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ABSTRACT

We use data from the Displaced Worker Survey supplements of the Current Population Survey from 1984 to 2012 to investigate the differences in job loss rates between workers in the public and private sectors. Our focus is on the extent to which recessions affect the differential between job loss rates in the two sectors.

Our main findings include the following: First, taking into account differences in characteristics among workers does not eliminate sectoral differences in the likelihood of losing one's job. After accounting for worker characteristics, during both recessionary and non-recessionary periods, the probability of job loss is higher for private sector workers than for public sector workers at all levels of government. Second, the probability of displacement for private sector workers increased during both the Great Recession and earlier recessions during our sample period. Third, it is less straightforward to characterize the experience of public sector workers during recessions. Job loss rates sometimes increased and sometimes decreased, depending on whether the employer was the federal, state, or local government. The impact of the Great Recession on displacement rates for public sector employees was somewhat different from that in previous recessions. Fourth, the advantage of public sector employment in terms of job loss rates generally increased during recessions for all groups of public sector workers.

Thus, the answer to the question posed in the title is that public sector jobs, while not generally recession-proof, do offer more security than private sector jobs, and the advantage widens during recessions. These patterns are present across genders, races, and educational groups.

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1. Introduction

As government budgets have tightened in the aftermath of the Great Recession, increased scrutiny has been placed upon the compensation received by public sector workers. Commentators such as Zuckerman [2010] have suggested that public sector workers are overpaid, while others such as Allegretto and Keefe [2010] have argued that their compensation packages are appropriate, particularly because they tend to have more education than their private sector counterparts. Most of the focus has been on wage and salary differentials, although pension benefits have also received some attention (Bewerunge and Rosen [2012]). However, a compensation package consists of non-pecuniary as well as pecuniary components. An important non-pecuniary benefit is job security. Assuming that workers are risk-averse, then jobs that offer more security are worth more than those that offer less, *ceteris paribus*.

It has been argued that government employment has a sizable advantage over private sector employment in this respect. Thus, for example, according to Biggs and Richwine [2012, p. 4], "It is well known that government employees enjoy considerably more job security than private workers," and Goldberg [2014] asserts that "Government employees are essentially unfireable." In the popular press, several commentators have stated that even during the Great Recession, government jobs were secure. At the beginning of a piece on this topic, Kittle [2012] asks and answers a question: "Looking for job security in economically trying times? Go government."[1] Similarly, Curry [2011] characterizes federal employment as being "recession proof."

[1] Pursuing this theme, he quotes a local government worker as saying that in the public sector, during a recession "things stay more the same. In the private sector, when times are good, they are good. When times are bad, you eat beans."

However, others assert that while public sector workers enjoyed more job security than private sector workers in the past, this advantage decreased in the Great Recession: "The public sector looks far, far worse now than it did then…Local government employment actually grew in the past two recessions by 7.7 percent and 5.2 percent for each respective period. This time around, it's hemorrhaging jobs" (Covert [2012, p. 6]). Similarly, Polak and Schott [2012, p. 3] write in the *New York Times*, "In the past, local government employment has been almost recession-proof. This time it's not."

Are the premises behind such statements correct? Previous research has documented that the impact of a recession upon the likelihood of job loss varies with worker characteristics such as gender, race, and educational attainment.[2] Some attention has been paid to the differences between public and private sector workers in this respect. However, as noted below, the manner in which the public-private differential varies over the business cycle, and whether it even makes sense to lump together employees of federal, state, and local governments into a single "public" category, have not received much attention. This paper examines the extent to which public sector employment has been relatively recession-proof in the past, whether previous patterns with respect to job displacement held during the Great Recession, and whether the experiences of federal, state, and local government workers have been similar.

Understanding public-private sector differences in job loss probabilities can help inform the ongoing debate over the compensation of government workers. Further, analyzing labor market dynamics in the public sector is important in its own right, given the significance of government employment in the United States—about 2.0 percent of the U.S. labor force work for

[2] On the relationship between recessions and the rate of job loss, see Munnell and Fraenkel [2013], Gardner [1995], and Kletzer [1997].) Much of this literature is surveyed in Farber [2010].

the federal government, 3.8 percent for state governments, and 10.5 percent for local governments (U.S Census Bureau [2014]).[3] In short, any program that seeks to improve the operation of labor markets needs to take into account the behavior of public sector employment.

Section 2 surveys the existing empirical research on job loss. Section 3 discusses the data set employed in this study, the Displaced Worker Survey supplements to the Current Population Survey. In Section 4, we specify the econometric model and present the basic results. We find that public sector jobs do offer more job security than private sector jobs, and this advantage widens during recessions. Section 5 explores whether the basic results hold for various subgroups in the population. One interesting result is that while public sector employment generally confers an advantage to both genders during recessions, the advantage is greater for males. Also, during recessions, the relative advantage of being in the public sector is greater for workers who have not graduated from college than for those who have. Section 6 concludes with a summary and some suggestions for future research.

2. Previous Literature

Research examining public-private sector compensation differentials has a long history. Starting with Smith's [1976a, 1976b, 1977] seminal series of papers, the focus has been primarily on wage differences. She estimates conventional human capital earnings functions, taking into account a list of worker characteristics including race, years of education, and a set of indicator variables for sector of employment (private, federal, state, and local). Later studies

[3] The figures for local and state governments include public school teachers.

refine Smith's methodology in various ways, but without changing her basic approach very much.[4]

A key result from this literature is that accounting for worker characteristics can lead to estimated public-private wage differentials that differ substantially from those suggested by the raw means. Indeed, for state and local workers, some evidence indicates that an apparently substantial advantage in earnings becomes small or even reverses sign once standard demographic characteristics are taken into account (Gittleman and Pierce [2012]). In contrast, even after controlling for such variables, the wage advantage of federal workers remains large and statistically significant (Bewerunge and Rosen [2012]). When it comes to analyzing other components of the compensation package, there would seem to be two lessons from this literature on wage differences. First, it is important to take into account worker characteristics, and second, one should allow for the possibility that any differentials can vary by level of government.

Another strain in the literature that is relevant to our research relates to the documentation of patterns of job loss over time. A key paper is Farber [2011], which uses data from the Displaced Worker Survey (DWS) January supplements of the Current Population Survey (CPS) from 1984 to 2010 to examine how the incidence of job loss changed during that period, and in particular, how the effects of the Great Recession compared to the effects of previous recessions. Farber presents a series of informative graphs plotting workers' job loss rates over time. Consistent with expectations, the graphs show that the job loss rate was generally elevated during recessions, and that it was particularly high during the Great Recession. Farber also plots the time series of job loss rates separately by education level and finds that job loss rates varied

[4] Gittleman and Pierce [2012] provide an illuminating survey.

inversely with education. As well, he looks at how displacement rates differ by age of workers and shows that the rates were highest for the youngest groups of workers. Hipple [1999] and Gardner [1995] also discuss summary statistics from the DWS. Much of the other research analyzing job loss over time is surveyed in Farber's [2010] study. Taken together, the various papers show that the incidence of job loss changes substantially during recessionary periods. Further, the papers reinforce the notion from the literature on wage differentials that it is important to take demographic differences into account in analyses of job loss.

Two studies have focused explicitly on public-private sector displacement differentials. Farber [2010] uses data from the DWS from 1984 to 2008 to produce a series of figures showing job loss rates over time for both public and private sector workers. One graph divides the sample by education attainment, one by gender, and one by age. He also provides a statistical summary of the information by organizing the data into a set of cells based on individual characteristics such as education, gender, and age, and estimating several weighted least squares regressions of the log-probability of job loss on a set of covariates defining the cell. He concludes that the public-private sector gap in job loss rates narrowed over time. For example, the public sector job loss rate was 57 percent lower than the private sector job loss rate in the 1980's and narrowed to 49 percent in the 2000's (Farber [2010, p. 257]).[5]

Farber's main goal in this study is to estimate the effect of tenure on job loss, and therefore there is no reason for him to distinguish among employees who work for different

[5] One issue that has not received much attention in the literature is whether differences on the demand side have contributed to public-private differentials in displacement rates. Perhaps the demand for public sector workers is less sensitive to the business cycle than that for private sector jobs. For example, the number of public school students does not decrease during a recession, and some jobs in the public sector, such as welfare administration, might actually be countercyclical.

levels of government. Given our focus, however, this is a critical issue because, as mentioned above, previous work has shown that public-private differences in several components of compensation vary by level of government. Job security might be similar in this respect and thus it is important to distinguish among employees in the federal, state, and local sectors rather than grouping them together. Our model allows for differentials with private sector workers to vary by level of government.

Another paper that compares the employment security of public and private sector workers is Munnell and Fraenkel [2013]. They use individual-level data from the 1990 to 2012 Annual Social and Economic (ASEC) March supplements of the CPS to estimate several ordinary least squares regressions in which the dependent variable is one if the individual loses his or her job, and zero otherwise. In addition to dichotomous variables for the sector of employment, the right hand side variables include gender, race, marital status, years of education, experience, time effects, state effects, firm size, and occupation. In order to assess the importance of the Great Recession, they divide their sample into two sub-periods, 1990 to 2007 and 2008 to 2012, and estimate the model separately for each time period. They conclude that even during the Great Recession, public sector employees had a greater degree of job security than employees in the private sector.

Munnell and Fraenkel's study comes closest to having the same goals as this paper. However, there are several differences between their approach and ours. Two are particularly important. First, their strategy for estimating the impact of the Great Recession on public-private differentials is to compare the coefficients on the public sector variables for the two sub-periods 1990-2007 and 2008-2012. Implicitly, this tack assumes that 1990-2007 is a kind of control period that one can use to gauge the effect of the Great Recession. But according to the National

Bureau of Economic Research, there were four years with at least some recessionary months during this interval (1990, 1991, 2001, and 2007). Because sectoral differentials are affected by recessions (see Farber [2010, p. 249]), it is not quite clear whether the period as a whole serves as a suitable point of reference. We construct a model that explicitly allows public-private sector differentials to vary during all recessions, which makes it clearer just how we are benchmarking the effects of the Great Recession.

The other major difference between our analysis and Munnell and Fraenkel's is the source of data. They use ASEC data, in which the main question relating to job loss is, "Did (name/you) lose any full weeks of work in 2012 because (you/he/she) (were/was) on layoff from a job or lost a job?" (U.S Census Bureau [2012a, p. 6]). There are, of course, many reasons why a worker might be laid off, including, for example, poor behavior. One simply cannot tell the reason for the layoff from this question. Our data source, the Displaced Worker Survey (DWS), leaves little ambiguity about the reason for a separation. The question about job loss, which is discussed in more detail in Section 3 below, specifically focuses on displacement. As Farber [2011, p. 3] observes, "The survey is meant to capture worker terminations as the result of business decisions of the employer (e.g., a plant closing, a layoff, the abolition of a job) unrelated to the performance or choices of the particular employee." Thus, the DWS is more suitable than the ASEC for exploring sectoral differences in job security.

3. Data

The Displaced Worker Survey. Our analysis relies primarily on the cross sectional data of the DWS supplements of the Current Population Survey (CPS) from 1984 to 2012, conducted as part of the January or February CPS in even years from 1984 to the present. Each wave has information on about 56,000 individuals (U.S. Census Bureau [2012b, p. 2]). The DWS contains

a vast amount of information relating to employment status, including whether the individual works or has worked in the private sector, or for local, state or the federal government. In addition, there are a number of standard demographic variables including age, marital status[6], education, and race.

Pooling together the surveys from 1984 through 2012 and excluding observations with incomplete information[7] gave us an analysis sample of 801,500 respondents between the ages of 20 and 64 living in the United States. Excluding teachers, 640,337 respondents worked in the private sector[8], 27,386 worked for the federal government, 23,373 worked for a state government, and 32,450 worked for a local government. 77,954 were teachers. The online appendix shows the distribution of individuals across occupations in each sector. As persuasively argued by Biggs and Richwine [2011] and Munnell and Fraenkel [2013], the job market for teachers differs from that for other government workers. In particular, public school teachers generally must earn a bachelor's degree and attend a pre-approved teaching program in order to gain a license. Further, in many jurisdictions, teachers have formal tenure contracts. These unique aspects of the market for teachers might make it inappropriate to pool them with other workers. We therefore exclude them from our basic model, and estimate a separate regression that includes only teachers.

The DWS is meant to capture worker terminations that are the direct result of business decisions of the employer unrelated to the preferences and choices of the impacted employee.

[6] Marital status has been found to be a significant determinant of employment experience in other contexts as well. While the reasons are not clear, some psychologists have argued that there is pervasive discrimination against single adults. See DePaulo and Morris [2005].

[7] The main reason for observations being excluded from the analysis sample was absence of a response to the question about sector of employment. We lost 224,215 observations because this variable was not reported.

[8] We exclude the observations on 100,268 individuals who were self-employed.

Examples include a plant closing, a layoff, and the abolition of a job. It is not intended to account for voluntary job changes such as quits (Farber [2011, p. 13]). The specific question (in 2012) was: "During the last 3 calendar years, that is, January 2009 through December 2011, did you lose a job, or leave one because: your plant or company closed or moved, your position or shift was abolished, insufficient work or another similar reason?" (U.S. Census Bureau [2012b, p. 125]). Farber [1997] points out that even with this carefully worded question, there remain inherent ambiguities when it comes to distinguishing between quits and layoffs. For example, firms may try to reduce employment without laying off workers by cutting or failing to increase wages. Another possible drawback to the DWS is that, because it asks about the respondent's experience over a period of several years, it might be affected more by recall errors than some other surveys. Further, as is generally the case, survey data may be less accurate than administrative data. In particular, respondents may misreport the sector in which they work, which would have the effect of biasing downward our estimated effects of sector upon job loss. However, despite these limitations, the DWS remains an invaluable source of information on job loss.

Dating recessions. One of our goals is to estimate how workers in the public and private sectors fare during recessions. Given the structure of the DWS, it is not straightforward to characterize whether a given observation is associated with a recession. Specifically, the survey question does not ask the precise year during which an individual lost his or her job, but rather only whether the worker was displaced during the three-year period prior to the survey.[9]

[9] During the 1984 to 1992 time interval, the DWS asked about job separations in the previous five years while all subsequent surveys only asked about job separations in the previous three years. Farber [1997] deals with this problem by adjusting upward the five-year job-loss rate by 11.2 percentage points from the 1984 to 1992 waves of the survey to account for the downward bias from the five-year recall period used in those surveys. As Farber notes, there are some limitations to this approach, including the fact that the

Therefore, for purposes of determining whether a given job loss occurred during a recession, the relevant year is not the year in which the survey was taken. For example, one of the recessions during our sample period began in July 1990 and ended in March 1991, but the relevant survey is not the 1990 survey, since it covers the period starting January 1987 and ending December 1989. Rather, questions that pertain to this recession should refer to the 1992 survey, which covers the period 1989-1991. We characterize an observation as being in a recession if any of the three years preceding it included a recession, as determined by the National Bureau of Economic Research. This will inevitably lead to misclassifications, since within any three-year period that includes both recession and non-recession years, some individuals will have lost their jobs during one of the latter years, even though the observation is classified as a recession. Such misclassifications will likely lead to underestimates of the effect of recessions on job losses.

Summary statistics. Table 1 presents definitions and summary statistics by sector of employment for the variables used in our empirical analysis.

Lostjob is a dichotomous variable equal to one if the individual lost his or her job during the previous three calendar years. 82,504 respondents from our analysis sample of 801,500 individuals were displaced. According to the figures in the table, workers in all levels of government were all about half as likely to be displaced as private sector workers, a figure that is in line with previous research. (See, for example, Munnell and Fraenkel [2013] and Farber [2010].)

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correction does not vary with worker characteristics or time. Nevertheless, it is entirely sensible, although one must be cognizant of the fact that, to the extent there are errors in the data with respect to the timing of job losses, it could bias our estimates of the impact of recessions. Farber [1997] explains in detail several other technical issues that arise when using the DWS data, for example, there is no information on multiple job losses during a single year-year period. We use the DWS data as adjusted by Farber, and we are grateful to him for making them available to us.

While these sectoral differences are striking, their interpretation requires caution because they might be due to differences in workers' characteristics, at least to some extent. Table 1 includes definitions and summary statistics for key demographic variables for private sector workers; federal, state, and local government workers (excluding teachers); and teachers, respectively. Consistent with previous research (see, for example, Bewerunge and Rosen [2012] and Gittleman and Pierce [2012]), worker characteristics differ substantially across sectors. For example, on average, public employees at all levels have more education than private sector employees. The workforces at all levels of government (excluding teachers) have a higher proportion of black workers than the private sector. In terms of marital status, private sector workers are more likely to have never been married than public sector workers. Workers' average age in the private sector is somewhat lower than the average ages in any of the public sectors. In the next section, we investigate the extent to which these and other differences in worker characteristics can explain the differences in displacement probabilities.

4. Econometric Specification and Results

Basic setup. There is some controversy about the best econometric strategy when the left hand side variable is dichotomous. Some argue for using a nonlinear estimator such as probit. However, we follow Angrist and Pischke [2009, p. 94], who observe that ordinary least squares provides the best linear approximation to the conditional expectations function, and hence, in a context like ours where censoring is not present, is the appropriate estimator.[10] Specifically, we estimate a series of linear probability models in which the dependent variable is *Lostjob*, which equals one if the respondent lost his or her job in the three years prior to the survey year and is

[10] However, as shown in the online appendix, when we re-estimated the model using a probit estimator, the marginal effects were quite similar to those from OLS.

zero otherwise. The model includes the standard set of worker characteristics listed in Table 1. To control for whether a given observation is from a recession (other than the Great Recession), we include the dichotomous variable *Recession,* which takes a value of one whenever a recession (other than the Great Recession) occurred during the three years prior to the survey. As noted above, the three-year window is needed because the survey asks only whether a worker lost his or her job during the three years immediately preceding the survey, and not the specific year. Following the National Bureau of Economic Research [2010, p. 1], we designate the following years as recessions: 1981, 1982, 1990, 1991, and 2001. These correspond to survey years 1984, 1992, and 2002. Several commentators have noted that the Great Recession had unique attributes, if for no other reason than its severity.[11] Therefore, we create a separate variable to differentiate it from other recessions. *Great Recession* equals one whenever the years covered by the survey include the Great Recession. These years, 2007, 2008, and 2009, correspond to the 2010 and 2012 waves of the survey.

As Gittleman and Pierce [2012] observe, there is some disagreement about whether occupation variables should be included in statistical analyses of public-private sector compensation differentials. Occupation might be correlated with the error term if, for example, the same unobservable characteristics that affect occupational choice also influence the likelihood that an individual will lose his or her job. Others argue that as an important determinant of compensation, occupation needs to be included. We include a set of occupational indicator variables in the main specification, but also estimate the model without them, in order

[11] During 2008 and 2009, the United States labor market lost 8.4 million jobs, or 6.1 percent of all paid U.S. employment (Mishel *et al*. [2012, p. 1]).

to determine whether they affect the substantive results.[12] Finally, all specifications include state and year effects.[13]

Results. To begin, we estimate the model only with the sectoral variables, the recession indicators, and the interactions between the recession indicators and the sectoral variables. The results are reported in the first column of Table 2. To interpret the results, note that the omitted category is private sector workers. Hence, the coefficient of -0.060 on the *Federal* variable means that federal government workers are 6.0 percentage points less likely to lose their jobs than private sector workers, other things being the same. One can reject the hypothesis that the coefficient is zero at the one percent level. Moving down the column, the results for state and local government workers are of similar magnitude and also statistically significant. The coefficient on *Recessions* indicates that other things being the same, the probability of losing one's job for private sector workers was a statistically significant 2.2 percentage points higher during recessions (other than the Great Recession). The negative coefficients on the interactions between the *Recession* variables and the sectoral variables indicate that the effect of a recession on the probability of job loss was less for government workers than for private sector workers. A similar pattern holds for the Great Recession. The probability of a private sector worker being displaced was 3.2 percentage points higher, other things being the same. The point estimates on the interaction terms for all government workers are negative, suggesting that the incremental effect of the Great Recession was less for them than for private sector workers. However, the

[12] The major occupational and industry codes were changed in 2004 (Bowler, *et al.* [2003]). We sorted the occupations into 17 categories; given the coding changes, some judgment calls were required when determining the category to which a given job should be assigned. The distribution of respondents across occupations is shown in the online Appendix.

[13] Unlike Munnell and Fraenkel [2013], we do not include firm size on the right hand side because it is not reported in the DWS. In any case, there is some evidence that it is endogenous [Winter-Ebmer, 1996]. Further, Gittleman and Pierce [2012, p. 226] argue that including firm size in compensation regressions is not appropriate because it is not a skill-related factor that an individual can transfer from job to job.

interaction with *Federal* is small in absolute value and insignificant.

In column (2) of Table 2, we augment the model with demographic variables. The coefficients on the sectoral variables remain negative and statistically significant, although their magnitudes are somewhat smaller. Note the contrast between this result and the finding in the literature that public-private wage differentials narrow substantially when demographic differences are taken into account, and sometimes disappear altogether.[14] The coefficients on the demographic variables themselves are generally as expected. The probability of job loss falls as the level of education rises. For example, a worker who completed college was 3.7 percentage points less likely to lose a job than a worker who never finished high school, other things being the same. Compared to white workers, black workers were 0.94 percentage points more likely to lose their jobs in any given period, while Asian workers were 1.0 percentage points less likely. Single workers were more likely to lose their jobs than their married counterparts. Widowed, divorced or separated, and never married workers were, respectively, 2.9 percentage points, 2.5 percentage points, and 1.2 percentage points, more likely to be displaced than married workers. Finally, the coefficients on age and its square imply that the probability of job loss first increases with age and then decreases after about 29 years of age.

The third column of the table shows the results when time and state effects are added. The coefficients are barely affected. Finally, column (4) includes the occupation variables. While the coefficients on the sectoral variables are somewhat smaller when occupation is taken into account, the qualitative story is essentially the same.

The regression coefficients allow us to recover the expected probability of a job loss in

[14] Gittleman and Pierce [2012] find such a result for state and local government workers as do Bewerunge and Rosen [2012] for federal government workers.

each sector during both recessionary and non-recessionary periods, holding worker characteristics constant. Suppose, for example, that we want the probability that a federal worker faced a job loss during the Great Recession, *ceteris paribus.* Employing the estimates from column (4) of Table 2, we set *Federal* and *Great Recession* equal to one, the other sectoral and recession variables equal to zero, and evaluate all the other right hand side variables at their means. Substituting these values into the equation, we find that the probability of a job loss is 7.3 percent. This calculation and the analogous ones for workers in other sectors are recorded in the top of Table 3. These figures are simply a convenient way to summarize the data, and allow us to address the question posed in the title of this paper: Are government jobs recession-proof? Comparing the first and second rows of the table, we see that during the Great Recession, the probability of a job loss increased for workers in the private and federal sectors, but went down for state and local workers, holding worker characteristics constant.[15] In that sense, employment in the federal government was not recession-proof, while state and local employment was. Such heterogeneity within the public sector is also found in a comparison of the first and third rows, which shows that during recessions other than the Great Recession, the probability of being displaced fell for federal and state government workers, but increased for local government workers.

As another way to characterize the data, in the bottom half of Table 3 we use the figures in the top half to compute the differences in the probabilities of a job loss between workers in the various levels of government and their private sector counterparts. Thus, for example, the entry -0.0420 means that during non-recessionary periods, federal workers were 4.20 percentage points less likely to lose their jobs than private sector workers, other things being the same. The

[15] All of these differences are significant at the 1 percent level. This is also true of all the various comparisons to which we refer in the discussions surrounding Tables 3 through 7 below.

advantage to federal workers increased to 5.3 percentage points during the Great Recession, and was 6.5 percentage points during other recessions. This widening of the public-private differential is also present for state and local government workers.

Summary. The main takeaways from Tables 2 and 3 are as follows. First, accounting for differences in worker characteristics does not eliminate sectoral differences in the likelihood of losing one's job. During both recessionary and non-recessionary periods, the probability of job loss is higher for private sector workers than for public sector workers at all levels of government. Second, the probability of displacement for private sector workers increased during both the Great Recession and earlier recessions during our sample period, but it is not quite so straightforward to characterize the experience of public sector workers during recessions. Job loss rates sometimes increased and sometimes decreased during recessions, depending on the level of government. Also, the impact of the Great Recession on displacement rates for public sector workers was somewhat different from that in previous recessions. Third, the difference between public and private sector displacement rates increased during recessions for all groups of public sector workers. A fair summary is that public sector jobs, while not always recession-proof, often offer more job security than private sector jobs. Further, this advantage increases during recessions. In this respect, the Great Recession has not been very different from other recessions in recent years.

5. Results for Subgroups

Our basic model assumes that the public-private differentials in the probability of a job loss are the same regardless of worker characteristics. We now explore the outcomes when this assumption is relaxed.

5.1 Probabilities of Job Loss By Race

It is well documented that blacks and whites have very different experiences in the labor market. Couch and Fairlie [2010, p. 230] attribute such differences to discrimination, and note that when unemployment is widespread, there is "less pressure on employers who have a taste for discrimination to hire minority workers because there is a greater availability of whites who are likely to have desired skills." In light of these observations, it makes sense to see whether public-private differences with respect to job losses are the same for whites and blacks.[16] We therefore re-estimate the basic model from column (4) of Table 2 separately for the two groups. The estimated coefficients are reported in the online appendix. As before, we report the associated probabilities of being displaced, and the public-private differences in these probabilities, *ceteris paribus*.

The results are reported in Table 4. Consider first the estimates for whites. Given that they comprise most of the sample, it is not surprising that the figures essentially mirror those from Table 3. Comparing those estimates with the ones for blacks in the next panel, the most striking (although unsurprising) finding is that in every cell except one the probability of losing one's job is higher for blacks than whites. (The exception is state workers during the Great Recession, where the point estimates of the probabilities for blacks and whites are essentially the same, although they are statistically different because of the large sample sizes.) However, the direction of the impact of recessions on displacement probabilities is generally similar for both races. Moving to the last two panels in the table, we see that for both blacks and whites, the

[16] We exclude Asians, Indians and Alaskans, and "other" races from these calculations because, as suggested by the coefficients in Table 2, their experience with displacement is different from that for blacks. For the sake of brevity and particularly because our sample does not have many observations on individuals in these groups (see Table 1), we do not compute public-private differences in displacement probabilities for them.

advantage of government employment in terms of a lower risk of job loss generally widens during recessions. In short, whites and blacks do not differ substantially with respect to how their probabilities of job loss compare to their counterparts in the private sector, although again, the baseline probabilities of losing a job are higher for blacks.

5.2 Probabilities of Job Loss by Gender

Just like race, it has been well documented that gender has an important effect on employment, perhaps because of discrimination or because within the broad occupational classifications available in conventional data sets, men and women have different kinds of jobs.[17] This suggests that experience with job loss and its interaction with sector of employment might differ by gender as well. We therefore re-estimate the basic model from column (4) of Table 2 separately for males and females. The regression results are reported in the online appendix. The probabilities of being displaced and the public-private differentials are reported in Table 5. The figures indicate that in the private sector, males have a higher probability of job loss than females, both during recessionary and non-recessionary periods. However, the story with respect to gender differences is less clear for public sector workers. For example, during the Great Recession, female workers at all levels of government had higher displacement rates than their male counterparts, other things being the same. However, during other recessions, female government employees had lower displacement rates than their male counterparts.

The figures reported in the bottom part of Table 5 indicate that public-private sector differentials for males were substantially larger than for their female counterparts, and the differentials for both genders increased during recessions. During recessions, the differential in

[17] Using Australian data, Wilkins and Wooden [2011] find that observed differences in gender dismissal rates are tied to differences in the types of jobs selected by men and women.

favor of public sector male employees over their private sector counterparts was generally in the range of six to eight percentage points. The comparable differential for females in the public sector was in the range of two to four percentage points. In short, while public sector employment conferred an advantage to both genders during recessions, the advantage was greater for males.

5.3 Probabilities of Job Loss by Education

Journalistic accounts have noted that, "The more educated you are, the less vulnerable you are to recession-related job loss" (Hawkins *et al*. [2009, p. 5]), and careful studies such as Farber [2010] have indeed documented that the probability of losing one's job falls with level of education. We therefore re-estimate the basic model from column (4) of Table 2 separately for workers who graduated college and those who did not. The regression results are reported in the online appendix, and the associated probabilities of being displaced are reported in Table 6.

During both recessionary and non-recessionary periods and in every sector, the probability of losing one's job is lower for college graduates, *ceteris paribus*. The figures at the bottom of the table indicate that the public-private differentials in displacement probabilities generally widen during recessions for both those with and without college degrees. However, the advantage of public sector employment in this respect is greater for workers who have not graduated from college.

5.4 Probabilities of Job Loss for Teachers

As noted above, due to the unique features of the market for teachers, we estimate a separate model using only respondents who are teachers. In effect, then, we are comparing

teachers who work in the public sector to their private sector counterparts. Because the great majority of public school teachers in our sample are employed by local governments, we include a single "public" variable rather than a breakdown by federal, state, or local employment. The regression results are available in the online appendix.

The associated probabilities of job loss are reported in Table 7. Mirroring the results from our basic model, during both recessionary and non-recessionary periods, private school teachers have a higher probability of losing their jobs than public school teachers, other things being the same. The probability of being displaced increases for teachers in both sectors during recessions. There are no clear patterns with respect to how recessions affect the size of the public-private differential. Relative to non-recessionary periods, the advantage of public school teachers was larger during the Great Recession, but smaller during other recessions.

6. Summary and Conclusions

We use a sample of over 800,000 workers taken from the Displaced Worker Survey January supplements of the Current Population Survey from 1984 to 2012 to study job loss differentials between public and private sector workers, and how these differentials change during recessions. We find that workers in all levels of government are substantially less likely to be displaced than their counterparts in the private sector even after differences in worker characteristics are taken into account. During non-recession years, employees of the federal government are 4.2 percentage points less likely to lose their jobs than private sector workers; the comparable figures for employees of local and state governments (other than teachers) are 4.2 percentage points and 3.3 percentage points, respectively. These differences are larger during recessions; that is, the advantage to being in the public sector widens during recessions. This

conclusion applies to both males and females, whites and non-whites, and college graduates and non-college graduates. Due to the idiosyncrasies of the market for teachers, we analyze teachers separately, and find the same general tendency: during both recessionary and non-recessionary periods, the probability of private school teachers losing their jobs is greater than that for public school teachers, other things being the same.

It has been argued that the value of job security should be quantified and factored into the calculation of compensation when making comparisons of public and private sector workers [Biggs, 2011a and 2011b]. If so, any advantage that public sector employees have over their private sector counterparts with respect to pecuniary compensation would widen, other things being the same. A contrary view, expressed by Munnell and Fraenkel [2013, p. 5], is that including the value of job security in a calculation of compensation would be inappropriate because there are many other non-monetary differences between public and private sector work, and some of them, such as cramped and relatively unpleasant working spaces, could move the differential in the opposite direction. However, just because one cannot quantify the differences in all the components of compensation packages does not mean that one should ignore any differences that can be estimated. If nothing else, such estimates could inform discussions of whether any disamenities of public sector employment could be large enough to offset the value of enhanced job security. Doing such a calculation is beyond the scope of this study. However, by estimating the public-private differences in the probability of job loss, the estimates in this paper provide the necessary first step for answering this important question.

That said, one must be cautious when interpreting the public-private differentials estimated in this study or any other. Although we control for a wide range of demographic and job characteristics, the interpretation of estimated differentials is always clouded by the fact that

missing variables might be important, including unobservable worker characteristics. Further, as Gittleman and Pierce [2012] note, conventional econometric analyses of compensation differences do not account for the forces behind the estimated differentials. In particular, political institutions likely play an important role. These are important topics for future research.

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Table 1*

Definitions and Summary Statistics

VARIABLE	Description	(1) Private	(2) Federal	(3) Local	(4) State	(5) Teachers
Lostjob	Employment: 1 if respondent lost job	0.116 (0.320)	0.051 (0.220)	0.058 (0.233)	0.056 (0.229)	0.050 (0.217)
Female	Gender: 1 if respondent is a female	0.469 (0.499)	0.435 (0.496)	0.433 (0.496)	0.526 (0.499)	0.692 (0.462)
Attended High School	Education Level: 1 if respondent didn't graduate high school	0.115 (0.319)	0.0304 (0.172)	0.069 (0.253)	0.044 (0.206)	0.031 (0.173)
Graduated High School	Education Level: 1 if respondent graduated high school	0.381 (0.486)	0.303 (0.460)	0.347 (0.476)	0.291 (0.454)	0.157 (0.363)
Attended College	Education Level: 1 if respondent attended college	0.280 (0.449)	0.309 (0.462)	0.333 (0.471)	0.294 (0.456)	0.178 (0.383)
Graduated College	Education Level: 1 if respondent graduated college	0.224 (0.417)	0.357 (0.479)	0.251 (0.434)	0.371 (0.483)	0.634 (0.482)
Married	Marital Status: 1 if respondent is married	0.605 (0.489)	0.658 (0.475)	0.658 (0.474)	0.636 (0.481)	0.679 (0.467)
Widowed	Marital Status: 1 if respondent is widowed	0.037 (0.188)	0.043 (0.202)	0.044 (0.204)	0.046 (0.201)	0.034 (0.182)
Divorced	Marital Status: 1 if respondent is divorced or separated	0.158 (0.365)	0.157 (0.364)	0.153 (0.360)	0.169 (0.375)	0.126 (0.332)
Never Married	Marital Status: 1 if respondent has never been married	0.200 (.400)	0.142 (0.349)	0.145 (0.352)	0.150 (0.357)	0.160 (0.367)
White	Race: 1 if respondent is	0.858	0.754	0.792	0.814	0.867

	White	(0.349)	(0.431)	(0.406)	(0.389)	(0.340)
Black	Race: 1 if respondent is Black	0.091 (0.288)	0.164 (0.370)	0.144 (0.351)	0.135 (0.342)	0.088 (0.283)
Indian or Alaskan	Race: 1 if respondent is American Indian or Alaskan Native	0.014 (0.116)	0.037 (0.189)	0.037 (0.189)	0.017 (0.129)	0.014 (0.116)
Asian	Race: 1 if respondent is Asian	0.029 (.169)	0.035 (0.185)	0.020 (0.140)	0.026 (0.158)	0.025 (0.156)
Other Race	Race: 1 if respondent is other	.008 (.087)	0.010 (0.097)	0.007 (0.084)	0.008 (0.090)	.00654 (0.081)
Age	Age of the respondent	38.40 (11.67)	42.55 (10.93)	41.317 (11.186)	41.75 (11.13)	41.67 (11.47)
Observations	Number of observations	640,337	27,386	32,450	23,373	77,954

* This table shows means and standard deviations calculated using the sample weights provided in the DWS. In the regressions, the following are the omitted characteristics: Sector: *Private*, Gender: *Male*, Education Level: *Attended High School*, Marital Status: *Married*, and Race: *White.*

Table 2*

Probabilities of Job Loss: OLS Estimates

	(1)	(2)	(3)	(4)
VARIABLE	Pr(*Lostjob*)	Pr(*Lostjob*)	Pr(*Lostjob*)	Pr(*Lostjob*)
Federal	-0.0603***	-0.0539***	-0.0546***	-0.0420***
	(0.00198)	(0.00200)	(0.00202)	(0.00235)
Local	-0.0600***	-0.0572***	-0.0575***	-0.0417***
	(0.00173)	(0.00175)	(0.00175)	(0.00215)
State	-0.0559***	-0.0484***	-0.0487***	-0.0332***
	(0.00217)	(0.00218)	(0.00218)	(0.00255)
Recessions	0.0216***	0.0203***	0.00567**	0.00698***
	(0.00116)	(0.00116)	(0.00249)	(0.00249)
*Recessions*Federal*	-0.0230***	-0.0240***	-0.0244***	-0.0226***
	(0.00381)	(0.00380)	(0.00380)	(0.00380)
*Recessions*Local*	-0.00380	-0.00474	-0.00484	-0.00376
	(0.00385)	(0.00386)	(0.00385)	(0.00386)
*Recessions*State*	-0.0146***	-0.0150***	-0.0149***	-0.0140***
	(0.00461)	(0.00459)	(0.00459)	(0.00460)
Great Recession	0.0324***	0.0366***	0.00856***	0.0142***
	(0.00150)	(0.00151)	(0.00261)	(0.00265)
*Great Recession*Federal*	-0.00873	-0.00734	-0.00695	-0.0107*
	(0.00590)	(0.00589)	(0.00589)	(0.00590)
*Great Recession*Local*	-0.0207***	-0.0191***	-0.0189***	-0.0218***
	(0.00480)	(0.00479)	(0.00479)	(0.00479)
*Great Recession*State*	-0.0142**	-0.0126**	-0.0130**	-0.0155**
	(0.00612)	(0.00611)	(0.00611)	(0.00611)
Female		-0.0282***	-0.0278***	-0.0188***
		(0.000842)	(0.000842)	(0.000902)
Graduated High school		-0.0151***	-0.0138***	-0.0106***

		(0.00156)	(0.00157)	(0.00157)
Attended College		-0.0198***	-0.0194***	-0.0127***
		(0.00161)	(0.00163)	(0.00165)
Graduated College		-0.0374***	-0.0363***	-0.0268***
		(0.00162)	(0.00163)	(0.00167)
Widowed		0.0291***	0.0261***	0.0254***
		(0.00229)	(0.00233)	(0.00232)
Divorced/Separated		0.0249***	0.0243***	0.0232***
		(0.00125)	(0.00125)	(0.00125)
Never Married		0.0118***	0.0137***	0.0129***
		(0.00127)	(0.00133)	(0.00133)
Black		0.00937***	0.0130***	0.0150***
		(0.00146)	(0.00150)	(0.00150)
Indian or Alaskan		0.0112***	0.00578	0.00586
		(0.00392)	(0.00399)	(0.00398)
Asian		-0.0104***	-0.0116***	-0.0104***
		(0.00240)	(0.00250)	(0.00250)
Other Race		0.0161***	0.0161***	0.0169***
		(0.00568)	(0.00576)	(0.00575)
Age		0.00217***	0.00225***	0.00254***
		(0.000264)	(0.000267)	(0.000268)
Age^2		-3.73e-05***	-3.74e-05***	-3.97e-05***
		(3.15e-06)	(3.18e-06)	(3.19e-06)
Constant	0.108***	0.109***	0.127***	0.113***
	(0.000544)	(0.00547)	(0.00681)	(0.00696)
Observations	723,546	723,546	723,546	723,546
State Effects	No	No	Yes	Yes
Time Effects	No	No	Yes	Yes
Occupation	No	No	No	Yes

*This table shows ordinary least squares estimates of the probability of being displaced from one's job. Variables are defined in Table 1. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

Table 3*

Probabilities of Job Loss

	(1) Private Worker	(2) Federal Worker	(3) Local Worker	(4) State Worker
		Probability of Job Loss		
Non-Recessions	0.1114***	0.0694***	0.0697***	0.0782***
	(0.00089)	(0.00233)	(0.00213)	(0.00253)
Great Recession	0.1256***	0.0728***	0.0621***	0.0769***
	(0.00214)	(0.00575)	(0.00470)	(0.00596)
Other Recessions	0.1184***	0.0538***	0.0729***	0.0712***
	(0.00188)	(0.00364)	(0.00383)	(0.00440)
		Difference in Probability of Job Loss (Public minus Private)		
Differentials in Non-Recessions		-0.0420***	-0.0417***	-0.0332***
		(0.00235)	-(0.00215)	-(0.00255)
Differentials in Great Recession		-0.0528***	-0.0635***	-0.0487***
		(0.00569)	(0.00466)	(0.00593)
Differentials in Other Recessions		-0.0646***	-0.0455***	-0.0472***
		(0.00348)	(0.00366)	(0.00427)

* The entries in this table are based upon the regression coefficients reported in column (4) of Table 2. The first bank of numbers shows the probability that an individual in a given sector is displaced depending on whether or not a recession is taking place. The second bank of numbers shows the difference in the probability of being displaced between an individual in a given government sector and an individual in the private sector. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

Table 4*

Probability of Job Loss by Race

	(1) Private Worker	(2) Federal Worker	(3) Local Worker	(4) State Worker
		Probability of Job Loss -- Whites		
Non-Recessions	0.1106***	0.0655***	0.0682***	0.0751***
	(0.00095)	(0.00254)	(0.00233)	(0.00273)
Great Recession	0.1240***	0.0702***	0.0593***	0.0777***
	(0.00233)	(0.00655)	(0.00520)	(0.00683)
Other Recessions	0.1162***	0.0502***	0.0723***	0.0624***
	(0.00200)	(0.00396)	(0.00426)	(0.00456)
		Probability of Job Loss -- Blacks		
Non-Recessions	0.1197***	0.0877***	0.0746***	0.0894***
	(0.00297)	(0.00650)	(0.00575)	(0.00704)
Great Recession	0.1405***	0.0947***	0.0746***	0.0766***
	(0.00696)	(0.01559)	(0.01263)	(0.01495)
Other Recessions	0.1396***	0.0743***	0.0825***	0.1138***
	(0.00642)	(0.01016)	(0.01012)	(0.01388)
		Difference in Probability of Job Loss (Public minus Private) -- Whites		
Differentials in Non-Recession		-0.0451***	-0.0424***	-0.0354***
		-(0.00256)	-(0.00236)	-(0.00275)
Differentials in Great Recession		-0.0538***	-0.0648***	-0.0463***
		(0.00648)	(0.00515)	(0.00679)
Differentials in Other Recessions		-0.0660***	-0.0439***	-0.0538***
		(0.00380)	(0.00410)	(0.00442)

	Difference in Probability of Job Loss (Public minus Private) -- Blacks		
Differentials in Non-Recession	-0.0321***	-0.0451***	-0.0303***
	-(0.00657)	-(0.00583)	-(0.00709)
Differentials in Great Recession	-0.0458***	-0.0659***	-0.0639***
	(0.01543)	(0.01269)	(0.01482)
Differentials in Other Recessions	-0.0653***	-0.0571***	-0.0258***
	(0.00960)	(0.00936)	(0.01337)

* The entries in this table are generated by estimating the OLS regression in column (4) of Table 2 separately for whites and blacks. The first bank of numbers shows the probability that an individual in a given sector is displaced depending on whether or not a recession is taking place. The second bank of numbers shows the difference in the probability of being displaced between an individual in a given government sector and an individual in the private sector. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

Table 5*

Probabilities of Job Loss by Gender

	(1) Private Worker	(2) Federal Worker	(3) Local Worker	(4) State Worker
		Probability of Job Loss -- Males		
Non-Recessions	0.1218***	0.0716***	0.0655***	0.0763***
	(0.00126)	(0.00317)	(0.00291)	(0.00369)
Great Recession	0.1378***	0.0712***	0.0518***	0.0707***
	(0.00311)	(0.00775)	(0.00625)	(0.00887)
Other Recessions	0.1439***	0.0609***	0.0761***	0.0730***
	(0.00269)	(0.00469)	(0.00513)	(0.00630)
		Probability of Job Loss -- Females		
Non-Recessions	0.0999***	0.0671***	0.0739***	0.0757***
	(0.00123)	(0.00345)	(0.00312)	(0.00346)
Great Recession	0.1080***	0.0729***	0.0702***	0.0761***
	(0.00293)	(0.00858)	(0.00711)	(0.00803)
Other Recessions	0.0892***	0.0459***	0.0688***	0.0636***
	(0.00258)	(0.00579)	(0.00579)	(0.00611)
		Difference in Probability of Job Loss (Public minus Private) -- Males		
Differentials in Non-Recessions		-0.0502***	-0.0564***	-0.0455***
		-(0.00320)	-(0.00296)	-(0.00374)
Differentials in Great Recession		-0.0666***	-0.0860***	-0.0671***
		(0.00764)	(0.00621)	(0.00885)
Differentials in Other Recessions		-0.0829***	-0.0677***	-0.0709***
		(0.00447)	(0.00489)	(0.00613)

	Difference in Probability of Job Loss (Public minus Private) -- Females		
Differentials in Non-Recessions	-0.0328***	-0.0260***	-0.0243***
	-(0.00348)	-(0.00314)	-(0.00349)
Differentials in Great Recession	-0.0350***	-0.0378***	-0.0318***
	(0.00853)	(0.00705)	(0.00795)
Differentials in Other Recessions	-0.0433***	-0.0203***	-0.0256***
	(0.00557)	(0.00556)	(0.00594)

* The entries in this table are generated by estimating the OLS regression in column (4) of Table 2 separately for males and females. The first bank of numbers shows the probability that an individual in a given sector is displaced depending on whether or not a recession is taking place. The second bank of numbers shows the difference in the probability of being displaced between an individual in a given government sector and an individual in the private sector. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

Table 6*

Probabilities of Job Loss by Education

	(1)	(2)	(3)	(4)
	Private Worker	Federal Worker	Local Worker	State Worker
		Probability of Job Loss -- Non-College Graduates		
Non-Recessions	0.1163***	0.0711***	0.0725***	0.0822***
	(0.00103)	(0.00291)	(0.00258)	(0.00327)
Great Recession	0.1318***	0.0786***	0.0612***	0.0785***
	(0.00262)	(0.00813)	(0.00581)	(0.00795)
Other Recessions	0.1285***	0.0556***	0.0792***	0.0812***
	(0.00216)	(0.00436)	(0.00442)	(0.00567)
		Probability of Job Loss -- College Graduates		
Non-Recessions	0.0963***	0.0589***	0.0597***	0.0646***
	(0.00173)	(0.00389)	(0.00375)	(0.00392)
Great Recession	0.1030***	0.0553***	0.0571***	0.0665***
	(0.00365)	(0.00807)	(0.00793)	(0.00902)
Other Recessions	0.0851***	0.0401***	0.0529***	0.0413***
	(0.00373)	(0.00655)	(0.00776)	(0.00684)
		Difference in Probability of Job Loss (Public minus Private) --Non-College Graduates		
Differentials in Non-Recessions		-0.0452***	-0.0437***	-0.0341***
		-(0.00292)	-(0.00261)	-(0.00329)
Differentials in Great Recession		-0.0532***	-0.0705***	-0.0533***
		(0.00808)	(0.00578)	(0.00791)
Differentials in Other Recessions		-0.0729***	-0.0493***	-0.0473***
		(0.00417)	(0.00423)	(0.00554)

	Difference in Probability of Job Loss (Public minus Private) --College Graduates		
Differentials in Non-Recessions	-0.0374***	-0.0366***	-0.0318***
	-(0.00401)	-(0.00382)	-(0.00402)
Differentials in Great Recession	-0.0477***	-0.0459***	-0.0365***
	(0.00795)	(0.00785)	(0.00898)
Differentials in Other Recessions	-0.0449***	-0.0322***	-0.0438***
	(0.00636)	(0.00744)	(0.00656)

* The entries in this table are generated by estimating the OLS regression in column (4) of Table 2 separately for individuals who graduated from college and those who did not. The first bank of numbers shows the probability that an individual in a given sector is displaced depending on whether or not a recession is taking place. The second bank of numbers shows the difference in the probability of being displaced between an individual in a given government sector and an individual in the private sector. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

Table 7*

Probabilities of Job Loss for Teachers

	(1) Private School Teachers	(2) Public School Teachers
	Probability of Job Loss	
Non-Recessions	0.0550***	0.0408***
	(0.00287)	(0.00171)
Great Recession	0.0925***	0.0679***
	(0.00651)	(0.00470)
Other Recessions	0.0608***	0.0544***
	(0.00581)	(0.00392)
		Difference in Probability of Job Loss (Public minus Private) -- Teachers
Differentials in Non-Recessions		-0.0142***
		-(0.00288)
Differentials in Great Recession		-0.0246***
		(0.00654)
Differentials in Other Recessions		-0.0064***
		(0.00525)

* The entries in this table are generated by estimating a modified version of the OLS regression in column (4) of Table A7 for public and private school teachers only. The first bank of numbers shows the probability that an individual in a given sector is displaced depending on whether or not a recession is taking place. The second bank of numbers shows the difference in the probability of being displaced between an individual employed in the public sector and one in the private sector. Standard errors are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.