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Structural earnings losses and between-industry mobility of displaced workers, 2003–2008

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ABSTRACT

This article investigates structural sources of earnings losses in the U.S. labor market, analyzing data from the Outgoing Rotation Groups and Displaced Worker Supplements of the 2003–2008 Current Populations Survey. After introducing the data and methodology, a descriptive model of inter-industry earnings differentials in the full labor market between 2003 and 2008 is presented to motivate a baseline claim that industry of employment represents a salient partition of the distribution of good and bad jobs over this time period. Then, the current wages of two groups of workers in 2006 and 2008, who were displaced from their jobs in the prior 3 years, are modeled. Earnings losses of re-employed workers are analyzed, conditional on re-employment in alternative industries, while simultaneously adjusting for observed determinants of selection into employment. The findings demonstrate that displaced workers who are then re-employed suffer from earnings losses in their new jobs. These losses are larger among those who switch industries, especially among those who move to traditional low-wage industries in the service sector. The losses are also larger for those who held their prior jobs for 3 or more years, and they cannot be explained away by differences in the skill requirements between the jobs from which individuals are displaced and those in which they are re-employed. The findings are discussed with reference to structural theories of labor market inequality from sociology and economics, which represent valuable complementary perspectives to individualistic skill-based accounts of earnings differences.

As the U.S. economy has shifted away from manufacturing to service production, average job tenure in the U.S. labor market has fallen substantially (Altonji and Shakotko, 1987; Cappelli, 1999; Heckscher, 1995). Since 1980, this structural shift has led to waves of downsizing and industrial restructuring (see Baumol et al. (2005), DiPrete et al. (2002), Kletzer (1998)), each time spreading human resource practices that emphasize flexible labor contracts and hiring patterns (see Cappelli (1995), Herzenberg et al. (1998), Kalleberg (2001, 2003), Kalleberg et al. (2003)). These trends have continued in the first decade of the twenty-first century, and a new wave of restructuring began with the recession of 2008 and 2009.

Most labor force participants can now expect to have careers with more job shifts than prior cohorts. Young workers are able to prepare themselves for this evolving post-industrial economy by investing heavily in transferable general skills provided by formal education. For others whose formal educations were completed long ago, each wave of restructuring places them at risk of displacement because large numbers of employers either downsize or disappear (Baumol et al., 2005). These workers must then search for new positions, often in new occupations and industries.

Displaced workers – those who experience an involuntary job separation based on an employer's operating decisions – suffer particularly long spells of unemployment, and, when re-employed, are more likely to be re-employed in part-time

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positions and/or have earnings that are substantially lower than in their prior jobs (Farber, 1997, 2003, 2005; Hipple, 1999; Jacobson et al., 1993). Because these earnings losses appear to be persistent, displacement may have long-run "scar effects." These effects are thought to be more substantial in the U.S. than in other OECD countries because the U.S. has weaker institutional support for the unemployed (Gangl, 2004).

In this article, we will offer an analysis of the earnings losses of displaced workers, seeking to document possible structural sources of these losses. Previous research, mostly in economics, has considered two sources of observed earnings losses. For the first, earnings losses are attributed to a selection process, whereby firms lay-off or fire their least productive workers. When these workers are then re-employed, they acquire wages that are more in line with their true latent productivities, as revealed in the labor market through implicit competition with other workers. In this line of research, displaced workers are often shown to be less educated, younger, and have fewer years of job tenure than non-displaced workers (Farber, 1997, 2003; Gibbons and Katz, 1991).[1] For much of this research, displaced workers are defined only as those who lost jobs due to plant closings. Accordingly, workers who were laid off are excluded in order to minimize the possibility that displacement has occurred because of individual job performance (based on the assumption that displacement due to plant closings affects everyone, not only those with disproportionately low productivity; Gibbons and Katz, 1991).

For the second line of research, earnings losses are attributed to skill mismatch (see Fallick (1996), Kletzer (1998) for reviews). When workers are displaced from their jobs, their firm-specific skills are (usually) rendered obsolete. Thus, when they are re-employed, they must compete with other workers in the labor market and can offer to prospective employers a skills package that is dominated by general skills learned through formal education. As a result, they receive a competitive wage that compensates them only for their past investments in general skills.[2]

These two sources of earnings losses are surely present for displaced workers, but we will argue in this article that they do not exhaust all forms of earnings loss. In particular, we will offer an empirical analysis to support the position that individual-specific sources of earnings losses are complemented by structural sources of earnings losses that are determined by the distribution of available jobs. Specifically, we will examine whether displaced workers' earnings losses are greatest when they are re-employed in low-wage industries.

For a heuristic example, consider two displaced workers with identical skills and prior job histories with the same company. The only difference between the two is that one is employed in the automobile industry in Akron, Ohio and the other is employed in the automobile industry in Toledo, Ohio. Given their identical skills and work histories, any difference in their post-displacement earnings will reflect structural opportunities.[3]

Suppose, for example, that the worker from Toledo finds an alternative job in manufacturing in Toledo that pays 95% of the wages received from his or her prior employer. In contrast, the worker from Akron is able to find a job only in the service industry in Akron, and the new job pays only 75% of the wages received from his or her prior employer. Both workers suffer earnings losses that are attributable to a loss of seniority, which in some cases may be considered a proxy for the returns to firm-specific skills. The worker in Akron, however, has suffered a larger earnings loss, and, in comparison to the counterfactual wages offered to the worker from Toledo, has suffered a 20% structural loss in his or her wages.

One might contend, taking the perspective of Neal (1995), that the Akron worker has lost a wage premium attributable to industry-specific skills and that such a loss is not properly interpreted as structural. In contrast, we will maintain that this loss can still be interpreted as a structural earnings loss generated by the distributions of available job opportunities, since presumably the worker would have chosen to take a job that would provide a wage premium for his or her industry-specific skills if one were available. Since the worker did not do so, we assume that no such job is available, and the lack of such an opportunity is ipso facto a structural fact that generates an earnings loss.

In this article, we will not be able to offer a comprehensive account of all structural sources of earnings losses because (a) it is difficult to circumscribe theoretically all potential sources of structural (and individual) earnings losses and (b) there is little incentive to do so because no known data allow for a comprehensive decomposition. Therefore, we will instead evaluate the case that structural effects are large enough to be meaningful, inferring job quality from the distribution of wages across industries secured by displaced workers when they are re-employed. In particular, we will adopt the position, based on the rent-sharing interpretation of inter-industry wage differentials (see Katz and Summers (1989), Krueger and Summers (1988), see also Blanchflower et al. (1996), Morgan and Tang (2007)) that differences in wages between observationally equivalent workers in alternative industries reflect structural advantages.

The literature on rent destruction suggests that displaced workers' earnings losses can be understood in the context of a larger causal narrative that explains the increase in earnings inequality in the U.S. labor market since the 1970s. This explanation builds on a prior literature from labor economics, pioneered by Slichter (1950), which has documented persistent wage differentials between industries, net of observable characteristics of workers and jobs. As the growth of inequality was beginning to unfold while the U.S. economy was moving away from its prior reliance on heavy manufacturing, a new literature developed in labor economics that interpreted these longstanding inter-industry wage differentials as evidence

[1] However, Farber (2009) documented that in the 2000s, older workers (45–54) were more likely than younger workers (20–24) to be displaced in the private sector, net of their years of job tenure.

[2] Not all firm-specific skills are non-transferable. Other studies have made the case that some skills are occupation- and industry-specific (Addison and Portugal, 1989; Carrington, 1993; Fallick, 1993; Neal, 1995). We will discuss this literature later.

[3] Assume, for simplicity, that workers search for jobs only in their local labor markets because they are constrained for some reason (family circumstances, etc.).

that some workers receive wage premia as partial distributions from firm profit (Katz and Summers (1989), Krueger and Summers (1988)). These shares of profit, labeled rent with deference to the literature from classical economics, were then recognized as worthy of analysis by sociologists from the new structuralist tradition. Sørensen (1996, 2000) adopted a broad definition of rent – an aggregation of all unearned benefits attached to a particular structural position. He also noted that industry of employment was a salient dimension of such structural advantage, citing the inter-industry wage differentials literature. Morgan and Tang (2007) then showed that rent destruction of this form is a plausible explanation for some portion of the growth of earnings inequality since the 1970s, as predicted by Sørensen (2000).

Consistent with this prior work, we will consider whether displaced workers' earnings losses can be explained in part by the industrial location of their post-displacement employment. Furthermore, we will consider these results within the rent-destruction narrative, which would interpret trends in worker displacement as a systematic response to industrial restructuring that repositions workers in different industrial locations, thereby eliminating their structural advantages in their pre-displacement industrial locations. During these structural shifts, those who are re-employed in high-wage industries receive a share of firm revenue as a distribution of rent. Their earnings losses may not be large, all else being equal. In contrast, those workers who are re-employed in lower-wage industries lose their rents from their prior industry, which leads to greater earnings losses. Although we will not be able to completely discount the relevance of individualist accounts because of data constraints, we will show that even when workers hold jobs with similar skill requirements before and after displacement, their earnings losses vary substantially depending on their post-displacement industry of re-employment.

All types of industrial movement are possible in response to worker displacement. To focus our analysis in ways that reduce the dimensionality of unobserved determinants of worker displacement, we will emphasize the earnings trajectories of workers displaced from the manufacturing industry, which, as we will show, is the industry with the highest rate of displacement and is also a traditional high-rent industry (Fallick, 1996; Farber, 2003; Kletzer, 1998). Also, the decline of the manufacturing industry in the U.S. is regarded as the primary feature of the large-scale structural transformation toward a post-industrial economy. Thus, focusing on the manufacturing industry as the source of displacement informs the empirical literature on precisely how this large structural transformation has consequences for workers.

We concede upfront, however, that any differences that we find cannot be regarded as definitive evidence of the existence of structural effects, nor of the effects generated by a rent destruction process. Data sources on the earnings of displaced workers are limited in size and scope. Only broad structural features of the labor market can be modeled, and unobservable determinants of both re-employment and wages may confound estimates of structural effects. Furthermore, with the limited data that are available, we will not be able to model the mechanisms that generate rent distribution and rent destruction across industries. We will therefore discuss in the conclusion of the article some interpretations of industry-based differences in the wages of re-employed workers. Beyond skill-based accounts, we will also discuss several structural accounts – from new structuralism to post-Fordism – that represent complementary accounts to the rent-based framework that we use to motivate our industry-based analysis.

1. Methods

In this article, we seek to determine whether displaced workers suffer the largest earnings losses when re-employed in traditional low-wage industries.[4] As we describe in this methods section, our analysis will be divided into three parts. In the first part, we show displacement rates by industry to demonstrate that the manufacturing industry has the highest displacement rates. In the second part, we document the distribution of earnings advantages associated with industry of employment in the full labor market. While inter-industry wage differentials have been examined for earlier years (e.g., Neal (1995), Morgan and Tang (2007)), we present results for our more recent study period to demonstrate the existence of between-industry wage differences that may reflect structural sources. In the third part of our analysis, we then model earnings losses of displaced workers, offering estimates of the distribution of earnings losses across types of between-industry mobility.

1.1. Data for the analysis of displacement rates and earnings losses

To estimate displacement rates and the effects of industry of re-employment on the wages of displaced workers (the first and the third part of the analysis), we utilize data from the 2006 and 2008 Displaced Workers Supplements for the January 2006 and 2008 Current Population Surveys (hereafter, CPS-DWS). We first show that the 2006 and 2008 datasets reveal similar patterns of displacement (because of the relative stability of the labor market between 2003 and 2007). We then estimate earnings losses for displaced workers after pooling the 2006 and 2008 datasets in order to boost the cell counts in the between-industry mobility table. We provide a side analysis in the Supplementary Appendix (Table S1) that demonstrates that the pooling is inconsequential for our conclusions, as judged by fitted interaction effects between datasets and all other variables in the models. This Supplementary Appendix is posted on the websites of both authors.

For the two CPS-DWS datasets, separate samples of workers in January 2006 and January 2008 were asked whether they lost a job or left one in the preceding 3-year period due to displacement (that is 2003–2005 and 2005–2007, respectively).

[4] Manufacturing, mining, and construction are traditionally considered high-wage industries while the wholesale and retail trade and service industries are considered low-wage industries (e.g., Katz and Summers, 1989; Krueger and Summers, 1988; Morgan and Tang, 2007).

Displacement is defined as an involuntary job separation based on the employer's operating decisions. Most displacements result from plant closings, layoffs, and employers going out of business (Farber, 1997, 2003; United States Department of Commerce, 1988).[5] In total, we count 7132 displaced workers for these 2 years, all of whom left jobs because of "plant closing," "insufficient work," or "position abolished."

The CPS-DWS collects information about current jobs for all workers in the labor market and then information about lost jobs for workers who were displaced in the last 3 years. These data allow us to model differences between lost-job earnings and current-job earnings for displaced workers. Of the 7132 displaced workers in the data, only 3705 workers reported earnings and industry of employment for both their lost job and current job. The missing data are produced by several interdependent processes. In some cases, respondents simply failed to provide either industry of employment or earnings for their lost or current job, presumably omitting one or the other because of generic recall difficulty. In many cases, however, they did not report characteristics of a current job because they were not currently employed. To compensate for non-random missingness of both types, we analyze the 3705 workers with full data, but we weight the models with the inverse of the probability of inclusion in this restricted analysis sample.[6] As a result, the models reflect the characteristics of all 7132 workers, and the results can be generalized to the population of all displaced workers (under a theoretically interesting but untrue counterfactual scenario where all displaced workers are re-employed in the same patterns as those who are observed to have been re-employed and who provided complete data).[7]

The outcome variable for the third part of the analysis is the earnings change of displaced workers, measured by the logged ratio of weekly earnings in the current job to weekly earnings in the lost job (in nominal 2008 dollars). Top-coded earnings are multiplied by 1.4, the most commonly accepted multiplier in labor economics. Earnings changes are predicted from between-industry mobility. We measure movement between industries using a constrained cross-classification of the seven-category industry variable (where we collapse some off-diagonal movers because of small cell counts). The seven-category industry variables we utilize here are: (1) manufacturing, (2) service, (3) wholesale and retail trade, (4) transportation and utilities, (5) construction, (6) agriculture, forestry, fishing, and mining, and (7) public administration.[8] We also include standard measures of individual characteristics in the earnings loss regressions, such as age, age squared, race, gender, a gender-specific marriage effect, a gender-specific parental status effect, education, union coverage of the job, region, metropolitan residency, and year (see list in Table A1).

We also include one additional variable that allows us to model the heterogeneity of earnings losses. We use a "long tenure" dummy variable that indicates whether a displaced worker spent more than 3 years in the job from which they were displaced, following the BLS definition of long tenure (Bureau of Labor Statistics, 2008). About half of all displaced workers are coded affirmative for this variable, which we interact with our measures of movement between industries in some later analysis.

1.2. Data for the analysis of the opportunity structure of the labor market

To capture the existing structure of labor market opportunities (the second part of the analysis), we estimate industry differences in earnings, adjusting for observed characteristics of workers. We utilize data from the Merged Outgoing Rotation Groups of the 2003 through 2008 Current Population Surveys (hereafter CPS-MORG). The CPS-MORG data are commonly used for the analysis of earnings, and they are particularly useful for this study because the variable construction is identical to the displaced worker supplement to the CPS that we also use in our analysis. The analysis sample is limited to those aged 18–64 and with positive earnings ($N = 664{,}157$).

The outcome measure for the analysis is the log of weekly earnings (in nominal 2008 dollars). We adjusted for inflation and top-codes by applying the same procedures for the CPS-DWS data, described earlier. In the models we report, earnings are predicted from individual characteristics, such as race, gender, age, marriage, education, and whether the respondent has children (see list in Table A2). Earnings are also predicted from a seven-category industry variable, as shown earlier. While a

[5] We adopt this BLS definition, and, consistent with other work on displaced workers (e.g., Farber, 2003), we do not count as displaced those who lost a job because "seasonal job ended," "self-operated business failed," and "other."

[6] The probability is calculated from a logistic regression model with predictor variables for age, age squared, gender, educational attainment, education by gender, race, race by gender, marital status, marital status by gender, have children, have children by gender, and metropolitan residency. The balance of these variables was assessed using standardized differences, as in Morgan and Todd (2008). The construction of the weight variable follows from the approach popular in counterfactual modeling and doubly robust regression analysis (see Imbens and Wooldridge (2009), Morgan and Winship (2007)) as well as weighted complete case analysis as a missing data adjustment strategy (see Little (1982), Little and Rubin 2002). Details of the construction of this weight are provided in the Supplementary Appendix. We incorporate the sampling weight provided by the BLS, which is multiplied by our inverse-probability weight.

[7] Table A1 compares means and standard deviations of all variables used in the analysis, with and without weighting to adjust for missingness. As shown there, the weights give more importance to workers, for example, who are older, single, childless, non-white, and have lower levels of education. These are the individuals less likely to be re-employed after displacement. If we did not perform any adjustment, we would surely underestimate the earnings losses associated with displacement that are of theoretical interest, since we would be estimating the losses only among the subset of relatively fortunate individuals who were in fact re-employed.

[8] The service industry category includes all service industries defined by census industry categorization, including professional, waste, educational, health, arts, entertainment, accommodation, and food services. Utilizing the broad category may include some service jobs that pay higher earnings than others. However, the average earnings in the service industry is among the lowest (see Fig. 1), although the standard deviation of earnings for the service industry is slightly larger (0.83) than the average (0.79). Furthermore, high paying service jobs tend to require higher levels of general skills, heterogeneity of which should be accounted for by the education variables that we include in the models.

more detailed categorization of industry is possible for this second part of our analysis, we nonetheless use only a broad categorization of industry for this part of the analysis. We have no choice but to do so when analyzing the displaced worker supplements because of the extremely small cell counts observed using the more detailed industry codes.

2. Results

2.1. Displacement rates

To demonstrate that displacement rates were highest in the manufacturing industry even in the relatively stable labor market between 2003 and 2007, Table 1 presents estimates of 3-year displacement rates across our industrial categorization, using the CPS-DWS data from January 2006 and January 2008. These displacement rates were calculated by dividing the number of workers in each industry group displaced in the prior 3-year windows (2003–2005 and 2005–2007) by the number of workers employed in each industry group in January 2006 and January 2008, respectively. Because the years of the numerator and denominator do not match in these calculations, the rates are only best approximations given the available data. Nonetheless, the correspondence between the two panels suggests stability of these approximations, which at least helps rule out the possibility that the approximations are too noisy given the available data.

The first panel in Table 1 shows that the approximate displacement rate in manufacturing is the highest, at 10.5% over the prior 3 years (thus, equal, on average, to 3.5% of all workers in manufacturing in each year). This is substantially higher than in all other industries. While some recent studies suggest that displacement rates in service industries have been increasing (e.g., Rodriguez and Zavodny, 2003), "service industry" and "wholesale and retail trade" in our data still show relatively low displacement rates, equal to 4.9 and 5.8% over 3 years.

For the second panel, which presents analogous results from the 2008 CPS-DWS, the differences across industries are similar. The displacement rate for the construction industry increased and is very close to the rate for the manufacturing industry. This increase reflects, we assume, the early slowdown in construction in the run-up to the recession that began in 2008. However, as shown in the first panel, displacement in the construction industry was the second highest even in the construction boom between 2003 and 2005. Thus, displacement is a more common occurrence in the construction industry because of the episodic nature of contracting, and trends in displacement from the construction industry are less reflective of the sort of structural changes in the labor market that generate displacement from declining sectors of the economy, such as manufacturing.

2.2. The prevailing opportunity structure of the labor market by industry

In order to document the earnings opportunities available to displaced workers, we estimate earnings regressions for the entire labor market between 2003 and 2008 using the CPS-MORG data. Given our interest in movement between industries, we emphasize inter-industry differentials in our presentation.

Table 1
Estimated 3-year rates of displacement by industry.

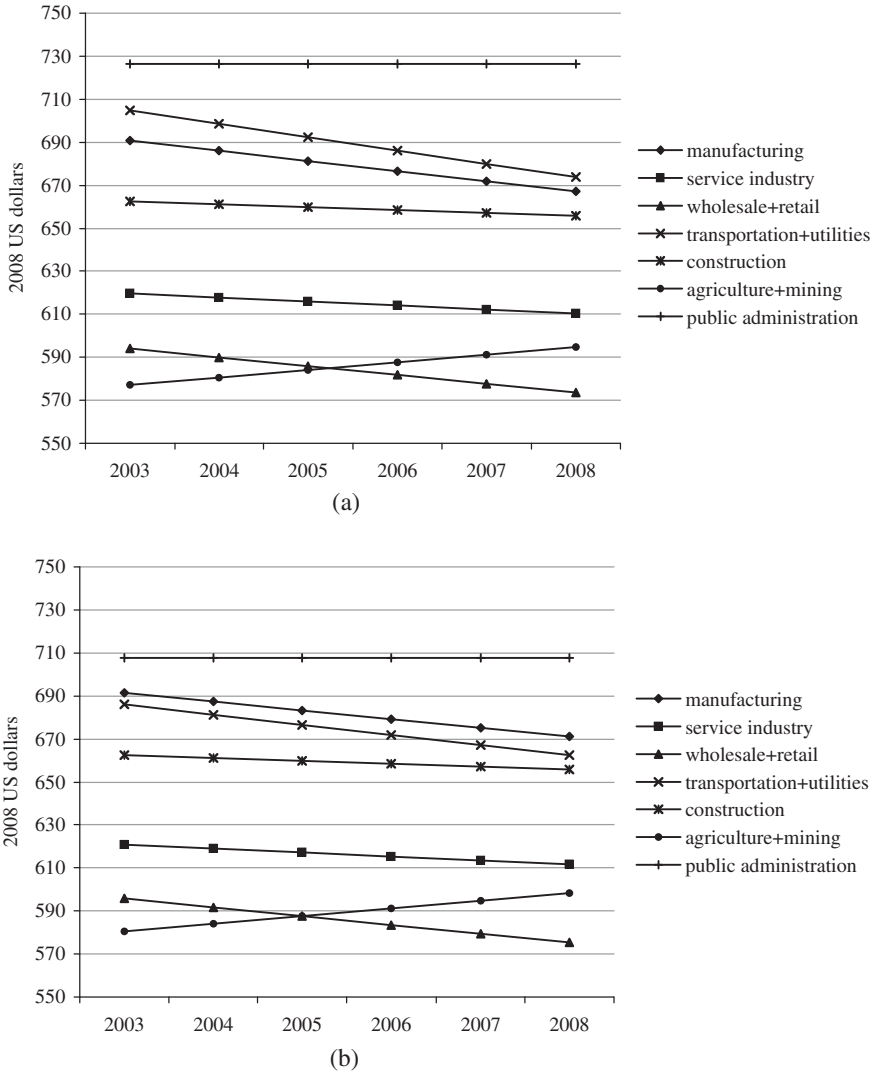
	Industry distribution of		
Industry	Job losses in prior 3 years	Current jobs	Implied displacement rate
(a) 2006 January CPS			
Manufacturing	725	6922	10.47
Service	1538	31320	4.91
Wholesale and retail trade	481	8353	5.76
Transportation and utilities	152	3077	4.94
Construction	387	4787	8.08
Agriculture, forestry, fishing, hunting, mining	46	1349	3.41
Public administration	31	2962	1.05
Total	3360	58770	5.72
(b) 2008 January CPS			
Manufacturing	615	6556	9.38
Service	1468	31595	4.65
Wholesale and retail trade	457	7920	5.77
Transportation and utilities	138	3085	4.47
Construction	428	4677	9.15
Agriculture, forestry, fishing, hunting, mining	37	1354	2.73
Public administration	45	2974	1.51
Total	3188	58161	5.48

Source: Current Population Surveys (Displaced Worker Supplements), January 2006 and 2008.
Note: The sample for the first column includes those between the ages of 20 and 64 who were displaced during 2003–2005 and 2005–2007 for the 2006 and 2008 January Current Population Surveys, respectively. The sample for second column includes those between the ages of 20 and 64 and who were currently employed in the labor force in January 2006 and 2008, respectively. The third column is equal to the first column divided by the second column. Data are weighted by the displaced worker supplement weight provided by Bureau of Labor Statistics.

Consistent with past research, our industrial categorization reveals differences in wages by industry that cannot be accounted for by other observed data. These differences are presented as predicted values in panel (a) of Fig. 1. They were calculated from an estimated earnings equation, in which logged weekly earnings was regressed on dummies for industrial group interacted with a linear term for year. Covariates included education, a ten-category variable for occupation, and all available CPS measures of demographic characteristics (see the list in Table A2). For panel (b), we then add union status as a covariate (see Table A3 for the coefficients from these two models).

Panel (a) of Fig. 1 suggests that wages in the manufacturing industry were substantially higher than in the service, wholesale and retail, construction, and agriculture and mining industries, with a wage premium of between 30 and 120 dollars per week. The transportation and utility industry was similar to the manufacturing industry, and public administration was higher still by about 35 dollars in 2003.

Earnings in the manufacturing industry declined by about 4 dollars, or 0.7%, per year between 2003 and 2008. This decline is very similar to the decline in earnings in the wholesale and retail industry group. Only earnings in the transportation and utilities industry group declined more, registering an earnings loss of about 6 dollars (0.9%) per year over the same time period. Most of the other industries had stagnant wages (although the small and heterogeneous industrial category of agriculture and mining saw an increase over this time period). The trends documented here are broadly similar to patterns that have unfolded since 1980 (see Morgan and Tang (2007)).



Source: Current Population Surveys (Merged Outgoing Rotation Groups), 2003-2008.

Fig. 1. Predicted earnings trends by industry for (a) model A1 in Table A3 and (b) Model A2 in Table A3.

When union status is added to the covariates, some modest changes emerge, as shown in panel (b) of Fig. 1. The net average wage ranking of industries differs because a single union effect is fit for all workers, and levels of unionization differ by industry.[9] Nonetheless, unionization can account for only a small portion of the trends, consistent with the work of others (see Blanchflower et al. (1996) and Morgan and Tang (2007)).

Overall, the results suggest that earnings levels are higher in manufacturing than in the service industries but that this net advantage continues to decline. Nonetheless, the difference in net earnings between those employed in the manufacturing industry and those in the service industry remains substantial. This suggests that economic restructuring that displaces workers from the manufacturing industry to the service, wholesale trade, and retail trade industries may generate substantial structural earnings losses for workers. In the next section, we investigate this possibility by examining how different types of between-industry mobility are associated with levels of earnings losses.

2.3. Between-industry mobility and earnings losses of displaced workers

Table 2 presents coefficients from two weighted regression models, where earnings changes between the lost job and the current job in the CPS-DWS data are regressed on workers' characteristics and the industry of employment for both the lost and current job. As noted earlier in the methods section, these regressions are weighted by the estimated inverse probability of being re-employed. Thus, the coefficients reflect earnings changes that would prevail if all displaced workers were re-employed in patterns equivalent to those observed among those who are re-employed. With our procedure, we are performing a modest adjustment where we assume that the wages of those who were not re-employed were equivalent to the wages of those with matching characteristics who were re-employed. This is a modest adjustment in the sense that there would be good reason to instead assert that the earnings of non-re-employed workers would be even lower in an equally plausible but more dire counterfactual scenario. Both models include as covariates all fixed individual characteristics of workers that are available in the CPS-DWS data, such as race, gender, educational attainment, marital status, whether the respondent has children, years displaced, and union coverage of the lost job (see list in Table A1).

Model 1 predicts earnings changes from industry of employment variables for the current and lost job. The model also includes two additional characteristics of the lost job: whether the displaced worker was in the lost job for more than 3 years and whether the displaced worker was in a lost job with union coverage. Our primary interest is in the coefficients for the between-industry mobility variables.

As listed in the first row, the constant is equal to the earnings change for workers who are re-employed within the manufacturing industry and who have mean values for all covariates (because of the centering of all variables other than industrial mobility). The coefficient of 0.024 suggests that displaced workers who find new jobs in the manufacturing industry do not experience earnings losses. In fact, their wages increase on average by 2.4%. The coefficients for other types of stayers vary quite a bit. Stayers in the service and construction industries have substantial earnings losses of 10% and 11%, respectively (i.e., exp [0.024–0.134] = 0.896 for stayers in the service industry). Similarly, stayers in the wholesale and retail trade industries suffer earnings losses of about 8%, although this estimate is quite noisy because of the small sample size. Other industry stayers do not experience any substantial earnings loss, such as in transportation and utilities or agriculture and mining, which have traditionally been considered high-rent industries (see Katz and Summers (1989)). Finally, stayers in public administration appear to experience a very large earnings loss, but this coefficient has a massive standard error (because there are very few individuals in this group). As a result, we do not interpret this coefficient.

A primary goal of this part of our analysis is to determine whether movement out of the high-wage manufacturing industry into the low-wage service industry is associated with a relatively large reduction in wages. Model 1 of Table 2 confirms this conjecture clearly. Displaced workers who are re-employed in the service industry experience an earnings loss of approximately 28% (i.e., exp [0.024–0.355] = 0.718). Similar earnings losses occur when workers displaced from manufacturing move to other low-wage industries, such as wholesale and retail trade and construction, where the declines in earnings suggested by Model 1 are approximately 33% and 39%, respectively. Among those who are re-employed in high-wage industries other than manufacturing, such as transportation and utilities as well as agriculture and mining, earnings losses are more modest, at only 0.5% and 7%, respectively. The only exception to this general pattern is public administration, and here those who were displaced from manufacturing experience a large earnings loss as well.[10]

Notice also that, for Model 1, earnings losses are about 10% larger for those who were in their lost job for more than 3 years. Model 2 examines this effect across the categories of between-industry mobility, and to do so it includes interactions between the long tenure variable and the industry mover-stayer dummy variables. In general, the coefficients show that the

[9] When we fit the data to the model with industry-specific union measures by allowing the interaction effects between union and industry, and apply industrial-level average union rates, the result looks virtually identical to Fig. 1(a) (see Table S3 and Figure S1 in the Supplementary Appendix).

[10] Of the 3670 individuals in these earnings loss regressions, 389 individuals (or 10.6%) reported that they were working less than full-time for non-economic reasons. If it is the case that some of these individuals were working part-time by choice, even though full-time work is available to them, our models overestimate structural earnings losses. To evaluate the robustness of our results to such hidden forms of voluntary earnings losses, we reestimated the models in Table 2 for the 3281 individuals who were either working full-time or who were working part-time only because they could not find full-time work. These results are presented in the Supplementary Appendix (Table S2), and all of the results are broadly similar to those in the main text, although the coefficients decline in magnitude slightly in most cases (and the standard errors increase because of the smaller sample). For example, for Model 1, the coefficients for stayers in manufacturing, service, and wholesale/retail trade change from 0.024, −0.134, and −0.111 to 0.041, −0.100, and −0.083. Likewise, the coefficients for movers from manufacturing to service and wholesale/retail trade change from −0.355 and −0.420 to −0.281 and −0.394.

Table 2
Regression coefficients from models that predict change in log earnings from variables for industry of employment, movement between industries, and the characteristics of individuals.

	Model 1	Model 2
Stayers:		
In manufacturing (the constant)	0.024	−0.059
	(0.031)	(0.040)
In service	−0.134**	−0.052
	(0.040)	(0.051)
In wholesale and retail	−0.111	−0.070
	(0.070)	(0.125)
In transportation and utilities	0.056	0.165
	(0.054)	(0.107)
In construction	−0.143**	−0.058
	(0.050)	(0.060)
In agriculture and mining	0.152	0.395
	(0.131)	(0.217)
In public administration	−0.586	−1.081
	(0.815)	(1.644)
Movers:		
Manufacturing to service	−0.355**	−0.229**
	(0.063)	(0.089)
Manufacturing to wholesale and retail	−0.420**	−0.109
	(0.129)	(0.125)
Manufacturing to transportation and utilities	−0.029	−0.094
	(0.190)	(0.148)
Manufacturing to construction	−0.518	−0.221
	(0.280)	(0.322)
Manufacturing to agriculture and mining	−0.094	−0.199
	(0.173)	(0.496)
Manufacturing to public administration	−0.396**	−0.447*
	(0.102)	(0.214)
All other types of industry movers	−0.157**	−0.072
	(0.037)	(0.059)
Long tenure	−0.104**	0.029
	(0.034)	(0.048)
×Stay in service		−0.130
		(0.076)
×Stay in wholesale and retail		−0.060
		(0.151)
×Stay in transportation and utilities		−0.176
		(0.121)
×Stay in construction		−0.142
		(0.109)
×Stay in agriculture and mining		−0.378
		(0.270)
×Stay in public administration		1.030
		(1.655)
×Manufacturing to service		−0.207
		(0.123)
×Manufacturing to wholesale and retail		−0.508*
		(0.231)
×Manufacturing to transportation and utilities		0.146
		(0.353)
×Manufacturing to construction		−0.536
		(0.540)
×Manufacturing to agriculture and mining		0.146
		(0.502)
×Manufacturing to public administration		0.042
		(0.234)
×All other types of industry movers		−0.139
		(0.073)
Education (Less than high school is omitted):		
High school graduates	0.020	0.012
	(0.045)	(0.047)
Some college	−0.006	−0.016
	(0.048)	(0.048)
College graduates	0.036	0.028
	(0.054)	(0.055)

Table 2 (*continued*)

	Model 1	Model 2
Advanced degrees	0.068	0.059
	(0.086)	(0.086)
Union coverage of the lost job	−0.071	−0.082
	(0.051)	(0.050)
Other human capital and demographic variables [a]	✓	✓
R-squared	0.04	0.04
N	3670	3670

Source: Current Population Surveys (Displaced Worker Supplement), January 2006 and 2008 combined.
Notes: Robust standard errors in parentheses. All variables except industrial mobility variables are centered at their means.

[a] Age, age squared, gender, marital status, gender × marital status, have children, gender × have children, race, metropolitan residency, year of displacement, and calendar year.

* $p < 0.05$.
** $p < 0.01$ (two-tailed).

earnings losses are almost always magnified by long tenure status, suggesting that workers with more time on their prior jobs had accumulated higher wages that were lost when they recompeted in the labor market with other workers. Whether these higher pre-displacement wages of long-tenured workers should be regarded as loyalty rent payments, returns to accumulated firm-specific skills, or the result of bureaucratic seniority wage rules is unclear (see our Section 3 later). Model 2 demonstrates that the association between tenure in the prior job and earnings losses is of modest size but broadly distributed across displaced workers who are re-employed.

Without measures of individuals' firm-specific skills, which are never available to the analyst with this type of earnings data, it is impossible to disentangle in any definitive way whether the earnings losses documented in Table 2 should be attributed to structural sources, skill mismatches, or (most likely) a combination of the two. There is, however, one way to assess the relevance of skill shifts to our analysis: model the relationship between earnings losses and shifts in the average skill levels of the occupations between which individuals move. Adjusting for the skill shifts at the detailed occupational level helps to show whether manufacturing workers whose jobs require similar skills experience different earnings losses when they move to different industrial locations.

For this supplementary analysis, which is reported in full in Table A4 in the Appendix, we took measures of occupational skills and requirements from the Occupational Information Network (O*NET) 12.0 database, made compatible with the 2000 census occupation classification, which consists of 509 occupations, through a multistage matching process.[11] O*NET is the nation's current primary source of occupational information, collected and compiled by the U.S. Department of Labor, which is the replacement for the Detailed Occupational Title (DOT) measures that have been used in many prior studies to measure occupational skill requirements and other occupational characteristics (e.g., Budig and England, 2001; Kilbourne et al., 1994; Weeden, 2002).

In our analysis, we use five occupational skill measures from the O*NET database: required education, required work experience, required on-site-training, required on-the-job training, and the level of occupation-specific skills. The educational requirement is measured by years of educational attainment by typical occupants, and the work experience, on-site-training, and on-the-job training variables are measures enumerated by months of required job training in the occupation. The occupation-specific skill requirement is measured by the Special Vocational Preparation (SVP) score (modified and renamed *job-zones* in recent O*NET datasets), which ranges from 1 to 5, with higher values indicating a higher level of occupation-specific skills.

We use these five measures to examine whether further adjusting for differences in skill measures between the lost job and the current job can account for the pattern of earnings losses documented already. The results are reported in Table A4 for the 3291 respondents of the 3670 respondents who offered occupational information for both their lost job and their current job. After specifying a version of Model 2 from Table 2 for these 3291 respondents, we then offer two separate models, one with an adjustment for the skill levels of the lost job and one with an additional adjustment for the skill levels of the current job. In general, the sizes of the between-industry mobility coefficients decrease slightly in magnitude, but the results continue to show that the vast majority of the earnings losses are generated by changes in jobs across industries rather than shifts toward jobs that have lower average skill requirements. For example, the coefficient for the main effect for moving from the manufacturing industry to the service industry is −0.229 with an interaction with long tenure of −0.207. After adjusting for skill differences in Model A3 in Table A4, these coefficients are −0.219 and −0.239. Although not strictly comparable because of the slight compositional shift in the analysis samples, these coefficients are nonetheless largely unchanged when adjustments for skill differences between occupations are offered. Although measuring skills at the occupational level does not reveal the particular skills possessed by individuals, this measure is the best that one can construct with available data. Overall, our results are consistent with the argument that structural sources can account for some

[11] More detailed information regarding the construction of these measures is available in the Supplementary Appendix.

of displaced workers' earnings losses, independent of individual workers' skills. Our results are *not* consistent with the alternative explanation that earnings losses observed for between-industry mobility can be attributed to underlying shifts toward jobs with lower skill requirements.

2.4. Summary of results

Taken together, our analysis reveals five key results. First, displacement rates vary substantially by industry, and between 2003 and 2007, the highest levels of displacement were observed in manufacturing and construction while the lowest levels of displacement were observed in public administration. Second, over this time period, traditional inter-industry earnings differences persisted, where workers in the manufacturing, transportation, and utility industries earned more than observationally equivalent workers in the service, wholesale trade, and retail trade industries. At the same time, however, these differences declined slightly. Most importantly, wages in the manufacturing industry fell as displacement rates remained high. Third, on average, displaced workers who were re-employed suffered earnings losses in their new jobs. These losses were larger among those who switched industries, and they were especially large among those who found work only in traditional low-wage industries, such as the service industry and wholesale and retail trade. Fourth, the earnings losses of re-employed workers were largest for those who held their prior jobs for three or more years. Fifth, none of these earnings losses could be accounted for by observed average skill differences between the jobs from which workers were displaced and the jobs in which they were re-employed.

3. Discussion

The results in this article suggest that individual-level, skill-based accounts of the earnings losses of displaced workers should be complemented by structuralist explanations that emphasize the distribution of good and bad jobs. From this perspective, displaced workers suffer multiple forms of earnings loss, some of which are attributable to the obsolescence of firm-specific skills and others of which are attributable to the evolving structure of opportunity in the labor market.

Although throughout this article we have emphasized that structural factors as well as individual-level factors are important components of full explanations for the earnings losses of displaced workers, our data do not directly measure the mechanisms that generate structural advantages in the labor market. In this concluding section, we discuss some of the prior literature that furnishes complementary perspectives that support our overall conclusions. These explanations for *why* we observe different earnings losses for workers who move between alternative industries are: (1) declines in industry rents along with continued growth in inequality, (2) the rise of post-Fordist production regimes and related changes in labor utilization strategies, and (3) institutional sources that have eroded the power of labor unions.

The literature on rent destruction suggests that the pattern of earnings losses documented in our analysis is part and parcel of a larger causal narrative that explains the increase in earnings inequality in the U.S. labor market since the 1970s. As we discussed in the introductory section, the literature on rent destruction provides a useful framework for interpreting displaced workers' earnings losses. Rents are attached to structural positions in the labor market, and accordingly they are unequally distributed across the labor market. Worker displacement redistributes workers across positions in the labor market, thereby reshuffling the distribution of rents across workers.

The manufacturing industry is a traditional high-rent industry, and yet it is an industry where rents are declining. This change plays out in the lives of workers, especially low-skilled workers, through displacement. Many of these workers have had careers in which they became accustomed to receiving wages that include as implicit rent a share of their employers' own profits. Since the 1980s, many of these workers have been displaced from jobs that they expected to hold until retirement. When these workers find new jobs in the manufacturing industry, their job losses are mitigated because they may still receive an industry-specific rent. When they can only find jobs in other industries without rent-sharing wage profiles, they suffer particularly large earnings losses. Thus, inequality increases in the labor market, as in our analysis in this article, because substantial numbers of workers are displaced from older, net-advantaged positions in the labor and then re-employed in newer, net-disadvantaged positions.

The origins of rent destruction, however, are unclear, as discussed in Morgan and Cha (2007). One candidate for the status of fundamental causal narrative may also explain the pattern of results we document in this article: the rise of post-Fordism. The claim of this literature is that the U.S. economy has shifted away from a "Fordist" model (characterized by mass-production) toward a "post-Fordist" model (characterized by greater organizational flexibility and increased dependence on markets external to institutions). While the consequences of this shift are argued to be broad, most work has focused on the causal chain that links organizational structures to employment relationships and the careers of particular workers (e.g., DiPrete et al., 2002; Osterman, 1994). During the former Fordist economy, organizations adopted hierarchical forms, developed internal labor markets, and protected their workers against competition by maintaining closed boundaries. In the post-Fordist economy, internal labor markets are less prominent and employment relationships are more flexible. Accordingly, in the post-Fordist economy, the average number of years that workers stay with the same employer decrease, and many positions are staffed with a non-standard workforce (e.g., subcontractors, part-timers, and temporary workers). The flattening of organizational hierarchies and the externalizing of human resource practices results in higher rates of job displacement, especially from many blue-collar factory jobs, coupled with the shifting of the base of the U.S. economy from the manufacturing to the

service sector. From this perspective, job displacement should be understood in the context of a structural shift, where jobs are simultaneously being destroyed in declining traditional industries at the same time that they are being created in expanding service sector industries. This shift, along with the concurrent pressure to reduce labor costs in order to increase competitiveness in the global market, keeps the wages in newly created service industry jobs below those of jobs that are being destroyed in manufacturing (Tilly, 1996). Because the structure of the labor market has reconfigured in this way, displaced workers tend to suffer from earnings losses, especially when they move from traditional good jobs in the manufacturing industry to newly created service sector jobs.

A related stream of literature in sociology has focused on labor utilization strategies, revising earlier new structuralist approaches (Kalleberg and Sørensen, 1979; Sørensen and Kalleberg, 1981) by specifying the conditions under which a dualism of good and bad jobs emerges. Kalleberg (2001) argues that such dualism should be considered a consequence of employers' labor utilization strategies that arise from increased global competition. To reduce labor costs, employers seek to increase organizational flexibility through "functional flexibility" and "numerical flexibility." Functional flexibility is pursued by developing new human resource management practices that encourage workers to develop general skills and then link their pay more directly to organizational performance. However, these changes are applied only to workers who are positioned in an organization's "core" occupations. For low-skilled workers or workers whose skills depreciate quickly as skill requirements change, a strategy of numerical flexibility is deployed instead. Numerical flexibility is pursued by "externalizing" positions that are either low-skilled or not within the demarcated occupational core of the organization. These externalized positions are then staffed by part-timers, subcontractors, and hourly workers from temporary help agencies. These non-standard positions are typically "bad jobs," which offer low wages, no health insurance, and no fringe benefits (Kalleberg et al., 2000). If job displacement is a process of sorting workers from good jobs and placing them in marginalized jobs, as industrial restructuring results in shifts in labor demand, the earnings losses of displaced workers can partly be explained by the extent to which the mobility is driven by this sorting process.

Finally, central to all of these accounts is a related decline in worker power, most frequently understood as a decline in union negotiating power (e.g., Wallace et al., 1999). When the U.S. economy entered widespread industrial restructuring from the 1980s onward, many jobs for production workers were eliminated while many service jobs were created. While many good jobs in traditional industries were covered by collective bargaining and federal labor protection laws, newly created jobs did not have similar levels of labor protection (Kalleberg et al. 2000). Here, it has been difficult to determine how much of the erosion of labor power is a simple consequence of increased global trade and the exporting of jobs, or whether there are exogenous institutional sources for the decline in union power (Bronfenbrenner, 2000). Regardless of the ultimate source of these changes, this perspective suggests that workers displaced from the manufacturing industry experienced the greatest earnings losses when they switched to service sector jobs because they moved from jobs that had union protection to those that lacked union protection. Our supplementary analysis, however, provides little direct support for this possibility. In the models where mobility variables are interacted with union coverage in the lost job, the models of earnings losses change little. Thus, our models suggest that this process, if true, must unfold in a more subtle form, where overall levels of wages in separate industries are a function of union threat, leading to union to non-union spillover effects (e.g., Kahn, 1980), as much as genuine union presence.

Although each of these theoretical approaches emphasizes different processes, they are clearly closely related to each other. The relative explanatory power of each perspective, as well as the conditions under which each of them may have distinct advantages, remains an important question. On the one hand, we anticipate that these alternative perspectives can be addressed by future research. On the other hand, labor market research, in both sociology and economics, has been hampered for the past two decades by a lack of powerful data to reject any particular perspectives. Until we have large-scale, firm-level data that include reliable measures of workers' earnings, background, and current levels of general and specific skills, indeterminate conclusions from studies will persist.

Nonetheless, these are important empirical processes that continue to evolve and demand investigation with the best available data at our disposal. Even though we cannot demonstrate conclusively that structural theories are important complements to individualistic, skills-based accounts from economics, it is important to recognize the same weakness of evidence among those who would deny any such complementarity. It would be audacious indeed for a critic of structuralist approaches to assert that skills-based accounts can effortlessly explain away the subtle patterns of between-industry earnings losses that we have documented in this article. They cannot do so based on the limited information in the CPS data.[12] To do so on theoretical grounds would require assumptions based in a faith that we do not possess, where human resource departments are able to properly price payments for necessary skills in their firms while setting wage standards. We know from prior scholarship, such as Nelson and Bridges (1999) on the processes by which gender differences in wages arise in organizations, that human resource managers do not, ironically, have the skills or inclination to carefully set wages in line with the specific skills of workers and the skill requirements of jobs.

Appendix A

Table A1–A4

[12] Some limited-access data (e.g., Longitudinal Employer-Household Dynamics) provide more comprehensive data on the characteristics of firms at which individuals are employed, but these data do not contain information on payments for the varieties of skills that workers provide to their firms.

Table A1
Means and standard deviations of displaced workers for variables used in the analysis.

Variables	Mean	Std. Dev.	Weighted for missingness	
			Mean	Std. Dev.
Changes in weekly earnings	−0.167	0.895	−0.172	0.877
Weekly earnings in the lost job	846.502	736.819	815.721	709.096
Weekly earnings in the current job	752.374	668.502	719.953	640.358
Industrial mobility ("stay in manufacturing" is omitted):				
Stay in wholesale and retail	0.061		0.061	
Stay in service	0.354		0.349	
Stay in transportation and utilities	0.020		0.019	
Stay in construction	0.065		0.066	
Stay in agriculture and mining	0.003		0.003	
Stay in public administration	0.002		0.002	
Manufacturing to wholesale and retail	0.024		0.026	
Manufacturing to service	0.064		0.066	
Manufacturing to transportation and utilities	0.008		0.008	
Manufacturing to construction	0.013		0.014	
Manufacturing to agriculture and mining	0.002		0.002	
Manufacturing to public administration	0.002		0.002	
Other types of industry movers	0.290		0.287	
Long tenure in lost job (>3 years)	0.487	0.500	0.490	0.500
Age	39.540	11.539	40.140	11.930
Female	0.413		0.424	
Education ("less than high school is omitted):				
High school graduates	0.329		0.346	
Some college	0.328		0.313	
College graduates	0.190		0.175	
Advanced degrees	0.072		0.060	
Race ("white" is omitted):				
Black	0.123		0.138	
Hispanic	0.139		0.149	
Other race	0.045		0.053	
Metropolitan Residency	0.867		0.866	
Married	0.556		0.533	
Have children	0.730		0.691	
Lost job's union coverage	0.085		0.086	
Calendar year displaced ("2003" is omitted)				
2004	0.160		0.159	
2005	0.319		0.320	
2006	0.171		0.172	
2007	0.185		0.187	
Do not know from 2006 DWS	0.000		0.000	
Do not know from 2008 DWS	0.001		0.001	
Year interviewed ("2006" is omitted)				
2008	0.489		0.493	
Number of observations	3670			
Levels of skills in the lost job:				
Years of required education	12.594	2.187	12.481	2.153
Months of related work experience	27.003	18.877	26.338	18.579
Months of required on-site-training	7.771	7.436	7.674	7.330
Months of on-the-job training	9.088	8.474	8.951	8.406
Differences of skills in the lost and current jobs				
Years of required education	0.001	1.803	−0.005	1.785
Months of related work experience	−1.126	18.085	−1.194	17.871
Months of required on-site-training	−0.223	7.548	−0.238	7.449
Months of on-the-job training	−0.111	8.473	−0.136	8.373
Number of observations	3291			

Source: Current Population Survey Displaced Worker Survey, 2006 and 2008 January.
Note: The sample includes those who are currently in the labor force and those who have displaced, whose age is between 18 and 64. Data are weighted by displaced worker supplement weight provided by Bureau of Labor Statistics.

Table A2
Means and standard deviations, Current Population Surveys (Merged Outgoing Rotation Groups), 2003–2008.

Variables	Mean	Std. Dev.
Weekly earnings (2008 US dollars)	746.11	550.87
Weekly earnings (log)	6.43	0.79
Industry (manufacturing is omitted):		
Service	0.54	
Wholesale and retail	0.15	
Transportation and utilities	0.05	
Construction	0.07	
Agriculture and mining	0.01	
Public administration	0.05	
Education (less than high school is omitted):		
High school graduates	0.31	
Some college	0.30	
College graduates	0.20	
Advanced degrees	0.10	
Age	39.37	12.13
Female	0.48	
Married	0.57	
Have children	0.68	
Race (white is omitted):		
Black	0.12	
Hispanic	0.14	
Other race	0.06	
Usual hours worked per week	39.22	9.53
Union member	0.13	
Region (East is omitted)		
Midwest	0.23	
South	0.36	
West	0.23	
Occupations ("management, business, and financial" is omitted):		
Professional and related	0.21	
Service	0.16	
Sales and related	0.10	
Office and administrative	0.15	
Farming, fishing, and forestry	0.01	
Construction and extraction	0.06	
Installation, maintenance, and repair	0.04	
Production	0.07	
Transportation and material moving	0.06	
N	996316	

Source: Current Population Surveys (Merged Outgoing Rotation Groups), 2003–2008.
Note: The sample includes those who are currently in the labor force, aged 18–64. Data are weighted by the outgoing rotation groups weight provided by the Bureau of Labor Statistics.

Table A3
Earnings Regressions for the Full Labor Market, 2003–2008.

	Model 1	Model 2
Constant	6.538**	6.539**
	(0.003)	(0.003)
Industry (manufacturing is omitted):		
Service	−0.109**	−0.108**
	(0.003)	(0.003)
Wholesale and retail	−0.151**	−0.149**
	(0.004)	(0.004)
Transportation and utilities	0.020**	−0.008
	(0.006)	(0.005)
Construction	−0.042**	−0.043**
	(0.005)	(0.005)
Agriculture and mining	−0.180**	−0.175**
	(0.011)	(0.011)
Public administration	0.050**	0.023**
	(0.005)	(0.005)

(*continued on next page*)

Table A3 (*continued*)

	Model 1	Model 2
Year	−0.007**	−0.006**
	(0.001)	(0.001)
×Service	0.004**	0.003**
	(0.001)	(0.001)
×Wholesale and retail	−0.000	−0.001
	(0.001)	(0.001)
×Transportation and utilities	−0.002	−0.001
	(0.002)	(0.002)
×Construction	0.005**	0.004**
	(0.002)	(0.002)
×Agriculture and mining	0.013**	0.012**
	(0.003)	(0.003)
×Public administration	0.007**	0.006**
	(0.002)	(0.002)
Education (Less than high school is omitted):		
High school graduates	0.195**	0.189**
	(0.002)	(0.002)
Some college	0.273**	0.265**
	(0.002)	(0.002)
College graduates	0.495**	0.486**
	(0.003)	(0.003)
Advanced degrees	0.589**	0.576**
	(0.003)	(0.003)
Union Member		0.133**
		(0.002)
Demographic and other human capital variables [a]	✓	✓
R-squared	0.55	0.55
N	996316	996316

Source: Current Population Surveys (Merged Outgoing Rotation Groups), 2003–2008.

Notes: Robust standard errors in parentheses. All variables except industrial mobility variables are centered.

[a] Age, age squared, gender, marital status, gender × marital status, have children, gender × have children, race, usual work hours, region, and occupations.

** $p < 0.01$ (two-tailed).

Table A4
Regression coefficients for comparison with those from the models in Table 2.

	Model A1	Model A2	Model A3
Stayers:			
In manufacturing industry (the constant)	−0.056	−0.060	−0.071
	(0.043)	(0.044)	(0.043)
In service	−0.036	−0.037	−0.026
	(0.055)	(0.057)	(0.057)
In wholesale and retail	−0.077	−0.101	−0.093
	(0.130)	(0.131)	(0.130)
In transportation and utilities	0.146	0.111	0.129
	(0.117)	(0.119)	(0.118)
In construction	−0.045	−0.002	0.017
	(0.057)	(0.063)	(0.073)
In agriculture and mining	0.395*	0.362	0.373*
	(0.220)	(0.223)	(0.221)
In public administration	0.603	0.606	0.646
	(0.551)	(0.524)	(0.507)
Movers:			
Manufacturing to service	−0.238*	−0.231*	−0.219*
	(0.096)	(0.097)	(0.097)
Manufacturing to wholesale and retail	−0.111	−0.125	−0.112
	(0.131)	(0.130)	(0.131)
Manufacturing to transportation and utilities	−0.138	−0.160	−0.144
	(0.207)	(0.210)	(0.217)

Table A4 (*continued*)

	Model A1	Model A2	Model A3
Manufacturing to construction	−0.183	−0.186	−0.178
	(0.371)	(0.371)	(0.381)
Manufacturing to agriculture and mining	1.397**	1.426**	1.465**
	(0.356)	(0.385)	(0.386)
Manufacturing to public administration	−0.418	−0.384	−0.413*
	(0.216)	(0.213)	(0.202)
All other types of industry movers	−0.078	−0.075	−0.068
	(0.064)	(0.064)	(0.065)
Long tenure	0.040	0.047	0.000
	(0.052)	(0.052)	(0.000)
×Stay in service	−0.126	−0.127	−0.137
	(0.077)	(0.077)	(0.075)
×Stay in wholesale and retail	−0.089	−0.085	−0.082
	(0.156)	(0.156)	(0.156)
×Stay in transportation and utilities	−0.189	−0.163	−0.174
	(0.132)	(0.133)	(0.133)
×Stay in construction	−0.194	−0.200	−0.206
	(0.107)	(0.106)	(0.106)
×Stay in agriculture and mining	−0.421	−0.356	−0.385
	(0.272)	(0.282)	(0.285)
×Stay in public administration	−0.654	−0.671	−0.725
	(0.590)	(0.564)	(0.552)
×Manufacturing to service	−0.220	−0.231	−0.239
	(0.137)	(0.137)	(0.137)
×Manufacturing to wholesale and retail	−0.537*	−0.531*	−0.535*
	(0.255)	(0.257)	(0.257)
×Manufacturing to transportation and utilities	0.141	0.161	0.175
	(0.407)	(0.403)	(0.406)
×Manufacturing to construction	−0.593	−0.608	−0.619
	(0.584)	(0.586)	(0.587)
×Manufacturing to agriculture + mining	−1.461**	−1.504**	−1.503**
	(0.368)	(0.396)	(0.396)
×Manufacturing to public administration	−0.027	−0.056	−0.019
	(0.237)	(0.234)	(0.221)
×All other types of industry movers	−0.140	−0.140	−0.138
	(0.077)	(0.077)	(0.076)
Education (Less than high school is omitted):			
High school graduates	0.007	0.011	0.003
	(0.050)	(0.050)	(0.051)
Some college	−0.021	−0.007	−0.022
	(0.052)	(0.055)	(0.056)
College graduates	0.018	0.046	0.014
	(0.057)	(0.068)	(0.072)
Advanced degrees	0.077	0.128	0.075
	(0.088)	(0.095)	(0.101)
Union coverage of the lost job	−0.090	−0.098	−0.096
	(0.052)	(0.053)	(0.054)
Other human capital and demographic variables [a]	✓	✓	✓
Levels of skills in the lost jobs		✓	✓
Differences of levels of skills in the lost and the current jobs			✓
R-squared	0.04	0.04	0.04
N	3291	3291	3291

Source: Current Population Survey Displaced Worker Survey, 2006 and 2008 January.
Notes: Robust standard errors in parentheses. All variables except industrial mobility variables are centered at their means.
[a] Age, gender, marital status, gender × marital status, have children, gender × have children, race, metropolitan residency, year of displacement, and calendar year.
* $p < 0.05$.
** $p < 0.01$ (two-tailed).

Appendix B. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.ssresearch.2010.08.002.

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