Does the color of the collar matter? Employment and earnings after plant closure *

Guido Schwerdt[‡] Andrea Ichino[†] Oliver Ruf[¶]
Rudolf Winter-Ebmer[§] Josef Zweimüller[¶]

July 15, 2009

Abstract

We investigate whether the costs of job displacement differ between blue and white collar workers. In the short run earnings and employment losses are substantial for both groups but stronger for white collars. In the long run, there are only weak effects for blue collar workers but strong and persistent effects for white collars.

JEL-Code: J14, J65.
Keywords: Firm Specific Human Capital, Plant Closures, Matching,

*We gratefully acknowledge support from the Austrian FWF (NRN Labor Economics and the Welfare State).

[‡]Ifo Institute for Economic Research, Munich
[†]University of Bologna
[¶]University of Zurich
[§]University of Linz and IHS, Vienna

1 Introduction

The loss of a job is certainly shaking up someone's career temporarily, but might also be a long-term problem. To which extent does the type of a worker's job affect the costs of displacement? Theoretical arguments suggest that losing a job associated with firm-specific human capital is more costly in terms of reduced lifetime earnings than losing a job where pay is closely aligned with a worker's general human capital. Similarly, workers who are displaced from manual work, maybe with piece rate compensation, are less likely to suffer substantial lifetime earnings losses than those displaced from their career path on internal labor markets associated with deferred payment contracts.

This paper looks at displacement costs for two broad occupational groups: white and blue collar workers. Arguably, firm-specific human capital, internal labor markets, and career concerns are more important in white than in blue collar jobs. When displacement costs are driven by loss of firm-specific rents we should observe higher displacement costs for white than for blue collar workers. (Lazear, 1979)

The issue has not been resolved in the literature: The authors in the book by Kuhn (2002) compare displacement costs across a number of countries and find no difference for earnings losses across education categories. Displacement costs with respect to unemployment are mixed: In the U.S., Canada, France and Belgium, more educated workers (who are more frequently found in white collar jobs) tend to suffer less from joblessness after displacement, the reverse is true for Germany.

We use exceptional administrative data, the Austrian Social Security Database (ASSD), to shed new light on the issue. This data set has four main advantages: First, it covers the universe of Austrian employees in the private sector. Second, it contains high-quality and high-frequency information on the individual workers' earnings and employment history over an extended period of time. Third, it contains an employer identifier that allows us to identify plant closures. Fourth, the Austrian white/blue collar is a legal (and historically determined) definition, which follows closely the distinction relevant in theories of firm-specific human capital and internal labor markets. Furthermore, as Austrian blue and white collar workers are subject to different social security rules measurement error in occupational status can be ruled out.

Taking plant closures as an indicator for exogenous job separations we can identify the causal effect of displacement on worker's future careers. Our empirical strategy exploits the rich nature of our data and applies exact matching techniques which makes treatment and control groups extremely well comparable.

2 Data

Our data comprise all private sector workers in Austria covered by the social security system.[1] All employment records can be linked to establishment identifiers. We use quarterly information from 1978-98 for daily employment and wages. This information is highly reliable, because social security payments hinge on these data.

We use workers employed between 1982 and 1988 at risk of a plant closure. This allows to observe workers' earnings and employment histories 4 years prior to potential displacement up to 10 years afterwards. We restrict the analysis to prime-age workers (age 35 - 50) with at least one year of tenure, who were employed in firms with more than 5 employees at least in one quarter during the period 1982-88, excluding construction and tourism industry.

White and blue collar workers are defined according to administrative rules: white collar workers comprise all clerical workers and higher non-clerical (manual) occupations, including salespersons (excluding waiters and salespersons in bakeries, etc.); blue collar workers are typically manual workers. As white collar workers enjoy better sick leave and redundancy pay regulations our data, which are from the social security administration, are very exact.

In the ASSD, each establishment has an identifier. Exits of establishments

[1] See Zweimüller et al. (2009) for a description of the data.

occur when the employer identifier ceases to exist. Some of these cases might not be true closures and (most of the) employees just continue under a new identifier. Therefore, we impose a further restriction: If more than 50% of the employees continue under a new employer identifier we do not consider this to be a closure.

Our treatment group comprises 9,656 workers who experienced a plant closure between 1982 and 1988. Our group of potential control observations comprises about 1 million workers from establishments not going bust during this period. To increase the comparability between treated and controls, we perform exact matching between treated and control subjects on the following criteria: sex, age, location of firm (9 provinces), industry (30 industries), employment history in the eight quarters before plant closure.[2] We do almost exact matching on continuous variables: average daily wages in the quarters 8, 9, 10 and 11 before plant closure are matched by decile group[3] and plant size two years before plant closure is matched by quartile groups. Applying this matching procedure allows us to identify at least one control subject for 5,570 treated subjects, which are matched to 30,156 controls.

3 Econometric Strategy

To estimate the effect of an involuntary job loss on earnings and employment prospects we specify the following model

$$\begin{aligned} Y_{i,t} &= \alpha + \beta_{1,20} BLUE_i PC_i Q_{i,t}^{1,20} + \beta_{21,40} BLUE_i PC_i Q_{i,t}^{21,40} \\ &+ \gamma_{1,20} BLUE_i Q_{i,t}^{1,20} + \gamma_{21,40} BLUE_i Q_{i,t}^{21,40} \\ &+ \delta_{1,20} PC_i Q_{i,t}^{1,20} + \delta_{21,40} PC_i Q_{i,t}^{21,40} \\ &+ \lambda_{1,20} Q_{i,t}^{1,20} + \lambda_{21,40} Q_{i,t}^{21,40} + \mu_i + \theta_t + \epsilon_{i,t}; \end{aligned} \tag{1}$$

$Y_{i,t}$ denotes the outcome variable (employment status or earnings) of individual i at quarter t, $BLUE_i$ is a dummy variable indicating whether individual

[2] See Ichino et al. (2007) for a detailed description of the matching algorithm.

[3] We do not match earnings close to closure, because of anticipatory wage effects. See Jacobson et al. (1993) for evidence on such effects.

i is a blue collar worker, PC_i is another dummy indicating whether individual i got displaced due to a plant closure and the $Q_{i,t}$'s are two dummies indicating the time period relative to plant closure (actual or potential). To keep the problem manageable and results easily interpretable, we focus on two post-displacement periods: the "short-run", defined as the first five years (20 quarters, $Q_{i,t}^{1,20}$) after potential displacement; and the "long-run" as years 6-10 after potential displacement ($Q_{i,t}^{21,40}$). Moreover, specification (1) includes a constant term, α, individual fixed effects, μ_i, calendar time effects, θ_t and an error term, $\epsilon_{i,t}$.

The parameters of interest are $\beta_{1,20}$ and $\beta_{21,40}$. They identify, for short- and long-run labor market outcomes, whether blue collar workers suffer more ($\beta_{1,20} < 0$, $\beta_{21,40} < 0$) or less from a plant closure than white collars.

4 Results

Figure 1 visualizes the evolution of earnings and employment by occupation and displacement status. Panel A shows employment profiles for displaced (treated) and non-displaced (control) white collar workers. The graph shows mean employment rates per quarter over 14 years – 4 years before and 10 years after potential displacement. By construction, employment rates are equal to unity in the year prior to potential displacement. Employment rates at earlier dates show that our matching procedure works well: During quarters -16 to -5 employment rates of treated and controls are identical. Immediately after displacement employment rates for the treated white collar workers decrease sharply. Only about 50 percent find a new job during the first quarter after displacement. Employment rates catch up during the first two years and decrease thereafter but never reach the level of the non-displaced.

Panel B shows the corresponding picture for blue collar workers. The immediate loss in employment rates after displacement is somewhat higher for displaced blue collars. However, displaced blue collars recover much faster and, about 6 years after displacement, reach a level only slightly below the employment of non-displaced blue collars. In sum, the graphical analysis shows that employment losses of displaced white collar workers are permanent and strong. In contrast, employment losses for displaced blue collars are more temporary and small in the long run.

Panels C and D portray the analogous phenomenon for the evolution of mean nominal daily earnings, conditional on employment. Obviously, this measure changes over time due to increases in real earnings, in inflation and because the set of employed workers changes. As in panels A and B, we see a remarkable difference between white and blue collar workers. Wages for displaced blue collar workers are only slightly below those of non-displaced blue collars throughout the post-plant closure period. In contrast, earnings profiles of displaced white collars are substantially below those of their non-displaced colleagues and remain so throughout the post-plant closure period.

Table 1 presents regression results from equation (1), both for employment and daily wages. Columns (1) and (2) use employment status and the wage as dependent variables. Individual fixed effects and dummies for calendar time are included.

Displaced white collar workers face substantial employment losses equal to a .231 reduction in the employment probability (coefficient of $PC_iQ_{i,t}^{1,20}$) in the short-run and a .137 reduction ($PC_iQ_{i,t}^{21,40}$) in the long-run. Displacement effects for blue collars are much more moderate: employment probabilities decrease by .149 (-.231 + .082) in the short-run and by .046 (-.137 + .091) in the long-run.

Blue-white collar differences in earnings losses are even more striking. Column (2) shows that earnings losses for displaced white collar are large both in the short-run (-.079 log points, coefficient of $PC_iQ_{i,t}^{1,20}$) and in the long-run (-.078 log points, $PC_iQ_{i,t}^{21,40}$). In contrast, blue collar workers' earnings drop by only .023 log-points (-.079 + .056) in the short-run and by negligible .006 log-points (-.078 + .072) in the long-run.

These findings are contrary to previous evidence for the US. Podgursky and Swaim (1987) explicitly consider a white-blue collar comparison and find lower earnings losses for white collars. The analysis in Podgursky and Swaim (1987), however, is based on comparing pre-post earnings differentials, while our empirical strategy takes counterfactual developments into account.

This might partly reconcile the difference in findings as in the absence of displacement blue collar workers face a less favorable evolution of wages and employment probabilities, which can be seen in rows 5 and 6 of table 1.

5 Conclusion

We investigated whether costs of job displacement differ by the nature of the job. Our findings suggest that both white and blue collar workers experience a decrease in employment and earnings in the short-run. However, for white collar workers these detrimental short-run effects are much stronger. Moreover, for blue collar workers employment losses are modest and earnings reductions are negligible in the long-run. In contrast, white collar workers experience strongly negative employment and earnings effects also in the long run.

The distinction between blue and white collar workers follows the Austrian legal definition which matches the distinction relevant in theories of firm-specific human capital and internal labor markets. Typically, blue-collar workers have less discretion at work than white collars, their output is more easily observable and they are more likely to be paid piece rates. Blue-collar workers are typically employed in manual jobs, are directly involved in the production process. In contrast, white-collar workers are non-manual workers in supervising and administrative jobs. Therefore we believe that the most plausible explanations for our findings are theories of firm-specific human capital and internal labor markets. These theories would predict that a job loss results in higher employment losses for white collars who are more likely to be employed in jobs where firm-specific human capital, career concerns and internal labor markets are relevant. Alternative explanations such as rent-sharing theories and union-power are probably less relevant as blue-collar workers are at least as well organized as white-collars both within firms (in works councils) and economy-wide (in unions organized at the industry level).

References

Ichino, A., Schwerdt, G., Winter-Ebmer, R., and Zweimüller, J. (2007). Too old to work, too old to retire? CESifo Working Paper No. 2118.

Jacobson, L. S., LaLonde, R. J., and Sullivan, D. G. (1993). Earnings losses of displaced workers. *American Economic Review*, 83(4):685–709.

Kuhn, P., editor (2002). *Losing Work, Moving On: Worker Displacement in International Perspective.* Kalamazoo, Mich.

Lazear, E. (1979). Why is there mandatory retirement? *Journal of Political Economy*, 87(6):1261–1284.

Podgursky, M. and Swaim, P. (1987). Job displacement and earnings loss: evidence from the displaced worker survey. *Industrial and Labor Relations Review*, 41(1):17–29.

Zweimüller, J., Winter-Ebmer, R., Lalive, R., Kuhn, A., Büchi, S., Wuellrich, J.-P., and Ruf, O. (2009). The Austrian Social Security Database (ASSD). IEW Working Paper, University of Zurich.

Table 1: Estimation results

	Employment	Earnings
	(1)	(2)
BLUE*PC*$Q_{01,20}$	.082	.056
	(.01)**	(.01)**
BLUE*PC*$Q_{21,40}$	.091	.072
	(.014)**	(.012)**
PC*$Q_{01,20}$	-.231	-.079
	(.006)**	(.007)**
PC*$Q_{21,40}$	-.137	-.078
	(.008)**	(.008)**
BLUE*$Q_{01,20}$	-.019	-.031
	(.004)**	(.004)**
BLUE*$Q_{21,40}$	-.056	-.041
	(.008)**	(.006)**
$Q_{01,20}$	-.033	.023
	(.003)**	(.003)**
$Q_{21,40}$	-.12	.027
	(.005)**	(.004)**
Const.	.96	5.678
	(.015)**	(.012)**
Obs.	2033304	1748184
R^2	.453	.883
F statistic	104.854	561.717

All regressions include individual fixed effects and calendar time dummies. Dependent variables are an employment dummy in column 1 and log daily earnings in column 2. Clustered standard errors reported in parenthesis.

Figure 1: Employment and Earnings