

# The Great Recession and Women's Employment

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## **Abstract**

Gender inequality in the workplace has been a focal point of politics in modern society. Even though great strides have been made in closing gaps in pay between men and women, some critics remain unconvinced that men and women are today treated the same in the workplace. The literature has generally established that the pay gap today is mainly explained by childbearing and caregiving effects. However, whether firms value female and male labor supply differently has not been determined. I turn to the exogenous shock of the 2008 Financial Crisis to examine how firms adjusted their labor gender composition in response to financial distress. This approach provides insight into whether employers view male and female labor as perfect substitutes or if gender-based preferences influence labor retention during difficult times. I find evidence that firms tended to retain women more than men as a response to the crisis.

## 1. Introduction

The literature has established that men and women choose to supply labor and join the labor market due to different factors, and it is clear that gender dynamics play a role in the labor market. Using COVID-19 as a case study, Alon et al. (2020) show that women experienced disproportionate employment losses relative to men during the pandemic due to childcare burdens and sectoral effects. However, it has been less established if firms value male or female labor inputs differently. In this paper, I use the exogenous shock of the 2008 Financial Crisis to determine if firms tended to hire one gender more than the other.

I use Difference-in-Differences (DiD), Triple Differences (DDD), and Event Study approaches to measure firm behavior in reallocating their gender labor mix when macroeconomic conditions tightened during the 2008 Financial Crisis, where the unemployment rate rose to a peak of 10% in October 2010. The results suggest that women were approximately 2 percentage points more likely to remain employed than men during the crisis.

## 2. Data

To investigate changes in employment, I use data from the Current Population Survey (CPS), as harmonized by IPUMS. The dataset utilized is a monthly repeated cross section spanning from 2006 to 2011. Variables include household covariates such as number of children and household income, demographics, labor status and income.

I recognize from prior literature that gender-related labor market effects are influenced by sector of employment. The sector variable in the CPS dataset separates public sector employees from private sectors, even if they hold similar roles. Thus, to have a meaningful comparison of similar roles between public and private employees, I utilize the occupation variable, and recategorize it to 13 broad categories. To ensure comparability and minimize occupational composition bias, I exclude individuals serving in the Armed Forces and restrict the estimation sample to civilian occupations with meaningful variation in public and private employment. Specifically, I drop occupation categories in which more than 95% or less than 5% of workers are employed in the private sector. For example, sectors such as agriculture and armed forces were dropped due to large imbalances in public/private share. This resulted in the dataset being reduced by 1/6.

The CPS surveys include children and those who may not be fully participating in the labor force. Thus, I only include people who are between the ages of 21 and 65 in the estimation sample.

Women could have entered the workforce due to financial limitations imposed on their partners by the crisis. Thus, I drop all people who were out of the labor force in the control year (2007), to identify changes in employment status for those already in the labor force in order to measure firm decisions on retaining women at a different rate.

Occupation Group	Observations	Private Share (%)
Agriculture/Forestry/Fishing	4,249	96%
Armed Forces	108	0%
Arts/Media/Communication	10,110	92%
Construction/Extraction	35,071	94%
Education/Training/Library	34,631	32%
Food/Personal Service	65,391	89%
Health/Medical	42,698	89%
Maintenance/Repair	19,770	91%
Management/Business/Finance	84,358	88%
Other/Unknown	147,652	6%
Production/Manufacturing	35,317	97%
Protective Service	11,445	30%
STEM/Technical/Engineering	22,562	87%
Sales/Office/Admin	127,486	89%
Science/Research	5,489	68%
Social/Community Service	9,249	63%
Transportation/Material Moving	32,780	92%

Table 1: Private Sector Share by Occupation Group

### 3. Empirical Strategy

In order to identify if corporations value the employment of women and men differently, I utilize the exogenous shock of the 2008 Financial Crisis, which started in December 2007. The reasoning being that if firms do not consider male and female labor as perfect substitutes, and have discriminatory views favoring one gender, workers of that gender will experience a positive employment shock relative to the other gender.

Firstly, I use a Difference-in-Difference setup with female workers being the treatment group, and months after the Stock Market crash being coded as post-treatment.

$$P(\text{Employed}_{i,s,t}) = \gamma(\text{Female}_i \times \text{PostCrash}_t) + X'_{i,t} + \alpha_s + \varepsilon_{i,t} \quad (1)$$

Where  $\gamma$  is the parameter of interest that measures the impact of the recession on female employees,  $X'_{i,t}$  are demographic, household, and labor-related controls, and  $\alpha_s$  are state-level fixed effects. The estimates of change in probability of employment are obtained using a linear probability model, as logit and probit specifications in Difference in Difference settings can be problematic.

This model yields the change in employment probability by gender during the recession, but it doesn't isolate firm-level employment decisions. Specifically, the baseline specification reflects aggregate employment outcomes, which may be influenced by both firm behavior and labor supply decisions.

To more directly capture how firms adjusted their workforce composition in response to the crisis, I distinguish between public and private sector employment. Public sector employees experienced far lower rates of layoffs than their private counterparts during the crisis. This difference stems from several institutional differences: Government services are essential, thus governments need most of their organs to function and can less easily cut back on "non-essential" components of their operations, especially during crises. Additionally, public sector employment is more insulated due to a higher prevalence of unions, and the bureaucratic complexity involved in executing layoffs.

For this reason, I use government workers as another control group to strengthen identification. The assumption being that, due to the relativity of public sector employment, any disproportionate change in employment by gender can be attributed to firm decision making rather than to changes in labor supply. One way to construct this model would be to use the DiD setting of equation (1), replacing the female treatment group with a private sector employee treatment group, and estimating coefficients with a female subsample and a male subsample, such as:

$$P(\text{Employed}_{i,s,t} | \text{Female}) = \gamma(\text{Private}_i \times \text{PostCrash}_t) + X'_{i,t} + \alpha_s + \varepsilon_{i,t} \quad (2)$$

$$P(\text{Employed}_{i,s,t} | \text{Male}) = \gamma(\text{Private}_i \times \text{PostCrash}_t) + X'_{i,t} + \alpha_s + \varepsilon_{i,t} \quad (3)$$

A Triple Difference approach can be used to obtain a robust estimate of this difference. By using two treatment groups, Female and Private Sector Employee, as a triple interaction term, the relative difference in employment probability by gender for firms can be estimated:

$$P(\text{Employed}_{i,s,t}) = \gamma(\text{Private}_i \times \text{Female}_i \times \text{PostCrash}_t) + X'_{i,t} + \alpha_s + \varepsilon_{i,t} \quad (4)$$

It is possible to extend these specifications to obtain how the employment probability changed in following years using an event study methodology. 2007 (the year preceding the Recession) is used as the base year, with the effects of all other years estimated.

$$P(\text{Employed}_{i,s,t}) = \sum_{y \neq 2007} \beta_y [\mathbf{1}\{\text{Year}_t = y\} \times \text{Female}_i] + X'_{i,s,t} + \alpha_s + \varepsilon_{i,s,t} \quad (5)$$

For the DDD specification, the model would be:

$$P(\text{Employed}_{i,s,t}) = \sum_{y \neq 2007} \gamma_y [\mathbf{1}\{\text{Year}_t = y\} \times \text{Private}_i \times \text{Female}_i] + X'_{i,s,t} + \alpha_s + \varepsilon_{i,s,t} \quad (6)$$

Where  $\mathbf{1}\{\cdot\}$  is an indicator function.

## 4. Results

Table 2: DiD and DDD Specifications

	Employed	
	(1)	(4)
PostCrash $\times$ Female	0.0158*** (0.0018)	$-7.9 \times 10^{-5}$ (0.0028)
PostCrash $\times$ Private $\times$ Female		0.0169*** (0.0029)
Observations	501,040	501,040
R <sup>2</sup>	0.037	0.039
State fixed effects	✓	✓

Standard errors clustered at the state level. Controls for both specifications include age, education, race, marital status, and occupation category. Fixed effects implemented on the state level. Data from every month of 2007-2008.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

The DiD and DDD results paint a clear picture, women were more likely to be employed by men during the 2008 Recession. In the Difference-in-Difference setting (1), women tended to be 1.58 percentage points more likely to be employed after the shock. In the Triple-Difference setting (4), women working for private firms tended to be 1.69 percentage points more likely to be employed than their male counterparts.

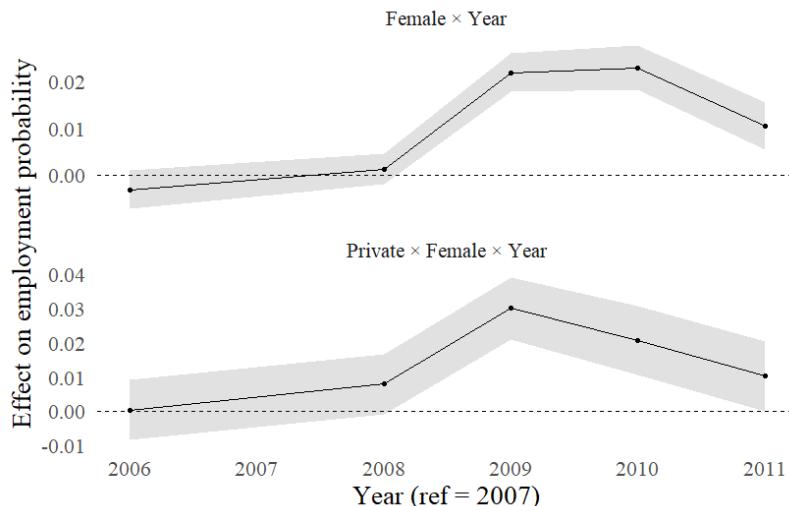


Figure 1: Event Study Coefficients with 95% Confidence Intervals

The figure above represents the results of the event study methodology for both DiD and DDD specifications, with the confidence bands at a 5% significance level. For both models, the 2006 coefficient is insignificant as expected, indicating no pre-trend prior to the crisis. Starting in 2008, the coefficients become positive (though not significant for model 5), and remain that way until 2011.

Table 3: Event Study Specifications

	Employed	
	(5)	(6)
Female $\times$ Year = 2006	-0.0033 (0.0037)	-0.0031 (0.0021)
Female $\times$ Year = 2008	-0.0059 (0.0038)	0.0013 (0.0016)
Female $\times$ Year = 2009	-0.0058 (0.0038)	0.0219*** (0.0021)
Female $\times$ Year = 2010	0.0034 (0.0049)	0.0229*** (0.0024)
Female $\times$ Year = 2011	0.0006 (0.0046)	0.0105*** (0.0026)
Private $\times$ Female $\times$ Year = 2006	0.0003 (0.0045)	
Private $\times$ Female $\times$ Year = 2008	0.0080* (0.0045)	
Private $\times$ Female $\times$ Year = 2009	0.0301*** (0.0046)	
Private $\times$ Female $\times$ Year = 2010	0.0207*** (0.0051)	
Private $\times$ Female $\times$ Year = 2011	0.0102* (0.0052)	
Observations	501,040	501,040
R <sup>2</sup>	0.04202	0.04005
State fixed effects	✓	✓

Standard errors clustered at the state level. Controls for both specifications include age, education, race, marital status, and occupation category. Fixed effects implemented on the state level. Data from every month of 2007-2008.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

## **5. Conclusion**

Through my Triple-Difference analysis, I find consistent evidence that women were retained more than their male counterparts by firms during the 2008 Financial Crisis (by roughly 1.7 p.p.). These results add to the literature by showcasing that the lower increase in women's employment during the crisis were not only due to supply side changes, (i.e. women supplying more labor due to their partner's financial limitations) but was also influenced by the demand side, firms appeared to slightly favor hiring or retaining female workers.

The Event-Study analysis supports these results, showing no pre-trend prior to 2008 and a clear positive divergence in female employment probabilities during and after the crisis. The differential resilience of female employment suggests that firms may have perceived female labor as relatively more cost-effective to retain during periods of financial distress, possibly reflecting persistent gender wage differentials or differing occupational structures between men and women.

Overall, these findings contribute to the broader understanding of how economic downturns interact with labor-market gender dynamics. While the 2008 Financial Crisis narrowed gender gaps in employment through asymmetric job losses, the mechanisms behind this pattern such as wage differences, job types, or employer preferences remain areas for future research.