

Appendix

A.1 Methodology for Estimating the National Rate of Establishment Mobility within Firms

In this appendix, we provide a more complete description of how we construct our estimate of the overall share of U.S. workers who switch establishments within the same firm each year.

Because we find marked heterogeneity in SEIN mobility rates by firm size category, we use as our starting point the predicted values from the version of our SEIN mobility regression reported in Table 9 that features separate distance bin profiles by out-of-SEIN employment bin:

$$\begin{aligned} SEIN\ Transition_{it}^p &= Size\ Cat_{SEINt}^{SN} \times BEM\ Access_{SEINt}^{X-SN} \kappa \\ &\quad + Size\ Cat_{SEINt}^{SN} \times BEM\ Access_{SEINt}^{In-SN} \psi \\ &\quad + X_{it}\chi + X_{et}\eta + \rho_{ft}^F + \rho_{ct}^C + \rho_{nst}^N + \varsigma_{it} \end{aligned} \quad (3)$$

These naive predicted values contain four sources of mismeasurement when used to capture predicted rates of all between-establishment mobility (not just between-SEIN mobility). First, we adjust our exposure measures for the SEIN mobility outcome, $BEM\ Access_{SEINt}^{X-SN}$, so that they capture shares of the firm's employment in any other establishments besides the worker's own that fell into each distance bin, including those within the worker's SEIN. This step assumes that the parameters κ that govern the relationship between SEIN mobility rates and out-of-SEIN employment shares by distance bin also correctly capture the corresponding relationship between establishment mobility rates and firm-wide employment shares by distance bin.

Second, we replace the indicators for the size category of employment at other SEINs that interact with the distance bin shares, $Size\ Cat_{SEINt}^{SN}$ with corresponding size category indicators for employment among all the firm's other establishments (with the same category cutoffs), so as to capture the relevant measure of the scale of establishment transition opportunities within the firm. These swaps assume that the heterogeneity in sensitivity of SEIN mobility to the distance distribution across different out-of-SEIN size classes captured in the original regression translates to the relationship between any establishment mobility and out-of-establishment size classes.

Third, the components of the naive predicted values contributed by the other control variables also have a mean that is scaled to fit observed SEIN mobility rates rather than overall establishment mobility rates. To estimate an appropriate re-scaling of these components, we isolate this predicted value component from the component related to distance bin shares of employment:

$$\hat{Y}_{it}^{controls} = X_{it}\hat{\chi} + X'_{et}\hat{\eta} + \hat{\rho}_{ft}^F + \hat{\rho}_{ct}^C + \hat{\rho}_{nst}^N$$

We then run an auxiliary regression of $\hat{Y}_{it}^{controls}$ on the same set controls except for the firm-year fixed effects, which we replace with indicators for categories of both within-SEIN and out-of-SEIN employment, $Size\ Cat_{SEIN,t}^{X-SN}$ and $Size\ Cat_{SEIN,t}^{In-SN}$:

$$\begin{aligned} \hat{Y}_{it}^{controls} = & Size\ Cat_{SEIN,t}^{X-SN}\phi^{X-SN} + Size\ Cat_{SEIN,t}^{In-SN}\phi^{In-SN} + X'_{et}\tilde{\eta} \\ & + \tilde{\rho}_{ct}^C + \tilde{\rho}_{nst}^N + v_{it} \end{aligned} \quad (4)$$

These estimates capture the (conditional) relationship between firm scale and SEIN mobility that was previously absorbed by the firm-year fixed effects. As before, we replace the out-of-SEIN employment categories with out-of-establishment employment categories, and impose that the coefficients capturing the relationship between SEIN mobility and out-of-SEIN employment also apply to the relationship between establishment mobility and out-of-establishment employment. We also set to zero all of the within-SEIN employment indicators, since these captured the role of unobservable “outside options” for establishment mobility that are now reflected in the out-of-establishment size categories. We then add the change in the auxiliary regression’s predicted values created by these adjustments, $(Size\ Cat_{et}^{X-Estab} - Size\ Cat_{SEIN,t}^{X-SN})\hat{\phi}^{X-SN} - Size\ Cat_{SEIN,t}^{In-SN}\hat{\phi}^{In-SN}$, to the predicted rate of establishment mobility for multi-SEIN workers.

Fourth, we use the same procedure to generate predicted establishment mobility rates for workers at multi-unit, single SEIN firms that were previously excluded from the regression sample, since we observe all variables needed to form their predicted values: distance bin employment shares, out-of-establishment size bins, and other worker, establishment, and location controls.

Finally, we add to these values an estimate of the rate of between SEIN transitions to out-of-sample states. Our goal is compute annual rates of within-firm establishment mobility among workers initially at multi-SEIN firms, $P(Estab.\ trans.|Multi-SEIN)$, among those at multi-establishment

firms, $P(\text{Estab. trans.}|\text{Multi-unit})$, and among all initially employed workers $P(\text{Estab. trans.}|\text{Employed})$.

We start by decomposing $P(\text{Estab. trans.}|\text{Multi-SEIN})$ using the law of total probability:

$$\begin{aligned}
 P(\text{Estab. trans.}|\text{Multi-SEIN}) = & \\
 & P(\text{Estab. trans.}|\text{In sample, Multi-SEIN}) * P(\text{In sample}|\text{Multi-SEIN}) \\
 & + P(\text{Estab. trans.}|\text{Out of sample, Multi-SEIN}) * P(\text{Out of sample}|\text{Multi-SEIN}) \quad (5)
 \end{aligned}$$

The four steps above generate an estimate of $P(\text{Estab. trans.}|\text{In sample, Multi-SEIN})$, the annual within-firm establishment transition rate among workers from multi-SEIN firms whose origin and destination establishments (regardless of firm) are within our sample states.

Next, we use the fact that the LEHD reports an indicator for whether a worker is employed in some U.S. state even if that state does not grant data access to our project. This allows us to estimate the share of all workers in multi-SEIN firms originating in our sample states whose destination establishment is inside (or outside) of our sample states, $P(\text{In sample}|\text{Multi-SEIN})$ and $P(\text{Out of sample}|\text{Multi-SEIN})$.

To estimate $P(\text{Estab. trans.}|\text{Out of sample, Multi-SEIN})$, we assume that the share job transitions that are within-firm is the same for transitions to out-of-sample states as for transitions to other in-sample states: $P(\text{Estab. trans.}|\text{Out of sample, Multi-SEIN}) \approx P(\text{Estab. trans.}|\text{Change state, In sample, Multi-SEIN})$. Since any within-firm transition across states requires a SEIN change, we can correctly measure the latter share. Combining the terms in equation 5 generates our estimate of the rate of establishment transitions among multi-SEIN workers. To compute the analogous rate among workers at multi-unit firms, we replace ‘‘Multi-SEIN’’ with ‘‘Multi-Unit’’ in 5, and use the fact that $P(\text{Estab. trans.}|\text{Out of sample, Multi-unit}) = P(\text{Estab. trans.}|\text{Out of sample, Multi-SEIN}) * P(\text{Multi-SEIN}|\text{Multi-unit})$ under the assumption that firms that operate only a single SEIN within our sample do not operate any SEINs in states outside our sample. To compute the rate of establishment mobility among all initially employed workers, we use the fact that $P(\text{Estab. trans.}|\text{Employed}) = P(\text{Estab. trans.}|\text{Multi-unit}) * P(\text{Multi-unit}|\text{Employed})$.

Finally, because within-firm establishment transition rates vary so strongly by firm size category, we perform the same set of adjustments separately by initial size category.

A.2 Tables

Table A.1: Determinants of the Number of State Employer Identification Numbers (SEINs) Operated by a Firm

Log(# of SEINs)	
Firm Size	Industry
Log(# of Estabs)	Mining
0.505‡ (0.041)	-0.252‡ (0.04)
Employees: 1-100	Construction
–	-0.174‡ (0.024)
Employees: 101-500	Manufacturing
-0.022 (0.024)	0.230‡ (0.027)
Employees: 501-1K	Trade & Transport
0.158+ (0.055)	-0.362‡ (0.062)
Employees: 1K-5K	Information
0.481‡ (0.089)	0.230+ (0.083)
Employees: >5K	Prof. Business Serv.
0.739‡ (0.118)	–
	Finance and Real Estate
	-0.192+ (0.062)
	Education and Health
	-0.649‡ (0.118)
	Leisure and Hospitality
	-0.234‡ (0.046)
	Other Services
	-0.203‡ (0.021)
Firm Average Pay	
Q1	–
Q2	0.032 (0.034)
Q3	0.180‡ (0.026)
Q4	0.199° (0.079)
Q5	0.417‡ (0.027)
Controls	
Demographics	X
State FE	X
Multi-Unit	X
Obs.	34.4M
R-squared	0.849

LEHD 2014 snapshot.

Notes: Each entry in this table provides the coefficient and standard error (in parenthesis) associated with the variable in the row label from a regression that predicts the logarithm of the number of SEINs operated by a worker's firm. All worker observations using our baseline sample. See Table 2 for a more complete description of the characteristic categories referred to by the row labels. ‡, †, and ° denote statistical significance at the 1%, 5%, and 10% levels.