

[Labor Economics]Replication Report

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1 Introduction

Focusing on wages of male displaced workers, Gibbons and Katz (1991) (henceforth GK) use data from the January 1984 and January 1986 Displaced Workers Supplements (DWS) to the Current Population Survey.

Gibbons and Katz (1991) examine how the change in wages, the pre-displacement wage, and the post displacement wage vary with the cause of displacement and with pre-displacement occupation.

Gibbons and Katz (1991) constrain the sample to the male workers between the ages of 20 and 61 who were permanently displaced from a private-sector, full-time, nonagricultural job because of a plant closing, slack work, or a position or shift that was eliminated. GK show that the layoff dummy has significantly negative effect on wage change and post-displacement wage, while the effect on pre-displacement wage is ambiguous and insignificant. By adding the interaction term between pre-layoff tenure and layoff dummy, they show that the effect varies substantially with pre-displacement tenure. Only the high-tenure white-collar workers suffer statistically significant effect from the layoff. The effect of layoff to blue-collar workers is never statistically significant no matter high or low tenure.

I use 2 way of defining layoffs and 2 dataset, in all 4 methods, to verify the lemon effect. I show that, in the main regression, there is little evidence supporting the lemon effect, which says layoffs will have wage loss after being displaced. In addition, by adding the tenure interaction term, which replicate their table 4, the results is not the same direction as that of GK's research. Therefore, I conclude that the GK's analysis does not provide clear and solid evidence on the lemon effect.

2 Data

2.1 GK's original data

In GK's empirical work, they use the data from the Displaced Workers Supplements in the January 1984 and 1986 Current Population Surveys. By using the CPS data, they would like to testify if there is signaling effect for the firms to

laying the workers off. They find that, for the layoff workers, the wage change is significantly negative for those being layoff with different controls. In addition, they also find a significant negative effect on post-displacement wage for the lay-off samples while this effect is either insignificant or positive for pre-displacement wage. These findings provide supports for their assumption.

They restrict the data on male workers between the ages of 20 and 61 who were permanently displaced from a private-sector, full-time, non-agricultural job. In their original paper, they specify that there are mainly three reasons for the workers being displaced, plant closing, slack work or a position/shift that was eliminated; and the workers classified as layoffs are those displaced because of slack work or a position or shift that was eliminated. The workers on construction works are eliminated; only those observations reemployed with earnings at least \$40 will be used.

2.2 Corrections and extensions to DWS Data

The data used for replication, CPS DWS, is acquired from the IPUMS website. They used January 1984 and 1986 CPS Displaced Workers Surveys for the main part and 12 outgoing rotation groups from the 1983 Current Population Survey for the unionization rate. The main variable to identify if the worker was layoff is 'layoff reason', which, according to the description in the paper, contains three categories - displaced because of slack work, displaced because of elimination of shift or position, or displaced because of plant closing.

There is huge difference in definition of displaced worker across the samples. Before 1994, displaced workers are those who lost or left a job during the past 5 years. After 1994, displaced workers are those who lost or left a job due to layoffs or shutdowns within the past 3 years. For 1998 on, respondents are only considered displaced workers if they had lost or left a job due to layoffs or shutdowns within the past 3 years, were not self-employed, and did not expect to be recalled to work within the next six months. Due to this reason, the variable used by GK's research has been harmonized and split into two variables - *DWREAS* and *UH_WHYLFT_1*. *DWREAS* is the harmonized variable which reports the reason why the respondent lost or left his/her job and *UH_WHYLFT_1* is the variable used during 1976-1993. Split of the variable has huge impact on the replication project. One of the condition, slack work or business conditions, is now included in the unharmonized variable *UH_WHYLFT_1*, while the other two, Plant or company operating but lost/left job because position or shift abolished and Plant or company closed down or moved, are in the harmonized variable.

Simply sorting the layoff workers according to GK's conditions provides us 1500 observations of Plant Closing workers and 358 observations of Layoff workers, which is far less than the dataset used by GK (1614 in Plant Closing and 1813 in Layoff). To construct a dataset with observation number closer to the one used by GK, I therefore include more conditions for identifying the lay-off workers. In addition to two reasons shown above, those been displaced because of 'Plant or company operating but lost/left job because of insufficient work' and

'Plant or company operating but lost/left job because seasonal job completed' are also identified as layoff workers. This strategy provides 1737 Layoff workers and 1500 Plant Closing workers. The replication will be conducted using two kinds of strategies.

In addition to the observation selecting method claimed by GK, there are three extensions for data selecting methods adopted by this research. By doing so, this research shows GK has used a bigger sample containing more observations other than just layoff and plant closing workers. The first extension, method 2 and method 4 (shown as M2 and M4, respectively in the table), adopts a relaxed rule for identifying the layoff workers. GK identifies layoff workers as those claiming themselves losing jobs because of Slack work or business conditions/ position or shift abolished (strict condition hereafter). By M2 and M4, those claiming themselves losing job because of insufficient work or seasonal job completed are also identified as layoff workers (relaxed condition). Therefore, more observations are added into the samples with a sample size closer to the one used by GK in M2. GK uses the dataset containing 2 years, 1984 and 1986. Method 3 and Method 4 (M3 and M4) enlarge the sample size by including the data from 1984, 1986, 1988, 1990 and 1992. M3 uses the identifying condition same as GK, and M4 applies the conditions same as M2, which identifies more people as layoff workers.

To comply with GK's research, the dataset used to calculate the industry union rate is also expended. GK uses all 12 outgoing rotation groups from the 1983 Current Population Survey (the full-year sample) to compute unionization rates for white- and blue-collar workers in each three-digit industry. However, the 1983 CPS dataset is not accessible from IPUMS, and therefore, 1985 CPS is used to compute the sector union rate for M1 and M2. For M3 and M4, dataset extended to 5 years, CPS from 1985, 1987, 1989 and 1991 are used to calculate the union rate. However, as shown below, the replicated dividing union rate (4.6%) is much lower than the one used by GK (around 25.5%).

3 Replication and Extensions

3.1 Descriptive statistics

In this section, I will conduct the replication research and present the comparable result in one table so that the difference among GK's result and replication results using different methods can be easily found.

They firstly presents the descriptive statistics (GK's Table 1). In Table 1, I present the similar table showing the summary statistics. Column 1, named GK, presents the original descriptive statistics, and column 2-5 present the result from method 1 to method 4 respectively.

In general, the results using the relaxed condition (M2 and M4) have less disparities to GK's result (GK), than the one using same condition (M1 and M3). The most obvious disparity between GK's results and M1, the one using same conditions to identify the layoff workers, is the number of observations. M1

contain much less observations (1858 vs 3427). This is mostly due to a smaller sample size in layoff workers, only 19% of entire sample. This disparity does not disappear with increasing observations. Using 5 years DWS data, the strict condition only provides us 21% of the entire sample as layoff worker, which is much lower than GK's dataset.

There are also some other differences between GK's researches and M1 M3. The whole sample identified using same condition as GK has longer length of pre-displacement tenure and work experience and shorter weeks of joblessness, while less people suffer the period of joblessness. By included more years of dataset, there are some other disparities (M3 & M4 vs GK). Sample covering 1984, 1986, 1988, 1990 and 1992 has less weeks of joblessness (around 14 weeks vs 21 weeks in GK). They got much less advance notification, with only 15% people being noticed before displacement. The years of schooling are shorter and length of work experience are longer.

Table 2 and table 3 present the descriptive statistics for layoff and plant closing workers separately. The condition identifying the plant closing workers is same for four methods, and therefore I combine the columns with same result (M1 & M2 and M3 & M4) in Table 2. The characteristics of plant closing workers using same dataset are close to those presented by GK, which shows the reliability of my sample selection strategy. However, there are some disparities between column 3 and GK's result. The larger dataset, the one using M3 and M4, has the observations having longer pre-displacement tenure, less weeks of joblessness and more work experience. For the layoff sample in table 3, column 3, M2 the relaxed conditions sample, are the most similar to GK column. The samples identified by strict condition, M1 and M3, contain the displaced workers having longer pre-displacement tenure, less weeks of joblessness, more work experience.

Firstly it confirms that the displaced loss has no relation with the pre-displacement tenure. These also results show that, in general, M2 column has the characteristics most similar to the original dataset used by GK. Therefore, the relaxed condition, rather than the strict one declared by GK, is more favored to replicated their study.

GK consider that the white/blue collar workers are different in bargaining power and therefore compare their characteristics, which I provide the result in Table 4-6. In table 4, the plant closing workers are separated into white and blue collar. For both white collar and blue collar, the workers identified by this research has less change in earnings, weeks of joblessness shorter years of schooling but more work experience. The results in table 5 and 6 show that the identified layoff worker samples are all similar to that identified by GK.

Based on the results of M2, the favored method, the difference in average pre-displacement tenure between workers displaced by plant closings and those displaced by layoffs is smaller for white-collar than for blue-collar workers, but the gap is smaller (2.19 years vs 2.58 years). I also find that more white collar workers received notification than blue collar for layoff sample; and white collar workers have higher earnings loss displaced by layoff.

3.2 Regressions

GK analyse the effect of layoff by putting the wage change, pre-displacement wage and post-displacement wage as dependent variable and running OLS against the layoff dummy in the first stage. In this research the exact replicating results of their table 3. Conditional on worker's characteristics and time effect, GK find a negative effect of layoff experience, even though it is statistically insignificant. GK also claim that, by separating the workers into white and blue collar, white collar workers suffer more from the layoff experience.

However, I did not find any negative effect of the layoff experience, except for the white collar sample using method 1 shown in column M1. Using the exact data of GK's research, DWS 1984 and 1986, it shows that most layoffed workers enjoyed a wage increase, and, in column M1 blue collar sample, this effect is even significant. When I extend the sample size to include the following year survey data, shown in column M3 and M4, I found the results turn into the correct sign as predicted by the lemon theory. I find a negative but statistically insignificant relationship between layoff experience and wage change during the displacement. Though the sign of effects all follow the model prediction, the layoff effect using different subsamples are all in the wrong extent. Predicted by GK, there should be larger effect for the white collar workers and workers in low union rate industry. I find that, oppositely, the layoff effect are more sizable for blue collar workers and workers in high union rate industries.

To better show the difference in sample size, I present the number of observations used by each regression in the second half of Table 7. In the GK column, the number is the sample size of GK's research. The numbers in other columns are the sample size used in replicating research. Using the exact definition of layoff workers, only 1138 observations are used, which is only 1/3 of the original sample size. In M2, the favored method, a huge observations drop, from 3237 to 1852, is experienced. When the dataset are expanded, the numbers of observations are increased to 4250 and 6481. This observation loss, especially in some sub-samples, e.g. low union and high union samples in M1 column, could significantly bias the estimate of the layoff effect.

Table 8 presents the results of coefficients on layoff dummy in earnings equations with the depend variables using pre-displacement and post-displacement wage. GK conclude from their table 3 that layoffed workers usually enjoyed higher pre-displacement wage and lower post-displacement wage. Using whole sample and both methods, I find the reverse result, as shown in column M1 and M2 whole sample. Layoffed workers have a lower wage before layoff and higher wage after that. GK also find that layoff experience will only affect the white collar workers and workers in low union industries. This is true while using method 1. While using method 2, the favored one, I find that, opposite to GK's finding, the wage is higher after the displacement for white collar workers. The only one supporting lemon effect is the post-displacement wage for workers in low union industries, though this effect is not statistically significant.

Expanding to cover more years, the results are more similar to those of GK. The post-displacement wage is positive but insignificant using M3, and yet

negative effect of layoff experience on the post-displacement wage for white collar samples. Using the favored method, M4, the layoff effect on post-displacement wage is significantly negative, which is same as the result of GK. This negative layoff effect is witnessed in most of the samples, except for the workers in high union industries.

With the result showing in table 7 and 8, I conclude that the layoff effect is less sizable and significant using the dataset same as GK. However, by extending the data to more years, I can find the lemon effect where the layoffed worker will have a lower wage.

GK investigate the combined effect of employment spell and layoff experience, which is the result presented in their table 4. I conduct the replicated research and present the result in table 9 and 10. Here I use the same definition of low and high tenure - pre-displacement tenure less than 2 years being low tenure and higher than 2 years being high tenure. GK find that, for the whole sample, only the white collar high tenure workers will experience statistically significant wage loss with layoff experience. Using the same data as GK's, only the white collar low tenure with M1 has a significant wage loss. The blue collar workers with low tenure even experience a wage increase with layoff experience. The results shown in M2 are all insignificant. The results using M3 and M4 are ambiguous. I find a significant wage loss for the high tenure workers using M3 and significant wage loss for low tenure workers using M4. I also find some significant effect for blue collar workers, instead of white collar samples.

Table 10 presents the results of pre-displacement wage and post-displacement wage as dependent variable and the interaction term of layoff dummy and tenure as main independent variable. GK find that high tenure white workers will suffer more from the layoff experience while the influence of a layoff on the pre-displacement earnings of high tenure white collar workers is close to zero. Consistent to GK for the pre-displacement wage part, I did not find a significant wage difference for the white collar workers. However, the results are different for the post-displacement part. I find that the coefficient of low tenure white collar sample is negative while it is positive for the high tenure white collar sample, which is opposite to the results of GK.

Using most of the methods, the identified layoffed high tenure blue collar workers will have significant higher wage during both pre-displacement and post-displacement jobs, while this is not significant for the low tenure blue collar workers. These results shows that only the high tenure (pre-displacement tenure greater than 2 years) will be affected by the layoff experience, yet , opposite to the lemon effect, high tenure blue collar workers have a wage gain after layoff.

GK conduct a sensitivity analyses by examining the subsample of workers who were displaced at least 2 years prior to the survey date. In table 11 I replicate the sensitivity analysis using 4 methods. GK claim that layoff effects for the white collar samples are similar to the analogous effects in previous table while the effect for the whole sample and for blue collar are consistent with the result in table 3. However, I find that the layoff effects for white collar samples are either positive or insignificant. This result is unchanged extending the data to cover more years.

For the whole sample, GK find that layoffed workers will have wage loss, while this is not the case in the replicated research. Using the same data, shown in column M1 and M2, the layoff dummy has a positive effect on both wage change and post-displacement wage. In column M3 and M4, the layoff effects are mostly negative but insignificant. GK find a positive but insignificant effect on layoff experience in their table 3. For the blue collar samples, results on column M1 and M2 show that, using the same time data as GK, there is a significant wage increase with the layoff experience. This effect becomes negative but insignificant for extended samples, as shown in column M3 and M4.

4 Conclusion

GK's analyses of layoffed workers play an important role in understanding the asymmetric information in labor market. Using data on displaced workers, GK run the regression trying to find out the relationship between wage information and layoff experience. They also explore the relationship by using the subsamples such as white collar, blue collar or people with different tenures. They attempted to provide evidence supporting the lemon effect, which argues that layoffed workers will be identified and earn less during the post-displacement period, especially for white collar workers and high tenure samples.

I found some problems during the data cleaning process. The data was accessed from the IPUMS. Following the same definition as GK's defining layoff worker, the sample size is much lower (around 1/3) of the sample used by GK. However, GK do not provide the information about the sample size for each of the variable and hence I do not know which variable is the main factor not matching GK's sample. To solve this problem, I try another definition of layoffs by including more population into the sample. The descriptive statistics of the alternative are more similar to that of GK's research than that of exact the same definition.

To provide more evidence verifying the lemon effect, in addition to the 1984 and 1986 data, I collect the Displaced Worker Survey data from 1984 to 1992. The reason I choose this period is that the structure of Displaced Worker Survey is totally changed and layoff workers were no longer included after 1992. I use both definition to the extended dataset.

My reassessment of GK's research shows that their results can hardly be replicated, and therefore, their conclusion about lemon effect is fragile. Using the same period of data, I can hardly find any significant result same as those of GK. Using the extended dataset, I find some negative effect of layoff experience but the effects, in most of the cases, are insignificant. The results of analysis about tenure also shows similar problem, where I can not find negative and significant effect for high tenure white collar workers. Instead, I find significant negative effect of layoff experience for low tenure workers and positive effect for blue collar workers. The results of replicated sensitivity analysis also shows little evidence supporting the lemon effect.

The theory of lemon effect is straight forward - asymmetric information. The

replicated research provide little evidence supporting the lemon effect using same period of data. More information will be needed to verify the lemon effect.

References

Gibbons, R. and Katz, L. F. (1991). Layoffs and lemons. *Journal of labor Economics*, 9(4):351–380.

Table 1: **Descriptive Statistics for Displaced Workers, Entire sample**

Variable	Entire sample				
	GK	M1	M2	M3	M4
Layoff	0.53	0.19 (0.39)	0.54 (0.50)	0.21 (0.41)	0.50 (0.50)
Previous tenure	4.73 (6.00)	5.76 (6.99)	4.74 (6.08)	6.04 (7.11)	5.07 (6.39)
Change in earnings	-0.16 (0.50)	-0.11 (0.56)	-0.10 (0.57)	-0.14 (0.72)	-0.14 (0.71)
Log previous earnings	5.94 (0.49)	5.82 (0.50)	5.79 (0.50)	6.01 (0.72)	5.96 (0.71)
Log current earnings	5.77 (0.54)	5.71 (0.62)	5.69 (0.60)	5.87 (0.63)	5.83 (0.63)
Weeks of joblessness	21.35 (25.71)	16.34 (19.22)	17.44 (19.68)	13.85 (17.28)	14.60 (17.63)
No unemployment	0.14	0.19 (0.39)	0.15 (0.35)	0.17 (0.38)	0.14 (0.35)
Advance notification	0.51	0.53 (0.50)	0.51 (0.50)	0.15 (0.36)	0.15 (0.36)
Years of schooling	12.62 (2.40)	12.60 (2.52)	12.60 (2.42)	11.18 (4.64)	11.28 (4.48)
Work experience	12.38 (10.33)	14.46 (10.76)	13.23 (10.35)	16.77 (11.33)	15.65 (11.20)
Job in manufacturing	0.53	0.62 (0.49)	0.62 (0.48)	0.54 (0.50)	0.56 (0.50)
White collar	0.34	0.40 (0.49)	0.37 (0.48)	0.43 (0.50)	0.41 (0.49)
N	3427	1858	3237	4993	7907

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4.

Table 2: **Descriptive Statistics for Displaced Workers, Plant Closing**

Variable	Plant Closing		
	GK	M1 & M2	M3 & M4
Previous tenure	5.87 (7.03)	6.05 (7.20)	6.18 (7.20)
Change in earnings	-0.16 (0.49)	-0.11 (0.57)	-0.13 (0.73)
Log previous earnings	5.94 (0.49)	5.80 (0.50)	5.97 (0.73)
Log current earnings	5.78 (0.54)	5.69 (0.61)	5.84 (0.63)
Weeks of joblessness	19.61 (25.21)	16.32 (19.66)	13.66 (17.47)
No unemployment	0.19	0.19 (0.40)	0.18 (0.39)
Advance notification	0.56	0.55 (0.50)	0.16 (0.37)
Years of schooling	12.41 (2.46)	12.38 (2.47)	11.18 (4.39)
Work experience	13.67 (10.85)	14.58 (10.83)	16.51 (11.21)
Job in manufacturing	0.51	0.62 (0.49)	0.56 (0.50)
White collar	0.34	0.36 (0.48)	0.39 (0.49)
N	1614	1500	3949

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers.

Table 3: **Descriptive Statistics for Displaced Workers, Layoff**

Variable	Layoff				
	GK	M1	M2	M3	M4
Previous tenure	3.72 (4.68)	4.52 (5.85)	3.61 (4.62)	5.48 (6.74)	3.97 (5.24)
Change in earnings	-0.17 (0.51)	-0.12 (0.55)	-0.10 (0.57)	-0.16 (0.68)	-0.14 (0.70)
Log previous earnings	5.93 (0.48)	5.91 (0.53)	5.78 (0.50)	6.13 (0.66)	5.96 (0.69)
Log current earnings	5.76 (0.48)	5.79 (0.64)	5.68 (0.60)	5.97 (0.66)	5.81 (0.63)
Weeks of joblessness	22.89 (26.05)	16.41 (17.28)	18.41 (19.65)	14.59 (16.55)	15.54 (17.73)
No unemployment	0.10	0.15 (0.36)	0.11 (0.31)	0.13 (0.34)	0.10 (0.30)
Advance notification	0.47	0.45 (0.50)	0.48 (0.50)	0.11 (0.31)	0.15 (0.35)
Years of schooling	12.81 (2.33)	13.50 (2.51)	12.79 (2.35)	11.16 (5.50)	11.38 (4.58)
Work experience	11.23 (9.71)	13.96 (10.44)	12.06 (9.77)	17.77 (11.74)	14.78 (11.13)
Job in manufacturing	0.54	0.62 (0.49)	0.63 (0.48)	0.48 (0.50)	0.56 (0.50)
White collar	0.35	0.56 (0.50)	0.39 (0.49)	0.59 (0.49)	0.42 (0.49)
N	1614	358	1737	1044	3958

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers.

Table 4: **Descriptive Statistics by Broad Occupation**

Variable	Plant closing					
	White collar			Blue Collar		
	GK	(1)	(2)	GK	(1)	(2)
Previous tenure	5.17 (0.28)	5.67 (7.04)	5.86 (6.93)	6.23 (0.22)	6.27 (7.29)	6.39 (7.38)
Change in earnings	-0.07 (0.02)	-0.05 (0.56)	-0.11 (0.76)	-0.208 (0.02)	-0.14 (0.57)	-0.15 (0.72)
Log previous earnings	6.06 (0.02)	5.95 (0.52)	6.15 (0.76)	5.88 (0.01)	5.71 (0.46)	5.85 (0.68)
Log current earnings	5.99 (0.02)	5.90 (0.60)	6.04 (0.65)	5.67 (0.02)	5.57 (0.58)	5.70 (0.57)
Weeks of joblessness	13.96 (0.84)	13.28 (18.18)	12.00 (16.22)	22.54 (0.84)	18.03 (20.26)	14.87 (18.24)
No unemployment	0.25 (0.02)	0.26 (0.44)	0.21 (0.41)	0.16 (0.01)	0.16 (0.36)	0.16 (0.37)
Advance notification	0.55 (0.02)	0.56 (0.50)	0.15 (0.36)	0.56 (0.02)	0.55 (0.50)	0.17 (0.38)
Years of schooling	13.87 (0.10)	13.93 (2.20)	12.05 (5.11)	11.65 (0.06)	11.52 (2.18)	10.78 (3.57)
Work experience	13.04 (0.44)	13.45 (9.88)	16.40 (10.80)	13.99 (0.34)	15.21 (11.28)	16.39 (11.40)
Manufacturing Job	0.35	0.52 (0.50)	0.45 (0.50)	0.60	0.67 (0.47)	0.62 (0.48)
N	552	536	1526	1062	964	2378

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The summary statistics is from January 1984 and 1986 CPS Displaced Workers Surveys, Males Reemployed at Survey Date in Wage and Salary Employment. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers.

* Work experience = (Age - education - 6) at displacement

Table 5: **Descriptive Statistics by Broad Occupation**

Variable	Layoff - White collar				
	GK	M1	M2	M3	M4
Previous tenure	3.84 (0.20)	4.43 (5.43)	3.48 (4.37)	5.47 (6.72)	4.25 (5.53)
Change in earnings	-0.13 (0.02)	-0.13 (0.50)	-0.08 (0.54)	-0.13 (0.63)	-0.10 (0.67)
Log previous earnings	6.05 (0.02)	6.05 (0.48)	5.93 (0.49)	6.25 (0.60)	6.13 (0.67)
Log current earnings	5.93 (0.02)	5.93 (0.63)	5.85 (0.59)	6.12 (0.62)	6.03 (0.62)
Weeks of joblessness	18.36 (0.85)	16.99 (18.22)	16.20 (17.72)	14.89 (16.32)	14.70 (16.43)
No unemployment	0.11 (0.01)	0.16 (0.37)	0.12 (0.33)	0.13 (0.34)	0.11 (0.31)
Advance notification	0.41 (0.02)	0.40 (0.49)	0.43 (0.50)	0.10 (0.30)	0.13 (0.34)
Years of schooling	14.21 (0.09)	14.70 (2.16)	14.13 (2.28)	11.79 (6.02)	12.03 (5.42)
Work experience	11.82 (0.40)	13.36 (9.92)	12.04 (9.85)	17.56 (11.49)	15.56 (11.68)
Manufacturing job	0.39	0.61 (0.49)	0.55 (0.50)	0.44 (0.50)	0.48 (0.50)
N	627	200	676	599	1662

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The summary statistics is from January 1984 and 1986 CPS Displaced Workers Surveys, Males Reemployed at Survey Date in Wage and Salary Employment. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers.

* Work experience = (Age - education - 6) at displacement

Table 6: **Descriptive Statistics by Broad Occupation**

Variable	Layoff - Blue collar				
	GK	M1	M2	M3	M4
Previous tenure	3.66 (0.13)	4.65 (6.37)	3.69 (4.77)	5.43 (6.88)	3.73 (4.98)
Change in earnings	-0.19 (0.02)	-0.10 (0.62)	-0.11 (0.59)	-0.22 (0.75)	-0.17 (0.72)
Log previous earnings	5.87 (0.01)	5.72 (0.53)	5.69 (0.48)	5.94 (0.70)	5.82 (0.67)
Log current earnings	5.68 (0.02)	5.62 (0.62)	5.57 (0.57)	5.72 (0.64)	5.64 (0.59)
Weeks of joblessness	25.29 (0.81)	15.66 (15.98)	19.88 (20.71)	13.96 (16.57)	16.19 (18.63)
No unemployment	0.09 (0.01)	0.15 (0.35)	0.09 (0.29)	0.14 (0.35)	0.09 (0.29)
Advance notification	0.51 (0.01)	0.52 (0.50)	0.51 (0.50)	0.14 (0.35)	0.16 (0.37)
Years of schooling	12.07 (0.06)	11.99 (2.08)	11.93 (1.97)	10.92 (3.98)	11.09 (3.56)
Work experience	10.92 (0.28)	14.72 (11.05)	12.07 (9.73)	17.05 (11.57)	13.89 (10.40)
Job in manufacturing	0.62	0.63 (0.49)	0.68 (0.47)	0.54 (0.50)	0.61 (0.49)

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The summary statistics is from January 1984 and 1986 CPS Displaced Workers Surveys, Males Reemployed at Survey Date in Wage and Salary Employment. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers.

* Work experience = (Age - education - 6) at displacement

Table 7: **Coefficients on Layoff Dummy in Earnings Equations, Wage change as dependent variable**

Sample	Wage change				
	GK	M1	M2	M3	M4
Whole Sample	-0.04 (0.17)	0.0352 (0.04)	0.0123 (0.03)	-0.0339 (0.03)	-0.0402 (0.02)
White Collar	-0.055 (0.028)	-0.0339 (0.06)	0.0078 (0.04)	-0.0184 (0.04)	-0.0101 (0.03)
Blue Collar	-0.024 (0.022)	0.1218 (0.07)	0.0160 (0.03)	-0.0586 (0.04)	-0.0645 (0.02)
Low Union	-0.04 (0.23)	0.0668 (0.07)	0.0830 (0.04)	-0.0038 (0.04)	-0.0220 (0.03)
High Union	-0.031 (0.026)	0.0463 (0.07)	-0.0526 (0.04)	-0.0569 (0.05)	-0.0637 (0.03)
	Sample size				
	GK	M1	M2	M3	M4
Whole Sample	3427	1138	1852	4250	6481
White Collar	1179	465	741	1846	2703
Blue Collar	2248	673	1111	2331	3687
Low Union	1716	210	809	1972	2958
High Union	1711	200	728	1813	2727

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The reported regressions include a spline function in previous tenure (with breaks at 1, 2, 3, and 6 years), education, a dummy for advance notification of displacement, year-of-displacement dummies, seven previous-industry dummies, eight previous-occupation dummies, experience (age - education - 6) and its square, a marriage dummy, a nonwhite dummy, three region dummies and years since displacement. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers. The low-union sample consists of workers in industry-occupation cells with unionization rates of less than 4.6% in 1985; all workers in industry occupation cells with higher unionization rates are in the high-union sample.

* Work experience = (Age - education - 6) at displacement

Table 8: **Coefficients on Layoff Dummy in Earnings Equations, Pre-displacement and Post-displacement wage as dependent variable**

	Pre-displacement wage				
	GK	M1	M2	M3	M4
Whole Sample	0.0170 (0.01)	0.0034 (0.03)	-0.0025 (0.02)	0.0614 (0.03)	0.0135 (0.02)
White Collar	-0.0094 (0.02)	-0.0167 (0.05)	-0.0058 (0.03)	0.0005 (0.04)	-0.0007 (0.03)
Blue Collar	0.0220 (0.02)	0.0140 (0.05)	0.0008 (0.03)	0.1019 (0.04)	0.0203 (0.02)
Low Union	-0.0070 (0.02)	-0.0830 (0.05)	-0.0890 (0.03)	0.0048 (0.04)	-0.0219 (0.03)
High Union	0.0300 (0.02)	0.0395 (0.06)	0.0530 (0.03)	0.1276 (0.04)	0.0683 (0.03)
	Post-displacement wage				
	GK	M1	M2	M3	M4
Whole Sample	-0.0210 (0.02)	0.0383 (0.04)	0.0092 (0.03)	0.0276 (0.02)	-0.0251 (0.01)
White Collar	-0.0640 (0.03)	-0.0506 (0.06)	0.0021 (0.04)	-0.0167 (0.03)	-0.0095 (0.02)
Blue Collar	0.0023 (0.02)	0.1348 (0.06)	0.0157 (0.03)	0.0420 (0.03)	-0.0426 (0.02)
Low Union	-0.0460 (0.02)	-0.0163 (0.07)	-0.0075 (0.04)	0.0002 (0.03)	-0.0426 (0.02)
High Union	0.0020 (0.00)	0.0866 (0.07)	0.0015 (0.04)	0.0711 (0.03)	0.0049 (0.02)

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The reported regressions include a spline function in previous tenure (with breaks at 1, 2, 3, and 6 years), education, a dummy for advance notification of displacement, year-of-displacement dummies, seven previous-industry dummies, eight previous-occupation dummies, experience (age - education - 6) and its square, a marriage dummy, a nonwhite dummy, and three region dummies. The post wage regression includes years since displacement. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers. The low-union sample consists of workers in industry-occupation cells with unionization rates of less than 4.6% in 1985; all workers in industry occupation cells with higher unionization rates are in the high-union sample.

* Work experience = (Age - education - 6) at displacement

Table 9: **Coefficients on Interaction of Layoff Dummy with Low- and High-Tenure Dummies in Earnings Equations, Wage change as dependent variables**

Variable	Wage change				
	Whole sample				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0110 (0.03)	0.0237 (0.07)	-0.0039 (0.04)	0.0318 (0.05)	-0.0905 (0.03)
Layoff x High-tenure	-0.0540 (0.02)	0.0388 (0.05)	0.0197 (0.03)	-0.0650 (0.03)	-0.0004 (0.02)
White collar					
Layoff x Low-tenure	0.0110 (0.05)	-0.1408 (0.09)	-0.0281 (0.06)	-0.0093 (0.07)	-0.0798 (0.04)
Layoff x High-tenure	-0.0870 (0.03)	0.0276 (0.07)	0.0253 (0.04)	-0.0270 (0.04)	0.0211 (0.03)
Blue collar					
Layoff x Low-tenure	-0.0100 (0.04)	0.2322 (0.11)	0.0273 (0.05)	0.0569 (0.08)	-0.1023 (0.04)
Layoff x High-tenure	-0.0300 (0.03)	0.0587 (0.08)	0.0085 (0.04)	-0.1131 (0.05)	-0.0178 (0.03)
Sample size					
Whole sample	3427	1127	1834	4222	6438
White collar	1179	462	736	1834	2687
Blue collar	2248	665	1098	2317	3662

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The reported regressions include a spline function in previous tenure (with breaks at 1, 2, 3, and 6 years), education, a dummy for advance notification of displacement, year-of-displacement dummies, seven previous-industry dummies, eight previous-occupation dummies, experience (age - education - 6) and its square, a marriage dummy, a nonwhite dummy, and three region dummies. The post wage regression includes years since displacement. The white-collar sample consists of workers with pre-displacement jobs as managers and administrators, professional and technical workers, clerical workers, or sales workers. The blue-collar sample consists of workers with pre-displacement jobs as craft and kindred workers, operatives, laborers, transport operatives, or service workers. The low-union sample consists of workers in industry-occupation cells with unionization rates of less than 4.6% in 1985; all workers in industry occupation cells with higher unionization rates are in the high-union sample. Low tenure = less than 2 years of tenure on pre-displacement job; high tenure = at least 2 years of tenure on pre-displacement job.

* Work experience = (Age - education - 6) at displacement

Table 10: **Coefficients on Interaction of Layoff Dummy with Low- and High-Tenure Dummies in Earnings Equations, Pre-displacement and Post-displacement wage as dependent variables**

Variables	Pre-displacement wage				
	Whole sample				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0220 (0.02)	-0.0701 (0.05)	-0.0784 (0.03)	-0.0665 (0.05)	-0.0217 (0.03)
Layoff x High-tenure	0.0360 (0.02)	0.0437 (0.04)	0.0408 (0.02)	0.1172 (0.03)	0.0310 (0.02)
	White collar				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0380 (0.04)	-0.0261 (0.08)	-0.0759 (0.05)	-0.0434 (0.06)	-0.0162 (0.04)
Layoff x High-tenure	0.0040 (0.03)	-0.0069 (0.06)	0.0371 (0.04)	0.0248 (0.04)	0.0140 (0.03)
	Blue collar				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0200 (0.03)	-0.1377 (0.08)	-0.0834 (0.04)	-0.0903 (0.07)	-0.0040 (0.03)
Layoff x High-tenure	0.0430 (0.02)	0.0943 (0.06)	0.0455 (0.03)	0.1922 (0.05)	0.0262 (0.03)
	Post-displacement wage				
	Whole sample				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0310 (0.03)	-0.0471 (0.07)	-0.0828 (0.04)	-0.0349 (0.04)	-0.1109 (0.02)
Layoff x High-tenure	-0.0160 (0.02)	0.0827 (0.05)	0.0600 (0.03)	0.0521 (0.03)	0.0310 (0.02)
	White collar				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0260 (0.05)	-0.1669 (0.10)	-0.1040 (0.06)	-0.0502 (0.05)	-0.0933 (0.03)
Layoff x High-tenure	-0.0820 (0.04)	0.0207 (0.07)	0.0624 (0.05)	-0.0017 (0.04)	0.0352 (0.02)
	Blue collar				
	GK	M1	M2	M3	M4
Layoff x Low-tenure	-0.0270 (0.04)	0.0918 (0.10)	-0.0567 (0.05)	-0.0361 (0.05)	-0.1056 (0.03)
Layoff x High-tenure	0.0170 (0.03)	0.1532 (0.08)	0.0531 (0.04)	0.0781 (0.04)	0.0088 (0.02)

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The reported regressions include a spline function.

* Work experience = (Age - education - 6) at displacement

Table 11: **Coefficients on Layoff Dummy in Earnings Equations, Males Displaced at Least 2 Years before the Survey Date and Reemployed at the Survey Date**

	wage change				
	GK	M1	M2	M3	M4
Whole sample	-0.0170 (0.03)	0.0311 (0.05)	0.0273 (0.03)	-0.0168 (0.03)	-0.0225 (0.02)
White collar	-0.0470 (0.04)	-0.0259 (0.07)	0.0220 (0.04)	0.0171 (0.04)	0.0193 (0.03)
Blue collar	0.0081 (0.03)	0.1381 (0.08)	0.0408 (0.04)	-0.0583 (0.05)	-0.0559 (0.03)
	pre-displacement wage				
	GK	M1	M2	M3	M4
Whole sample	0.0028 (0.02)	-0.0032 (0.04)	-0.0147 (0.02)	0.0485 (0.03)	0.0194 (0.02)
White collar	-0.0300 (0.03)	-0.0284 (0.05)	0.0018 (0.04)	-0.0210 (0.04)	-0.0053 (0.03)
Blue collar	0.0130 (0.02)	0.0156 (0.06)	-0.0282 (0.03)	0.1111 (0.05)	0.0351 (0.03)
	post-displacement wage				
	GK	M1	M2	M3	M4
Whole sample	-0.0130 (0.02)	0.0274 (0.05)	0.0118 (0.03)	0.0317 (0.02)	-0.0026 (0.02)
White collar	-0.0750 (0.04)	-0.0543 (0.07)	0.0238 (0.04)	-0.0035 (0.03)	0.0141 (0.02)
Blue collar	0.0210 (0.03)	0.1522 (0.07)	0.0113 (0.04)	0.0515 (0.04)	-0.0202 (0.02)

NOTE GK column shows the results from GK's research. M1 - result from Method 1, M2 - result from Method 2, M3 - result from Method 3, M4 result from Method 4. The reported regressions include a spline function.