Unemployment Fluctuations, Match Quality, and the Wage Cyclicality of New Hires

Mark Gertler[1], Christopher Huckfeldt[2], Antonella Trigari[3]

[1]New York University, NBER

[2]Cornell University

[3]Bocconi University, CEPR, IGIER, and BAFFI CAREFIN

May 11, 2015

What we do

1. Present new panel data evidence on the cyclical behavior of wages for new hires versus existing workers

2. Develop model of unemployment fluctuations consistent with this evidence

3. Model is variant of Mortensen/Pissarides that features:
   - Wage stickiness via staggered multi-period contracts (with Nash bargaining)
   - Job-to-job flows with endogenous procyclical match quality

Why we do it

- Long (and controversial!) tradition of incorporating wage stickiness in macro models to improve empirical performance
  - True for DSGE models (e.g. CEE, SW, GST, GSW, CET)
  - Also for searching and matching models (e.g, Shimer, Hall)
- Pissarides critique: existing evidence finds greater cyclicality of wages for new hires than for existing workers (e.g., Bils, 1985)
  - Most cyclical movement in hours is along the extensive margin
    - New hires' wages relevant to this margin
    - Wages of existing workers may not be allocational for either margin
  - Justification for wage rigidity based on aggregate data may be misplaced

Addressing the Pissarides critique

- Our take: evidence reflects compositional effects associated with procyclical movements in match quality for job changers
- Typical regression recover estimate of new hire effect by pooling new hires from unemployment and new hires from other jobs
  - Job-to-job changes important source of wage growth (Topel and Ward, 1992)
  - Workers searching on-the-job more likely to find suitable match during expansion (Barlevy, 2002)
- Implication: new hire contract effect not separately identified from composition effect

Our approach and main findings

- Construct new panel data set that permits distinguishing new hires that are job changers vs. those coming from unemployment
- Show no new hire effect for workers hired from unemployment
  - Key margin for unemployment fluctuations
  - Indicative job changers new hire effect due to composition bias
- Develop a search and matching model with staggered wage contracting and on-the-job search to explain
  - Aggregate evidence on unemployment and wage cyclicality
  - Panel data evidence on new hire wage cyclicality for job changers vs. from unemployment

Data

- Survey of Income and Program Participation, 1990-2012
  - 1990-1993, 1996, 2001, 2004, and 2008 panels
- Large, representative sample
- Interviews every four months
- High-frequency structure allows for construction of precise measurements of job tenure and wages
- Can separate new hires between job changers and those coming from unemployment
  - Correct for recalls (Fujita and Moscarini, 2014)

Existing econometric framework, e.g. Bils (1985)

$$\log w_{ijt} = x'_{ijt}\pi_x + \pi_u \cdot U_t + \pi_n \cdot \mathbb{I}(new_{ijt}) + \pi_{nu} \cdot \mathbb{I}(new_{ijt}) \cdot U_t + \alpha_i + e_{ijt}$$

- x_{ijt}: observables for individual i in job j at time t
- $\mathbb{I}(\text{new}_{ijt})$: indicator for new hire
- α_i: person fixed effect

$$\boxed{\text{Key finding: } \pi_{nu} < 0}$$

Two observations:

1. New hire interaction does not vary by type of job transition
2. Unobserved match quality $\Rightarrow$ possible estimation bias for job changers

"Bils regressions" and new hire effect

	1990-2012 sample	
	(1)	(2)
Unemployment rate	-0.162***	-0.448***
	(0.0582)	(0.0920)
Unemp. rate $\cdot \mathbb{I}(\text{new})$	-1.247***	-0.997**
	(0.2477)	(0.4465)
Estimator	FE	FD
No. observations	379,104	321,397

Robust standard errors in parenthesis

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

- Pissarides (2009) interpretation: flexible wages for new hires

Our econometric framework

$$
\begin{aligned}
\log w_{ijt} = {} & x'_{ijt}\pi_x + \pi_u \cdot U_t \\
& + \pi_n^{EE} \cdot \mathbb{I}(new_{ijt} \,\&\, EE) + \pi_n^{ENE} \cdot \mathbb{I}(new_{ijt} \,\&\, ENE) \\
& + \pi_{nu}^{EE} \cdot \mathbb{I}(new_{ijt} \,\&\, EE) \cdot U_t + \pi_{nu}^{ENE} \cdot \mathbb{I}(new_{ijt} \,\&\, ENE) \cdot U_t \\
& + \alpha_i + e_{ijt}
\end{aligned}
$$

- Allow separate coefficients for new hires from employment (EE) and new hires from non-employment (ENE)
- Estimate in fixed effects and first differences
- Several measures of *EE* and *ENE*

Job changers (EE) vs. new hires from unemployment (ENE): fixed effects

	1990-2012 sample			
	(1)	(2)	(3)	(4)
UR	-0.160***	-0.160***	-0.159***	-0.159***
	(0.0582)	(0.0582)	(0.0582)	(0.0582)
$UR \cdot \mathbb{I}(\text{new \& } EE)$	-1.921***	-1.927***	-1.920***	-1.926***
	(0.4696)	(0.4403)	(0.4696)	(0.4403)
$UR \cdot \mathbb{I}(\text{new \& } ENE)$	-0.326	0.120	-0.487	0.005
	(0.5086)	(0.5636)	(0.5616)	(0.6353)
$UR \cdot \mathbb{I}(\text{new \& } LTU)$	–	–	0.963	0.964
	–	–	(1.1325)	(1.1325)
$P(\pi_{nu}^{EE} = \pi_{nu}^{ENE})$	0.019	0.004	0.046	0.011
Unemp spell for ENE	0+	1+	(0,9]	(1,9]
No. observations	375,649	375,649	375,649	375,649
No. of fixed effects	56,878	56,878	56,978	56,878

Robust standard errors in parenthesis

* p<0.10, ** p<0.05, *** p<0.01

Job changers (EE) vs. new hires from unemployment (ENE): first differences

	1990-2012 sample			
	(1)	(2)	(3)	(4)
UR	-0.415***	-0.410***	-0.397***	-0.395***
	(0.0912)	(0.0912)	(0.0911)	(0.0911)
UR$\cdot\,\mathbb{I}(\text{new \& } EE)$	-1.556**	-1.523***	-1.540**	-1.510***
	(0.6609)	(0.6068)	(0.6609)	(0.6068)
UR$\cdot\,\mathbb{I}(\text{new \& } ENE)$	-0.289	-0.267	-0.748	-0.743
	(0.6364)	(0.6990)	(0.7497)	(0.8593)
UR$\cdot\,\mathbb{I}(\text{new \& } LTU)$	–	–	-0.067	-0.068
	–	–	(1.1398)	(1.1400)
$P(\pi_{nu}^{EE} = \pi_{nu}^{ENE})$	0.163	0.171	0.424	0.463
Unemp spell for ENE	0+	1+	(0,9]	(1,9]
No. observations	318,771	318,771	318,771	318,771

Robust standard errors in parenthesis

* p<0.10, ** p<0.05, *** p<0.01

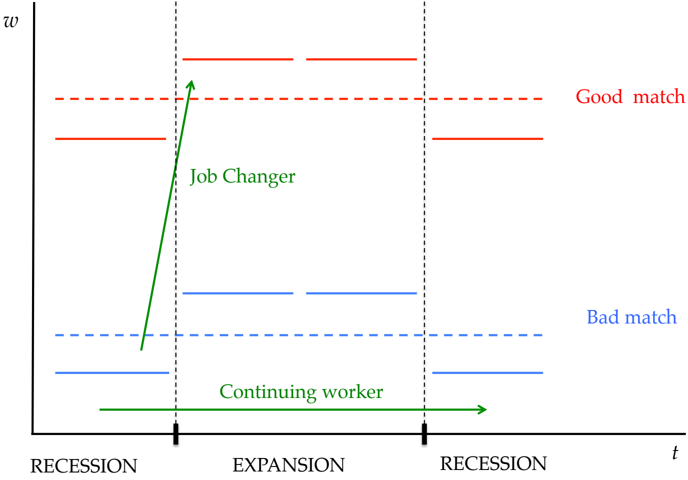
Composition bias and new hire effect for job changers

$$\log w_{ijt} = x'_{ijt}\pi_x + \pi_u \cdot U_t + \pi_n \cdot \mathbb{I}(new_{ijt}) + \pi_{nu} \cdot \mathbb{I}(new_{ijt}) \cdot U_t + \alpha_i + e_{ijt}$$

$$e_{ijt} = q_{ij} + \varepsilon_{ijt}$$

- q_{ij}: unobserved match quality
- Procyclical match quality $\Rightarrow \mathrm{Cov}(\Delta q_{ij}, \mathbb{I}(new_{ijt}) \cdot \Delta U_t) < 0$
- $\mathrm{Cov}(\Delta q_{ij}, \mathbb{I}(new_{ijt}) \cdot \Delta U_t) < 0 \Rightarrow \hat{\pi}_{nu}$ biased downward
- Bias stronger for job-changers (e.g., “job ladder” effects)
  - Implies job changer wage semi-elasticity higher than for new hires from unemployment

Composition bias and new hire wage cyclicality



Model

- Starting point: RBC with search and matching, perfect consumption insurance (Merz, 1995; Andolfatto, 1996)
- Variations:
  - On-the-job search with variable match quality (Barlevy, 2002)
  - Staggered Nash wage bargaining (Gertler and Trigari, 2009)
- No wage flexibility for new hires!
- Evaluate model's ability to match micro and macro data

Vacancies, searchers and matching

- Each firm employs n_t workers in good matches and b_t workers in bad matches

- Labor quality l_t

$$\begin{aligned} l_t &= n_t + \phi b_t \quad \text{with} \quad 0 < \phi < 1 \\ &= (1 + \phi\gamma_t) n_t \quad \text{with} \quad \gamma_t = \frac{b_t}{n_t} \end{aligned}$$

- Posts v_t vacancies
  - Random search: learns quality after match
  - Probability of good match, ξ

- Exogenous separation probability, $1 - \nu$

Vacancy, searchers and matching, cont.

- Three types of searchers

  1. Unemployed, $\bar{u}_t = 1 - \bar{b}_t - \bar{n}_t$ workers in unemployment
  2. On-the-job searchers
     - $\bar{n}_t$ good workers: search with intensity ς_n
     - $\bar{b}_t$ bad workers: search with variable intensity ς_{bt}
     - Only good matches accepted
  3. Separated within period, search with intensity ς_u

Vacancy, searchers and matching, cont.

- Searchers:

$$\bar{s}_t = \underbrace{\bar{u}_t}_{\text{unemployed}} + \underbrace{\nu \varsigma_{bt} \bar{b}_t + \nu \varsigma_n \bar{n}_t}_{\text{OTJ search}} + \underbrace{(1-\nu)\, \varsigma_u \left(\bar{n}_t + \bar{b}_t\right)}_{\text{separated within period}}$$

- Matching function:

$$\bar{m}_t = \sigma_m \bar{s}_t^{\sigma} \bar{v}_t^{1-\sigma}$$

- Job finding rates for good and bad:

$$\begin{aligned} p_t^n &= \xi \left(\bar{m}_t / \bar{s}_t\right) \\ p_t^b &= (1-\xi) \left(\bar{m}_t / \bar{s}_t\right) \end{aligned}$$

- Job filling rates for good and bad:

$$\begin{aligned} q_t^n &= \xi \left(\bar{m}_t / \bar{v}_t\right) \\ q_t^b &= (1-\xi) \left(\bar{m}_t / \bar{v}_t\right) \left(1 - \frac{\nu \varsigma_{bt} \bar{b}_t + \nu \varsigma_n \bar{n}_t}{\bar{s}_t}\right) \end{aligned}$$

Firms

- Technology: $y_t = z_t k_t^{\alpha} l_t^{1-\alpha}$
- Labor quality: $l_t = n_t + \phi b_t = (1 + \phi \gamma_t) n_t$
- Composition: $\gamma_t = b_t / n_t$
- Dynamics of good and bad matches:

$$\begin{aligned} n_{t+1} &= \rho_t^n n_t + q_t^n v_t \\ b_{t+1} &= \rho_t^b b_t + q_t^b v_t \end{aligned}$$

with

$$\rho_t^i = \nu(1 - \varsigma_{it} p_t \xi), \;\; i = n, b$$

Firms: problem

Firms choose hiring rate x_t and capital k_t to max firm value F_t

$$F_t = \max_{x_t, k_t} \left\{ z_t k_t^{\alpha} l_t^{1-\alpha} - w_t l_t - r_t k_t - \frac{\kappa}{2} x_t^2 l_t + \mathbb{E}_t \left\{ \Lambda_{t,t+1} F_{t+1} \right\} \right\}$$

- Laborforce: $l_{t+1} = (\rho_t + x_t)\, l_t$
  - Retention rate: $\rho_t \equiv \frac{\rho_t^n + \phi \gamma_t \rho_t^b}{1 + \phi \gamma_t}$
  - Hiring rate: $x_t \equiv \frac{\left(q_t^n + \phi q_t^b\right) v_t}{l_t}$
- Composition: $\gamma_{t+1} = \gamma(\gamma_t, x_t, \rho_t^n, \rho_t^b, q_t^n, q_t^b) \quad (\gamma_t \equiv b_t / n_t)$
- $F_t \equiv F_t(l_t, \gamma_t, w_t)$

Firms: solution

- Homogeneity: $F_t(l_t, \gamma_t, w_t) = J_t(\gamma_t, w_t) \cdot l_t$
  - Choice of x_t and $\check{k}_t \equiv k_t / l_t$ depend only on $\{w_t, \gamma_t\}$
  - $J_t = \max_{x_t, \check{k}_t} \left\{ z_t \check{k}_t^{\alpha} - w_t - r_t \check{k}_t - \frac{\kappa}{2} x_t^2 + (\rho_t + x_t)\, \beta \mathbb{E}_t \left\{ \Lambda_{t,t+1} J_{t+1} \right\} \right\}$
- Hiring:

$$\kappa x_t = \mathbb{E}_t \left\{ \Lambda_{t,t+1} J_{t+1} \right\}$$

- Capital:

$$r_t = \alpha z_t \check{k}_t^{\alpha - 1}$$

Workers

- Value of unemployment

$$U_t = u_B + \mathbb{E}_t \left\{ \Lambda_{t,t+1} \left[p_t^n \bar{V}_{t+1}^n + p_t^b \bar{V}_{t+1}^b + (1 - p_t)\, U_{t+1} \right] \right\}$$

- Value of worker in a match of type $i = n, b$

$$\begin{aligned} V_t^i &= w_{it} - [\nu c(\varsigma_{it}) + (1-\nu) c(\varsigma_u)] \\ & +\mathbb{E}_t \left\{ \Lambda_{t,t+1} \left[\nu \left[(1 - \varsigma_{it} p_t^n) V_{t+1}^i + \varsigma_{it} p_t^n \bar{V}_{t+1}^n \right] \right.\right. \\ & \left.\left. + \; (1-\nu) \left[\varsigma_u p_t^n \bar{V}_{t+1}^n + \varsigma_u p_t^b \bar{V}_{t+1}^b + (1 - \varsigma_u p_t) U_{t+1} \right] \right] \right\} \end{aligned}$$

Search intensity: problem

$$
\begin{aligned}
\bar{V}_t^b &= \max_{\varsigma_{bt}} \{\phi \bar{w}_t - \nu \left[c(\varsigma_{bt}) + (1-\nu) c(\varsigma_u)\right] \\
&+ \mathbb{E}_t \left\{ \Lambda_{t,t+1} \left[\nu \left[(1 - \varsigma_{bt} p_t^n) \bar{V}_{t+1}^b + \varsigma_{bt} p_t^n \bar{V}_{t+1}^n \right] \right.\right. \\
&+ \left.\left. (1-\nu) \varsigma_u \left[p_t^n \bar{V}_{t+1}^n + \varsigma_u p_t^b \bar{V}_{t+1}^b + (1 - \varsigma_u p_t) U_{t+1} \right] \right] \right\} \Big\}
\end{aligned}
$$

- $c(\varsigma_{it})$ is convex cost of on-the-job search:

$$c(\varsigma_{bt}) = \frac{\varsigma_0}{1+\eta_\varsigma} \varsigma_{bt}^{1+\eta_\varsigma}$$

- wage insurance among bad workers (search intensity insurance):

$$\tau(w_t, \bar{w}_t) = \phi(\bar{w}_t - w_t)$$

Search intensity: solution

$$\varsigma_0 \varsigma_{bt}^{\eta_\varsigma} = \mathbb{E}_t \left\{ \Lambda_{t,t+1} p_t^n \left[\bar{V}_{t+1}^n - \bar{V}_{t+1}^b \right] \right\}$$

Staggered Nash bargaining

- Probability $1 - \lambda$ of re-bargaining every period
- Firms bargain with good workers over wage per unit of labor quality
- Bad workers receive fraction ϕ of contract wage w_t
  - Pay commensurate with relative productivity
- Good worker surplus: $H_t \equiv V_t^n - U_t$

Staggered Nash bargaining, cont.

- Contract wage w_t^* solves

$$\max_{w_t^*} H_t^\eta J_t^{1-\eta}$$

s.t.

$$w_{t+1} = \begin{cases} w_t \text{ with probability } \lambda \\ w_{t+1}^* \text{ with probability } 1-\lambda \end{cases}$$

- Evolution of average wage:

$$\bar{w}_t \simeq (1-\lambda)\bar{w}_t^* + \lambda \bar{w}_{t-1}$$

- New hires entering in between contract periods receive current contract wage $\Rightarrow$ no extra wage flexibility for new hires!

Wage growth of job changers

$$\widehat{\bar{g}}_t^{JC} = \underbrace{\omega\widehat{\bar{g}}_t^{w}}_{\substack{\text{fundamental}\\ \text{component}}} + \underbrace{(1-\omega)\,\widehat{c}_t^{w}}_{\substack{\text{compositional}\\ \text{component}}}$$

where

$$\widehat{\bar{g}}_t^{w} = \widehat{\bar{w}}_t - \widehat{\bar{w}}_{t-1}$$

and

$$\widehat{c}_t^{w} = \pi_{BG}\widehat{\delta}_{BG,t-1} - \pi_{GB}\widehat{\delta}_{GB,t-1}$$

$$\widehat{\delta}_{GB,t-1} = \pi_{\gamma}\widehat{\bar{\gamma}}_t + \pi_{\varsigma}\widehat{\bar{\varsigma}}_{bt}$$

- $\delta_{XY,t-1}$ is X-to-Y share of job flows initiated at $t-1$
- $\widehat{c}_t^{w}$ is procyclical due to procyclicality of $\widehat{\delta}_{BG,t-1}$
  - latter due to procyclicality of search intensity $\widehat{\bar{\varsigma}}_{bt}$

Calibration

Parameter values		
Discount factor	β	$0.997 = 0.99^{1/3}$
Capital depreciation rate	δ	$0.008 = 0.025/3$
Production function parameter	α	0.33
Technology autoregressive parameter	ρ_z	$0.983 = 0.95^{1/3}$
Technology standard deviation	σ_z	0.0070
Elasticity of matches to searchers	σ	0.4
Bargaining power parameter	η	0.5
Matching function constant	σ_m	1.0
Search cost elasticity	η_ς	1.0
Renegotiation frequency	λ	0.917 (4 quarters)

Jointly calibrated parameters

Parameter	Description	Value	Target
ϕ	Inverse productivity premium	0.70	Average E-E wage increase (4.80%)
ξ	Prob. of good match	0.02	Average E-N-E wage decrease (6.20%)
κ	Hiring cost parameter	165.73	U-E probability (0.45)
ς_0	Scale parameter of search cost	0.06	E-E probability (0.029)
u_b	Flow value of unemployment	1.91	Relative value, non-work (0.501)
$1 - v$	Separation probability	0.05	E-U probability (0.026)

- Steady state/parameter restriction: $\varsigma_u = \varsigma_n = \tilde{\xi}_b$

Aggregate statistics

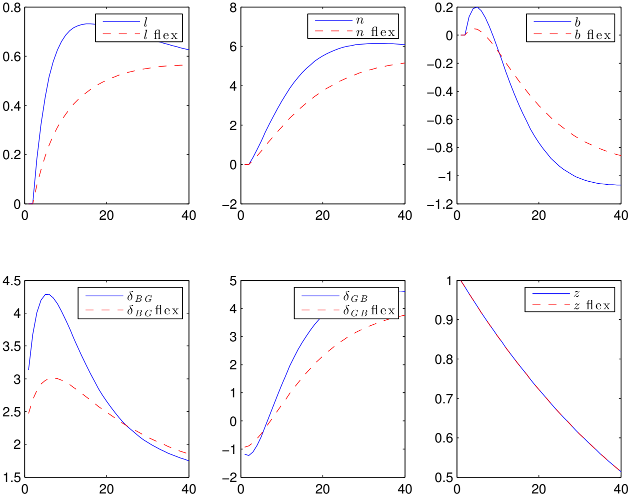
	y	w	$n+b$	u	v
	U.S. Economy, 1964:1-2013:02				
Relative St. Dev.	1.00	0.48	0.64	5.74	6.38
Autocorrelation	0.88	0.88	0.94	0.92	0.92
Correlation with y	1.00	0.57	0.79	-0.87	0.91
	Model Economy, $\lambda = 11/12$ (4 quarters)				
Relative St. Dev.	1.00	0.45	0.31	5.41	8.15
Autocorrelation	0.85	0.96	0.89	0.89	0.86
Correlation with y	1.00	0.64	0.92	-0.92	0.98
	Model Economy, $\lambda = \infty$ (Flex wages)				
Relative St. Dev.	1.00	0.74	0.16	2.76	4.73
Autocorrelation	0.82	0.80	0.91	0.91	0.88
Correlation with y	1.00	1.00	0.83	-0.83	0.98

Wage semi-elasticities

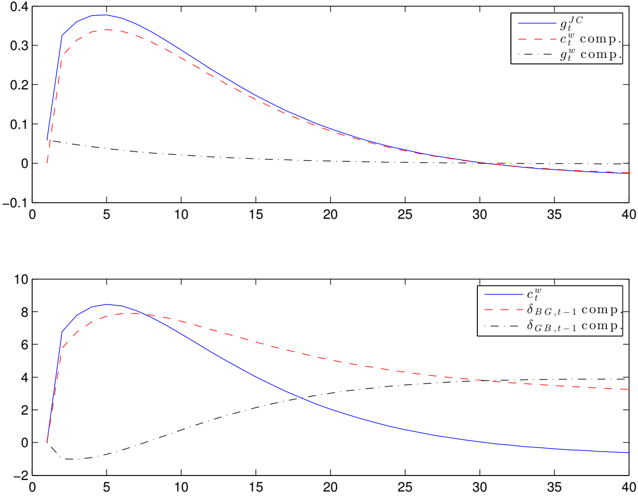
Semi-elasticities of wages w/r.t. unemployment

	SIPP	Model, 4Q	Model, flex
UR	-0.45	-0.53	-2.41
UR$\cdot \mathbb{I}(\text{new})$	-1.00	-1.08	-2.64

Impulse responses of employment to productivity shock



Wage growth and components



TFP, productivity and output

- Output:

$$y_t = z_t k_t^{\alpha} \left(n_t + \phi b_t\right)^{1-\alpha}$$

- Measured output:

$$y_t = z_t \left(\frac{1+\phi\gamma_t}{1+\gamma_t}\right)^{1-\alpha} k_t^{\alpha} \left(n_t + b_t\right)^{1-\alpha}$$

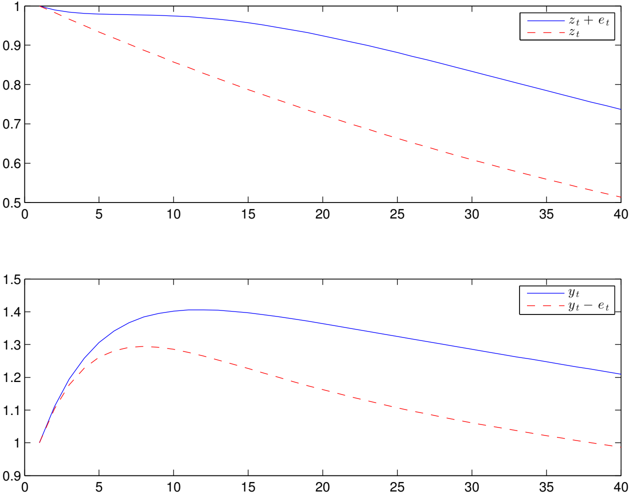
- Loglinearized measured TFP:

$$\widehat{z}_t - (1-\alpha)\frac{\tilde{\gamma}}{1+\tilde{\gamma}}\frac{1-\phi}{1+\phi\tilde{\gamma}}\widehat{\gamma}_t$$

- Extra term is procyclical

  $\rightarrow$ γ falls during an expansion

TFP, productivity and output, con't



$(TFP = z_t + e_t)$

Conclusion

- No evidence that new hire wages are more flexible than those for existing workers
  - No new hire effect for workers coming from unemployment
  - Cyclical wages for job changers consistent with "job ladder" models
- Developed model of unemployment fluctuations with
  1. Wage rigidity
  2. Variation in match quality
  3. On-the-job search
- Model consistent with both macro and micro evidence
  - All three ingredients necessary

Supplementary Slides

Recent literature

- Barattieri, Basu, Gottschalk (2012)
  - Average duration between wage change 3.8 to 4.7 quarters
- Martins, Solon, and Thomas (2012)
  - Cyclical wages for entry workers in Portugal, but wage cyclicality of entry workers $\approx$ wage cyclicality for continuing workers
- Hyatt and McEntarfer (2012)
  - Wages for workers with 3 to 8 mths of nonemployment btwn jobs far less cyclical than for workers changing jobs within a quarter
- Gertler and Trigari (2009)
  - New hire effect driven by match quality; after introducing fixed-effects at worker-job level, no evidence of new hire cyclicality
- Hagedorn and Manovskii (2013)
  - Develop indirect measures of match quality to argue that empirical claims of new hire flexibility and implicit contracts are unfounded
- Haefke, Sonntag and van Rens (2013)
  - Wages for new hires from unemployment display greater co-movement with productivity, but not statistically significant

Return

Martins, Solon, and Thomas

Table 2—Estimates of Cyclicality of Log Entry Wages in Portugal, 1982–2008

Estimation method	Estimated coefficient of unemployment rate (and estimated standard error)
1. Weighted least squares for regression of log modal entry wage year effects on unemployment rate and linear time trend	−1.81 (0.38)
2. Same as (1) but ordinary least squares	−1.66 (0.47)
3. Ordinary least squares for first differences	−1.48 (0.78)

Table 3—Estimates from Regressions of Portuguese Workers' Change in Log Wages on Change in Unemployment Rate, 1986–1987 to 2007–2008

Estimation method	Estimated coefficient of change in unemployment rate (and estimated standard error)
1. All longitudinally matched workers, with controls for age and time	−1.25 (0.38)
2. Same as (1) but with wage measure including non-base pay	−1.51 (0.37)

Return

Sample selection

- Men, ages 20-60; drop individuals attending school full-time, self employed, armed forces, permanent disabilities; hours $\in [10, 100]$
- We only use wage observation from last month of wave (SIPP seam effect)
- Drop observations where individual holds multiple jobs
- Drop observations with top-coded or imputed wages
- Drop observations with wage below minimum wage minus two
- Wage measure unreliable at beginning and end of job spell
  - New hires who are not paid hourly: use second wage
  - Last month on job: use previous wave's wage

Return

Measurement

- We use direct measure of hourly wage when available
- Otherwise construct hourly wage from job-specific earnings divided by hrs/wk $\times$ wks/mth
- Wages deflated with PCE
- Unemployment: Males, 20 yrs+
- Longterm unemployed: duration > 9 months
- Job tenure: beginning of period retrospective information, then update for each month observed working for pay
- EE transitions: change in job ID across two months, both months worked for pay
- ENE transitions: change in job ID, intervening month(s) w/o work for pay
- New hire: tenure < 4 months

Return

Recalls

- SIPP maintains unique job identifiers for each job, except if a worker spends an entire wave in non-employment (1996+)
- If worker returns to previous job after full wave in non-employment, the job is given a new ID
- Potential for mis-labeling recalls as ENE transitions
- Our solution:
  - Each time a new job is recorded, worker provides start date associated with that job
  - Question is designed to record the first time a worker was at job
  - We identify potential recalls as workers reporting a start date prior to wave of non-employment

Recalls, cont.

Panel	No. of jobs post 4 month empl. gap	% Potential recalls
1996	13,360	33.20
2001	8,605	38.81
2004	16,675	49.22
2008	23,776	52.49

Recalls, cont.

- Separate start date questions for jobs that start before or during current wave
- 1996 panel: "Did [FIRST AND LAST NAME] begin [HIS\HER] employment with [NAME OF EMPLOYER] at some time between [MONTH1] 1st and today?" (variable STRTJB).
  - If yes, respondent gives month and day that job began (STRTREFP)
  - If no, respondents are asked to give their "BEST estimate" of the year, month, and date that the job began (variables STRTMONJB, STRTJYR, STRTJMTH).