

# Recession Severity and Lagging Employment

An Examination of the Effect of Recession Severity on Demographic Groups  
after the Great Recession

**William Schirmer**

Advisers: Chris Handy and Katharine Shester <sup>1</sup>

## Abstract

This paper uses the Current Population Survey to examine the differential experiences of demographic groups following the Great Recession. Geographic variation in recession severity is used to assess the effect of recession severity on long term employment outcomes. I use three empirical strategies to find that the effect of recession severity on employment is more severe for men in the short run, but quickly evens before affecting women more deeply. Seven years after the lowest point of employment, women are 100% more affected by local recession severity than men. For a 10% decrease in employment during the recession, this paper finds that women's employment after seven years is 4% lower than if there was no drop in employment during the recession while men's is 2% lower. These findings suggest that women suffer the long term effects of recessions significantly more than men.

## 1 Introduction

The Great Recession was characterized by severe unemployment and economic instability, but its lasting effect on employment rates is often overlooked. Persistently low employment rates that followed the Great Recession solidified speculations that the nature of recessions had changed drastically over the past 50 years. Expansions have grown in average duration, but economic recoveries after recessions have also grown tepid. Production and unemployment rates are observed recovering at slow, but steady rates until they reach pre-recession levels. However, "jobless recoveries" paired with employment scarring have caused employment rates to be depressed throughout economic

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expansions. Jobless recoveries are economic expansions during which macroeconomic indicators of growth rebound from an economic trough during recession, but employment lags behind. Scarring is the economic phenomenon where individuals who lose their jobs during recessions “continue to earn less or to be unemployed more than their non-displaced counterparts, even after the conclusion of a several-year adjustment period” (Ruhm, 1991). My research explores disparities between demographic group’s employment rate recoveries. I use varying geographic recession severity to examine the varied effect of recessions on demographic groups. Examining the differences in recoveries and those whose long term employment is most affected can guide our understanding of jobless recoveries and employment scarring.

## 1.1 Background

Over the past 50 years, the business cycle has changed drastically. In the past, recessions have typically displayed sharp downturns allowing employment rates to reach their trough quickly and then a slow return to pre-recession levels (Jaimovich and Siu, 2012). In the 1970, 1975, and 1982 recessions, we see the percent change in the employment rate reach its most negative value within 2-6 months followed by positive employment rate growth within 4-16 months. Despite the drop in production and any underlying causes to these recessions, there was a rapid return to growth when examining employment rates. In contrast, in the 1991, 2001, and 2009 recessions the time until the most negative percent change in employment rate was reached was extended to 17-23 months. Employment began to grow within 31-76 months. While these metrics are simplistic, they exhibit the lengthening of the impact of recessionary periods on employment. Siu and Jaimovich, among others, have described recent slow recoveries as jobless recoveries (Jaimovich and Siu, 2012).

Macroeconomic trends in recent recessions exhibit the symptoms of jobless recoveries or employment scarring, but do not validate these claims alone. Recent work focusing on the labor force experiences driving these trends has shown the effects of jobless recoveries and employment scarring more precisely. Work surrounding the 1991 recession found that those who lost their jobs earned 10-13 percent less than their non-displaced

counterparts after returning to work (Ruhm, 1991). Similar studies conducted using British data show comparable rates of wage scarring for workers who return to employment from unemployment (Arulampalam, 2001). While these studies both show the effect of job displacement on wages, others have shown significant impacts of recession on long term employment in populations. Recent work studying the effects of the Great Recession show that a 1 percentage point increase in the severity of the Great Recession in a local labor market is associated with over a 0.3 percentage points decrease in working age employment rates in 2015 (Yagan, 2019). Leveraging differential severity of the Great Recession across geographic areas allows us to study the effects of varying recession severity on long term outcomes. While the long term effect of recessions on employment has been documented, I add to the literature by focusing my research on determining the driving demographic groups behind employment hysteresis and using widely available data to verify recent work.

## 1.2 Mechanisms

While many have studied the general increase in length of recession recoveries, the economic literature has reached no consensus in determining the underlying cause of this shift in recovery dynamics from rapid and unpredictable to slow and lasting.

The mechanisms behind persistently low rates of employment can be divided into macroeconomic effects and individual level effects. Macroeconomic effects include structural changes and overall economic stagnation that may be occurring. Many speculate that structural changes to the labor market in the past 30 years have had a significant impact on recession recoveries. Structural changes in the labor market may have unexpected consequences during and after a recession. The effects of these changes may vary greatly by the demographic breakdown of any shifts in employment.

As the economy has become increasingly more global and the availability of efficient automation has increased, jobs have shifted away from routine low skill routine labor to non-routine or high skill labor (Burger and Schwartz, 2018). The shift away from low skill routine labor can be explained by large increases in non routine service industry jobs. From 1980 to 2005 the share of US labor hours in service occupations grew by 30%

after little growth in previous years. The growth in share of labor hours is even more pronounced for those with a high school education or less, as there was a 53% increase in service hours provided by this group. These changes in the service industry ran counter to other low skill occupations (Autor and Dorn, 2013). In 1968 73% of women's market hours were in services and this rose to 88% by 2008. Men saw a similar increase in their share of market hours in service industries, growing from 50% in 1968 to 65% in 2008. The difference in work allocation along side growth of female employment led to the service industry drastically changing in sex composition over time. In 1968, 37% of all service industry jobs were held by women. By 2008, 52% of service industry jobs were held by women (Ngai and Petrongolo, 2017). In some ways this concentration of women's work in service industry can help to protect them from economic fluctuations, as service industries are thought to be generally less cyclical than alternative industries (Hoynes et al., 2012). However, there could be unforeseen lasting effects on employment.

More general effects may also lead to persistently low employment rates following severe recessions. When the economy enters a recession the first jobs to be cut by companies are those that are easily replaced by outsourcing the labor or automating the job. After a recession, then there is little reason for employers to rehire the labor that was replaced (Jaimovich and Siu, 2012). This hypothesis aligns with others who have pointed to the increase in average duration of economic expansion as a potential cause for the decrease in employment rate recovery following recessions. Long expansions allow firms to take on unnecessary "fat" in the form of unproductive employees. When economic downturn occurs, firms fire these employees leaving them with only the most productive workers which leaves them well prepared to meet demand when the economy begins to recover. Therefore, any hiring of other workers is delayed by the relatively higher productivity of the surviving employees. David Berger uses a model based on this hypothesis to explain 55% of the decline in the procyclicality of average labor productivity and subsequent lagging employment (Berger, 2012).

Other researchers have explained the persistence of low employment rates through general economic stagnation. Since 1990, job reallocation rates, the rate of creation and destruction of jobs across employers, have fallen by more than a quarter and worker

reallocation rates, the rate at which employees change employers, have fallen a similar amount since 2000 (Davis and Haltiwanger, 2014). Decreasing fluidity in the labor market has been linked to aging businesses and fewer startups (Burger and Schwartz, 2018). The decrease in fluidity then can lead to decreased effectiveness of labor markets as job reallocation rates fall and workers struggle to find suitable employment pairings.

The mechanisms for persistently low employment outlined above all include changes to the demand for labor as a result of recessions. Despite the focus in most literature on demand side factors, there are additional changes in the supply of labor that may hinder employment rate recovery after recessions. During periods of extended unemployment, individuals may become discouraged and become marginally attached to the labor force. These individuals may not respond quickly to changes in the economy and thus depress the employment rate recovery. Further, others have documented the effect of unemployment spells on subsequent employment opportunities. In a 2013 study, Kroft, Lange and Notwidigdo examine negative duration dependence. Negative duration dependence is the decreasing probability that an individual finds a job as a result of unemployment spells. In their study they find that the probability that a job applicant receives a callback for an interview declines from nearly 8% to just above 4% after a 6 month unemployment spell (Kroft et al., 2013). Beyond six months of unemployment their callback rate further declines, but at a much slower rate. Their results show how poor economic conditions can affect the perceived quality of applicants, and thus depress long-term employment rates. Clearly, both supply side and demand side factors play a role in determining the employment rate recovery following economic downturn.

In my work I hope to isolate groups whose long term employment is most affected by recessions to examine any underlying causes and evaluate potential mechanisms. This work can help to inform decisions made to decrease the lasting effects of recessions on employment and aid any particularly affected groups.

## 2 Data: CPS Sample Design

In this paper we use the Current Population Survey, which is the primary source of labor force statistics for the Census Bureau. The survey is implemented by the U.S.

Census Bureau and the U.S. Bureau of Labor Statistics. The data set used in this paper to examine the demographic groups driving the long term low employment rate after the Great Recession is publicly available through IPUMS CPS<sup>2</sup>. IPUMS CPS is a condensed and harmonized version of the original Current Population Survey. Roughly 65,000 households are interviewed monthly to create the microdata set. The CPS uses a multi-stage stratified sample method to select counties and households for interview. The sampling method results in approximately one third of all U.S. counties being covered by survey responses. While using county level data would result in more variation in recession severity and demographic makeup of comparison groups, I use state level data due to sample size. Compiling survey results to the state level allows for more statistically meaningful results to be reached. Among selected households the average response rate for the monthly CPS is around 90% with all interviews being conducted by interviewers through personal visit or telephone interviews<sup>3</sup>

After each household is selected they remain in the sample for four consecutive months, before leaving the sample for the next 8 months, and finally returning for a final 4 more months in the sample. This rotating sample strategy means that in each monthly sample, 50% of the households were in the sample in the same month one year prior and 50% of the households will be in the sample in the same month of the next year<sup>4</sup>

While all months of the CPS are available this paper uses the Annual Social and Economic Supplement (ASEC), also known as the March supplement. The March Supplement includes an increased sample of over 95,000 households interviewed during February-April and an expanded set of social and economic questions for every member of each household. For the years 2006-2018 the number of individual responses ranges from 180,000-210,000 responses.

When using the March Supplement variables are condensed into categorical variables, such as race, education, age, and employment status<sup>5</sup>. This paper also uses 1990

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<sup>2</sup>For access to IPUMS CPS data please visit <https://cps.ipums.org/cps/>.

<sup>3</sup><https://www.census.gov/programs-surveys/cps/about/faqs.html#Q6>

<sup>4</sup>More information on CPS Sample Design can be found at the CPS IPUMS website.

<sup>5</sup>Employment to population ration is defined as those at work within the last week divided by population.

occupation data from the March Supplement paired with David Dorn’s six “Level 1” aggregate occupation groups<sup>67</sup>.

### 3 Empirical Strategy

To analyze the change in long term employment rates throughout and after the Great Recession, I use three empirical strategies. The first of the three strategies uses individual level CPS data to provide summary statistics. This strategy uses a simple linear probability for employment to provide summary statistics by demographic characteristics. The second strategy also uses individual level CPS data to examine individual’s predicted probability of employment based on location, demographic factors, and the severity of the recession in their locality. Lastly, CPS data that is grouped by demographic characteristics at the state level is used to compare the employment experiences of demographic groups across the country during the Great Recession. Each of these strategies provide additional information that allow us to create a more holistic picture of the Great Recession and particularly groups that drive long term employment hysteresis.

#### 3.1 Summary Regression

As noted above the first empirical strategy uses a linear probability model with individual level CPS data to track changes in employment from 2006-2017. The following regression specification can be used to describe the strategy.

$$y_{i,year} = \Gamma_{year} + \beta \cdot X_{dem} + Female \times \gamma_{year} + \Theta_{state} + \epsilon \quad (1)$$

Note that the left hand side variable in the specification is the probability that an individual is employed in the given year. The right hand side variables include dummy variables for year, demographic characteristics including sex, race, and education, an

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<sup>6</sup>Used in Autor and Dorn, “The Growth of Low-Skill Service Jobs \* and the Polarization of the U.S. Labor Market”.

<sup>7</sup>Level 1 Occupations: management/professional/technical/financial sales/public security occupations; Group 2: administrative support and retail sales occupations; Group 3: low skill occupations; Group 4: precision production and craft occupations; Group 5: machine operators, assemblers, and inspectors; Group 6: transportation/construction/mechanics/mining/agricultural occupations

interaction term between female and year, and lastly state geographic controls. The coefficients on each of the non-interacted variables can be interpreted as the percent change in the probability of employment. For example, if we found that there was a -0.03 coefficient on the year 2010, then we can interpret this as the relative change from 2006, the base year. Thus there would be a 3 percentage point decrease in the probability of employment from 2006 to 2010. Similar conclusions can be made for demographic characteristics. If a coefficient of 0.02 were found on Hispanic, we would interpret this as Hispanics being 2 percentage points more likely to be employed versus whites, the base case. When interpreting the coefficient on the interaction between female and year, we use the usual indicator variable interaction interpretation. For example a coefficient of 0.03 on female interacted with the year 2009 tells us that women are 3 percentage points more likely to be employed than men in 2009 relative to the 2006 female-male difference. Considering Figure 1, we would expect our regression results to appear similarly. Overall we see a drop in employment after the Great Recession followed by a slow return to prerecession levels. Therefore we would expect coefficients on our years to become increasingly negative, until returning slowly to near zero. Focusing on the coefficient on the interaction term, we would expect a positive coefficient on female interacted with the years most effected by the Great Recession, as women’s employment was relatively less affected as seen in Figure 1.

### 3.2 Individual Interaction

The individual interaction regressions also use individual level data in a linear probability model, but add state and sex specific recession severity measures as predictive of individuals’ future employment. The main regression specification equation can be found below.

$$y_{i,2017} = \gamma \cdot (-\% \Delta Emp_{07-10,s,state}) + \Gamma \cdot X_{dem} + \beta \cdot \% Emp_{2007} + \omega \cdot (-\% \Delta Emp_{07-10,s,state}) \cdot X_d + \epsilon \quad (2)$$

On the left hand side of the equation is the probability of an individual being em-



ployed in the selected year. In this case, the outcome year is 2017, however regressions were run so that every year from 2010-2017 was the outcome year. The right hand side variables vary across our five regressions. In our first two regressions the employment variables are calculated at the state level. For example Pct. Emp. 2007 is the employment percentage in 2007 in each state. In the last three regressions employment variables are calculated at the state by sex level. In these three regressions there would be a different measure of each employment variable for men and women at the state level.

On the right hand side of the equation we have the negative of recession severity at the state level as our first variable of interest. Recession severity is measured by the change in the employment to population ratio from 2007 to 2010 in each state. In Table 1 we see that this variable is almost always negative for both men and women, therefore we take the negative of the value to ease interpretation. The years 2007 to 2010 were chosen because the employment to population ratio generally hit its lowest point in 2010. Therefore, the change from 2007 to 2010 is indicative of the downturn in employment as a result of the recession, while the change from 2010 onward shows the recovery in the employment to population ratio.

A negative coefficient on the recession severity variable indicates that those who experienced a more severe recession are less likely to be employed in the outcome year if all else is equal. Demographic controls for sex, race, age, occupation, and education are also included. A state level measure of the employment to population ratio in 2007 is also included to control for differences in starting levels of employment to population ratios between states. Positive or negative coefficients on these variables can be interpreted directly. Lastly, recession severity is interacted with female and level of education. Since the negative of recession severity is expected to be positive and education and female are both indicator variables, a negative coefficient on the interaction suggests that for the interacted group, severe local recessions had a lasting impact on their long term employment. In contrast, a positive coefficient suggests a weaker effect of severe local recession on the interacted groups.

### 3.3 Grouped Interaction

In contrast to the other two regression specifications, the grouped regression specification collapses individual level data into broad demographic groups. Demographic groups were determined on the basis of sex, race, educational attainment, and state. For each demographic group the change in the employment to population ratio was calculated from 2007 to 2010 and from 2010 to 2017. The year 2010 was chosen as the pivot between these two metrics, as it was the year of the lowest overall employment to population ratio. Therefore, the change in the employment to population ratio for most demographic groups from 2007 to 2010 is negative, while the change from 2010 to 2017 is generally positive. Similarly to the individual level regressions, we use the negative of the change in employment from 2007 to 2010 for ease of interpretation. The regression equation is listed below and you will see both of these figures play a prominent role in the specification.

$$\begin{aligned} \% \Delta Emp_{10-17,g} = & \beta \cdot (-\% \Delta Emp_{07-10,g}) + \Gamma \cdot X_{dem} \\ & + \omega \cdot (-\% \Delta Emp_{07-10,g}) \cdot X_{dem} + \epsilon \quad (3) \end{aligned}$$

On the left hand side of the equation our outcome variable is the change in employment to population ratio for each demographic group,  $g$ . Recall we expect this value to be positive. The first right hand side variable is the negative of the change in the employment to population ratio from 2007 to 2010. We expect this value to be positive, so a negative coefficient for  $\beta$ , indicates that demographic groups more affected by the recession had slower recoveries all else equal. In contrast a positive coefficient suggests that more affected groups had stronger recoveries. Naturally, we should consider that more effected groups have much greater potential to recover from the recession. The next right hand side variables are the traditional demographic controls of sex, race, educational attainment, and state. A positive or negative coefficient on these variables can be interpreted as a percentage point change in the recovery of the employment rate after the trough of the recession, the change in the employment to population ratio from 2010 to 2017. Lastly, the recession severity, negative change in employment to popu-

lation ratio from 2007-2010, is interacted with sex, race, and educational attainment. Since the negative recession severity is expected to be positive, a negative coefficient on the interaction suggests a weaker recovery relative to other groups, while a positive coefficient suggest a relatively stronger recovery. The exact magnitude of these effects is difficult to determine, but the signs and general magnitude are strong indicators of relative recoveries of disparate demographic groups.

## 4 Results

### 4.1 Summary Regression

While the summary regression described in our empirical strategy does not dictate our final analysis of the employment hysteresis after the Great Recession, it helps to shape our analysis of further results. This specification uses a linear probability model to predict the changes in employment probability over time based on individual's demographic characteristics.

In column one of Table 2, we see employment regressed on demographic variables, education variables, and year and state fixed effects are included. The simplicity of the linear probability model allows us to interpret the coefficients on any variables directly. The model suggests that women have a roughly 14% lower probability of being employed in any given year than their male counterparts. We should expect this difference in employment levels considering historical trends and changes in employment levels over time. We can see this difference reflected in Figure 1. Further, there appear to be differences in employment probability based on race, age, and education. These coefficients align with our expectations as we would expect small racial differences in employment and age based on historical levels of employment. Differences in education also conform to our expectations as we see individuals with higher levels of education are significantly more likely to be employed. We can extend these interpretations to many of the results in Table 2 column 2, however we add an interaction term between female and year in this regression. The interaction shows us the relative difference between male and female employment over time. We see little difference between 2006 and 2008,

followed by a slight increase in the employment probability of women. The coefficients indicate that women are 2% - 3% more likely to be employed than men from 2009 to 2011, before returning to similar levels of relative employment. Overall, these results help us to understand the relative levels of employment between demographic groups and importantly between men and women.

## 4.2 Individual Interaction

In this specification I use individual level data to regress the employment in our outcome year of interest, 2017, on recession severity, demographic factors, education, occupation, and employment prior to the recession.

The first regression in the table is regresses individual's probability of employment on the state level recession severity and demographic variables. Recession severity is measured by the change in employment from 2007 to 2010. For nearly every state this value is negative, so we use the negative of the recession severity in our regressions. Therefore a positive coefficient on the variable suggests that individuals in more severely affected regions are more likely to be employed. The coefficient on recession severity in Table 11 column 1 is negative and takes a value of -0.390. This coefficient suggests that a more severe recessions, controlling for demographic differences, results in lower long term employment. For example, a 10% decrease in employment from 2007 to 2010 would be associated with 3.9 percentage point lower employment in 2017. The coefficients on all demographic variables can be interpreted directly as noted above. These results are consistent with our summary regression results in Table 2.

The remaining regressions include interaction terms that are our primary variables of interest. In Table 11 column 2, we first interact female with recession severity and find a coefficient of -0.308. We see that both men's and women's employment was negatively affected by a stronger recession. However, the strong coefficient on the interaction between female and recession severity suggests that the effect of the recessions was stronger for women in 2017. Between regressions 2 and 3, I change how the recession severity variables are calculated. For regressions 1 and 2, the recession severity variables are calculated at the state level. In regressions 3, 4, and 5 the recessions severity

variables are calculated at the state by gender level. Using sex specific employment variables allows for a more acute comparison between men's and women's experiences. We then add interactions for education levels and controls for occupation. Regression five is our preferred specification. In this specification we see that the coefficient on recession severity alone, which can be interpreted as the effect for men, is -0.209 and the coefficient on the interaction of recession severity and female is -0.200. Therefore we see that both men and women were affected by the recession, even seven years after the lowest point in employment, but women were effected significantly more so. A 10% change in employment form 2007 to 2010 in a state would suggest that men in the affected area were 2 percentage points less likely to be employed, while women were 4 percentage points less likely to be employed, all else equal.

### 4.3 Grouped Interaction

The grouped interaction model helps to provide insight to recession recovery and employment hysteresis, because of its unique outcome variable. The specification regresses the change in employment from 2010 to 2017 for a demographic group. In Table 3 column 1 we see the variables that create a demographic group, sex, race, age, and education. There are also state level fixed effects included in all regressions. Interpreting the coefficient on female in column 1 suggests that women see roughly 2% less of an increase in employment rates from 2010 to 2017. Another coefficient of note in column 1 is the coefficient on black. The coefficient of 0.039 implies that blacks experienced a 4% stronger increase in employment from 2010 to 2017 than whites. In column 2 of Table 3, the negative of recession severity is added to the regression specification. The coefficient of 0.570 suggests that more severely affected groups had significantly stronger recoveries in employment. A group that experienced a 10% decline in employment from 2007 to 2010 would expect an increase in employment of 2.5% greater than a group that experienced a 5% decline in employment. We should expect these results as more affected groups have significantly more potential for recovery. This is particularly true as employment levels begin to reach the speculated natural rate of employment.

In columns 3-5 of Table 3, the negative of recession severity is interacted with vari-

ables of interest, such as sex, race, and education. In column 3, the interaction with female has a negative coefficient of -0.230. This suggests that while affected groups have stronger recoveries in general, women have relatively weaker recoveries from the recession. For example, a group of men who experienced a 10% decline in employment from 2007 to 2010 would be expected to have a 23% stronger increase in employment between 2010 and 2017 than a similar group of women.

## 5 Effects Over Time

Each of these regression specifications point towards an interesting point of inquiry, but fail to provide any conclusive results when evaluated alone. However, when considered in concert there is strong evidence that employment hysteresis is differentially experienced by men and women, and further that women drive the slow return to employment that we observed after the Great Recession. Not only is it true that women are persistently less likely to be employed and show a more sustained drop in employment after the Great Recession at the national level, but these regressions show that women's employment is particularly sensitive to local recessions despite controls for occupation and education.

The individual level summary provide a simplistic evaluation of women's employment, but still allow insight into our main takeaway. When interacting female and year in column 2 of Table 2 the coefficients tell us that the change in women's employment is first quite similar to men's change in employment before diverging in 2009. In 2009 men's employment drops more than similar women's and this change persists for several years until the two converge in 2012. While these results do not point to any particular conclusion, they suggest that men and women had significantly different employment experiences after the Great Recession. Next we consider the grouped interaction regressions. In these regressions, we use the grouped data to help inform how differences in employment experiences during the recession shape a demographic group's recovery from the recession. This model is unique because it uses the change in employment from 2010 to 2017 as the outcome. The model shows the ability for a demographic group to bounce back after a decrease in employment. We see that more affected groups have greater increases in employment after the recession, however the negative and significant

coefficient on the interaction between female and recessions severity suggest that women have a much harder time recovering after a recession. Lastly our individual interaction regression allows us to track the probability of individual's employment over time as a result of demographic variables and recession severity. While in the results section of the paper I outline the regression results for 2017, each regression was conducted with years 2010 through 2017 as the outcome year of interest. This setup allows us to track the changes in coefficients over time. We use this technique to compare the differential effect of state level recessions on men's and women's employment over time. The results from each year are compiled in Figure 2. In 2011 we see that a more severe recession more strongly effected men, as their coefficient was roughly 70% while women's was roughly 50%. We then see the two coefficients converge as the effect of the recession on men's employment fades over time, while the effect on women persists. From 2011 to 2017 the effect on men drops roughly 50% while the effect on women drops 10%. These results suggest that there is a much stronger unemployment hysteresis effect present in the female population.

Overall we see that women's employment after the recession is not only lower in value, but the employment recovery after a shock is significantly longer lasting for women than men.

## 6 Conclusion

Over the past 40 years there have been far reaching changes in the economy. Women have entered the workforce in unprecedented levels, routine jobs have begun to be replaced by fewer workers operating machinery, and countless other changes. These changes have altered and continue to influence how the economy responds to shocks demanding the continual study of recessions and any subsequent recovery.

The evidence unveiled in this paper exposes a new realization in the recovery since the Great Recession. Earlier research has documented the effect of recession severity on long term employment and the lasting effects it can have. However, there has been little research showing the differences in recession recovery experiences between men and women. As far as nine years out from the beginning of the Great Recession we see that

women are 20% more affected by local recession severity than men.

Investigation into the groups that suffer the most and dynamics that fuel employment hysteresis help to inform policy to enable recession recoveries and help to validate or cast doubt on economic theories behind jobless recoveries and employment scarring. While results can never be applied directly, because of the variance from recession to recession, even small gains in understanding the complexities of past and future recessions can have profound impacts on economic stability and individual well-being.



## A Tables and Figures

**Table 1:** Percent Change in Employment from 2007 to 2010

State	Male	Female	State	Male	Female
Alabama	-10.4	-7.2	Missouri	-10.1	-3.7
Alaska	-4.8	0.5	Montana	-9.8	-4.7
Arizona	-11.5	-2.0	Nebraska	-1.1	-0.8
Arkansas	-6.5	-11.5	Nevada	-13.8	-10.4
California	-6.6	-2.7	New Hampshire	-4.6	-1.9
Colorado	-7.6	-2.4	New Jersey	-6.3	-0.7
Connecticut	-4.8	-5.1	New Mexico	-8.8	-7.4
Delaware	-5.7	-2.0	New York	-5.7	-4.6
District of Columbia	-5.9	-3.6	North Carolina	-6.5	-4.1
Florida	-10.6	-6.2	North Dakota	-1.4	-1.7
Georgia	-8.2	-2.5	Ohio	-7.6	-4.1
Hawaii	-4.4	0.0	Oklahoma	0.5	0.1
Idaho	-6.3	-5.5	Oregon	-7.4	-1.0
Illinois	-8.6	-0.4	Pennsylvania	-4.7	-4.6
Indiana	-7.9	-0.9	Rhode Island	-10.1	-4.4
Iowa	-3.3	0.4	South Carolina	-8.5	-0.1
Kansas	-5.6	-2.2	South Dakota	-7.4	0.3
Kentucky	-6.9	-2.0	Tennessee	-6.1	-3.0
Louisiana	-3.3	2.5	Texas	-5.4	-3.1
Maine	-5.2	-5.0	Utah	-12.0	-6.5
Maryland	-4.3	-0.8	Vermont	-3.9	-0.9
Massachusetts	-3.9	0.2	Virginia	-7.6	-5.5
Michigan	-8.1	-5.0	Washington	-9.4	-3.6
Minnesota	-4.7	-0.9	West Virginia	-6.0	-7.5
Mississippi	-10.7	-5.1	Wisconsin	-8.0	-5.0
			Wyoming	-7.5	-1.3

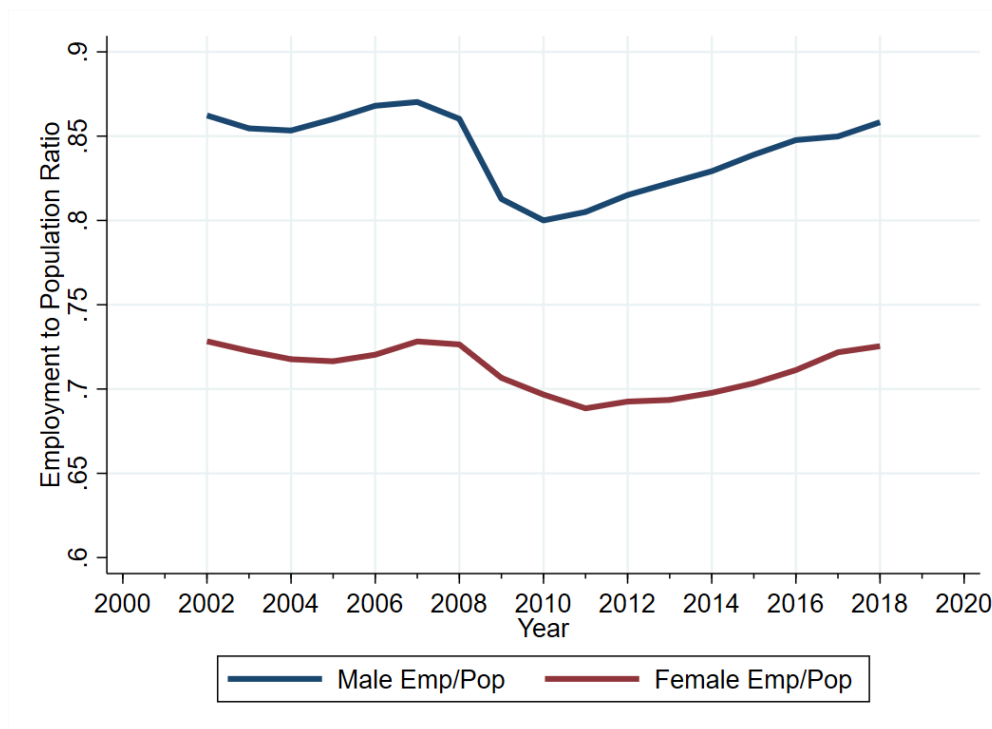
*Note: Age restricted to 25-55*

**Table 2:** Linear Probability Model for Employment: Summary Statistics

	(1)		(2)	
	Employment Probability		Employment Probability	
<b><i>Demographics</i></b>				
Female	-0.137***	(0.001)	-0.142***	(0.003)
Black	-0.045***	(0.001)	-0.045***	(0.001)
Hispanic	0.021***	(0.001)	0.021***	(0.001)
Other	-0.046***	(0.002)	-0.046***	(0.002)
Age 35-45	0.025***	(0.001)	0.025***	(0.001)
Age 45-55	0.007***	(0.001)	0.007***	(0.001)
High School	0.145***	(0.001)	0.146***	(0.001)
Some College	0.210***	(0.001)	0.210***	(0.001)
≥ Bachelors	0.286***	(0.001)	0.286***	(0.001)
<b><i>Year Interaction</i></b>				
Female × 2006			-0.012**	(0.004)
Female × 2007			-0.008	(0.004)
Female × 2008			-0.000	(0.004)
Female × 2009			0.028***	(0.004)
Female × 2010			0.028***	(0.004)
Female × 2011			0.017***	(0.004)
Female × 2012			0.009*	(0.004)
Female × 2013			0.002	(0.004)
Female × 2014			0.002	(0.004)
Female × 2015			-0.004	(0.004)
Female × 2016			-0.004	(0.004)
Female × 2017			0.004	(0.004)
Female × 2018			0.000	(.)
Year FE	Yes		Yes	
State FE	Yes		Yes	
Adjusted R-Squared	0.072		0.072	
Observations	1,059,096		1,059,096	

*Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.*

**Figure 1:** Employment to Population Ratio by Sex: Age 25-54



**Table 3:** Grouped Recession Recovery Model

	Percent Change in Employment from 2007 to 2010									
	(1)		(2)		(3)		(4)		(5)	
<b><i>Demographics</i></b>										
Female	-0.018***	(0.002)	-0.002	(0.002)	0.009***	(0.002)	-0.002	(0.002)	-0.002	(0.002)
Black	0.039***	(0.003)	0.017***	(0.003)	0.018***	(0.003)	0.015***	(0.004)	0.018***	(0.003)
Hispanic	0.012***	(0.003)	0.011***	(0.002)	0.012***	(0.002)	0.007*	(0.003)	0.012***	(0.002)
Other	-0.004	(0.004)	0.000	(0.003)	0.001	(0.003)	0.003	(0.003)	0.000	(0.003)
Age 35-45	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)
Age 45-55	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.002)
High School	-0.027***	(0.004)	-0.022***	(0.004)	-0.021***	(0.003)	-0.022***	(0.003)	-0.025***	(0.005)
Some College	-0.013**	(0.004)	-0.004	(0.004)	-0.002	(0.003)	-0.003	(0.004)	-0.002	(0.005)
≥ Bachelors	-0.024***	(0.004)	0.005	(0.004)	0.007*	(0.004)	0.005	(0.004)	0.009*	(0.004)
<b><i>Recession Severity</i></b>										
−%Δ Emp. 07-10			0.570***	(0.015)	0.697***	(0.021)	0.570***	(0.025)	0.596***	(0.032)
Female × −%Δ Emp. 07-10					-0.230***	(0.026)				
Black × −%Δ Emp. 07-10							0.025	(0.039)		
Hispanic × −%Δ Emp. 07-10							0.077*	(0.036)		
Other × −%Δ Emp. 07-10							-0.114**	(0.039)		
High School × −%Δ Emp. 07-10									0.050	(0.042)
Some College × −%Δ Emp. 07-10									-0.008	(0.040)
≥ Bachelors × −%Δ Emp. 07-10									-0.160***	(0.044)
State FE	Yes		Yes		Yes		Yes		Yes	
Adjusted R-Squared	0.137		0.373		0.385		0.376		0.377	
Observations	4,110		3,962		3,962		3,962		3,962	

*Note: Age restricted to 25-55*

**Table 4:** Linear Probability Model for Employment: Individual Interaction - 2010

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.877***	(0.07)	-0.927***	(0.10)	-0.964***	(0.09)	-0.945***	(0.09)	-1.018***	(0.09)
Pct. Emp. 2007	0.725***	(0.06)	0.725***	(0.06)	0.807***	(0.05)	0.778***	(0.05)	0.837***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.113***	(0.00)	-0.118***	(0.01)	-0.038***	(0.01)	-0.139***	(0.01)	-0.133***	(0.01)
Black	-0.060***	(0.00)	-0.060***	(0.00)	-0.061***	(0.00)	-0.060***	(0.00)	-0.061***	(0.00)
Hispanic	0.013**	(0.00)	0.013**	(0.00)	0.014**	(0.00)	0.013**	(0.00)	0.013**	(0.00)
Other	-0.043***	(0.01)	-0.043***	(0.01)	-0.043***	(0.01)	-0.043***	(0.01)	-0.043***	(0.01)
Age 35-45	0.027***	(0.00)	0.027***	(0.00)	0.027***	(0.00)	0.027***	(0.00)	0.027***	(0.00)
Age 45-55	0.012***	(0.00)	0.012***	(0.00)	0.012***	(0.00)	0.012***	(0.00)	0.012***	(0.00)
High School	0.159***	(0.01)	0.159***	(0.01)	0.159***	(0.01)	0.108***	(0.01)	0.108***	(0.01)
Some College	0.219***	(0.01)	0.219***	(0.01)	0.219***	(0.01)	0.157***	(0.01)	0.158***	(0.01)
$\geq$ Bachelors	0.301***	(0.01)	0.301***	(0.01)	0.300***	(0.01)	0.252***	(0.01)	0.254***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			0.099	(0.14)	0.135	(0.13)	0.125	(0.13)	0.120	(0.13)
Female $\times$ High School							0.108***	(0.01)	0.107***	(0.01)
Female $\times$ Some College							0.124***	(0.01)	0.124***	(0.01)
Female $\times$ $\geq$ Bachelors							0.101***	(0.01)	0.100***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.065		0.065		0.067		0.068		0.068	
Observations	86,996		86,996		86,996		86,996		86,996	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 5:** Linear Probability Model for Employment: Individual Interaction - 2011

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.542***	(0.07)	-0.611***	(0.11)	-0.705***	(0.09)	-0.685***	(0.09)	-0.718***	(0.09)
Pct. Emp. 2007	0.915***	(0.06)	0.915***	(0.06)	0.887***	(0.05)	0.854***	(0.05)	0.904***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.124***	(0.00)	-0.131***	(0.01)	-0.031**	(0.01)	-0.144***	(0.01)	-0.138***	(0.01)
Black	-0.069***	(0.00)	-0.069***	(0.00)	-0.069***	(0.00)	-0.070***	(0.00)	-0.069***	(0.00)
Hispanic	0.015***	(0.00)	0.015***	(0.00)	0.015***	(0.00)	0.015***	(0.00)	0.020***	(0.00)
Other	-0.041***	(0.01)	-0.041***	(0.01)	-0.042***	(0.01)	-0.041***	(0.01)	-0.039***	(0.01)
Age 35-45	0.031***	(0.00)	0.031***	(0.00)	0.031***	(0.00)	0.032***	(0.00)	0.032***	(0.00)
Age 45-55	0.013***	(0.00)	0.013***	(0.00)	0.013***	(0.00)	0.013***	(0.00)	0.014***	(0.00)
High School	0.161***	(0.01)	0.161***	(0.01)	0.161***	(0.01)	0.111***	(0.01)	0.112***	(0.01)
Some College	0.225***	(0.01)	0.225***	(0.01)	0.225***	(0.01)	0.151***	(0.01)	0.153***	(0.01)
$\geq$ Bachelors	0.308***	(0.01)	0.308***	(0.01)	0.308***	(0.01)	0.251***	(0.01)	0.253***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			0.134	(0.15)	0.230	(0.13)	0.217	(0.13)	0.222	(0.13)
Female $\times$ High School							0.104***	(0.01)	0.104***	(0.01)
Female $\times$ Some College							0.148***	(0.01)	0.147***	(0.01)
Female $\times$ $\geq$ Bachelors							0.118***	(0.01)	0.117***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.071		0.071		0.073		0.075		0.075	
Observations	84,391		84,391		84,391		84,391		84,391	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 6:** Linear Probability Model for Employment: Individual Interaction - 2012

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.500***	(0.07)	-0.500***	(0.11)	-0.630***	(0.09)	-0.624***	(0.09)	-0.642***	(0.09)
Pct. Emp. 2007	0.780***	(0.06)	0.780***	(0.06)	0.742***	(0.05)	0.709***	(0.05)	0.723***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.132***	(0.00)	-0.132***	(0.01)	-0.053***	(0.01)	-0.160***	(0.01)	-0.159***	(0.01)
Black	-0.060***	(0.00)	-0.060***	(0.00)	-0.061***	(0.00)	-0.061***	(0.00)	-0.060***	(0.00)
Hispanic	0.023***	(0.00)	0.023***	(0.00)	0.023***	(0.00)	0.023***	(0.00)	0.026***	(0.00)
Other	-0.054***	(0.01)	-0.054***	(0.01)	-0.054***	(0.01)	-0.053***	(0.01)	-0.051***	(0.01)
Age 35-45	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)
Age 45-55	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)
High School	0.146***	(0.01)	0.146***	(0.01)	0.147***	(0.01)	0.100***	(0.01)	0.101***	(0.01)
Some College	0.207***	(0.01)	0.207***	(0.01)	0.207***	(0.01)	0.146***	(0.01)	0.147***	(0.01)
$\geq$ Bachelors	0.295***	(0.01)	0.295***	(0.01)	0.295***	(0.01)	0.234***	(0.01)	0.236***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			-0.001	(0.15)	0.122	(0.13)	0.125	(0.13)	0.138	(0.13)
Female $\times$ High School							0.096***	(0.01)	0.096***	(0.01)
Female $\times$ Some College							0.124***	(0.01)	0.124***	(0.01)
Female $\times$ $\geq$ Bachelors							0.123***	(0.01)	0.122***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.070		0.070		0.071		0.073		0.073	
Observations	82,237		82,237		82,237		82,237		82,237	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 7:** Linear Probability Model for Employment: Individual Interaction - 2013

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.400***	(0.07)	-0.408***	(0.11)	-0.496***	(0.09)	-0.487***	(0.09)	-0.444***	(0.09)
Pct. Emp. 2007	0.711***	(0.06)	0.711***	(0.06)	0.694***	(0.05)	0.664***	(0.05)	0.633***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.140***	(0.00)	-0.140***	(0.01)	-0.058***	(0.01)	-0.171***	(0.01)	-0.174***	(0.01)
Black	-0.054***	(0.00)	-0.054***	(0.00)	-0.055***	(0.00)	-0.055***	(0.00)	-0.055***	(0.00)
Hispanic	0.021***	(0.00)	0.021***	(0.00)	0.021***	(0.00)	0.021***	(0.00)	0.022***	(0.00)
Other	-0.049***	(0.01)	-0.049***	(0.01)	-0.049***	(0.01)	-0.048***	(0.01)	-0.046***	(0.01)
Age 35-45	0.026***	(0.00)	0.026***	(0.00)	0.026***	(0.00)	0.026***	(0.00)	0.026***	(0.00)
Age 45-55	0.006	(0.00)	0.006	(0.00)	0.006	(0.00)	0.006	(0.00)	0.006	(0.00)
High School	0.141***	(0.01)	0.141***	(0.01)	0.142***	(0.01)	0.093***	(0.01)	0.093***	(0.01)
Some College	0.212***	(0.01)	0.212***	(0.01)	0.212***	(0.01)	0.148***	(0.01)	0.149***	(0.01)
$\geq$ Bachelors	0.292***	(0.01)	0.292***	(0.01)	0.292***	(0.01)	0.232***	(0.01)	0.232***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			0.015	(0.15)	0.002	(0.13)	0.004	(0.13)	0.016	(0.13)
Female $\times$ High School							0.103***	(0.01)	0.104***	(0.01)
Female $\times$ Some College							0.133***	(0.01)	0.133***	(0.01)
Female $\times$ $\geq$ Bachelors							0.126***	(0.01)	0.126***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.071		0.071		0.072		0.074		0.074	
Observations	81,970		81,970		81,970		81,970		81,970	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.



**Table 8:** Linear Probability Model for Employment: Individual Interaction - 2014

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.365***	(0.07)	-0.391***	(0.11)	-0.351***	(0.09)	-0.346***	(0.09)	-0.442***	(0.10)
Pct. Emp. 2007	0.825***	(0.06)	0.825***	(0.06)	0.808***	(0.05)	0.775***	(0.05)	0.844***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.140***	(0.00)	-0.143***	(0.01)	-0.033**	(0.01)	-0.171***	(0.01)	-0.167***	(0.01)
Black	-0.039***	(0.00)	-0.039***	(0.00)	-0.039***	(0.00)	-0.039***	(0.00)	-0.039***	(0.00)
Hispanic	0.028***	(0.00)	0.028***	(0.00)	0.028***	(0.00)	0.028***	(0.00)	0.031***	(0.00)
Other	-0.041***	(0.01)	-0.041***	(0.01)	-0.041***	(0.01)	-0.040***	(0.01)	-0.036***	(0.01)
Age 35-45	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)	0.034***	(0.00)
Age 45-55	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.012***	(0.00)
High School	0.142***	(0.01)	0.142***	(0.01)	0.142***	(0.01)	0.081***	(0.01)	0.082***	(0.01)
Some College	0.200***	(0.01)	0.200***	(0.01)	0.200***	(0.01)	0.123***	(0.01)	0.125***	(0.01)
$\geq$ Bachelors	0.289***	(0.01)	0.289***	(0.01)	0.289***	(0.01)	0.211***	(0.01)	0.214***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			0.049	(0.15)	-0.133	(0.13)	-0.117	(0.13)	-0.018	(0.13)
Female $\times$ High School							0.128***	(0.01)	0.127***	(0.01)
Female $\times$ Some College							0.157***	(0.01)	0.156***	(0.01)
Female $\times$ $\geq$ Bachelors							0.158***	(0.01)	0.158***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.070		0.070		0.071		0.074		0.075	
Observations	79,954		79,954		79,954		79,954		79,954	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 9:** Linear Probability Model for Employment: Individual Interaction - 2015

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.498***	(0.07)	-0.402***	(0.11)	-0.370***	(0.09)	-0.377***	(0.09)	-0.473***	(0.09)
Pct. Emp. 2007	0.690***	(0.06)	0.691***	(0.06)	0.733***	(0.05)	0.696***	(0.05)	0.791***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.146***	(0.00)	-0.137***	(0.01)	-0.047***	(0.01)	-0.193***	(0.01)	-0.184***	(0.01)
Black	-0.046***	(0.00)	-0.046***	(0.00)	-0.046***	(0.00)	-0.046***	(0.00)	-0.045***	(0.00)
Hispanic	0.026***	(0.00)	0.026***	(0.00)	0.026***	(0.00)	0.026***	(0.00)	0.032***	(0.00)
Other	-0.051***	(0.01)	-0.051***	(0.01)	-0.051***	(0.01)	-0.050***	(0.01)	-0.045***	(0.01)
Age 35-45	0.029***	(0.00)	0.029***	(0.00)	0.030***	(0.00)	0.030***	(0.00)	0.030***	(0.00)
Age 45-55	0.005	(0.00)	0.005	(0.00)	0.005	(0.00)	0.006	(0.00)	0.006	(0.00)
High School	0.136***	(0.01)	0.136***	(0.01)	0.136***	(0.01)	0.081***	(0.01)	0.083***	(0.01)
Some College	0.212***	(0.01)	0.212***	(0.01)	0.212***	(0.01)	0.128***	(0.01)	0.131***	(0.01)
$\geq$ Bachelors	0.292***	(0.01)	0.292***	(0.01)	0.291***	(0.01)	0.204***	(0.01)	0.207***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			-0.186	(0.15)	-0.220	(0.13)	-0.193	(0.13)	-0.145	(0.13)
Female $\times$ High School							0.113***	(0.01)	0.112***	(0.01)
Female $\times$ Some College							0.170***	(0.01)	0.169***	(0.01)
Female $\times$ $\geq$ Bachelors							0.178***	(0.01)	0.176***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.076		0.076		0.077		0.082		0.082	
Observations	79,158		79,158		79,158		79,158		79,158	

Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 10:** Linear Probability Model for Employment: Individual Interaction - 2016

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.401***	(0.08)	-0.284**	(0.11)	-0.151	(0.09)	-0.154	(0.09)	-0.256**	(0.10)
Pct. Emp. 2007	0.662***	(0.06)	0.662***	(0.06)	0.688***	(0.05)	0.664***	(0.05)	0.713***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.146***	(0.00)	-0.135***	(0.01)	-0.040***	(0.01)	-0.180***	(0.01)	-0.178***	(0.01)
Black	-0.039***	(0.00)	-0.039***	(0.00)	-0.039***	(0.00)	-0.039***	(0.00)	-0.037***	(0.00)
Hispanic	0.015***	(0.00)	0.015***	(0.00)	0.015***	(0.00)	0.015***	(0.00)	0.020***	(0.00)
Other	-0.056***	(0.01)	-0.056***	(0.01)	-0.056***	(0.01)	-0.054***	(0.01)	-0.051***	(0.01)
Age 35-45	0.020***	(0.00)	0.020***	(0.00)	0.020***	(0.00)	0.021***	(0.00)	0.020***	(0.00)
Age 45-55	0.008*	(0.00)	0.008*	(0.00)	0.008*	(0.00)	0.008*	(0.00)	0.009*	(0.00)
High School	0.111***	(0.01)	0.111***	(0.01)	0.112***	(0.01)	0.058***	(0.01)	0.059***	(0.01)
Some College	0.185***	(0.01)	0.185***	(0.01)	0.186***	(0.01)	0.105***	(0.01)	0.106***	(0.01)
$\geq$ Bachelors	0.270***	(0.01)	0.270***	(0.01)	0.270***	(0.01)	0.186***	(0.01)	0.189***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			-0.224	(0.15)	-0.393**	(0.13)	-0.366**	(0.13)	-0.287*	(0.13)
Female $\times$ High School							0.110***	(0.01)	0.109***	(0.01)
Female $\times$ Some College							0.163***	(0.01)	0.162***	(0.01)
Female $\times$ $\geq$ Bachelors							0.168***	(0.01)	0.167***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.073		0.073		0.074		0.078		0.079	
Observations	73,520		73,520		73,520		73,520		73,520	

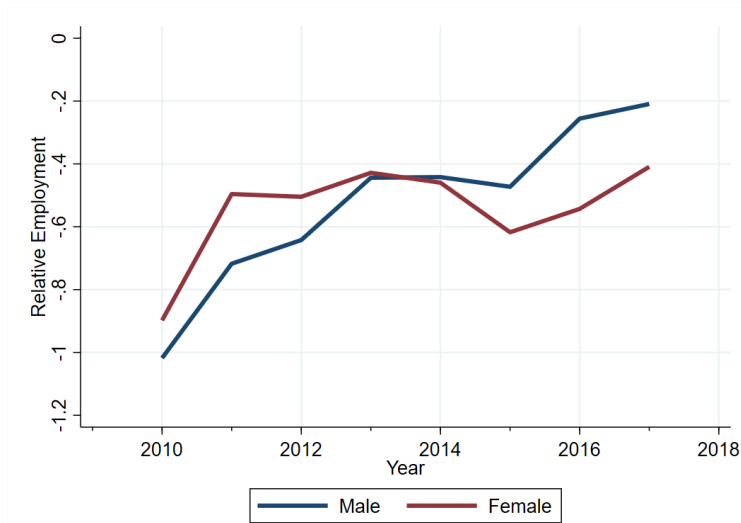
Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Table 11:** Linear Probability Model for Employment: Individual Interaction - 2017

	State Level Employment Variables				Sex $\times$ State Level Employment Variables					
	(1)		(2)		(3)		(4)		(5)	
<b><i>Employment</i></b>										
−% $\Delta$ Emp. 07-10	-0.390***	(0.07)	-0.229*	(0.11)	-0.170	(0.09)	-0.157	(0.09)	-0.209*	(0.10)
Pct. Emp. 2007	0.703***	(0.06)	0.704***	(0.06)	0.736***	(0.05)	0.714***	(0.05)	0.708***	(0.05)
<b><i>Demographics</i></b>										
Female	-0.138***	(0.00)	-0.123***	(0.01)	-0.028**	(0.01)	-0.156***	(0.01)	-0.163***	(0.01)
Black	-0.033***	(0.00)	-0.033***	(0.00)	-0.033***	(0.00)	-0.033***	(0.00)	-0.032***	(0.00)
Hispanic	0.017***	(0.00)	0.017***	(0.00)	0.017***	(0.00)	0.017***	(0.00)	0.018***	(0.00)
Other	-0.049***	(0.01)	-0.049***	(0.01)	-0.049***	(0.01)	-0.048***	(0.01)	-0.047***	(0.01)
Age 35-45	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)	0.011**	(0.00)
Age 45-55	0.001	(0.00)	0.001	(0.00)	0.001	(0.00)	0.002	(0.00)	0.002	(0.00)
High School	0.129***	(0.01)	0.128***	(0.01)	0.129***	(0.01)	0.084***	(0.01)	0.083***	(0.01)
Some College	0.206***	(0.01)	0.206***	(0.01)	0.206***	(0.01)	0.128***	(0.01)	0.128***	(0.01)
$\geq$ Bachelors	0.274***	(0.01)	0.274***	(0.01)	0.274***	(0.01)	0.198***	(0.01)	0.197***	(0.01)
<b><i>Interactions</i></b>										
Female $\times$ −% $\Delta$ Emp. 07-10			-0.308*	(0.15)	-0.309*	(0.13)	-0.302*	(0.13)	-0.200	(0.13)
Female $\times$ High School							0.093***	(0.01)	0.094***	(0.01)
Female $\times$ Some College							0.158***	(0.01)	0.158***	(0.01)
Female $\times$ $\geq$ Bachelors							0.154***	(0.01)	0.155***	(0.01)
Occupation FE	No		No		No		No		Yes	
Adjusted R-Squared	0.068		0.068		0.070		0.073		0.073	
Observations	73,393		73,393		73,393		73,393		73,393	

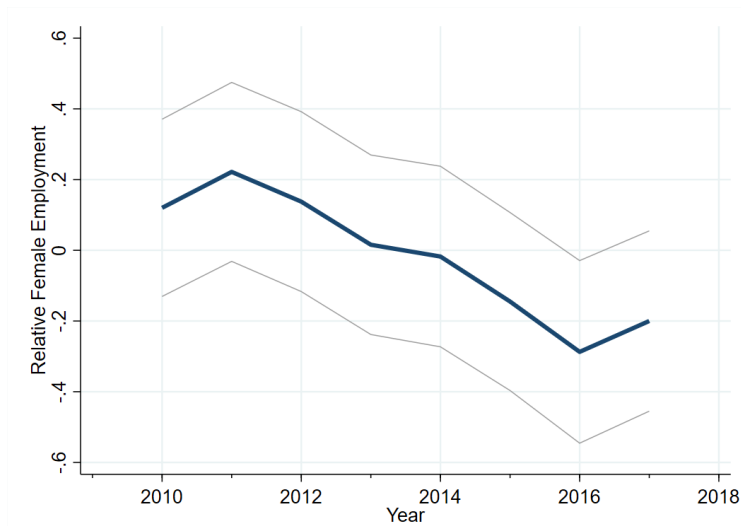
Note: Age restricted to 25-55; Omitted categories are sex: male, race: non-Hispanic white, age: 25-34, education: less than high school.

**Figure 2:** Female and Male Employment  $\times$  Recession Severity



Note: Coefficients are reported from Linear Probability Model for Employment: Individual Interaction Column 5. Male Coefficient is  $-\% \Delta \text{Emp.} 07-10$ . Female Coefficient is generated by summing Female  $\times -\% \Delta \text{Emp.} 07-10$  and  $-\% \Delta \text{Emp.} 07-10$ . Age restricted to 25-55

**Figure 3:** Female Employment  $\times$  Recession Severity



Note: Coefficient reported from Linear Probability Model for Employment: Individual Interaction Column 5. Coefficient reported is Female  $\times -\% \Delta \text{Emp.} 07-10$  with 95% CIs. Age restricted to 25-55.

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