## WHAT HAPPENED TO LONG TERM EMPLOYMENT?

## **ONLINE APPENDIX**

This appendix contains additional analyses that are mentioned in the paper but not reported in full due to space constraints. I also provide more details on how I matched data across different waves of the CPS. Definitions of the variables and detailed descriptions of the analysis approach are contained in the main paper, unless they are unique to these tables.

#### Additional Information on Matching Across Waves of the CPS

The CPS surveys each household eight times, spread across 16 months. In order to build a data set that could test my hypotheses I had to match different waves of the CPS (Bureau of Labor Statistics 2009). I matched the tenure data to size data from the "March supplement" from 1992 onwards. Unionization data was matched in using earnings supplements which each household answers twice.

Matching across waves of the CPS creates three problems. First, not all workers can be matched. In addition to workers who are interviewed for the last time in a given month, some respondents may not fill out later months' surveys, perhaps because they refused, moved house, died, or could not be contacted (Madrian and Lefgren 1999). I found that around 80% of those eligible to match from one wave to another could be matched, consistent with prior work. Of particular concern is that this non-match rate might bias the results. I checked this by comparing time trends in tenure for those workers who could be matched to organizational size and those that could not. The time trends were extremely similar. I also checked whether match rates varied by organization size. Among the 2008 data, I did not find substantial variation in match rates across the different organizational size classes. It does not appear that failure to match across waves should introduce substantial biases.

The second problem is that some matches may be inaccurate due to recording errors in the CPS. Such mismatches are reasonably easy to detect by looking at changes in sex, or changes in age that cannot be accounted for by the passage of time. Using these metrics, I found that match rates were extremely good (errors of the order of 1-2%), with the exception of 2002 and 1995, where I found matching errors of around 10% (Madrian and Lefgren (1999) note, though, that at least some of these errors may be due to inaccurate recording of age and sex, rather than matching errors). All mismatches were dropped from the sample.

The third problem with matching workers' details across waves is that it assumes that they remain in the same job throughout that time. Fortunately, the level of mobility for our sample is low enough to lead to very small levels of mismatches. Based on the distribution of tenure within the surveys (based on those waves where workers were asked how many days they had been in the current job), around 1.5% of the sample should change jobs from one month to the next, and 2.5% of the sample should change jobs over the course of two consecutive months. In addition, many moves within the sample occur between firms of the same industry, further reducing mismatch (the data does not enable us to estimate the extent to which workers move between firms of similar size, but it is reasonable to assume that there is also some persistence in organizational size in moves across firms). I ran two robustness checks to assess the extent of this measurement error. First, I introduced analogous measurement error into the pre-1995 data (which was not matched), randomly assigning organizational sizes to 1.5% of the sample. The time trends for these robustness checks were extremely similar to those in the actual data. Second, I matched the April 1993 benefits data (which included both tenure and employer size in the same survey) with March 1993 data on employer size (these were the only overlapping sources of data on employer size). This exercise produced two parallel sets of 1993 data – one set that had employer size from the same survey, as with the

other data before 1995, and one set that had employer size matched in from another survey, as with the post 1995 data. Examination of the time trends in mobility demonstrated no significant bias from this matching for the largest and smallest size categories.

## Table 1A: Replication of Table 2 with additional specifications

Table 1A presented here offers similar analysis to Table 2 in the paper. It builds on that analysis in two ways:

## Use of Year Dummies

Instead of using a linear year specification, I instead use year dummies. These year dummies are more flexible, allowing us to look at how trends evolve over time in a more detailed manner. The year dummies are also easier to interpret. Because the omitted category is 1979, the coefficients on the other dummies represent how much tenure changed by between 1979 and the reported year. Hence, in Model 1, the coefficient on the year 2008 indicates that tenure fell by 1.47 years between 1979 and 2008. I do not use the year dummies in the paper because of space constraints. I report them here. Note that the import analyses only run to 2006 because of data limitations.

The substantive results are unchanged when using this more flexible specification.

## Effects of Independent Variables Across All Organizations

In the paper, I just explore the effects of unionization, imports and technology on employees of large organizations, on the basis that they were the organizations that saw the largest changes in tenure. Here I also report results for employees of all organizations (Models 13-17).

The analyses demonstrate a very similar pattern to those for large organizations. There is a strong effect of unionization – indeed including the unionization variable explains all of the change in tenure when I include all organizations. There is no effect for import penetration or technology intensity.

#### Time Trends by Employer Size **Effects of Industry Characteristics** All < 25 emp 25-999 1000+ 1000+ 1000+ 1000+ 1000 +1000+ **Employer size** Sample Tradable Tradable IT only IT only Model 3 1 2 4 5 6 7 8 9 1.035\*\*\* 0.940\*\*\* 0.539\*\*\* 0.159\* 0.309\*\*\* 0.939\*\*\* 0.856\*\*\* 1.034\*\*\* 0.940\*\*\* Age [0.0751] [0.117] [0.117] [0.0927] [0.0601] [0.0575] [0.0827] [0.0928] [0.0689] -0.00142\* 0.00196\* 0.000398 -0.005\*\*\* -0.004\*\*\* -0.005\*\*\* -0.005\*\*\* -0.005\*\*\* -0.005\*\*\* Age squared [0.000857] [0.000786] [0.00128] [0.000599] [0.000810] [0.000668] [0.00128] [0.000962] [0.000962] 1.114\*\*\* 1.077\*\*\* 1.592\*\*\* 1.344\*\*\* 1.502\*\*\* 1.501\*\*\* 1.481\*\*\* 1.483\*\*\* High school 0.370\* [0.197] [0.290] [0.147] [0.180][0.245] [0.234] [0.330] [0.330] [0.290] Associates -0.904\*\*\* -0.207 -0.947\*\*\* -1.177\*\*\* -1.043\*\*\* -1.319\*\*\* -1.326\*\*\* -1.241\*\*\* -1.238\*\*\* [0.134] [0.209] [0.156] [0.167] [0.164] [0.278] [0.276] [0.206] [0.206] -0.932\*\*\* -0.937\*\*\* Bachelors -0.429\*\*\* -0.186 -0.362\* -0.566\*\* -0.455\*\* -0.566\*\* -0.563\*\* [0.128] [0.262] [0.171][0.181] [0.175][0.279] [0.280][0.205] [0.205] -0.893\*\*\* -1.218\*\*\* -1.516\*\*\* -1.522\*\*\* -1.567\*\*\* Post grad -0.996\*\*\* -1.280\*\*\* -1.562\*\*\* -0.363 [0.222] [0.390] [0.240][0.194] [0.188][0.334] [0.333] [0.205] [0.204] 0.140\*\* 0.0834\* -0.0386 0.0695 0.0696 0.144 0.142 0.13 State unemp 0.13 [0.0376] [0.0547] [0.0374] [0.0516] [0.0413] [0.0784] [0.0774] [0.0696] [0.0696] 25-999 emp 0.311\* [0.154] 1000 + emp3.103\*\*\* [0.268] 1983 -0.142 0.332 -0.0563-0.2110.85 -0.219-0.2090.285 0.284 [0.422] [0.521] [0.422][0.582] [0.517] [0.627] [0.630] [0.500][0.500] 1988 -0.125 0.342 -0.0964-0.2730.999\* 0.42 0.398 0.342 0.344 [0.400][0.434][0.516] [0.411][0.384] [0.536] [0.512] [0.461] [0.461] 1993 1.687\*\* -0.0439 -0.408 -0.403 -0.0332 -0.7770.7 -0.189-0.213 [0.405] [0.580] [0.421] [0.556] [0.467] [0.514] [0.513] [0.506] [0.508] 1995 0.729\* -0.224 -1.643\*\* 0.0493 -0.562 -0.957 -0.95 -0.712 -0.523 [0.376] [0.371] [0.342][0.559] [0.476] [0.549] [0.549] [0.580][0.583] 1996 0.405 -0.265 -1.947\*\*\* -0.178-1.041-1.083-1.131 -0.921\* -1.124[0.378] [0.378] [0.362] [0.560] [0.450] [0.625] [0.610] [0.617] [0.620] 1997 -0.747 0.865\* -0.466 -1.513\*\* 0.172 -0.623 -0.668 -1.250\* -1.228\* [0.542] [0.389] [0.382] [0.362] [0.562] [0.447][0.534] [0.552] [0.558] 1998 -1.133\*\* 0.299 -0.635 -2.074\*\*\* -0.274 -1.390\* -1.436\* -1.802\*\*\* -1.785\*\* [0.381] [0.381] [0.353] [0.554] [0.444][0.617] [0.611] [0.541] [0.547] 1999 -0.840\* 0.841\* -0.349 -1.928\*\*\* -0.142 -0.867 -0.922 -1.675\*\* -1.654\*\* [0.372] [0.382] [0.352] [0.548] [0.429] [0.597] [0.583] [0.541] [0.545] -2.388\*\*\* -2.609\*\*\* -2.212\*\*\* -2.407\*\*\* 2000 -1.190\*\* 0.484 -0.433 -0.75 -2.147\*\*[0.542] [0.444][0.377][0.369] [0.376][0.661] [0.646][0.526][0.530] -1.257\*\*\* -2.560\*\*\* -2.300\*\*\* -2.281\*\*\* 2001 0.519 -0.515 -0.667 -1.564\* -1.627\* [0.371] [0.337] [0.546] [0.456] [0.643] [0.637] [0.543] [0.547] [0.371] -2.694\*\*\* 2002 -1.603\*\*\* -0.807\* -3.216\*\*\* -2.094\*\*\* -2.160\*\*\* -2.709\*\*\* 0.554 -1.103\* [0.348] [0.390] [0.335] [0.524] [0.435] [0.565] [0.559] [0.504] [0.507] -1.420\*\*\* -0.947\* -2.223\*\*\* -2.288\*\*\* -2.627\*\*\* -2.617\*\*\* 2004 0.842\* -0.638 -3.156\*\*\* [0.364] [0.426] [0.350] [0.526] [0.462][0.582] [0.598] [0.491] [0.493] 2005 -1.286\*\*\* 1.010\*\* -3.104\*\*\* -0.859\* -2.317\*\*\* -2.389\*\*\* -2.607\*\*\* -2.594\*\*\* -0.468[0.343] [0.390] [0.337] [0.506] [0.437][0.525] [0.542] [0.462] [0.464] 2006 -1.565\*\*\* 0.707 -0.825\* -3.382\*\*\* -1.140\*-2.601\*\*\* -2.687\*\*\* -2.749\*\*\*-2.735\*\*\* [0.346] [0.372] [0.342][0.507] [0.446] [0.530] [0.544] [0.452] [0.455] -1.471\*\*\* -1.129\* -3.119\*\*\* -3.104\*\*\* 2008 -0.583 -3.366\*\*\* 0.810\* [0.394] [0.357] [0.334] [0.523] [0.468] [0.497] [0.500] 10.89\*\*\* Unionization [0.664] Import pen 0.356 [0.479] Tech intens -2.465 [3.430] 1000+ emp \* unionization 1000+ emp \* imports 1000+ emp \* Tech intens 138612 36921 50447 51244 51244 19606 19606 33428 33428 Observations 0.307 R-squared 0.223 0.173 0.164 0.277 0.313 0.313 0.287 0.287 Omitted year is 1979. All details as in Table 2 in the paper, except for use of dummy variables for years. \*: p<.05; \*\* p<.01 \*\*\* P<.001

#### Table 1A: Additional Details on Time Trends and Effects of Industry

Continued overleaf

## Table 1A continued

	Interactions with Size			Industry Characteristics - All Employers					
Employer size	All	All	All	All	All	All	All	All	
Model	10	Tradable	IT only	12	Tradable	Tradable	IT only	IT only	
Model	10	11	12	13	14	15	10	1/	
Age	[0.0539]	[0.0809]	[0 0722]	[0 0546]	[0.0808]	[0.0809]	[0 0720]	[0.0721]	
Age squared	-0.000913	-0.000704	-0.000648	-0.00093	-0.000711	-0.000704	-0.000646	-0.000649	
81	[0.000543]	[0.000823]	[0.000701]	[0.000550]	[0.000822]	[0.000824]	[0.000699]	[0.000700]	
High school	0.950***	1.111***	1.036***	1.003***	1.112***	1.110***	1.029***	1.033***	
	[0.141]	[0.177]	[0.161]	[0.142]	[0.177]	[0.177]	[0.161]	[0.161]	
Associates	-0.827***	-1.241***	-0.981***	-0.844***	-1.244***	-1.239***	-0.990***	-0.982***	
	[0.131]	[0.251]	[0.191]	[0.132]	[0.253]	[0.252]	[0.192]	[0.191]	
Bachelors	-0.323**	-0.823***	-0.391*	-0.320**	-0.826***	-0.822***	-0.400*	-0.392*	
Post grad	_0 795***	[0.215] -1 268***	[0.106] _1 314***	_0.769***	[0.214] -1.267***	[0.213] -1.264***	[0.170] _1 325***	_1 313***	
i ost giud	[0.221]	[0.325]	[0.210]	[0.232]	[0.327]	[0.326]	[0.210]	[0.210]	
State unemployment	0.0408	0.102	0.0601	0.0508	0.101	0.102	0.0595	0.06	
1 2	[0.0291]	[0.0662]	[0.0556]	[0.0303]	[0.0666]	[0.0662]	[0.0557]	[0.0556]	
25-999 emp	0.181	0.668*	0.383	0.0102	0.661*	0.666*	0.373	0.38	
	[0.133]	[0.315]	[0.219]	[0.122]	[0.318]	[0.317]	[0.219]	[0.219]	
1000+ emp	1.298***	4.102***	3.189***	2.320***	4.146***	4.155***	3.218***	3.235***	
1083	[0.231]	[0.450]	[0.345]	[0.186]	[0.426]	[0.425]	[0.333]	[0.333]	
1703	0.333	0.180	0.798	0.434	0.2	0.100	0.794 [0.46 <b>5</b> ]	0.797	
1988	0.756*	0.719	0.502	0.741*	0.732	0.729	0.496	0.501	
.,	[0.335]	[0.473]	[0.446]	[0.364]	[0.479]	[0.475]	[0.446]	[0.445]	
1993	0.972**	0.655	0.376	0.921**	0.665	0.666	0.362	0.379	
	[0.335]	[0.494]	[0.466]	[0.351]	[0.499]	[0.494]	[0.465]	[0.465]	
1995	0.434	0.149	-0.381	0.386	0.153	0.163	-0.396	-0.377	
1007	[0.313]	[0.452]	[0.471]	[0.335]	[0.458]	[0.453]	[0.468]	[0.469]	
1996	0.269	0.0433	-0.5	0.227	0.0445	0.0573	-0.514	-0.495	
1007	[0.312]	[0.468]	[0.522]	[0.337]	[0.4/8]	[0.4/2]	[0.517]	[0.519]	
1997	[0 321]	[0.454]	-0.812	[0 350]	0.123 [0.462]	[0 457]	-0.857	-0.81	
1998	0.0898	-0.517	-1.206*	0.0621	-0.516	-0.501	-1.241**	-1.203*	
	[0.307]	[0.512]	[0.470]	[0.332]	[0.513]	[0.512]	[0.467]	[0.468]	
1999	0.366	-0.177	-0.915*	0.337	-0.177	-0.16	-0.952*	-0.911*	
	[0.299]	[0.475]	[0.456]	[0.326]	[0.483]	[0.479]	[0.454]	[0.454]	
2000	0.0539	-0.753	-1.311**	0.0305	-0.757	-0.734	-1.352**	-1.309**	
2001	[0.308]	[0.503]	[0.466]	[0.335]	[0.512]	[0.507]	[0.465]	[0.464]	
2001	0.0145	-0.493	-1.281**	-0.0146	-0.5	-0.4/5	-1.322**	-1.2/9**	
2002	[0.309]	[0.313] -0.918*	[0.405] _1 533***	[0.338]	-0.926*	[0.316] -0.901	[0.462] _1 575***	[0.401] -1 535***	
2002	[0.289]	[0.463]	[0.420]	[0.311]	[0.462]	[0.462]	[0.419]	[0.419]	
2004	0.0511	-0.546	-1.325**	0.0371	-0.55	-0.528	-1.362**	-1.328**	
	[0.309]	[0.414]	[0.422]	[0.323]	[0.419]	[0.413]	[0.421]	[0.422]	
2005	0.186	-0.814*	-1.336**	0.171	-0.831*	-0.798	-1.376***	-1.338**	
	[0.290]	[0.408]	[0.408]	[0.303]	[0.414]	[0.407]	[0.406]	[0.407]	
2006	-0.0822	-1.041*	-1.478***	-0.0793	-1.056*	-1.022*	-1.515***	-1.479***	
2008	[0.292]	[0.418]	[0.405]	[0.305]	[0.426]	[0.419]	[0.403] 1 597***	[0.404] 1.550***	
2008	0.00285		-1.331****	-0.0119			-1.30/****	-1.330****	
Unionization	5.091***		[0.455]	9.706***			[0.452]	[0.455]	
	[0.779]			[0.708]					
Import pen		-0.391				-0.3			
		[0.287]				[0.278]			
Tech intens			-11.79*					-7.623	
1000			[5.245]					[4.401]	
1000+ emp *	7.566***								
unionization	[0.765]	0.204							
imports		0.284							
1000 + omn *		[0.501]	6.0.40						
1(N) + C(D)			0.242						
Tech intens			6.242 [4.050]						
Tech intens Observations	138612	48656	6.242 [4.050] 88317	138612	48656	48656	88317	88317	

## Table 2A: Replication of Table 3 with additional specifications

Table 2A provides alternative specifications from Table 3 in the paper. The key differences are:

- 1. As in Table 1A, I use the more flexible form of year dummies. The results are largely similar to those in the paper, although the within industry effects of unionization are more significant.
- 2. I add an additional comparison of within and between industry effects. I measured the betweenindustry differences using the initial unionization level of the industry in 1979. Effects of this variable represent cross-sectional differences in tenure levels in industries that traditionally had high tenure versus those that had low tenure. The within-industry changes are measured using the change in industry-unionization from 1979 to the observed year, testing how changes within an industry affected tenure. A particular advantage of this specification is that it allows me to control for different within versus between industry effects of union change, and see what the resulting impact on the year effects is.

Model 11 of Table 2A confirms that both the between- and within- industry differences in unionization have significant effects of tenure, and that the between-industry effect is larger. It also shows that those effects continue to explain a large portion of the over-time decline in tenure, even when the within and between effects of unionization are allowed to vary.

Sample         All         All         All         Union mem         Non union         Union mem         Non union           Age         0.879***         0.917***         0.820***         1.128***         0.868***         1.068***         0.827**           [0.0761]         [0.0859]         [0.0778]         [0.161]         [0.0759]         [0.152]         [0.0738]           0.004***         0.004***         0.004***         0.005***         0.005***         0.005***         0.005***	on *
Age         0.879***         0.917***         0.820***         1.128***         0.868***         1.068***         0.827**           [0.0761]         [0.0859]         [0.0778]         [0.161]         [0.0759]         [0.152]         [0.0738]           0.004***         0.004***         0.004***         0.005**         0.005**         0.005**         0.005**	*
[0.0761] [0.0859] [0.0778] [0.161] [0.0759] [0.152] [0.0738 0.004*** 0.004*** 0.005** 0.005*** 0.005*** 0.005**	
	]
Age squared $-0.004^{****}$ $-0.004^{****}$ $-0.005^{***}$ $-0.005^{***}$ $-0.005^{***}$ $-0.005^{***}$	**
$\begin{bmatrix} 0.000798 \end{bmatrix} \begin{bmatrix} 0.000893 \end{bmatrix} \begin{bmatrix} 0.000814 \end{bmatrix} \begin{bmatrix} 0.00172 \end{bmatrix} \begin{bmatrix} 0.000829 \end{bmatrix} \begin{bmatrix} 0.00163 \end{bmatrix} \begin{bmatrix} 0.00080 \end{bmatrix}$	6]
High school         1.206***         1.567***         1.137***         1.346***         1.745***         1.192***         1.520**	*
[0.230] [0.248] [0.233] [0.323] [0.306] [0.316] [0.309]	
Associates -1.271*** -1.197*** -1.163*** -1.86*** -0.734*** -1.79*** -0.687**	**
[0.163] [0.172] [0.166] [0.317] [0.178] [0.307] [0.174]	
Bachelors -0.697*** -0.540** -0.572*** -1.070** -0.528* -1.117** -0.465*	k
[0.171] [0.188] [0.172] [0.389] [0.212] [0.401] [0.207]	
Post grad -1.277*** -1.200*** -1.142*** -1.382 -1.284*** -1.101 -1.261**	**
[0.196] [0.207] [0.199] [1.053] [0.192] [0.946] [0.194	
State unemp         0.122**         0.136**         0.0707+         0.0223         0.0607         -0.009         0.034	
[0.0460] [0.0518] [0.0420] [0.0792] [0.0503] [0.0677] [0.0477	]
1983         -0.275         -0.0102         0.709         1.066         0.141         1.824*         0.684	
[0.520] [0.586] [0.494] [0.887] [0.548] [0.753] [0.519]	
$1988    -0.203   -0.101   0.872^*   1.556^*   -0.821^+   2.663^{***}   -0.051^4$	1
[0.473] [0.543] [0.421] [0.781] [0.478] [0.607] [0.447]	
1993         -0.707         -0.631         0.486         0.765         -0.901+         2.156***         -0.124	
[0.499] [0.569] [0.451] [0.776] [0.503] [0.600] [0.481]	
$1995    -1.526^{**}   -1.428^{*}   -0.117   0.212   -1.713^{***}   1.731^{*}   -0.767$	
[0.500] [0.571] [0.465] [0.858] [0.491] [0.697] [0.473]	
$1996   -1.820^{***} -1.638^{**} -0.282   0.202   -2.310^{***}   1.757^{**} -1.293^{**}$	*
[0.492] [0.571] [0.428] [0.794] [0.465] [0.627] [0.436]	
$1997    -1.398^{**}   -1.244^{*}   0.00541   0.566   -1.803^{***}   2.049^{**}   -0.828^{*}$	F
[0.489] $[0.572]$ $[0.431]$ $[0.797]$ $[0.471]$ $[0.623]$ $[0.439]$	
$1998 \qquad -1.913^{***} -1.757^{**} -0.388 \qquad 0.0169  -2.417^{***} \qquad 1.652^{**} -1.374^{**}$	*
[0.490] $[0.564]$ $[0.430]$ $[0.811]$ $[0.465]$ $[0.689]$ $[0.437]$	
$1999  -1.791^{***} -1.636^{**} -0.283  0.234  -2.255^{***}  1.959^{**} -1.235^{**}$	*
[0.486] $[0.552]$ $[0.415]$ $[0.831]$ $[0.454]$ $[0.678]$ $[0.413]$	
$2000 \qquad -2.500^{***} -2.249^{***} -0.865 + -0.895 -2.824^{***} 0.907 -1.749^{**}$	**
[0.489] $[0.552]$ $[0.441]$ $[0.792]$ $[0.463]$ $[0.692]$ $[0.428]$	
$2001  -2.385^{***} -2.109^{***} -0.722 -0.512 -2.722^{***} 1.239+ -1.609^{**}$	**
$\begin{bmatrix} 0.512 \\ 0.552 \end{bmatrix} \begin{bmatrix} 0.451 \\ 0.451 \end{bmatrix} \begin{bmatrix} 0.880 \\ 0.451 \end{bmatrix} \begin{bmatrix} 0.461 \\ 0.451 \end{bmatrix} \begin{bmatrix} 0.727 \\ 0.552 \end{bmatrix} \begin{bmatrix} 0.434 \\ 0.552 \end{bmatrix}$	
2002 -2.98*** -2.99*** -1.169** -0.4/4 -3.446*** 1.510* -2.250**	· •
[0.484] $[0.334]$ $[0.435]$ $[0.435]$ $[0.844]$ $[0.450]$ $[0.720]$ $[0.720]$ $[0.420]$	 
2004 -2.9192.8181.1430.9553.018 - 1.058 - 1.1450.9553.018	
$\begin{bmatrix} 0.488 \\ 0.557 \end{bmatrix} \begin{bmatrix} 0.442 \\ 0.807 \end{bmatrix} \begin{bmatrix} 0.459 \\ 0.159 \end{bmatrix} \begin{bmatrix} 0.759 \\ 0.159 \end{bmatrix} \begin{bmatrix} 0.424 \\ 0.159 \end{bmatrix}$	 
$-2.639^{-1.029}$ $-2.610^{-1.029}$ $-1.029^{-1.055}$ $-2.901^{-1.01}$ $0.452$ $-1.001^{-1.01}$	1
$\begin{bmatrix} [0.405] & [0.320] & [0.425] & [0.627] & [0.445] & [0.707] & [0.427] \\ 2006 & 2.148*** 2.020*** 1.277** 1.276 & 2.562*** 0.642 & 1.042*: \\ \end{bmatrix}$	 **
[0.464] [0.531] [0.442] [0.812] [0.450] [0.821] [0.440]	I
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	 **
[0.480] [0.540] [0.456] [0.854] [0.448] [0.811] [0.444]	I
[0.50] [0.50] [0.50] [0.50] [0.55] [0.55] [0.55] [0.51] [0.51]	
[1 008] [0 799]	
Industry growth $-0.478^{***} = 0.354^{***}$	
since 1979 [0.108] [0.0657]	
Since 1777         [0.100]         [0.007]           Unionization         \$2.560***         \$2.760***         \$2.85**	*
[0.699] [0.950] [0.862]	l
Unionization in 1979	
Unionization change since 1979	
Observations 51242 48410 48408 11476 37805 11476 37805	
R-squared 0.296 0.287 0.32 0.346 0.243 0.369 0.257	
Continued Overleaf	

 Table 2A: Replication and extension of Table 3

## Table 2A continued

	8	9	10	11
	Consistent ind	Consistent ind	Consistent ind	Consistent ind
Age	0.792***	0.789***	0.858***	0.849***
0	[0.0800]	[0.0791]	[0.0752]	[0.0750]
Age squared	-0.00365***	-0.00362***	-0.00399***	-0.00391***
8 1	[0.000782]	[0.000772]	[0.000789]	[0.000786]
High school	0.827***	0.847***	1.365***	1.330***
8	[0.219]	[0.219]	[0.242]	[0.238]
Associated	-1.100***	-1.094***	-1.061***	-1.041***
	[0.172]	[0.171]	[0.165]	[0.164]
Bachelors	-0.408**	-0.410**	-0.394*	-0.417*
	[0.141]	[0.141]	[0.177]	[0.176]
Post grad	-1.212***	-1.213***	-1.139***	-1.165***
8	[0.172]	[0.171]	[0.195]	[0.191]
State unemp	-7.93E-05	-0.00607	0.0897*	0.0738
r	[0.0383]	[0.0374]	[0.0416]	[0.0406]
1983	0.666*	0.908**	0.309	0.685
	[0.286]	[0.287]	[0.504]	[0.498]
1988	0.201	0.606+	0.0309	0.639
1,000	[0 261]	[0 344]	[0 425]	[0 426]
1993	0.156	0.665*	-0.383	0.3
1775	[0 318]	[0 323]	[0 492]	[0 459]
1995	-0.606*	-0.0723	-1 236**	-0.433
1775	[0 279]	[0 388]	[0.467]	[0 464]
1996	-0.852*	-0.303	_1 478**	-0.661
1770	[0.330]	[0 371]	[0 454]	[0.433]
1007	_0 561+	-0.0251	[0. <del>4</del> 54] _1.074*	_0.20
1))/	-0.301+ [0.322]	-0.0251	-1.074	-0.27 [0.444]
1008	[0.322]	0.508]	1 657***	[0.444]
1990	-1.232	-0.009+	-1.037	-0.795
1000	[0.312]	[0.392]	[0.450]	[0.444]
1999	-1.075**	-0.464	-1.552***	-0.078
2000	[0.340]	[0.425]	[0.419] 2.100***	[0.432]
2000	-1.080***	-1.080*	-2.199	-1.299
2001	[0.391]	[0.436]	[0.437]	[0.404]
2001	-1.428***	-0.827*	-2.102	-1.203***
2002	[0.379]	[0.416]	[0.451]	[0.401]
2002	-1.0/3***	-1.020*	-2.055****	-1.081****
2004	[0.418]	[0.452]	[0.455]	[0.458]
2004	-1.38/***	-0.732	-2.528***	-1.525**
2005	[0.399]	[0.461]	[0.461]	[0.486]
2005	-1.38/***	-0.737	-2.452***	-1.45/**
2004	[0.386]	[0.473]	[0.432]	[0.458]
2006	-1./11***	-1.053*	-2.693***	-1./00***
2000	[0.414]	[0.493]	[0.439]	[0.465]
2008	-1.799***	-1.147*	-2.640***	-1.656***
	[0.406]	[0.464]	[0.443]	[0.480]
Industry wage pro	emium			
Industry growth				
since 1070				
Unionization		3 025*		
Unionization		5.755		
Industry E E	Vec	[1.003] Voc		
Industry F.E.	070	1 05	Q 770***	10 57***
Unionization in I	717		0.220	10.3/*****
Unionization st-	200		[0.043]	[U.00U]
cinomization cha	nge			0.331***
since 1979	E1017	E1017	<b>F1010</b>	[1.301]
Observations	51017	51017	51018	51017
K-squared	0.218	0.219	0.305	0.309

All details as in Table 3 in the paper, except for use of year dummies

#### **Table 3A: Effects by Occupation**

I also explored how changes in tenure and effects of unionization varied by occupation. Traditionally, different occupations have had very different unionization rates: blue collar workers have been most likely to be unionized, while labor law in the US does not protect managers' unions, effectively preventing their unionization; service and professional jobs fall in between these two.

Table 3A analyzes time trends across four different occupational groups: blue collar workers (cleaning, farming, construction, maintenance, production, and transport) service and clerical workers (health support, technical care, sales, office and admin), professional and technical workers (computer and math, architecture and engineering, science, education, healthcare, and professional workers) and managerial workers. I again present the analyses for employees of large organizations only.

The analyses demonstrate similar time trends across the different occupations (Models 1, 3, 5 and 7) although professional and technical workers demonstrate lower declines in tenure than other groups. Industry unionization has significant effects in all occupations, although the coefficient varies from 8 (professional and technical workers) to 13 (service and clerical workers). Including unionization in the analysis explains much more of the decline in tenure for blue collar workers than other occupations, reflecting the way that unionization fell much further in the industries that employ blue collar workers.

It may seem surprising that industry unionization has a strong effect on the tenure of managerial workers, given that those workers should be non-union. Evidence from other studies, though, suggests that employment practices of frontline workers often spill over to managers because of institutionalization processes and the need to maintain internal equity. For example, Colvin et al (2001) find that wages for managers are higher in unionized workplaces, an effect that is explained by frontline workers' wages. Within the automotive industry, MacDuffie (1996) found that employment relationships for managers were heavily modeled on the terms secured by unions for their blue collar members. It is therefore plausible that firms and industries that adopted closed employment relationships for frontline workers adopted similar employment models for their managerial workers. Alternatively, this finding could indicate that the effects of unionization in part reflect other pressures on firms.

Table 3A:	Changes i	in	Tenure	by (	Occu	pational	Groups
-----------	-----------	----	--------	------	------	----------	--------

	1	2	3	4	5	6	7	8
Workers	Profes	ssional	Blue	collar	White	collar	Mana	gerial
Age	0.613***	0.581***	1.173***	1.054***	0.861***	0.821***	0.834***	0.738***
0	[0.123]	[0.122]	[0.140]	[0.124]	[0.135]	[0.131]	[0.160]	[0.155]
Age squared	-0.000982	-0.000701	-0.007***	-0.006***	-0.005**	-0.004**	-0.003	-0.003
<b>U</b>	[0.00138]	[0.00136]	[0.00145]	[0.00129]	[0.00159]	[0.00153]	[0.00182]	[0.00176]
High school	0.349	0.228	1.875***	1.529***	-0.373	-0.293	2.650*	2.369*
0	[1.389]	[1.388]	[0.263]	[0.243]	[0.688]	[0.674]	[1.069]	[1.019]
Associates	-0.850*	-0.633	-1.278***	-1.171***	-1.395***	-1.263**	-1.256**	-1.181**
	[0.375]	[0.363]	[0.271]	[0.266]	[0.391]	[0.382]	[0.393]	[0.380]
Bachelors	-1.164***	-1.161***	-0.899**	-0.800*	0.0788	0.25	-0.284	-0.0961
	[0.293]	[0.265]	[0.327]	[0.329]	[0.420]	[0.433]	[0.405]	[0.369]
Post grad	-1.199***	-1.094***	-1.679*	-1.596*	-0.993*	-0.745	-1.388***	-1.426***
-	[0.251]	[0.242]	[0.683]	[0.668]	[0.448]	[0.436]	[0.292]	[0.288]
State unemployment	0.0966	0.0693	0.201**	0.0992	0.165	0.135	-0.0852	-0.118
	[0.0865]	[0.0837]	[0.0701]	[0.0577]	[0.0936]	[0.0919]	[0.0853]	[0.0760]
1983	-0.432	0.18	-0.274	1.029	-0.445	0.682	0.411	0.885
	[0.736]	[0.704]	[0.762]	[0.677]	[0.895]	[0.885]	[0.944]	[0.894]
1988	-0.341	0.312	0.494	2.056***	-1.621	-0.243	-1.466	-0.563
	[0.634]	[0.556]	[0.688]	[0.586]	[0.898]	[0.797]	[0.837]	[0.783]
1993	-0.329	0.343	-1.119	1	-1.269	0.223	-0.731	0.0463
	[0.569]	[0.514]	[0.749]	[0.652]	[0.822]	[0.729]	[0.882]	[0.807]
1995	-0.643	0.297	-1.581*	0.573	-2.196*	-0.61	-2.784***	-1.641*
	[0.585]	[0.524]	[0.769]	[0.701]	[0.896]	[0.758]	[0.825]	[0.758]
1996	-1.568**	-0.547	-1.534*	0.722	-3.097***	-1.469*	-2.676***	-1.519*
	[0.582]	[0.503]	[0.754]	[0.632]	[0.796]	[0.714]	[0.804]	[0.747]
1997	-1.038	-0.147	-1.317	0.797	-2.083*	-0.437	-2.568**	-1.338
	[0.637]	[0.517]	[0.725]	[0.613]	[0.878]	[0.752]	[0.819]	[0.728]
1998	-1.529**	-0.523	-1.896**	0.424	-2.398**	-0.725	-3.207***	-1.977**
	[0.563]	[0.509]	[0.713]	[0.614]	[0.904]	[0.773]	[0.833]	[0.750]
1999	-1.336*	-0.376	-1.367	0.964	-2.962***	-1.148	-3.562***	-2.395**
	[0.546]	[0.482]	[0.709]	[0.604]	[0.866]	[0.740]	[0.852]	[0.738]
2000	-2.010**	-0.941	-2.306**	0.0898	-3.008***	-1.188	-4.162***	-2.950***
	[0.639]	[0.533]	[0.704]	[0.617]	[0.824]	[0.708]	[0.816]	[0.728]
2001	-1.993**	-0.901	-2.200**	0.189	-3.441***	-1.602*	-3.947***	-2.558***
	[0.669]	[0.578]	[0.725]	[0.632]	[0.863]	[0.749]	[0.824]	[0.744]
2002	-2.241***	-1.132*	-3.003***	-0.266	-3.905***	-1.919*	-4.628***	-3.065***
	[0.611]	[0.566]	[0.684]	[0.587]	[0.853]	[0.770]	[0.851]	[0.760]
2004	-2.430***	-1.130*	-3.600***	-0.684	-3.936***	-2.011**	-3.046***	-1.553
	[0.583]	[0.567]	[0.740]	[0.653]	[0.884]	[0.770]	[0.853]	[0.813]
2005	-2.236***	-0.84	-3.268***	-0.361	-3.719***	-1.730*	-4.024***	-2.458**
	[0.568]	[0.573]	[0.688]	[0.600]	[0.802]	[0.678]	[0.855]	[0.818]
2006	-2.247***	-0.849	-3.750***	-0.834	-4.293***	-2.188**	-4.163***	-2.689***
	[0.609]	[0.613]	[0.637]	[0.594]	[0.948]	[0.808]	[0.797]	[0.759]
2008	-2.933***	-1.636**	-3.665***	-0.669	-3.613***	-1.577	-3.683***	-2.107*
	[0.570]	[0.576]	[0.730]	[0.684]	[0.968]	[0.806]	[0.887]	[0.847]
Unionization		7.895***		11.37***		12.93***		10.21***
		[1.049]		[0.820]		[1.029]		[1.177]
Observations	10960	10959	21558	21558	8869	8869	8579	8579
R-squared	0.302	0.316	0.278	0.313	0.232	0.268	0.27	0.295

## Table 4A: Effects of Industry Layoffs on Tenure

I also carried out an exploratory analysis to examine the relationship between layoffs within an industry and subsequent tenure. I calculate the proportion of all workers (including women and younger workers) laid off from the industry over the prior three years, using data from the Displaced Workers Survey, and introduce this as a control into the analysis. It is important to be aware of a couple of limitations of this analysis:

- It requires merging data from the displaced worker survey with other surveys that measure tenure. Because of this, I make inferences about layoff rates based on different years. Specifically, the layoff data only started in 1984, and runs in alternate years. That means that I have to drop 1979 from the analysis. I also have to match the 1983 data to 1984 layoff data. For the other odd years in the dataset I match in data from the prior year (hence, I look at the effect of layoffs in the three years prior to 1994 on tenure in 1995).
- It is hard to construct an exact measure of layoffs from an industry. The Displaced Worker Survey tells us which workers were laid off from an industry over the prior three years. It does not tell us, though, whether which other workers were in that industry three years earlier. Instead, I assume that non laidoff workers have not changed industries, which is inaccurate.

The analysis is on employees of large organizations only. The dependent variable is tenure again.

The results of this analysis demonstrate no effects of lay off rates out of an industry on tenure within that industry, and no difference in the unionization estimate once the layoff variable is included.. Although this analysis is problematic for the reasons laid out above, it is indicative that declines in tenure are not solely due to changes in layoff behavior. If increasing layoffs were driving declines in tenure, we would expect to see a strong relationship between layoffs out of an industry and tenure, given that the effects in such an analysis are largely driven by cross-industry differences

# Table 4A: Effects of Layoff Rates out of an Industry on Tenure Within that Industry

Age $0.959***$ $0.958***$ $0.868***$ Age $[0.0876]$ $[0.0872]$ $[0.0800]$ Age squared $-0.00509***$ $-0.00509***$ $-0.00422***$ $[0.00898]$ $[0.000895]$ $[0.000829]$ High school $1.591***$ $1.559***$ $1.261***$ $[0.255]$ $[0.249]$ $[0.246]$ Associates $-1.165***$ $-1.163***$ $-1.048***$ $[0.171]$ $[0.171]$ $[0.167]$ Bachelors $-0.530**$ $-0.522**$ $-0.401*$ $[0.188]$ $[0.188]$ $[0.182]$ Post grad $-1.258**$ $-1.282***$ $-1.171***$ $[0.201]$ $[0.201]$ $[0.192]$ State $[0.0538]$ $[0.0545]$ $[0.0435]$ unemployment $0.138*$ $0.145**$ $0.0623$ $[0.351]$ $[0.361]$ $[0.367]$ $[0.367]$ $1993$ $-0.585$ $-0.613$ $-0.119$ $[0.369]$ $[0.370]$ $[0.367]$ $1995$ $-1.49***$ $-1.423***$ $-0.639$ $[0.369]$ $[0.370]$ $[0.367]$ $1996$ $-1.756***$ $-1.750***$ $-0.989**$ $[0.391]$ $[0.391]$ $[0.367]$ $1997$ $-1.316**$ $-1.304**$ $-0.639$ $[0.462]$ $[0.493]$ $[0.479]$ $1999$ $-1.733***$ $-1.878***$ $[0.452]$ $[0.463]$ $[0.472]$ $2000$ $-2.411***$ $-2.430***$ $-1.838**$ $2000$ $-2.411***$ $-2.430***$ $-1.878***$ $[0.45$	Model	1	2	3
IntermIntermInterm $[0.0876]$ $[0.0872]$ $[0.0800]$ Age squared $-0.00509^{***}$ $-0.00509^{***}$ $-0.00422^{***}$ $[0.000898]$ $[0.000895]$ $[0.000829]$ High school $1.591^{***}$ $1.559^{***}$ $1.261^{***}$ $[0.255]$ $[0.249]$ $[0.246]$ Associates $-1.165^{***}$ $-1.163^{***}$ $-1.048^{***}$ $[0.171]$ $[0.171]$ $[0.167]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $[0.201]$ $[0.201]$ $[0.201]$ $[0.182]$ Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.201]$ $[0.192]$ Stateunemployment $0.138^{*}$ $0.145^{**}$ $0.0623$ $[0.538]$ $[0.0545]$ $[0.0435]$ $[0.435]$ $[993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $[995$ $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ $[0.369]$ $[0.370]$ $[0.367]$ $[996$ $-1.756^{***}$ $-1.935^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.367]$ $[997$ $-1.316^{**}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.406]$ $[0.389]$ $[998$ $-1.878^{***}$ $-1.935^{***}$ $-1.060^{*}$ $[0.411]$ $[0.443]$ $[0.479]$ $2000$ $-2.411^{***}$ $-2.480^{***}$ $-1.525^{**}$ $[0.443]$ $[0.443]$ $[0$	Age	0.959***	0.958***	0.868***
Age squared $-0.00509^{***}$ $-0.00509^{***}$ $-0.00520^{***}$ $-0.00422^{***}$ $[0.000898]$ $[0.000895]$ $[0.000829]$ $[0.000829]$ High school $1.591^{***}$ $1.559^{***}$ $1.261^{***}$ $[0.255]$ $[0.249]$ $[0.246]$ Associates $-1.165^{***}$ $-1.163^{***}$ $-1.048^{***}$ $[0.171]$ $[0.171]$ $[0.171]$ $[0.167]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $[0.188]$ $[0.188]$ $[0.182]$ $[0.182]$ Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.201]$ $[0.192]$ Stateunemployment $0.138^{*}$ $0.145^{**}$ $0.0623$ $[0.0538]$ $[0.0545]$ $[0.0435]$ $[0.345]$ $[0.351]$ $[0.361]$ $[0.367]$ $[0.367]$ $1993$ $-0.585$ $-0.613$ $-0.119$ $[0.369]$ $[0.370]$ $[0.367]$ $1995$ $-1.449^{***}$ $-1.23^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.367]$ $1996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.363]$ $[0.420]$ $1999$ $-1.733^{***}$ $-1.304^{**}$ $-0.639$ $[0.440]$ $[0.479]$ $[0.479]$ $[0.479]$ $2000$ $-2.411^{***}$ $-2.480^{***}$ $-1.525^{**}$ $[0.420]$ $[0.498]$ $[0.479]$ $2001$ $-2.363^{***}$ $-2.73^{***}$ $-1.23^$	8-	[0.0876]	[0.0872]	[0.0800]
Age equated $[0.003898]$ $[0.000895]$ $[0.000829]$ High school $1.591^{***}$ $1.559^{***}$ $1.261^{***}$ $[0.255]$ $[0.249]$ $[0.246]$ Associates $-1.165^{***}$ $-1.163^{***}$ $-1.048^{***}$ $[0.171]$ $[0.171]$ $[0.171]$ $[0.171]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $[0.188]$ $[0.188]$ $[0.182]$ Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.201]$ $[0.192]$ Stateunemployment $0.138^{*}$ $0.145^{**}$ $0.0623$ $[0.0538]$ $[0.0545]$ $[0.0435]$ $[0.0435]$ $1988$ $-0.0872$ $-0.163$ $0.167$ $[0.351]$ $[0.361]$ $[0.367]$ $[0.367]$ $1993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $1995$ $-1.449^{***}$ $-1.423^{***}$ $-0.639$ $[0.369]$ $[0.370]$ $[0.367]$ $1996$ $-1.756^{***}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.406]$ $[0.389]$ $1998$ $-1.878^{***}$ $-1.935^{***}$ $-1.060^{*}$ $[0.431]$ $[0.438]$ $[0.420]$ $1999$ $-1.733^{***}$ $-1.325^{***}$ $-0.628^{**}$ $[0.420]$ $[0.492]$ $[0.498]$ $[0.456]$ $2000$ $-2.411^{***}$ $-2.80^{***}$ $-1.525^{**}$ $[0.452]$ $[0.453]$ $[0.440]$ $[0.479]$ <td>Age squared</td> <td>-0.00509***</td> <td>-0.00509***</td> <td>-0.00422***</td>	Age squared	-0.00509***	-0.00509***	-0.00422***
High school $1.591^{+**}$ $1.559^{+**}$ $1.261^{+**}$ $1.591^{+**}$ $1.659^{+**}$ $1.163^{+**}$ $-1.048^{+**}$ $10.1711$ $[0.1711]$ $[0.1711]$ $[0.167]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $10.188]$ $[0.188]$ $[0.182]$ Post grad $-1.288^{***}$ $-1.282^{***}$ $-1.171^{***}$ $10.2011$ $[0.2011]$ $[0.192]$ State $0.2011$ $[0.2011]$ $[0.192]$ unemployment $0.138^{*}$ $0.145^{**}$ $0.0623$ $1988$ $-0.0872$ $-0.163$ $0.167$ $1993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $1995$ $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ $[0.369]$ $[0.370]$ $[0.367]$ $1996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.367]$ $1997$ $-1.316^{**}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.406]$ $[0.389]$ $1998$ $-1.878^{***}$ $-1.935^{***}$ $-1.060^{*}$ $[0.420]$ $[0.492]$ $[0.498]$ $[0.456]$ $2000$ $-2.411^{***}$ $-2.430^{***}$ $-1.525^{**}$ $[0.452]$ $[0.463]$ $[0.445]$ $2001$ $-2.363^{***}$ $-2.873^{***}$ $-1.623^{**}$ $[0.549]$ $[0.547]$ $[0.521]$ $2004$ $-2.945^{***}$ $-1.623^{**}$ $[0.549]$ $[0.547]$ $[0.521]$ </td <td>nge squarea</td> <td>[0 000898]</td> <td>[0 000895]</td> <td>[0 000829]</td>	nge squarea	[0 000898]	[0 000895]	[0 000829]
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	High school	1 501***	1 550***	1 261***
Associates $[0.25]$ $[0.249]$ $[0.249]$ $[0.171]$ $[0.171]$ $[0.171]$ $[0.167]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $[0.188]$ $[0.188]$ $[0.182]$ Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.201]$ $[0.182]$ State $[0.201]$ $[0.201]$ $[0.192]$ State $[0.0538]$ $[0.0545]$ $[0.0435]$ $[1988$ $-0.0872$ $-0.163$ $0.167$ $[0.351]$ $[0.361]$ $[0.367]$ $[1993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $[1995$ $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ $[0.369]$ $[0.370]$ $[0.367]$ $[1996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.370]$ $[0.367]$ $[1997$ $-1.316^{**}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.431]$ $[0.438]$ $[0.420]$ $[1999$ $-1.73^{***}$ $-1.935^{***}$ $-1.060^{*}$ $[0.431]$ $[0.448]$ $[0.420]$ $[0.456]$ $2000$ $-2.411^{***}$ $-2.480^{***}$ $-1.525^{**}$ $[0.452]$ $[0.463]$ $[0.445]$ $2001$ $-2.363^{***}$ $-2.797^{***}$ $-1.878^{***}$ $[0.452]$ $[0.463]$ $[0.444]$ $2004$ $-2.945^{***}$ $-2.873^{***}$ $-1.623^{**}$ $[0.549]$ $[0.540]$ $[0.541]$ </td <td>ringii school</td> <td>[0 255]</td> <td>[0 240]</td> <td>[0 246]</td>	ringii school	[0 255]	[0 240]	[0 246]
Associates $-1.165^{+++}$ $-1.065^{+++}$ $-1.065^{+++}$ $[0.171]$ $[0.171]$ $[0.171]$ $[0.167]$ Bachelors $-0.530^{**}$ $-0.532^{**}$ $-0.401^{*}$ $[0.188]$ $[0.188]$ $[0.188]$ $[0.182]$ Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.192]$ State $0.0623$ $[0.0538]$ $[0.0545]$ $[0.0538]$ $[0.0545]$ $[0.0435]$ $[988$ $-0.0872$ $-0.163$ $0.167$ $[0.351]$ $[0.361]$ $[0.367]$ $[993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $[995$ $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ $[0.369]$ $[0.370]$ $[0.367]$ $[996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.367]$ $[0.367]$ $[996$ $-1.736^{***}$ $-1.935^{***}$ $-0.639$ $[0.406]$ $[0.391]$ $[0.367]$ $[997$ $-1.316^{**}$ $-1.935^{***}$ $-0.639$ $[0.406]$ $[0.431]$ $[0.438]$ $[0.420]$ $[999$ $-1.73^{***}$ $-1.92^{***}$ $-0.28^{**}$ $[0.431]$ $[0.438]$ $[0.420]$ $[999$ $-1.73^{***}$ $-1.82^{***}$ $-0.639$ $[0.442]$ $[0.479]$ $[0.452]$ $[0.463]$ $[0.445]$ $2000$ $-2.411^{***}$ $-2.480^{***}$ $-1.438^{***}$ $[0.453]$ $[0.440]$ <td>Associates</td> <td>[0.233]</td> <td>[0.249]</td> <td>[0.240]</td>	Associates	[0.233]	[0.249]	[0.240]
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Associates	-1.103***	-1.103	-1.048
Bachelors $-0.50^{**}$ $-0.52^{2**}$ $-0.401^{*}$ [0.188][0.188][0.188][0.188]Post grad $-1.258^{***}$ $-1.282^{***}$ $-1.171^{***}$ [0.201][0.201][0.192]State[0.0538][0.0545][0.0435]unemployment $0.138^{*}$ $0.145^{**}$ $0.0623$ [0.0538][0.0545][0.0435]1988 $-0.0872$ $-0.163$ $0.167$ [0.351][0.361][0.367]1993 $-0.585$ $-0.613$ $-0.119$ [0.364][0.366][0.339]1995 $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ [0.369][0.370][0.367]1996 $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ [0.391][0.391][0.367]1997 $-1.316^{**}$ $-1.304^{**}$ $-0.639$ [0.406][0.406][0.389]1998 $-1.878^{***}$ $-1.935^{***}$ $-1.060^{*}$ [0.431][0.431][0.420]1999 $-1.733^{***}$ $-1.782^{***}$ $-0.928^{*}$ [0.420][0.498][0.445]2000 $-2.411^{***}$ $-2.430^{***}$ $-1.525^{**}$ 2011 $-2.363^{***}$ $-2.430^{***}$ $-1.878^{***}$ [0.452][0.463][0.445]2004 $-2.945^{***}$ $-2.873^{***}$ $-1.623^{**}$ 2015 $-2.888^{***}$ $-2.818^{***}$ $-1.623^{**}$ 2005 $-2.888^{***}$ $-2.818^{***}$ $-1.623^{**}$ <		[0.1/1]	[0.1/1]	[0.167]
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Bachelors	-0.530**	-0.532**	-0.401*
Post grad $-1.258***$ $-1.282^{***}$ $-1.171^{***}$ $[0.201]$ $[0.201]$ $[0.192]$ State $[0.201]$ $[0.201]$ $[0.192]$ unemployment $0.138*$ $0.145^{**}$ $0.0623$ $[0.0538]$ $[0.0545]$ $[0.0435]$ 1988 $-0.0872$ $-0.163$ $0.167$ $[0.351]$ $[0.361]$ $[0.367]$ 1993 $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ 1995 $-1.449^{***}$ $-1.423^{***}$ $-0.769^{*}$ $[0.369]$ $[0.370]$ $[0.367]$ 1996 $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.367]$ 1997 $-1.316^{**}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.406]$ $[0.389]$ 1998 $-1.878^{***}$ $-1.935^{***}$ $-1.060^{*}$ $[0.431]$ $[0.438]$ $[0.420]$ 1999 $-1.733^{***}$ $-1.782^{***}$ $-0.928^{*}$ $[0.492]$ $[0.498]$ $[0.420]$ 1999 $-1.733^{***}$ $-1.82^{***}$ $-0.928^{*}$ $[0.442]$ $[0.492]$ $[0.498]$ $[0.456]$ 2000 $-2.411^{***}$ $-2.480^{***}$ $-1.525^{**}$ $[0.452]$ $[0.463]$ $[0.443]$ 2001 $-2.363^{***}$ $-2.873^{***}$ $-1.722^{**}$ $[0.453]$ $[0.440]$ $[0.441]$ 2004 $-2.945^{***}$ $-2.818^{***}$ $-1.623^{**}$ $[0.543]$ $[0.540]$ $[0.542]$ <td< td=""><td></td><td>[0.188]</td><td>[0.188]</td><td>[0.182]</td></td<>		[0.188]	[0.188]	[0.182]
	Post grad	-1.258***	-1.282***	-1.171***
State0.138*0.145**0.0623 $[0.0538]$ $[0.0545]$ $[0.0435]$ 1988-0.0872-0.1630.167 $[0.351]$ $[0.361]$ $[0.367]$ 1993-0.585-0.613-0.119 $[0.364]$ $[0.366]$ $[0.339]$ 1995-1.449***-1.423***-0.769* $[0.369]$ $[0.370]$ $[0.367]$ 1996-1.756***-1.750***-0.989** $[0.391]$ $[0.391]$ $[0.367]$ 1997-1.316**-1.304**-0.639 $[0.406]$ $[0.406]$ $[0.438]$ $[0.420]$ 1998-1.878***-1.935***-1.060* $[0.431]$ $[0.438]$ $[0.420]$ 1999-1.733***-1.782***-0.928* $[0.492]$ $[0.498]$ $[0.456]$ 2000-2.411***-2.480***-1.525** $[0.452]$ $[0.463]$ $[0.445]$ 2001-2.363***-2.974***-1.878*** $[0.452]$ $[0.463]$ $[0.444]$ 2004-2.945***-2.873***-1.722** $[0.543]$ $[0.540]$ $[0.512]$ 2005-2.888***-2.818***-1.623** $[0.550]$ $[0.560]$ $[0.532]$ 2006-3.172***-3.215***-1.879*** $[0.550]$ $[0.560]$ $[0.532]$ 2008-3.150***-3.214***-1.856*** $[0.570]$ $[0.585]$ $[0.541]$ Industry layoffs-3.7131.035	a	[0.201]	[0.201]	[0.192]
unemployment $0.138^*$ $0.145^{**}$ $0.0023$ $[0.0538]$ $[0.0545]$ $[0.0435]$ $1988$ $-0.0872$ $-0.163$ $0.167$ $[0.351]$ $[0.361]$ $[0.367]$ $1993$ $-0.585$ $-0.613$ $-0.119$ $[0.364]$ $[0.366]$ $[0.339]$ $1995$ $-1.449^{***}$ $-1.423^{***}$ $-0.769^*$ $[0.369]$ $[0.370]$ $[0.367]$ $1996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.370]$ $[0.367]$ $1996$ $-1.756^{***}$ $-1.750^{***}$ $-0.989^{**}$ $[0.391]$ $[0.391]$ $[0.367]$ $1997$ $-1.316^{**}$ $-1.304^{**}$ $-0.639$ $[0.406]$ $[0.406]$ $[0.406]$ $[0.389]$ $1998$ $-1.878^{***}$ $-1.935^{***}$ $-1.060^*$ $[0.431]$ $[0.431]$ $[0.438]$ $[0.420]$ $1999$ $-1.733^{***}$ $-1.782^{***}$ $-0.928^*$ $[0.492]$ $[0.498]$ $[0.456]$ $2000$ $-2.411^{***}$ $-2.480^{***}$ $-1.438^{***}$ $[0.452]$ $[0.463]$ $[0.445]$ $2001$ $-2.363^{***}$ $-2.430^{***}$ $-1.438^{***}$ $[0.453]$ $[0.453]$ $[0.440]$ $[0.479]$ $2001$ $-2.363^{***}$ $-2.873^{***}$ $-1.623^{**}$ $[0.453]$ $[0.547]$ $[0.521]$ $2004$ $-2.945^{***}$ $-2.873^{***}$ $-1.623^{**}$ $[0.550]$ $[0.560]$ $[0.532]$ $2006$	State	0.120*	0 145**	0.0(22
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	unemployment	0.138*	0.145**	0.0623
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		[0.0538]	[0.0545]	[0.0435]
$ \begin{bmatrix} [0.351] & [0.361] & [0.367] \\ [0.364] & [0.366] & [0.339] \\ [0.364] & [0.366] & [0.339] \\ [0.369] & [0.370] & [0.367] \\ [0.369] & [0.370] & [0.367] \\ [0.369] & [0.370] & [0.367] \\ [0.391] & [0.391] & [0.367] \\ [0.391] & [0.391] & [0.367] \\ [0.391] & [0.391] & [0.367] \\ [0.406] & [0.406] & [0.389] \\ [0.406] & [0.406] & [0.389] \\ [0.406] & [0.406] & [0.389] \\ [0.406] & [0.406] & [0.389] \\ [0.431] & [0.438] & [0.420] \\ [0.492] & [0.498] & [0.456] \\ 2000 & -2.411^{***} & -2.480^{***} & -1.525^{**} \\ & [0.484] & [0.494] & [0.479] \\ 2001 & -2.363^{***} & -2.430^{***} & -1.438^{**} \\ & [0.452] & [0.463] & [0.445] \\ 2002 & -3.007^{***} & -2.974^{***} & -1.878^{***} \\ & [0.453] & [0.440] & [0.444] \\ 2004 & -2.945^{***} & -2.873^{***} & -1.722^{**} \\ & [0.549] & [0.547] & [0.521] \\ 2005 & -2.888^{***} & -2.818^{***} & -1.623^{**} \\ & [0.550] & [0.560] & [0.532] \\ 2008 & -3.150^{***} & -3.215^{***} & -1.856^{***} \\ & [0.570] & [0.585] & [0.541] \\ Industry layoffs & -3.713 & 1.035 \\ \end{bmatrix}$	1988	-0.0872	-0.163	0.167
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		[0.351]	[0.361]	[0.367]
$ \begin{bmatrix} 0.364 \end{bmatrix} & \begin{bmatrix} 0.366 \end{bmatrix} & \begin{bmatrix} 0.339 \end{bmatrix} \\ \begin{bmatrix} 0.369 \end{bmatrix} & \begin{bmatrix} 0.370 \end{bmatrix} & \begin{bmatrix} 0.367 \end{bmatrix} \\ \begin{bmatrix} 0.369 \end{bmatrix} & \begin{bmatrix} 0.370 \end{bmatrix} & \begin{bmatrix} 0.367 \end{bmatrix} \\ \\ \begin{bmatrix} 0.369 \end{bmatrix} & \begin{bmatrix} 0.370 \end{bmatrix} & \begin{bmatrix} 0.367 \end{bmatrix} \\ \\ \begin{bmatrix} 0.391 \end{bmatrix} & \begin{bmatrix} 0.391 \end{bmatrix} & \begin{bmatrix} 0.367 \end{bmatrix} \\ \\ \begin{bmatrix} 0.391 \end{bmatrix} & \begin{bmatrix} 0.391 \end{bmatrix} & \begin{bmatrix} 0.367 \end{bmatrix} \\ \\ \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.389 \end{bmatrix} \\ \\ \end{bmatrix} \\ \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.389 \end{bmatrix} \\ \\ \begin{bmatrix} 0.420 \end{bmatrix} & \begin{bmatrix} 0.431 \end{bmatrix} & \begin{bmatrix} 0.438 \end{bmatrix} & \begin{bmatrix} 0.420 \end{bmatrix} \\ \\ \end{bmatrix} \\ \begin{bmatrix} 0.420 \end{bmatrix} & \begin{bmatrix} 0.498 \end{bmatrix} & \begin{bmatrix} 0.456 \end{bmatrix} \\ \\ 2000 & -2.411^{**} & -2.480^{**} & -1.525^{**} \\ & \begin{bmatrix} 0.484 \end{bmatrix} & \begin{bmatrix} 0.494 \end{bmatrix} & \begin{bmatrix} 0.479 \end{bmatrix} \\ \\ 2001 & -2.363^{***} & -2.430^{***} & -1.438^{**} \\ & \begin{bmatrix} 0.452 \end{bmatrix} & \begin{bmatrix} 0.463 \end{bmatrix} & \begin{bmatrix} 0.445 \end{bmatrix} \\ \\ 2002 & -3.007^{***} & -2.974^{***} & -1.878^{***} \\ & \begin{bmatrix} 0.453 \end{bmatrix} & \begin{bmatrix} 0.440 \end{bmatrix} & \begin{bmatrix} 0.444 \end{bmatrix} \\ \\ 2004 & -2.945^{***} & -2.873^{***} & -1.722^{**} \\ & \begin{bmatrix} 0.549 \end{bmatrix} & \begin{bmatrix} 0.547 \end{bmatrix} & \begin{bmatrix} 0.521 \end{bmatrix} \\ \\ 2006 & -3.172^{***} & -3.215^{***} & -1.879^{***} \\ & \begin{bmatrix} 0.550 \end{bmatrix} & \begin{bmatrix} 0.560 \end{bmatrix} & \begin{bmatrix} 0.532 \end{bmatrix} \\ \\ 2008 & -3.150^{***} & -3.214^{***} & -1.856^{***} \\ & \begin{bmatrix} 0.570 \end{bmatrix} & \begin{bmatrix} 0.585 \end{bmatrix} & \begin{bmatrix} 0.541 \end{bmatrix} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	1993	-0.585	-0.613	-0.119
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		[0.364]	[0.366]	[0.339]
$ \begin{bmatrix} 0.369 \\ 0.370 \end{bmatrix} \\ \begin{bmatrix} 0.370 \\ 0.391 \end{bmatrix} \\ \begin{bmatrix} 0.391 \\ 0.391 \end{bmatrix} \\ \begin{bmatrix} 0.391 \\ 0.391 \end{bmatrix} \\ \begin{bmatrix} 0.391 \\ 0.367 \end{bmatrix} \\ \begin{bmatrix} 0.367 \\ 0.367 \end{bmatrix} \\ \begin{bmatrix} 0.367 \\ 0.367 \end{bmatrix} \\ \begin{bmatrix} 0.391 \\ 0.367 \end{bmatrix} \\ \begin{bmatrix} 0.367 \\ 0.389 \end{bmatrix} \\ \begin{bmatrix} 0.367 \\ 0.389 \end{bmatrix} \\ \begin{bmatrix} 0.406 \\ 0.389 \end{bmatrix} \\ \begin{bmatrix} 0.406 \\ 0.406 \end{bmatrix} \\ \begin{bmatrix} 0.406 \\ 0.389 \end{bmatrix} \\ \begin{bmatrix} 0.438 \\ 0.420 \end{bmatrix} \\ \begin{bmatrix} 0.431 \\ 0.431 \end{bmatrix} \\ \begin{bmatrix} 0.431 \\ 0.431 \end{bmatrix} \\ \begin{bmatrix} 0.438 \\ 0.420 \end{bmatrix} \\ \begin{bmatrix} 0.492 \\ 0.498 \end{bmatrix} \\ \begin{bmatrix} 0.494 \\ 0.479 \end{bmatrix} \\ \begin{bmatrix} 0.479 \\ 0.456 \end{bmatrix} \\ \begin{bmatrix} 0.484 \\ 0.494 \end{bmatrix} \\ \begin{bmatrix} 0.479 \\ 0.479 \end{bmatrix} \\ 2001 \\ -2.363^{**} \\ -2.430^{**} \\ -2.430^{**} \\ -1.438^{**} \\ \\ \begin{bmatrix} 0.452 \\ 0.463 \end{bmatrix} \\ \begin{bmatrix} 0.463 \\ 0.445 \end{bmatrix} \\ \begin{bmatrix} 0.445 \\ 0.451 \end{bmatrix} \\ 2002 \\ -3.007^{**} \\ -2.974^{**} \\ -1.878^{***} \\ \\ \begin{bmatrix} 0.549 \\ 0.547 \end{bmatrix} \\ \begin{bmatrix} 0.547 \\ 0.521 \end{bmatrix} \\ \begin{bmatrix} 0.547 \\ 0.521 \end{bmatrix} \\ 2005 \\ -2.888^{***} \\ -2.818^{***} \\ -1.623^{**} \\ \\ \begin{bmatrix} 0.543 \\ 0.540 \end{bmatrix} \\ \begin{bmatrix} 0.540 \\ 0.512 \end{bmatrix} \\ 2006 \\ -3.172^{***} \\ -3.215^{***} \\ -1.879^{***} \\ \\ \begin{bmatrix} 0.570 \\ 0.585 \end{bmatrix} \\ \begin{bmatrix} 0.541 \\ 0.541 \end{bmatrix} \\ Industry layoffs \\ -3.713 \\ 1.035 \end{bmatrix}$	1995	-1.449***	-1.423***	-0.769*
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		[0.369]	[0.370]	[0.367]
$ \begin{bmatrix} 0.391 \\ 0.391 \\ 0.3067 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.406 \\ 0.408 \\ 0.420 \\ 0.484 \\ 0.492 \\ 0.498 \\ 0.498 \\ 0.496 \\ 0.498 \\ 0.496 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.494 \\ 0.445 \\ 0.452 \\ 0.463 \\ 0.445 \\ 0.453 \\ 0.463 \\ 0.445 \\ 0.445 \\ 0.453 \\ 0.440 \\ 0.444 \\ 0.444 \\ 0.04 \\ -2.945^{***} \\ -2.873^{***} \\ -1.878^{***} \\ 0.521 \\ 0.543 \\ 0.543 \\ 0.540 \\ 0.543 \\ 0.540 \\ 0.512 \\ 0.543 \\ 0.540 \\ 0.512 \\ 0.541 \\ 0.560 \\ 0.532 \\ 0.541 \\ 1ndustry layoffs \\ -3.713 \\ 1.035 $	1996	-1.756***	-1.750***	-0.989**
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		[0.391]	[0.391]	[0.367]
$ \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.406 \end{bmatrix} & \begin{bmatrix} 0.389 \end{bmatrix} \\ 1998 & -1.878^{***} & -1.935^{***} & -1.060^* \\ & \begin{bmatrix} 0.431 \end{bmatrix} & \begin{bmatrix} 0.438 \end{bmatrix} & \begin{bmatrix} 0.420 \end{bmatrix} \\ 1999 & -1.733^{***} & -1.782^{***} & -0.928^* \\ & \begin{bmatrix} 0.492 \end{bmatrix} & \begin{bmatrix} 0.498 \end{bmatrix} & \begin{bmatrix} 0.456 \end{bmatrix} \\ 2000 & -2.411^{***} & -2.480^{***} & -1.525^{**} \\ & \begin{bmatrix} 0.484 \end{bmatrix} & \begin{bmatrix} 0.494 \end{bmatrix} & \begin{bmatrix} 0.479 \end{bmatrix} \\ 2001 & -2.363^{***} & -2.430^{***} & -1.438^{**} \\ & \begin{bmatrix} 0.452 \end{bmatrix} & \begin{bmatrix} 0.463 \end{bmatrix} & \begin{bmatrix} 0.445 \end{bmatrix} \\ 2002 & -3.007^{***} & -2.974^{***} & -1.878^{***} \\ & \begin{bmatrix} 0.453 \end{bmatrix} & \begin{bmatrix} 0.440 \end{bmatrix} & \begin{bmatrix} 0.444 \end{bmatrix} \\ 2004 & -2.945^{***} & -2.873^{***} & -1.722^{**} \\ & \begin{bmatrix} 0.549 \end{bmatrix} & \begin{bmatrix} 0.547 \end{bmatrix} & \begin{bmatrix} 0.521 \end{bmatrix} \\ 2005 & -2.888^{***} & -2.818^{***} & -1.623^{**} \\ & \begin{bmatrix} 0.543 \end{bmatrix} & \begin{bmatrix} 0.540 \end{bmatrix} & \begin{bmatrix} 0.512 \end{bmatrix} \\ 2006 & -3.172^{***} & -3.215^{***} & -1.879^{***} \\ & \begin{bmatrix} 0.550 \end{bmatrix} & \begin{bmatrix} 0.560 \end{bmatrix} & \begin{bmatrix} 0.532 \end{bmatrix} \\ 2008 & -3.150^{***} & -3.214^{***} & -1.856^{***} \\ & \begin{bmatrix} 0.570 \end{bmatrix} & \begin{bmatrix} 0.585 \end{bmatrix} & \begin{bmatrix} 0.541 \end{bmatrix} \\ Industry layoffs & -3.713 & 1.035 \end{bmatrix} $	1997	-1.316**	-1.304**	-0.639
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		[0.406]	[0.406]	[0.389]
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1998	-1.878***	-1.935***	-1.060*
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		[0.431]	[0.438]	[0.420]
$ \begin{bmatrix} 0.492 \\ 0.498 \\ 0.498 \\ 0.498 \\ 0.496 \\ 0.446 \\ 0.540 \\ 0.547 \\ 0.540 \\ 0.547 \\ 0.543 \\ 0.540 \\ 0.543 \\ 0.540 \\ 0.512 \\ 0.543 \\ 0.540 \\ 0.512 \\ 0.543 \\ 0.560 \\ 0.512 \\ 0.532 \\ 0.532 \\ 0.541 \\ 0.570 \\ 0.585 \\ 0.541 \\ 0$	1999	-1 733***	-1 782***	-0.928*
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1,,,,	[0 492]	[0.498]	[0.456]
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2000	[0.492]	-2 /80***	-1 525**
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2000	-2.411	-2.400	-1.525
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2001	[0.404] 0.262***	[0.494]	[0.479]
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2001	-2.303***	-2.430***	-1.436
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2002	[0.452]	[0.463]	[0.445]
$ \begin{bmatrix} [0.453] & [0.440] & [0.444] \\ 2004 & -2.945^{***} & -2.873^{***} & -1.722^{**} \\ [0.549] & [0.547] & [0.521] \\ 2005 & -2.888^{***} & -2.818^{***} & -1.623^{**} \\ [0.543] & [0.540] & [0.512] \\ 2006 & -3.172^{***} & -3.215^{***} & -1.879^{***} \\ [0.550] & [0.560] & [0.532] \\ 2008 & -3.150^{***} & -3.214^{***} & -1.856^{***} \\ [0.570] & [0.585] & [0.541] \\ Industry layoffs & -3.713 & 1.035 \\ \end{bmatrix} $	2002	-3.00/***	-2.974***	-1.8/8***
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	• • • • •	[0.453]	[0.440]	[0.444]
[0.549]       [0.547]       [0.521]         2005       -2.888***       -2.818***       -1.623**         [0.543]       [0.540]       [0.512]         2006       -3.172***       -3.215***       -1.879***         [0.550]       [0.560]       [0.532]         2008       -3.150***       -3.214***       -1.856***         [0.570]       [0.585]       [0.541]         Industry layoffs       -3.713       1.035	2004	-2.945***	-2.8/3***	-1.722**
2005       -2.888***       -2.818***       -1.623**         [0.543]       [0.540]       [0.512]         2006       -3.172***       -3.215***       -1.879***         [0.550]       [0.560]       [0.532]         2008       -3.150***       -3.214***       -1.856***         [0.570]       [0.585]       [0.541]         Industry layoffs       -3.713       1.035		[0.549]	[0.547]	[0.521]
[0.543]         [0.540]         [0.512]           2006         -3.172***         -3.215***         -1.879***           [0.550]         [0.560]         [0.532]           2008         -3.150***         -3.214***         -1.856***           [0.570]         [0.585]         [0.541]           Industry layoffs         -3.713         1.035	2005	-2.888***	-2.818***	-1.623**
2006         -3.172***         -3.215***         -1.879***           [0.550]         [0.560]         [0.532]           2008         -3.150***         -3.214***         -1.856***           [0.570]         [0.585]         [0.541]           Industry layoffs         -3.713         1.035		[0.543]	[0.540]	[0.512]
[0.550] [0.560] [0.532] 2008 -3.150*** -3.214*** -1.856*** [0.570] [0.585] [0.541] Industry layoffs -3.713 1.035	2006	-3.172***	-3.215***	-1.879***
2008         -3.150***         -3.214***         -1.856***           [0.570]         [0.585]         [0.541]           Industry layoffs         -3.713         1.035		[0.550]	[0.560]	[0.532]
[0.570] [0.585] [0.541] Industry layoffs -3.713 1.035	2008	-3.150***	-3.214***	-1.856***
Industry layoffs -3.713 1.035		[0.570]	[0.585]	[0.541]
	Industry layoffs		-3.713	1.035
[3.084] [2.204]			[3.084]	[2.204]
Unionization 11.58***	Unionization			11.58***
[0.689]				[0.689]
Observations 48874 48874 48874	Observations	48874	48874	48874
R-squared 0.266 0.267 0.297	R-squared	0.266	0.267	0.297

## Table 5A: Effects of Industry Growth and Reorganization

I also analyzed how industry growth rates might have affected my findings. Average tenure rates reflect fluctuations in growth rates over long periods of time, making it difficult for fully control for effects of industry growth. I simplify this problem by dichotomizing tenure, to look at whether a worker has less than a set threshold of tenure; I can then simply control for how much the industry has grown since that threshold. Specifically, I created a new dependent variable for whether the worker had been hired within the prior three years (around 30% of the sample have less than three years tenure; results are very similar using a five year cutoff, but the three year cutoff is less subject to rounding concerns). I then created a control for the rate of industry growth during the prior three years, using data on total industry employment calculated from the January files of the CPS (because of industry code changes during the course of the 30 years, I translated all industries into the 1990s census codes for these calculations). I created a spline for this industry employment change with a knot at 0 to allow industry growth and decline to have separate effects (Davis et al. 2008).

Table 5A reports logit analyses where the dependent variable is whether the worker has tenure of less than three years. I include the same controls as in the prior analysis; again, I restrict the sample to employees of large firms, as this is where the bulk of changes in tenure have been concentrated.

Models 1 and 2 of Table 5A replicate the basic results of the prior tables. I find that the probability that a worker has less than three years of tenure increased significantly between 1979 and 2008. The coefficient on 2008 indicates that the odds of having less than three years of tenure increased by 1.6 times during this period. Model 2 shows that unionization rates again explain the growth of short tenured relationships. Indeed, once I control for industry unionization I find that the probability of having fewer than three years of tenure did not change at all between 1979 and 2008 (i.e. the coefficient on the 2008 dummy is not significant). The model therefore suggests that controlling for industry unionization fully explains the growth in short-term employment relationships during this period. The stronger results compared to the analyses of average tenure may reflect the greater sensitivity of this dependent variable to the environment, as the proportion of workers with less than three years of tenure largely reflects processes from the past three years, rather than accumulated decisions over a much longer period.

Models 3 and 4 then introduce the industry growth and decline variables. I find that workers are more likely to have less than three years of tenure when the industry is growing more rapidly, and less likely to have less than three years of tenure when the industry is shrinking more rapidly. More important than these direct effects are the changes in the other coefficients. I do not find that changes in industry growth rates explain the declines in tenure during this period: the year effects in Model 3 are very similar to the year effects in Model 1. Nor do I find that introducing industry growth rates changes the effects of industry unionization (Model 2 versus Model 4).

I also explored whether my results might reflect changes in intra-industry turbulence using data from the Statistics of US Business (SUSB). The SUSB contains annual, industry-level data on the number of jobs destroyed by establishment contraction and death and the number of jobs created by establishment birth and expansion, tabulated by enterprise size (the largest enterprise size is 500+). I draw on the SUSB data to create two new variables: cumulative job creation (the number of new jobs created by establishment birth or expansion among enterprises with more than 500 workers in that industry during the prior three years) and cumulative job destruction (the number of jobs lost by establishment death or contraction among enterprises with more than 500 workers in that industry during the prior three years). Unfortunately, the SUSB data only goes back to 1989. I am therefore only able to present analyses for the years 1993-2006. I first present a Model (5) which contains baseline results for that period, before introducing the controls for within industry expansions and contractions (Models 6-8).

I find modest effects of industry turbulence in shaping the growth of short-term employment in large firms between 1993 and 2006 (1993 is the omitted year against which others are compared). Cumulative hiring and layoffs significantly predict having less than 3 years of tenure, but produce very little change in

the year effects (comparison of Models 5 and 6), indicating that changes in intra-industry turbulence played little role in declines in tenure during this period. Models 7 and 8 then introduce the industry unionization variable. Again, I find that industry unionization has a substantial and significant effect on the probability of having been hired in the prior three years, although this effect declines a little when I control for overall levels of industry hiring and layoffs. Furthermore, including the unionization variable produces a substantial decline in the year effects (albeit smaller than when I include the full time series from 1979 to 2008), indicating that unionization explains a substantial proportion of the change in short term employment relationships, even after controlling for intra-industry job growth and destruction.

These analyses confirm that changes in the rate of inter-and intra-industry reallocation of workers have played little role in driving over time declines in tenure, and do not account for the effects of unionization.

Model	1	2	3	4	5	6	7	8
Age	-0.168***	-0.158***	-0.169***	-0.160***	-0.175***	-0.169***	-0.166***	-0.164***
	[0.0178]	[0.0172]	[0.0178]	[0.0173]	[0.0217]	[0.0220]	[0.0211]	[0.0214]
Age squared	0.00130***	0.00122***	0.00132***	0.00124***	0.00144***	0.00138***	0.00135***	0.00133***
	[0.000192]	[0.000186]	[0.000192]	[0.000187]	[0.000233]	[0.000236]	[0.000226]	[0.000229]
High school	-0.240***	-0.186**	-0.239***	-0.187**	-0.309***	-0.293***	-0.252**	-0.253**
	[0.0664]	[0.0650]	[0.0666]	[0.0651]	[0.0841]	[0.0847]	[0.0816]	[0.0819]
Associates	0.117**	0.0995*	0.120**	0.103*	0.0775	0.0799	0.0637	0.0693
	[0.0450]	[0.0455]	[0.0458]	[0.0463]	[0.0540]	[0.0548]	[0.0543]	[0.0550]
Bachelors	0.0711	0.0527	0.054	0.0373	0.0652	0.0429	0.0482	0.0355
<b>D</b>	[0.0543]	[0.0545]	[0.0540]	[0.0546]	[0.0647]	[0.0653]	[0.0656]	[0.0658]
Post grad	0.191***	0.182***	0.18/***	0.179**	0.209***	0.238***	0.211***	0.232***
<b>G</b>	[0.0549]	[0.0541]	[0.0554]	[0.0546]	[0.0585]	[0.0616]	[0.0547]	[0.0581]
State unemployment	-0.0425**	-0.0339**	-0.0367**	-0.0295*	-0.0293	-0.0332	-0.0287	-0.0314
1000	[0.0129]	[0.0122]	[0.0130]	[0.0124]	[0.0190]	[0.0189]	[0.0184]	[0.0185]
1983	-0.00798	-0.191	0.0111	-0.182				
1000	[0.162]	[0.163]	[0.162]	[0.166]				
1988	0.0636	-0.174	0.0475	-0.155				
1002	[0.128]	[0.124]	[0.131]	[0.126]				
1993	-0.0113	-0.2/1*	0.0544	-0.207				
1005	[0.127]	[0.129]	[0.126]	[0.127]	0.207*	0 1 4 2	0.120	0.0094
1995	0.215	-0.0909	0.297*	-0.0186	0.207*	0.142	0.139	0.0984
1006	[0.129]	[0.128]	[0.127]	[0.126]	[0.100]	[0.0975]	[0.0982]	[0.0992]
1996	0.396**	0.0803	0.463***	0.142	$0.34/^{***}$	0.252**	0.2/6**	0.201*
1007	[0.121]	[0.119]	[0.120]	[0.119]	[0.0911]	[0.0891]	[0.0895]	[0.0929]
1997	0.340**	0.0421	0.383**	0.0824	0.294**	0.148	0.240*	0.121
1008	[0.121]	[0.110]	[0.119]	[0.113]	[0.0995]	[0.0998]	[0.102]	[0.105]
1998	0.4/8	0.132	0.302	0.180	0.410**** [0.0050]	0.243*	0.557***	0.209*
1000	[0.121]	[0.119]	0.110	[0.117]	[0.0939]	[0.0902]	[0.0903]	[0.0975]
1999	[0.410**	0.066	[0 125]	0.134	[0.121]	0.2	0.291	0.101
2000	[0.127]	$\begin{bmatrix} 0.122 \end{bmatrix}$	0.505***	[0.121] 0.265*	$\begin{bmatrix} 0.121 \end{bmatrix}$ 0 544***	0.200**	[0.121] 0.432***	0.333**
2000	[0.121]	0.222	[0 120]	[0 117]	[0 115]	[0 125]	[0 114]	[0 123]
2001	0.505***	0.150	0.548***	0.206	0.113	0.125	0.242**	0.258*
2001	[0 118]	[0 116]	[0 113]	0.200	[0 109]	[0 122]	[0 108]	[0 117]
2002	0 564***	0.187	0 632***	0.255*	0 560***	0.465***	0.405***	0 372**
2002	[0 123]	[0.125]	[0 120]	[0 124]	[0 109]	[0 113]	[0 109]	[0 114]
2004	0 408**	0.0119	0 472***	0.0847	0 396**	0 432**	0.26	0 328*
2001	[0 129]	[0 132]	[0 131]	[0 133]	[0 141]	[0 143]	[0 135]	[0 138]
2005	0.332**	-0.0703	0.381***	-0.00469	0.296*	0.355**	0.155	0.234*
	[0.114]	[0.115]	[0,114]	[0.114]	[0.124]	[0.121]	[0.117]	[0.117]
2006	0.423***	0.0172	0.489***	0.0889	0.411**	0.415***	0.237	0.277*
	[0.112]	[0.116]	[0.111]	[0.115]	[0.127]	[0.124]	[0.125]	[0.124]
2008	0.482***	0.0797	0.521***	0.129				
	[0.112]	[0.116]	[0.112]	[0.115]				
Prop emp growth			1.043**	0.690**	1.137*	0.451	0.788*	0.315
(spline > 0)			[0.320]	[0.267]	[0.442]	[0.252]	[0.342]	[0.236]
Prop emp growth			0.789**	0.729**	0.760*	0.261	0.736*	0.337
(spline < 0)			[0.269]	[0.250]	[0.326]	[0.302]	[0.308]	[0.286]
Unionization		-2.189***		-2.080***			-2.339***	-1.811***
		[0.188]		[0.180]			[0.254]	[0.237]
Cumulative job creation						1.467***		1.237***
(last 3 years)						[0.256]		[0.227]
Cumulative job destruc						0.344		0.428
(last 3 years)						[0.313]		[0.308]
Observations	51244	51244	50730	50730	34058	34058	34058	34058

Table 5A: Determinants of Less than 3 years of Tenure. Logit Analysis