HIGH AND LOW EARNINGS JOBS: THE FORTUNES OF EMPLOYERS AND WORKERS

BY JULES THEEUWES

University of Amsterdam

JULIA LANE

American University and Urban Institute

DAVID STEVENS

University of Baltimore

The focus of the literature on the effect of job changes has been on the consequences of job destruction on the individual worker. In this paper we analyze the impact on the earnings distribution of both job creation and job destruction. We establish a link between job reallocation and the movement of workers into and out of the tails of the earnings distribution. Both job creating and job destroying employers shed jobs mostly from the middle and lower tails of the earnings distribution, although this is cyclically very sensitive. Labor mobility (triggered by job reallocation) is risky: mobile workers will generally end up in the upper or lower tail of the distribution rather than in the middle. If workers move across industry boundaries, they typically move to the lower tails of the distribution. In sum, the fortunes of workers depend on the fortunes of their employers.

I. INTRODUCTION

One of the most interesting empirical facts reported in the 1990s has been the magnitude of job and worker reallocation in the economy. In a competitive economy, such a reallocation of labor should be accompanied by changes in labor prices. This link has not gone unnoticed by the popular press, which have been quick to associate downsizing with a loss of high earnings jobs and an increase in low earnings jobs (especially in the service industry).[1] This focus on the negative effects of job destruction on earnings inequality has not been combined with the simultaneous effects of job creation on the earnings distribution. This paper uses a matched employer-employee data set to document whether job destruction does indeed entail the loss of high earnings jobs and also looks at the other side of the coin: the effects of job creation on earnings.

We address the effects of job reallocation on the earnings distribution by holding worker characteristics as constant as possible. We do this by focusing on the movements of a fixed cohort of workers into and out of the tails of the income distribution: namely, high earnings and low earnings jobs. We first analyze the

    [1]The *New York Times* devoted a seven part front page series to this issue in May 1996, and the July /August 1996 Challenge leads with an interview of Robert Reich on downsizing and inequality.

impact of job reallocation across employers on the probability of workers moving into and out of these jobs. We then turn to the employer as the unit of analysis and describe how job creation and destruction are linked to the proportion of high earnings jobs in each employer. In these ways we link the earnings fortunes of workers with the employment fortunes of their employers.

The paper is structured as follows. The following section provides a brief review of the theoretical literature. Section III describes the data and establishes that the earnings distribution changes at the industry, employer and worker level quite markedly, despite the choice of a fixed cohort of workers. Section IV uses the worker as the unit of analysis to quantify the link between worker transitions across the earnings distribution and employer fortunes, as categorized by employer job creation and destruction performance. Section V provides a complementary analysis using employers as the unit of observation. Section VI concludes.

II. BACKGROUND AND LITERATURE REVIEW

The magnitude of job reallocation (the sum of job creation and destruction) has been thoroughly documented (Davis and Haltiwanger, 1990; Davis, Halti-wanger and Schuh, 1996), as have the magnitude of and trends in earnings inequality (Levy and Murnane, 1992). Levy and Murnane do conclude their comprehensive survey by noting the possible influence of demand side effects, but blame the lack of empirical evidence on a paucity of good, employer level data.

The theoretical link between job reallocation and earnings inequality is straightforward at the aggregate level. In the short run, job-creating employers may bid up wages if they face an upward sloping supply curve; the converse is true for job-destroying employers. Thus workers who work for job creating firms should move into the upper tails of the earnings distribution; those who work in job destroying firms should move into the lower tails. Although wages should eventually return to the original equilibrium, this can take a long time (Lilien, 1982; Abraham and Katz, 1984), since they are often rigid and workers are immobile. Furthermore, employer specific human capital can be lost, or there can be matching problems in the labor market. The theoretical link is muddied, however, because the effect also depends on where jobs are being destroyed and where they are being created. Although Foster, Haltiwanger, and Krizan (1998) note that much of U.S. productivity growth is due to the reallocation of factors of production (including labor) from less productive to more productive firms, it is an empirical question as to whether these are high wage or low wage jobs. This depends on the production technology of the successful firms—and as Haltiwanger, Lane and Spletzer (1999) point out, firms do appear to choose different input modalities.

The effect on individual workers of job reallocation, and the consequent mobility, is even more complex. Involuntary mobility may result in a downward movement in the earnings distribution, due to a loss of employer specific human capital, "scarring" by unemployment, and may also face spatial problems matching their skills to new employers. Empirical evidence (Jacobson, LaLonde and Sullivan, 1993) confirms this, finding that the average present discounted value of

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life-time lost earnings for older, long tenured displaced workers is about $80,000.

The effect of voluntary mobility on earnings is the reverse. Workers who willingly quit presumably do so to improve their lot and move up in the earnings ranks. Indeed, Topel and Ward (1992) find that mobility is a critical component of wage gains for young men, contributing to over a third of wage growth. Some workers will also decide to move to avoid a (further) worsening of their earnings at the present employer. Empirical labor mobility research has established that there is a greater probability of quitting a low wage job than a high wage job and that employees in industries with lower wages have higher quit rates than in industries with higher wages (see Parsons, 1977, for an early reference).

There is also an employer side to this story. Quit rates tend to decline as firm size increases. This could be because large firms generally pay higher wages and because they have larger internal markets to reallocate workers internally (Oi, 1991). Selection models (such as Borjas and Rosen, 1980; Holmlund, 1982) suggest that workers who stay, do so for a reason. In a favorable environment they may develop more specific human capital, receive more training and move up the earnings ranks with the present employer. Other stayers might not be so lucky with their present employer, yet have no good outside opportunities and hence get stuck in a job. Selection research indicates that those who quit have more to gain from a job change than those who stay, and that their wage gain after changing is greater than would have been true on their old job.

The age and tenure effects of job mobility have been the subject of intense discussion. It is obvious that job mobility declines with age and tenure (Topel and Ward, 1992; Farber, 1994; Jovanovic, 1979). If mobility is seen as investment in human capital, then younger workers face a longer pay back period and will invest more in mobility than older workers. If on the job training in specific human capital is important then specific capital will increase with tenure and this will make the worker more productive on the present job and less so on outside jobs. These are the human capital explanations of the negative age and tenure effect on mobility.

There is also a matching model explanation (Jovanovic, 1979) which assumes that the information which workers and employers have about each other is incomplete and costly to obtain. As time is spent on the job, the productivity of the match between worker and job becomes apparent. Workers for whom the realized value of the match is below their market earnings will either quit or be fired.[2] As a result of this process the economy will move to better matches through a series of trials and quits (Mincer and Jovanovic, 1981). The effects of this trial and error process on earnings distribution is not clear. If the first match was a failure the next job could have both lower earnings or higher earnings.

Although the distinction between voluntary quits and involuntary lay-offs or separations seems obvious at first glance, McLaughlin (1991) argues that it is difficult to separate voluntary and involuntary moves. Both the worker and the employer are involved in the mobility decision. A worker will quit if his present employer does not match an outside offer, and an employer will lay off a worker

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[2]Empirical evidence for this is found in Spurr and Sueyoshi (1996) and Lane and Parkin (1998).

if she does not accept a wage reduction. Whether the worker who leaves experiences a wage gain or wage loss will depend on the relative change in the productivity value of the worker with the incumbent and the outside employer.

The mobility literature also extensively documents the link between the business cycle and mobility. Tight labor markets (with low unemployment) have high quit rates and low lay-off rates. Loose labor markets (with high unemployment) have low quit rates and high lay-off rates. This implies a negative relationship between quit rate and unemployment whereas the lay-off rate moves with the unemployment rate.

In sum, the literature posits a number of possible links between worker mobility and worker earnings: in general voluntary mobility should increase worker earnings and involuntary mobility should decrease worker earnings. The focus of the literature has been on the earning and job effects at the level of the individual worker and firm. The net effects of worker or employer initiated mobility on the earnings distribution are not determinable *a priori*, neither have they been the subject of extensive empirical research.

III. DATA, TRENDS AND TRANSITIONS

We first provide a short introduction to the data (see Appendix A for more detail) and then describe the cyclical trends in earnings inequality at the level of the industry and the individual employer and conclude with a description of the transition of workers in to and out of the tails of the earnings distribution. This demonstrates that there are considerable changes over time both in the proportion of high and low earnings jobs and in the movement of workers in and out of these jobs. In the next section we relate these changes in the tails with job creation and destruction.

(a) *Data*

We take advantage of a new database which enables us to match workers with past and present employers. This database consists of quarterly establishment records of the employment and earnings of almost all individuals who worked in the state of Maryland from the third quarter of 1985 to the third quarter of 1994. These data have several advantages over household-based, survey data. In particular, the earnings are quite accurately reported: there are financial penalties for misreporting. The data are current, and the dataset is extremely large: earnings information is available for over 2 million jobs with over 100,000 employers every quarter. Since we have almost the full universe of employers and workers, we can track movements across earnings categories and across employers with a great deal of accuracy.

These job-based data are different from the worker based data with which many researchers are familiar. In particular, we have no socio-economic information on workers; nor do we have any data on the employer other than their earnings and employment records, their date of application for an employer identification number and their 4 digit industry code. Earnings refer to quarterly earnings, and we have no information on hours worked. Other researchers

working with similar data have made a series of standard decisions, which we follow. In particular, we follow the approach taken by Jacobson, LaLonde and Sullivan (1993), in defining earnings to be the maximum earnings by the individual in a quarter. This ensures that there is a one to one relationship between workers and employers in each quarter. We also follow our previous work and work by Topel and Ward (1992), in that we define employment to be full quarter employment and take only workers whose earnings exceed 70 percent of the minimum wage during the quarter. The decision to use full quarter employment is a consequence of not being able to observe hours or weeks worked in the data. Since this makes it possible that earnings reported by the employer only reflects partial quarter earnings, we define full quarter employment as employment where the worker has been employed by the same employer in the quarter before and after the quarter under consideration. (see Burgess, Lane and Stevens, 1999, for a detailed discussion).

In this analysis we focus on a cohort of all workers who were employed by reporting units in the third quarter of each year in all 10 years.[3] This restriction enables us to track a cohort of workers over time, and to control, as much as possible, for the effects of labor force entry and exit, and of unobserved heterogeneity on earnings inequality (although there will be tenure and experience effects on earnings). This cohort consists of close to a hundred thousand individuals and 997,650 data points, representing about 12 percent of the dataset.

Although we have no information on the characteristics of the individuals from this data, we can get a sense of the impact of this restriction on our analysis by looking at the PSID for the same period. Workers who are employed for all ten periods are more likely to be males (62 percent vs 55 percent) and are older than those workers who are employed for less than the full period worker (43 vs 32). They are also more highly educated (average years of education are 13.29 years rather than 12.29 years in the PSID dataset). Reflecting this greater homogeneity, earnings inequality is lower (the Gini is 0.37 versus 0.46 for the full dataset) and mobility lower (0.03 vs 0.09).

The impact of the restriction of the analysis to the state of Maryland is not particularly severe. Maryland workers are not very different from workers in the U.S. at large—as Appendix B, Tables 1 and 2 suggest, they are less likely to be in mining and manufacturing and more likely to be in retail trade and services; their earnings are slightly higher, but their age and distribution across other industries is rather similar to the nation as a whole.

The last decision is defining the tails of the earning distribution, and hence whether to set the earnings thresholds at an absolute or a relative level. We choose to follow the Bluestone and Harrison (1986) convention and define earnings classes by setting the cut-offs for high and low earnings jobs at twice and half the median of 1985 earnings (in real terms). This choice gives us the advantage of

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[3]Restricting the dataset to full quarter employment reduces the number of workers by roughly 10 percent (but eliminates almost one-quarter of job spells). The earnings restriction reduces the number of workers by about 9.5 percent; the restriction to workers who work all 10 periods is most restrictive, in that we lose about 70 percent of workers as a result. However, we have repeated the analysis for workers who were employed in both 1985 and 1986 and at least 5 of the remaining 8 years, with essentially similar results.

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being able to capture the effect of cyclical changes on the earnings distribution, which is important given our focus on job creation and destruction. The potential disadvantage of this choice is that changes in median earnings due to secular growth in the economy will tend to move more workers up to the top end of the earnings, distribution. However, since there is almost no secular growth in median earnings over the period, this effect is minimized.

The strength of these administrative records is evident from our ability, for the first time in the United States, to focus on a very large sample of almost 100,000 workers, track them for 10 years across all employers, and document the effect of employer changes on earnings outcomes.

(b)*Trends and Changes across Industries and Employers*

This section establishes that there are quite substantially changes over time in the tails of the earnings distribution even for this fixed cohort of workers. Table 1 shows the proportion of high and low level jobs for our fixed cohort of workers by major sector in each of the years under consideration. Even though there has been a great deal of evidence describing levels and changes in earnings variation across individual characteristics, such as age, race, sex and education

TABLE 1a:
PROPORTION OF HIGH EARNINGS JOBS BY INDUSTRY AND YEAR
(in percents)

	Manu-facturing	Transportation, Communication, Utilities	Wholesale	Retail	Finance Insurance, Real Estate	Professional Services	Other Services	Overall
1986	17.14	24.76	14.75	7.63	12.84	9.82	8.84	12.2
1987	16.89	26.34	15.86	7.27	13.80	9.72	11.79	12.9
1988	15.86	27.41	30.29	7.75	16.13	14.35	10.64	8.02
1989	17.36	20.56	16.05	7.68	16.17	15.68	8.16	13.3
1990	18.66	17.35	14.63	6.70	16.66	16.01	8.28	12.7
1991	18.82	21.76	14.97	7.23	16.73	16.83	8.57	12.3
1992	22.27	22.66	14.98	6.15	17.13	16.44	8.71	12.8
1993	23.28	26.37	15.29	5.93	17.52	16.97	8.48	13.1
1994	32.54	33.06	16.75	7.53	19.68	18.43	9.34	13.25

TABLE 1b
PROPORTION OF LOW EARNINGS JOBS BY INDUSTRY AND YEAR
(in percents)

	Manu-facturing	Transportation, Communication, Utilities	Wholesale	Retail	Finance Insurance, Real Estate	Professional Services	Other Services	Overall
1986	7.37	14.60	37.10	51.90	32.57	23.37	52.73	22.2
1987	7.76	15.99	38.97	53.55	33.67	25.75	52.19	21.3
1988	8.59	17.27	28.29	53.61	33.64	18.92	57.05	18.8
1989	8.91	16.97	41.28	53.86	34.42	19.16	59.78	20.2
1990	10.19	17.50	42.08	54.35	33.81	19.40	61.17	20.9
1991	10.02	16.20	39.81	52.17	32.96	17.79	59.80	21.5
1992	9.61	15.17	40.29	61.56	33.17	18.57	59.46	21.3
1993	10.38	17.04	42.01	63.11	34.49	19.87	62.29	20.9
1994	8.23	18.01	41.88	52.74	33.92	19.96	63.08	21.0

level, this demonstrates that there is similar variation in jobs (rather than individuals) across industries, holding worker characteristics constant.

The differences across sectors is quite striking. About one in thirteen jobs in retail trade and other services is highly paid compared with one in five in transportation, communication and utilities. By contrast, more than half of the jobs in retail trade and other services are low paid jobs. It is also interesting to note the trends in the distribution over time. The two sectors which have declined in employment, manufacturing and professional services, which declined by 5 percent and 18 percent respectively, show a clear increase in the proportion of high wage jobs (presumably reflecting the increase in experience of this fixed group). The other sectors, which increased in employment by between 3 to 5 percent , show little upward trend in the proportion of either high wage or low wage jobs.

Although Table 1 demonstrates that there are substantial differences across sectors and over time for the fixed cohort, this is not surprising, given that these sectors hire very different types of workers.[4] A more interesting question is the degree to which employers change their earnings distributions over time. We thus disaggregate the data to look at how much change there was at the employer level over this period—in other words, how much change there is in the earnings distribution over time even controlling for the type of product produced. We calculated for each employer the ratio of the proportion of high earnings jobs in this year (third quarter) over the proportion previous year (third quarter). The ratio is weighted by employment. We repeat the exercise for low earnings jobs. This creates a distribution of employer level earnings changes for each period. We present the first and third quartile and the median of the distribution of these ratios for each year in Table 2. Table 2a presents the statistics derived from the distribution of the changes in the proportion of high earnings jobs, Table 2b that for changes in the proportion of low earnings jobs.

The overwhelming impression from this analysis is the degree to which employers adjust the earnings distribution, even for this homogeneous group of workers. For example, the first row in Table 2 shows the ratio for the 1985–86 period. In that period at least a quarter of the employers increased the number of high earnings jobs by at least 39 percent (as implied by the third quartile value of 1.39). The value for the median in the same row is 1.06: half the employers increased their proportion of upper tail jobs with at least 6 percent. Similarly, looking at the first row in Table 2b we see that 50 percent of the employers reduced their share of low earnings jobs with at least 8 percent in the 1985–86 period (median value is 0.92).

Looking at the changes in the third quartile in Table 2a we see a clear pattern over time. High earnings job creation starts at a high level in the 1985–86 period, then its importance decreases until 1989–90 and increases again afterwards. This pattern follows the movement into and out of the 1990 recession. A reverse pattern holds for the creation of low earnings jobs. The third quartile value increases

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[4]Appendix B, Tables 3a–c confirm these differences in the proportion of jobs by industry. Although CPS data are not well suited to comparison, being worker rather than job based, these tables reveal that workers who primarily worked in retail trade, for example, were more likely to be in low earnings jobs than those in manufacturing. Similarly, earnings dispersion in retail trade and finance, insurance and real estate is much greater than that in manufacturing.

CHANGES IN EARNINGS DISTRIBUTION
(employment weighted)

Period	First Quartile	Median	Third Quartile
Distribution of Ratio % High Earnings $(t+1)$/% High Earnings (t)			
1985–86	0.85	1.06	1.39
1986–87	0.79	1.01	1.33
1987–88	0.67	0.93	1.30
1988–89	0.67	1.00	1.22
1989–90	0.70	0.95	1.15
1990–91	0.73	0.98	1.17
1991–92	0.78	1.00	1.21
1992–93	0.78	1.00	1.21
1993–94	0.79	1.00	1.29

TABLE 2B:
CHANGES IN EARNINGS DISTRIBUTION
(employment weighted)

Period	First Quartile	Median	Third Quartile
Distribution of Ratio % Low Earnings $(t+1)$/% Low Earnings (t)			
1985–86	0.60	0.92	1.17
1986–87	0.62	0.93	1.21
1987–88	0.54	1.07	1.21
1988–89	0.71	1.00	1.30
1989–90	0.69	0.99	1.27
1990–91	0.67	0.98	1.23
1991–92	0.65	0.95	1.21
1992–93	0.68	0.97	1.24
1993–94	0.59	0.94	1.21

until the late eighties and decreases in the nineties. The substantial size in the increases or decreases in high and low earnings jobs at the level of the employer from year to year and the clear cyclical pattern is noteworthy, as is the simultaneous occurrence of strong positive and negative changes in the level of both high and low earnings jobs.

Each period is characterized by substantial across-the-board changes in the earnings distribution of this cohort of workers even at the level of the employer. Of course, these changes can come about either because high (low) earnings workers are simply shuffled from one employer to another or because employers change the earnings distribution for current workers. If the former is the case, then individual workers should not display high rates of transition across earnings classes; whereas this is more likely to be true in the latter case. The next subsection addresses this by describing the movements of workers from and into the high and low earnings classes over time.

(c) *Changes Across Workers*

In this section we classify our fixed cohort of workers according to whether they hold high, middle or low earnings jobs in each period and describe their

GROSS TRANSITIONS IN AND OUT OF TAILS

	To High Earnings	Out of High Earnings	To Low Earnings	Out of Low Earnings
1985–86	3.03	1.19	0.85	2.60
1986–87	2.98	1.60	1.52	1.71
1987–88	3.73	1.49	0.61	3.13
1988–89	2.41	2.66	0.61	0.74
1989–90	2.24	2.48	0.61	0.57
1990–91	2.49	2.09	0.64	0.59
1991–92	2.16	2.12	0.65	0.62
1992–93	2.70	2.18	0.58	0.63
1993–94	3.71	2.01	0.73	0.62

TABLE 3b

NET TRANSITION IN AND OUT OF TAILS

	Net High Tail	Net Low Tail	Net Middle
1985–86	1.84	−1.75	−0.09
1986–87	1.38	−0.19	−1.19
1987–88	2.24	−2.52	0.28
1988–89	−0.25	−0.13	0.38
1989–90	−0.24	0.04	0.20
1990–91	0.40	0.05	−0.45
1991–92	0.04	0.03	−0.07
1992–93	0.52	−0.05	−0.47
1993–94	1.70	0.11	−1.81

Note: These are proportions of the cohort who change from one state to another

gross flows into and out of the fixed earnings classes in Table 3a. Table 3a documents quite large flows into and out of the upper and lower tails of the earnings distribution by a fairly homogeneous set of workers. A yearly gross flow in and out of the upper tail of between 2 and 3 percent is substantial—had earnings been allowed to grow for everyone by only the group average, there would have been no exits out of high wage jobs in 1985–89 and 1993–1994 (where average earnings grew) and no entries in 1990–92 (where average earnings declined). Indeed even during the years where average earnings for the group grew, entries into high wage jobs averaged roughly 4 times what would be predicted by such a simple simulation. The fluctuation in the size of the flows also reinforces what was already found in Table 2: namely that there is a great deal of high and low earnings reallocation over time even among the same group of workers. The impact of these gross flows on the earnings distribution is summarized in Table 3b which derives the net inflow to each part of the earnings distribution from the information in Table 3a.[5]

[5]The net change in high earnings jobs is the difference between workers entering and exiting the upper tail; the same is true for lower tail movements. Clearly the change in middle earnings jobs is the complement of the changes in high and low earnings jobs. It is worth noting at this point that while workers can enter the upper tail from any point in the distribution, over 95 percent of such movements come from workers in the middle; the same holds true for workers entering the lower tail.

There is a clear upward shift of the whole distribution to the right in the 1985-87 period: out of low earnings, out of middle class earnings and into high earnings. In 1987–90 period the middle classes in the earnings distribution are expanding at the expense, first of the low tail and later of the high tail. From 1990 onward the middle classes lose again especially in the 1992–94 period. The cyclical pattern of net movements into the middle part of the earnings distribution in Table 3b. conflicts with the popular press view of the definite disappearance of middle class jobs. These results confirm what we found above when discussing Table 2. Earnings distribution change markedly, whether the unit of analysis is the employer or the workers, and the changes in the earnings distribution at the employer level are mirrored at the worker level.

This section has thus documented that earnings distribution change, even for a fixed cohort of workers, over time. In the next two sections we will, using regression models, try to tie these changes in the earnings distribution to job creation and destruction at the level of the employer.

IV. Tying Employee's Transitions to Employer's Fortune

This section analyzes the effect of job reallocation on the movement of workers in and out of the tails of the distribution. In the next section (V) we turn the question around and use the employer as the unit of analysis to describe the effect of job creation and destruction on the proportion of jobs at the tails of the income distribution.

The sheer size combined with the panel nature of the data provides a unique opportunity to focus directly on these demand based sources of change. Since we have information on all workers with a given employer, and longitudinal data on both the workers and the employers, we can complement previous work, which has extensively discussed the effect of changes in supply side characteristics. In particular, we control for many supply side characteristics by only looking at the same group of workers, and focus on job reallocation effects.

In simple terms, if the earnings of worker i are a function of her time varying characteristics, X_t, her time invariant characteristics, X_i and employer fortunes $F_{j(it)}$, then we can write

$$w_{it} = X_{it}a + F_{j(it)} \, b + X_i c + e_{it}.$$

As was stressed in the literature review in Section II, years of experience and tenure and cyclical effects are time varying characteristics. We approximate the effect of these variables on the change in earnings by time T and time squared T^2. Hence the change in earnings Δw equation becomes:

$$\Delta w_{it} = Ta_1 + T^2 a_2 + \Delta F_{j(it)}b + e_{it}.$$

The ΔF represents employer fortunes. We include an extra variable (the growth in employment in Maryland) to capture cyclical effects. The fortunes of the employer can be variously defined but in this paper we focus on the job creation

and destruction performance of the employer.[6] We are particularly interested in two key issues. The first is whether there is a link between job reallocation and the reallocation of workers into and out of the tails of the distribution. The second springs from the discussion in the literature review, namely, whether the effects differ depending on the (voluntary or involuntary) mobility of the worker. We capture the former by including as regressors the job creation and destruction performance of previous and current period employers. In particular, we define an employer as being a job creator if employment has grown by more than 10 percent in the previous year; a job destroyer if employment has decreased by more than 10 percent in the same time period. The omitted category is thus employers with stable employment levels. We also looked at the effect of birth and death of a firm defining a variable for the current employer being a new firm and a variable for the previous employer having shut down. The mobility issue is addressed by distinguishing between workers who changed employers in the past year and workers who were mobile across the borders of an industry. The omitted category is workers who did not change jobs.

Since the focus of the paper is movements into and out of the tails of the distribution, we look at movements across our two earnings thresholds in year to year transitions. To this end, we estimate four linear probability models for each movement into and out of these tails and use these gross probabilities to calculate net flows.[7] These results are quite precisely estimated, thanks to the size of the dataset (a total of 10 years of observations on 99,765 workers each year) and are reported in Table 4.

Several results stand out. The first is that, even controlling for cyclical effects and imposing fixed effects on the worker, job reallocation does have an impact on workers' transitions into and out of the tails of the distribution, although in general the order of magnitude of the effect is quite small. Employees' fortunes are indeed tied to those of the employer. The second is that mobility also has an impact—and that this effect is generally stronger than the effect of employer fortunes (although the mobility may in itself be attributed to this source). The third confirms Gottschalk and Moffitt's (1994) results about the transitory nature of earnings variability: cyclical effects, as proxied by the Maryland growth variable, are important.

Table 5 highlights the strong effect of the cyclical variable, suggesting that the middle class will grow during times of employment expansion at the expense of both the high and low tails. The net effect of mobility is to increase risk: workers who change employers will in general end up in the upper or lower tail of the distribution rather than in the middle. Mobility across the borders of the industry, however, increases the odds that they will end up in the lower tail. We suggest that mobility to a different sector might often entail a loss of specific

[6]We define job creating and expanding employers by whether the employer had expanded or contracted employment by more than 10 percent over the previous two years. The results are insensitive to whether this threshold is set at 10 percent or 20 percent. An employer is defined to have died if no subsequent employment is reported (we use data until 96:1 for this definition); a new employer is defined in the same way. Size refers to the employment size.

[7]The regression model defines the probability of entering or exiting the tails against the full sample.

TABLE 4
WORKER LEVEL ESTIMATES OF TRANSITION PROBABILITIES

	Enter Low Tail	Exit High Tail	Exit Low Tail	Enter High Tail
Maryland growth rate	−0.00028	0.0014	0.00004	−0.0017
	(4.17)	(10.59)	(0.60)	(12.07)
Time	−0.002	0.003	−0.002	−0.032
	(3.45)	(2.15)	(3.08)	(25.00)
Time squared	0.000013	−0.0001	0.000011	0.00019
	(3.53)	(2.48)	(3.04)	(25.61)
Worker changed employers	0.0146	0.011	0.005	0.0144
	(6.55)	(2.63)	(2.27)	(3.17)
Worker changed employers and industry	0.057	0.012	0.0365	0.0065
	(44.35)	(5.03)	(28.45)	(2.47)
Current employer contracted more than 10% in previous year	−0.00178	−0.00140	0.0028	0.0138
	(5.75)	(2.38)	(9.00)	(21.86)
Current employer expanded more than 10% in previous year	0.0008	0.0044	0.0003	−0.004
	(2.31)	(6.96)	(1.03)	(5.81)
Employer in current quarter is a new firm	0.0056	0.00152	−0.0036	0.0063
	(2.46)	(.35)	(1.58)	(1.36)
Previous employer				
Previous employer contracted more than 10% in previous year	0.0002	0.0063	0.00023	0.0011
	(.78)	(10.85)	(1.74)	(1.79)
Previous employer expanded more than 10% in previous year	0.0012	0.0091	−0.0006	−0.010
	(3.51)	(14.08)	(1.75)	(15.00)
Worker left contracting employer	−0.0149	−0.0162	0.0237	0.0063
	(10.26)	(5.90)	(16.48)	(2.13)
Worker left expanding employer	−0.0199	−0.0194	0.0035	0.0050
	(12.95)	(6.66)	(2.30)	(1.59)
Worker left employer which shut down	0.0145	0.02008	0.0055	−0.0116
	(7.07)	(5.13)	(2.68)	(2.77)
Size of current employer	−0.001	0.0059	0.0003	−0.002
	(11.57)	(26.04)	(2.47)	(8.33)
R^2	0.21	0.20	0.22	0.21

Note: t–statistics in parentheses.

human capital. This highlights one of the difficulties with the dataset: namely that it is not possible to distinguish between voluntary and involuntary job shifts.

The critical question of the impact of job reallocation on the earnings distribution can also answered by analyzing this table. Job contracting or destroying employers seem to shed mostly jobs in the middle and at the lower tail of the earnings distribution. An expanding, job creating employer on the other hand creates mostly jobs at the middle and lower end of the earnings distribution. There is an interesting complementarity in the effects of job creation and job destruction on the earnings distribution. New employers seem to be even more active at the lower end of the earnings distribution. Workers who leave employers which are reallocating jobs (either contracting or expanding jobs) will on average move out of the lower tail of the earnings distribution and into the middle and higher classes. Through mobility workers seem to move to better matches. When mobility is involuntary however, as is presumably the case when the worker left an employer which shut down, the movement is predominantly out of the higher tail into lower ones.

The size of the job creation/destruction effect is not on the face of it very large: the order of magnitude for a particular worker of moving into or out of the tails of the distribution is less than 2 percent, when combined with mobility coefficients. However the impact on the earnings distribution can be quite large. Consider, for example, if for every 100 workers moving from job creating firms, 2 more move into high wage jobs and a further 2 more move out of low wage jobs—on a quarterly measure—this would certainly lead to substantial changes in the earnings distribution. Recall from Table 1 that roughly 13 percent of all jobs are high earnings jobs; 21 percent are low earnings, and that. Thus if these 100 were representative of the overall earnings distribution before, they would now number 15 high earnings workers and 19 low earnings workers.

TABLE 5

NET CHANGES IN THE PROBABILITY OF MOVING IN THE EARNINGS DISTRIBUTION

Variable	Net High Tail	Net Middle	Net Lower Tail
Maryland growth rate	−0.0031	0.0034	−0.00032
Time	−0.035	0.035	0.0
Time Squared	0.00029	−0.000292	0.000002
Worker changed employers	0.0034	−0.013	0.0096
Worker changed employers and industry	−0.0055	−0.015	0.0205
Current employer contracted more than 10% in previous year	0.0152	−0.0106	−0.0046
Current employer expanded more than 10% in previous year	−0.0084	0.0076	0.0008
Employer in current quarter is a new firm	0.0	−0.0056	0.0056
Previous employer			
Previous employer contracted more than 10% in previous year	−0.0063	0.0063	0.0
Previous employer expanded more than 10% in previous year	−0.0191	0.0179	0.0012
Worker left contracting employer	0.0225	0.0161	−0.0386
Worker left expanding employer	0.0194	0.004	−0.0234
Worker left employer which shut down	−0.0317	0.0226	0.009
Size of current employer	−0.0019	0.0032	−0.0013

V. EMPLOYERS AND THE TAILS OF THE DISTRIBUTION

We now focus on the employer as the unit of analysis, and analyze the determinants of the proportions of high and low earnings jobs.[8] Thus, while the preceding section tracked how workers move across the earnings distribution, this section focuses on how employers set the earnings distribution. This characterizes the experience of the average employer, rather than the average worker, which was the thrust of the previous analysis.

These results confirm those reported in Tables 4 and 5 before. In particular, the cyclical effect of Maryland growth results in an increase of the proportion of middle earnings jobs. The higher the proportion of new workers, the higher the proportion of both high and low earnings jobs. If the employer hires workers from a different industry, then those workers are more likely to go into the low

[8]We subset the data once more to only look at employers with more than 15 workers: this makes the analysis of proportions more sensible.

TABLE 6

CORRELATES OF THE PROPORTION OF HIGH EARNINGS AND LOW EARNINGS JOBS

	Proportion High Earnings	Proportion Low Earnings
Maryland growth Rate	−0.0004	−0.0002
	(0.52)	(0.53)
Time	−0.026	0.006
	(3.52)	(1.80)
Time squared	0.001	−0.00004
	(3.53)	(1.79)
Proportion of workers in firm who are new	0.0012	0.006
	(0.03)	(0.27)
Proportion of workers who come from different industry	−0.1098	0.072
	(3.39)	(4.62)
Employer destroyed jobs in previous period	0.0076	−0.002
	(2.83)	(1.66)
Employer created jobs in previous period	−0.006	0.0027
	(2.19)	(2.00)
$R2$	0.36	0.38

$n = 17,668$ (employers > 15 workers); fixed effects on 3-digit industry
Note: *t*-statistics in parentheses.

earnings portion of the employer's earnings distribution; less likely to be in the high earnings portion. These are quite substantial effects. These results are in accordance with what we found in the previous section on mobile workers experiencing the risk of ending up in one of the tails of the income distribution. The risk of ending up in the lower tail increases if the worker crosses industry borders.

The results on job reallocation remain similarly undisturbed: job destroying employers shed mostly low earnings jobs whereas expanding employers create low earnings jobs. Job destroyers increase the proportion of high earnings jobs by close to 1 percent, job creators reduce it by almost the same percentage.

VI. CONCLUSIONS

The focus of this paper was whether job creation and destruction at the employer level affected the earnings distribution. We addressed this by focusing on a fixed cohort of workers, and establishing that the earnings distribution (as measured by the tails of the distribution) did in fact change quite markedly, whether the worker or the employer was the unit of analysis. Although we present results on one state rather than the nation, the employment distribution, earnings and weeks worked in Maryland is not so different from the nation.

We confirmed earlier work that the cyclical behavior of the economy is very important. We also found that mobility is risky—mobile workers will in general end up in the upper or lower tail of the distribution rather than in the middle. However when they are mobile across the borders of the industry the odds are greater that they will end up in the lower tail. We suggest that mobility to a different sector might often entail a loss of specific human capital.

Most importantly we have found that job destroying employers shed jobs mostly from the middle and lower tails of the earnings distribution, at least for this fixed cohort of workers. Job creating employers, on the other hand, create

jobs mainly at the middle and lower end of the distribution. This stands in direct contrast to the popular press view, which was mentioned in the introduction. The action is not only in the upper tail of the income distribution but also in other areas of the income distribution. In other words, focusing on the job destruction side of the economy gives a very incomplete picture of the dynamics of the labor market, since job destruction and job creation occur simultaneously and affect the same regions of the earnings distribution. This complementarity in the effects of job creation and job destruction on the earnings distribution is a very interesting result. We suggest that it is very much influenced by a reallocation of labor in the middle and lower ranges from industry to the service sector.

Our central contribution is that we have established a link between job reallocation and the reallocation of workers into and out of the tails of the distribution. The fortunes of workers do, in fact, depend on the fortunes of their employers.

APPENDIX A

The data are derived from an archival file of the universe of quarterly employment and earnings records submitted by covered employers to the Unemployment Compensation Unit, within Maryland's Department of Economic and Employment Development. Employers who are required to comply with the state's unemployment compensation law include virtually all employers of one or more paid employees. The principal excluded employers are the Federal government, self-employed individuals, some small agricultural enterprises, and philanthropic and religious organizations. Employment of individuals who receive no salary at all, who are totally dependent upon commissions, and who work on an itinerant basis with no fixed location or home base is not reported by covered employers. Both single-establishment enterprises and multi-establishment entities are included. The precise unit of analysis is the *employing unit* as this is defined for businesses that are required to file a quarterly contribution and earnings report in compliance with The Unemployment Insurance Law of Maryland. More than ninety percent of the legal business entities in Maryland that are required to submit quarterly reports are single-establishment enterprises. Each quarter, covered employers report the social security number of every employee who worked during that quarter and received pay for these services. Employers who maintain more than one business location in the state are permitted to report all of their employees using a single reporting address. In such cases we cannot fully disaggregate the reported employment to individual work sites. While this masks internal flows among establishments within the employer, such internal flows are peripheral to our study. In contrast, non-reporting and erroneous reporting of individual employee's affiliation could have important effects on our estimates. Fortunately compliance is very high—as would be expected in any mandatory reporting situation that involves recurring and unpredictable access of the records for eligibility and payment determination purposes—since these administrative records are used in the day-to-day management of the state's unemployment compensation program. Finally, due to difficulties in complying with the quarterly timing of required submission, late reporting does occur. However, this does not affect the archival records because they are routinely updated to reflect such cases.

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These are confidential records. The identities of individual employers and employees cannot be revealed to the public.

APPENDIX B

TABLE B-1

EMPLOYMENT DISTRIBUTION BY INDUSTRY 1995
(in parentheses)

	Maryland	U.S.
Mining	0.05%	0.52%
Construction	5.83%	4.66%
Manufacturing	8.06%	16.72%
Wholesale trade	4.88%	5.53%
Retail trade	24.17%	19.12%
FIRE	5.89%	6.14%
Services	31.80%	29.89%
Government	19.31%	17.42%

Source: http://www.bls.gov

TABLE B-2

DIFFERENCES IN WORKER CHARACTERISTICS BETWEEN
MARYLAND AND THE US

	Maryland	US
Age	39.8	39.3
Annual Earnings	2844.9	2468.2
Weeks Worked Last Year	47.57	45.29
Weekly Earnings	911.34	865.37

Source: CPS data; Moffitt (1995).

TABLE B-3A:

PROPORTION OF HIGH EARNINGS JOBS BY INDUSTRY AND YEAR—CPS
(in percents)

	Manu-facturing	Transportation, Communication, Utilities	Wholesale	Retail	Finance Insurance, Real Estate	Services	Overall
1985	19	22	21	14	17	14	17
1988	22	26	23	14	21	17	20
1992	28	31	36	31	18	21	25

Source: CPS data; Moffitt (1995)

TABLE B-3b:

PROPORTION OF LOW EARNINGS JOBS BY INDUSTRY AND YEAR—CPS
(in percents)

	Manu-facturing	Transportation, Communication, Utilities	Wholesale	Retail	Finance Insurance, Real Estate	Services	Overall
1985	13	7	11	24	14	15	15
1988	9	4	8	20	9	12	11
1992	7	5	2	5	14	10	8

Source: CPS data; Moffitt (1995)

TABLE B–3:

EARNINGS INEQUALITY (90/10 RATIOS) OF WEEKLY EARNINGS BY INDUSTRY FROM THE CPS

	Manu-facturing	Transportation, Communication, Utilities	Wholesale	Retail	Finance Insurance, Real Estate	Services	Overall
1985	4.19	3.64	4.08	4.57	4.56	4.32	4.63
1988	4.40	3.60	4.41	4.74	5.00	4.52	4.58
1992	4.55	3.85	3.15	4.58	5.00	4.76	5.00

Source: CPS data; Moffitt (1995)

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