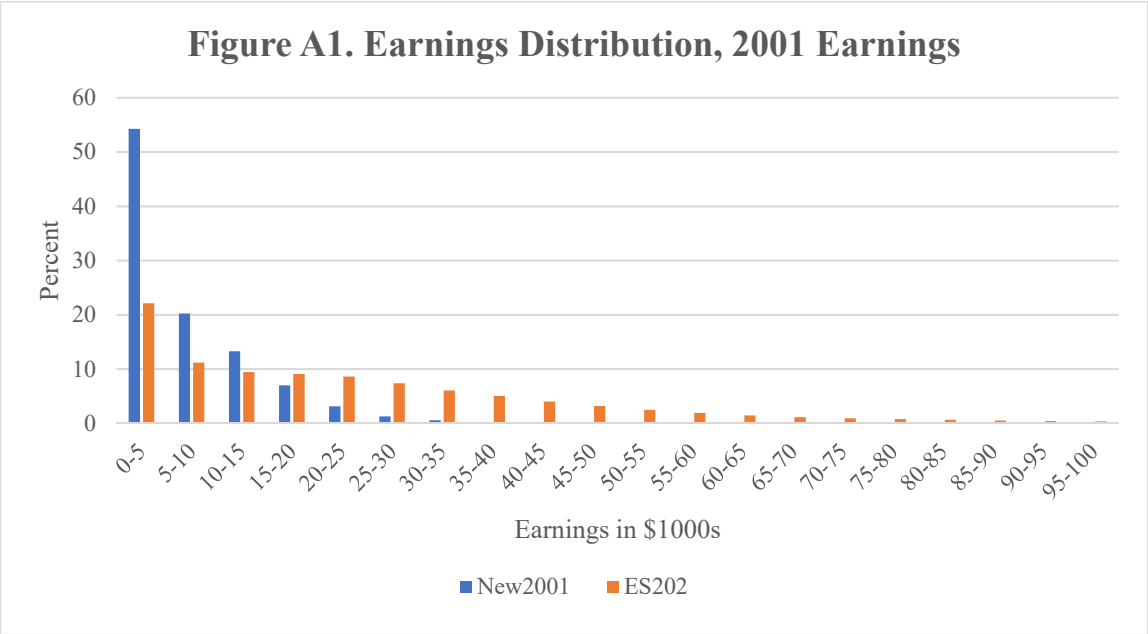
Appendices

Appendix A. Descriptive Figure and Table.



Note: earnings are in nominal terms.

Table A1. Descriptive Statistics

Sample Name	Exist2001	Exist2008	Difference
Sample size	139,892	249,489	
% White	27.98%	31.87%	-3.89***
% Female	81.16%	78.09%	3.07***
Mean Age	30.69	31.24	-0.55***
% Married	13.83%	14.84%	-1.00***
% with children	53.42%	46.04%	7.38***
Sample Name	New2001	New2008	Difference
Sample size	16,218	20,094	
% White	38.77%	37.19%	1.59***
% Female	70.95%	66.43%	4.52***
Mean Age	30.91	31.89	-0.98***
% Married	18.71%	16.51%	2.20***
% with children	40.65%	31.37%	9.29***
Sample Name	Exist2001	Exist2008M	Difference
Sample size	139,892	139,892	
% White	27.98%	27.93%	0.05
% Female	81.16%	81.08%	0.08
Mean Age	30.69	30.72%	-0.03
% Married	13.83%	14.00%	-0.17
% with children	53.42%	53.29%	0.13
Sample Name	New2001	New2008M	Difference
Sample size	16,218	16,218	
% White	38.77%	39.02%	-0.25
% Female	70.95%	71.48%	0.54
Mean Age	30.91	30.93	-0.02
% Married	18.71%	18.48%	0.23
% with children	40.66%	37.63%	3.03***

*** $p < 0.01$

Appendix B: Summary of Mobility Indices

In this Appendix, we provide the formula for and a brief explanation of each of the mobility indices we report. Bradbury (2016) provides a discussion of various income mobility measures; see also Fields (2010). Note that in what follows rank refers to the column or row in transition matrix.

The Average Movement index measures the average rank change, and is given by $\frac{1}{N}\sum_{i=1}^{N}|rank(y_{ib}) - rank(y_{ie})|$, where N is the number of individuals, y_i is earnings of individual i, and b and e denote beginning and ending period. This index is bound between zero, i.e., no mobility, and 10 for a 6x6 transition matrix. If everyone changed by one rank, the value of the index is one. The index is not the average of the change in rank for those who changes rank, and it does not reflect whether the rank change was more likely to be positive or negative.

Shorrocks' mobility index measures the size of the off-diagonal where each rank is represented equally rather than proportionally with respect to the size of each rank and is given by $\frac{k-\sum_{i=1}^{n} q_{ii}}{k-1}$, where k is the number of ranks and $q_{ii} = \frac{r_{ii}}{\sum_{j=1}^{k} r_{ij}}$. Observe that q_{ii} is the conditional probability of ending at rank i given beginning at rank i, while r_{ii} is the unconditional probability of beginning and ending at rank i. Since column counts are not equal in our setting, we calculate an adjusted index weighted group mobility, denoted WGM, which is given by

$$WGM = \sum_{i=1}^{k} \frac{1 - q_{ii}}{k(1 - c_i)}$$

where $c_i = \sum_{j=1}^{k} r_{ji}$, i.e., column total.

The Prais-Bibby Index is given by $1 - \sum_{i=1}^{n} r_{ii}$. This index measures the probability that an individual is not in the same rank at beginning and ending years. The index ranges from zero, the case where everyone is in the same rank in which they started, to one, the case where no one is the same rank in which they began.

The Origin-Specific Indices measure the share of the sample that moved from the top or from the bottom ranks by at least two ranks. For the transition matrices we construct, I_{OSTF} is the probability that an individual moves from the top rank to the 4rd rank or lower, and is given by

$I_{OSTF} = \sum_{j=1}^{k-2} q_{kj}$, while I_{OSBF} is the probability that an individual moves from the bottom rank to the 3rd rank or higher, and is given by $I_{OSBF} = \sum_{j=3}^{k} q_{1j}$.

Appendix C. Transition Matrices and Cell Bounds
Note that earnings are real earnings.

Table C1. Position Relative Transition Matrix, *New2001*, 2001-2007

		2007					
		1	2	3	4	5	6
2001	1	0.000	0.035	0.030	0.019	0.016	0.014
	2	0.097	0.027	0.018	0.016	0.011	0.008
	3	0.081	0.027	0.024	0.019	0.017	0.009
	4	0.063	0.021	0.026	0.028	0.021	0.017
	5	0.050	0.014	0.022	0.032	0.033	0.025
	6	0.042	0.009	0.013	0.019	0.034	0.060

2001 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,371.40	$4,374.48	$9,034.85	$15,366.40	$49,962.08

2007 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$2,977.86	$8,712.04	$15,414.08	$24,232.25	$133,475.60

Table C2. Position Relative Transition Matrix, *New2008*, 2008-2014

2008 \ 2014	1	2	3	4	5	6
1	0.000	0.038	0.030	0.024	0.020	0.018
2	0.102	0.023	0.020	0.013	0.009	0.006
3	0.086	0.023	0.023	0.019	0.014	0.008
4	0.072	0.020	0.022	0.024	0.021	0.015
5	0.059	0.013	0.021	0.029	0.030	0.022
6	0.049	0.009	0.011	0.017	0.033	0.057

2008 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,357.46	$4,158.85	$8,448.20	$14,793.26	$49,848.00

2014 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$3,481.26	$9,363.24	$15,623.30	$24,277.85	$274,092.90

Table C3. Position Relative Transition Matrix, *New2008M*, 2008-2014

		2014					
		1	2	3	4	5	6
2008	1	0.000	0.038	0.030	0.025	0.020	0.018
	2	0.099	0.025	0.021	0.014	0.010	0.006
	3	0.083	0.023	0.024	0.019	0.015	0.009
	4	0.069	0.021	0.022	0.025	0.022	0.015
	5	0.055	0.014	0.022	0.030	0.030	0.023
	6	0.047	0.009	0.010	0.017	0.033	0.058

2008 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,418.17	$4,254.45	$8,580.98	$14,921.27	$49,848.00

2014 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$3,536.83	$9,356.84	$15,530.05	$24,055.18	$122,116.40

Table C4. Dollar Relative Transition Matrix, *New2001*, 2001-2007

2001	2007 1	2	3	4	5	6
1	0.000	0.022	0.021	0.022	0.018	0.031
2	0.097	0.017	0.014	0.015	0.015	0.019
3	0.081	0.016	0.018	0.018	0.018	0.026
4	0.063	0.013	0.014	0.022	0.026	0.039
5	0.050	0.008	0.011	0.019	0.030	0.058
6	0.042	0.005	0.007	0.011	0.018	0.094

2001 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,371.40	$4,374.48	$9,034.85	$15,366.40	$49,963.08

2007 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,371.40	$4,374.48	$9,034.85	$15,366.40	$133,476.56

Table C5. Dollar Relative Transition Matrix, *New2008*, 2008-2014

		2014					
		1	2	3	4	5	6
2008	1	0.000	0.020	0.021	0.021	0.026	0.041
	2	0.102	0.013	0.013	0.014	0.015	0.017
	3	0.086	0.012	0.014	0.017	0.019	0.025
	4	0.072	0.011	0.012	0.016	0.025	0.039
	5	0.059	0.007	0.010	0.015	0.029	0.055
	6	0.049	0.004	0.006	0.008	0.016	0.093

2008 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,357.46	$4,158.85	$8,448.20	$14,793.26	$49,849.00

2014 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,357.46	$4,158.85	$8,448.20	$14,793.26	$274,093.90

Table C6. Dollar Relative Transition Matrix, *New2008M*, 2008-2014

2008 \ 2014	1	2	3	4	5	6
1	0.000	0.021	0.021	0.021	0.027	0.040
2	0.099	0.014	0.013	0.015	0.015	0.018
3	0.083	0.013	0.014	0.018	0.020	0.026
4	0.069	0.011	0.012	0.016	0.026	0.039
5	0.055	0.007	0.010	0.016	0.030	0.056
6	0.047	0.004	0.005	0.008	0.016	0.093

2008 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,362.58	$4,185.78	$8,470.50	$14,810.37	$49,849.00

2014 Upper Bounds

0%	20%	40%	60%	80%	100%
$0.00	$1,362.58	$4,185.78	$8,470.50	$14,810.37	$122,117.40

Appendix D. Simulations

To explore the effect that greater unemployment has on mobility, we conducted a simple simulation. We took the distribution of earnings of new SNAP recipients in 2001; we deleted any observation with earnings less than $1000. Refer to these data as *EARNA*. Using a truncated normal distribution, we randomly assigned percentage changes in earnings. The percentage changes ranged from 254.0 percent to –20.6 percent, with an average percentage change of 2.69 percent, which is close to the change in earnings per worker using data from the Bureau of Economic Analysis. Refer to these data as *EARNA'*.

We consider two unemployment scenarios. Using annual unemployment claims data, we calculated the percentage of workers who were unemployed at some point during 2000 and 2010;

10.77 percent in 2000 and 26.50 percent in 2010. We randomly assigned worker to the unemployed status. The distribution of the duration of unemployment across five categories of weeks is available from BLS; durations are longer for 2010 than 2000. Using the distributions for 2000 and 2010, we fitted regression to obtains the distribution by week for 52 weeks. We randomly assigned these weeks to those who were assigned as being unemployed. We reduce *EARNA'* by the fraction of the year the employee was unemployed for each of the two unemployment scenarios. Refer to resulting earnings as *EARNB* and *EARNC* for the 2000 and 2010 unemployment conditions, respectively.

We calculated the WGM index for the two pairs of earnings, *EARNA* and *EARNB*, and *EARNA* and *EARNC*. The dollar-relative WGM index for *EARNA-EARNB* is 0.592 and for *EARNA-EARNC* is 0.710. Not unexpectedly our simple simulation implies that greater unemployment results in greater mobility. Note that the simulations are not meant to reflect the real world, although the calculations are based on data that does attempt to match the real world. Note that the values of the indices are much smaller than those in Table 1.

We also calculated the dollar-absolute mobility indices. The difference in values is much smaller, namely 0.585 and 0.634 for the WGM index for the two unemployment scenarios.