
We prepared the paper for the Federal Reserve Bank of Kansas City’s economic policy symposium on “Re-Evaluating Labor Market Dynamics,” held August 21-23 in Jackson Hole, Wyoming.

– A high-profile conference, and we took the opportunity to draw attention to what we saw as important, and under appreciated, developments in the U.S. economy.

– We had some success in this regard. See, for example, “Fluid Dynamics: America’s famously flexible labor market is becoming less so,” Economist, 28 August 2014.

These notes also include some discussion of later work on the same topic.
Preview of Main Themes

1. **U.S. labor markets became much less fluid in recent decades**
   - Fluidity declines hold across states, industries, firm size and age categories, and demographic groups defined by age, gender and education.

2. **Many contributing factors, including:**
   - Shift of activity to older firms and establishments
   - Shift to larger firms and establishments in some sectors (e.g., Retail Trade)
   - An aging workforce
   - Policy developments that suppress reallocation (e.g., erosion of employment-at-will)

3. **Reasons for Concern:**
   - Worker and job reallocation contribute to productivity and real wage growth
   - Reduced fluidity negatively affects employment, especially for those with limited skills

4. **Key Implication for U.S. economic outlook:**
   - U.S. faced serious impediments to high employment before the Great Recession. A return to sustained high employment unlikely without restoring labor market fluidity
Why We Wrote the Paper

1. The long-term decline of U.S. labor market fluidity is a major, largely unrecognized, development. It gets too little attention in our view. We marshal and extend evidence on the phenomenon, and seek to put it squarely on the research agenda.

2. Our current understanding of why fluidity declined is limited. We take stock of what we know and add some new evidence.

3. Previous research on innovation, productivity growth, labor mobility and real wage growth provide ample grounds for concern about the past and future consequences of reduced fluidity.

4. We consider some of potentially important implications of reduced fluidity for economic performance and policy.
Quarterly Rates of Worker Reallocation, Job Reallocation & Churn, U.S.
Nonfarm Private Sector

Annual Rates of Job Reallocation Across Firms and Establishments, U.S. Nonfarm Private Sector

Worker Reallocation = Job Reallocation + Churn
(Hires + Separations) (Creation + Destruction)
Annual Job Reallocation Rates in Selected U.S. Industry Sectors

- Services
- Retail Trade
- Manufacturing
Changes in Quarterly Job Reallocation, Churn and Worker Reallocation Rates by State from 1999-01 to 2010-12, 30 States Covered by QWI
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
Why the Decline in Labor Market Fluidity?

- A shift to older firms and establishments accounts for a quarter of the decline in job reallocation intensity since the early 1980s.
- A shift to larger businesses played an important role in retail trade.
- Shifts in the industry distribution of employment go the “wrong” way.
- Taken together, shifts in the industry, age and size distribution of employment account for about 15% of the secular drop in job reallocation.
- An aging workforce contributes to the decline in worker reallocation intensity – a bigger factor in the 1980s and early 1990s than 2000s.
- Policy developments also suppressed labor market fluidity:
  - Occupational restrictions in the form of government-mandated licensing requirements grew from 5% of jobs in 1950s to 25% by 2008.
  - Erosion of employment-at-will doctrine.
  - Expansion of protected classes of workers (age, race, disability, etc.).
  - “Job lock” associated with employer-provided health insurance.
  - As yet, we know little about how much these policy factors suppressed fluidity.
Strong Up or Out Dynamics Among Young Firms ➔ Much Greater Job and Worker Reallocation at Younger Firms
Figure A.5: Change in State-Level Worker Reallocation Rates from 1999-01 to 2010-12, Actual and Holding Age and Education Distributions Fixed within States

Note: Authors’ calculations using data from the Quarterly Workforce Indicators. We use the same age and education categories and dating conventions as in Figures 6 and 7.
Figure A.6: Change in State-Level Worker Reallocation Rates from 1999-01 to 2010-12, Actual and Holding Industry Distributions Fixed within States
Erosion of Employment-At-Will Contributed to Fluidity Declines

<table>
<thead>
<tr>
<th>Estimated Effects of Employment-at-Will Exceptions on Annual Job Reallocation Rates, by Firm Size Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firm Size Class, Number of Employees</strong></td>
</tr>
<tr>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Good-Faith Exception</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Implied-Contract Exception</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Public Policy Exception</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Adj. R-Squared</td>
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<tr>
<td>N</td>
</tr>
</tbody>
</table>

* 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.

3. The dummy variables for the employment-at-will exceptions follow Autor et al. (2006). For a given exception and state, the dummy is set to one in the first and later years after the introduction of the exception, and zero in earlier years. The data are taken from http://economics.mit.edu/faculty/dautor/data/autdonschw06.

4. The “Good-Faith Exception” to the employment-at-will doctrine refers to an implied covenant to terminate a worker only in good faith and fair dealing. The “Implied-Contract Exception” refers to an implicit agreement that the employer not terminate a worker without good cause. The “Public Policy Exception” limits the right of the employer to invoke employment-at-will when doing so would violate public policy. See Autor et al. (2006, 2007) for a fuller discussion.
Only 5% in mid 1950s; 10% by 1965,

Examples
Barber, manicurist, florist, funeral attendant, tree trimmer, music therapist, massage therapist, sign language interpreter, taxidermist, auctioneer, travel agent, travel guide, animal trainer, taxi driver, interior designer, and hundreds of others.

See Carpenter et al. (2012).
Occupational Licensing Restrains Geographic Mobility

Figure 1: Difference in Migration Rates of Workers in Most vs. Least Licensed Occupations

Source: Census Bureau, American Community Survey 2010-2013; CEA Calculations. Number is calculated from an OLS regression controlling for race, citizenship, sex, citizenship, number of children, marital status, education, income, year, and state. Ages 25 to 65 were included.

Is Reduced Fluidity Cause for Concern?

1. Beneficial and benign aspects of reduced fluidity:
   A. Less job reallocation means fewer layoffs, smaller unemployment inflows, less frictional unemployment.
      A. This effect is large. See Davis et al. in the 2010 AEJ Macro for a detailed analysis.
   B. Reduced fluidity is partly a by-product of developments that raised productivity and improved welfare: The shift away from small, independent stores to big box retailers (e.g., Wal-Mart) raised productivity, lowered prices, and increased product selection. This shift to larger firms and establishments brought lower rates of reallocation.

2. Reasons for concern:
   A. Reallocation plays a key role in prominent theories of innovation and growth.
   B. Factor reallocation flows are an important source of medium-term productivity growth according to many empirical studies.
   C. Fluidity facilitates job mobility, wage growth and career advancement.
   D. Fluidity promotes high employment. (New evidence in this paper.)
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. My paper with Haltiwanger discusses other mechanisms as well.
Employment Rates by Age for Men with Some College

Males, some college

Employment rate

Age

1977-1979
1987-1989
1998-2000
2009-2011
Male Employment Rates by Age and Education for Selected Periods

Males, less than high school

Males, high school

Males, some college

Males, college or higher
Female Employment Rates by Age and Education for Selected Periods

Females, less than high school

Females, high school

Females, some college

Females, college and higher
How We Assess the Fluid Labor Markets Hypothesis

1. Estimate effects of fluidity on state-level employment rates for groups defined by gender, education, and age.
   - Use variation over time within states and demographic groups

2. Baseline Regression Specification:
   - Three-year averages of all variables
   - Controls for state fixed effects, and for national and state-level cyclical conditions
   - Additional controls for presence of children and young children in the HH

3. Instrument fluidity variables to address measurement error, endogeneity concerns, and retain focus on longer-term effects. Instruments:
   - Share of working-age population 18-24 years old in the state and time period
   - Abundance of less educated persons 25-31 in the state and time period: relative to working-age population, and relative to working-age persons with < HS education.
   - Reallocation intensity measures that derive from national shifts in the industry mix of employment and the state’s legacy industry mix.
Estimating the Effects of Fluidity on Employment Rates

To investigate the relationship of labor market fluidity to Employment and U-Pop rates, we estimate specifications of the form:

\[ Y_{est} = \lambda_{es} + \beta_e \cdot F_{est} + X'_{est} \Theta_e + R'_{st} \Phi_e + A'_t \Omega_e + \varepsilon_{est} \]  \hspace{1cm} (1)

where \( e \) is a demographic group (for example, a specific gender-education-age group), \( s \) is state, \( t \) is time period, \( Y \) is an outcome variable, \( \lambda_{es} \) is a set of state fixed effects fit separately for each demographic group, \( F_{est} \) is the fluidity measure, \( X_{est} \) are controls that vary by demographic group, state, and time period, \( R_{st} \) are controls that vary by state and time period only, and \( A_t \) are controls that vary by time period. The fluidity measure varies by demographic group, state and time period in our main specification. We estimate (1) separately by demographic group, allowing parameter estimates to vary freely across groups. We first estimate by education-gender groups, using the same four education groups as before. Second, we extend the analysis to groups defined by gender, education and age. Our age groups are 18-24, 25-34, 35-54, and 55-64 years old.
Bartik-Like Controls and Reallocation Intensity Instruments

We use three Bartik-like (1991) measures in Section IV. The first is a control for state-level labor demand:

\[ LD_{st} = \sum_{i} \theta_{ist} g_{it}^{\sim s}, \]

where \( LD_{st} \) varies by state \( s \) and time \( t \), \( \theta_{ist} \) are Davis, Haltiwanger and Schuh (1996) (DHS) employment weights for industry \( i \) in state \( s \) at time \( t \), and \( g_{it}^{\sim s} \) is the DHS net employment growth rate at the “national” level for industry \( i \) at time \( t \). DHS weights at the industry-state-time level are the average of employment in \( t-1 \) and \( t \) in the industry and state divided by the average of employment in \( t-1 \) and \( t \) in the state. By “national” we mean the weighted average employment growth rate for all states excluding the own state \( s \) (so the \( \sim s \) superscript refers to all states but \( s \)).
Bartik-Like Controls and Reallocation Intensity Instruments

Our two Bartik-like instruments capture changes over time in state-level reallocation intensities that derive from “national” changes in the industry mix of employment and the industry-level reallocation intensities. Our first state-level reallocation intensity instrument is

\[ IM_{st} = \sum_i \theta_{ist-1} g_{it}^s J_{R_{it}}^s, \]

where \( J_{R_{it}}^s \) is the “national” job reallocation rate for industry \( i \) at time \( t \), excluding the own state contribution to job reallocation. Here, we use lagged industry-level DHS employment weights in the state, since we use this variable as an instrument rather than a control.

Our second reallocation intensity instrument is

\[ IM2_{st} = \sum_i \theta_{ist-1} J_{R_{it}}^s \]
Bartik-Like Controls and Reallocation Intensity Instruments

These two reallocation intensity measures capture somewhat different variation. The second reallocation intensity instrument captures the interaction between the industry-level reallocation intensities in other states (the $JR_{it}^s$ terms) and the state’s own legacy industry structure (the $\theta_{ist-1}$ industry employment shares). The first reallocation intensity instrument also includes changes in the national industry mix of employment (the $g_{it}^s$) as part of the term that interacts with the state’s legacy industry structure. When we use these reallocation intensity instruments, we always include controls for the Bartik-like labor demand measure defined above and all other controls discussed in the main text. Thus, our IV estimation with the reallocation intensity instruments relies on variation in $IM_{st}$ and $IM^2_{st}$ conditional on $LD_{st}$ and other controls to achieve identification of the fluidity effects.
Baseline Regressions – Uniform Slope by Age

Unit of observation: State-level 3-year averages for the indicated demographic groups
Dependent variable: Employment rate in the gender-education group for persons 18-64
Key explanatory variable: Fluidity, as measured by worker reallocation rate
Time Period: 1998-2000 to 2010-11 (Averaging over two years in the last period)

<table>
<thead>
<tr>
<th>OLS Results</th>
<th>Less than High School</th>
<th>High School</th>
<th>Some College</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.27</td>
<td>0.14</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.08)</td>
<td>(0.05)</td>
<td>(0.03)</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>0.15</td>
<td>0.04</td>
<td>0.16</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td>(0.08)</td>
<td>(0.06)</td>
<td>(0.05)</td>
</tr>
</tbody>
</table>
Baseline Regressions – Uniform Slope by Age

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<table>
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<tr>
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<th>High School</th>
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<tbody>
<tr>
<td>Males</td>
<td>0.77</td>
<td>0.61</td>
<td>0.39</td>
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</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.35)</td>
<td>(0.22)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>Females</td>
<td>0.47</td>
<td>0.16</td>
<td>0.41</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.22)</td>
<td>(0.27)</td>
<td>(0.25)</td>
</tr>
</tbody>
</table>
Notes: Standard errors clustered at the state level in parentheses. These results report estimated coefficients from regression specifications with the dependent variable the employment rate and the regressors include a measure of labor market fluidity (the worker reallocation rate) and controls including state effects, the growth rate of national GDP, the deviation of national GDP from the Hodrick Prescott Trend, a state cyclical indicator, and indicators of the number of children in the household. The data are on a state by time period basis where the time periods reflect 3-year non-overlapping periods from 1998-2011 (where years are defined from April to March). The last time period only uses two years (2010-11). Each cell in the above table represents coefficients from a separate regression for the identified cell. The measures of fluidity used are from the QWI and vary by state, time period, education group, and gender. The regressions are employment-weighted using the average (over time) DHS denominator used to compute these fluidity rates. The instruments for the fluidity measure are the share of the working age population in the state 18-24, the share of the working age population in the state that is 25-31 and has less than a high school degree, and the share of the less than high school working age population in the state that is 25-31. No estimates are presented for Age<25 and College.
Actual and Predicted Changes in Employment Rates Implied by Changes in Fluidity, 1998-00 to 2010-11

“Predicted changes” refer to the employment rate changes implied by actual changes in reallocation intensity, according to our IV regression estimates, holding fixed national and state controls for cyclical conditions, state effects, and controls for children under 18 and under 5.
Baseline Regressions – Letting Slopes Differ by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Less than High School</th>
<th>High School</th>
<th>Some College</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>1.43</td>
<td>1.18</td>
<td>0.93</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>(0.59)</td>
<td>(0.67)</td>
<td>(0.54)</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>0.76</td>
<td>0.64</td>
<td>0.37</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.28)</td>
<td>(0.24)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>35-54</td>
<td>0.46</td>
<td>0.41</td>
<td>0.19</td>
<td>-0.13</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
<td>(0.22)</td>
<td>(0.18)</td>
<td>(0.38)</td>
</tr>
<tr>
<td>55+</td>
<td>0.17</td>
<td>0.28</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.25)</td>
<td>(0.18)</td>
<td>(0.35)</td>
<td></td>
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</tbody>
</table>
### Baseline Regressions – Letting Slopes Differ by Age

<table>
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<tbody>
<tr>
<td>&lt;25</td>
<td>1.04</td>
<td>0.57</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
<td>(0.30)</td>
<td>(0.41)</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>0.48</td>
<td>-0.34</td>
<td>0.49</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>(0.21)</td>
<td>(0.30)</td>
<td>(0.26)</td>
<td>(0.39)</td>
</tr>
<tr>
<td>35-54</td>
<td>-0.12</td>
<td>0.32</td>
<td>0.19</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.30)</td>
<td>(0.25)</td>
<td>(0.21)</td>
</tr>
<tr>
<td>55+</td>
<td>-0.01</td>
<td>-0.16</td>
<td>0.10</td>
<td>-0.34</td>
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<td></td>
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<td>(0.30)</td>
<td>(0.39)</td>
</tr>
</tbody>
</table>
Actual and Predicted Changes in Employment Rates Implied by Changes in Fluidity, 1998-00 to 2010-11, Males
### Implied Elasticities for Male Employment Rates with Respect to Worker Reallocation Rates, IV Estimates for the 1998-2011 Sample

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Less than High School</th>
<th>High School</th>
<th>Some College</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>1.36</td>
<td>0.68</td>
<td>0.53</td>
<td>0.12</td>
</tr>
<tr>
<td>25-34</td>
<td>0.49</td>
<td>0.30</td>
<td>0.15</td>
<td>0.09</td>
</tr>
<tr>
<td>35-54</td>
<td>0.32</td>
<td>0.19</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>55+</td>
<td>0.16</td>
<td>0.18</td>
<td>0.06</td>
<td>-0.05</td>
</tr>
</tbody>
</table>
Are These Results Driven by the Great Recession?

Re-estimating our baseline specifications using data that ends in 2007, and projecting pre-GR fluidity trends forward through 2011, we still obtain large effects. For example, taking this approach and repeating the exercise on the previous slide yields a model-predicted decline of 7.4 percentage points from 1998 to 2011 in the employment rate for men with less than a high school education, as compared to an actual decline of 10 percentage points.
Baseline Regressions – Uniform Slope by Age

Unit of observation: State-level 3-year averages for the indicated demographic groups
Dependent variable: Employment rate in the gender-education group for persons 18-64
Key explanatory variable: Fluidity, as measured by job reallocation rate
Time Period: 1987-89 to 2008-10

<table>
<thead>
<tr>
<th>OLS Results</th>
<th>Less than High School</th>
<th>High School</th>
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</thead>
<tbody>
<tr>
<td>Males</td>
<td>0.27  (0.12)</td>
<td>0.14  (0.08)</td>
<td>0.16  (0.05)</td>
<td>0.03  (0.03)</td>
</tr>
<tr>
<td>Females</td>
<td>0.15  (0.09)</td>
<td>0.04  (0.08)</td>
<td>0.16  (0.06)</td>
<td>0.05  (0.05)</td>
</tr>
</tbody>
</table>
Baseline Regressions – Uniform Slope by Age

Unit of observation: State-level 3-year averages for the indicated demographic groups
Dependent variable: Employment rate in the gender-education group for persons 18-64
Key explanatory variable: Fluidity, as measured by *job* reallocation rate
Time Period: 1987-89 to 2008-10

<table>
<thead>
<tr>
<th>IV Results</th>
<th>Less than High School</th>
<th>High School</th>
<th>Some College</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td>0.77 (0.26)</td>
<td>0.61 (0.35)</td>
<td>0.39 (0.22)</td>
<td>0.17 (0.16)</td>
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<td><strong>Females</strong></td>
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<td>0.41 (0.27)</td>
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Notes: Standard errors clustered at the state level in parentheses. These results report estimated coefficients from regression specifications with the dependent variable the employment rate and the regressors include a measure of labor market fluidity (the job reallocation rate from the BDS) and controls including state effects, the growth rate of national GDP, the deviation of national GDP from the Hodrick Prescott Trend, a state cyclical indicator, and indicators of the number of children in the household. The data are on a state by time period basis where the time periods reflect 3-year non-overlapping periods from 1987-2010 (where years are defined from April to March). Each cell in the above table represents coefficients from a separate regression for the identified cell. The measures of fluidity used are from the BDS and vary by state and time period. The regressions are employment-weighted using the average (over time) DHS denominator used to compute these fluidity rates. The instruments for the fluidity measure are the share of the population in the state between 18-24 and a composite measure that is constructed as follows. Reallocation and net employment growth rates are constructed at the national by industry by year basis (excluding the own state). To construct the state by year composite measure, the product of the national by industry reallocation and net employment growth rates are weighted by lagged state-specific employment shares at the industry state year level. No estimates are
In unreported results, we also experimented with a variety of other instrument sets. The QWI-CPS results discussed above are robust to using the reallocation intensity instruments in addition to, or instead of, the demographic instruments. The BDS-CPS results are robust to using only the youth share instrument (share of working age population 18-24), the youth share instrument together with the second reallocation intensity instrument, and the youth share instrument together with the two reallocation intensity instruments. Finally, we tried IV specifications that allow for separate effects of the job reallocation rate and churn rate components of worker reallocation in the QWI-CPS sample. Unfortunately, the data do not provide enough leverage to separately identify distinct effects of these two components of worker reallocation.
Actual and Predicted Changes in State-Level Employment Rates Implied by Changes in Fluidity, 1998-00 to 2010-11, For 30 States Covered by QWI Data

This chart suggests that differences across states in the size of fluidity declines are a factor behind the differences in the evolution of state-level employment rates.

Fluidity Measure = Worker Reallocation Rate
Actual and Predicted Changes in State-Level Employment Rates Implied by Changes in Fluidity, 1987-89 to 1999-01 and 1999-01 to 2008-10, All 50 States

This chart suggests that differences across states in the size of fluidity declines are a major factor behind differences in the long-term evolution of state-level employment rates.

Fluidity Measure = Job Reallocation Rate
Related Evidence from Other Studies

• The available evidence indicates that U.S. employers became less responsive to idiosyncratic shocks in recent decades, not that they experienced a fall in the variability of idiosyncratic shocks.

• Job reallocation rates in high-tech industries rose in the 1990s, cutting against the prevailing pattern, but they fell sharply in these industries after 2000.

• Related, the high-tech sector experienced a large decline in startups and fast-growing young firms after 2000, reversing an earlier pattern.

• The frequency of IPOs in the United States plunged after 2000, following a robust pace of IPOs in the 1980s and 1990s.
Fig. 4: Young Firms (aged five years or younger) as a Share of Total Firms by Sector (1982–2011)

Source: U.S. Census Bureau, BDS and Special Tabulation; authors’ calculations

Initial Public Offerings (IPOs) Plunged after 2000

Summary of Key Points

1. Broad-based declines in U.S. labor market fluidity in recent decades
   - Large declines for most demographic groups, huge for younger and less-educated
   - Sharp drop in fluidity and entrepreneurial dynamism in high-tech since 2000

2. Why? Full story yet to be written, but multiple forces are at work:
   - Shift of activity to older firms and establishments (why is not well understood)
   - Shift to larger firms and establishments in some sectors (e.g., Retail Trade)
   - An aging workforce
   - Policy developments that suppress reallocation (e.g., erosion of employment-at-will)

3. Reasons for Concern:
   - Worker and job reallocation contribute to productivity and real wage growth
   - Reduced fluidity negatively affects employment, especially for those with limited skills

4. Key Implication for U.S. economic outlook:
   - U.S. faced serious impediments to high employment before the Great Recession. A return to sustained high employment unlikely without restoring labor market fluidity
Research Topics (Largely Open Questions)

1. Have most other advanced economies experienced large declines in labor market fluidity in recent decades? Or, is the U.S. an outlier?

2. What explains the long-term decline of fluidity in U.S. labor markets? Quantify the role of specific driving forces and mechanisms. Some recent contributions:

   • “Understanding the 30-year Decline in the Startup Rate: A General Equilibrium Analysis,” Karahan, Pugsley and Sahin, July 2015. My comments on this working paper are appended to the end of these lecture notes.

3. What roles for policy and institutional developments (perhaps as mitigating factors) in the long-term decline of labor market fluidity?
   • Occupational licensing and certification requirements
   • Erosion of employment-at-will
   • Laws that aim to protect workers based on race, gender, age, disability, etc.
   • “Job lock” associated with employer-provided health insurance
   • Declining private sector unionization
   • Minimum wage laws and other government-mandated wage floors
   • Overall rise in the scale and complexity of the regulatory burden.
     • See below for a sketch of evidence and economic reasoning that suggest this effect might be important
Research Topics (Largely Open Questions)

4. How has the “information revolution” affected labor market fluidity?
   • Easier access to credit information, arrest records, social media, etc.
   • Better screening technologies (machine learning methods applied to “big data”)
   • Drug testing
   • Personal testing

5. Why has the U.S. experienced a large shift in economic activity away from younger firms? What, if anything, does that shift portend for innovation and growth?
   • See remarks below on overall rise in scale and complexity of regulatory burdens

6. Do other identification strategies support the conclusion that labor market fluidity promotes high employment? Especially for marginal and less skilled workers?
7. If so, what mechanism or mechanisms link fluidity to employment? Distinguish the youth share/recruitment-cost mechanism in Shimer (2001) from the human capital accumulation mechanism sketched in Davis and Haltiwanger (2014) and other mechanisms.

8. Does fluidity promote life-cycle wage growth and career advancement? If so, how?

9. Develop a theoretical model that links labor market fluidity to human capital accumulation, employment and wage growth.
The Expanding Regulatory State

Some Systematic Evidence

1. Scale and growth of federal regulations
2. Scale of the federal tax code
3. State & local government regulations
   - Example: Expansion in occupational licensing
   - Land-use restrictions. See, e.g., “Housing Constraints and Spatial Misallocation,” by Hsieh and Moretti, 2017
   - Another example, not covered here: Expansion of Certificate-of-Need requirements.
CFR page counts do not include executive memoranda, regulatory guidance, and other regulatory “dark matter.”

In recent years, the CFR contains more than 1 million “commandments”: instances of “must”, “shall”, “may not”, “required” and “prohibited”. Commandments grow roughly in proportion to page counts.

Updated from Davis (2015), who draws on Dawson and Seater (2013) and Crews (2016)
Regulatory “Dark Matter”

CFR page counts underestimate the scale and growth of the regulatory state, because many important pronouncements by the regulators involve “guidance” rather than formal regulations.

As the D.C. Circuit Court observed in Appalachian Power Co. v. EPA (208 F.3d 1019 (D.C. Cir. 2000)):
“The phenomenon we see in this case is familiar. Congress passes a broadly worded statute. The agency follows with regulations containing broad language, open-ended phrases, ambiguous standards and the like. Then as years pass, the agency issues circulars or guidance or memoranda, explaining, interpreting, defining and often expanding the commands in regulations…. Several words in a regulation may spawn hundreds of pages of text as the agency offers more and more detail regarding what its regulations demand of regulated entities. Law is made, without notice and comment, without public participation, and without publication in the Federal Register or the Code of Federal Regulations.”

The U.S. Federal Tax Code

• The scale and complexity of the U.S. tax code also grew dramatically in recent decades. As of 2011, it takes four million words or 70,000 pages (another 52 bibles!) to explain the federal tax code (McCaherty, 2014).

• There were about 4,400 changes to the tax code from 2000 to 2010, 579 changes in 2010 alone.
The U.S. Federal Tax Code

• One reason the federal tax code is so large and complex is because policy makers (and citizens) insist on using it to bestow financial favors on certain activities and groups.

• “Tax expenditures” – tax revenues foregone because of rules that grant tax breaks under particular conditions and for certain taxpayers – in FY 2015 were about $1.4 trillion. By way of comparison, all direct federal spending was about $3.5 trillion in 2014.
Breeding Complexity and Uncertainty

Some Evidence

1. 10Ks: Regulation is a growing source of business risks
2. Newspapers: An upward drift in policy uncertainty
3. Newspapers: Narrower measures
   - Healthcare Policy Uncertainty Index
   - Financial Regulation Uncertainty Index
Regulation as a Source of Business Risks: Using 10-K Filings to Quantify Its Importance

• Since 2006 (for FY 2005) the SEC has required most publicly held firms to include a separate discussion of “Risk Factors” in Part 1a of their annual 10-K filings.

• In explaining “How to Read a 10-K” at [www.sec.gov/answers/reada10k.htm](http://www.sec.gov/answers/reada10k.htm), the SEC describes Part 1a as follows:
  – **Item 1A - “Risk Factors”** includes information about the most significant risks that apply to the company or to its securities. Companies generally list the risk factors in order of their importance. In practice, this section focuses on the risks themselves, not how the company addresses those risks. Some risks may be true for the entire economy, some may apply only to the company’s industry sector or geographic region, and some may be unique to the company.

• **Quantification**: (a) Calculate the share of sentences in Part 1a of each 10-K filing that contains one or more regulation-related terms. (b) Compute the cross-firm average of this share by filing year. Plot the resulting time series.
Regulation and Other Government Policy Matters Account for a Growing Share of Business Risks, According to 10-K Filings

Note: In addition to regulatory matters, “All Government Policy Risks” includes those related to fiscal policy, monetary policy, entitlement and welfare programs, trade policy and more.
An Upward Drift in U.S. Economic Policy Uncertainty

Newspaper-Based Index of Economic Policy Uncertainty (EPU)

EPU Scaled by the Number of Articles About Economy, Business and Industry

Source: Baker et al. (2014), based on a balanced panel of six newspapers. Data are annual averages of monthly values from 1949 to 2012.
Healthcare Policy Uncertainty Index, 1985 Q1 to 2016 Q4, Quarterly

Notes: The index reflects the frequency of newspaper articles about economic policy uncertainty and healthcare policy matters, as indicated by terms like "healthcare," "hospital," "health insurance," and "Medicare." Data are from Baker, Bloom, and Davis (2016) and are available and updated at www.PolicyUncertainty.com. Normalized to a mean of 100 from 1985 to 2009.
Financial Regulation Uncertainty Index, 1985 Q1 to 2016 Q4, Quarterly

Disproportionate Regulatory Burdens On Smaller and Newer Businesses?
Yes, despite some small-firm exemptions. Why? Three basic reasons:

1. Scale economies in compliance $\rightarrow$ higher compliance costs per unit of output (or per worker) at smaller firms
2. One-time costs of learning relevant regulations, establishing relationships with regulators, and developing compliance systems $\rightarrow$ favoring incumbents over entrants
3. Larger, established firms have greater capacity & incentive to lobby for legislative exemptions, administrative waivers, and favorable regulatory treatment.

Points 1 & 2 also imply that regulatory and tax complexity deter large, mature firms from expanding into new markets, products, etc. Thus, tax and regulatory complexity also soften competitive pressures and repress creative destruction more broadly.
Employment in firms less than five years old fell from about 18% of private sector employment in 1981 and 1987-1988 to 8.2% in 2013. “Young” means < 60 months since the firm’s first paid employee as of March in the indicated calendar year.
Understanding the 30-Year Decline in the Startup Rate: A GE Approach
By Fatih Karahan, Ben Pugsley and Aşegül Şahin

Comments by Steven J. Davis
Chicago Booth & NBER
faculty.chicagobooth.edu/steven.davis/

Macroeconomics & Productivity
NBER Summer Institute
July 2015
Overview of My Main Points

1. The Hopenhayn (1992) mechanism, whereby slower LS growth yields lower business entry rates, is plausible and finds support in the authors’ study. Issues:
   – Robustness to other entry measures
   – Threats to identification, because LS growth can also affect entry and dynamism through other mechanisms

2. How important is this mechanism for the overall drop in business dynamism? Quite modest, in my view:
   – Need hybrid model (e.g., Hopenhayn + Jovanovic) for LS growth to capture negative relationship of dynamism to business age and get potentially big effects of LS growth on broader business dynamics (not just on entry).
   – Previous empirical work suggests that even hybrid model can explain, at most, one-quarter of overall drop in U.S. business dynamism since the early 1980s.
Overview of My Main Points

3. Bounding explanatory potential of H and HJ models:
   – Rightward shift in age distribution of employment accounts for 20-25% of secular decline in business volatility according to calculations in Davis et al. (2006) and Decker et al. (2014).
   – Authors’ estimate that Hopenhayn mechanism accounts for about 25% of secular decline in entry rates (more with corrections for anticipation bias).
   – Entry margin itself is only small part of larger HJ model story.

4. Much evidence points to other forces in play for both entry rates and business dynamism more broadly.

5. Accepting authors’ results and interpretations at face value does not diminish (my) concerns about the labor market consequences of secular declines in business dynamism and labor market fluidity. See DH (2014).
How to Measure Entry?

Authors’ choice: annual flow of new firms with one or more employees

• Better to weight by size/activity, in my view.
• Firm or establishment entry? Does it matter much, in practice? Probably not.

Other readily available LBD entry measures:

1. Gross job creation at new firms (or estabs) as % of employment – a size-weighted entry rate
2. Share of employment at young firms and at young establishments
Population Aging and Business Dynamism

**Hypothesis:** Aging societies are more likely to adopt policies that hamper business entry & adjustment.

**Why this hypothesis is plausible:**

1. Regulatory barriers to entry become less costly as the need for entry diminishes.
   - Hopenhayn mechanism implies less need for entry as society ages and labor supply growth slows

2. Political economy: “Incumbent” firms & workers have more political clout in an older society.
   → More occupational licensing, restrictions on firing, barriers to product market competition, etc.
A Threat to Identification?

Authors’ IV Strategy: Use 20-year-ago birth rates to instrument for current LS growth rates.

If this hypothesis is correct (and the effects are material), does it undermine identification?

No: If the goal is to evaluate the impact of LS growth on business entry rates, regardless of the mechanism(s) through which LS growth matters.

Yes: If the goal is to evaluate the impact of labor supply growth working through the mechanism highlighted in Hopenhayn (1992).
A Threat to Identification?

The authors’ Table 11 includes a crude control for the age composition of the population. It goes part way to address the threat to identification associated with the foregoing hypothesis; the authors motivate the age composition control based on a very different story.

Question: Do the authors’ main results survive with a (much) richer set of controls for the age structure of the population? Perhaps a rich set of age structure controls reduces power too much.
More on Identification

**Question**: Must we isolate variation in LS growth that is exogenous with respect to geographic mobility of persons to assess the strength and role of the Hopenhayn mechanism?

I think not. Any amenity shifter that operates differently across regions (e.g., air con effect in the South) induces population flows, but the Hopenhayn mechanism still operates. Similar remarks pertain to region-specific neutral TFP shocks. We need a multi-region version of Hopenhayn (1992) to fully address this matter.
Literature Notes and Context

• Davis et al. (2006, NBER Macro Annual), using the LBD, first documented the secular decline in U.S. business dynamism:
  – For firms and establishments
  – For volatility and dispersion of business growth rates, excess job reallocation, sum of entry & exit
  – Across all industries

• They overturned the prior view (based on unrepresentative data sources) that business dynamism had been rising secularly.

• Davis et al. (2010, AEJ Macro) and DH (2014) provide additional evidence and consider implications for labor market performance.
Note: “Firm Volatility” reports the employment-weighted mean volatility of firm-level growth rates, measured as the standard deviation of annual employment growth rates in a moving 10-year adjustable window (“adjustable” to retain entrants and exits).

Reproduced from Davis et al. (2006).
"Firm Volatility" reports the employment-weighted mean volatility of firm-level growth rates, measured as the standard deviation of annual employment growth rates in a moving 10-year window (with window adjustments to retain entrants and exits).

Reproduced from Davis et al. (2006).

### Table 4: Employment Shares and Volatility by Firm Age, Privately Held Firms

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1982 Age-Specific Volatilities Evaluated at the 2001 Age Distribution of Employment: 0.57
Percentage of 1982-2001 Volatility Decline Accounted for by Shift to Firms 6+ Years Old: 19.6
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Note: “Firm Volatility” reports the employment-weighted mean volatility of firm-level growth rates, measured as the standard deviation of annual employment growth rates in a moving 10-year window (with window adjustments to retain entrants and exits).

The age distribution of employment shifted out accounting for about one-fifth of the overall drop in business dynamism.

Reproduced from Davis et al. (2006).
Employment Has Continued to Shift Toward Older Firms

Figure A.1: Employment Share of Firms Five Years Old or Younger, United States, 1982-2011

Reproduced from Davis and Haltiwanger (2014).
Note: “Firm Volatility” reports the employment-weighted mean volatility of firm-level growth rates, measured as the standard deviation of annual employment growth rates in a moving 10-year window (with window adjustments to retain entrants and exits).

Reproduced from Davis et al. (2006).
Evidence That Other Forces Are Also in Play (A Partial List)

1. The authors estimate that about one-quarter of the secular decline in firm entry rates is due to the decline in labor supply growth rates (more when accounting for anticipation effects).

2. Business volatility fell secularly, conditional on business age (Davis et al., 2006).

3. U.S. manufacturing plants became less responsive to idiosyncratic TFP shocks in recent decades (Decker et al., 2014).
   - And the intra-industry dispersion of plant-level TFP drifted upward since the early 1990s, which also suggests less responsiveness.
Evidence That Other Forces Are Also in Play (A Partial List)

4. State-level exceptions to employment-at-will led to lower job reallocation rates (DH, 2014).

5. Large secular increase in occupational licensing restrictions (Kleiner & Krueger, 2013).
Papers Cited


