THE RISE OF PART-TIME EMPLOYMENT

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INTRODUCTION

- Part-time employment is a major channel of adjustment in hours and wages Borowczyk-Martins & Lalé ['17], Daly & Hobijn ['17], Kurmann et al. ['17]

- Relatively little is known about the secular and cyclical behavior of the part-time employment margin; this partly reflects data limitations

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This paper:

- We construct new time series of stocks and flows for part-time employment
- Using these data, we establish facts about its long-run and short-run behaviors
- We relate these facts to several research areas in macro and labor economics

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1. There is a **rising trend** in turnover between full-time and part-time employment

2. The risk of working part-time involuntarily has **markedly increased** in downturns

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   The dynamics of involuntary part-time employment are remarkably fast

   ... and, unlike unemployment, they are driven by the inflows from employment

INTRODUCTION

These facts are potentially relevant for:

1. Slowdown in U.S. labor market dynamism; e.g. Davis et al. [JEP '06], Mukoyama & Şahin [JME '09], Galí & van Rens ['14]; Fujita ['15]

2. Changes in job stability and job security; e.g. Farber [JoLE '99], Davis [AEA P&P '08], Farber [NBER '10]

3. Assessment of slack in the labor market; Yellen ['14], Hornstein et al. [FRB QE '14], Blanchflower & Levin ['15]
   Cyclical/structural shift in part-time work: Valletta et al. ['15], Even & Macpherson ['15]

OUTLINE

DATA AND MEASUREMENT

LONG-RUN EVOLUTION

CYCLICAL FLUCTUATIONS

I. Data and measurement issues

DATA AND DEFINITIONS

Data

- Monthly files of the CPS for the period 1976m01–2015m12
- Annual data from the March demographic supplement of the CPS

Definitions

- Part-time employment: less then 35 total usual hours per week
  In the CPS, this measure includes usual paid and unpaid overtime hours
- Involuntary part-time work is based on the following question:

  Some people work part time because they cannot find full time work or because business is poor. Others work part time because of family obligations or other personal reasons. What is (name's/your) MAIN reason for working part time?

CPS REDESIGN

	Before 1994	After 1994
Usual hours	Only for workers < 35 actual hours	All workers
Involuntary part-time work	Loose wording	Must want and be available for full-time

CORRECTION PROCEDURES

1. Labor market stocks

- Discrepancy between the monthly-based and March-based estimates
- We require that the *discrepancy* remains constant across the 1994 break
- Pre-1994 data are adjusted using multiplicative factors ▸ Graph

2. Labor market flows

- We reconcile the flows with corrected labor market stocks using margin-error adjustments (Poterba & Summers [ECMA '86], Elsby et al. [JME '15])
- Correct flow hazards for time-aggregation bias (Shimer [RED '12])

Additional adjustments :

- Remove systematic seasonal variation using X13-ARIMA-SEATS
- Adjust individual weights to control for changing demographics

II. Part-time employment in the long run

EMPIRICAL FRAMEWORK

Framework

- The labor market in period t is described by

$$\boldsymbol{\ell}_t = \begin{bmatrix} F & P & U & N \end{bmatrix}_t'$$

- $\boldsymbol{\ell}_t$ is governed by a first-order Markov chain $\boldsymbol{\ell}_t = \boldsymbol{M}_t \boldsymbol{\ell}_{t-1}$
- The elements of $\boldsymbol{M}_t$ are transition probabilities p^{ij} from state i to j

Main objects

- Part-time employment share

$$\omega_t^P = \frac{P_t}{F_t + P_t}$$

- Flow hazards λ^{ij} (i.e. $p^{ij} = 1 - e^{-\lambda^{ij}}$)

PART-TIME EMPLOYMENT SHARE

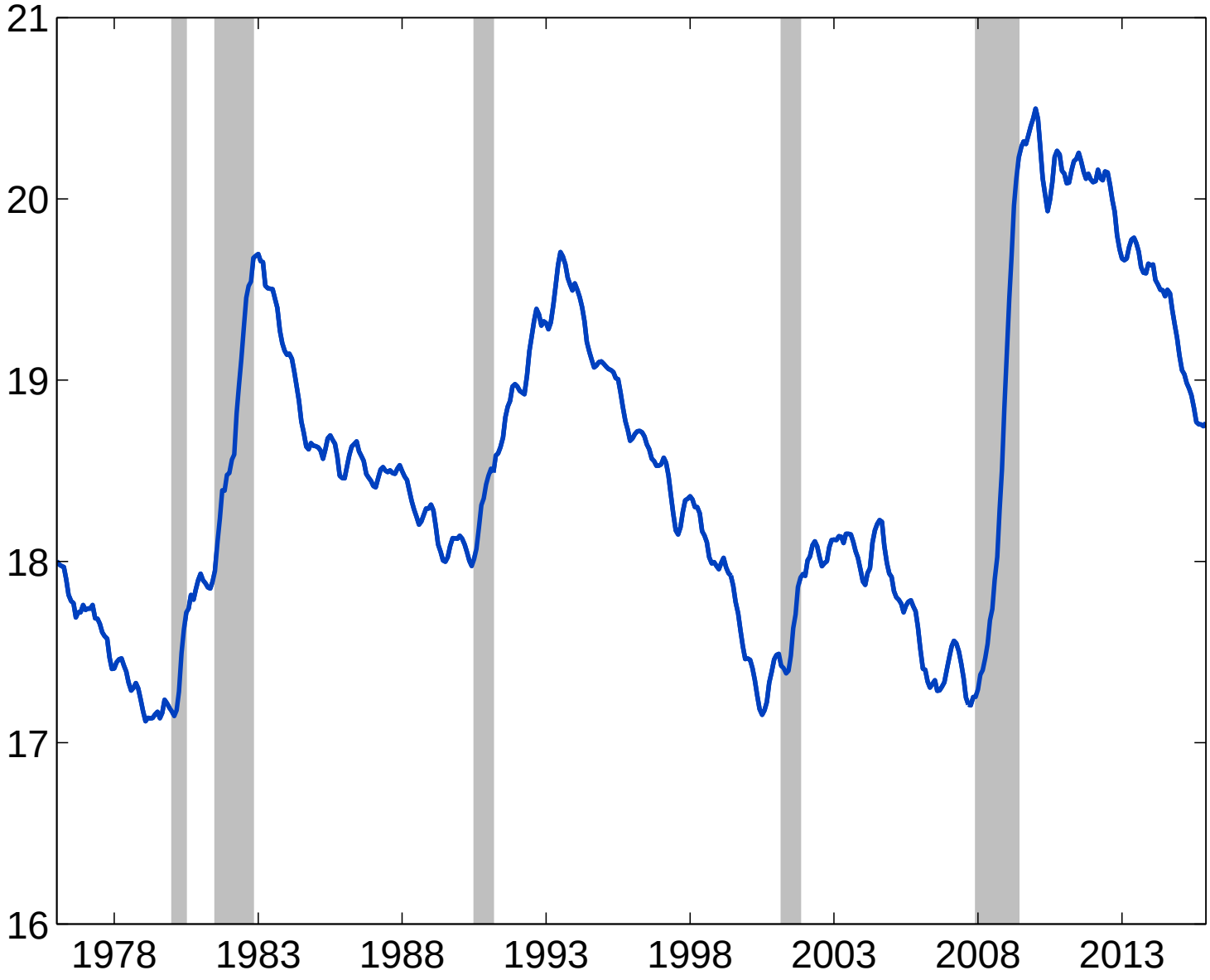

Figure 1: Part-time employment share

INFLOWS AND OUTFLOWS

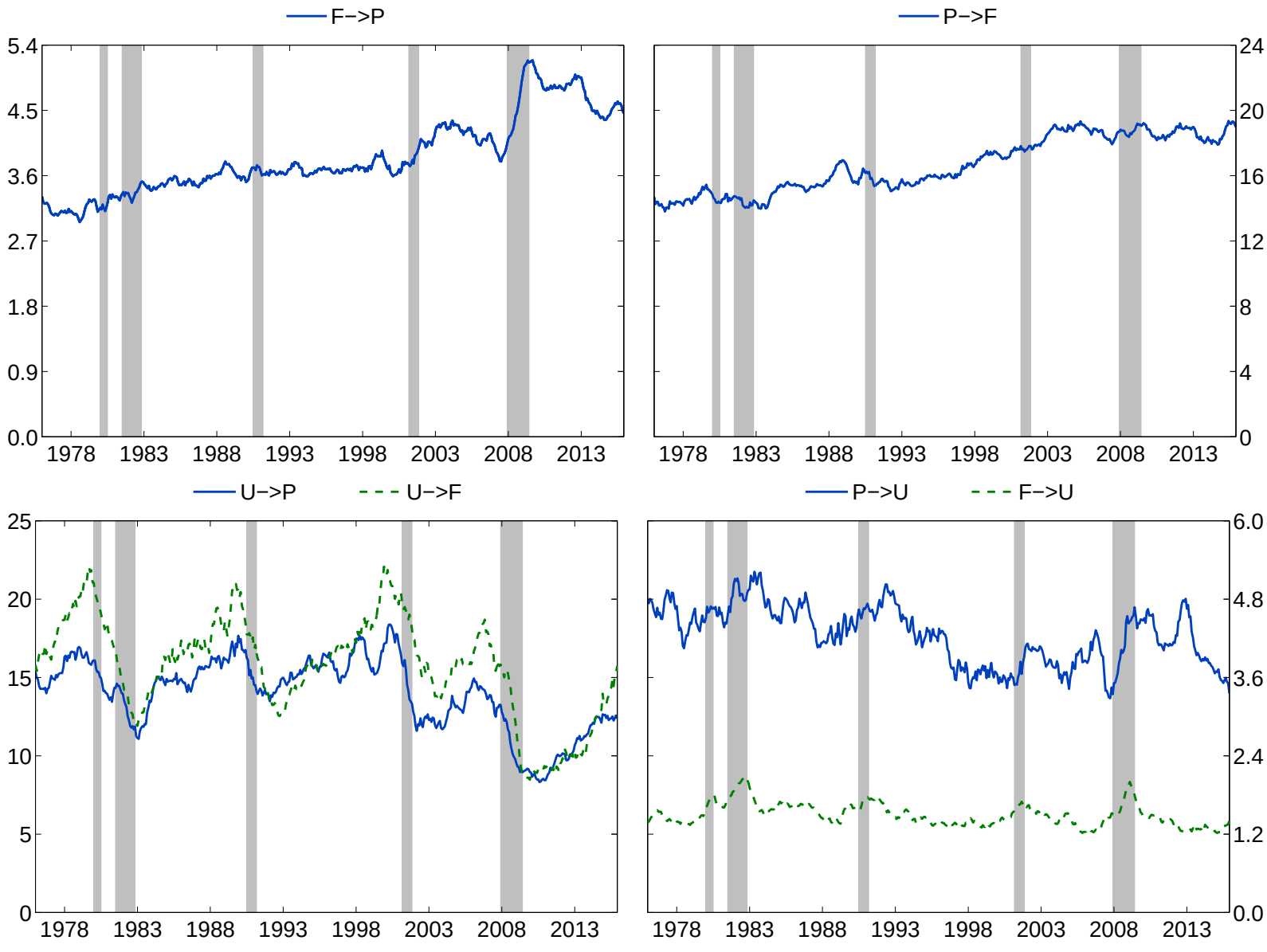

Figure 2: Transition probabilities, within employment and w.r.t. unemployment

DECOMPOSITION OF LONG-RUN CHANGES

Steady state

- We focus on

$$\bar{\omega}_t^P = \frac{\bar{P}_t}{\bar{F}_t + \bar{P}_t} = \frac{\lambda^{FP} + \lambda_n^{FP}}{\lambda^{FP} + \lambda_n^{FP} + \lambda^{PF} + \lambda_n^{PF}}$$

  λ^{FP}, λ^{PF}: within-employment effects

- Non-employment matters via, e.g.,

$$\lambda_n^{PF} = \left(\lambda^{PU} + \lambda^{PN}\right) \frac{\lambda^{UF}\bar{U}_t + \lambda^{NF}\bar{N}_t}{\sum_{k=P,F} \lambda^{Uk}\bar{U}_t + \lambda^{Nk}\bar{N}_t}$$

Decomposition

- Use a Taylor expansion $d\bar{\ell}_t \approx \sum_{i \neq j} \frac{\partial \bar{\ell}_t}{\partial \lambda^{ij}} d\lambda^{ij}$, and write $\bar{\omega}_t^P$ as

$$d\bar{\omega}_t^P \approx \frac{d\bar{P}_t(1 - \bar{\omega}_t^P) - d\bar{F}_t \bar{\omega}_t^P}{\bar{P}_t + \bar{F}_t}$$

DECOMPOSITION OF LONG-RUN CHANGES

Table 1: Long-run changes of the part-time employment share

	1976 – 1985 (1)	1986 – 1995 (2)	1996 – 2005 (3)	2006 – 2015 (4)	1976 – 2015 (5)
$D\bar{\omega}^P$	2.12	0.43	-1.08	0.90	1.95
(i) Counterfactuals – Within-employment					
$D\bar{\omega}^P(F \to P)$	1.45	0.37	1.32	1.02	4.03
$D\bar{\omega}^P(P \to F)$	-0.46	-0.35	-2.23	-0.04	-3.26
(ii) Counterfactuals – Aggregate					
$D\bar{\omega}^P_w$	0.99	0.02	-0.91	0.98	0.77
$D\bar{\omega}^P_n$	1.19	0.34	-0.36	0.07	1.13
$D\bar{\omega}^P_w + D\bar{\omega}^P_n$	2.18	0.36	-1.27	1.05	1.90

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DECOMPOSITION OF LONG-RUN CHANGES

Taking stock

- $P \to F$ and $F \to P$ imply changes that cancel each other out:
  - $\beta\left(P \to F\right) = -47.4$
  - $\beta\left(F \to P\right) = 111.7$
- The decline in $P \to U$ and $P \to N$ mattered in the 1970s/1980s
- From 1976 to 2015, within-employment effects explain 64% of the variation of $\bar{\omega}_t^P$

- In Borowczyk-Martins & Lalé ['17], we find that transitions between F and P explains more than 3/4 of the cyclical dynamics of part-time employment

III. Cyclical fluctuations and involuntary part-time work

EMPIRICAL FRAMEWORK

Framework

- We extend our framework to consider:

$$\begin{bmatrix} F & V & I & U & N \end{bmatrix}_t'$$

- Correction in the spirit of Elsby, Hobijn & Şahin [JME '15] to discard spurious transitions between V and I (and also between U and N)

Main objects

- Involuntary part-time share

$$\omega_t^P = \omega_t^V + \omega_t^I$$

  i.e.

$$\omega_t^I = \frac{I_t}{F_t + V_t + I_t}$$

- $\frac{\mathbb{C}\text{ov}(\Delta\omega_t^P, \Delta\omega_t^I)}{\mathbb{V}\text{ar}(\Delta\omega_t^P)}$ is 59.3% for the sample period, and is 72.1% for last decade

INVOLUNTARY PART-TIME EMPLOYMENT

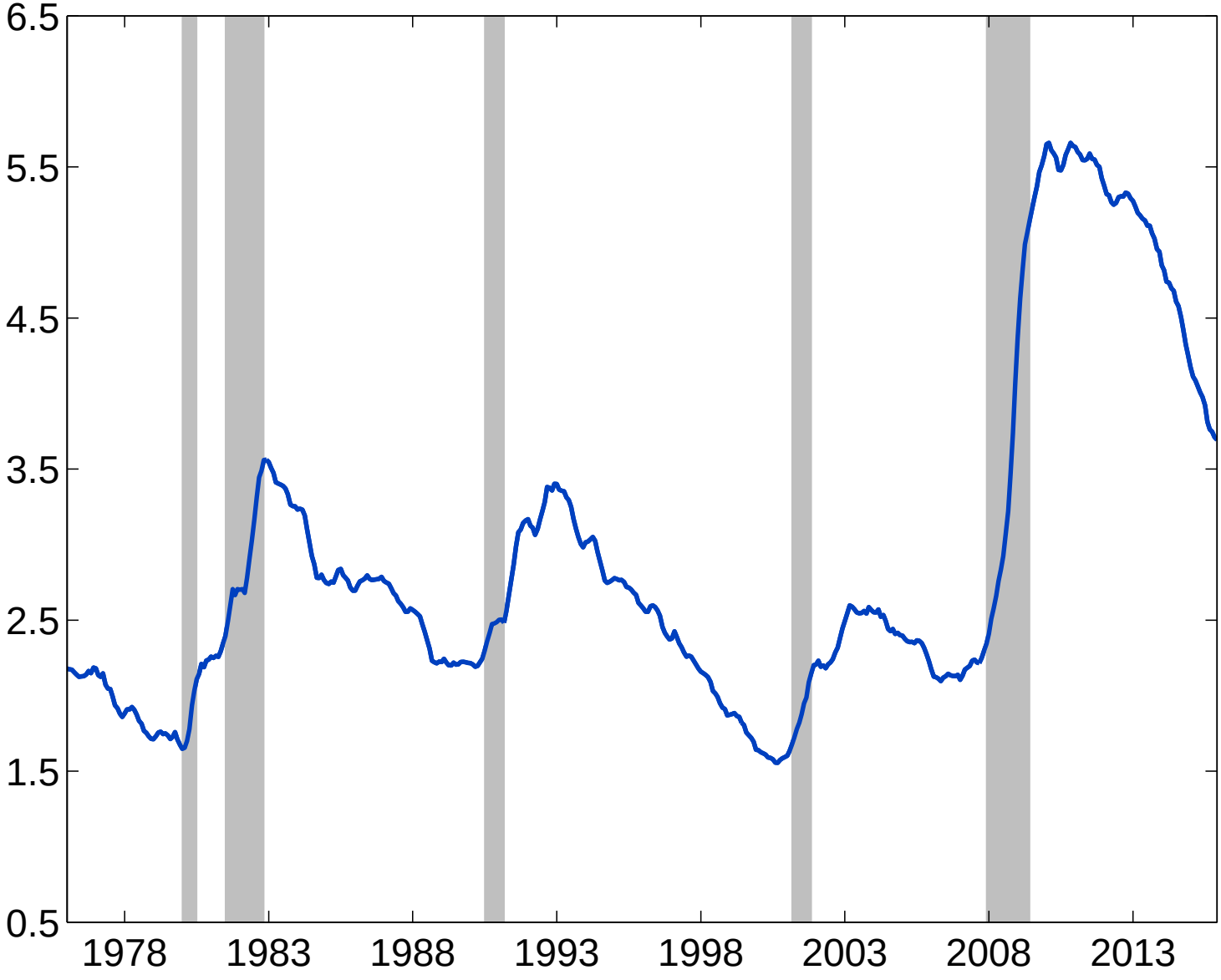


Figure 3: Involuntary part-time employment share

INFLOWS AND OUTFLOWS

Table 2: Sample averages: involuntary part-time work vs. unemployment

Involuntary part-time work				Unemployment			
Inflows		Outflows		Inflows		Outflows	
$q(F \to I)$	28.8	$p(I \to F)$	29.0	$q(F \to U)$	17.6	$p(U \to F)$	15.7
$q(V \to I)$	16.3	$p(I \to V)$	15.4	$q(V \to U)$	6.77	$p(U \to V)$	7.56
$q(U \to I)$	16.9	$p(I \to U)$	11.6	$q(I \to U)$	4.45	$p(U \to I)$	6.41
$q(N \to I)$	5.35	$p(I \to N)$	4.43	$q(N \to U)$	15.1	$p(U \to N)$	12.0
$\sum_{i \neq I} q(i \to I)$	67.3	$\sum_{j \neq I} p(I \to j)$	60.4	$\sum_{i \neq U} q(i \to U)$	43.9	$\sum_{j \neq U} p(U \to j)$	39.1

INFLOWS AND OUTFLOWS

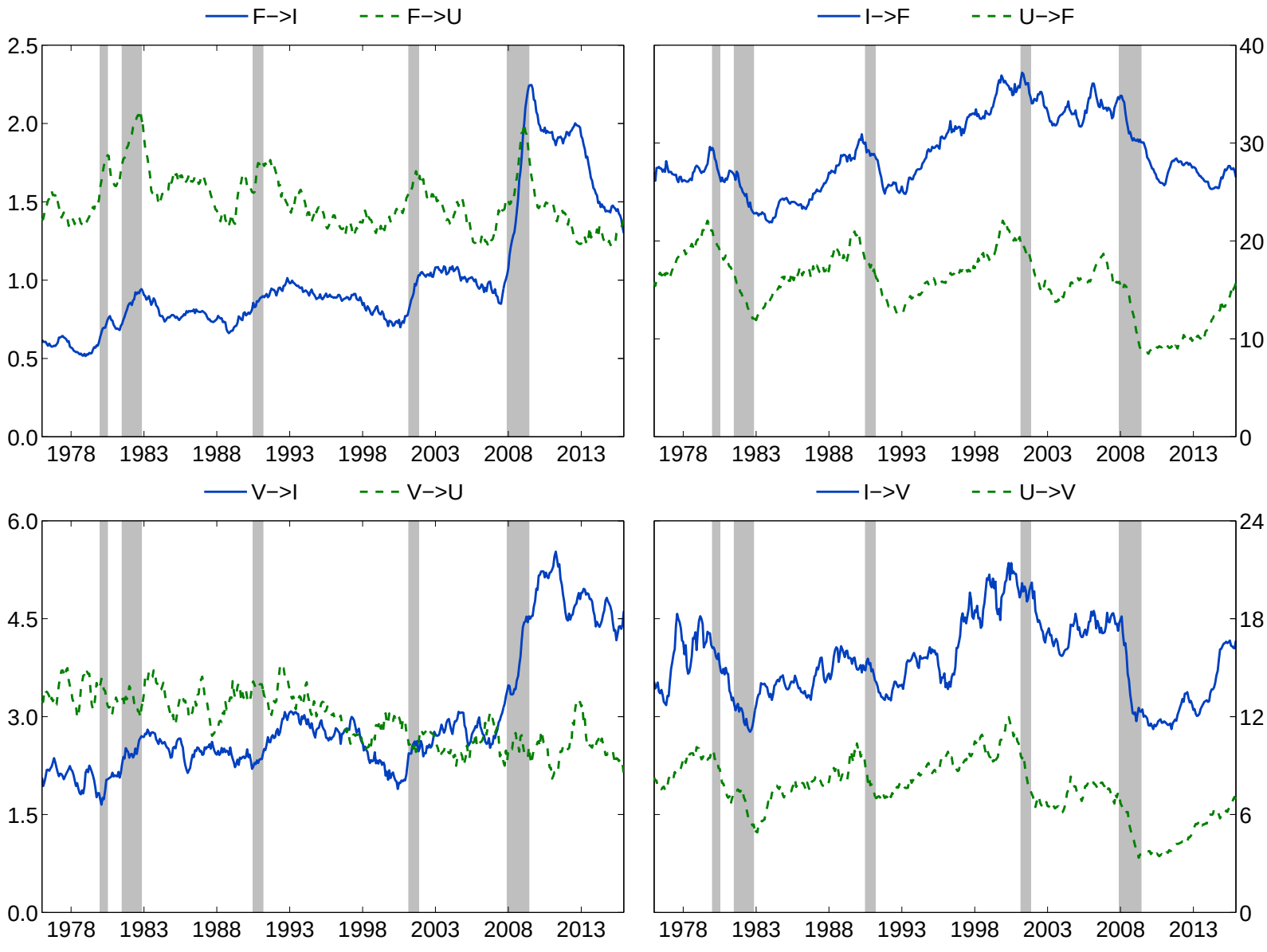


Figure 4: Transition probabilities: involuntary part-time work vs. unemployment

DYNAMIC VARIANCE DECOMPOSITION

Decomposition

- Estimate the relative importance of each flow hazard λ^{ij} to the dynamics of involuntary part-time work using Elsby, Hobijn & Şahin [JME '15]'s method

- Specifically, the contribution of each flow hazard λ^{ij} to the variation in the involuntary part-time employment share ω_t^I is:

$$\beta^{ij} = \frac{\text{Cov}\left(\Delta\omega_t^I, \Delta\widetilde{\omega_t^I}^{ij}\right)}{\text{Var}(\Delta\omega_t^I)}$$

$\Delta\widetilde{\omega_t^I}^{ij}$ denotes changes in the counterfactual involuntary part-time share whose evolution is based on the past and contemporaneous changes of λ^{ij}

- It can be shown that:

$$\sum_{i \neq j} \beta^{ij} \approx 1$$

DYNAMIC VARIANCE DECOMPOSITION

Table 3: Variance contributions: involuntary part-time work vs. unemployment

Involuntary part-time share				Unemployment rate			
Inflows		Outflows		Inflows		Outflows	
$\beta(F \to I)$	28.9	$\beta(I \to F)$	21.7	$\beta(F \to U)$	13.6	$\beta(U \to F)$	21.9
$\beta(V \to I)$	17.9	$\beta(I \to V)$	13.0	$\beta(V \to U)$	1.74	$\beta(U \to V)$	6.05
$\beta(U \to I)$	6.59	$\beta(I \to U)$	2.52	$\beta(I \to U)$	5.58	$\beta(U \to I)$	8.87
$\beta(N \to I)$	4.96	$\beta(I \to N)$	1.81	$\beta(N \to U)$	20.0	$\beta(U \to N)$	20.4
$\sum_{i \neq I} \beta(i \to I)$	58.4	$\sum_{j \neq I} \beta(I \to j)$	39.1	$\sum_{i \neq U} \beta(i \to U)$	40.9	$\sum_{j \neq U} \beta(U \to j)$	57.2
$\sum_{i \neq I} \beta(i \to I) + \sum_{j \neq I} \beta(I \to j) = 97.5$				$\sum_{i \neq U} \beta(i \to U) + \sum_{j \neq U} \beta(U \to j) = 98.1$			

RECESSION EPISODES

- Within-employment reallocation (especially the interaction with F) became stronger throughout the past 4 decades
- The increase in ω_t^I during the Great Recession was unprecedented

Putting it all together

- Counterfactual changes:

$$\sum_{\tau=t_0}^{t_1} \Delta\widetilde{\omega_t^{Is}} + \sum_{\tau=t_0}^{t_1} \Delta\widetilde{\omega_t^{sI}}$$

with $s \in \{F, V, U, N\}$

RECESSION EPISODES

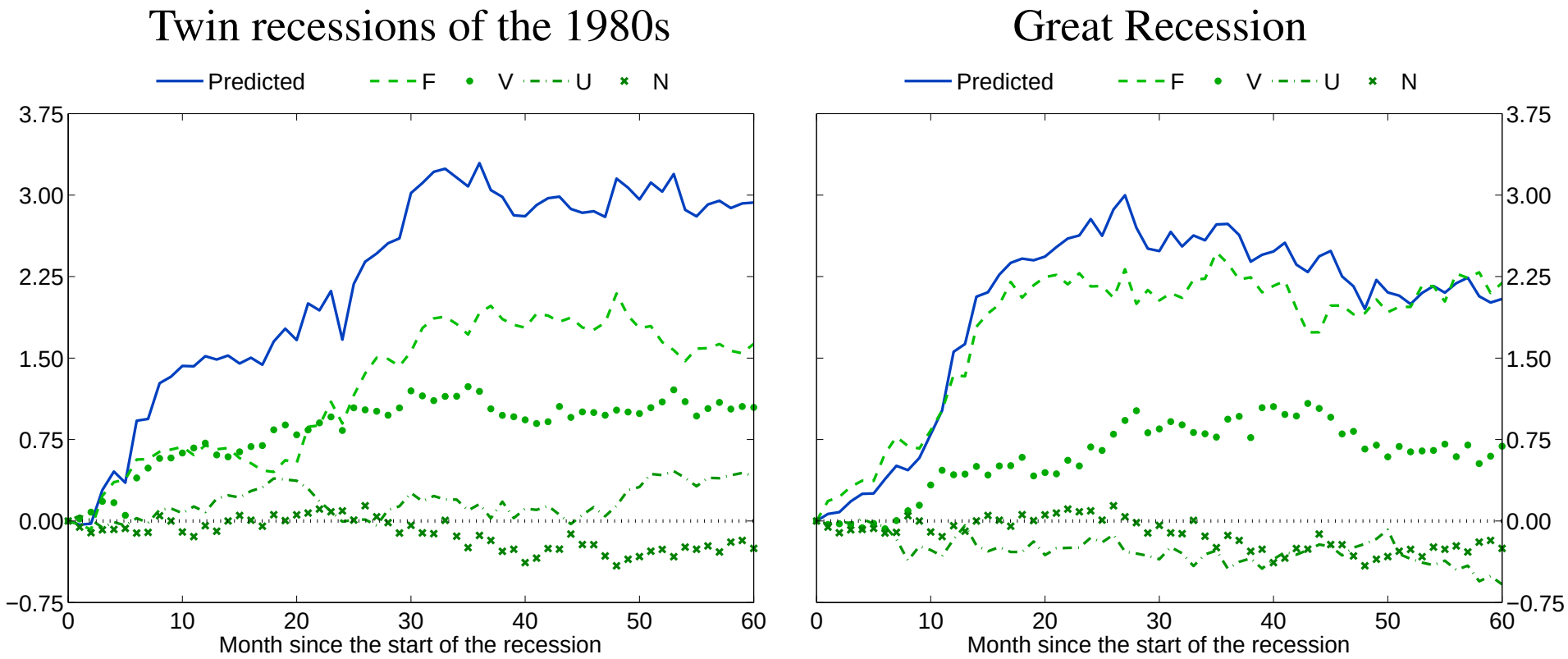


Figure 5: Recessionary increases in involuntary part-time work

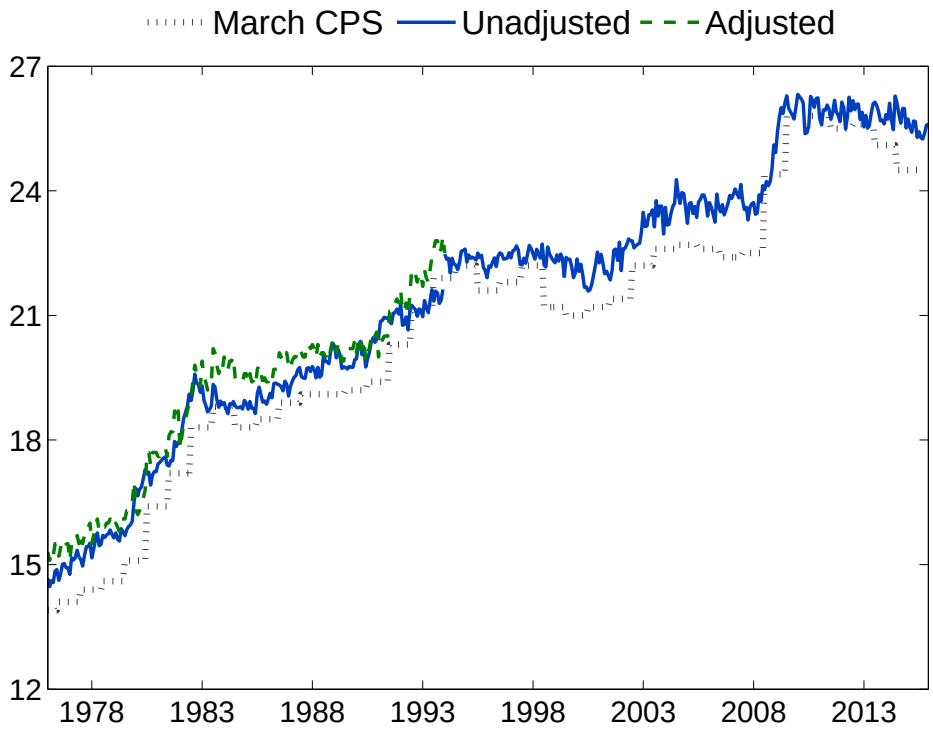
Conclusion

CONCLUSION

- Using new data, we conduct a detailed empirical analysis of the long-run and short-run behaviors of the part-time employment margin
- The importance of within-employment reallocation underscores the advantage of using our data, that splits employment into finer categories
- Part-time work plays an increasingly important role in shaping the employment experience of workers in the U.S. labor market

Extras

CORRECTION PROCEDURES



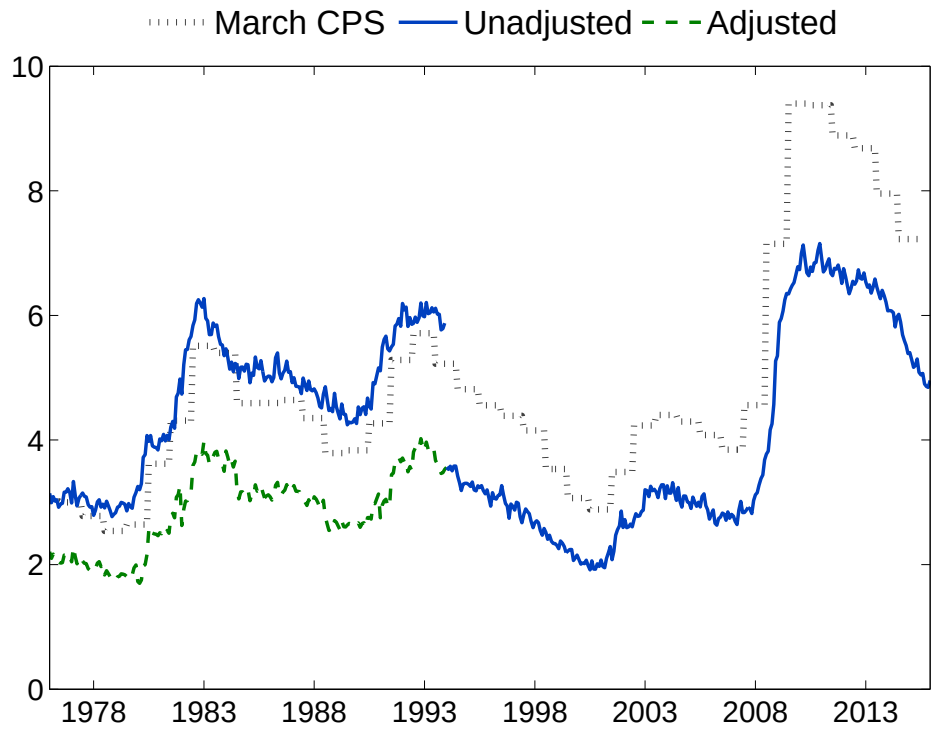


Figure A1: Labor market stocks, March CPS and monthly CPS

Back

SPURIOUS TRANSITIONS

Observed	Corrected	Observed	Corrected
$F \to V \to I \to V$	$F \to V \to V \to V$	$F \to I \to V \to I$	$F \to I \to I \to I$
$V \to V \to I \to V$	$V \to V \to V \to V$	$I \to I \to V \to I$	$I \to I \to I \to I$
$U \to V \to I \to V$	$U \to V \to V \to V$	$U \to I \to V \to I$	$U \to I \to I \to I$
$N \to V \to I \to V$	$N \to V \to V \to V$	$N \to I \to V \to I$	$N \to I \to I \to I$
$V \to I \to V \to F$	$V \to V \to V \to F$	$I \to V \to I \to F$	$I \to I \to I \to F$
$V \to I \to V \to V$	$V \to V \to V \to V$	$I \to V \to I \to I$	$I \to I \to I \to I$
$V \to I \to V \to U$	$V \to V \to V \to U$	$I \to V \to I \to U$	$I \to I \to I \to U$
$V \to I \to V \to N$	$V \to V \to V \to N$	$I \to V \to I \to N$	$I \to I \to I \to N$

TRANSITIONS BETWEEN (F, P) AND N

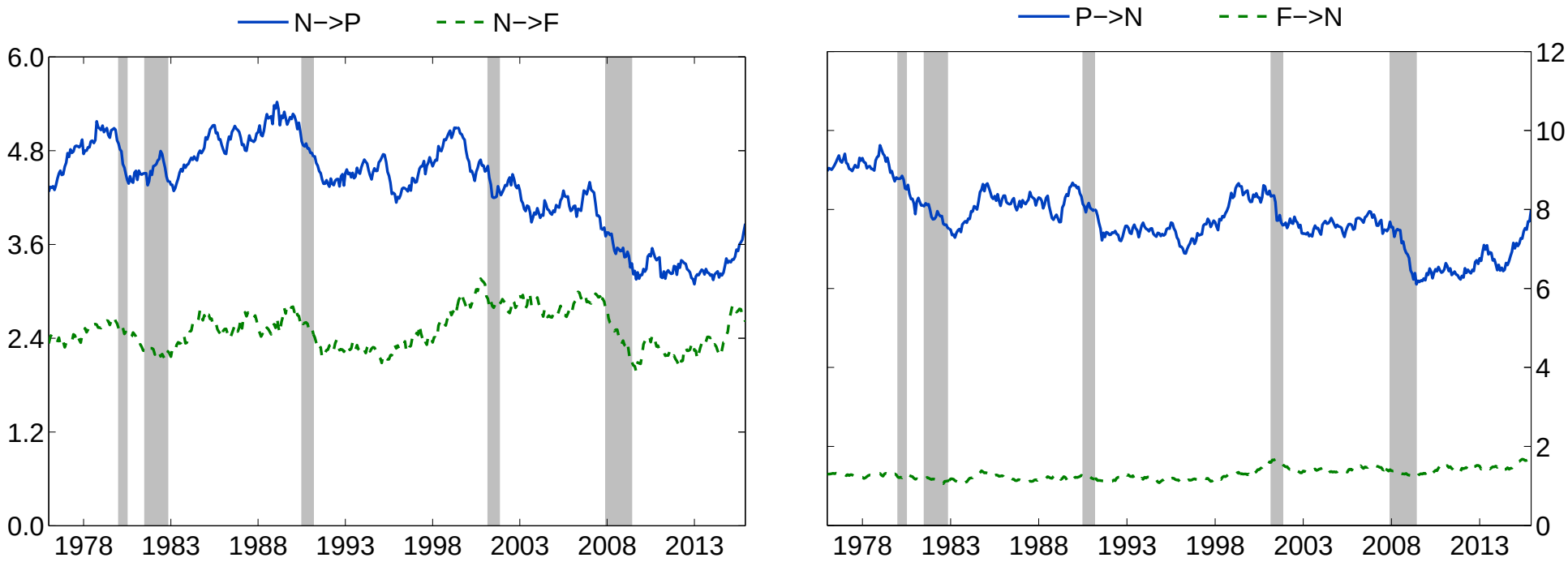


Figure A2: Inflows from and outflows to non-participation

TRANSITIONS BETWEEN (I, U) AND N

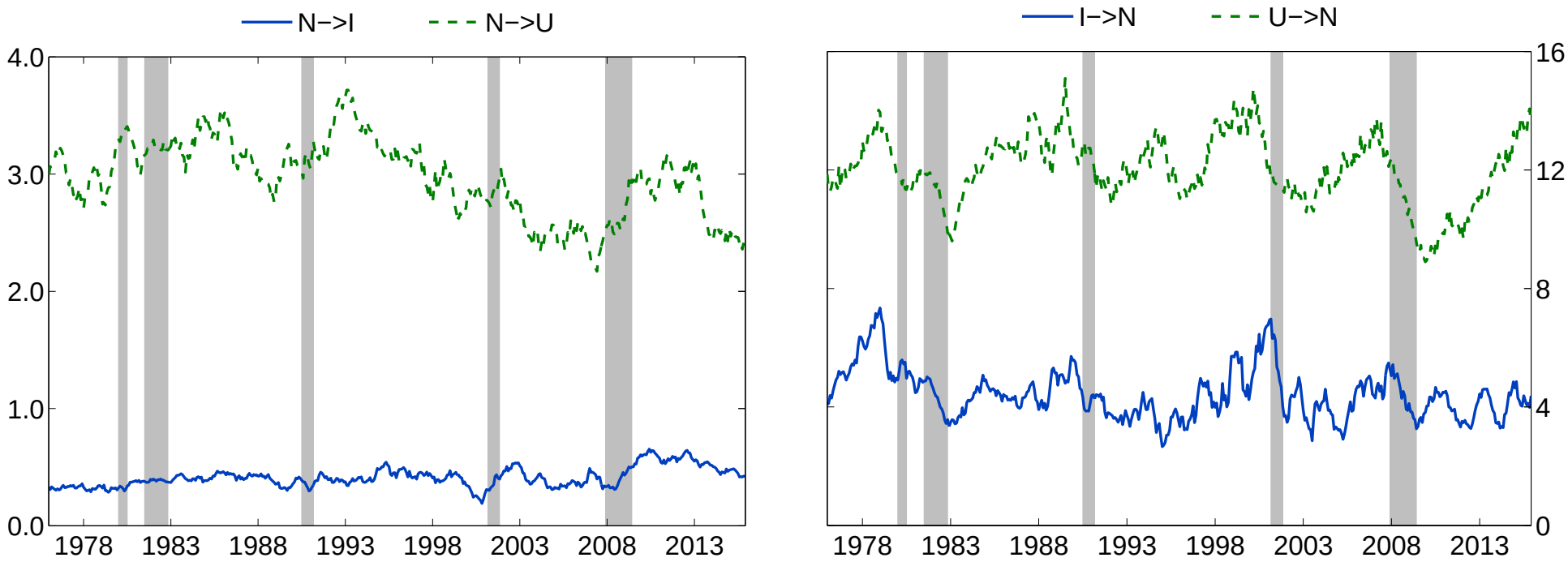


Figure A3: Inflows from and outflows to non-participation