

Declining Business Dynamism and Labor Market Fluidity: Causes and Consequences

By

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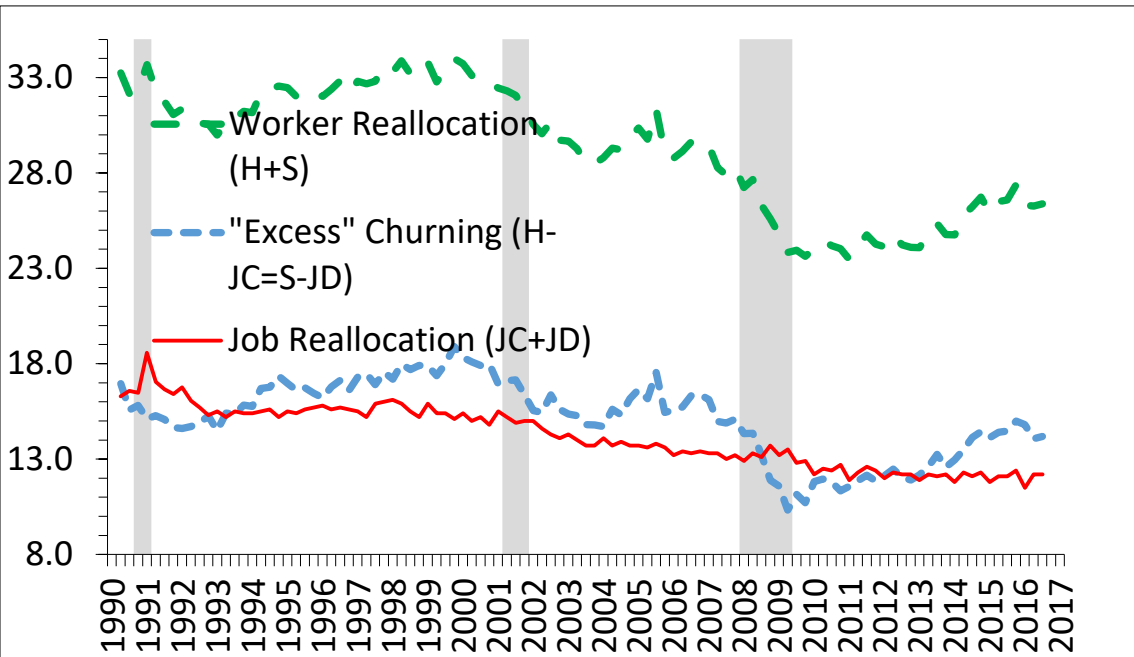
June 2017

(Without implication, this presentation draws heavily on joint work with Steven Davis, Ryan Decker, Jason Faberman, Lucia Foster, Cheryl Grim, Henry Hyatt, Ian Hathaway, Ron Jarmin, Lisa Kahn, Erika McEntarfer, Javier Miranda and Zoltan Wolf)

...One leading explanation for the strong U.S. productivity growth is that labor markets in the United States tend to be more flexible and competitive, market characteristics that have allowed the United States to realize greater economic benefits from new technologies. For example, taking full advantage of new information and communication technologies may require extensive reorganization of work practices, the reassignment and retraining of workers, and ultimately some reallocation of labor among firms and industries. Regulations that raise the costs of hiring and firing workers and that reduce employers' ability to change work assignments--like those that exist in a number of European countries--may make such changes more difficult to achieve.

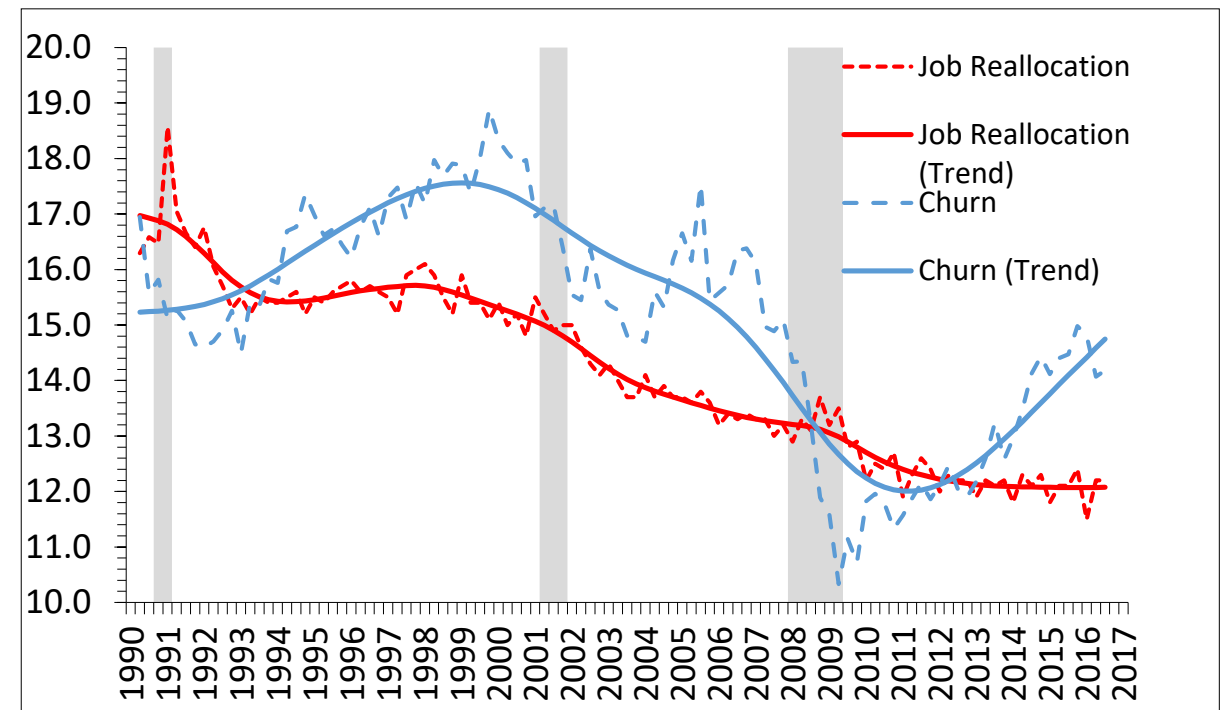
Remarks by Chairman Ben Bernanke on August 31, 2006 speech on "Productivity"

Quarterly Rates of Worker Reallocation, Job Reallocation & Churn, U.S. Nonfarm Private Sector



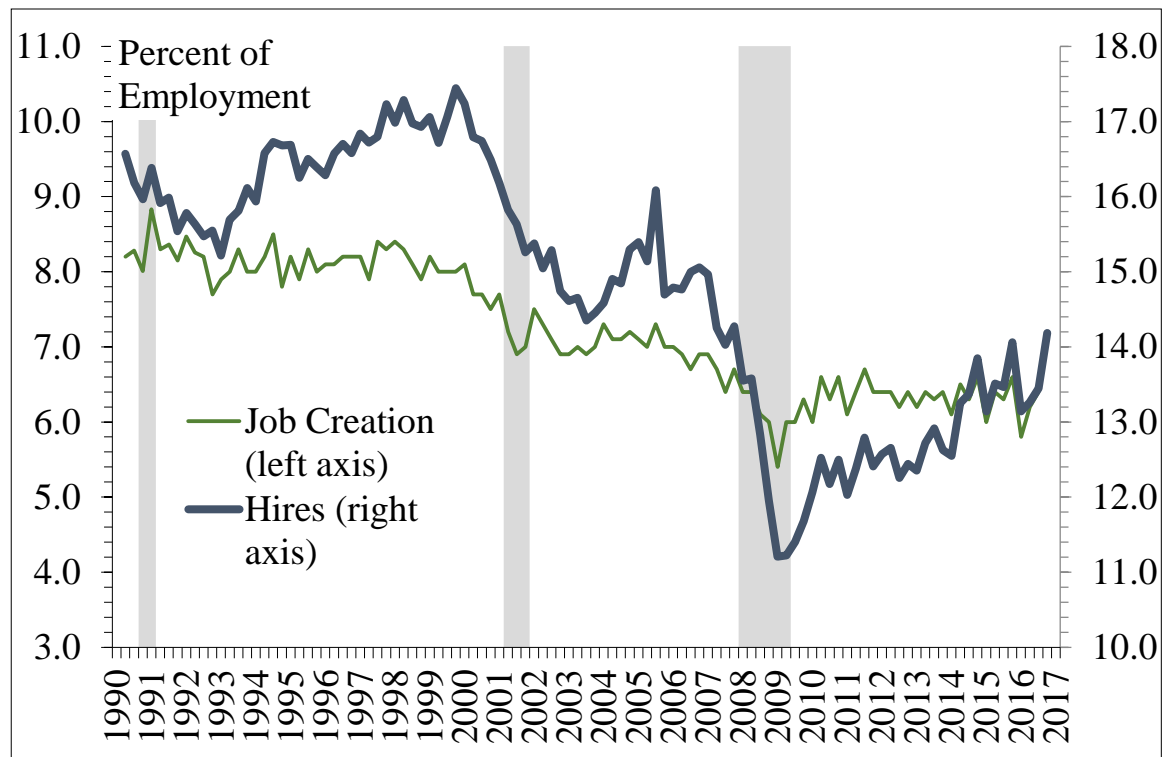
Source: Davis, Faberman and Haltiwanger (2012)
Methodology combining BED and JOLTS

Quarterly Rates of Job Reallocation and Churn Across Establishments, U.S. Nonfarm Private Sector



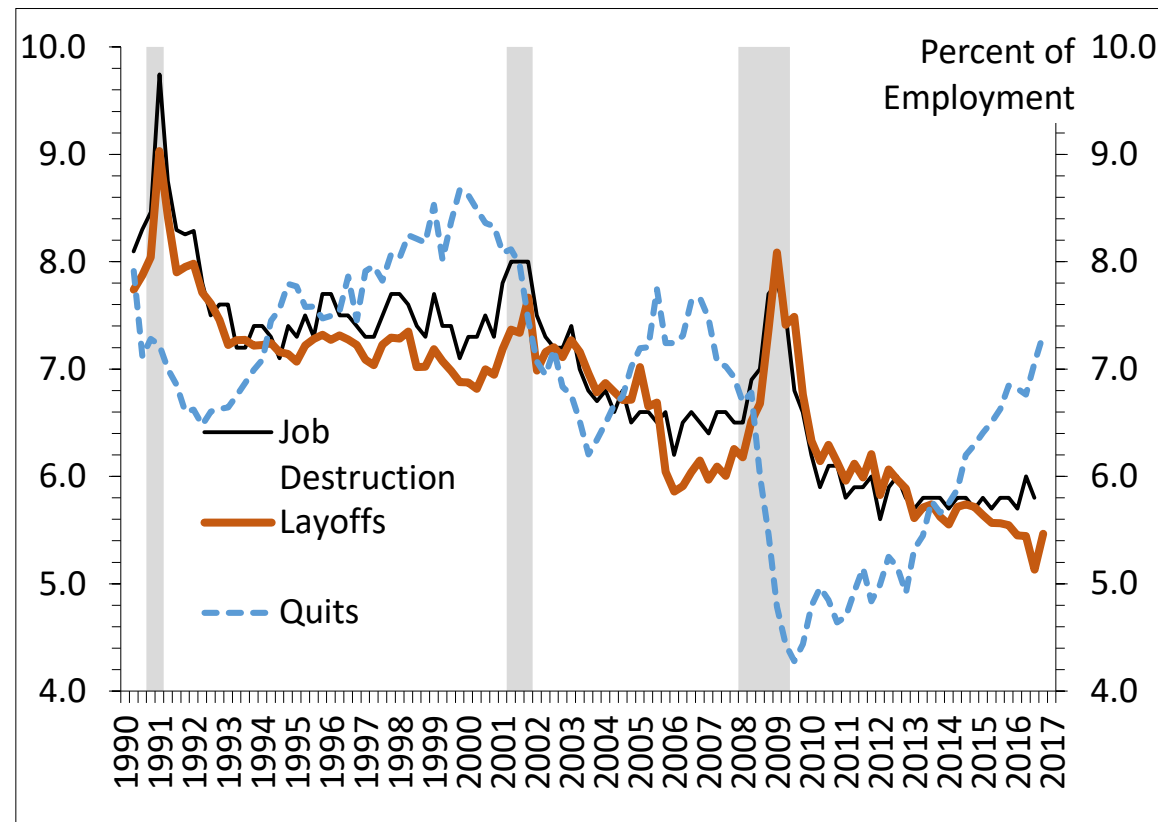
Worker Reallocation = **Job Reallocation** + **Churn**
 (Hires + Separations) (Creation + Destruction)

Quarterly Hiring and Job Creation, U.S. Nonfarm Private Sector



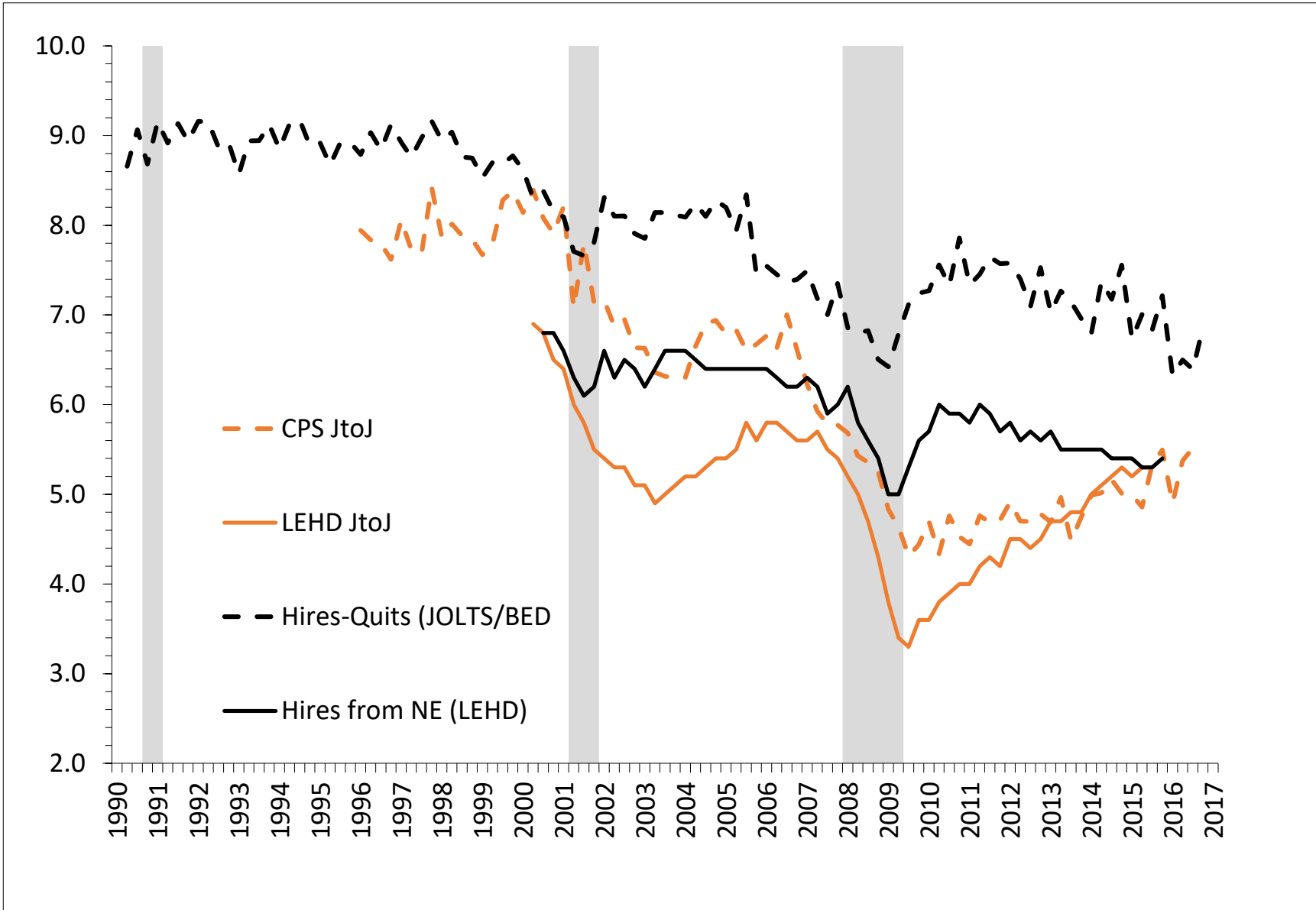
Source: Davis, Faberman and Haltiwanger (2012)
Methodology combining BED and JOLTS

Quarterly Separations, Layoffs, Quits and Job Destruction



Hiring more procyclical than job creation. Job destruction/layoffs strongly countercyclical. Quits strongly procyclical. All exhibit downward trend.

Job-to-Job Flows and Hires from Non-Employment have both declined



Job-to-Job Flows and Quits are highly correlated (0.96)

This suggests Hires-Quits is an approximation For Hires from Non-Employment (correlation between Hires From non-employment from LEHD and Hires-Quits is 0.83).

Job-to-Job Flows known to play a major role in earnings gains especially for young workers building their career.

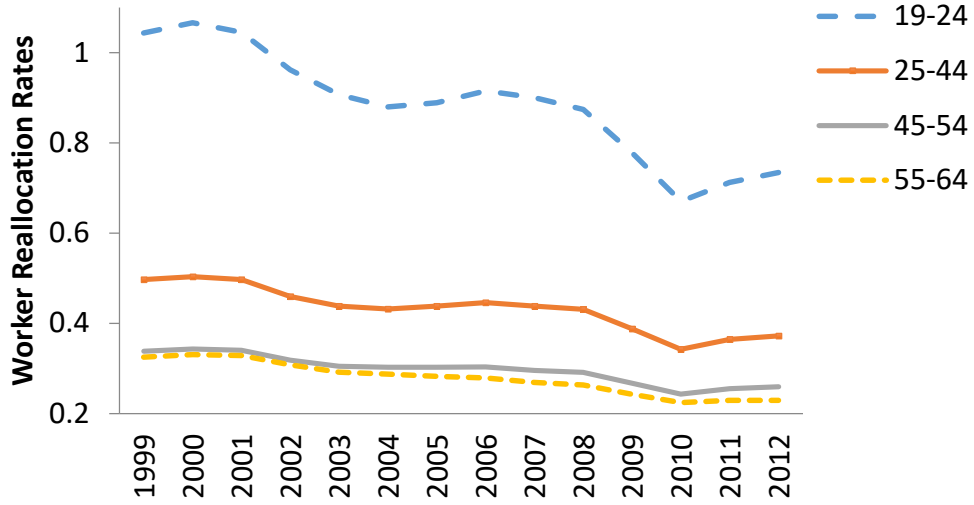
Earnings and productivity Implications considered below

The Aging of US Workers and Businesses

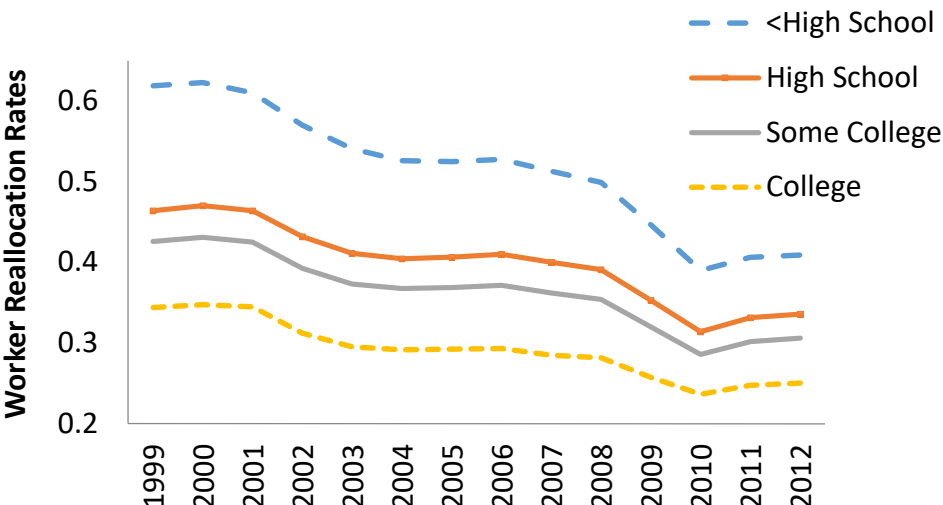
- Share of employment accounted for by workers less than 45 years old has fallen substantially (e.g., from around 75 percent in 1990 to 57 percent by 2015)
 - Younger workers exhibit much higher pace of job and worker reallocation
- Share of employment accounted for by firms less than 5 years old has risen substantially over this same period (e.g., from 18 percent in 1981 to 9 percent in 2014)
 - Younger businesses exhibit higher pace of job and worker reallocation
 - This change is associated with a decline in the pace of startups

Quarterly Worker Reallocation Rates by Gender, Age and Schooling Attainment

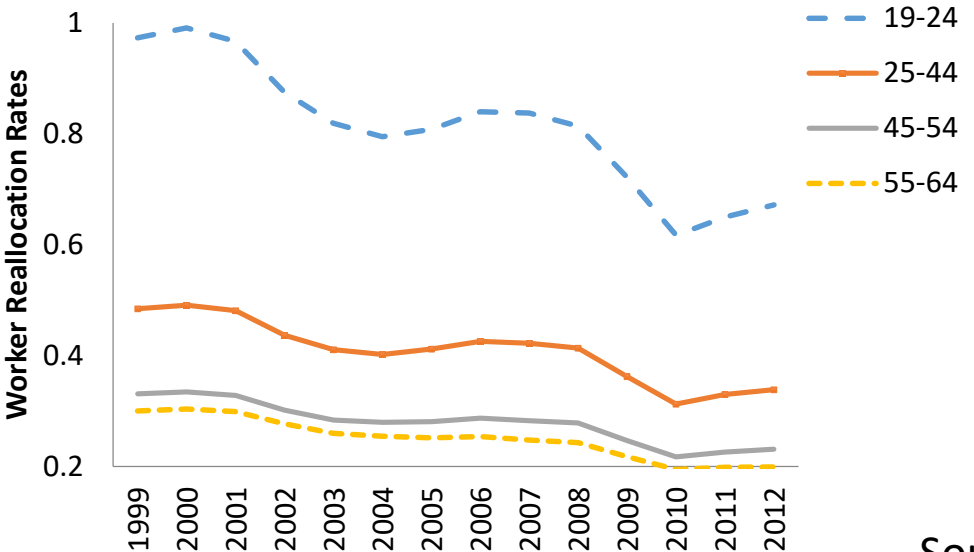
Worker Reallocation Rates by Age Groups, Males



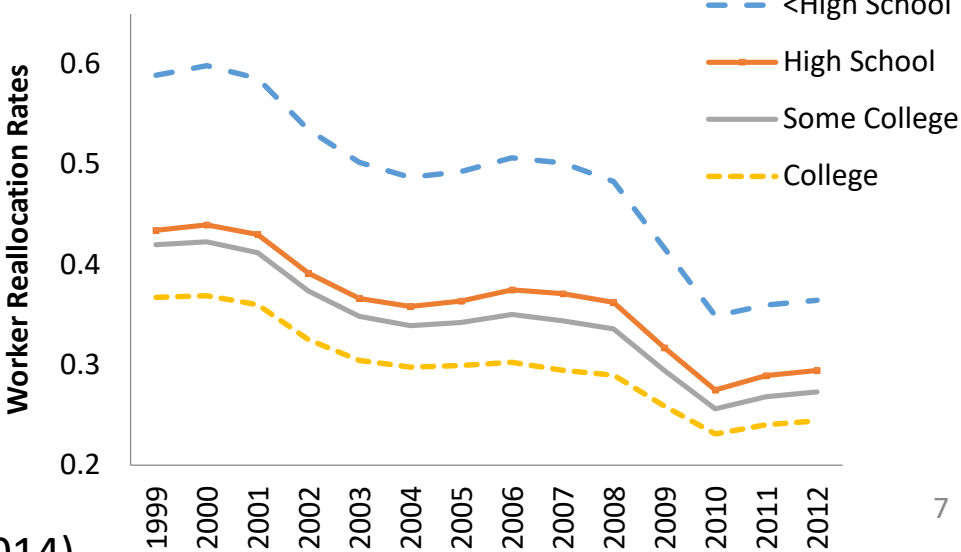
Worker Reallocation Rates by Education, Males



Worker Reallocation Rates by Age Groups, Females

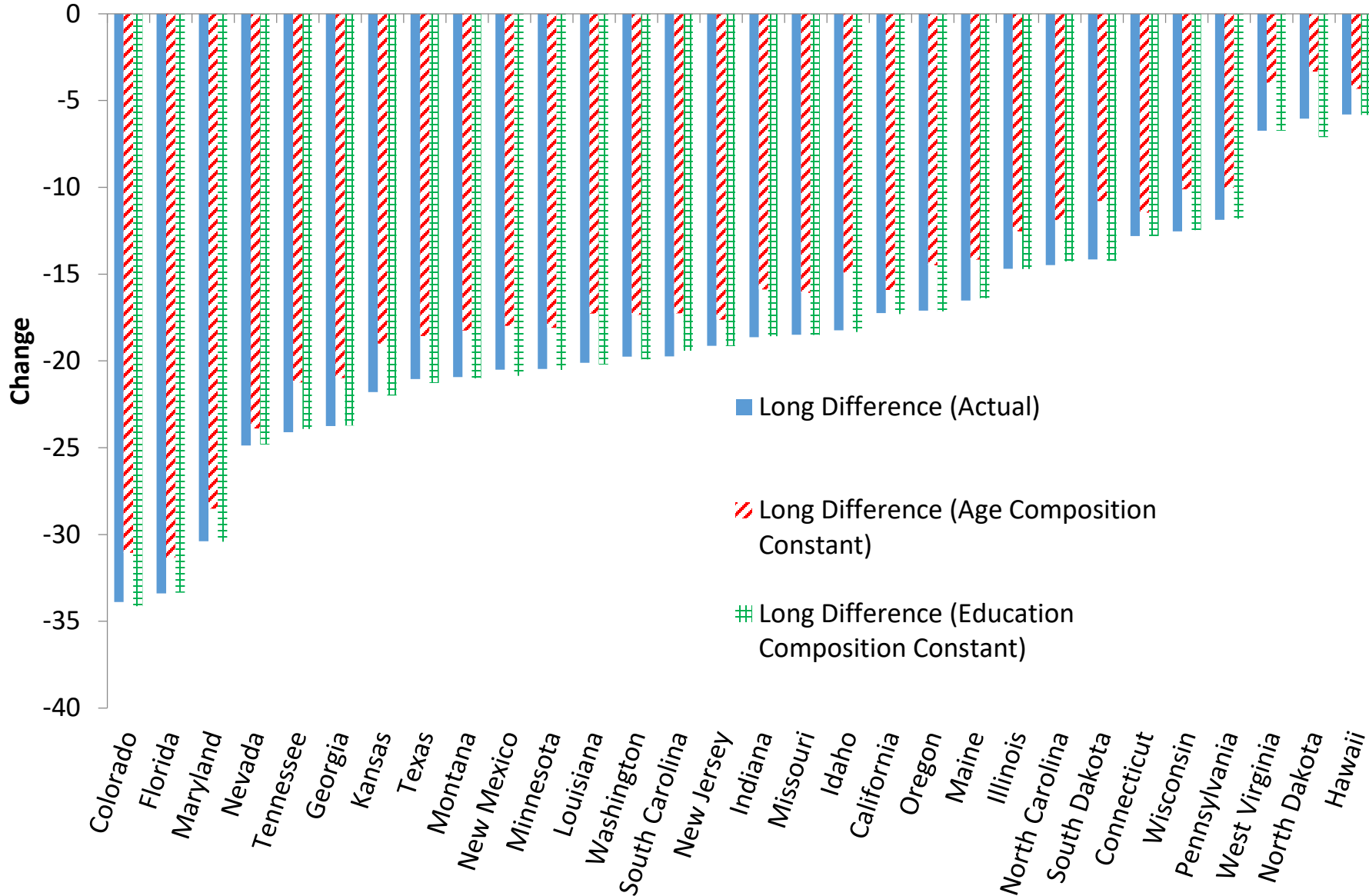


Worker Reallocation Rates by Education, Females



Source: D&H (2014)

Change in Worker Reallocation Rates at State Level from 1999-01 to 2010-12, Actual and Holding Age and Education Distributions Constant



Changing Worker Age Distribution Accounts for about 13 percent of Decline.

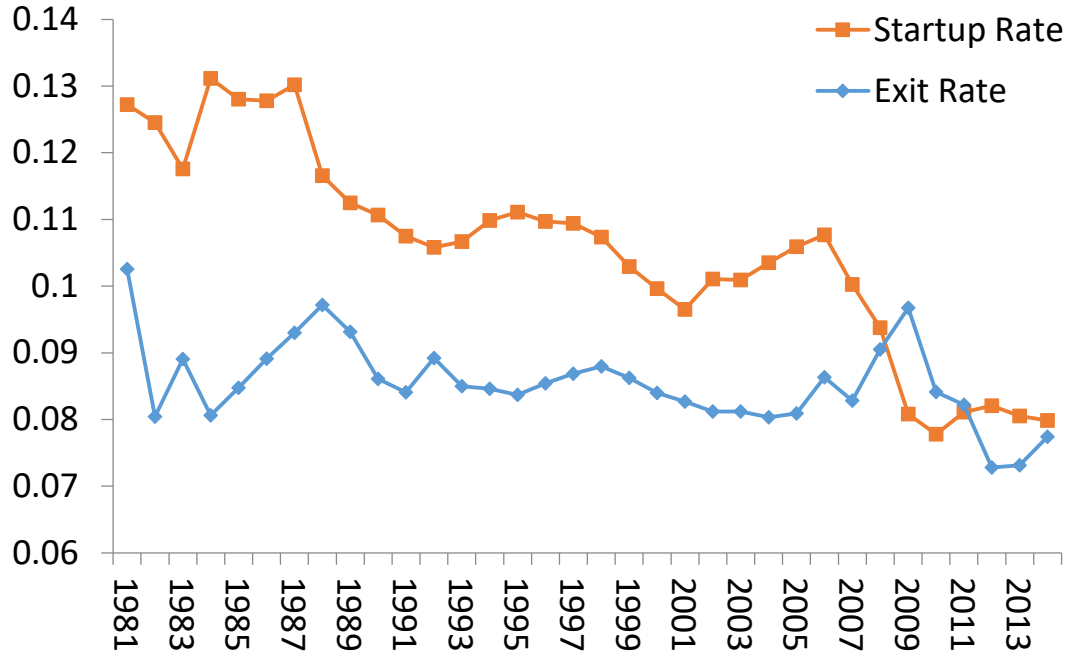
Changing Education Distribution Accounts for little or nothing

Similar patterns hold for job reallocation

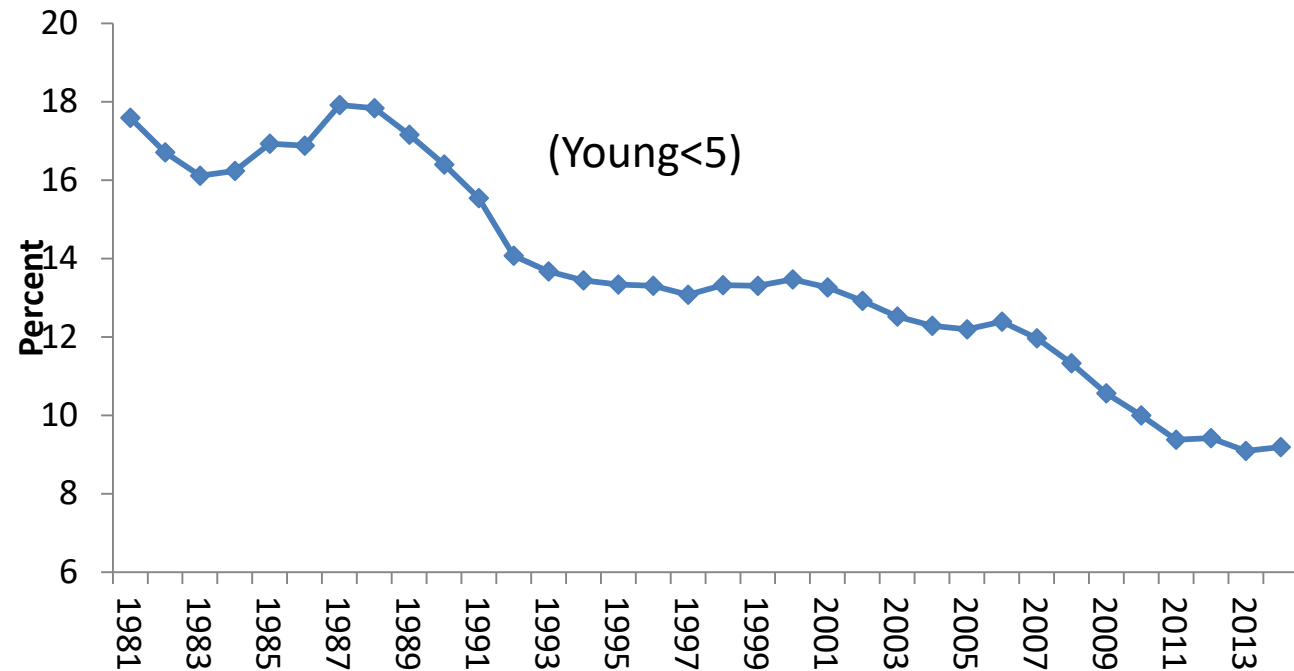
Source: D &H (2014)

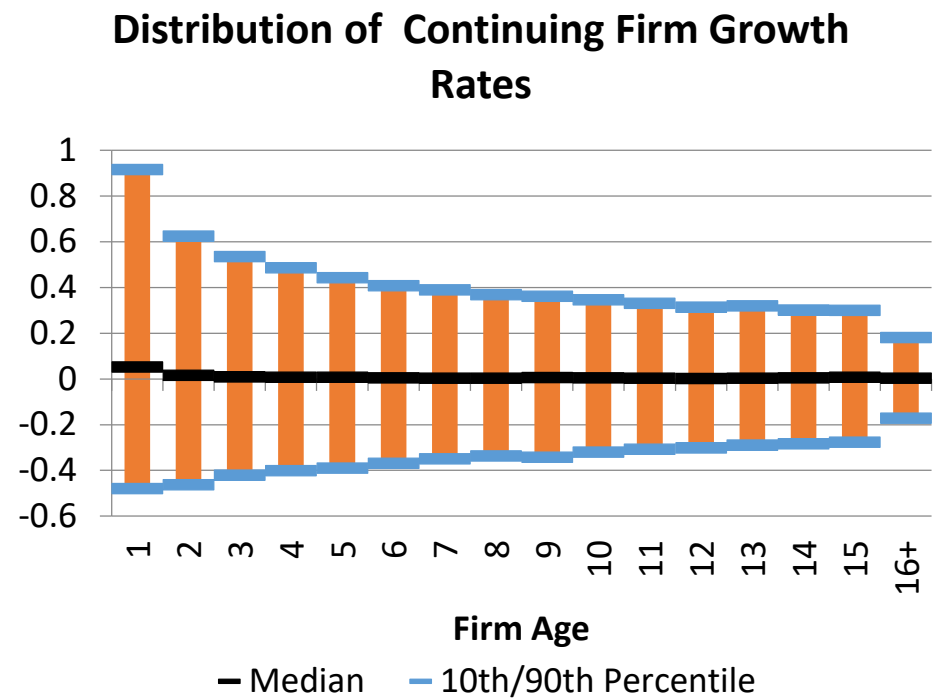
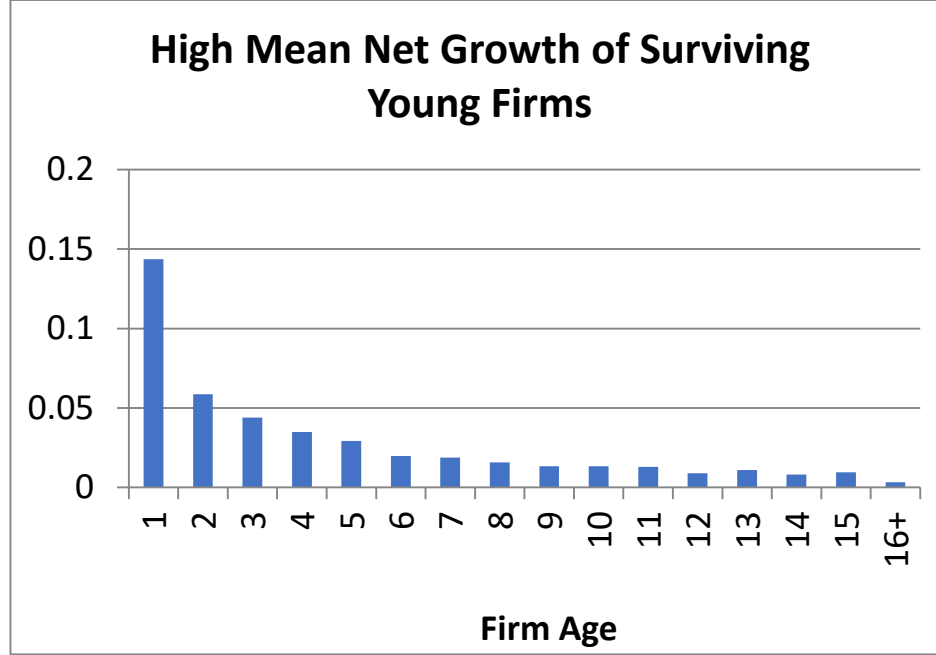
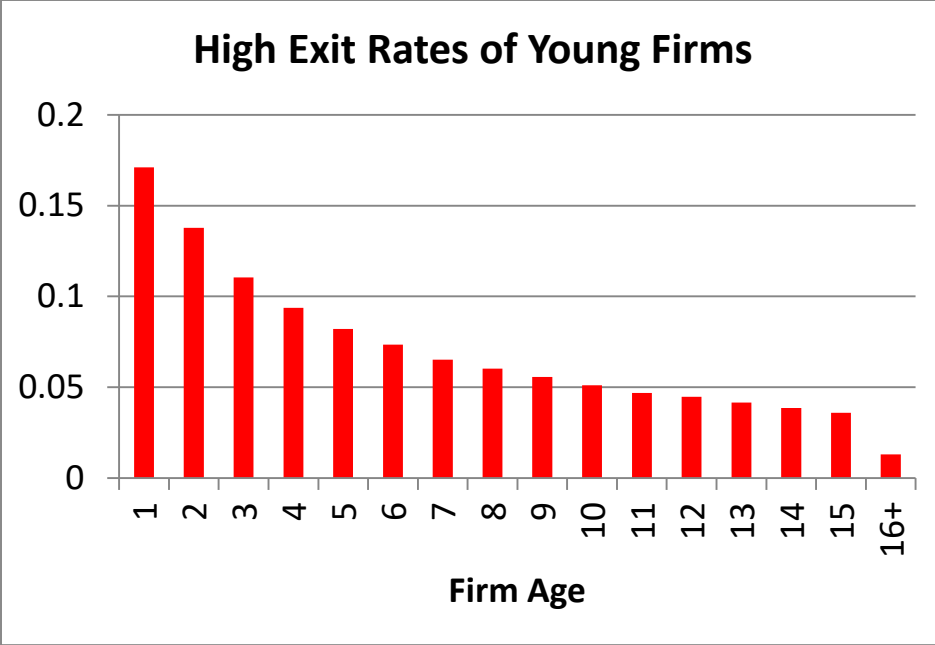
Startup and Exit Rates in Nonfarm Private Sector, 1981-2014

Startup and Exit Rates



Share of Employment for Young Firms, 1981-2014, Nonfarm Private Sector

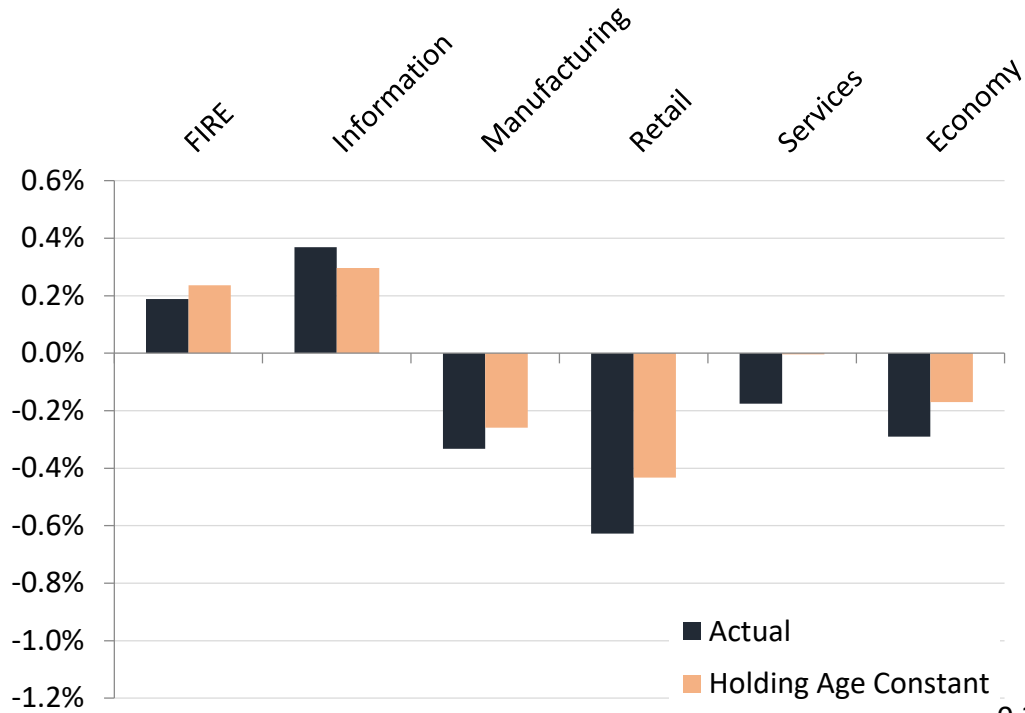




- Strong “up-or-out” dynamics and high dispersion/skewness of young firms
- High growth young firms disproportionately account for job creation.
- These patterns differ widely by sector

Source: Decker et. al. (2014)

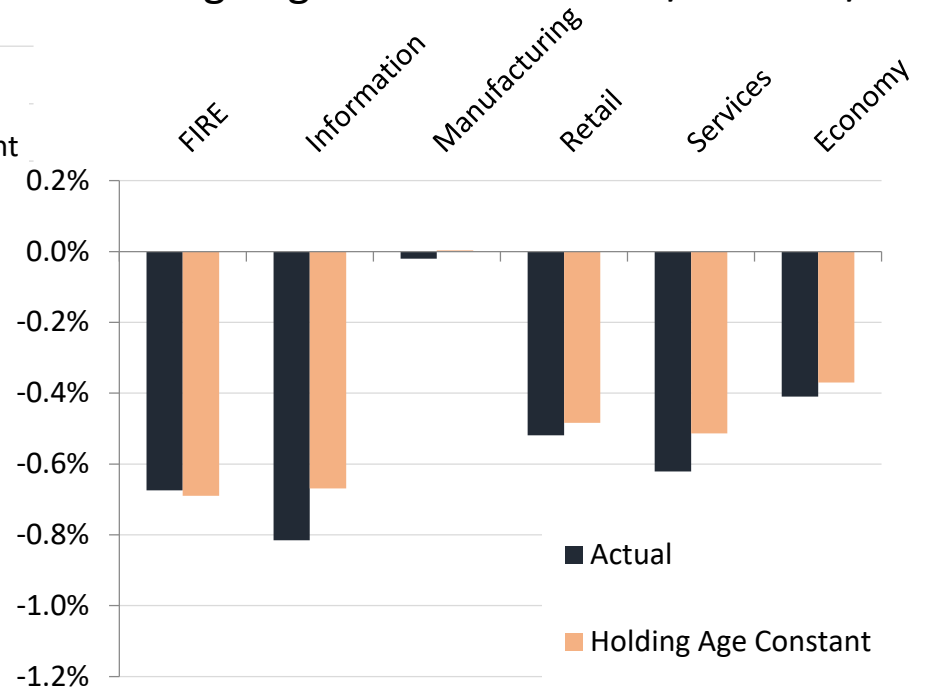
Annual Avg Chg in Job Reallocation 87/89 to 97/99



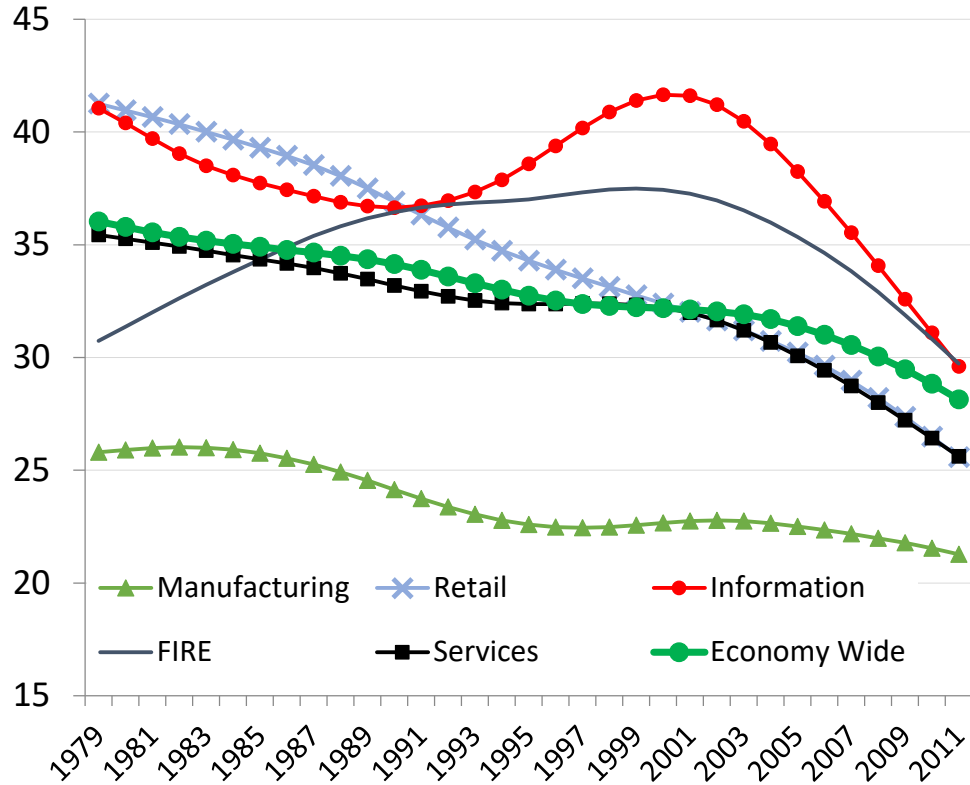
Changing Firm Age Composition Does **NOT** account for most of the decline in Job Reallocation. 40% of EconomyWide in 1990s but only 10% post 2000.

In information sector, rising share of Young firms for 20% of increase in Job reallocation in 1990s and 18% of Decline in post 2000 period.

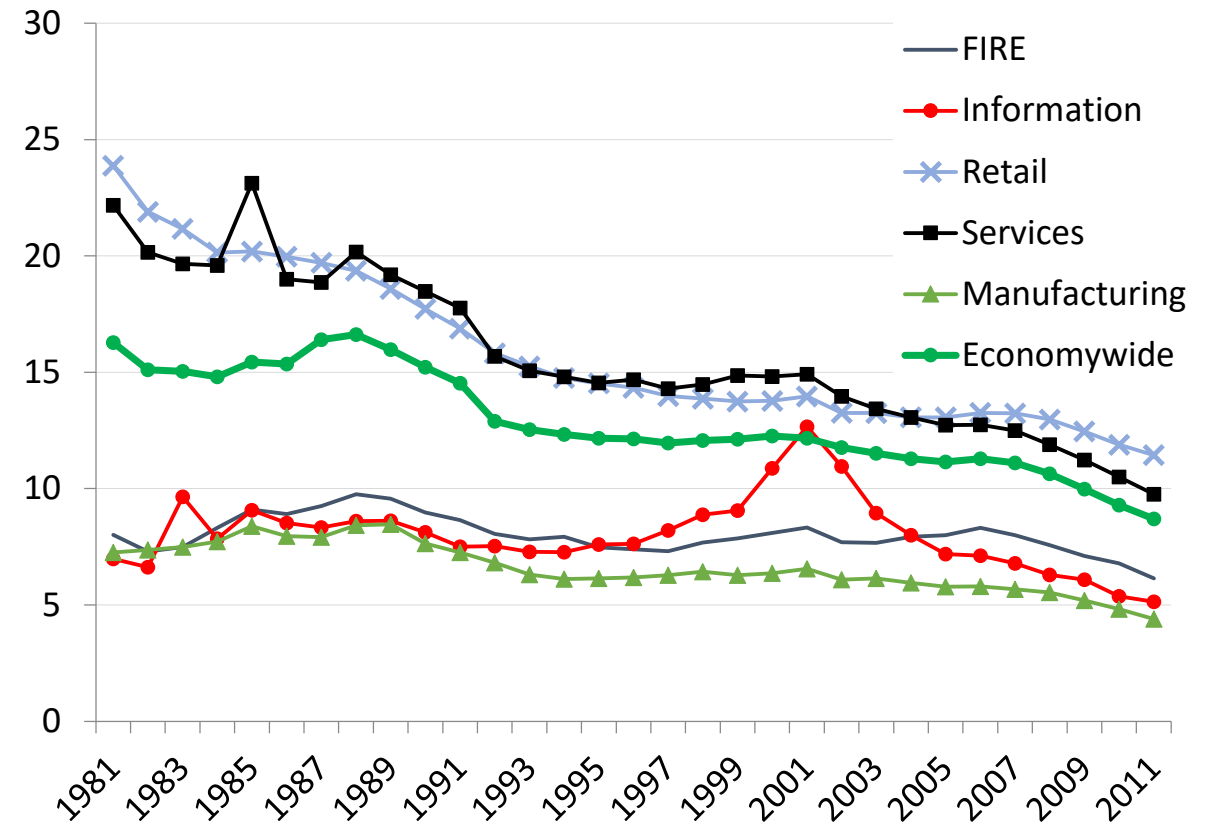
Ann Avg Chg in Reallocation 97/99 to 04/06



Patterns of Changing Reallocation Vary by Sector – Especially Pre-2000

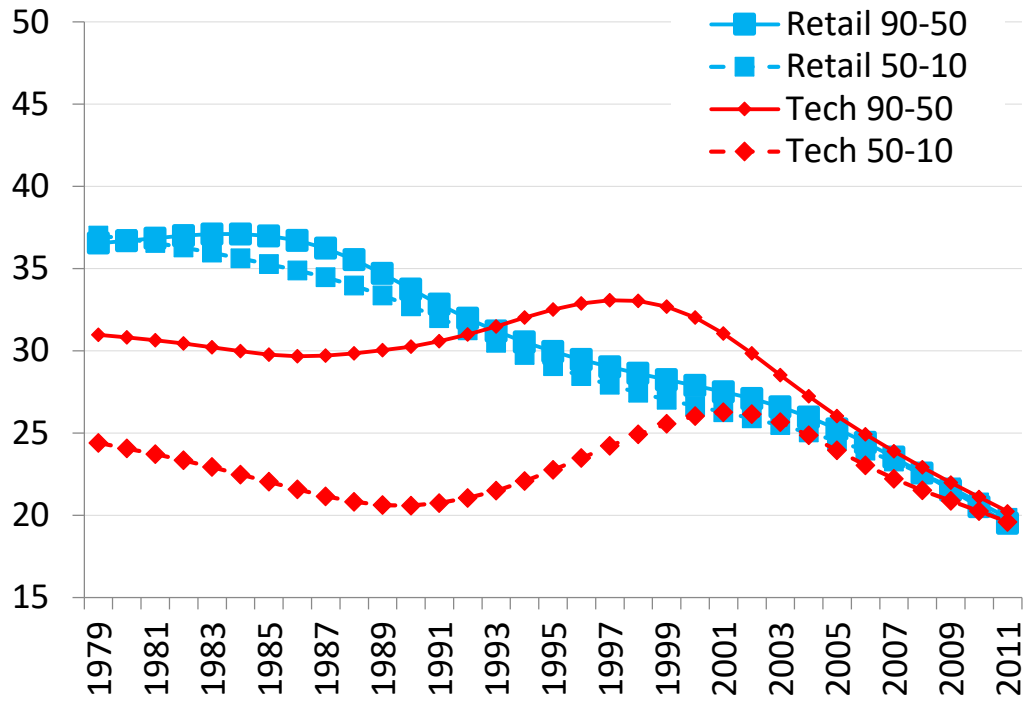


Post 2000 widespread decline in reallocation and young firm share activity.



Source: Decker et. al. (2017)

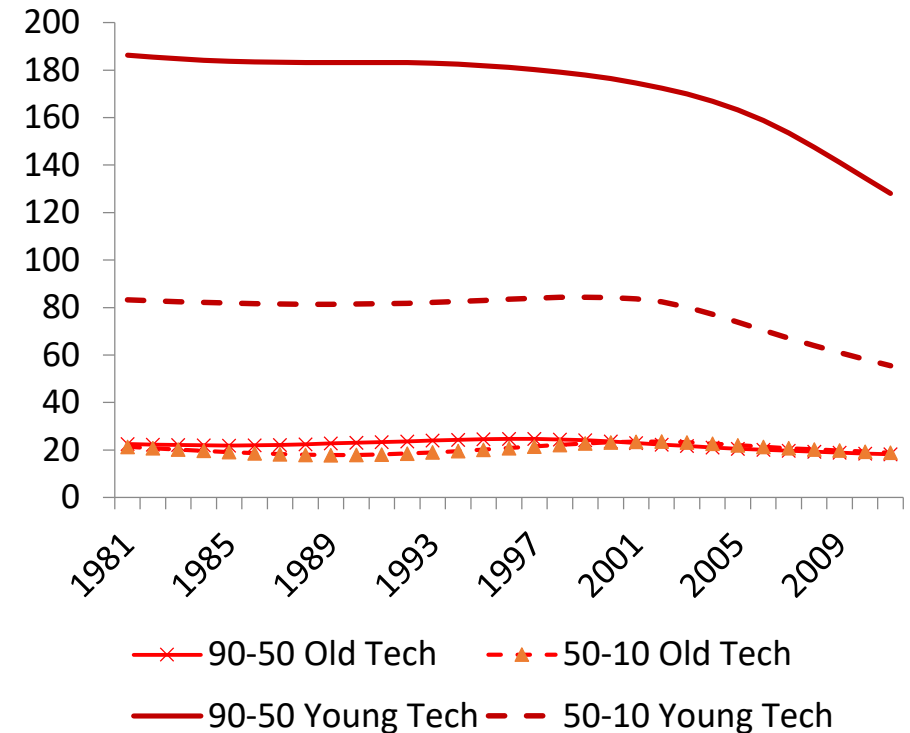
Skewness (high growth) patterns also vary dramatically across sectors



Retail: dispersion decline
equal parts 90-50, 50-10

High Tech: Growing
Skewness in 1990s, sharp
Decline post 2000

Skewness primarily accounted
for by Young Firms. In High Tech,
Decline in young firms and decline
In High Growth Firms in High Tech





High Tech includes (most of) Information but also High Tech Mfg and Services

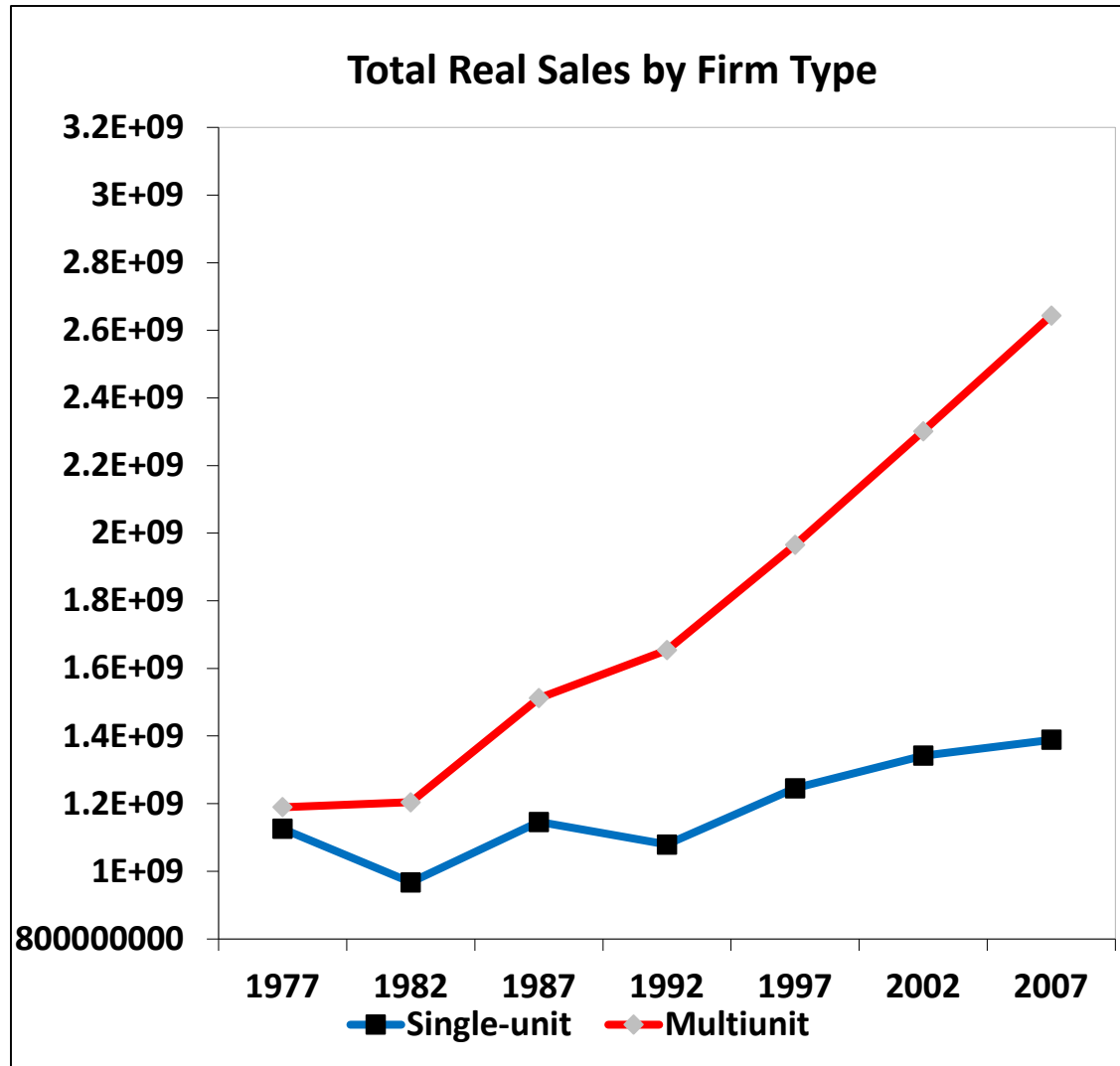
Consequences?

- Productivity?
 - Decline in Productivity Enhancing Reallocation?
 - By Exploring this channel we also learn about causes – increase in frictions?
- Labor force participation?
 - Fluid labor markets promote labor force attachment
- Earnings?
 - High Productivity Firms are High Wage Firms
 - Decline in fluidity implies less economic mobility of workers moving up the job ladder (by firm wage and firm productivity)

Possible connections of changing pace of worker and job flows and productivity ?

1. Increase in frictions and distortions has reduced pace of reallocation and entrepreneurship.
 - Ubiquitous finding: Large, within industry dispersion in productivity.
 - In healthy economy, reallocation moving resources from less productive to more productive.
 - An increase in frictions (e.g., Hopenhayn and Rogerson (1993)) will yield a decline in the pace of reallocation and in turn productivity
 - How to reconcile 1990s?
 - 2. Decline in pace of innovation/technological change (Gordon (2016)) has led to decline in reallocation/entrepreneurship (Gort and Klepper (1982) and Jovanovic (1982))
 - Innovation/entry  Experimentation/Dispersion  Reallocation/Productivity Growth
3. Structural changes due to demographics, changes in business model
 - Unclear prediction or even benign implications for productivity?

In Retail Trade, Change in Business Model



Source: Foster et. al. (2016)

Share of activity accounted for by Single Unit Establishment Firms (“Mom and Pop” Firms) has declined From 50 to 35 percent. Almost all of the increase in Multi-Unit Share is from Large, National Chains

Productivity Gap between Single-Unit Establishment Firms and Large, National Chains is 25 log points.

Employment-weighted annual exit Rate of Single-Units is about 8 percent. About one half of one percent for Large, National Chains.

Job Reallocation Rate for Single-Units is almost 3 times larger than for National Firms.

Shift to National Chains has been productivity enhancing and reduced volatility.

Increases in Frictions and Distortions?

- Hopenhayn and Rogerson (1993):
 - Canonical firm dynamics model where firms face idiosyncratic productivity shocks, endogenous entry and exit and adjustment frictions (extension of Hopenhayn (1992) with adjustment frictions).
 - Increased adjustment frictions imply:
 - Reduced dispersion of firm growth rates
 - Firms with higher realizations in productivity are less likely to grow, lower realizations in productivity are less likely to contract/exit.
 - Reduced aggregate productivity

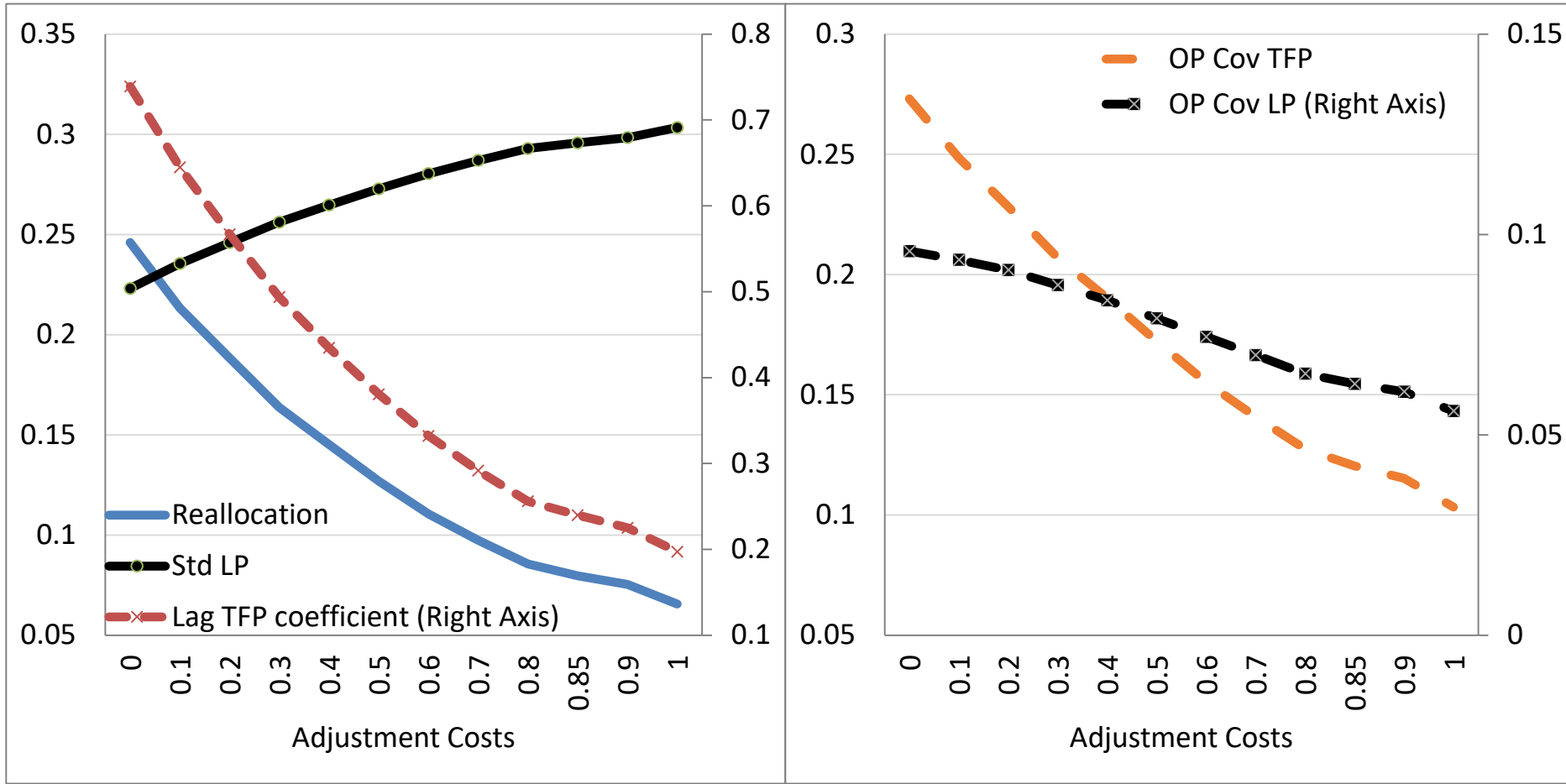
Illustrative Model of Increases in Adjustment Frictions

- Decker et al. (2017) consider an illustrative model of adjustment frictions (consistent with Cooper and Haltiwanger (2000, 2006), Cooper, Haltiwanger and Willis (2007, 2014) and Elsby and Michaels (2013)):

$$\begin{aligned}
 V(E_{it-1}; A_{it}) &= A_{it}E_{it}^\alpha - w_t E_{it} - C(H_{it}) + \beta V(E_{it}; A_{it+1}) \\
 C(H_{it}) &= \begin{cases} \frac{\gamma}{2} \left(\frac{H_{it}}{E_{it-1}} \right)^2 & + F_+ \max(H_{it-1}, 0) + F_- \max(-H_{it-1}, 0) \text{ if } H_{it} \neq 0 \\ 0, & \text{otherwise} \end{cases} \\
 a_{it} &= \rho a_{it} + \eta_{it} \\
 E_{it} &= E_{it-1} + H_{it}
 \end{aligned}$$

Where $\alpha < 1$ due to decreasing returns or product differentiation.
 Calibration of this model helps illustrate different mechanisms.

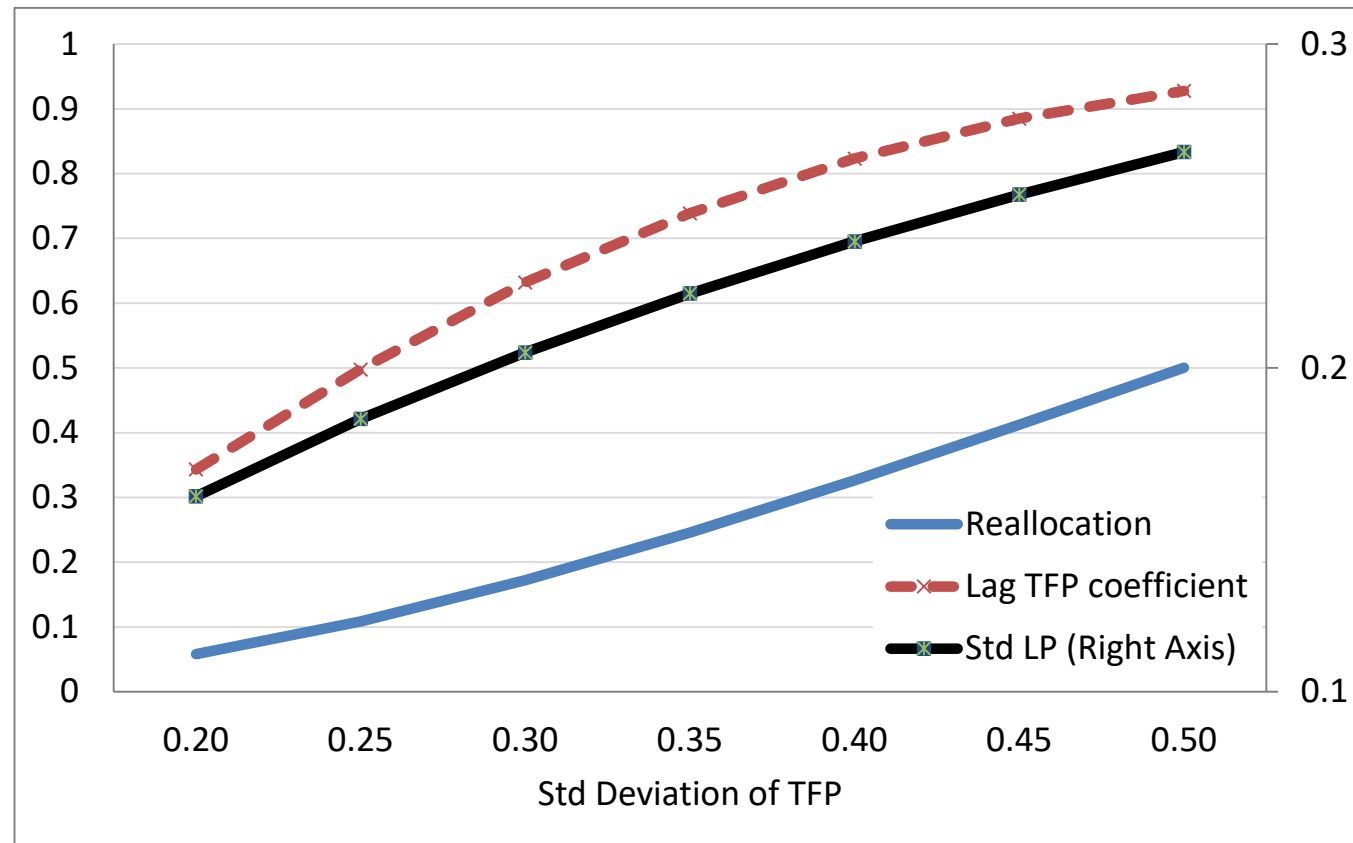
Shocks vs. Responsiveness: Responsiveness



Source: Illustrative model from Decker et. al. (2017)

**Higher adjustment costs → Lower reallocation, weaker responsiveness,
misallocation (lower productivity)**

Shocks vs. Responsiveness: Shocks



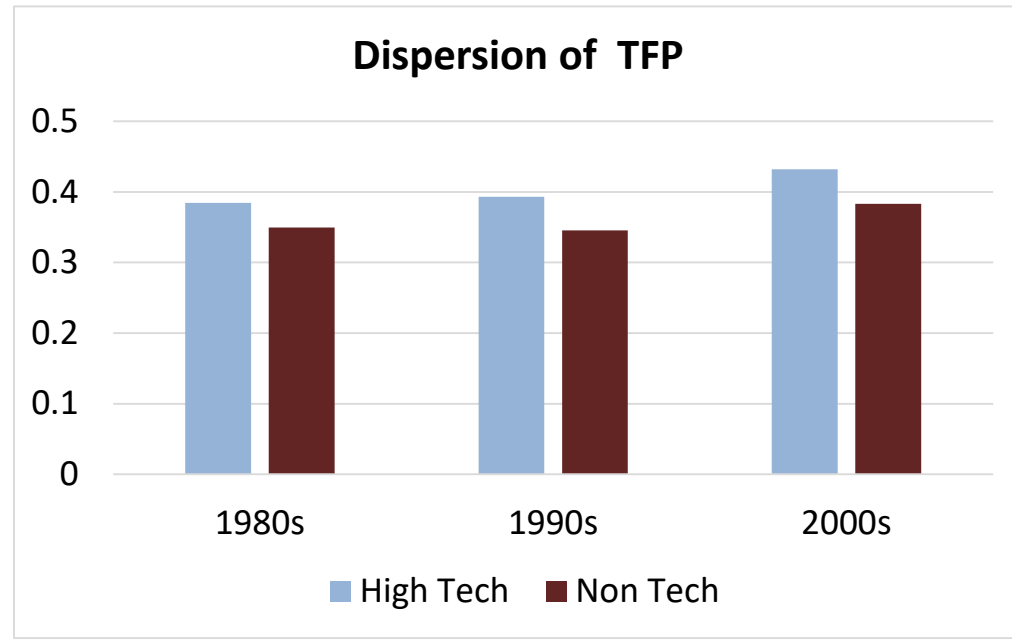
Source: Illustrative model Decker et. al. (2017)

Lower TFP dispersion → Lower reallocation, weaker responsiveness

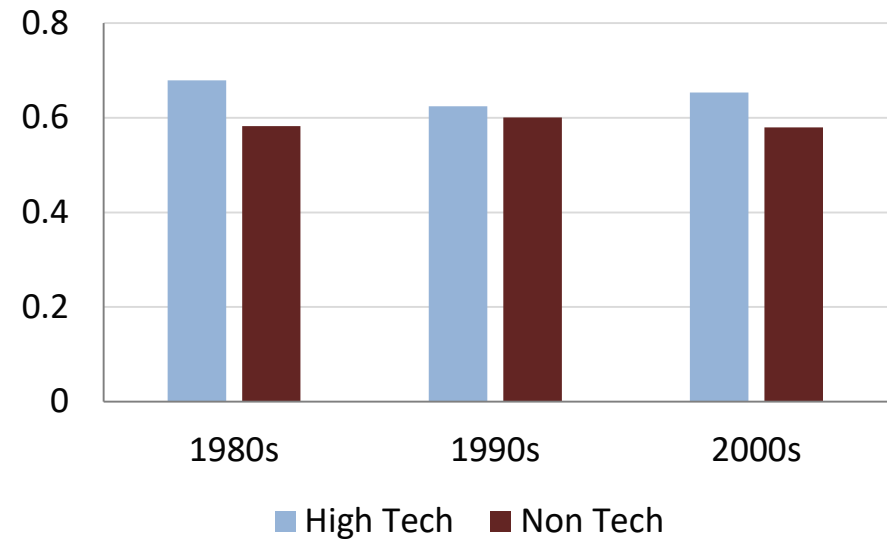
Dispersion and Persistence

Shock Processes in Manufacturing

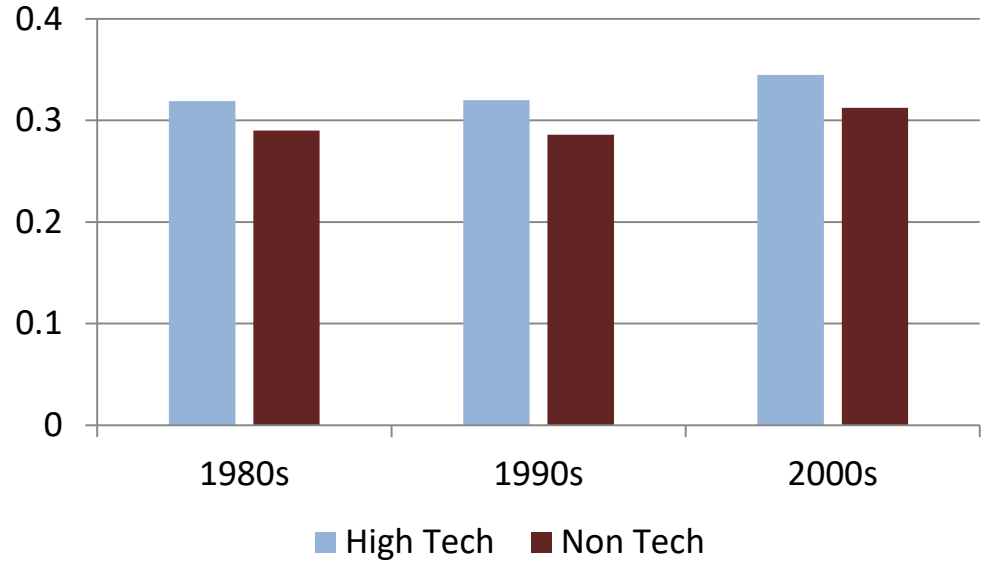
Source: Decker et. al. (2017)



AR(1) Coefficient



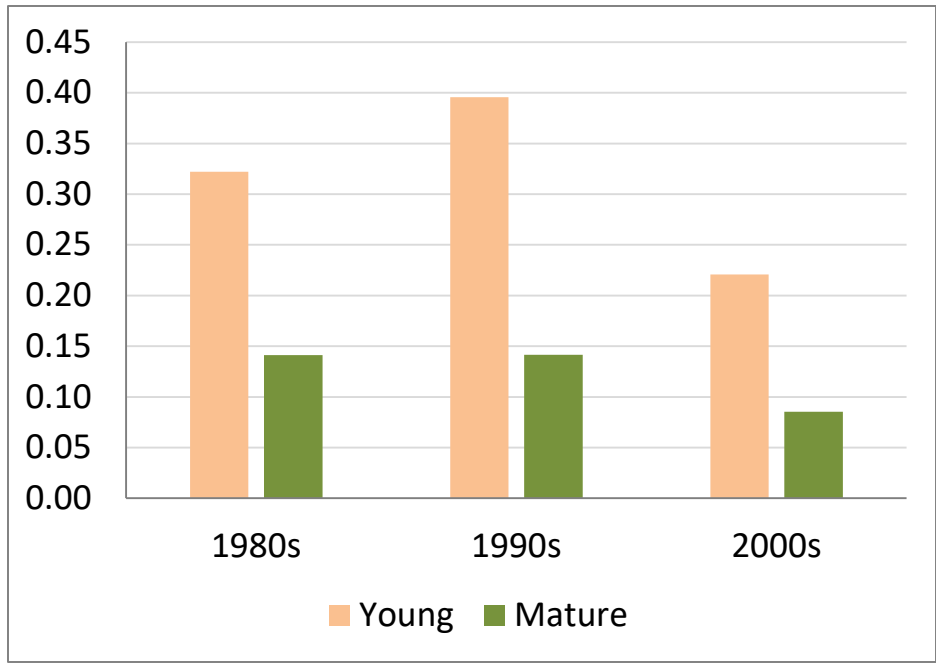
Std Deviation of Innovations



Little evidence that changes in persistence drive patterns of reallocation

Patterns for innovations mimic overall shocks

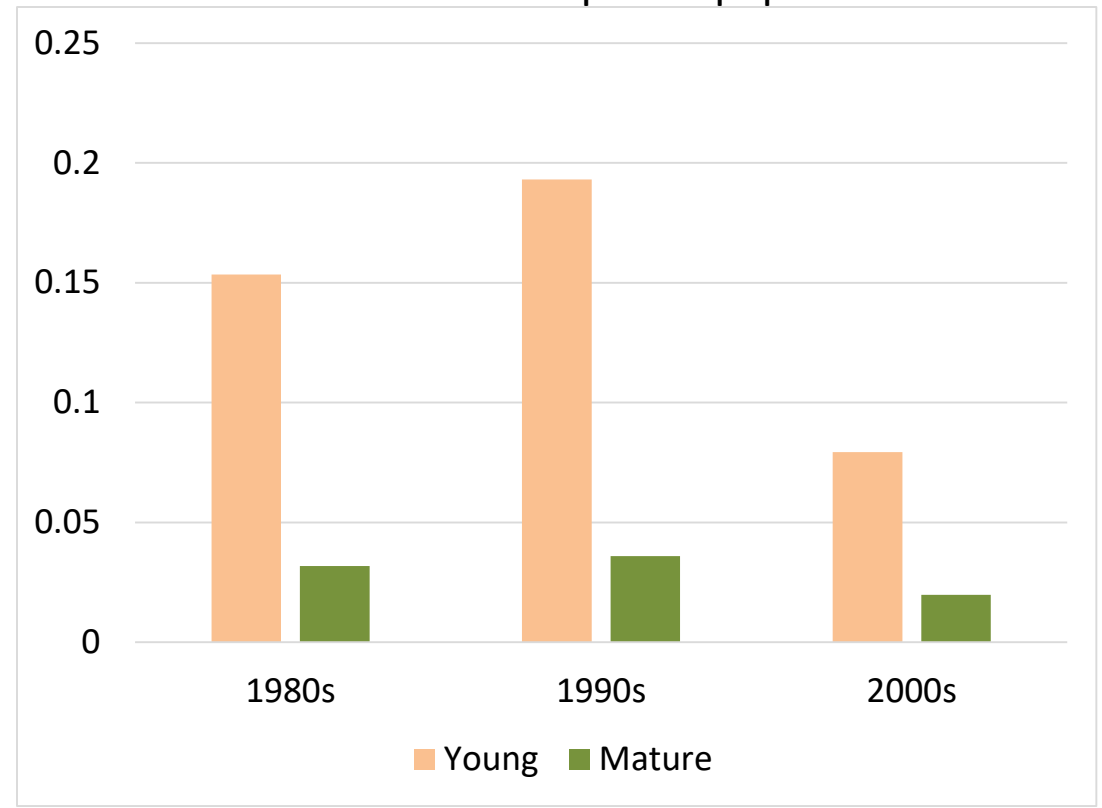
Employment Growth



- Increased responsiveness during 1990s for young firm plants in High Tech
- Decreased responsiveness during 2000s for both young and mature firm plants in High Tech

Marginal Response of Plant-Level Employment Growth and Investment to TFP for High Tech – Results from estimating plant-level regressions of outcomes on lagged TFP realizations

Investment in Capital Equipment



Implications for Aggregate (Industry-Level) Productivity

Start with (industry) aggregate productivity:

$$P_t = \sum_i \theta_{it} P_{it}$$

θ_{it} = employment weight, P_{it} = plant TFP, Correlation with traditional measures about 0.8

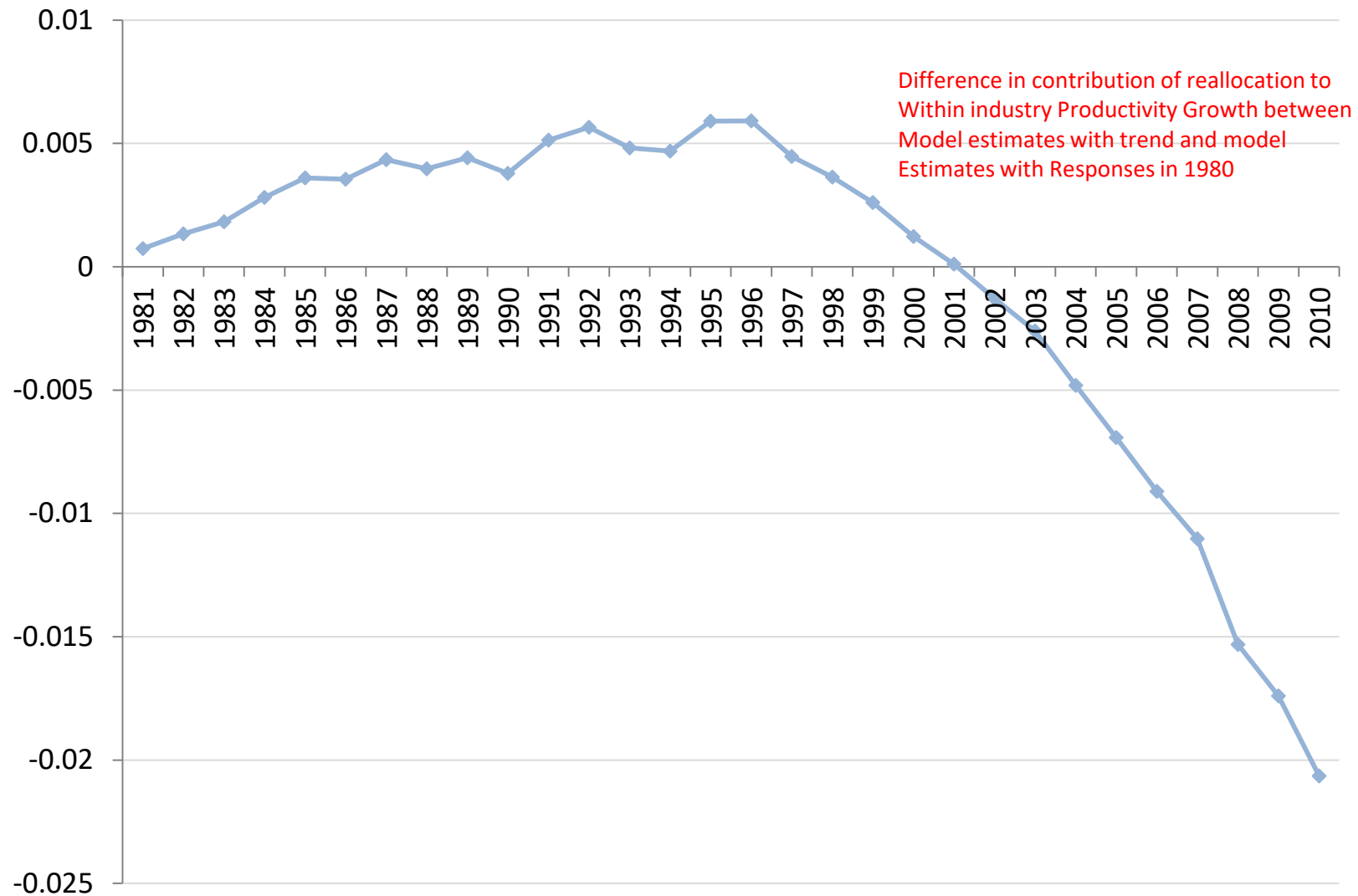
Reallocation contribution to prod. growth:

$$P_{t+1}^C = \sum_i \theta_{it+1} P_{it} \quad P_{t+1}^C - P_t$$

Agg. prod. growth accounted for by reallocation (essentially Change in OP covariance for fixed P_{it})

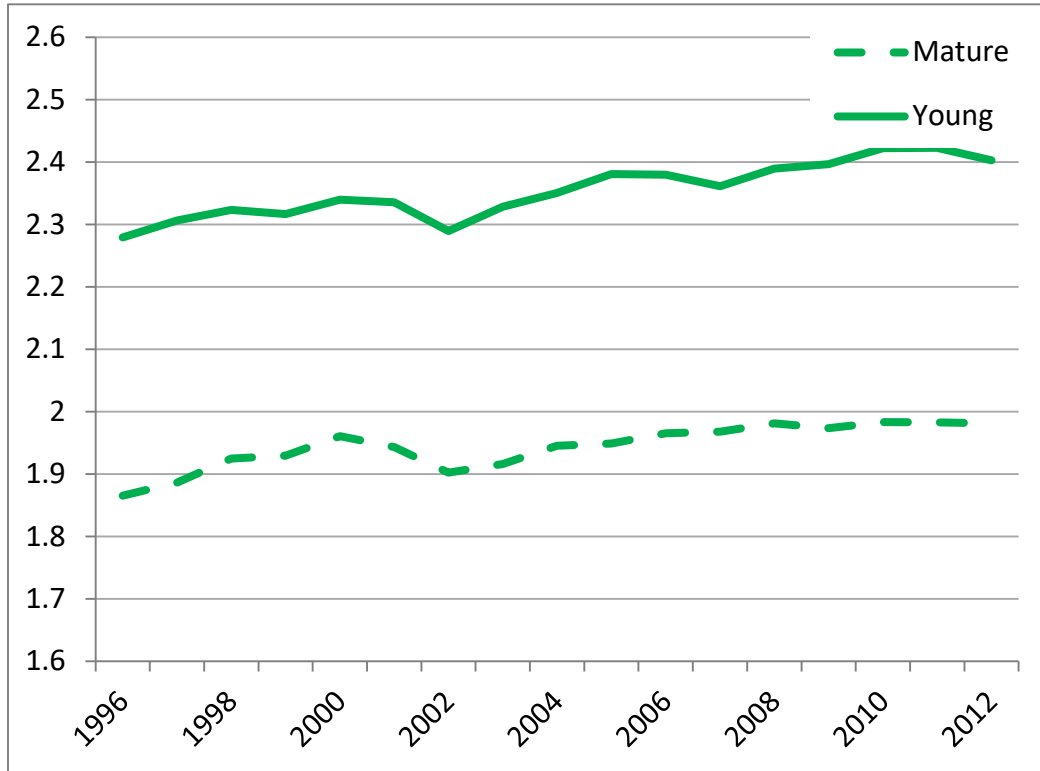
Model-based $\theta_{it+1} \Rightarrow$ counterfactual $P_{t+1}^C - P_t$ (with and without change in responsiveness) \Rightarrow Diff-in-diff

Diff-in-Diff Accounting Counterfactual for Changing Responsiveness in High Tech



Source: Decker et. al. (2017)

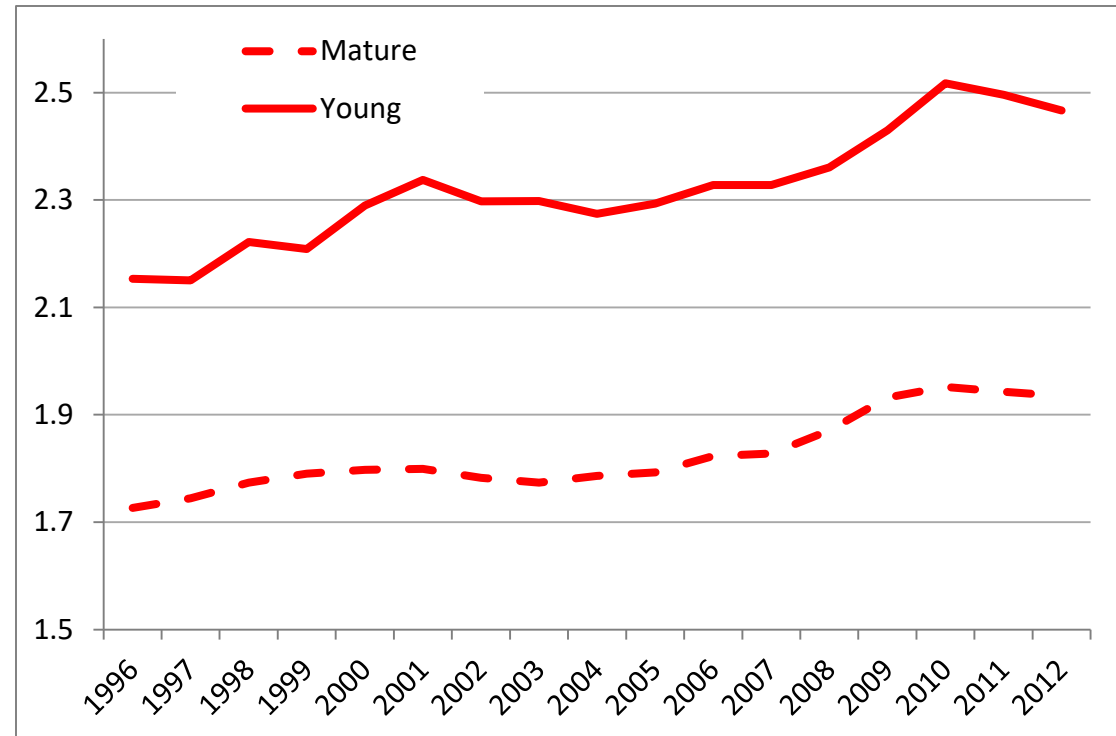
Within Industry Labor Productivity Dispersion, All Sectors



Rising Within Industry Labor
Productivity Dispersion (Gross Output
Per Worker) Within Age Groups

**Within 6 digit NAICS Industries, 90-10
Differential**

Within Industry Labor Productivity Dispersion, High Tech, by Firm Age

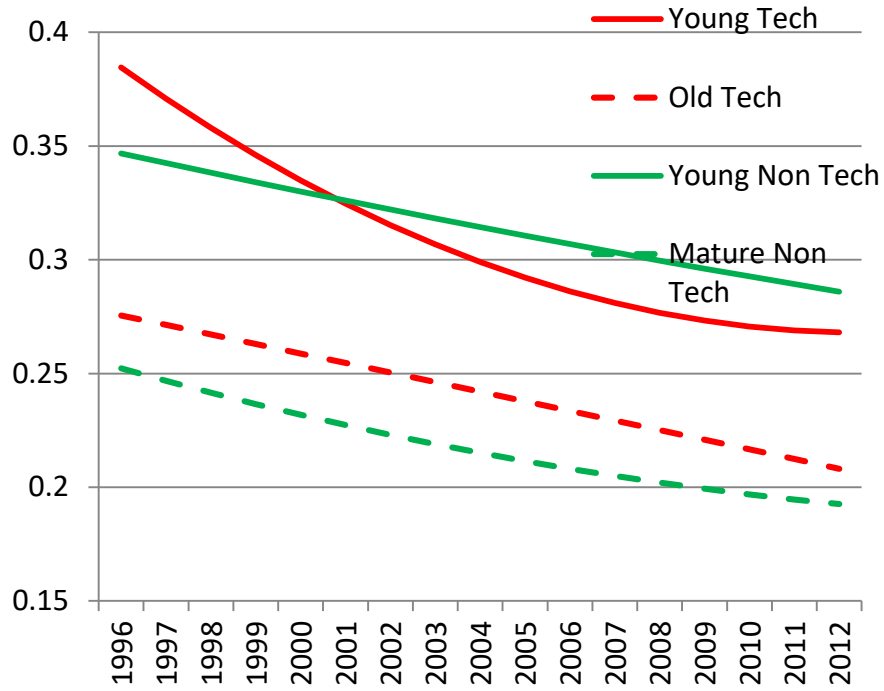


Young dispersion > Mature dispersion
Consistent with Young facing more frictions,
engaged in learning and experimentation.

Dispersion rises within age groups post 2000.
Difficult to reconcile with Gort-Klepper dynamics

Source: Decker et. al. (2017)

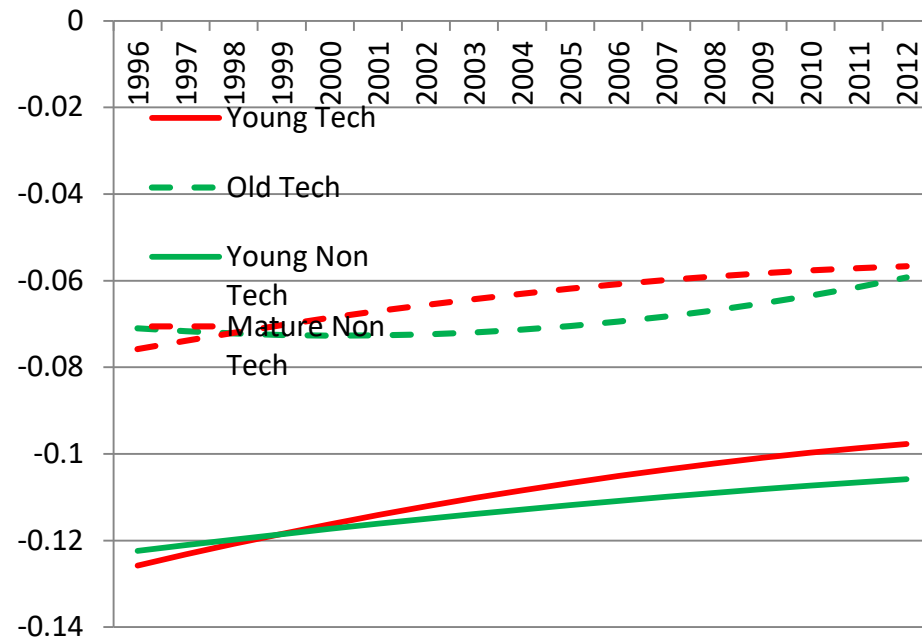
Reduced Responsiveness of Employment Growth to Productivity in 1997-2013 (Cov(growth,productivity) is declining)



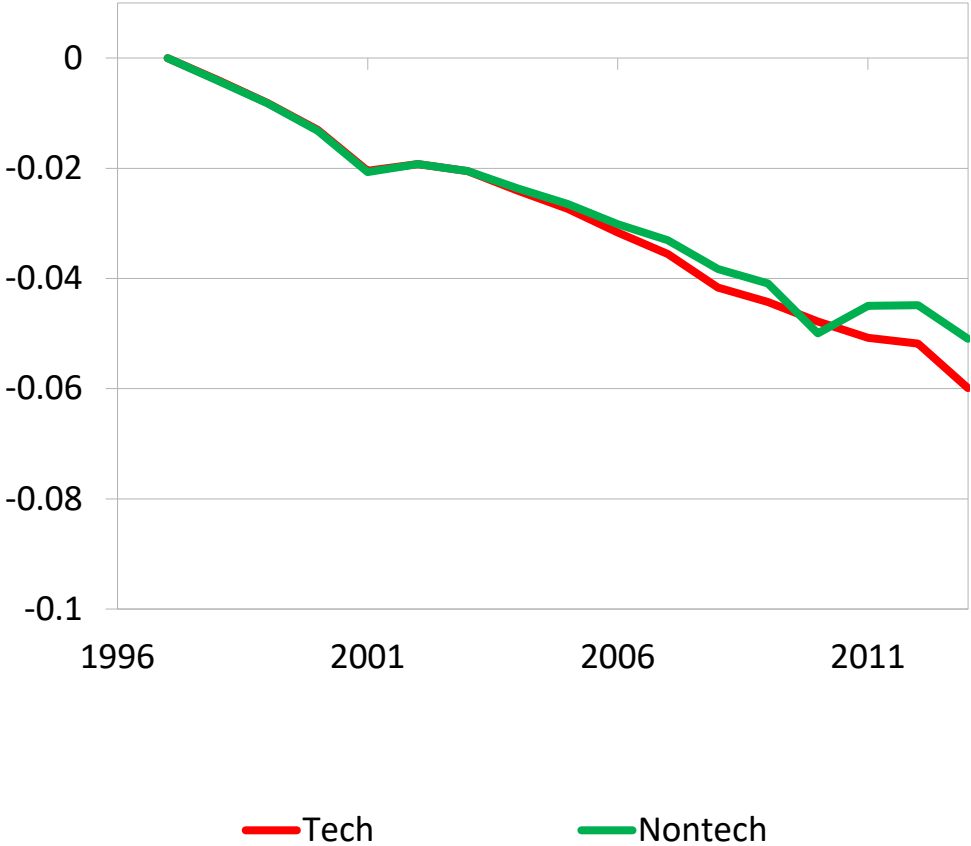
Declining responsiveness is consistent
With rising dispersion in Revenue
Labor Productivity

Exit has become less
Responsive to Productivity

Overall Net Employment Growth
(inclusive) of Exit has become less
Responsive to Productivity



Reduction in Contribution of Reallocation to Productivity from Reduced Responsiveness, Tech vs. Nontech (Diff-in-Diff counterfactual)



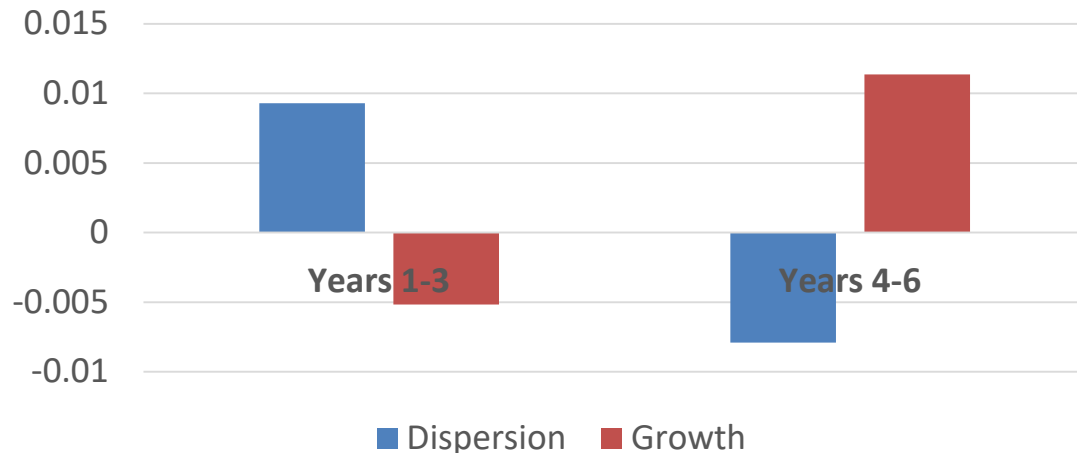
Each point reflects immediate gains in specified year if responsiveness returned to 1997 rates with current year dispersion (latter partly reflects accumulated effects of declining responsiveness)

Source: Decker et. al. (2017)

Gort-Klepper Dynamics?



Changes in Productivity Dispersion and Growth from a 1% (one time) Increase in Entry Rate, High Tech



Some evidence of Gort and Klepper Dynamics in High Tech:

1. Surge of Entry (proxy for innovative period) leads to immediate rise in dispersion and lagged rise in productivity.
2. But these dynamics can't account for increase in within industry dispersion post 2000 (IQR increases by more than 10 log points for both young and mature firms in post 2000 period in High Tech). Entry is declining over this same period. Based on Gort-Klepper dynamics we would have expected a decline in dispersion.

Rising Frictions/Distortions?

- Labor market (e.g., Occupational Licensing, Employment at Will, Non-compete clauses)
- Decline in competition (e.g., winner takes all sectors make it more difficult to identify and enforce exclusionary practices)
- Financial market regulation (e.g., Sarbanes-Oxley, Dodd-Frank)
- Zoning restrictions in information-centric locations? (Hsieh and Moretti, 2015)

Erosion of Employment-At-Will Contributed to Fluidity Declines

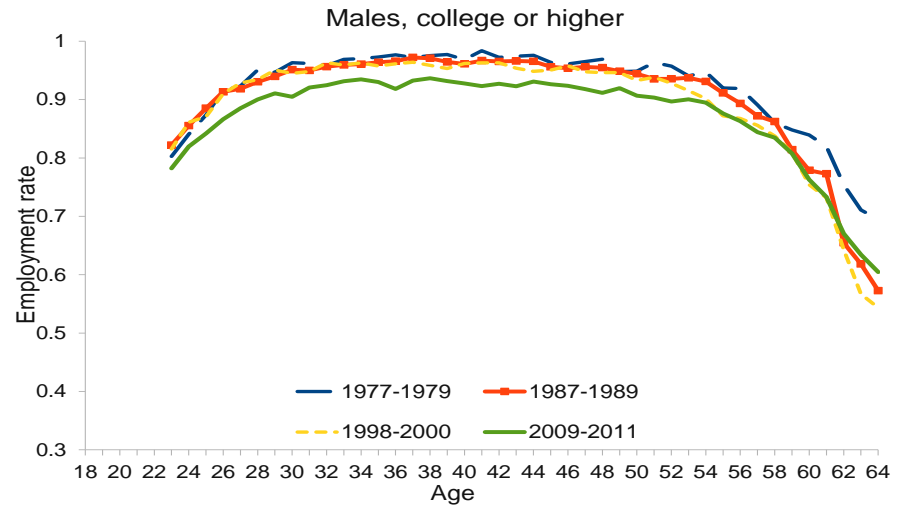
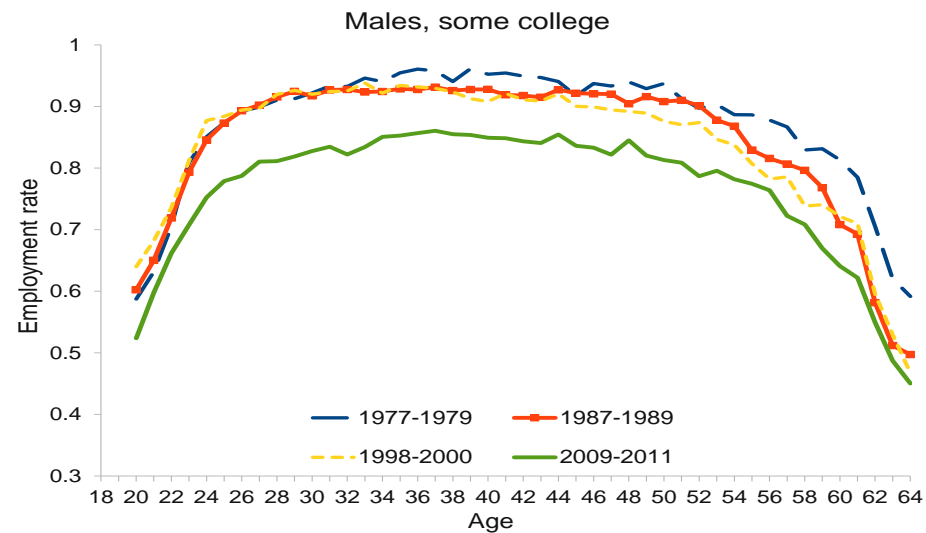
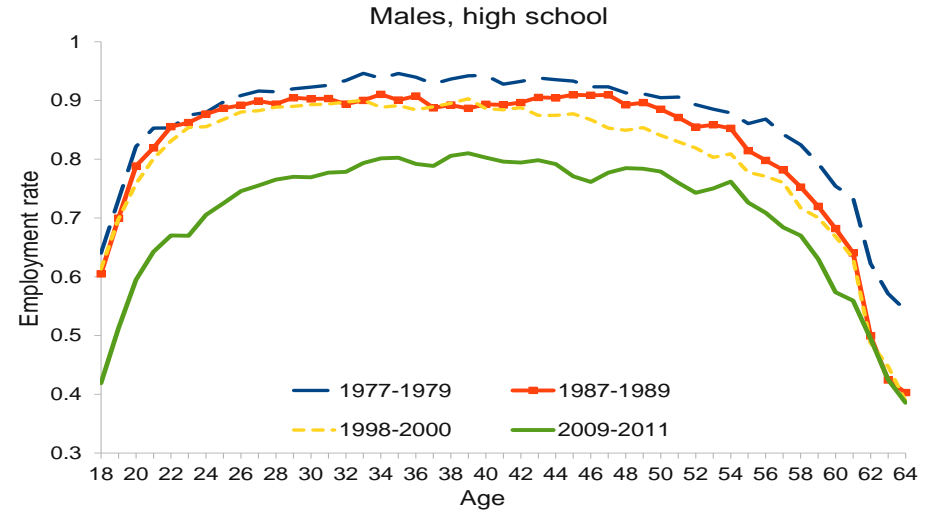
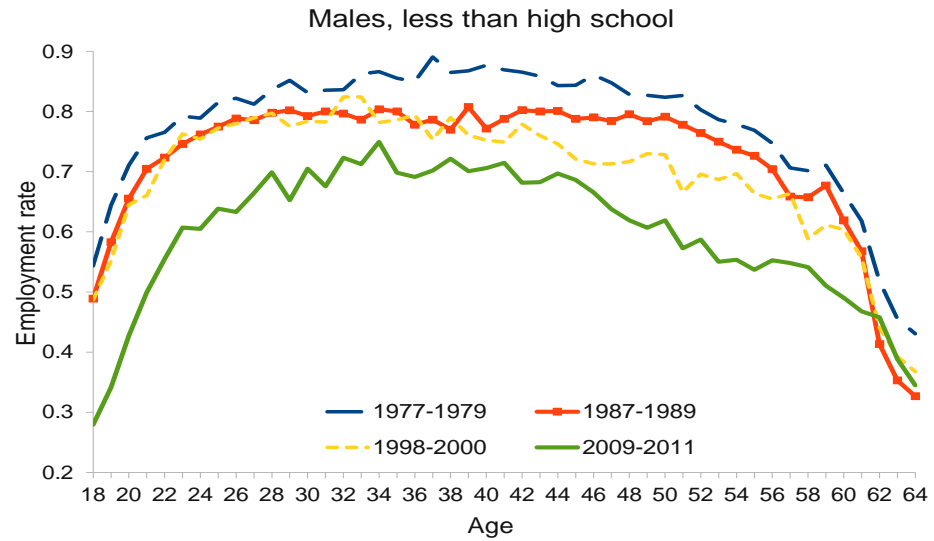
Estimated Effects of Employment-at-Will Exceptions on Annual Job Reallocation Rates, by Firm Size Class

	Firm Size Class, Number of Employees				
	Less than 20	20 to 49	50 to 499	500 or more	All
Good-Faith Exception	-2.141*** (0.580)	-1.700*** (0.486)	-1.400*** (0.400)	0.186 (0.499)	-1.042*** (0.384)
Implied-Contract Exception	0.023 (0.459)	-0.010 (0.217)	0.309 (0.250)	-0.271 (0.433)	-0.108 (0.295)
Public Policy Exception	-0.472 (0.552)	0.084 (0.274)	-0.047 (0.274)	0.227 (0.511)	-0.124 (0.378)
Adj. R-Squared	0.76	0.81	0.74	0.50	0.69
N	1,000	1,000	1,000	1,000	1,000

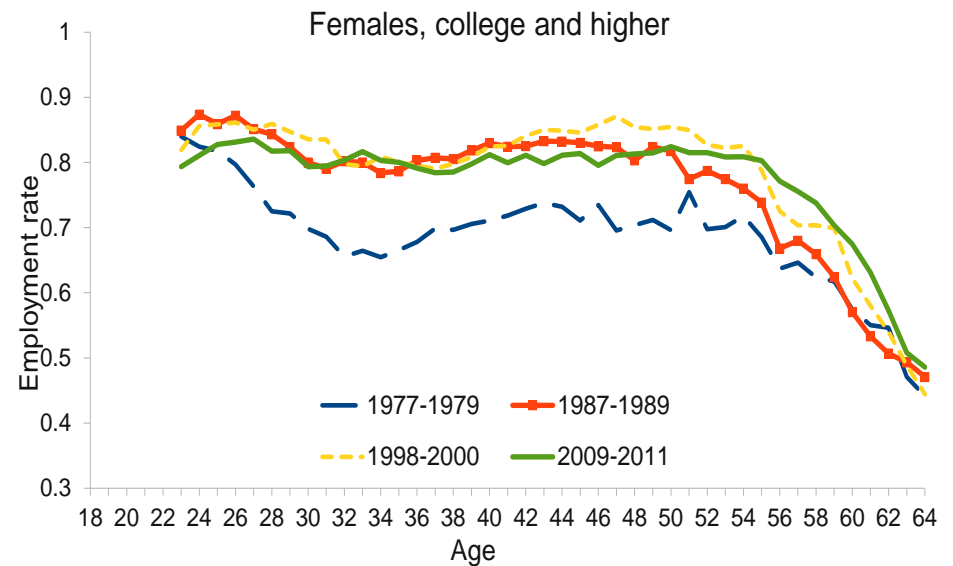
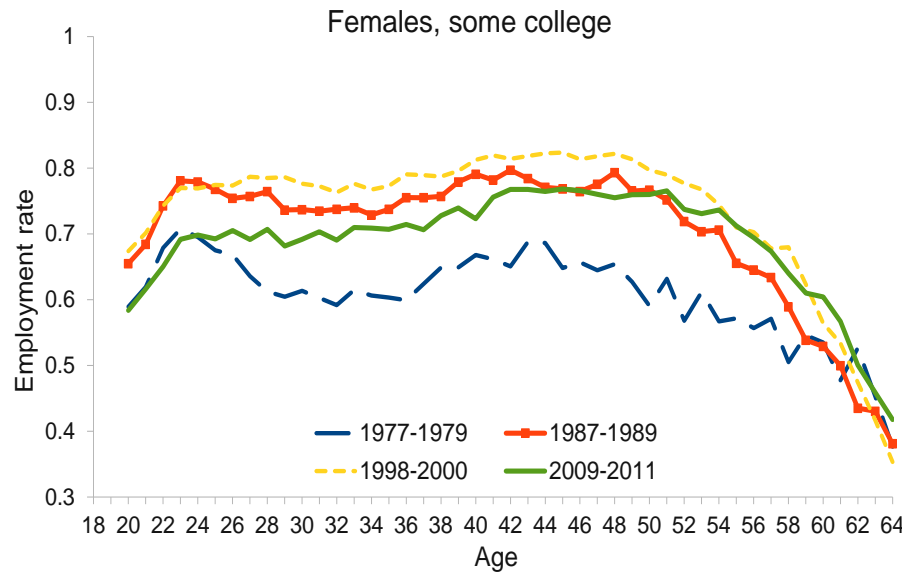
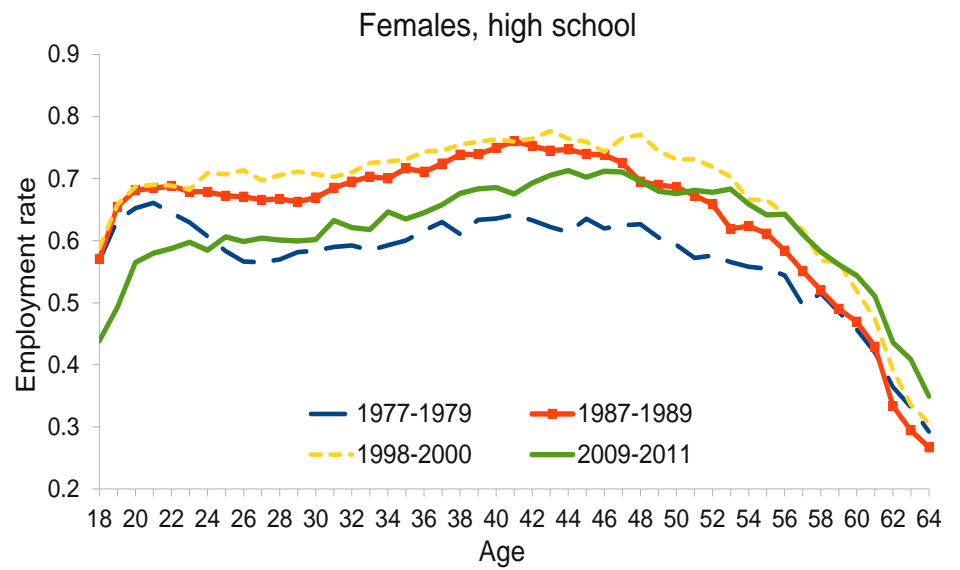
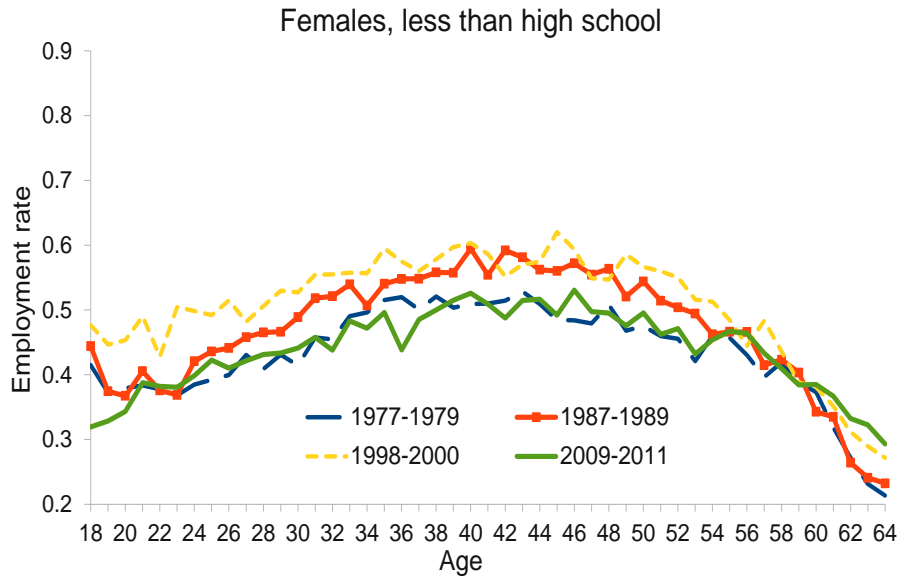
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

1. Each column reports results for an employment-weighted least squares regression of the job reallocation rate in the indicated size class on state effects, year effects and dummy variables for exceptions to the employment-at-will doctrine. The sample period runs from 1978 to 1998, following Autor et al. (2006). Standard errors in parentheses are clustered at the state level.
2. The dependent variable is the private sector annual job reallocation rate for the state-year-size class cell, which we obtain from the Census Bureau's Business Dynamics Statistics.

Employment Rates by Age and Education for Selected Periods, Males



Employment Rates by Age and Education for Selected Periods, Females



The Fluid Labor Markets Hypothesis

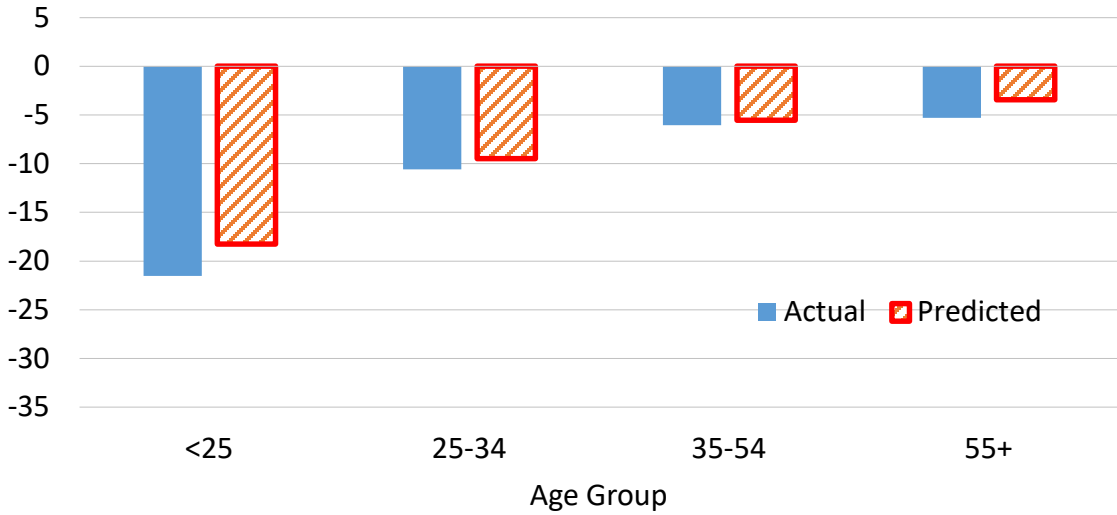
Hypothesis: Fluid labor markets promote high employment.

Mechanisms:

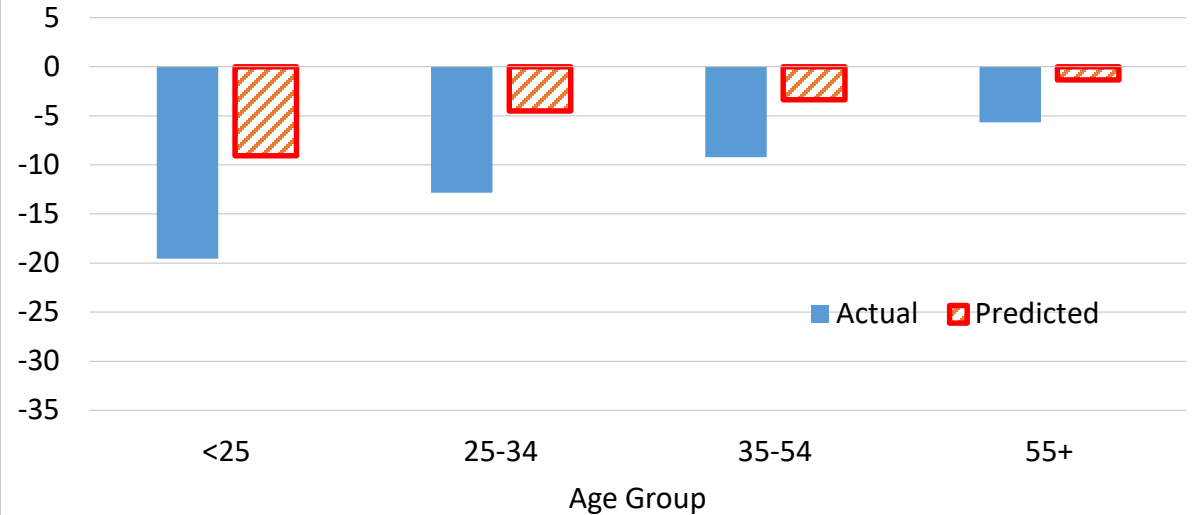
- 1. Job creation incentives** (Rob Shimer, 2001): Young workers tend to be less well matched to suitable jobs than older workers. When the youth share of the working-age population is high, average match quality is low, and employers with open job positions are more likely to encounter poorly matched workers. Easier recruiting, in turn, leads to higher equilibrium job creation and lower unemployment rates for workers of all ages.
- 2. Human Capital Accumulation:** Fluid labor markets offer abundant opportunities to find a job, prospect for the “right” job, move up a job ladder, satisfy locational constraints, re-enter the labor market, etc. The result is better opportunities and stronger incentives to accumulate market-relevant human capital, increasing earnings capacity and strengthening work attachment. (The effects on employment are especially relevant for younger and marginal workers, and those with limited skills.)
- 3. Other related mechanisms:** discouraged workers, employer screening.

Actual and Predicted Changes in Employment Rates Implied by Changes in Fluidity, 1998-00 to 2010-11, Males, Bartik Reallocation Instruments (Estimation from Diff-in-Diff using State by Year Variation with IV)

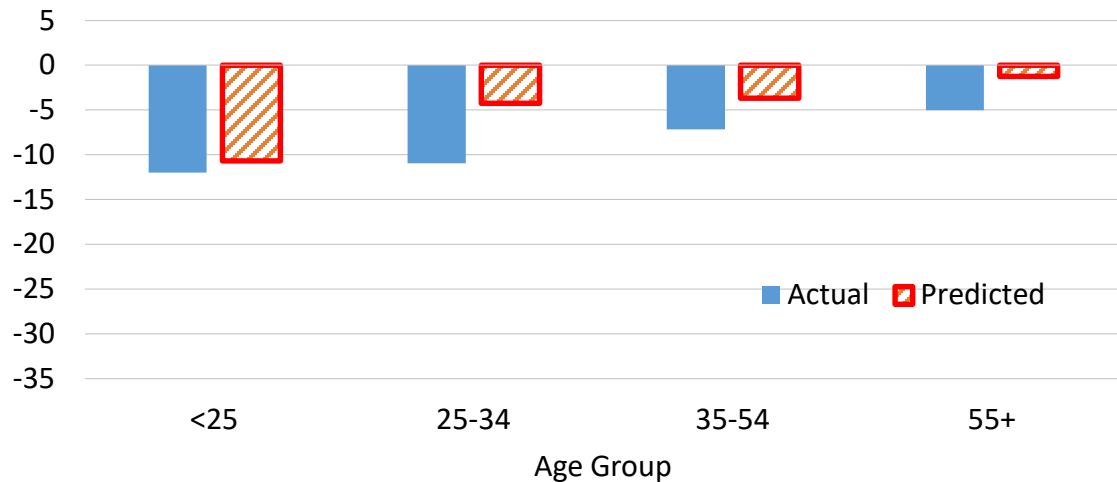
Less than High School



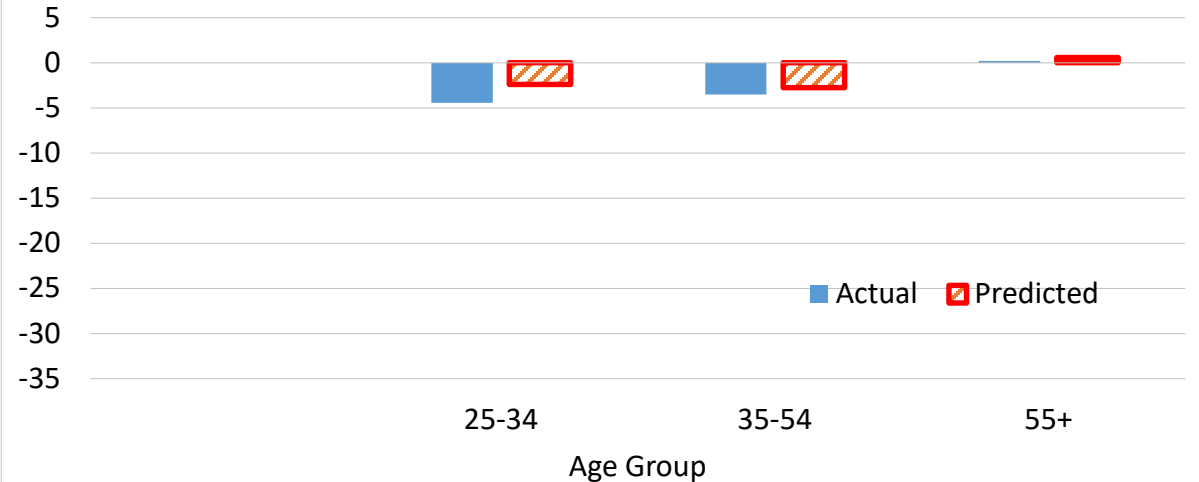
High School



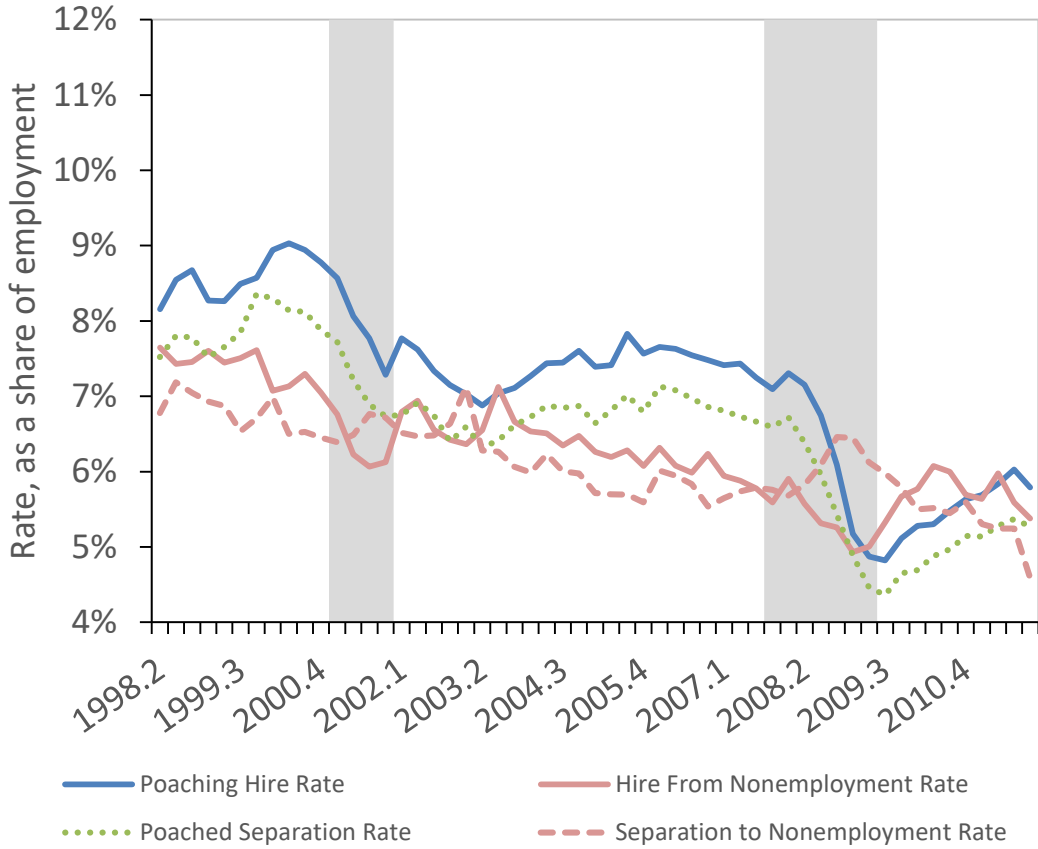
Some College



College



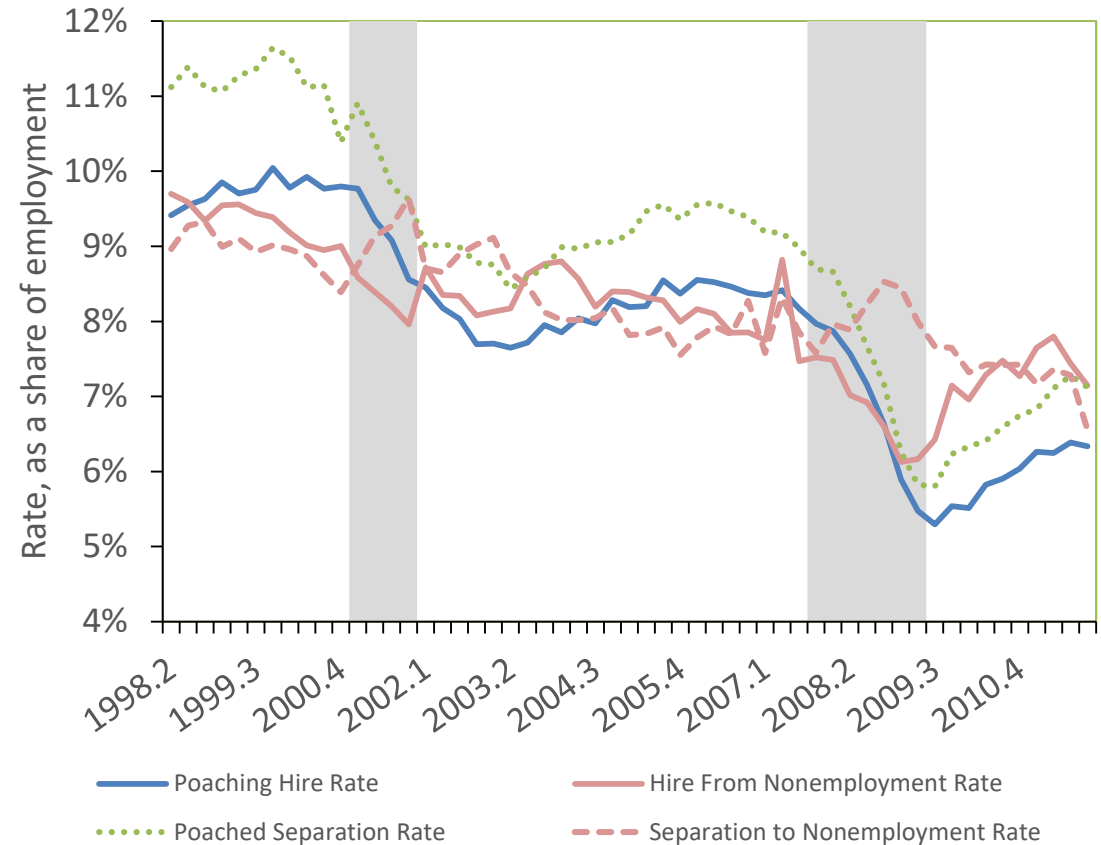
High Productivity Firms (Top Quintile)

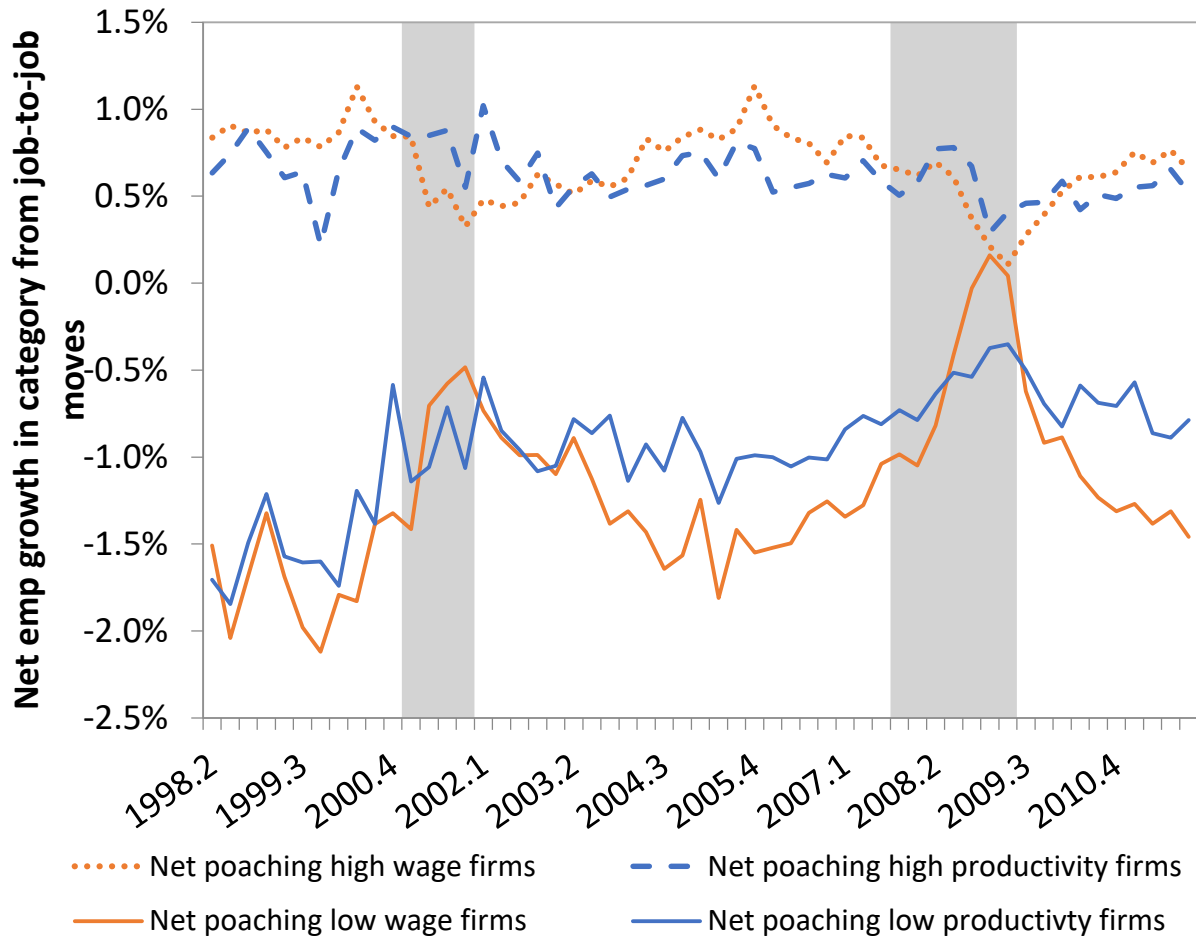


High Productivity Firms have Avg Net (Quarterly) Growth Rate of 0.8 percent. 80 percent from Job-to-Job Flows.

Low Productivity Firms Have Avg Net (Quarterly) Growth Rate of -1.1 percent. 90 percent from Job-to-Job Flows.

Low Productivity Firms (Bottom Quintile)

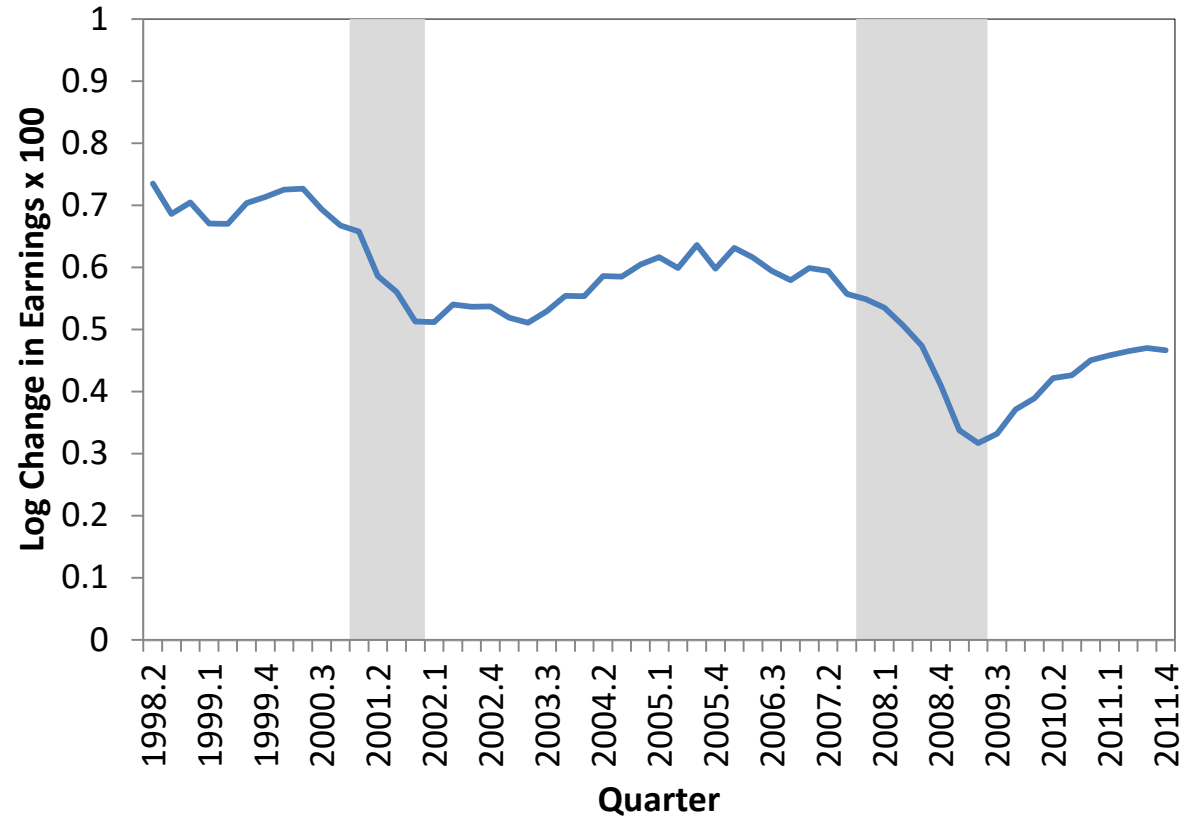




Net poaching patterns for firms ranked by productivity and earnings have very similar patterns. (High wage firms are top two quintiles, low wage firms are bottom quintile)

Source: Haltiwanger, Hyatt, Kahn and McEntarfer (2017) And HHM (2017)

Earnings gains from job-to-job flows that reflect workers moving up the ladder are substantial but have declined over time.



Summary of Key Points

1. **Broad-based declines in U.S. Worker and Job Flows in recent decades**

- Large declines for most demographic groups, especially for younger and less-educated
- Large declines within firm age groups – but declining startups/young firm activity accounts for as much as 30 percent.
- Acceleration of decline since 2000

2. **Reasons for Concern:**

- Worker and job reallocation contribute to productivity and real wage growth
- Evidence suggests that the decline in the flows has been a drag on both productivity and earnings growth.
- Reduced fluidity negatively affects employment, especially for those with limited skills

3. **Why? Full story yet to be written, but multiple forces are at work:**

- Decline in startup rates
 - Implications appear to be very different across sectors (e.g., Retail Trade vs. High Tech)
 - Retail Trade decline due to changing business model – arguably benign change
 - In High Tech, reduction in high growth young businesses
- Policy developments that suppress business dynamism and labor fluidity (e.g., employment-at-will, expansion of occupational licensing, non-compete clauses)

4. **Key Implications for U.S. economic outlook.**