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New Hires Quality Index

Brad J. Hershbein

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A Quality Index for New Job Hires

Brad Hershbein

W.E. Upjohn Institute for Employment Research

May 2017

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 - But by industry, not occupation or much else
- There are also considerable wage data for workers
 - But almost always for incumbents, not new hires
- The result is that we don't know much about the “quality” of new jobs

Motivation

- Understanding characteristics of new jobs, and workers in them, of key concern
 - An important coincident, and perhaps leading, indicator
 - Provides insight into cyclical labor markets
 - Can shed light on structural changes in skill demand

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 - Wage is often a useful summary statistic, but...
 - Other nuances important, especially volume of new hires
 - How much detail is possible? Useful?

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- **Goal: Create a new index of job hires quality**

Occupations vs. Industries

- Economic literature has long recognized that what one does affects compensation more than where one does it
 - Roy (1951); Houty (1958, 1961); Groshen (1991)
 - And now task-based models of human capital: Spitz-Oener (2006); Gathmann & Schoenberg 2010; Acemoglu & Autor (2011); Autor (2013)

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- Mincer-style wage regressions show that occupations explain 2–4 times the variance of industries, even with additional controls
- Despite this, armchair analysis on wages of new jobs is often based on industry, not occupation
 - Unlike for industries, no high-frequency occupation-level releases...
 - Result is lamp-post inference



National Employment Law Project

DATA BRIEF

April 2014

The Low-Wage Recovery:

Industry Employment and Wages Four Years into the Recovery

Most jobs added in Boston since recession called low-paying

By Katie Johnston | GLOBE STAFF | SEPTEMBER 22, 2015

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The Washington Post

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To do this, she divided businesses into three groups by their pay. Today’s average hourly pay is \$25. Low-paying employment is dominated by restaurant and hotel jobs (2015 average hourly rate: \$14.12) and retail jobs (\$17.21). Midlevel jobs include manufacturing (\$23.90), health care and education (\$24.97) and construction (\$26.91). Finally, high-paying jobs included professional and business services (\$29.59), finance (\$31.10) and utilities (\$36.02).

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The Upshot

EVERYDAY ECONOMICS

Justin Wolfers @JustinWolfers

There are many highly paid managers working in the low-paid retail trade sector, just as there are many low-paid janitors working in the high-paid professional services sector

Figuring out whether the recovery is creating “good jobs” or “bad jobs” requires looking deeply into skill levels and job responsibilities

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Exactly. Why not do this?

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- Detailed occupation in CPS merged with OES occupational wage data via SOC crosswalks
 - Overcomes some weaknesses of self-reported CPS wage data
 - Automatically adjusts for inflation

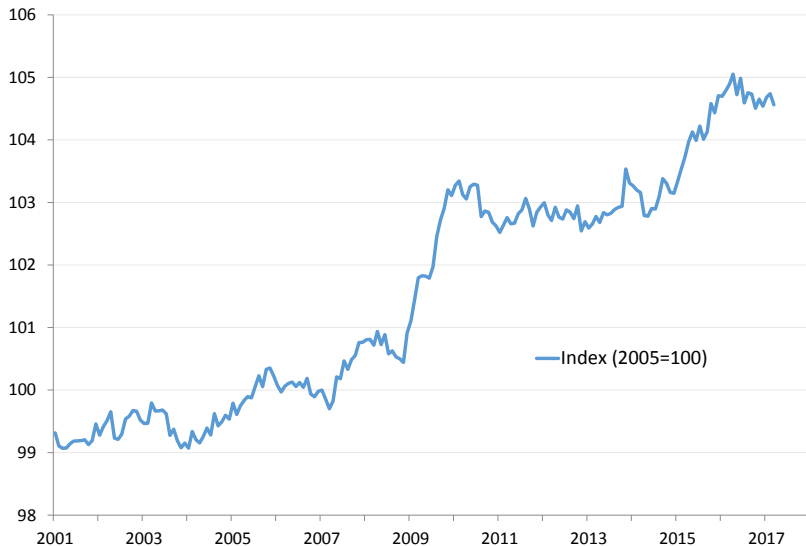
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 - Overcomes some weaknesses of self-reported CPS wage data
 - Automatically adjusts for inflation
- Resulting index shows change in realized skill demand through *changes in occupation mix*
 - Adjust for new-hire demographics, but not within-occupation skill changes
 - compare with self-reported wages to understand differences
 - Also yields hire volume, and index for many subgroups

Summary of findings

- 1 Hourly wage index is up nearly 5 percent from 2005

New Hires Quality Index: Hourly Wages



SOURCE: Upjohn Institute New Hires Quality Index

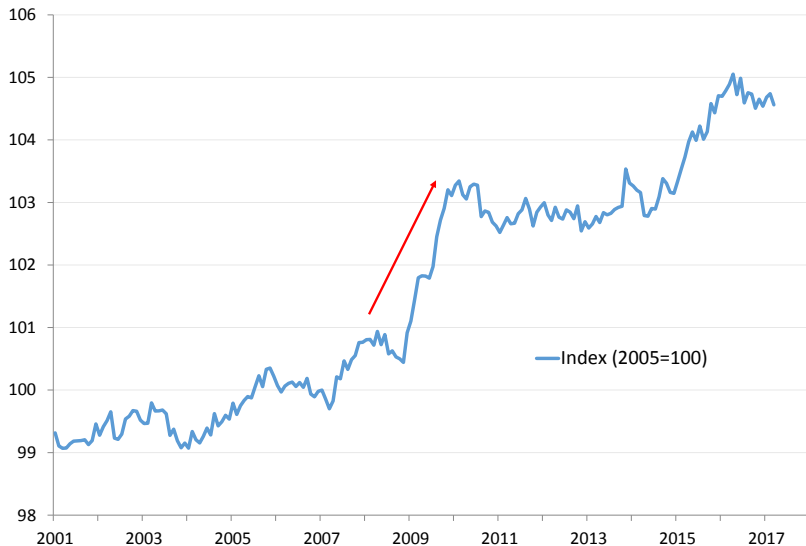
NOTE: Wage index is based on a 12-month lagged moving average of monthly data

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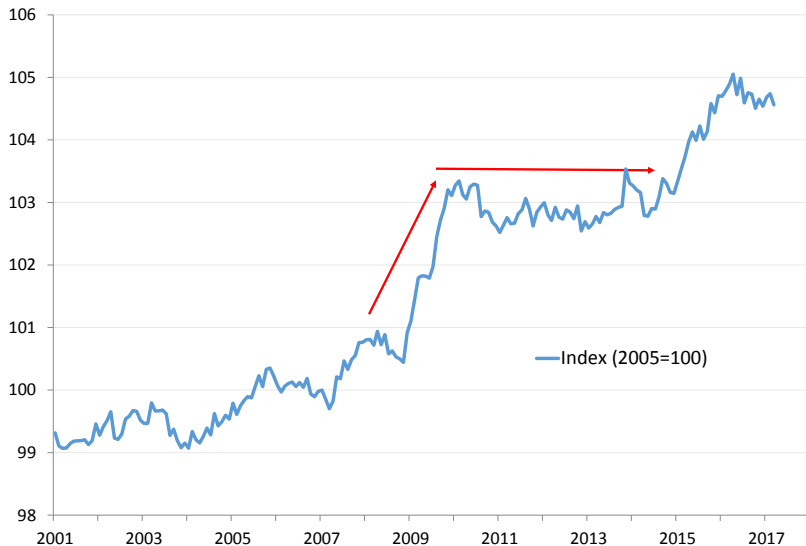


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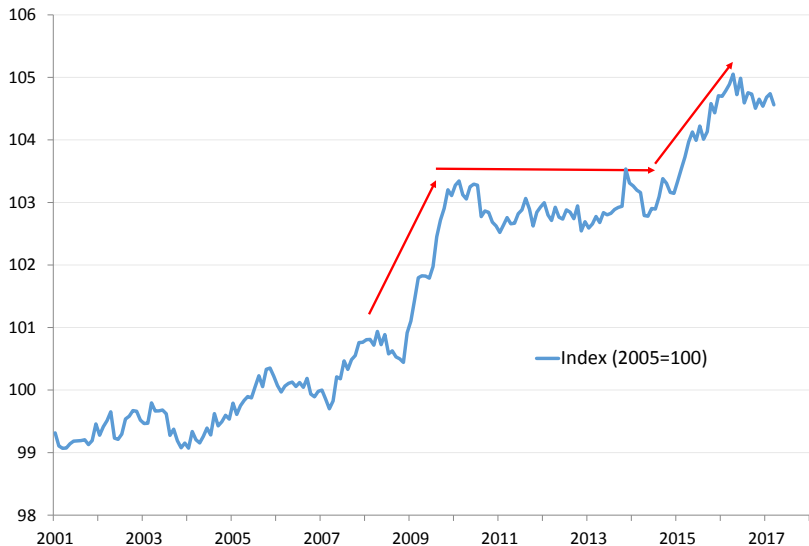


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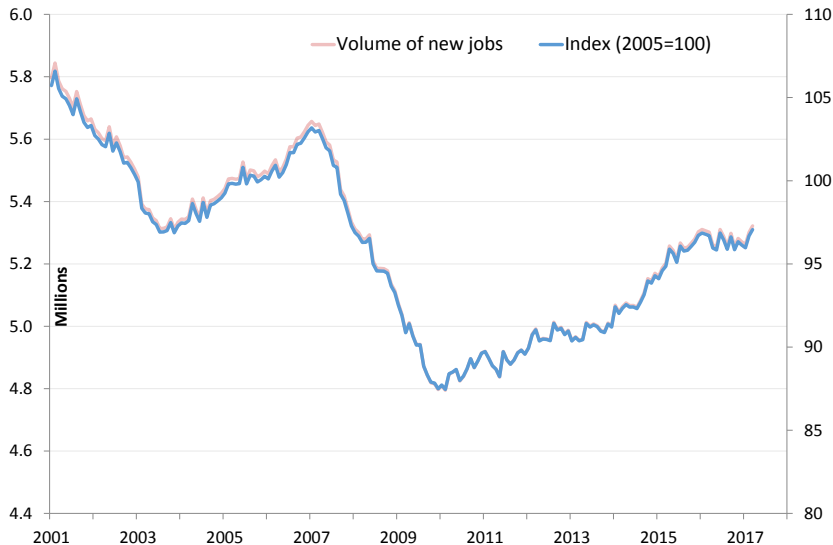
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New Hires Quality Index: Monthly Volume



SOURCE: Upjohn Institute New Hires Quality Index

NOTE: Wage index is based on a 12-month lagged moving average of monthly data



New Hires Quality Index: Monthly Wage Bill

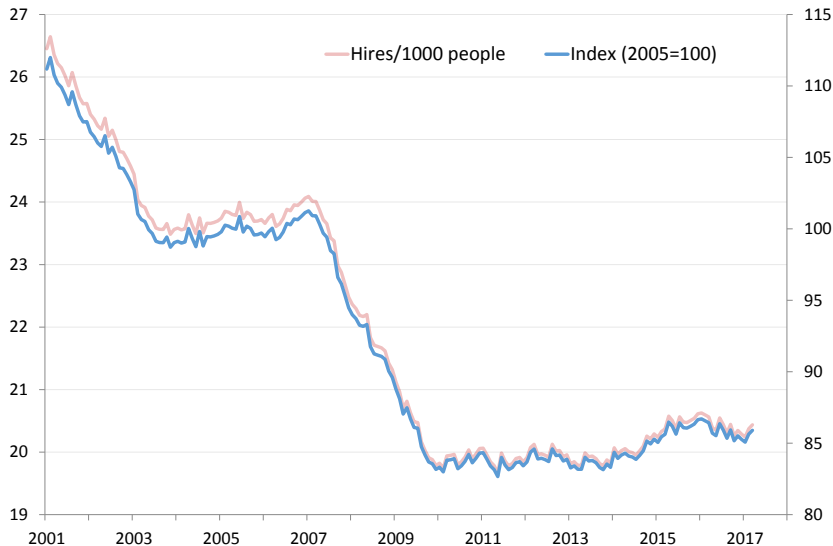


SOURCE: Upjohn Institute New Hires Quality Index

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New Hires Quality Index: Hires per capita



SOURCE: Upjohn Institute New Hires Quality Index

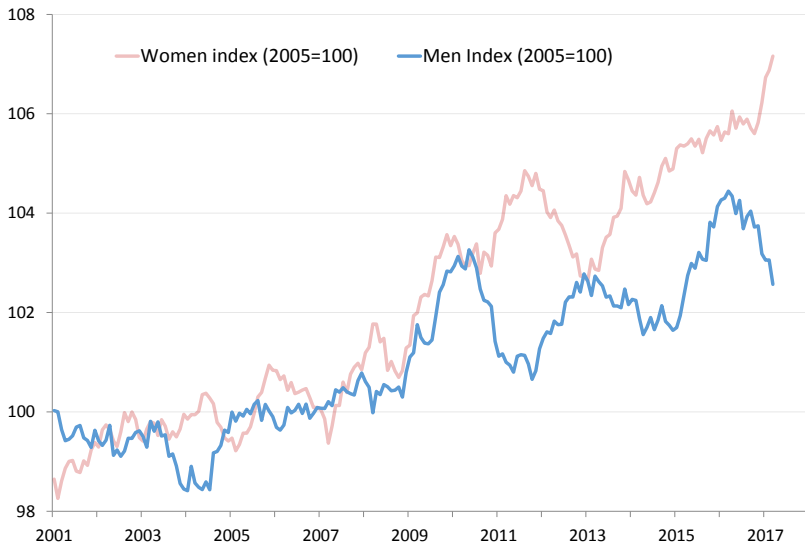
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New Hires Quality Index: Women and Men

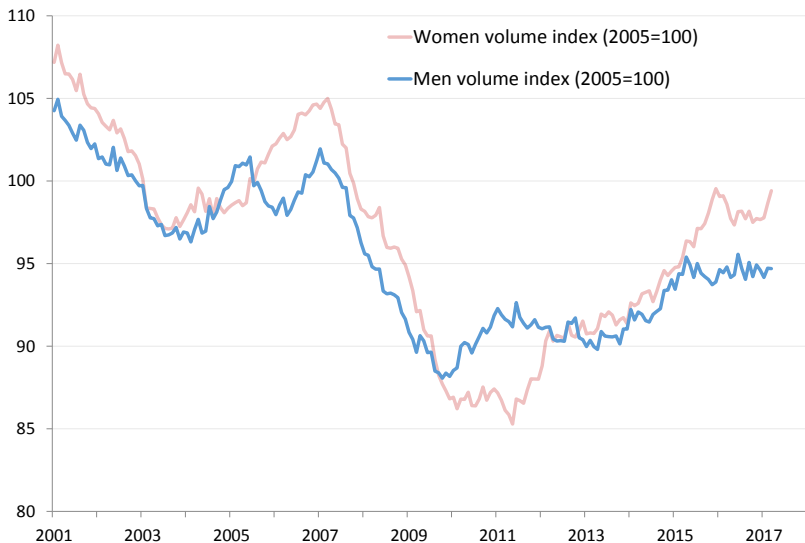


SOURCE: Upjohn Institute New Hires Quality Index

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New Hires Quality Index: Women and Men, volume



SOURCE: Upjohn Institute New Hires Quality Index

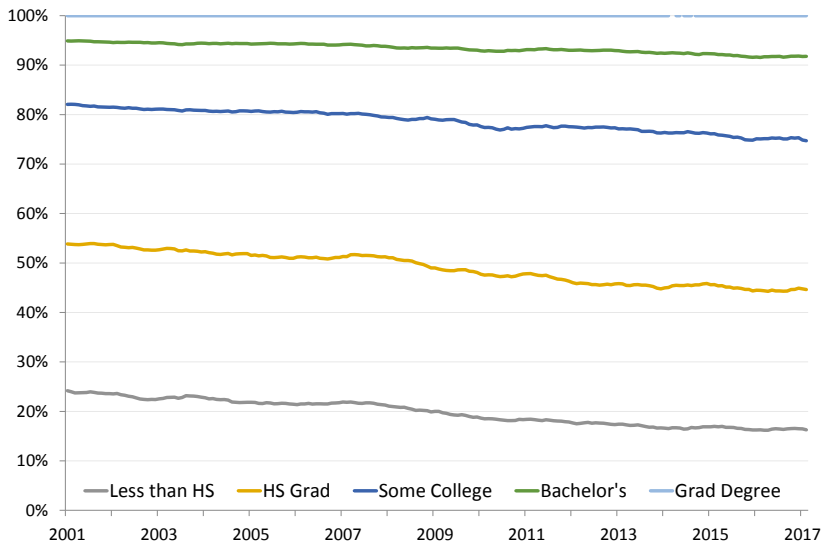
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New Hires Quality Index: Volume by education

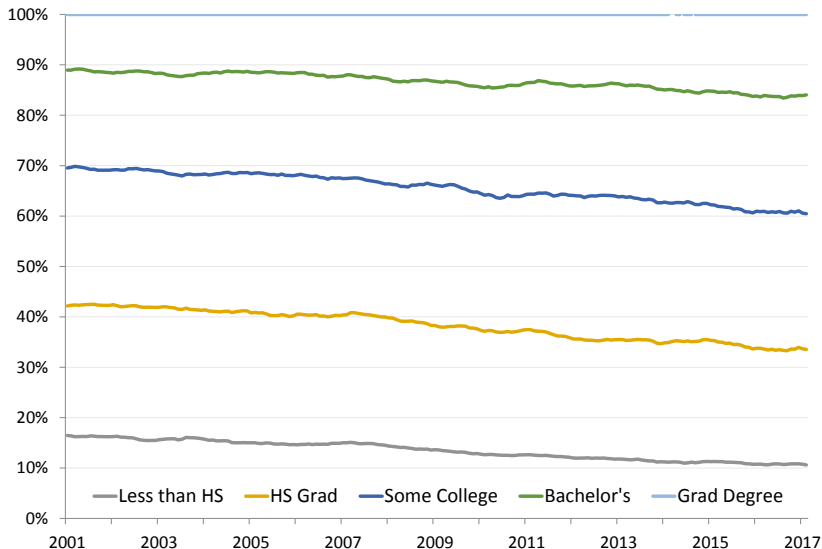


SOURCE: Upjohn Institute New Hires Quality Index

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New Hires Quality Index: Wage bill by education



SOURCE: Upjohn Institute New Hires Quality Index

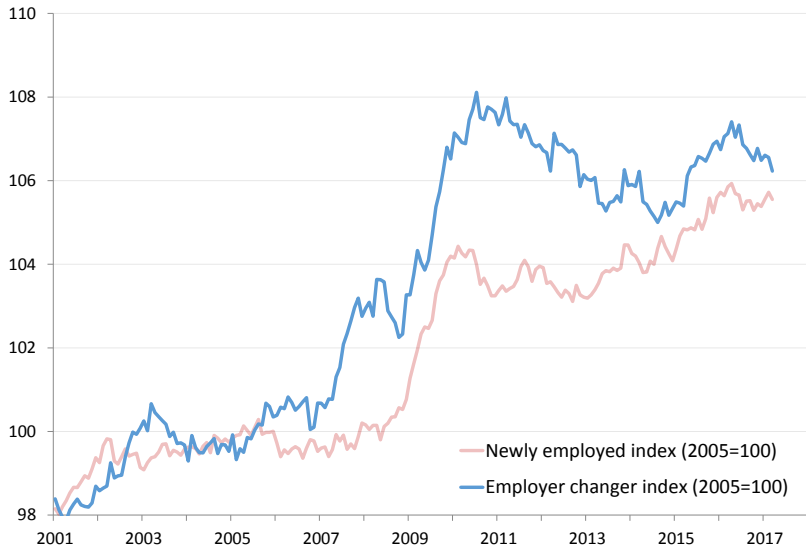
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- 5 In 2005, college graduates accounted for one-fifth of all hires; in 2016, they accounted for one-fourth
- 6 Wage index gains have been comparable for newly employed and employer changers, but volume growth of former vastly outpaces that of latter

New Hires Quality Index: Index by Hire Type

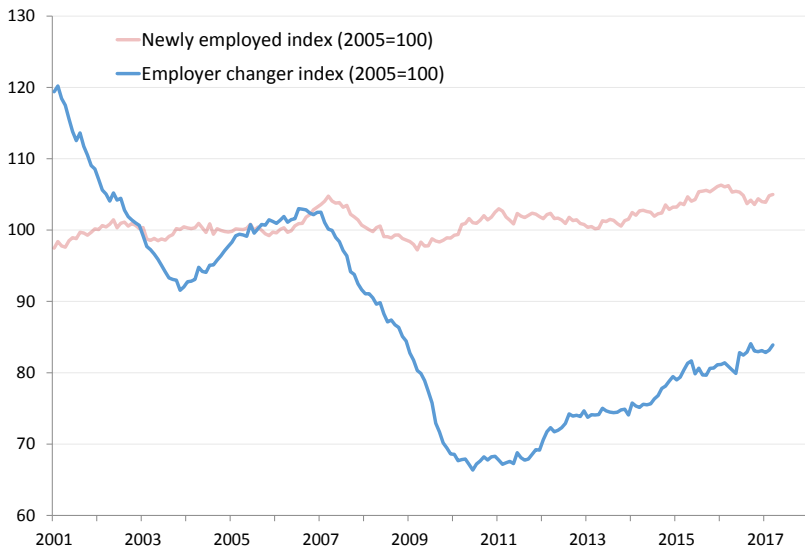


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New Hires Quality Index: Volume by Hire Type



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- 1 Methodology
- 2 Robustness
- 3 What about actual reported wages?
- 4 Subgroups
- 5 Conclusions

Methodology: CPS1

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- Still, will check SIPP(?) to gauge magnitude of new hires who change residences
 - Probably positively selected...

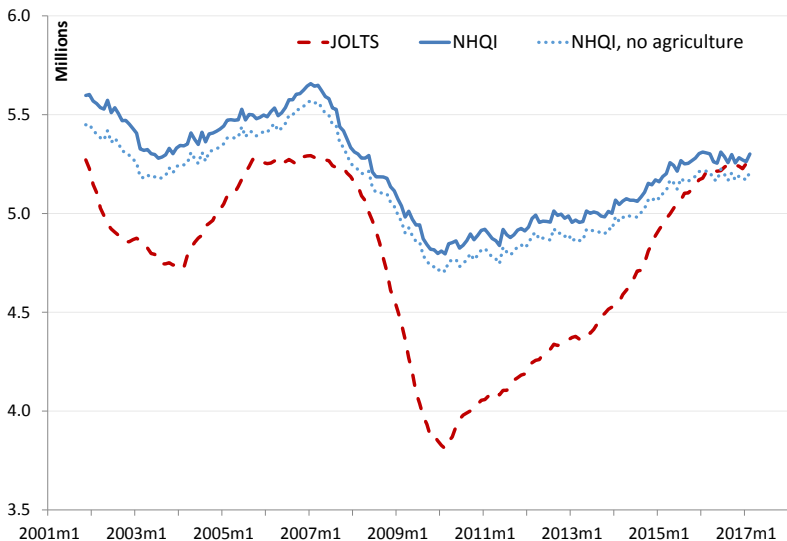
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- Weighted aggregates compare reasonably well with JOLTS, but less cyclical
 - Conceptual differences, and JOLTS undercounts relative to QWI

CPS New Hires Volume vs JOLTS



SOURCE: Upjohn Institute New Hires Quality Index; JOLTS (BLS)

NOTE: Both measures based on a 12-month lagged moving average of NSA monthly data



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 - Will not count occupation changes with same employer (ignore internal labor market); too arbitrary and problematically measured
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- Simple correlation is 0.92, and some conceptual differences in samples (reference period, unpaid leave, informal work)

Methodology: CPS3

- Need to harmonize occupation codes over time
 - From 1994 through 2002 → 1990 Census codes
 - From 2003 through 2010 → 2000 Census codes
 - From 2011 to current → 2010 Census codes

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- The 2011 → period is straightforward...

Methodology: CPS4

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- But need to map 2000 SOCS → 2010 SOCS
 - Some simple 1:1 recodes or combinations, but also several splits
 - For splits, randomly assign based on empirical shares from ACS over 2010–2012
- These adjustments are minor, as most splits are into similarly paid occupations
 - Many splits into same 5-digit SOC, a few into same 4-digit SOC

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- Thus, focus on 2000 → period

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- Much easier than trying detailed NAICS crosswalk
- Census industry codes map into 3-digit NAICS easily in 2003 → period
- In pre-2003 period, mapping isn't exact, but still quite good
 - And CPS extracts solve 2000–2002 period

Methodology: OES

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 - At national level, available at cross of 6-digit SOC and 2-6 digit NAICS
 - Also available at MSA, state, and some state-industry levels

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- Merge on 6-digit SOC by 2-digit NAICS
 - Hierarchical process; use coarser SOC for unsuccessful matches

Methodology: Demographic Adjustment

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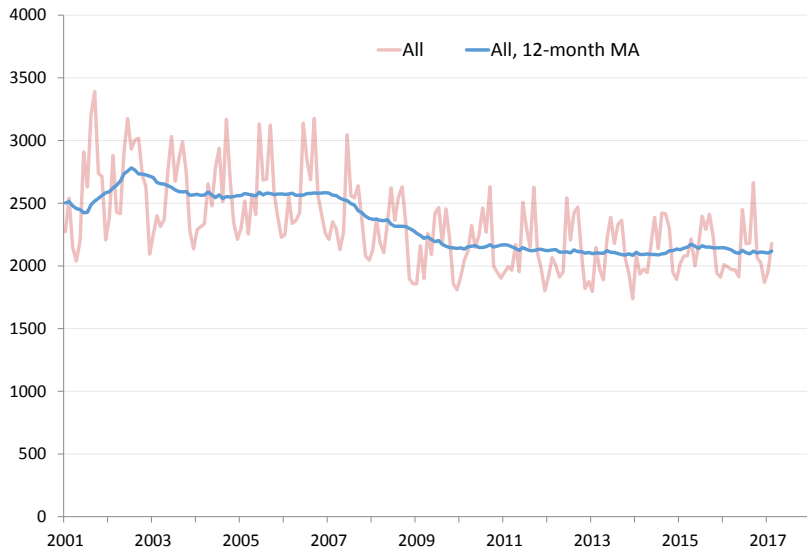
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- Desirable to adjust for these types of demographic differences in new hires, within occupation
- Use data on actual, valid self-reported (log hourly) wages to estimate adjustment factors
 - 1st: regress wages on non-demographics (time, worker type, hire type, occupation, industry)
 - 2nd: regress residuals, separately by 4-digit SOC, on sex, race, education, and quartic in age
 - 3rd: Use predicted values to adjust OES wages

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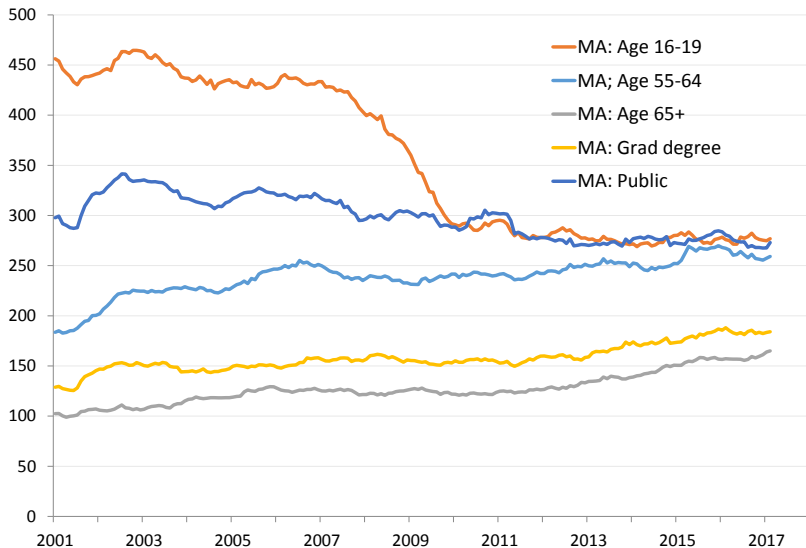
New Hires Quality Index: Sample Size Over Time



Source: Upjohn Institute New Hires Quality Index; CPS

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New Hires Quality Index: Sample Size, by group



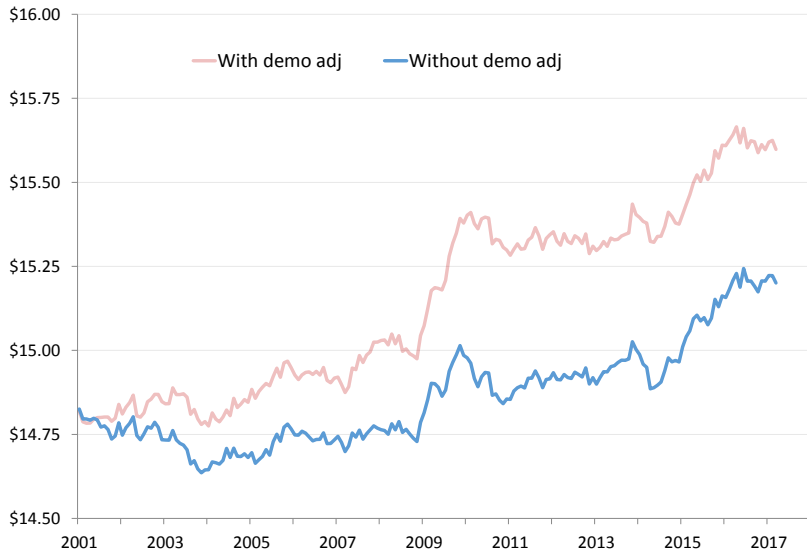
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- Taking means weights right-tail occupations more heavily
 - Could look at quantiles, too

Robustness: Demographic adjustment

- Adjustment is mostly a level shift up, overall, and again after recession
- Hires in highly paid occupations are older and more educated
- Also permanent(?) shift in hiring demographics after GR (Hershbein and Kahn 2017)

NHQI: Robust to Demographic Adjustment

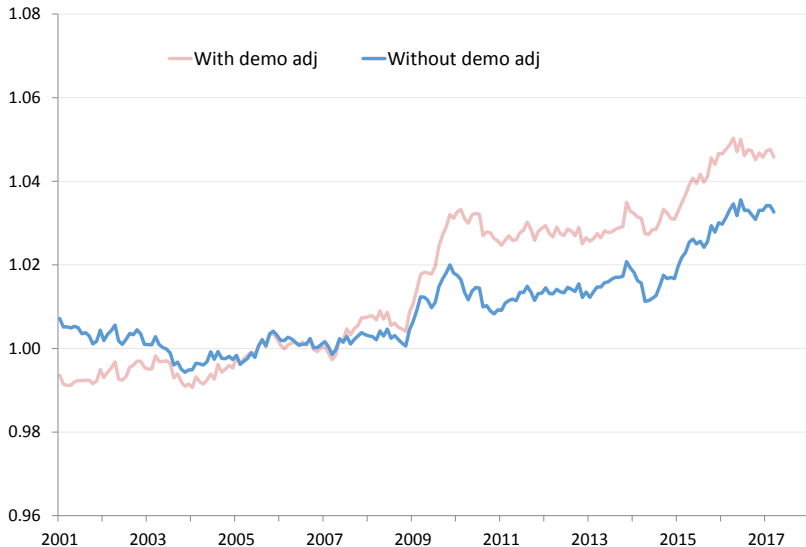


SOURCE: Upjohn Institute New Hires Quality Index

NOTE: Wage index is based on a 12-month lagged moving average of monthly data



Robustness: Robust to Demographic Adjustment



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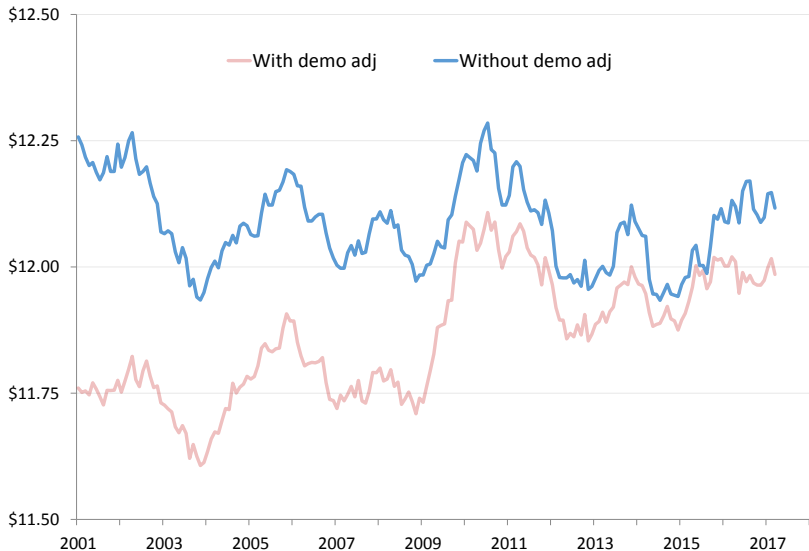
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Robustness: Median vs Mean

- Adjustment is mostly a level shift up, overall, and again after recession
 - Hires in highly paid occupations are older and more educated
 - Also permanent(?) shift in hiring demographics after GR (Hershbein and Kahn 2017)
- Can also take *median* instead of mean of new hires
 - Without demo adjustment, not very interesting...
 - Captures **only** change in median occupation hired
 - Even with demo adjustment, misses rest of distribution

Robustness: Median



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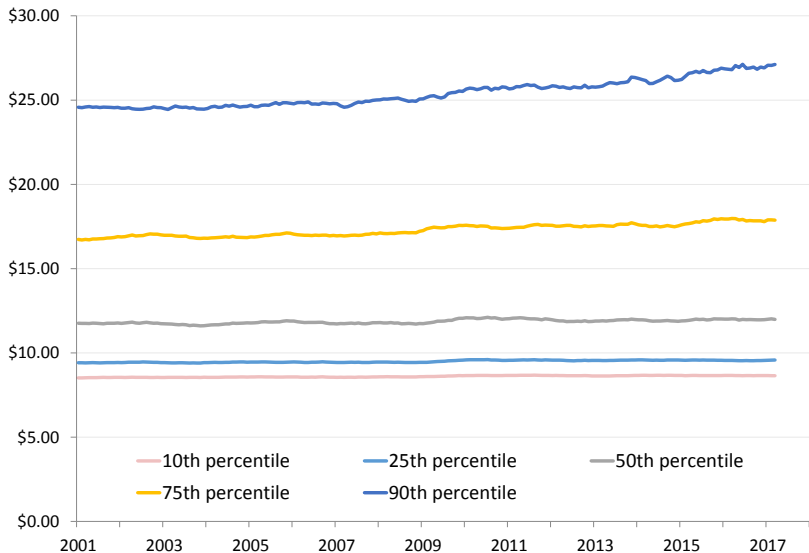
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- Growth is concentrated in right-tail occupations

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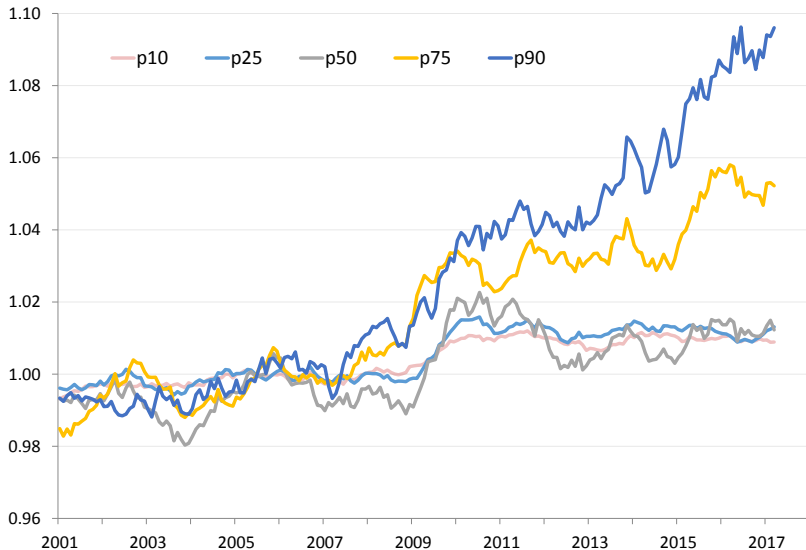


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Robustness: Quantiles (Index: 2005=1)

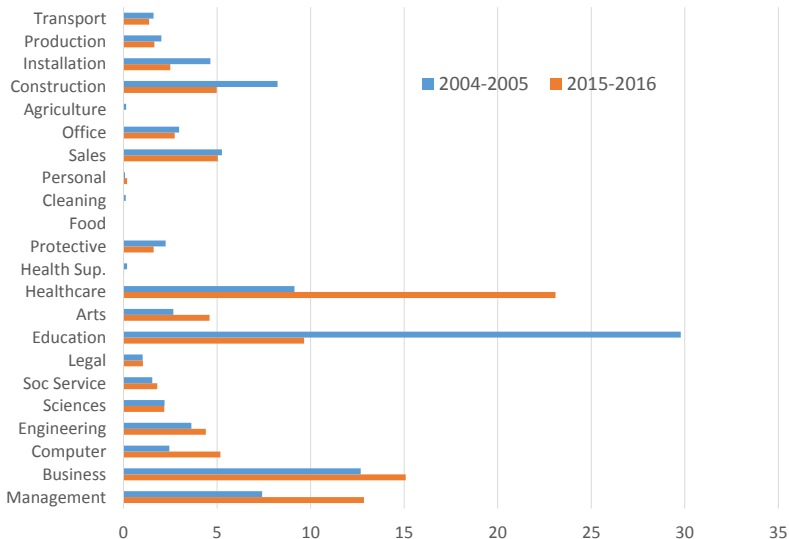


SOURCE: Upjohn Institute New Hires Quality Index

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Occupational Distribution at 90th percentile



SOURCE: Upjohn Institute New Hires Quality Index; CPS

NOTE: Data are for 89th–91st percentile of wage index for years shown.



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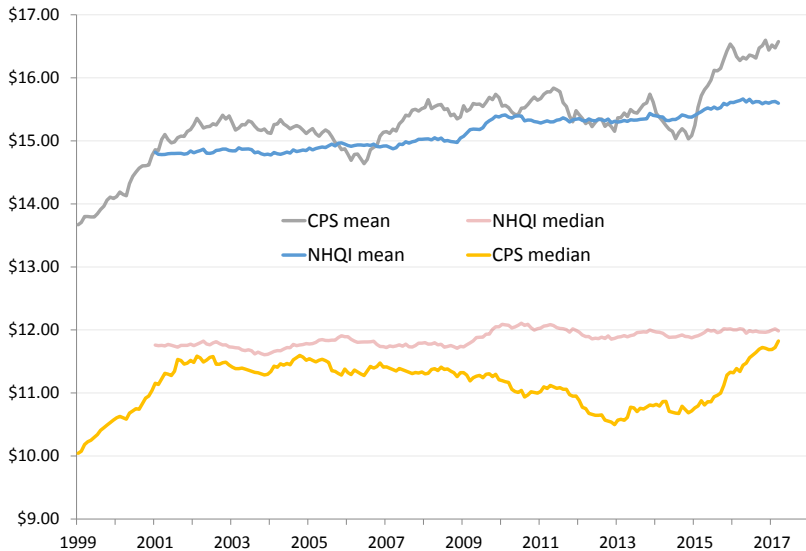
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- But also conceptual difference: X s vs. β s

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NHQI and CPS self-reports

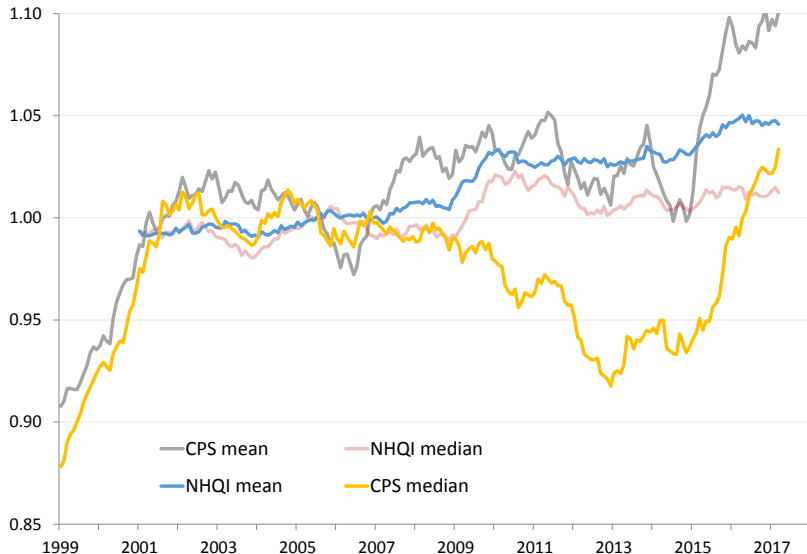


SOURCE: Upjohn Institute New Hires Quality Index; CPS

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NHQI and CPS self-reports (2005=1)



SOURCE: Upjohn Institute New Hires Quality Index; CPS

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- Wages flat or falling even as positive occupation shift during GR
- Ocular evidence suggests roles for within-occupation and cross-occupation change at different times
 - But need to address composition bias

Composition Bias: All new hires and valid wages

	1999			2007			2016		
	All	Wage	Diff	All	Wage	Diff	All	Wage	Diff
Age	33.4	32.4	-1.1	35.2	34.0	-1.2	36.9	35.6	-1.3
Race									
White	0.682	0.695	0.012	0.628	0.651	0.024	0.572	0.588	0.016
Black	0.137	0.123	-0.014	0.130	0.108	-0.023	0.140	0.119	-0.021
Asian	0.038	0.036	-0.002	0.047	0.042	-0.005	0.058	0.056	-0.002
Hispanic	0.134	0.137	0.003	0.175	0.177	0.002	0.205	0.209	0.005
Education									
< HS	0.242	0.252	0.010	0.212	0.219	0.006	0.165	0.163	-0.002
HS grad	0.307	0.297	-0.010	0.300	0.296	-0.004	0.284	0.278	-0.006
Some college	0.279	0.291	0.012**	0.282	0.281	-0.002	0.304	0.318	0.014
Bachelor's	0.124	0.116	-0.008**	0.143	0.142	-0.001	0.165	0.162	-0.003
Grad degree	0.047	0.044	-0.003	0.062	0.062	0.000	0.082	0.079	-0.003
Sector									
Goods	0.214	0.209	-0.005	0.194	0.194	-0.000	0.167	0.156	-0.010
Services	0.786	0.791	0.005	0.806	0.806	0.000	0.833	0.843	0.010
Hire type									
Newly employed	0.581	0.560	-0.021	0.646	0.614	-0.032	0.675	0.617	-0.058
Change employer	0.419	0.440	0.021	0.354	0.386	0.032	0.325	0.383	0.058

SOURCE: Upjohn Institute New Hires Quality Index; CPS

NOTE: Wage index is based on a 12-month lagged moving average of monthly data

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- Tried reweighting valid wage sample to all new hires, but did not work well
 - Insufficient predictors
- Can back out expected bias (from observables)
 - Run (valid) wage regression on \mathbf{X} and adjust for $\Delta\mathbf{X}$
 - Results imply about 1% negative bias, mostly from age
 - Adding occupation and industry to \mathbf{X} increases bias slightly, to 2.7%
 - Stable over time, for offsetting reasons

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- Tradeoff between simplicity and breadth of applicability

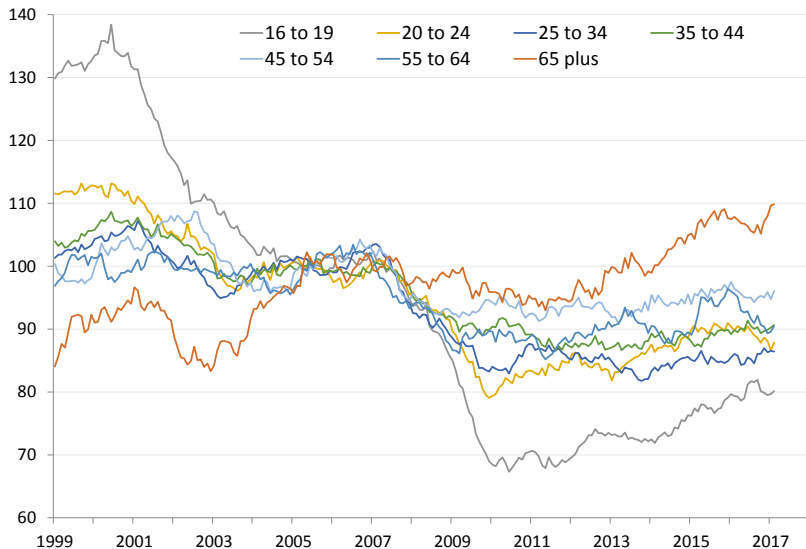
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- For age, also calculate per-capita volume

NHQI: Per-capita volume, by age (2005=100)

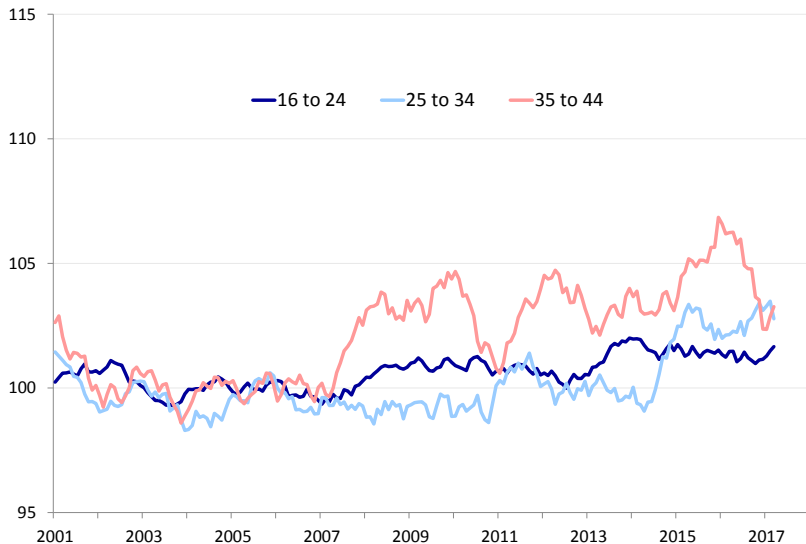


SOURCE: Upjohn Institute New Hires Quality Index

NOTE: Per-capita volume is based on a 12-month lagged moving average of monthly data

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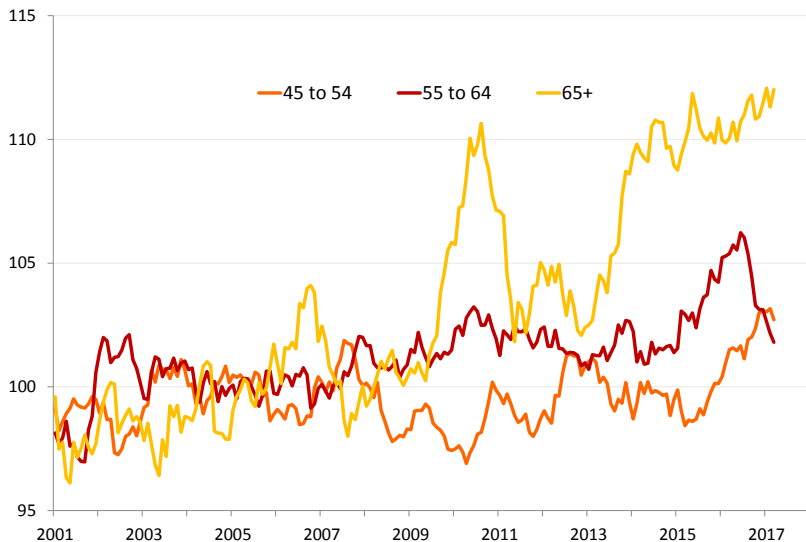


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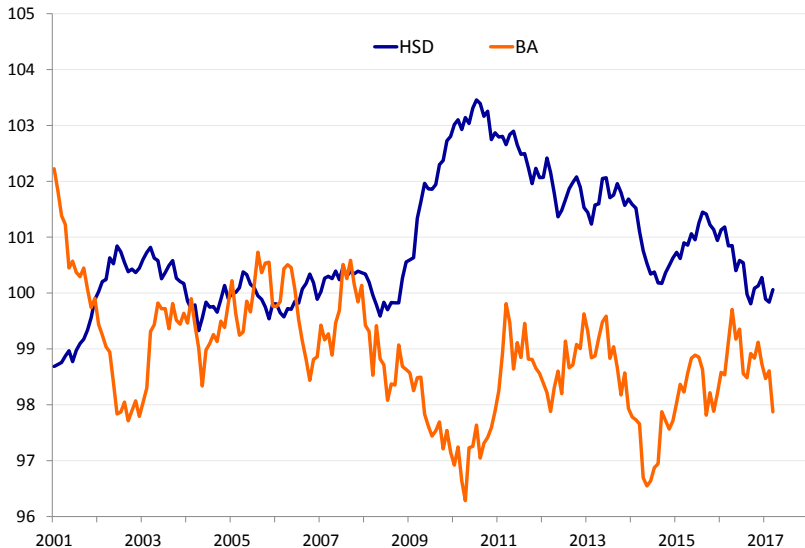


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NHQI: Index, by education (2005=100)

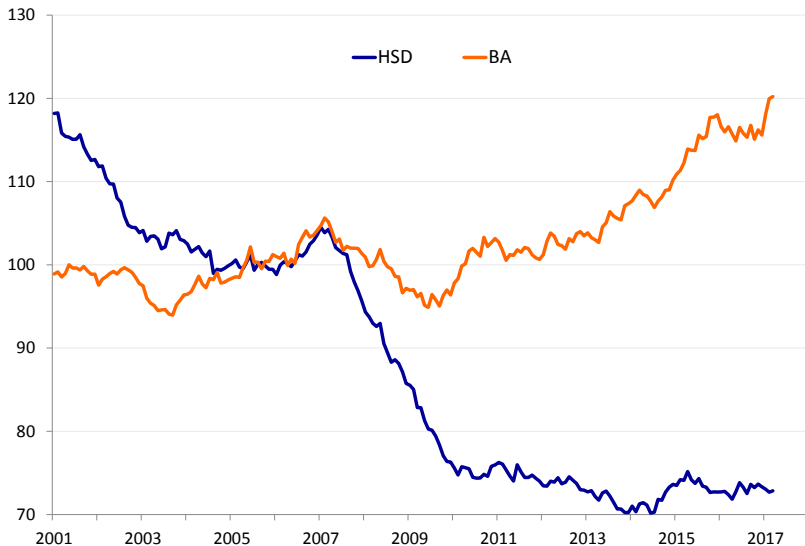


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NHQI: Volume index, by education (2005=100)



SOURCE: Upjohn Institute New Hires Quality Index

NOTE: Volume index is based on a 12-month lagged moving average of monthly data



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- Both measures show increases since 2005 and sharply since 2015, but demographics play a role