How Tight is the Labor Market?

Katharine G. Abraham and John C. Haltiwanger

University of Maryland

Challenging to assess slack in the labor market

…with the unemployment rate well below estimates of its longer-term normal level, why isn't the FOMC tightening monetary policy more sharply to head off overheating and inflation?

…while the unemployment rate is below the Committee's estimate of the longer-run natural rate, estimates of this rate are quite uncertain.

Federal Reserve Chair Jerome Powell, August 2018, Jackson Hole

… factors determining maximum employment "may change over time and may not be directly measurable," and… assessments of the level of maximum employment "are necessarily uncertain and subject to revision.

…(I)n its 2012 statement,… the FOMC explicitly recognized that our assessments of the degree of slack must be based on a wide range of variables and will require difficult judgments about the cyclical and structural influences in the labor market.

Federal Reserve Chair Janet Yellen, August 2014, Jackson Hole

Overview

- Labor market tightness commonly discussed in terms of U-U*
  - Gap measures at core of New Keynesian models
  - Framing grew out of focus on Phillips Curve

- Modern macro labor models (e.g., Diamond-Mortensen-Pissarides (DMP)) use flow approach with focus on labor market tightness
  - In canonical DMP model, labor market tightness measured as $\theta = V/U$
  - Job finding rate (H/U) and job filling rate (H/V) driven by variation in θ
  - Increases in θ create upward pressure on wages (and in turn on prices)

- Defining and measuring labor market tightness the central theme of our paper

Standard measure of labor market tightness (V/U) higher than any time in past 20 years…
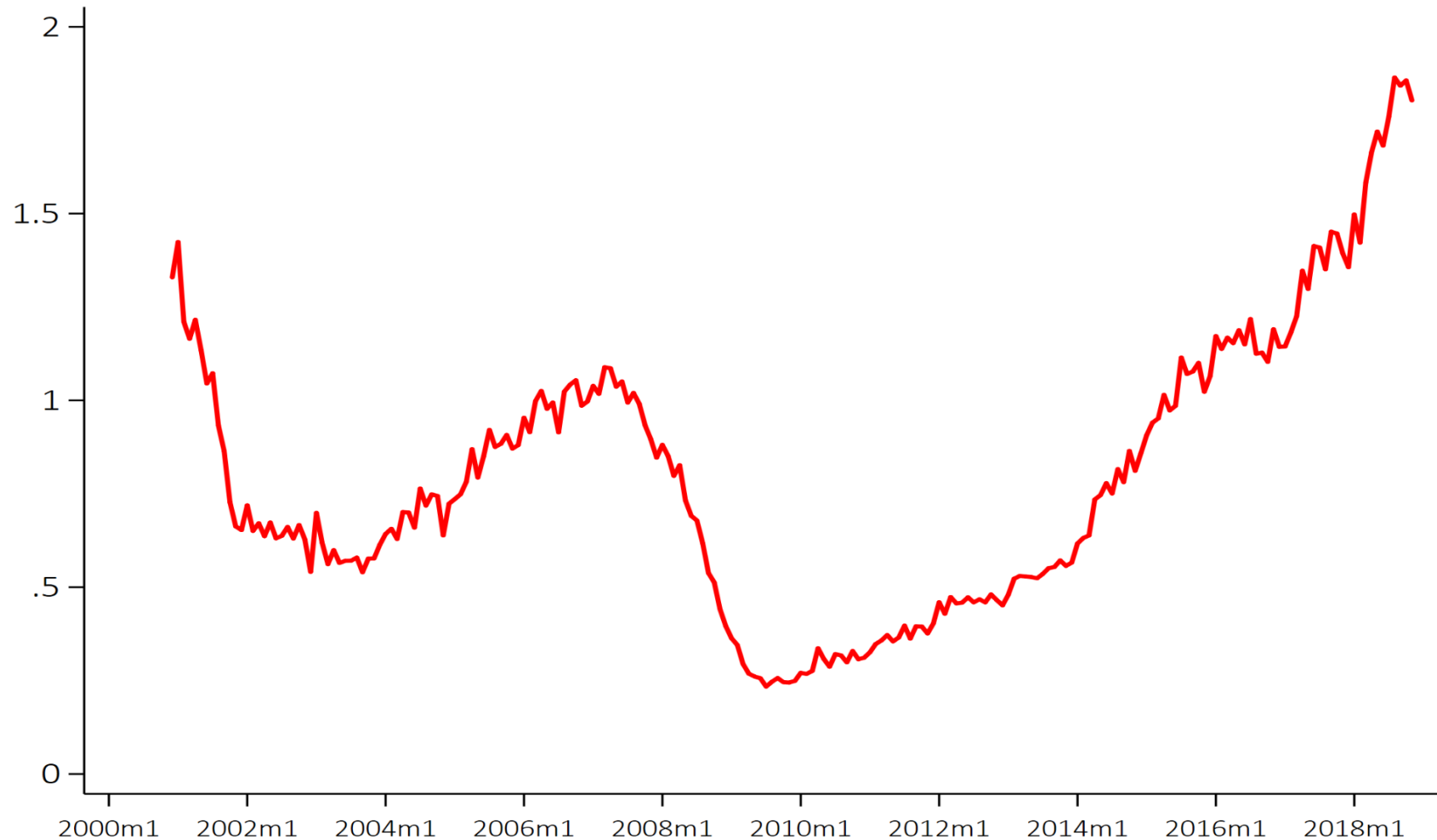
Normalized to be equal to one (on average) in 2007

… but little sign of accelerating wages or prices
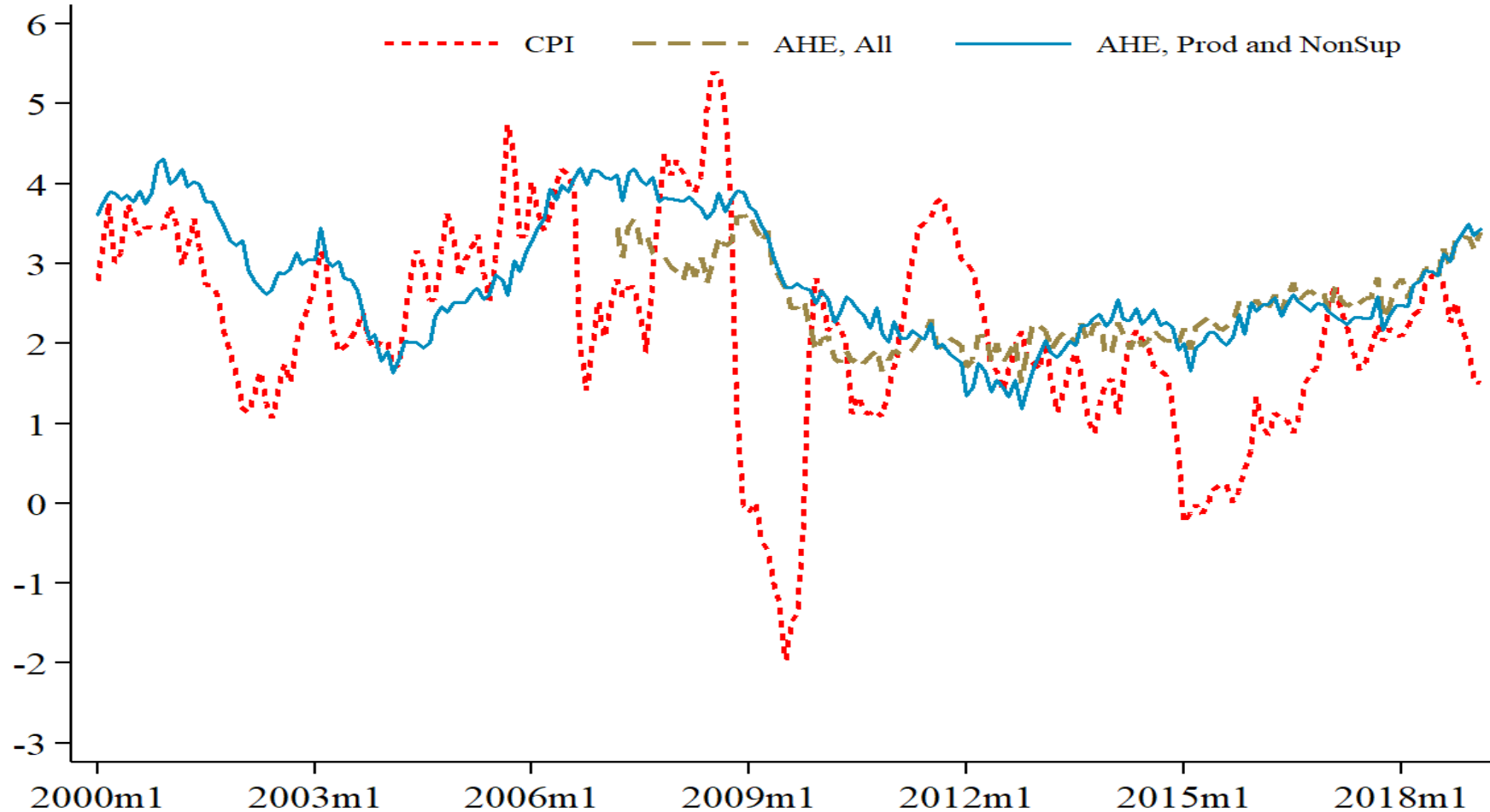
Source: BLS

Many potential explanations for disconnect between V/U and wage/price inflation

- Inflation expectations better anchored than in past (Ball and Mazumder 2014, Blanchard 2016)

- Globalization has flattened the Phillips curve (Bean 2006; Auer, Borio and Filardo 2017; Jasova, Moessner and Takats 2018)

- Workers have less bargaining power than in past (Krueger 2018)

- Labor market tightness has been mis-measured
  - Focus of this paper

Standard model of labor market tightness

- Matching function $H_t = m(V_t, U_t) = \mu V_t^{1-\alpha} U_t^{\alpha}$
  - H is hires, V is job openings, U is unemployment

- In this framework, $\theta_t = \dfrac{V_t}{U_t}$ measures labor market tightness

- Job finding rate (job filling rate) related directly (inversely) to θ_t
  - Job finding rate: $H_t/U_t = \mu(\dfrac{V_t}{U_t})^{1-\alpha} = \mu(\theta_t)^{1-\alpha}$
  - Job filling rate: $H_t/V_t = \mu(\dfrac{U_t}{V_t})^{1-\alpha} = \mu(\dfrac{1}{\theta_t})^{\alpha}$

What is missing from standard model of labor market tightness? Unemployed ≠ effective searchers

- Unemployed are heterogeneous
  - Demographics (e.g., Perry 1970, Shimer 2001, Barnichon and Mesters 2018)
  - History (e.g., Fujita and Moscarini 2017, Kudlyak and Lange 2019)
  - Duration (e.g., Kaitz 1970, Krueger, Cramer and Cho 2014)
- Many job searchers out of labor force (e.g., Flinn and Heckman 1983, Jones and Riddell 1999, Hornstein, Kudlyak and Lange 2014)
- Many job searchers already employed (e.g., Faberman et al 2016, Hall and Schulhofer-Wohl 2018, Haltiwanger, Hyatt and McEntarfer 2018, Haltiwanger, Hyatt, Kahn and McEntarfer 2018)
- Job search intensity may vary with labor market conditions
  - Studies using direct measures find conflicting results (e.g., Shimer 2004, Deloach and Kurt 2013, Gomme and Lkagvasuren 2015, Mukoyama, Patterson and Sahin 2018)
  - Nascent literature makes inferences from relative job finding rates (e.g., Varacierto 2011, Hornstein and Kudlyak 2016, Sedlacek 2016, Hall and Schulhofer-Wohl 2018)

What is missing from standard model of labor market tightness? Vacancies $\neq$ effective vacancies

- Employer recruiting intensity may vary with labor market conditions
  - Reports of changes in employer recruiting behavior in tighter labor markets (e.g., Casselman 2018, Smialek 2019)
  - Evidence from job boards on stated job requirements (Modestino, Shoag and Balance 2019)
  - Analysis of relationship in microdata between job filling rate by establishments and hires (Davis, Faberman and Haltiwanger 2013)

$\neq$

Generalized labor market tightness

- Our objective: Use estimates in the literature to construct a generalized measure of labor market tightness
  - Want a measure of Effective Vacancies/Effective Job Searchers
  - Requires adjustments to both numerator and denominator
- Compare and contrast with standard V/U measure (and other measures), explore sources of differences

Generalized labor market tightness (cont'd)

Challenge: How to measure search and recruiting intensities?

- Build on Hall and Schulhofer-Wohl (2018) (hereafter HSW) to construct effective searchers. In simplified form (actual implementation uses 16 groups rather than 3 groups):

$$Effective\ Searchers = \rho_t^u U_t + \rho_t^n N_t + \rho_t^e E_t$$

where ρ_t^i is search intensity for job search group i in period t

- Use measures of recruiting intensity based on Davis, Faberman and Haltiwanger (2013) (hereafter DFH) to construct effective vacancies:

$$Effective\ Vacancies = \rho_t^v V_t$$

where ρ_t^v is recruiting intensity in period t

Preview: Generalized measure(s) of tightness imply substantially less tightness than standard measure
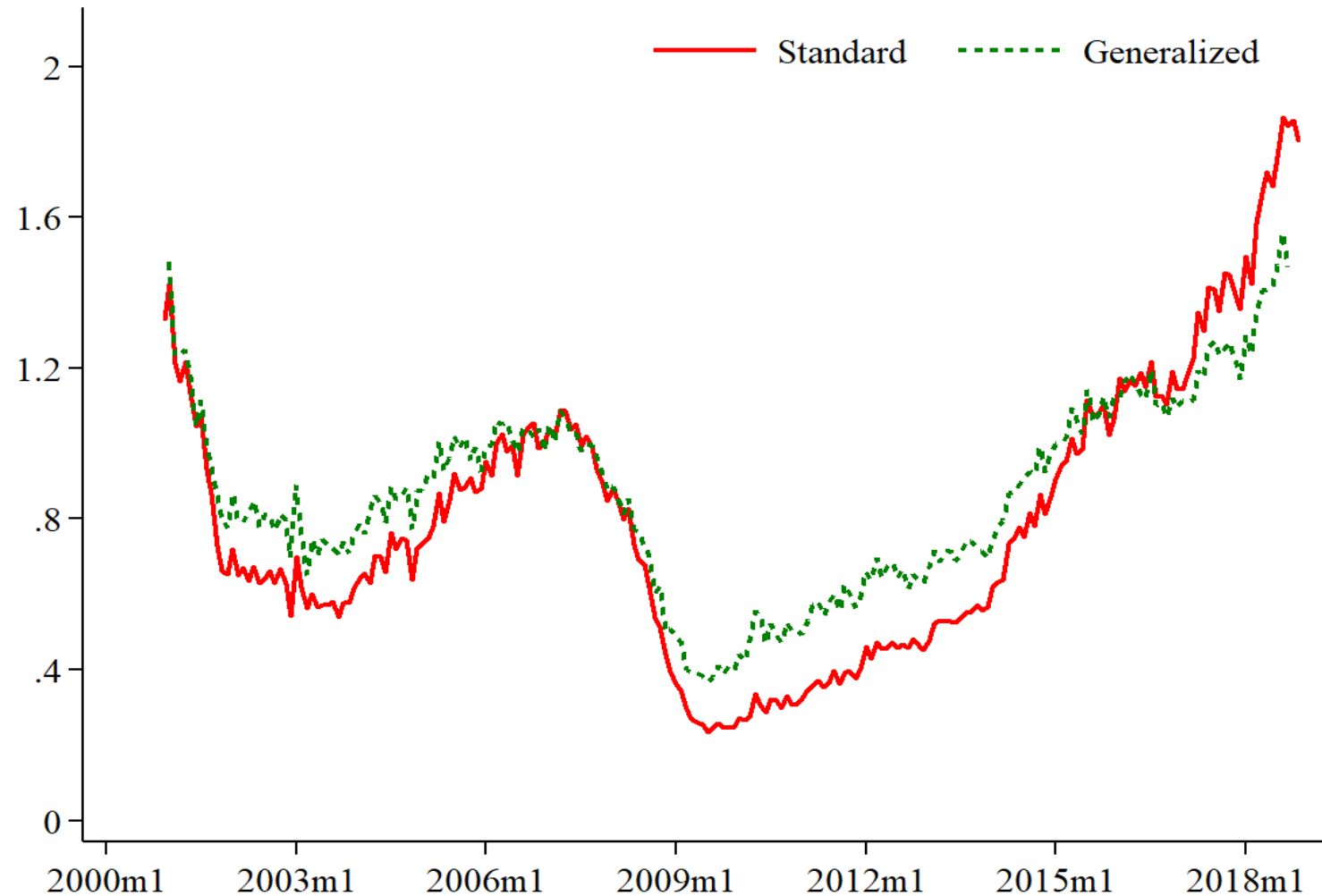
Generalized measure reduces RMSE for difference between predicted and actual job filling rates

Both series normalized to be equal to one (on average) in 2007

Building on HSW for effective searchers

- Hall and Schulhofer-Wohl (2018) define 16 distinct labor market groups
  - Thirteen groups among the unemployed (duration by reason for those unemployed less than 4 weeks or 4-26 weeks; unemployed 27 plus weeks not further disaggregated
    - Reasons are job leaver, permanent layoff, temporary layoff, temporary job ended, entrant, re-entrant
  - Two OLF groups (want a job, do not want a job)
  - Employed the 16th group
- Use CPS microdata to estimate job finding rates for members of each group
  - For further analysis, use adjusted estimates of f_{it} that control for demographic structure (but demographics explain little of group-specific variation)
  - Variation in relative job finding rates most naturally interpreted as variation in relative search intensity

Building on HSW for effective searchers (cont'd)

- Model group-specific job-finding rates allowing for base period differences, group-specific variation in response to labor market tightness (T=V/H) and group-specific trends

$$\log f_{it} = \log \gamma_{it} + \widetilde{\eta_i} \log T_t + \epsilon_{it}$$

$$\log \gamma_{it} = \log \gamma_i + \widetilde{\delta_i} t$$

  - Estimated over different horizons; we use short-span (3-month) estimates
  - $\widetilde{\eta_i} = \eta + \eta_i$. We construct estimate of η as population-weighted average (using 2007 population weights) and use only η_i in calculation of relative search intensities
  - Similar approach for $\widetilde{\delta_i} = \delta + \delta_i$ (and for additional post 2008 trend).

Building on HSW for effective searchers (cont'd)

- HSW estimates allow us to construct $\rho_t^i = \gamma_i T_t^{\eta_i} e^{\delta_i t}$, which gives us information needed to construct three versions of the effective searcher series
  - First version uses only the γ_i, base period job finding rates (defined relative to rate for unemployed who were recently laid off)
  - Second version incorporates $T_t^{\eta_i}$
  - Third version additionally incorporates $e^{\delta_i t}$ (and post-2008 trend)

Selected search intensities
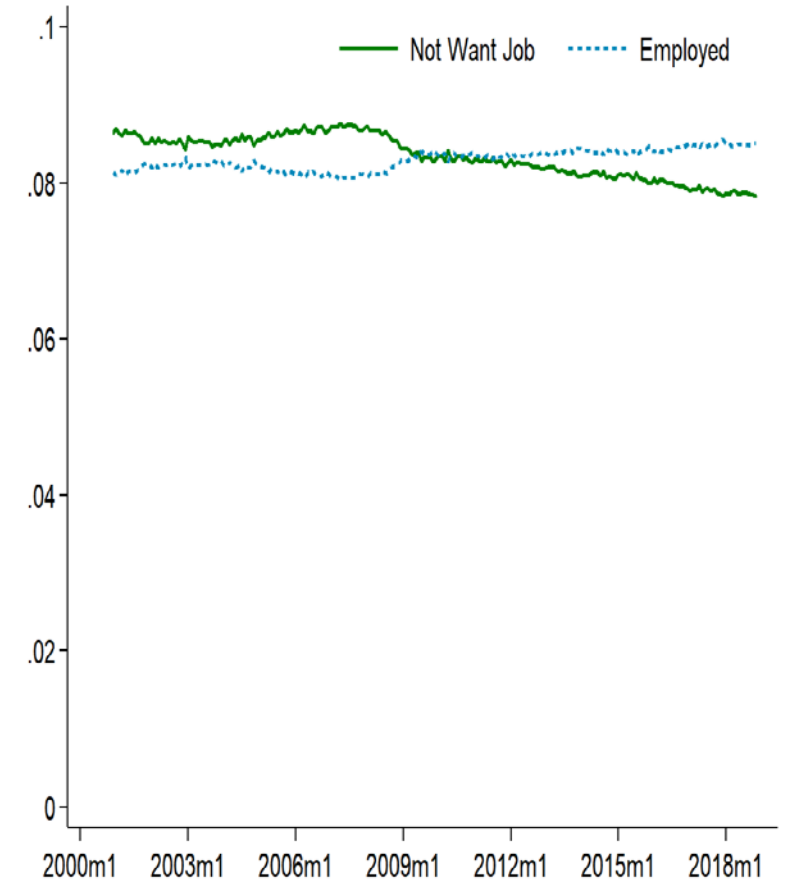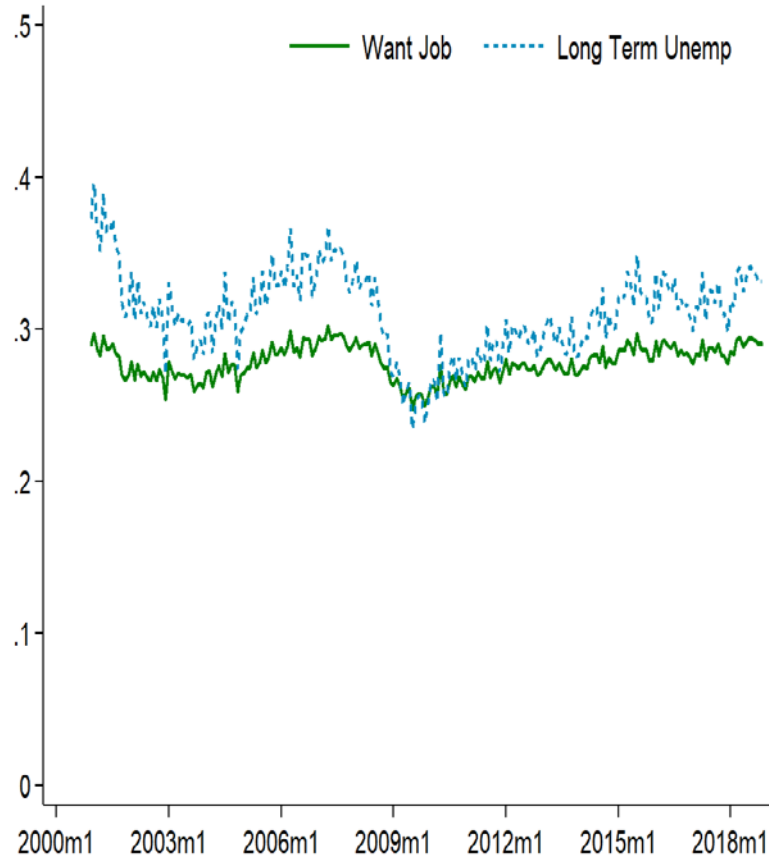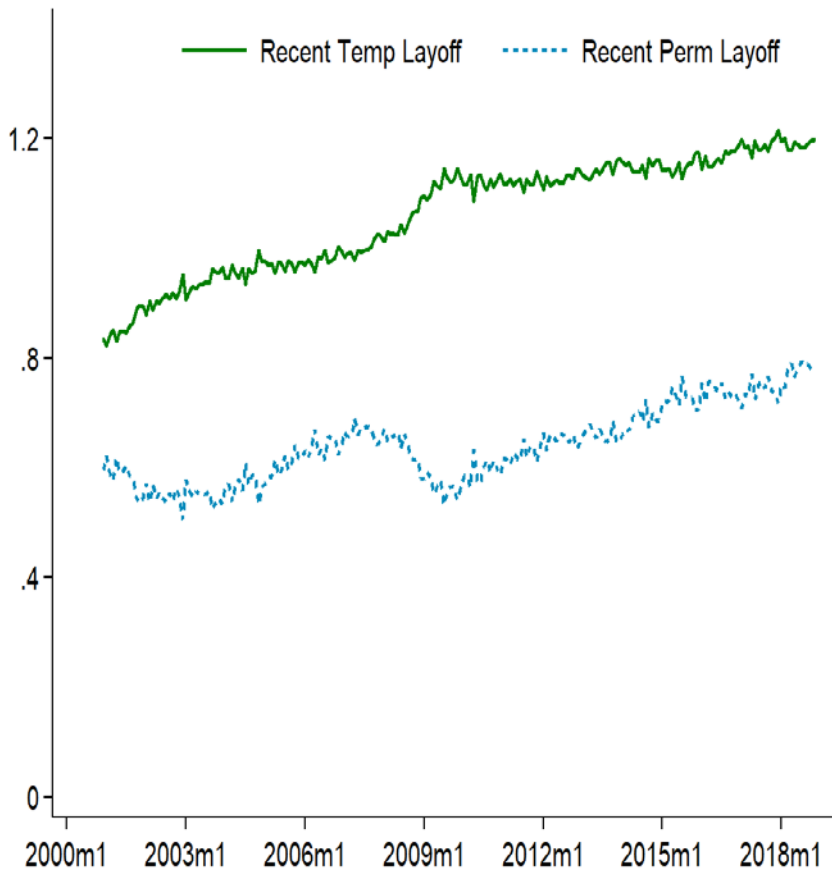
Weight (search intensity) for some groups rising over time, while weight for others falling due to group specific trends.
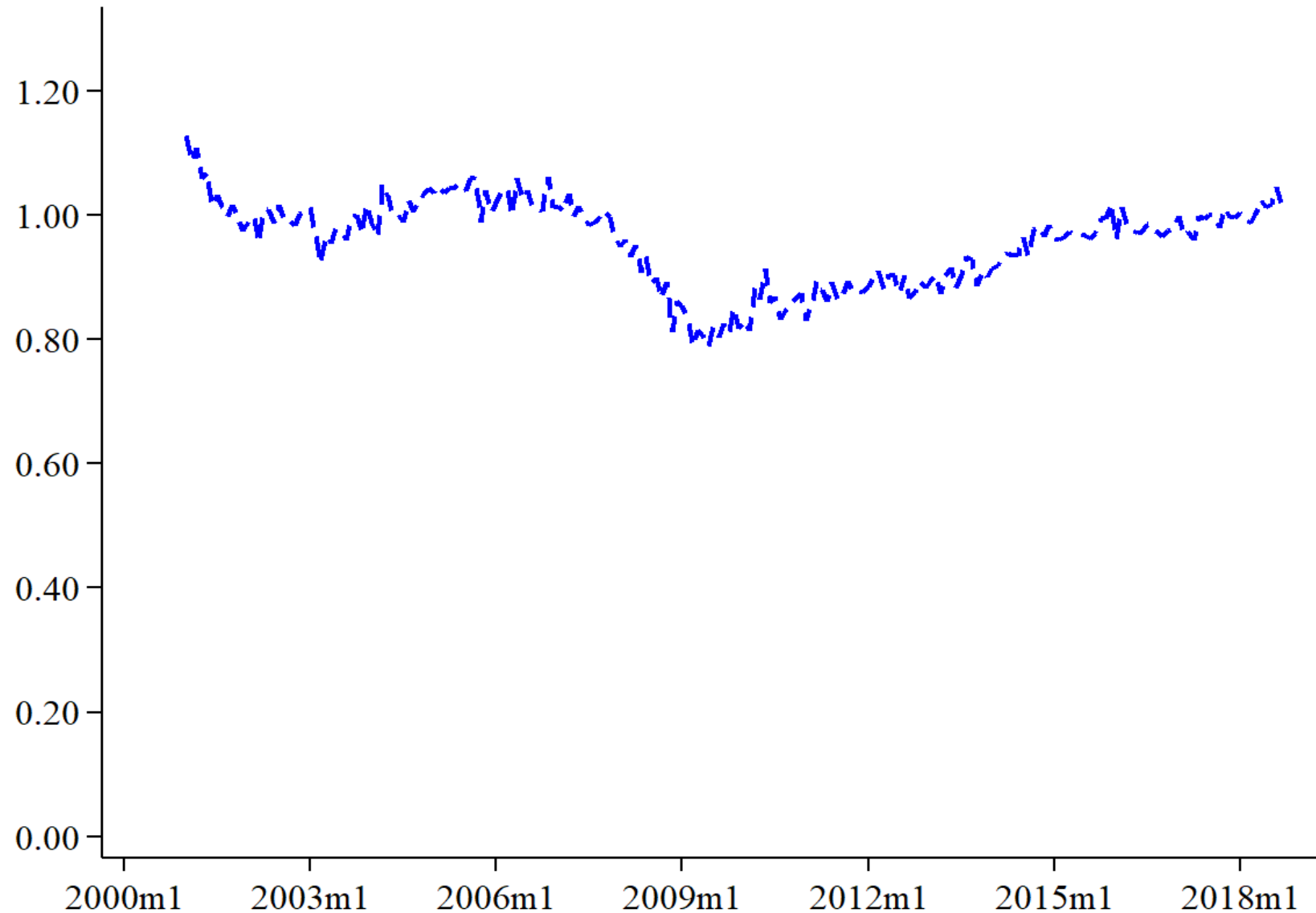
These trends abstract from common trends that influence common job finding rate for effective searchers.
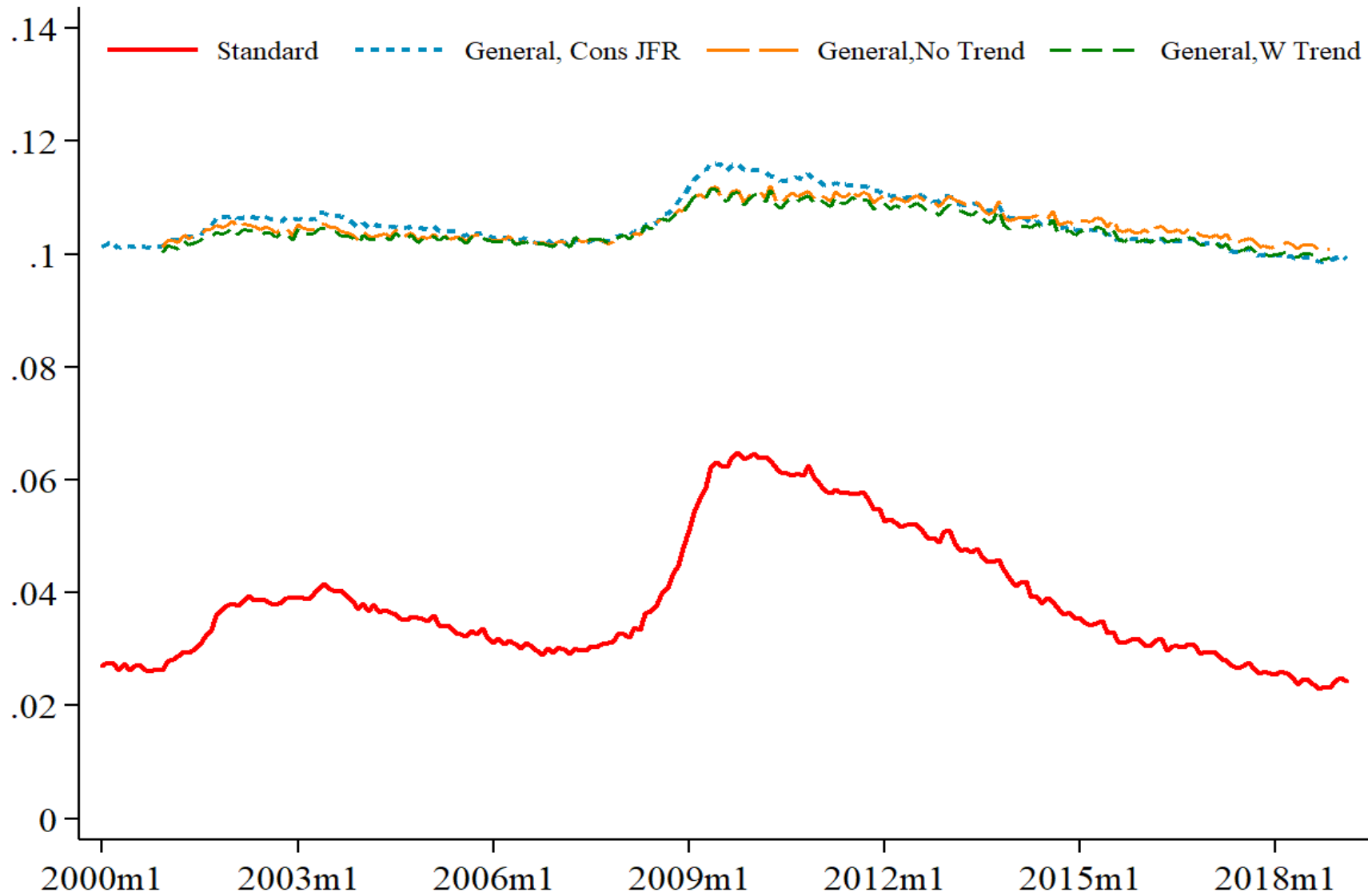
Shares of effective searchers
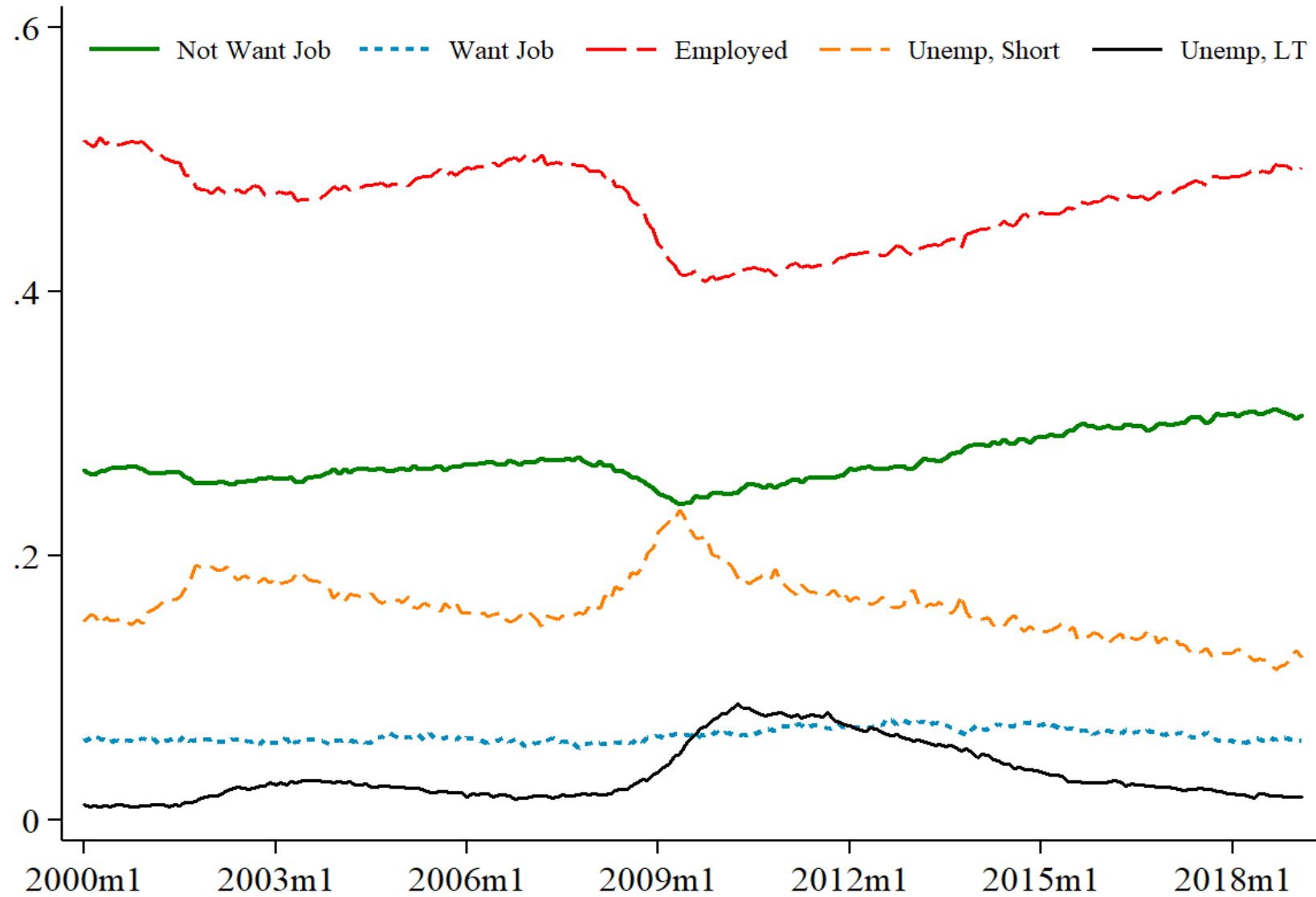
Recruiting intensity (DFH 2013, updated)

Uses micro data on relationship between job filling rate by establishments and hires to construct measure

# Effective searchers versus standard searchers


All series are relative to 16+ population

Other expanded measures of available labor/searchers

- Index based on Bureau of Labor Statistics U6 measure
  - U6 alternative measure of labor underutilization that adds marginally attached and part-time for economic reasons to unemployed in both numerator and denominator of the unemployment rate
  - U6 *index* is sum of unemployed, marginally attached and part-time for economic reasons as a share of the population age 16 and older

- Richmond Fed Non-Employment Index (Kudlyak 2017)
  - Based on disaggregation of non-employed into nine mutually exclusive groups
    - Groups are: 1) short term unemployed (<27 weeks), 2) long term unemployed (27 plus weeks), 3) discouraged workers, 4) other marginally attached, 5) other want a job, 6) OLF disabled, 7) OLF retired, 8) other OLF in school, and 9) other OLF not in school
  - Relative weights based on average job finding rates over 1994-2016 period
  - Normalized by population age 16 and older

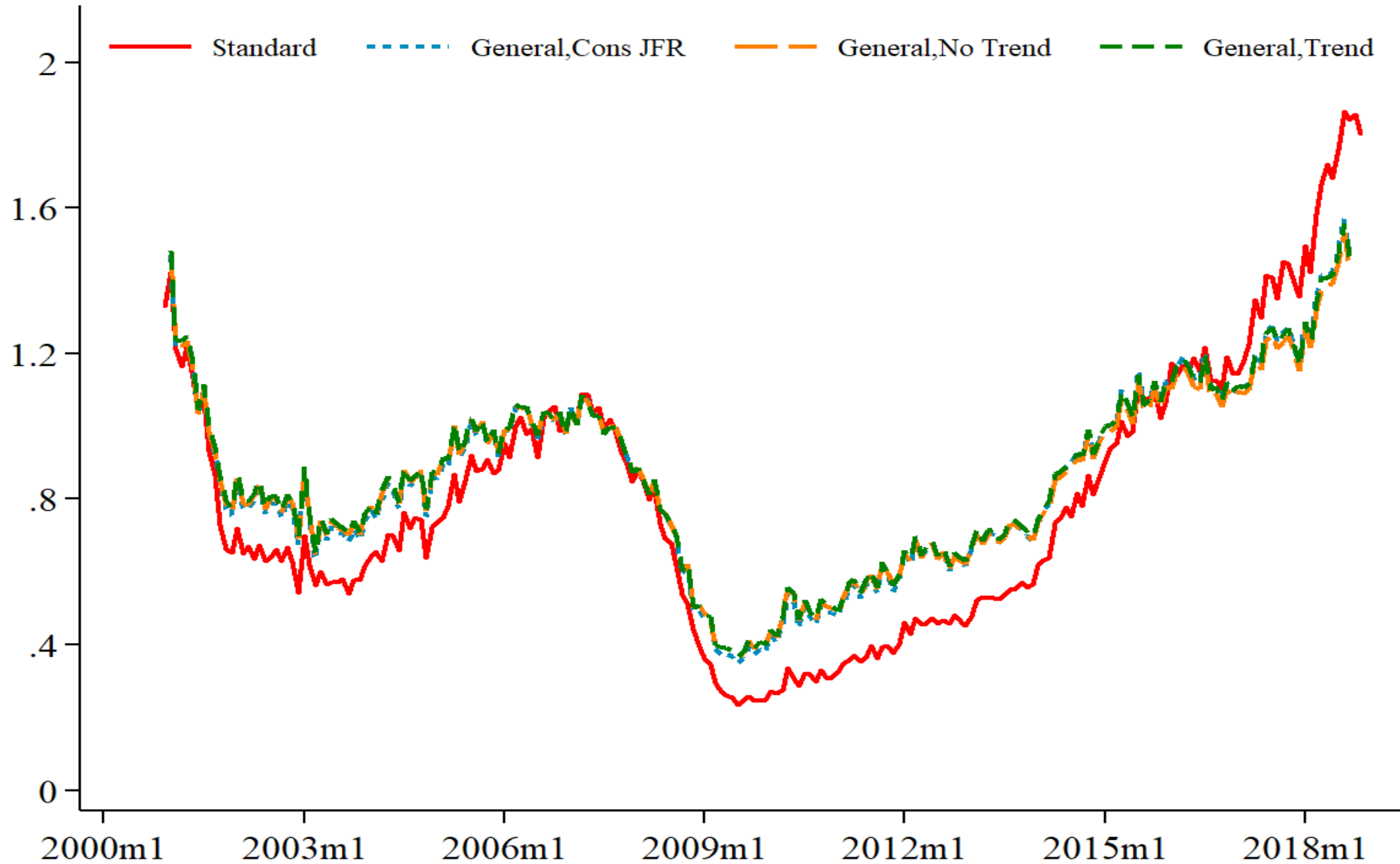# Comparison to U6 and Richmond Fed Non-Employment Indexes
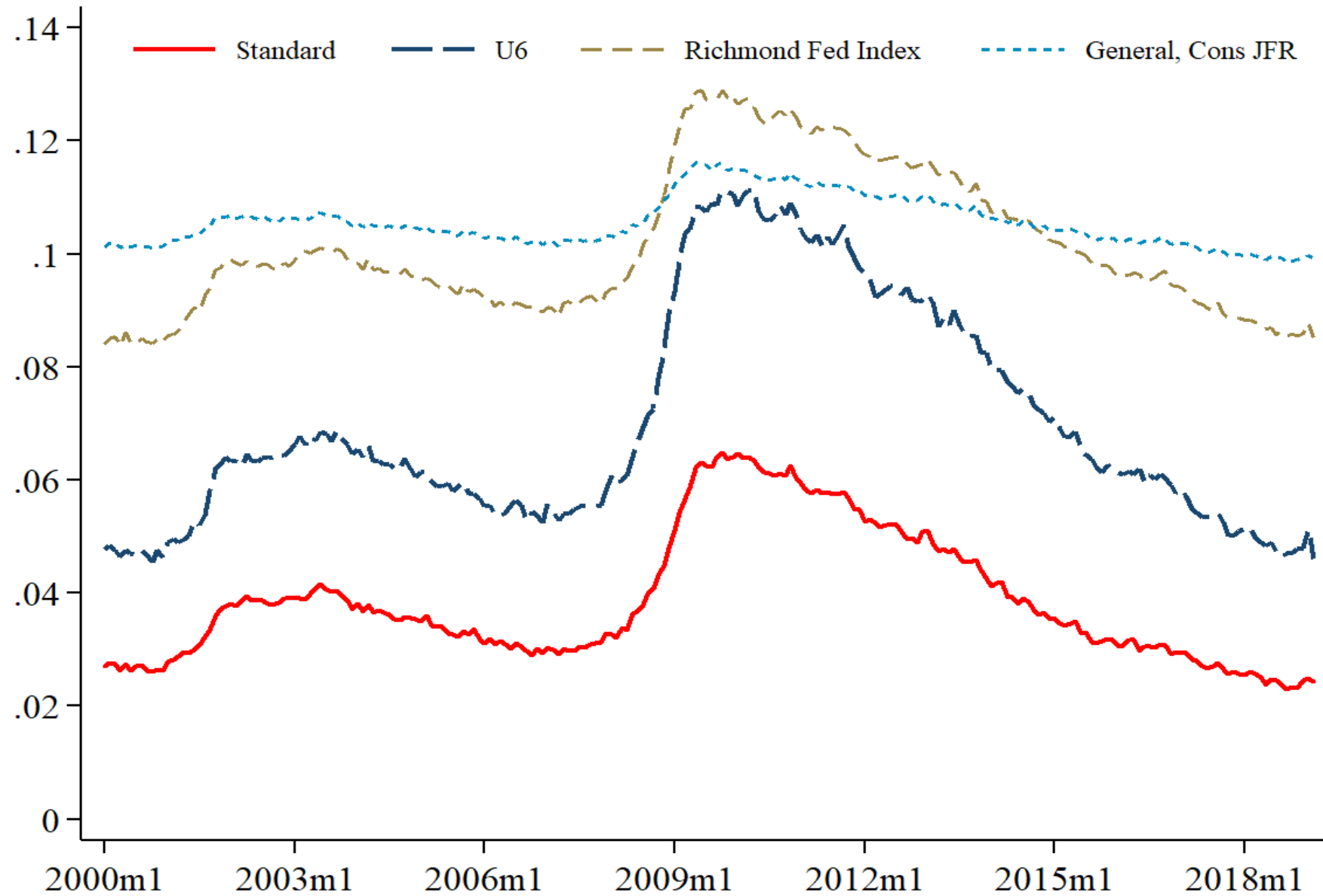
Effective vacancies vs. standard vacancies
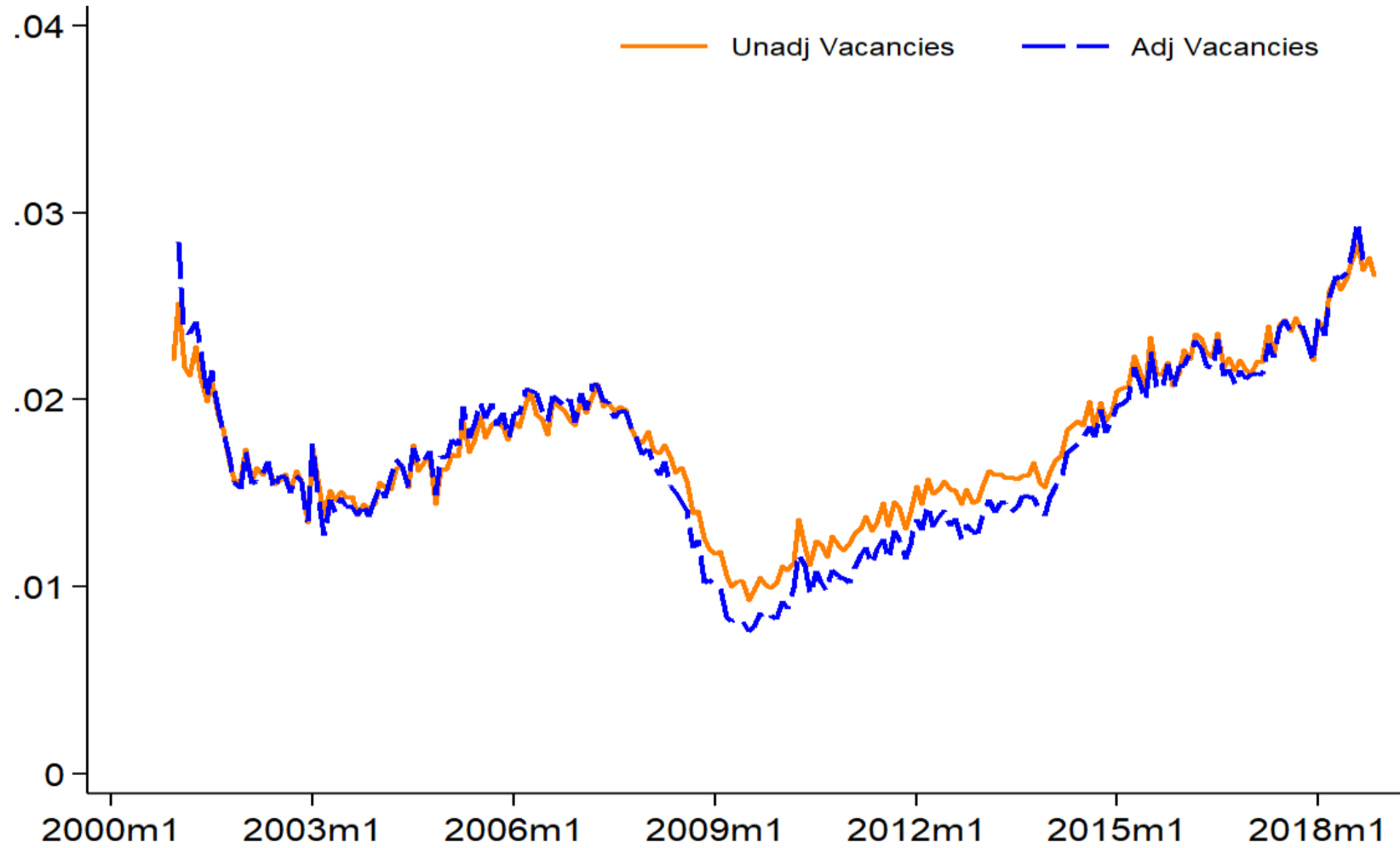
Both series normalized by 16+ population

Putting the pieces together: Generalized measure(s) of tightness imply substantially less tightness than standard measure

Evaluation

- Matching function given by:
$$H_t = m(EV_t, ES_t) = \mu EV_t^{1-\alpha} ES_t^{\alpha}$$
- The (common) matching function elasticity derived from HSW estimates (can show $\alpha = \left(\frac{1}{1+\eta}\right)$)
- Evaluate through lens of hires per vacancy:
  - Standard model: $H_t/V_t = \mu(\frac{U_t}{V_t})^{\alpha}$
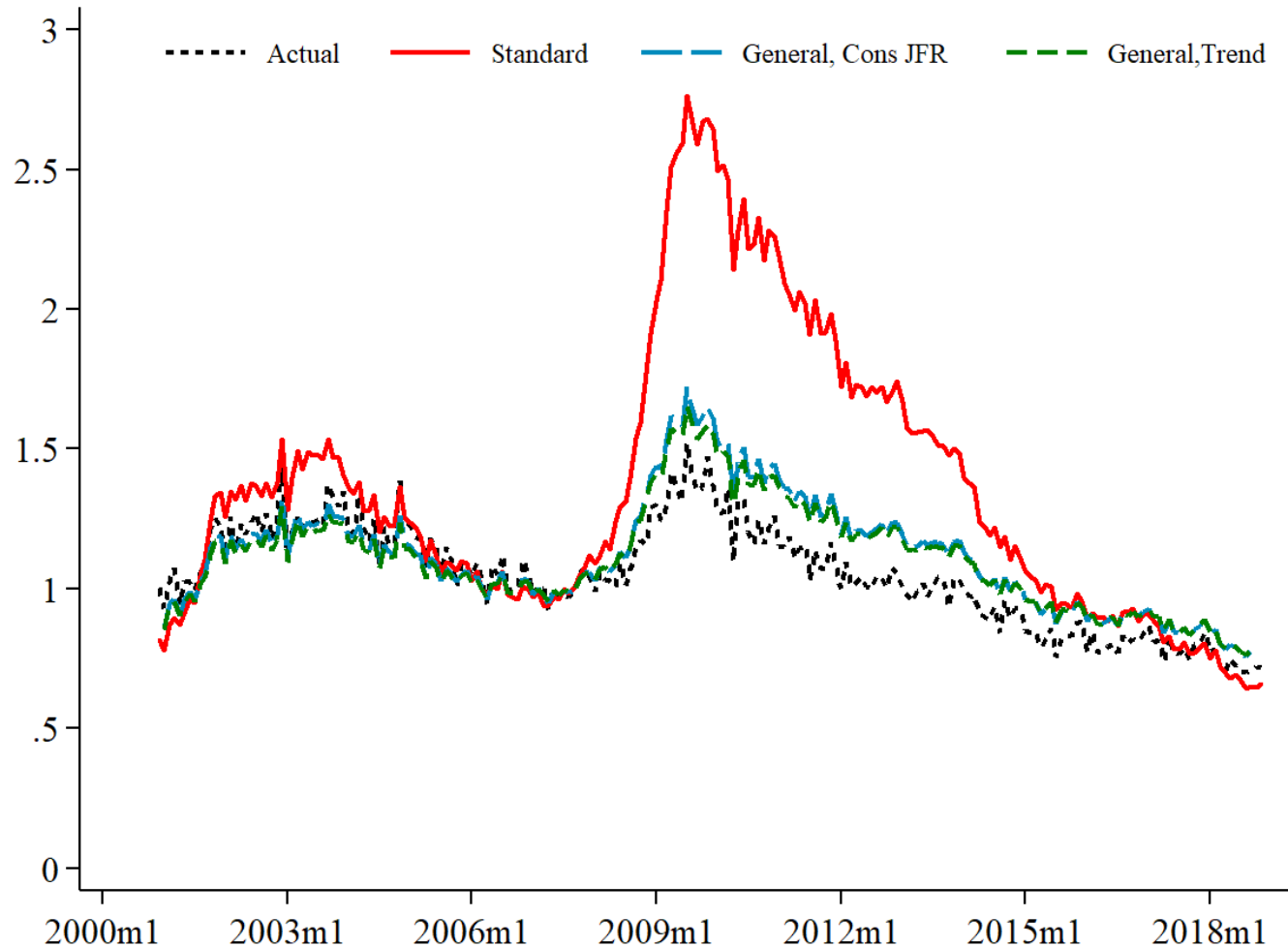 - Generalized Model: $H_t/V_t = \mu(\frac{ES_t}{EV_t})^{\alpha}\rho_t^v = \mu(\frac{ES_t}{V_t})^{\alpha}(\rho_t^v)^{1-\alpha}$
- Compare actual hires per vacancy (LHS) to predicted for standard and generalized model
  - Effective searchers don't rise as much in recessions as standard searchers.
  - Recruiting intensity declines in recessions
  - Both work to dampen cyclicality of job filling rate

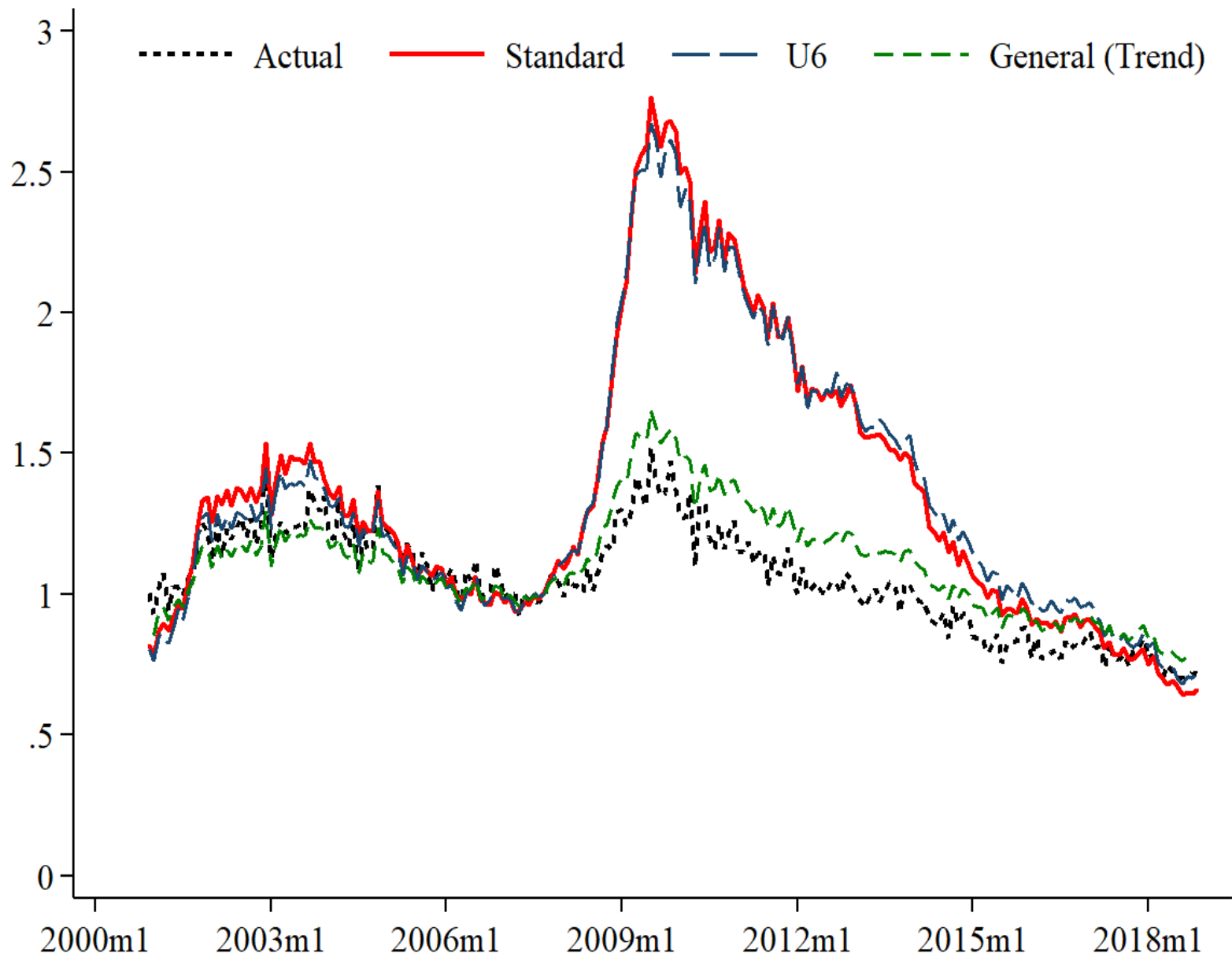# Generalized measures better predict job filling rate

Generalized model tracks H/V much more closely.

RMSE for generalized models less than 25% of standard model

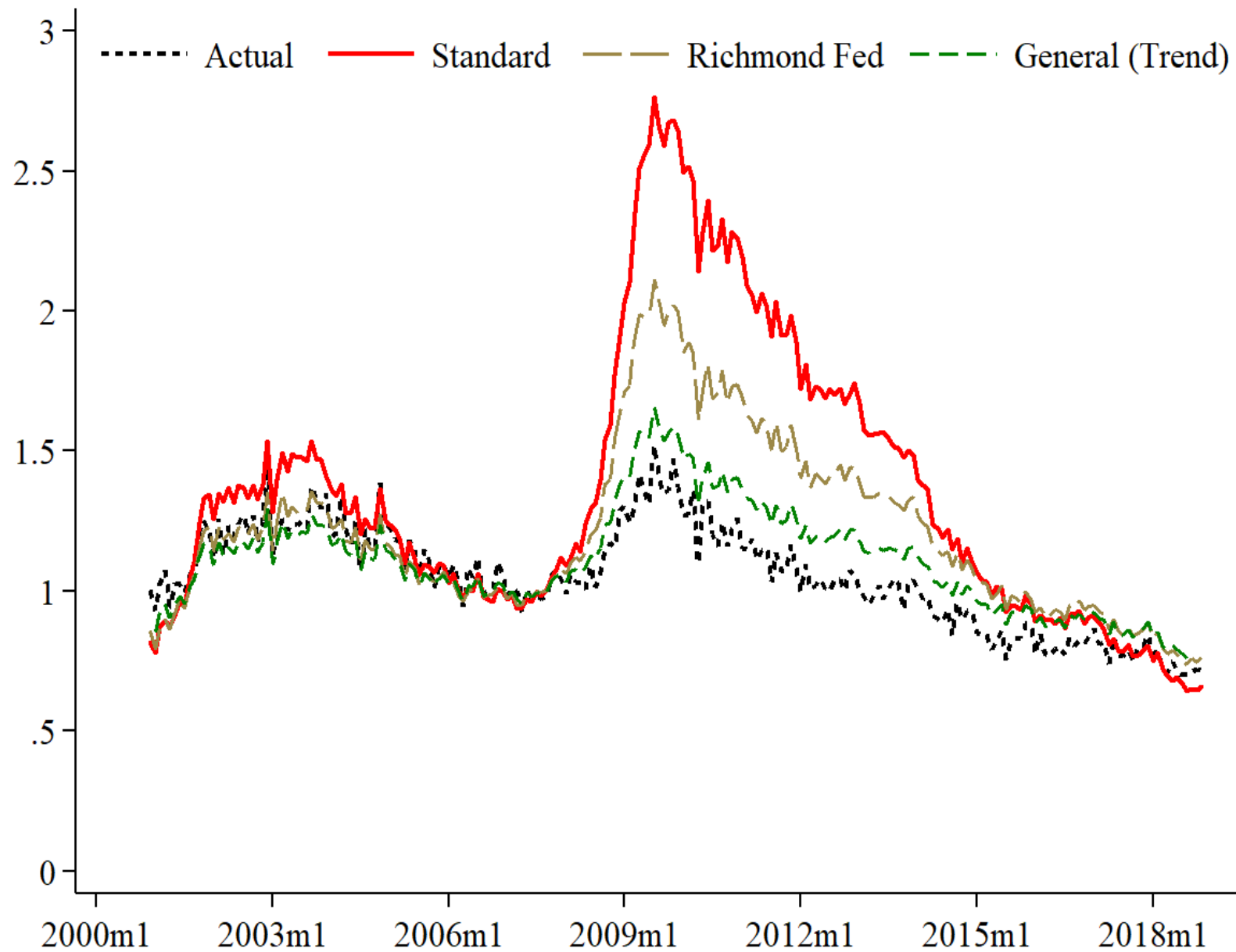Estimated $\alpha \approx 0.7$ based on estimate of η.

If we use $\alpha \approx 0.5$ for standard model, RMSE of standard model is reduced, but still more than twice that of generalized model.

Uses fully generalized measure with trend. Series normalized to one in 2007.

Using U6 yields no improvement over standard measure in predicting job filling rate
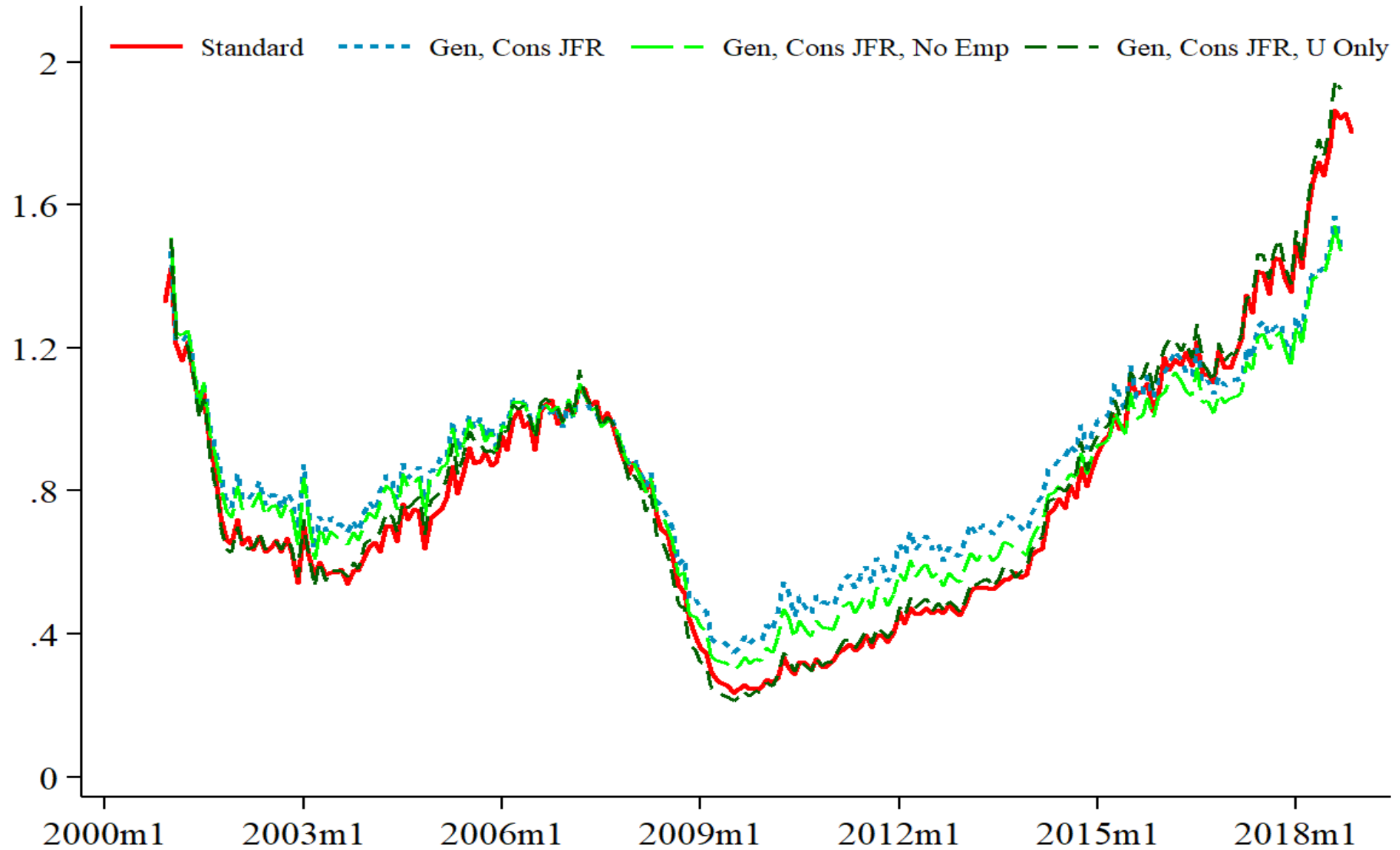
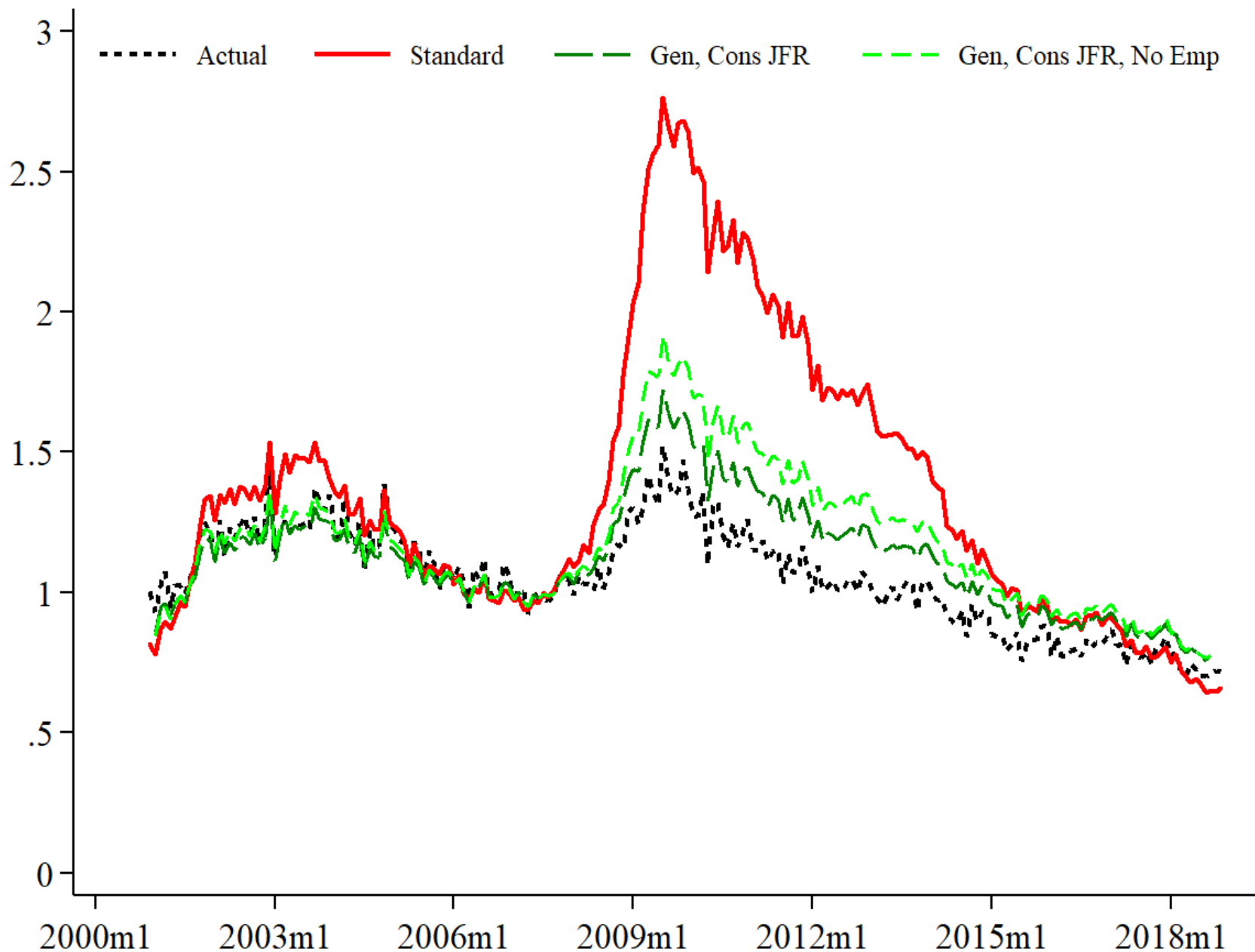Series normalized to one in 2007.

Richmond Fed Index improves performance of matching function quite a bit, but not nearly so much as generalized measure

Series normalized to one in 2007.

Eliminating employed and out of the labor force yields greater cyclicality in effective searchers

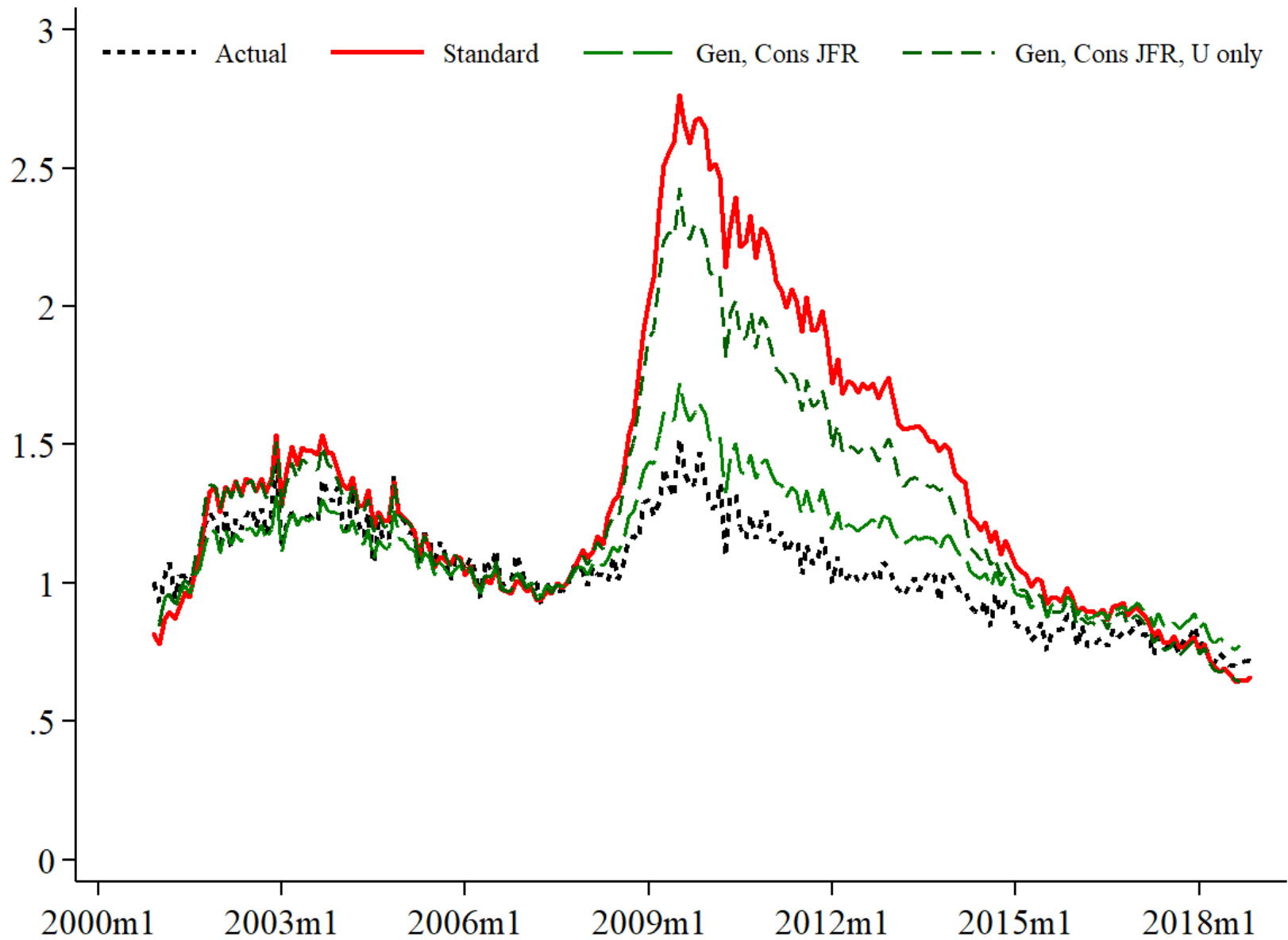Legend: Standard, Gen, Cons JFR, Gen, Cons JFR, No Emp, Gen, Cons JFR, U Only

Eliminating employed from effective searchers yields poorer performance in predicting job filling rate

RMSE is about 40% of standard

Series normalized to one in 2007.

Eliminating employed and out of the labor force from effective searchers yields *substantially* poorer performance

RMSE is about 70% of standard

Series normalized to one in 2007.

Taking stock

- Generalized measure of labor market tightness implies labor market is not currently as tight as suggested by standard V/U measure

- V/U much more cyclical than EV/ES!

- Generalized measure improves fit of hiring function substantially
  - Accounting for changes in the composition of the unemployed helps
  - Accounting for search among the employed and those out of the labor force even more important
  - Do somewhat better if allow for variation in search intensities over time
  - Variations in employer recruiting intensity also play a role

Next steps

- HSW estimates provide proof of concept for effective searchers, DFH for effective vacancies; undoubtedly can be improved upon
  - Return to micro data to explore best effective searcher groupings
    - Revisit role of demographics
    - Break out those out of the labor force by reason? Distinguish between those who are part-time for economic reasons and other employed?
  - Reconcile direct and indirect evidence on cyclical variation in group-specific search intensities
  - Seek more direct evidence on employer recruiting intensity
- Practical immediate step: Begin real-time construction of a generalized labor market tightness measure based on assumption of constant relative job finding rates
  - Straightforward and even proof-of-concept measure we have presented significantly outperforms other measures

Next steps (continued)

- Explore performance of alternative measures of labor market tightness in explaining wages and prices.
  - If labor markets not as tight as implied by standard measure, easier to reconcile lack of wage and price pressure from the labor market
  - Have left this ambitious task for future research

Thank you!