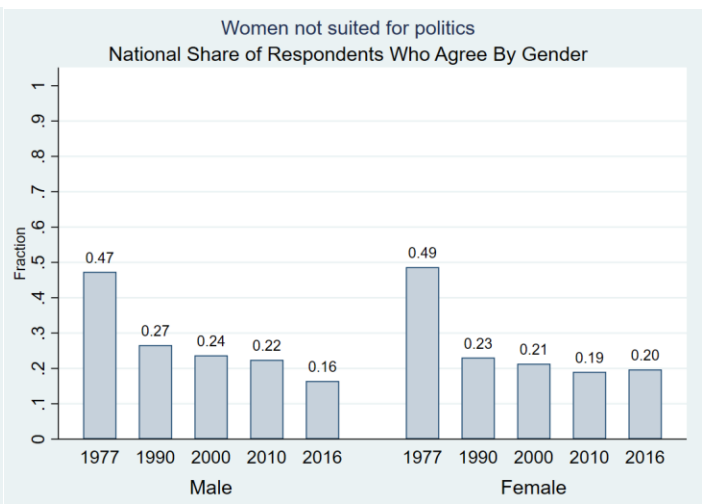
Source: GSS data.

Figure 2: Changes in gender attitudes in the U.S. over time by gender

Panel (a)



Panel (b)

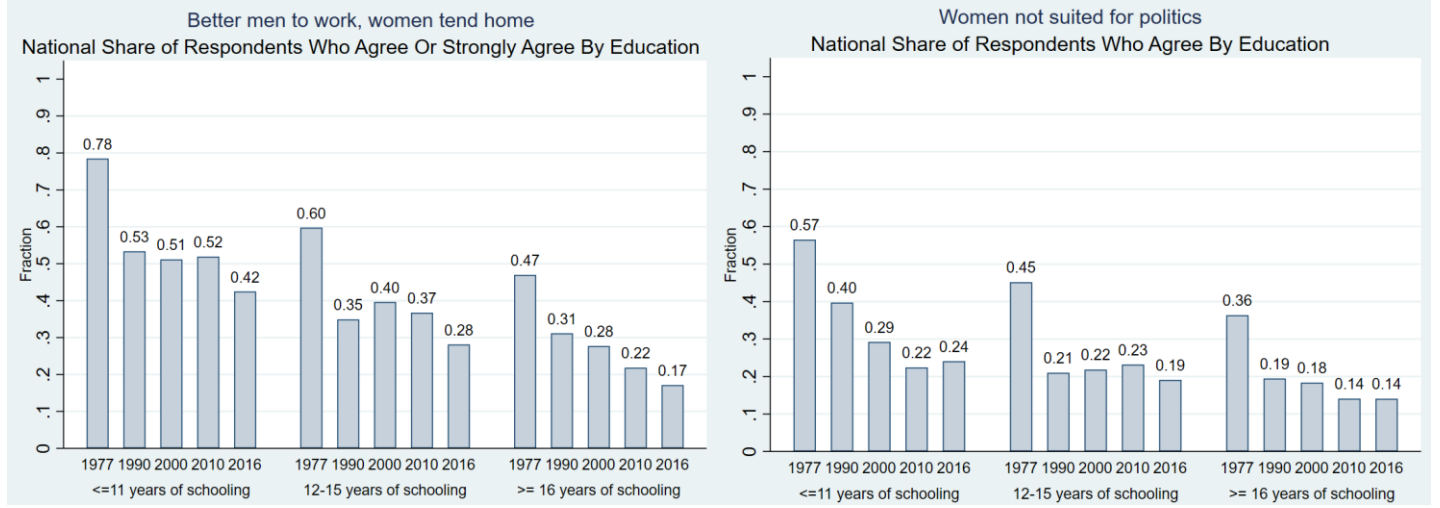


Source: GSS data.

Figure 3: Changes in gender attitudes in the U.S. over time by education

Panel (a)

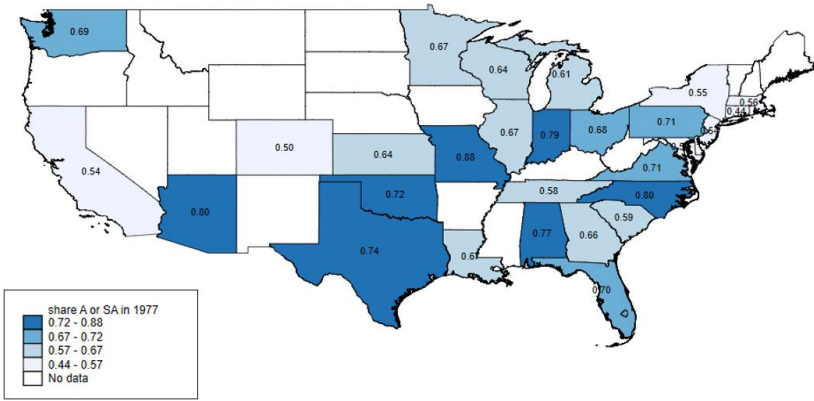
Panel (b)



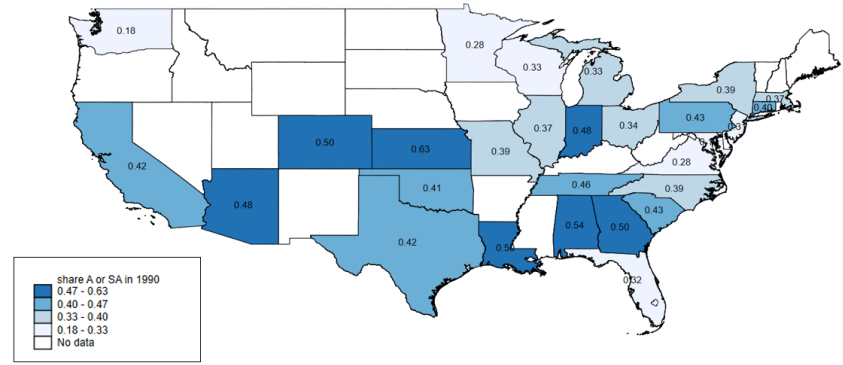
Source: GSS data.

Figure 4: Variation in share of traditional views on whether women should tend home

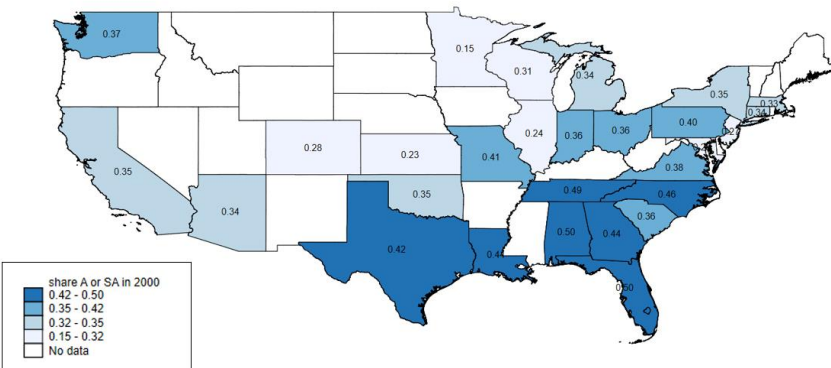
Panel (a)



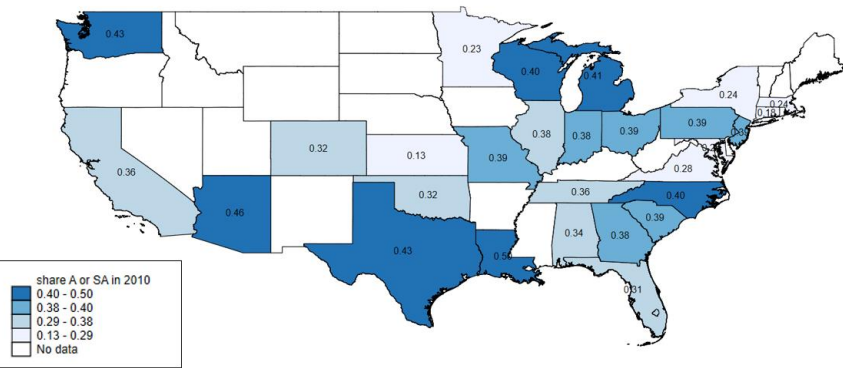
Panel (b)



Panel (c)



Panel (d)



Panel (e)

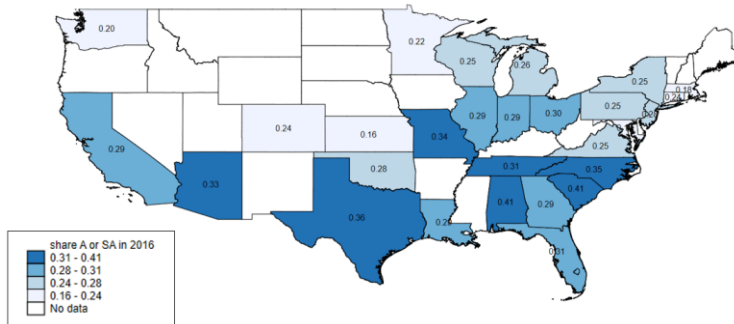
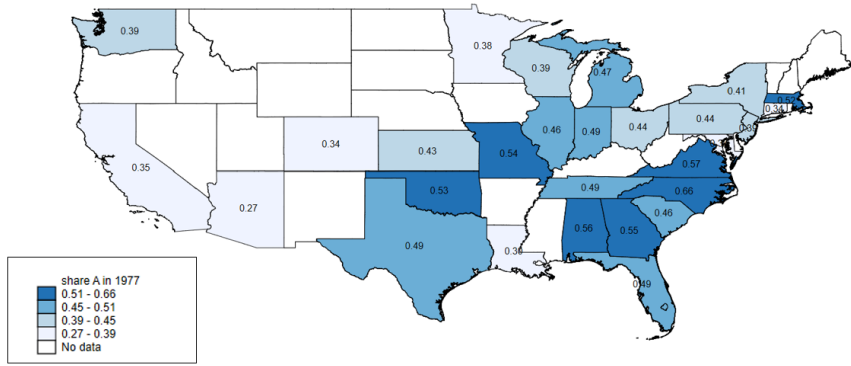
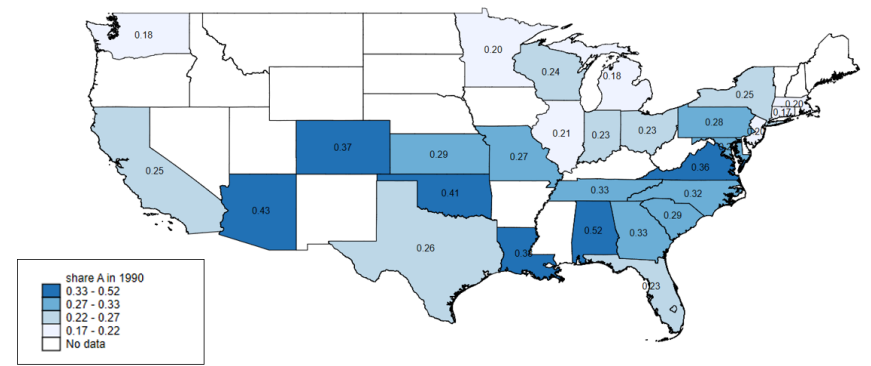


Figure 5: Variation in share of traditional views on whether women are suited for politics

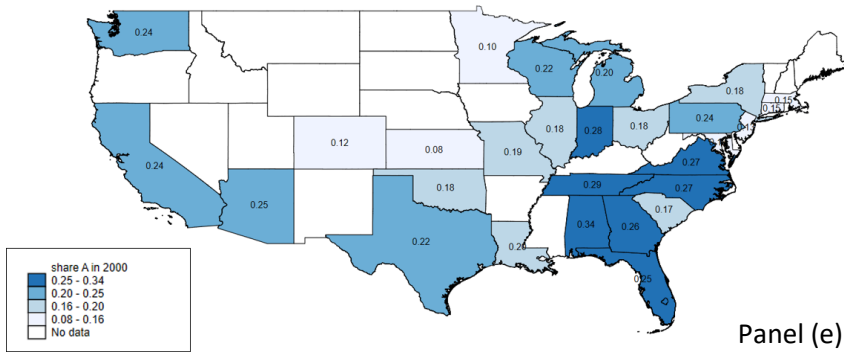
Panel (a)



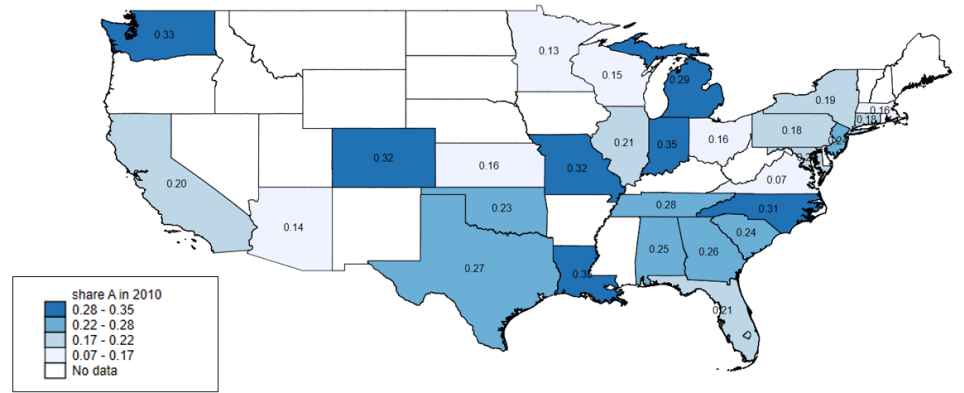
Panel (b)



Panel (c)



Panel (d)



Panel (e)

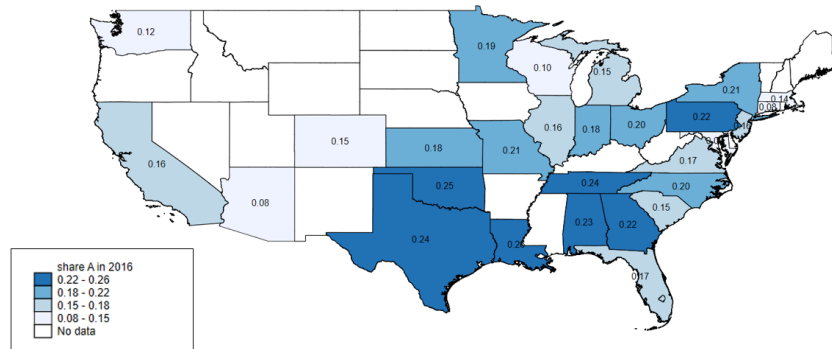


Table1: Fixed Effects Estimates of Labor Market Conditions on Share Agree or Strongly Agree That Women Should Tend Home

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
In(Employment)	-0.63** (0.27)			-0.48 (0.32)			-0.38 (0.28)		
Employment to Population Ratio		-1.00** (0.28)			-0.69 (0.52)			-0.52 (0.48)	
Bartik Shocks			-0.58* (0.30)			-0.83** (0.41)			-0.64* (0.37)
Lagged Dependent Variable				-0.20** (0.09)	-0.21** (0.09)	-0.21** (0.09)	0.15 (0.17)	0.20 (0.19)	0.16 (0.17)
Instrumental Variable	No	No	No	No	No	No	Yes	Yes	Yes
N	140	140	112	84	84	84	84	84	84

Notes: All regressions include state and year fixed effects and are weighted. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Table 2: Fixed Effects Estimates of Labor Market Conditions on Share Agree That Women Are Not Suited for Politics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
In(Employment)	-0.19 (0.25)			-0.42 (0.29)			-0.31 (0.29)		
Employment to Population Ratio		-0.28 (0.38)			-0.50 (0.50)			-0.35 (0.52)	
Bartik Shocks			-0.28 (0.27)			-0.18 (0.40)			0.73 (0.77)
Lagged Dependent Variable				-0.28** (0.10)	-0.24** (0.11)	-0.28** (0.11)	0.29 (0.37)	0.43 (0.39)	0.70 (0.65)
Instrumental Variable	No	No	No	No	No	No	Yes	Yes	Yes
N	140	140	112	84	84	84	84	84	84

Notes: All regressions include state and year fixed effects and are weighted. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Table 3: Estimated Effects of Labor Market Conditions on Share Agree or Strongly Agree That Women Should Tend Home for Separate Gender and Education Samples

	Men			Women		
	≤11 years	12-15 years	≥16 years	≤11 years	12-15 years	≥16 years
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
Bartik Shocks	-4.79*	-0.89**	-0.07	-0.30	-0.28	-0.40
	(2.53)	(0.45)	(0.55)	(1.75)	(3.32)	(2.62)
Lagged Dependent Variable	No	No	No	No	No	No
Instrumental Variable	No	No	No	No	No	No
N	84	63	63	100	75	75
Panel B:						
Bartik Shocks	-9.65***	-1.38**	-0.20	-0.11	-0.54	32.94
	(3.40)	(0.61)	(0.69)	(0.58)	(0.86)	(1569.80)
Lagged Dependent Variable	Yes	Yes	Yes	Yes	Yes	Yes
Instrumental Variable	No	No	No	No	No	No
N	112	84	84	112	84	84
Panel C:						
Bartik Shocks	-9.30***	-1.03	0.46	0.24	0.21	6.94
	(2.74)	(0.65)	(0.82)	(0.35)	(0.46)	(15.03)
Lagged Dependent Variable	Yes	Yes	Yes	Yes	Yes	Yes
Instrumental Variable	Yes	Yes	Yes	Yes	Yes	Yes
N	72	54	54	80	60	40

Notes: All regressions include state and year fixed effects and are weighted. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Table 4 : Estimated Effects of Labor Market Conditions on Gender and Education Specific Groups Who Agree or Strongly Agree That Women Should Tend Home

	≤11 years			12-15 years			≥16 years		
Panel A: Men	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bartik	-0.79	-0.67	-0.84	-1.16*	-2.00**	-1.60*	-1.08	-0.23	1.18
	(1.15)	(1.76)	(1.40)	(0.59)	(0.79)	(0.87)	(0.87)	(1.14)	(1.22)
Lagged Dependent Variable	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Instrumental Variable	No	No	Yes	No	No	Yes	No	No	Yes
N	84	63	63	112	84	84	92	69	69
Panel B: Women	≤11 years			12-15 years			≥16 years		
Bartik	-0.55	-1.62	-1.57	0.08	-0.18	28.50	-0.21	-0.80	21.00
	(0.95)	(1.67)	(1.33)	(0.50)	(0.79)	(635.81)	(0.72)	(1.12)	(24.06)
Lagged Dependent Variable	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Instrumental Variable	No	No	Yes	No	No	Yes	No	No	Yes
N	100	75	75	112	84	84	80	60	40

Notes: All regressions include state and year fixed effects and are weighted. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Appendix

Table A1: First-stage relationship between changes in employment and changes in labor demand

	In(Employment)
Bartik Shocks	0.92*** (0.34)
N	84

Notes: No control variables other than state and year fixed effects are included. Bartik shocks are anchored in 1977. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Table A2: Fixed Effects Estimates of Labor Market Conditions on Share Agree or Strongly Agree That Women Should Tend Home

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
In(Employment)	-0.63** (0.25)			-0.48 (0.45)			-0.38 (0.31)		
Employment to Population Ratio		-1.00** (0.39)			-0.69 (0.76)			-0.52 (0.55)	
Bartik Shocks			-0.58* (0.29)			-0.83 (0.59)			-0.64 (0.52)
Lagged Dependent Variable				-0.20 (0.12)	-0.21* (0.12)	-0.21* (0.11)	0.15 (0.22)	0.20 (0.23)	0.16 (0.24)
Instrumental Variable	No	No	No	No	No	No	Yes	Yes	Yes
N	140	140	112	84	84	84	84	84	84

Notes: All regressions include state and year fixed effects and are weighted. Clustered standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Table A3: Fixed Effects Estimates of Labor Market Conditions on Share Agree That Women Are Not Suited for Politics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(Employment)	-0.19 (0.23)			-0.42 (0.38)			-0.31 (0.32)		
Employment to Population Ratio		-0.28 (0.34)			-0.50 (0.67)			-0.35 (0.54)	
Bartik Shocks			-0.28 (0.27)			-0.18 (0.41)			0.73 (1.04)
Lagged Dependent Variable				-0.28* (0.14)	-0.24 (0.16)	-0.28** (0.13)	0.29 (0.69)	0.43 (0.74)	0.70 (1.09)
Instrumental Variable	No	No	No	No	No	No	Yes	Yes	Yes
N	140	140	112	84	84	84	84	84	84

Notes: All regressions include state and year fixed effects and are weighted. Clustered standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01