

Labor Mobility: First Lecture

LABOR ECONOMICS (ECON 385)

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Introduction

- From studying the preceding chapters, you might get a deterministic impression of labor markets.
 - People are born with preferences; they form ability by the end of childhood (the fraction that is not endowed by genes); they acquire schooling to suit those preferences and ability; then they are hired by a firm to do a job befitting of their credentials and preferences.
 - Eventually they retire (implied even though we did not discuss in class).
- Several observable features of labor markets have, so far, not been included in this discussion.
 - Employees change jobs because of quits (employee-initiated separations) and layoffs (employer-initiated).
 - Making an employment match is not costless and involves search costs.
 - Sometimes search costs are prohibitively high and prevent willing applicants from finding a job.

New behavior we can explain

- These features are necessary if one is to model concepts such as:
 - Job Turnover,*
 - Frictional Unemployment,
 - Structural Unemployment, and
 - Skill Mismatch.

*The first economist to study turnover according to this framework was Boyan Jovanovic (NYU), and it was one of the first things he studied in his career. His papers laid the foundation for most contemporary research on the subject of turnover and matching:

Jovanovic, Boyan. 1979. "Job Matching and the Theory of Turnover." *Journal of Political Economy*, Vol. 87, No. 5: 972-990.

Jovanovic, Boyan. 1979. "Firm-specific Capital and Turnover." *Journal of Political Economy*, Vol. 87, No. 6: 1246-1260.

Jovanovic, Boyan. 1984. "Matching, Turnover, and Unemployment." *Journal of Political Economy*, Vol. 92, No. 1: 108-122.

Some stylized facts about job turnover, e.g., hazard rate by age and over time

- The probability of turnover decreases with experience.

Royalty, Anne B. "Job-to-Job and Job-to-Nonemployment Turnover by Gender and Education Level." 1998. *Journal of Labor Economics*, Vol. 16, No. 2: 392-433.

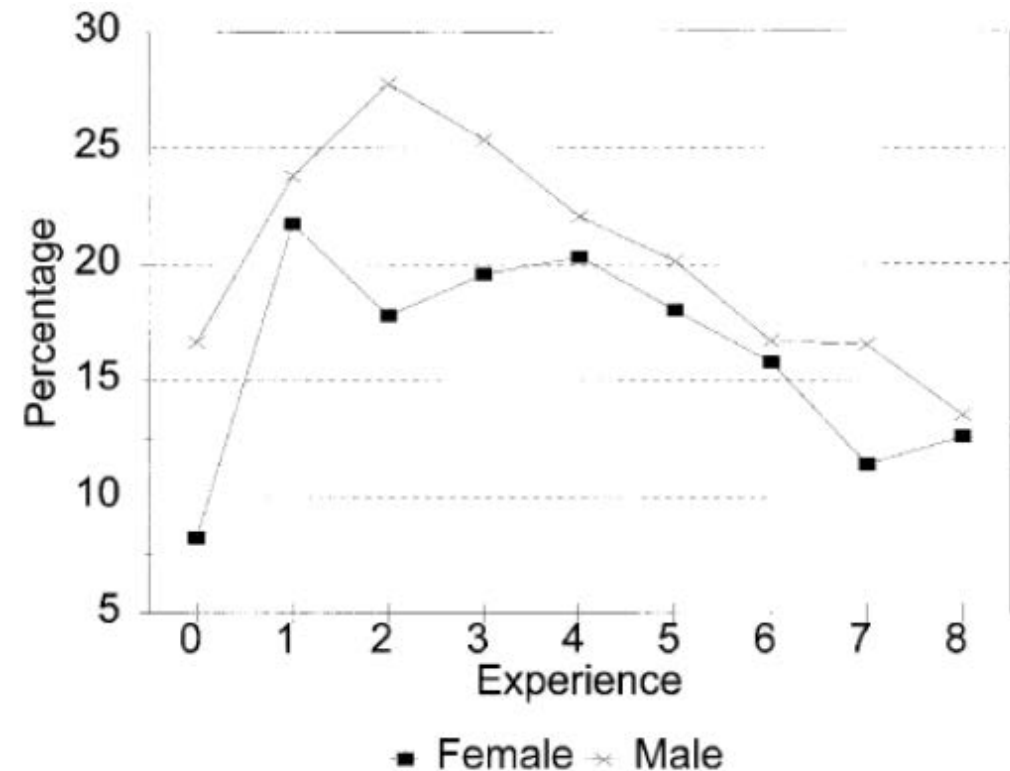


FIG. 1.—Average annual job-to-job turnover by experience

Figure 1: From Royalty (1998), page 400.

Stylized facts about job turnover, continued

- The probability of turnover decreases with tenure at a specific job.

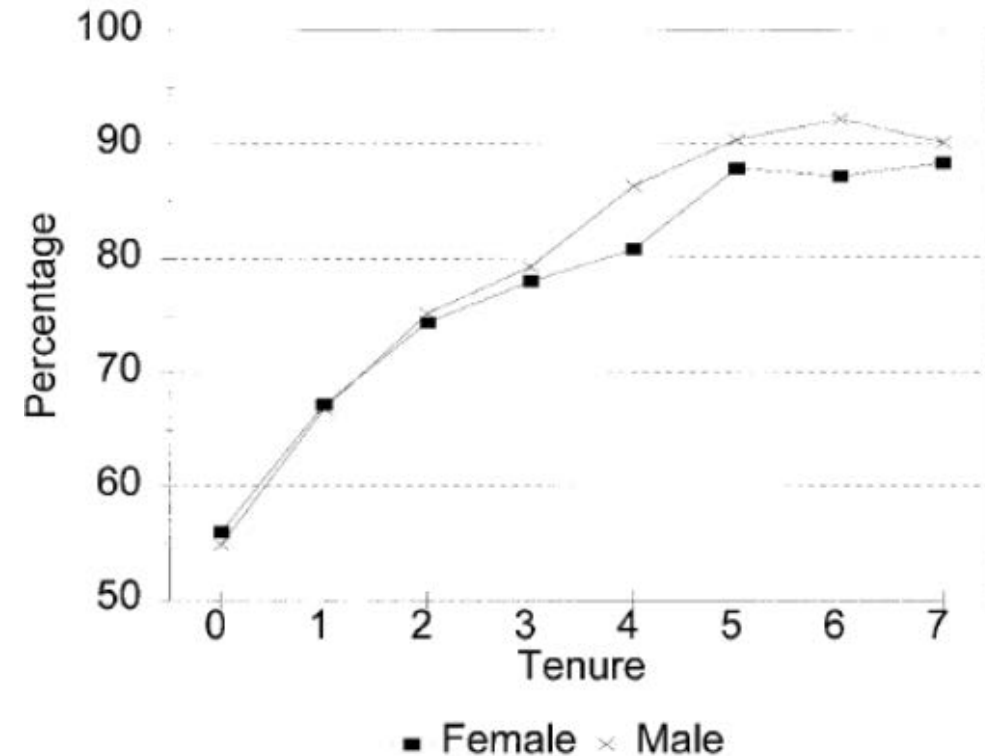


FIG. 3.—Average annual probability of staying on the job by tenure

Figure 2: From Royalty (1998), page 402.

Stylized facts about job turnover, continued

- Turnover probability increases with education.

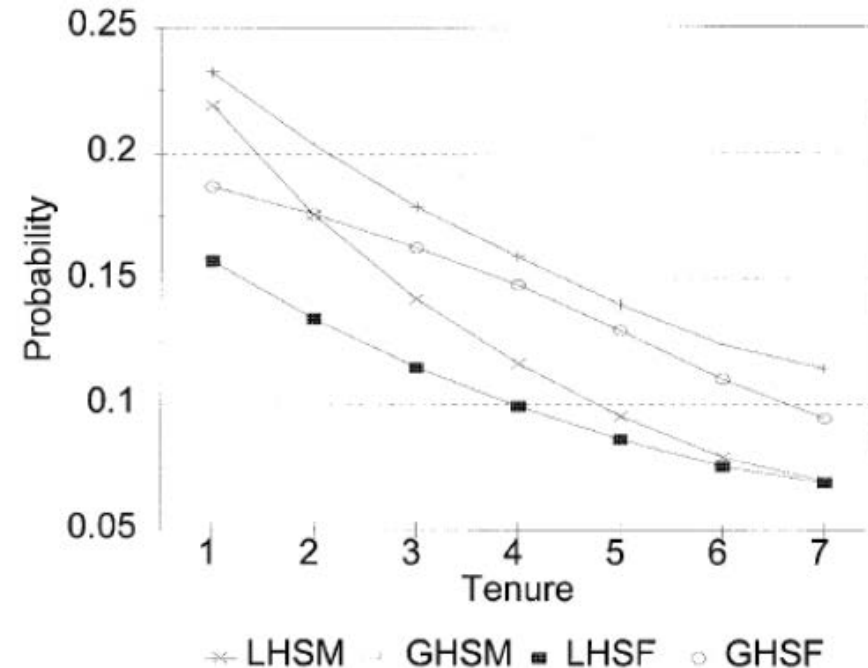


FIG. 8.—Job-to-job turnover by tenure and education level, multinomial probit annual estimates. Note: Predicted probabilities control for out-of-school status. Other variables are held constant at the mean for each sex-education group. LHSM and LHSF are males and females, respectively, with less than or equal to a high school education. GHSM and GHSF are males and females, respectively, with a greater than high school education.

Figure 3: From Royalty (1998), page 416.

Stylized facts about job turnover, continued

- Turnover at the macro level is measured using statistics produced from the JOLTS (job openings and labor turnover survey).
 - It tracks the aggregate number of separations (quits and layoffs) in the labor market over time.

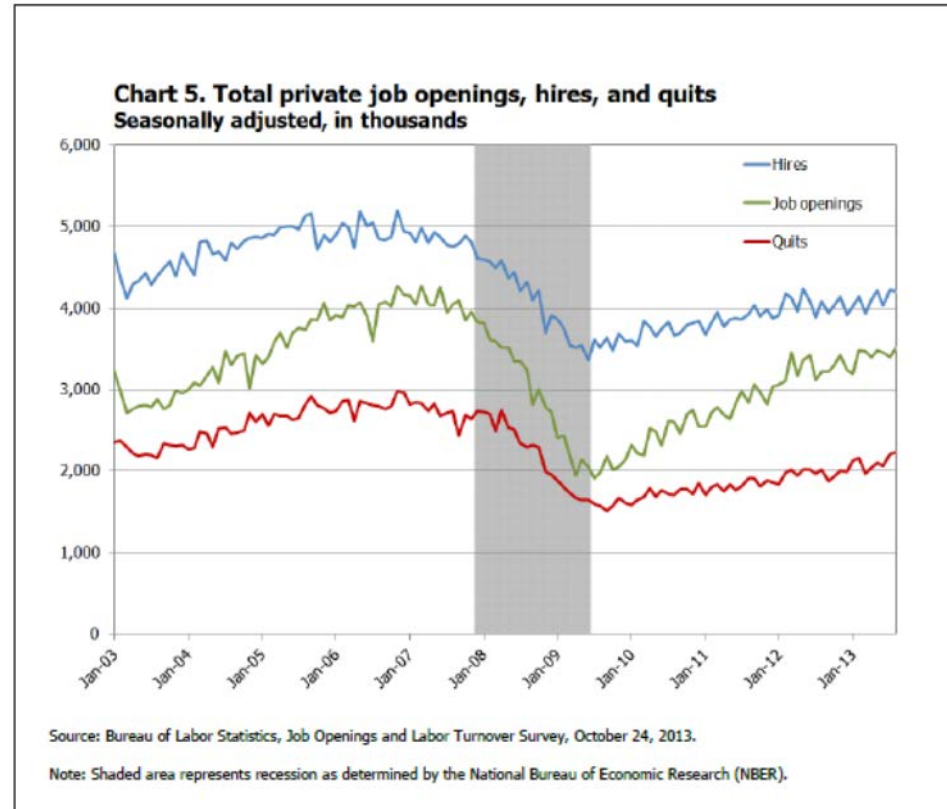


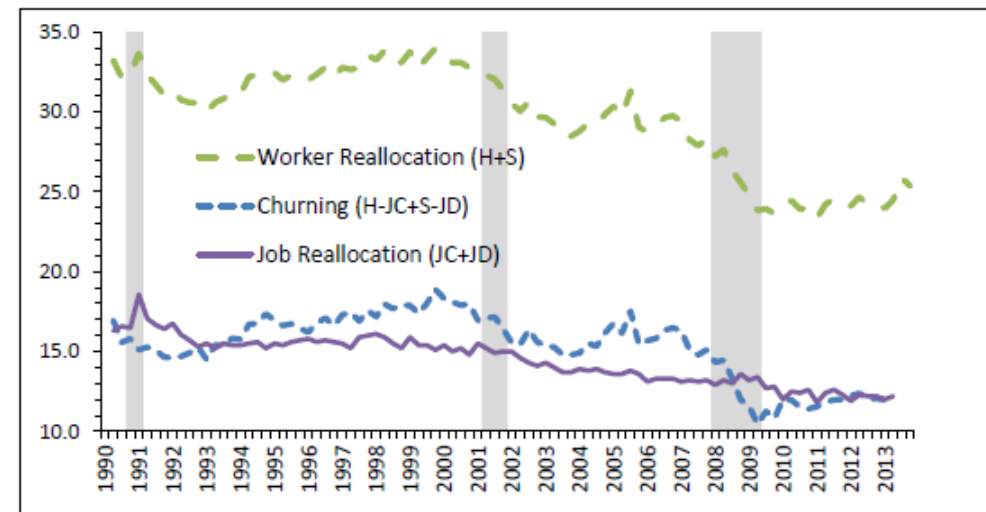
Figure 4: From <http://www.bls.gov/jlt/news.htm>.

Stylized facts about job turnover, continued

Churn, the movement of workers from one job to another (on average better) job, is pro-cyclical.

- It declined disastrously during the most recent recession.

Figure 2: Quarterly Rates of Job Reallocation, Worker Reallocation and Churning for the U.S. Nonfarm Private Sector, 1990Q2 to 2013Q4



Notes to Figure 2:

1. See notes to Figure 1.
2. Job Reallocation (JC+JD) is the sum of quarterly job creation and destruction rates in the BED. Worker Reallocation (H+S) is the sum of the quarterly rates of hires and separations in the reweighted JOLTS data, inclusive of retirements and other separations not shown separately in Figure 1. Churning (H-JC+S-JD) is the excess of worker reallocation over job reallocation.

From Davis and Haltiwanger (2014) [NBER Working Paper](#): "Labor Market Fluidity and Economic performance."

Stylized facts about job turnover, concluded

- As one might imagine, the numbers of quits, hires, and openings all decrease during periods of recession and contraction.
- The relative probability of a layoff (compared to a quit) is higher during recessions.

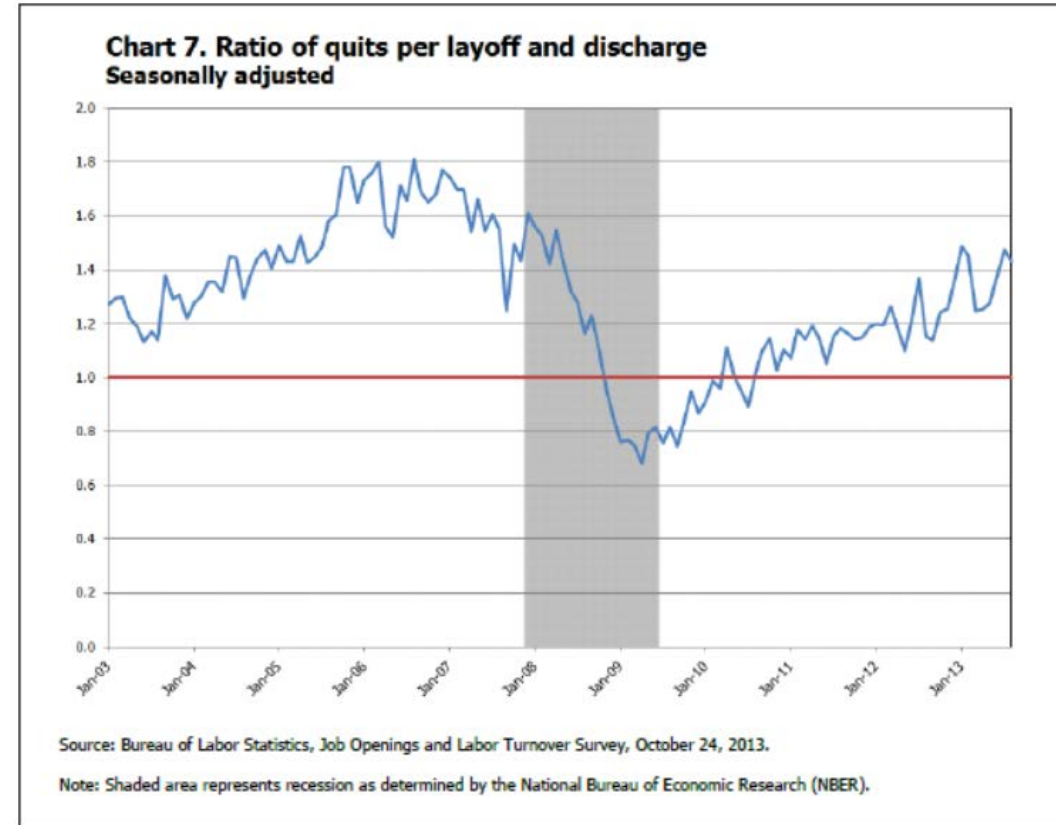


Figure 5: From <http://www.bls.gov/jlt/news.htm>.

Geographical mobility, stylized facts

Who moves?

- The young,
- Non-homeowners,
- The college-educated.

They've all been slowing down over time, though.

Table 1: Population Shares and Migration Rates by Selected Demographic and Socioeconomic Group

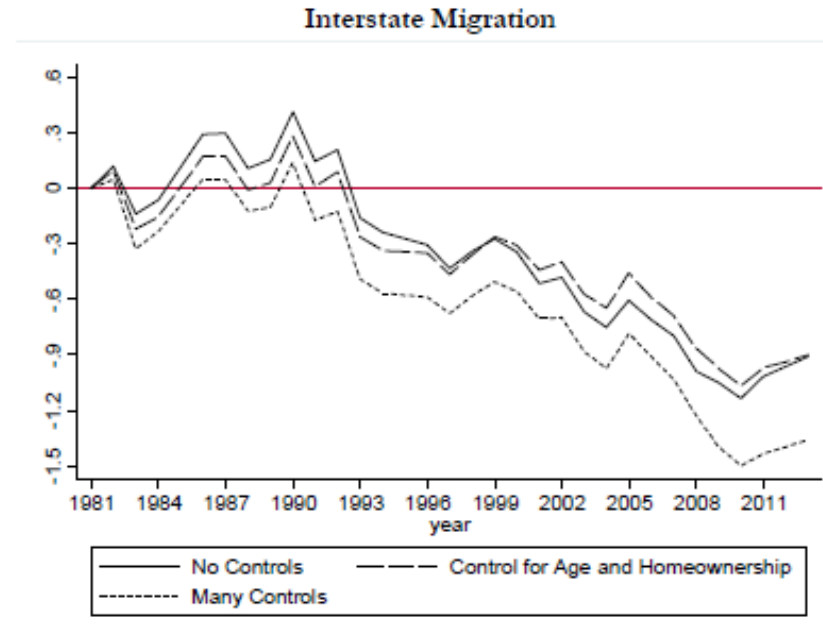
	Population Share		Within County Migration Rate		Interstate Migration Rate	
	1981-89	2002-12	1981-89	2002-12	1981-89	2002-12
Age						
Age 20-24	12.2	9.4	22.2	19.1	5.7	3.3
Age 25-34	25.0	18.6	16.8	15.2	4.3	3.0
Age 35-44	19.3	22.7	8.7	6.6	2.6	1.5
Age 45-54	27.5	34.8	4.6	3.8	1.5	0.9
Age 55+	16.5	14.9	2.8	2.2	0.9	0.6
Homeownership						
Renter	29.6	27.4	22.3	16.9	6.4	3.6
Homeowner	70.4	72.6	5.1	3.4	1.5	0.9
Educational attainment						
Less than high school	26.8	13.9	7.7	7.2	1.5	0.9
High school	38.1	30.6	8.3	6.3	2.2	1.1
Some college	16.3	26.5	9.9	6.4	3.1	1.5
College+	18.8	29.0	8.9	5.3	4.2	2.1

Note. Authors' calculations based on data from the March CPS. Sample includes all individuals age 20 and up that do not have imputed migration data. Educational attainment is only available for individuals age 25 and up.

From Molloy, Smith, and Wozniak (2014) [NBER Working Paper](#): "Declining Migration within the U.S.: the Role of the Labor Market."

Geographical mobility, stylized facts

See?



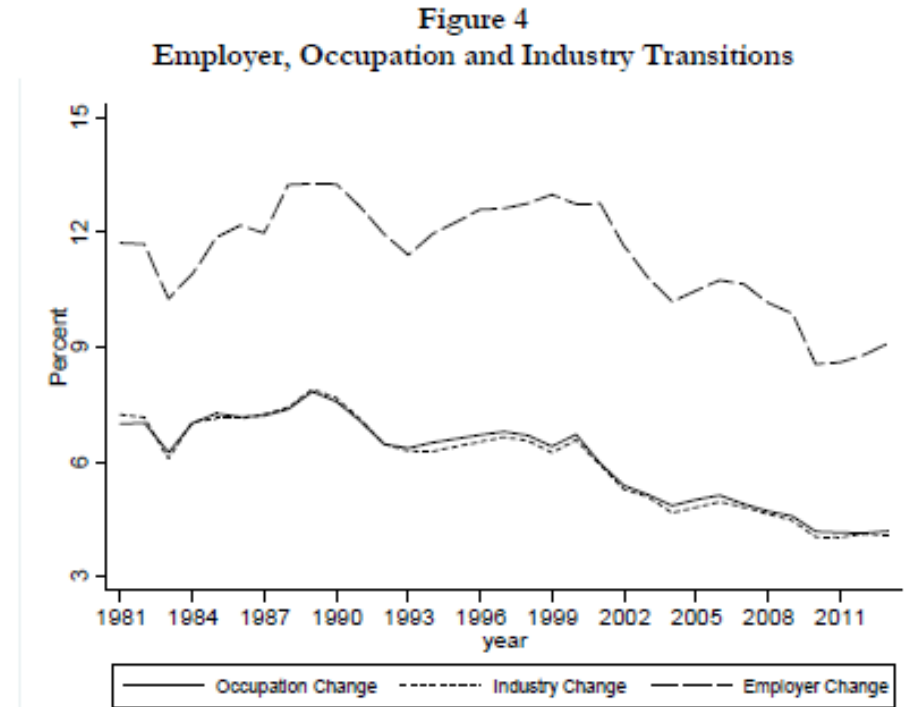
Note. Each line shows the coefficients of year indicators from regressing whether an individual moved on year indicators and other controls using the March CPS. All observations with imputed values of migration are excluded. Controls are age, homeownership, sex, education, race, marital status, presence of kids, presence of kids interacted with a divorce indicator, indicators for quintiles of the real income distribution, labor force status, self-employed status, Census region, and metropolitan status.

From Molloy, Smith, and Wozniak (2014) [NBER Working Paper](#): “Declining Migration within the U.S.: the Role of the Labor Market.”

Geographical mobility, stylized facts

We haven't been changing employers, occupations, or industries as much, either.

- This is true, even if you control for lots of the aforementioned demographic changes that could affect the probability of job change.



Note. Authors' calculations from the March CPS. All observations with imputed values of industry, occupation, or employer change are excluded. Occupations and industries are defined at the 3-digit level.

From Molloy, Smith, and Wozniak (2014) [NBER Working Paper](#): "Declining Migration within the U.S.: the Role of the Labor Market."

Comparative advantage, job match

The first thing that is necessary to account for turnover is that not all workers (even controlling for their schooling and human capital) have equal productivity on a given job. Nor does the same worker have identical productivity on all possible jobs.

- This is labor market differentiation taken to the extreme: each combination of worker and job has its own unique match quality, measured in, say, VMP_L .
- It may be useful to think of these differences in terms of a worker's comparative advantage.^{*} In the simple case that considers two workers and two jobs, where worker 1's output (per unit of time) in jobs 1 and 2 are respectively:

$$a_{11} \text{ and } a_{12},$$

and worker 2's output in each job is:

$$a_{21} \text{ and } a_{22}.$$

^{*}This analysis follows this paper: Sattinger, Michael. 1993. "Assignment Models of the Distribution of Earnings." *Journal of Economic Literature*, Vol. 31, No. 2: 831-880.

Comparative advantage, continued

- Worker 1 has a comparative advantage in job 1 if:

$$\frac{a_{11}}{a_{12}} > \frac{a_{21}}{a_{22}} \Leftrightarrow \frac{a_{11}}{a_{21}} > \frac{a_{12}}{a_{22}}$$

- Worker 2 has a comparative advantage in job 2, then, according to this inequality.
- When firms decide which worker to hire, they consider how to minimize the cost per unit of output when wages for each worker are:

w_1 and w_2 .

- This means that firm 1 will prefer worker 1 if:

$$\frac{a_{11}}{w_1} > \frac{a_{21}}{w_2} \Leftrightarrow \frac{a_{11}}{a_{21}} > \frac{w_1}{w_2}$$

and firm 2 will prefer worker 2 if:

$$\frac{w_1}{w_2} > \frac{a_{12}}{a_{22}}$$

Comparative advantage, concluded

- If comparative advantage obeys the inequality above, then,

$$\frac{a_{11}}{a_{21}} > \frac{w_1}{w_2} > \frac{a_{12}}{a_{22}} \Leftrightarrow \frac{a_{11}}{a_{12}} > \frac{w_1}{w_2} > \frac{a_{12}}{a_{22}}.$$

- If the ratio of wages does not satisfy this inequality, both firms prefer the same worker. Since that worker can only take one job, the wage ratio has to change (increase for the “sought after” worker) until one firm prefers the other guy.
- The equilibrium, here, features a wage ratio somewhere between the two workers’ ratios of outputs on the two jobs, and each worker is assigned to the job in which he has a comparative advantage.
- Comparative advantage, so far, implies that workers merely sort themselves into jobs in which they are relatively productive, compared to other workers. This sorting is efficient because you have all workers allocated to their most productive roles. But they sort *frictionlessly*—without any “testing the waters” that takes the form of taking a job, observing how good the match is, and (possibly) searching for a new one.

Matching

- To model turnover, we must assume that neither the worker nor the firm has perfect information about how productive the match will be prior to making it.
- This uncertainty—which is resolved only after the match is formed—leads to matches that are sub-optimal.
- Sub-optimal matches are dissolved in favor of more efficient ones, but the process takes time.
- This is the essential reason we observe quits and firings in the real labor market; firms and individuals are constantly searching for better matches.

Matching (continued)

- To make a simple formal model of this, say that when a given firm hires new workers, it draws from a pool of heterogeneous applicants. Applicants are identical except for their productivity on each job. Each applicant has a “comparative advantage” set that looks like this (if there are n jobs):

individual i has: $\{a_{1i}, a_{2i}, a_{3i} \dots a_{ni}\}$.

- But neither the firms nor the individual know the values of the “a” in the set. Employers do, however, know the distribution of a_1 in the population, $E(a_1)$. And employees know their overall ability (average of comparative advantage set), $E(a_i)$.

Matching, continued

- When a hire is made, the firm (1, for example) gets a random draw from this distribution. The worker performs the job for one period; both parties observe the output, a_{1i} . Then the worker is paid according to this output: $w(a_{1i})$.
 - Again for simplicity assume the fruits from the match are divided evenly between worker and firm such that:

$$w_{ij} = \pi_{ij} = \frac{a_{ij}}{2}$$

Matching, continued

- Firm profits (as well as workers' wages) are increasing in a_{ij} . Consequently both have incentives to seek out better matches. From the perspective of the firm, (expected) profits can be increased by firing worker i whenever:

$E(a_j) > a_{ij}$ (average in the population exceeds the current employee).

- Employees quitting will benefit them through higher (expected) wages whenever:

$E(a_i) > a_{ij}$ (average over all jobs exceeds the current employer).

Sorting

- When an inferior match of this kind is made, both parties have an incentive to search for a better one. This will lead to quits and firings in the labor market, and they will be examples of efficient turnover—as jobs and workers re-allocate themselves to their best matches.
- It should be pointed out that (except in extreme instances) a better match is not guaranteed when a quit or firing takes place. Just because the average job is a better match than the current one, doesn't mean you won't get a worse match next time! The basic sorting properties will still emerge as workers “try on” different jobs and ultimately stay with a match that is among the best possibilities.

Sorting, dramatized

Area Man Released After Being Wrongfully Employed For 9 Years

NEWS IN BRIEF · Workplace · Local · Jobs · Business · ISSUE 50-42 · Oct 22, 2014

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RICHMOND, VA—In response to mounting evidence showing that he never should have been in there in the first place, administrators at KDM Marketing officially released 34-year-old account manager Alex Olmstead today after nine years of being wrongfully employed. "After nearly a decade inside KDM's sales division with absolutely no justifiable cause, Alex has finally been let go," said coworker Jason Woodworth, adding that a vocal and passionate contingent of people familiar with Olmstead's situation have been advocating for his release on grounds that he had

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Quit Your Job

By Derek Thompson

My friends sometimes approach me with career anxieties, under the false impression that writing about economics makes somebody a good career advisor. My counsel is typically something like optimistic incrementalism. *Don't quit your job, mastery comes with time, job satisfaction comes with mastery...* that sort of stuff.

When the same friends ask my roommate, an entrepreneur building a financial services app, they're whiplashed with radical optimism. *Get the hell out of there! Quit if you have to! You'll be happier doing just about anything else!*

I never said it outright, but I assumed that my cautious approach was more responsible, even if it seldom proved more inspirational. But according to a [new study of youth unemployment](#) by economists Martin Gervais, Nir Jaimovich, Henry Siu, and Yaniv Yedid-Levi, my incrementalist advice, while appropriate for the worst periods of the Great Recession, isn't so great, overall.

Instead, there is what you might call a "dream-job premium." Jumping between jobs in your 20s, which strikes many people as wayward and noncommittal, improves the chance that you'll find more satisfying—and higher paying—work in your 30s and 40s.

"People who switch jobs more frequently early in their careers tend to have higher wages and incomes in their prime-working years," said Siu, a professor at the Vancouver School of Economics. "Job-hopping is actually correlated with higher incomes, because people have found better matches—their true calling."

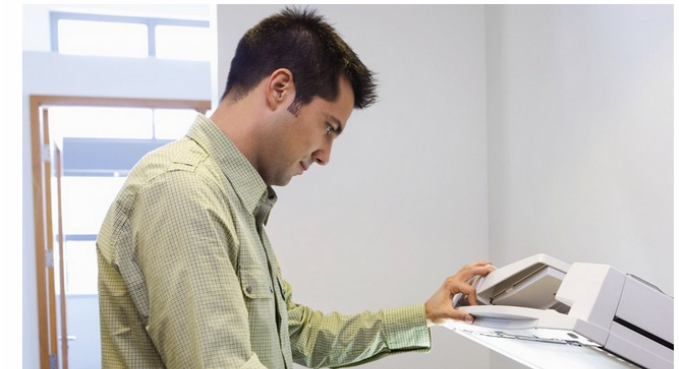
"True calling" is a messy term, since (a) job mastery, (b) job satisfaction, and (c) compensation don't always line up. There are talented yet miserable investment bankers (a and c, not b), talented and fulfilled public-school teachers (a and b, not c), and several shan't-be-named general managers of professional sports teams (b and c, not a). But overall, Siu said, adults who switch jobs multiple times are more likely to find a position in their prime-work years where they earn a higher wage and have a lower chance of quitting. (As always, causality is difficult to prove: Perhaps pro-active behavior leads to both higher wages and a greater likelihood of quitting.)

Young people are more likely to be unemployed. Siu's paper tries to understand why. Is it because they have a harder time finding work or because they're more likely to leave jobs? I always assumed that youth unemployment was higher because it was harder to find a job than keep one, and most people

New Employee Finally Around Long Enough To Be Deemed Incompetent

NEWS IN BRIEF · Coworkers · Work · News · Business · ISSUE 50-14 · Apr 8, 2014

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ST. LOUIS—More than a month into his employment at Archmont Insurance, colleagues of account manager Martin Wallace told reporters Tuesday they can now definitively state that the 30-year-old's constant errors and general carelessness on work projects is a product of sheer personal ineptitude and not a lack of experience. "At first I thought he was misfiling claims forms and botching PowerPoint slides because he was still learning the ropes around here, but at this point it seems pretty clear that he's actually an imbecile who's simply too dumb to understand what he's doing at all," colleague Diane Kendrick said after Wallace's fifth straight week of incorrectly calculating insurance quotes, screwing up Excel spreadsheets, and showing up to meetings having read the wrong documents. "I suppose there's a chance he's just a really slow learner

Sorting, continued

- A lot of this messiness can be cleaned up in the model by introducing some signaling. Surely some jobs are similar enough that match quality with a given worker will have some covariance. For example,

$Cov(a_{i,waiting\ tables}, a_{i,tending\ bar}) > 0$ because the jobs are similar, and

$Cov(a_{i,waiting\ tables}, a_{i,driving\ a\ semi}) < 0$ because the jobs are different.

- Experiences with prior jobs could make the individual more discerning about his future prospects and could enable him to avoid other bad matches. For example if he know he's not a very good waiter, he would likely not take the next job offer to become a bar tender. Formally he would consider whether:

$$E(a_{i,new\ job} | a_{ij}) > a_{ij}$$

when choosing to take new job.

Risk aversion

- One last thing that can get in the way of the beneficial effects of sorting is risk aversion. Even if there are better opportunities available to the risk averse employee, i.e., $E(a_{i,new\ job} | a_{ij}) > a_{ij}$, he may prefer the current (imperfect) match because he doesn't want to risk quitting for an even worse match. Risk aversion keeps workers in mediocre matches instead of motivating them to pursue more productive ones.
 - This is especially true in recessions like the 2008-2009 example. The amount of inter-firm labor turnover (called “churn”) since 2008 has severely dropped off since this recession, and this phenomenon—the reluctance to change jobs—held back the pace of expansion in the recovery.*

*The foremost expert on the subject of churn and turnover is Stephen Davis of the University of Chicago. Among the many high quality publications he has written on the subject, take the most recent as an example:

Davis, Stephen J., Jason Faberman and John Haltiwanger. “The Establishment-Level Behavior of Vacancies and Hiring.” 2013. *Quarterly Journal of Economics*, Vol. 128, No. 2: 581-622.

Consequences of sorting

- Sorting reinforces the effect of specific human capital (often measured as years of tenure) on wages and separation probability. When individuals are observed with different lengths of tenure, there is a “survivorship bias” among those with longer tenures. They would not have stayed that long, generally, unless the match proved to be at least somewhat good.
 - In addition to the causal effect of tenure, which operates through accumulation of human capital, the effect on wages and separation probability appears even larger because those with long tenures have revealed that their matches are of uncommonly high quality.*

*One of the most prominent authors on this subject is Robert Topel (also of University of Chicago). As a representation of his contributions consider reading:

Topel, Robert and M.P. Ward. 1992. “Job Mobility and the Careers of Young Men.” *Quarterly Journal of Economics*, Vol. 107, No. 2: 441-479.

Topel, Robert and George Neumann. 1991. “Employment Risk, Diversification, and Unemployment.” *Quarterly Journal of Economics*, Vol. 106, No. 4: 1341-1365.

Topel, Robert. 1991. “Specific Capital, Mobility, and Wages: Wages Rise with Job Seniority.” *Journal of Political Economy*, Vol. 99, No. 1: 145-176.