

# Flow Origins of Labor Force Participation Fluctuations

Michael Elsby, Bart Hobijn, Fatih Karahan, Gizem Koşar, and **Ayşegül Şahin**<sup>1</sup>



ASSA Meetings, January 6, 2019, Atlanta

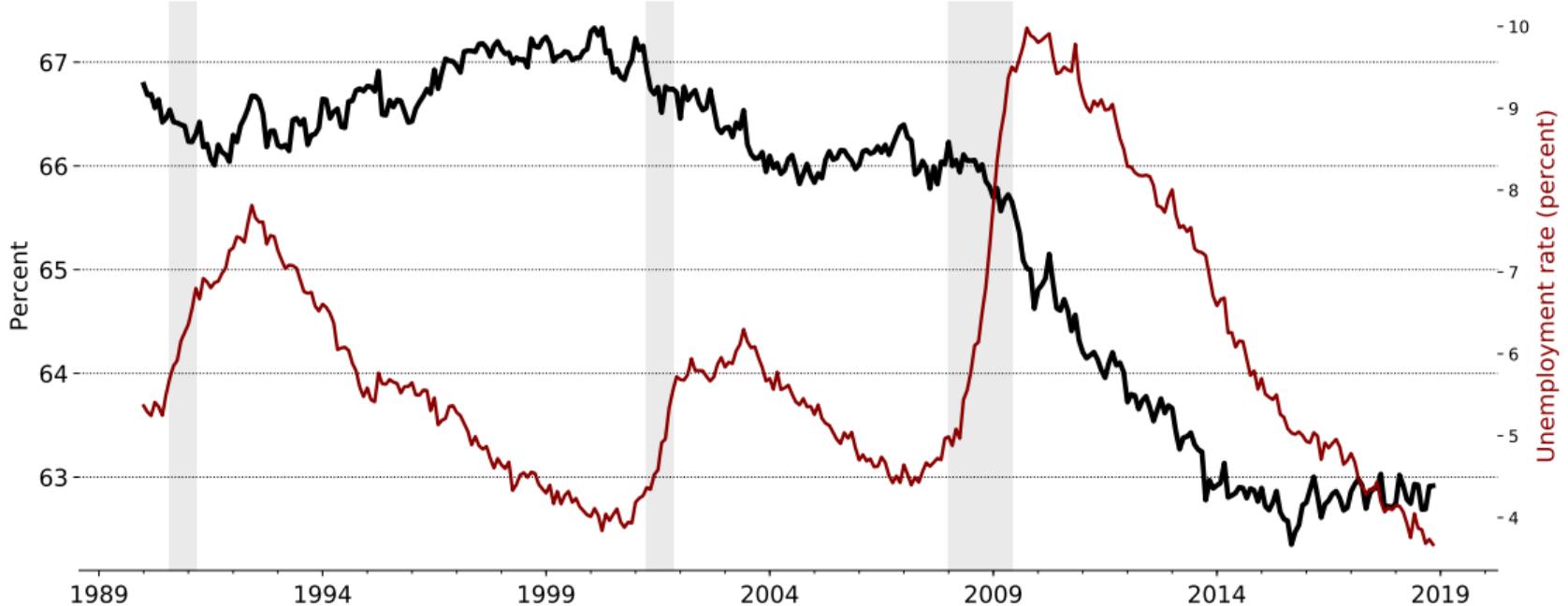
---

<sup>1</sup>The views expressed in this paper are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

# Joint evolution of unemployment and participation

## Labor force participation rate and unemployment rate

Monthly observations; seasonally adjusted; share of CNI population age 16+; Total



Source: Bureau of Labor Statistics

# Joint evolution of unemployment and participation

General tendency to study unemployment fluctuations and *lfpr* trends separately

- ▶ A long-standing literature focuses on examining procyclicality of employment
  - ▶ unemployment is *countercyclical* and labor force participation rate is *procyclical*

# Joint evolution of unemployment and participation

General tendency to study unemployment fluctuations and *lfpr* trends separately

- ▶ A long-standing literature focuses on examining procyclicality of employment
  - ▶ unemployment is *countercyclical* and labor force participation rate is *procyclical*
- ▶ A long-standing literature focuses on examining labor force participation trends
  - ▶ dramatic rise and flattening of female labor force participation

# Joint evolution of unemployment and participation

General tendency to study unemployment fluctuations and *lfpr* trends separately

- ▶ A long-standing literature focuses on examining procyclicality of employment
  - ▶ unemployment is *countercyclical* and labor force participation rate is *procyclical*
- ▶ A long-standing literature focuses on examining labor force participation trends
  - ▶ dramatic rise and flattening of female labor force participation

**This paper:** Use a unified flow decomposition where unemployment and *lfpr* are determined jointly and examine the flow origins of *lfpr* **fluctuations** and **trends**

# Joint evolution of unemployment and participation

General tendency to study unemployment fluctuations and *lfpr* trends separately

- ▶ A long-standing literature focuses on examining procyclicality of employment
  - ▶ unemployment is *countercyclical* and labor force participation rate is *procyclical*
- ▶ A long-standing literature focuses on examining labor force participation trends
  - ▶ dramatic rise and flattening of female labor force participation

**This paper:** Use a unified flow decomposition where unemployment and *lfpr* are determined jointly and examine the flow origins of *lfpr* **fluctuations** and **trends**

1. Why is the labor force participation rate is procyclical?
2. Which flows account for labor force participation rate trends?

# Why is the labor force participation rate is procyclical?

Conventional wisdom:

- ▶ Discouraged workers leave the labor force during recessions → *countercyclical* exits
- ▶ Encouraged workers enter as labor market conditions improve → *procyclical* entry

# Why is the labor force participation rate is procyclical?

Conventional wisdom:

- ▶ Discouraged workers leave the labor force during recessions → *countercyclical* exits
- ▶ Encouraged workers enter as labor market conditions improve → *procyclical* entry

# Why is the labor force participation rate is procyclical?

Conventional wisdom:

- ▶ Discouraged workers leave the labor force during recessions → *countercyclical* exits
- ▶ Encouraged workers enter as labor market conditions improve → *procyclical* entry

What we find:

- ▶ Labor force exits strongly *procyclical*
- ▶ Labor force entry *acyclical*

# Why is the labor force participation rate is procyclical?

Conventional wisdom:

- ▶ Discouraged workers leave the labor force during recessions → *countercyclical* exits
- ▶ Encouraged workers enter as labor market conditions improve → *procyclical* entry

A new stylized fact

- ▶ procyclicality of the *lfpr* is mostly due to *churn* within the labor force—flows between unemployment and employment.

# Which flows account for *lfpr* trends?

Conventional wisdom:

- ▶ Macro literature : labor force entry shapes *lfpr* trends
- ▶ Female *lfpr* literature: labor force attachment important for the rise in female *lfpr*

# Which flows account for *lfpr* trends?

Conventional wisdom:

- ▶ Macro literature : labor force entry shapes *lfpr* trends
- ▶ Female *lfpr* literature: labor force attachment important for the rise in female *lfpr*

What we find:

- ▶ Labor force attachment key in understanding the rise in female *lfpr* and the decline in male *lfpr* in the 1990s
- ▶ Labor force entry important for the recent decline in male and female *lfpr*

# A novel flow decomposition I

Define the vector of labor force states,

$$\mathbf{s}_t = [e_t \quad u_t]'$$

where

- ▶  $e_t$  is the epop
- ▶  $u_t$  is the upop

The  $lfpr$  is given by

$$lfpr_t = e_t + u_t$$

## A novel flow decomposition II

$\mathbf{s}_t$  evolves as

$$\Delta \mathbf{s}_t = \mathbf{d}_t + \mathbf{P}_t \mathbf{s}_{t-1},$$

where

$$\mathbf{d}_t = [\rho_{n,e,t} \quad \rho_{n,u,t}]'$$

and  $\mathbf{P}_t$  is

$$\begin{aligned} \mathbf{P}[1, 1]_t &= & -\rho_{e,n} - \rho_{e,u} - \rho_{n,e} \\ \mathbf{P}[1, 2]_t &= & \rho_{u,e} - \rho_{n,e} \\ \mathbf{P}[2, 1]_t &= & \rho_{e,u} - \rho_{n,u} \\ \mathbf{P}[2, 2]_t &= & -\rho_{u,e} - \rho_{u,n} - \rho_{n,u} \end{aligned}$$

with  $p_{i,j,t}$  the probability of transitioning from state  $i$  to state  $j$ .

## A novel flow decomposition III

For fixed transition probabilities, the state vector  $\mathbf{s}_t$  converges to the flow-steady-state

$$\bar{\mathbf{s}}_t = -\mathbf{P}_t^{-1} \mathbf{d}_t$$

## A novel flow decomposition III

For fixed transition probabilities, the state vector  $\mathbf{s}_t$  converges to the flow-steady-state

$$\bar{\mathbf{s}}_t = -\mathbf{P}_t^{-1} \mathbf{d}_t$$

An additive decomposition of changes in  $\mathbf{s}_t$

$$\Delta \mathbf{s}_t = \mathbf{P}_t (\mathbf{I} + \mathbf{P}_{t-1}) \mathbf{P}_{t-1}^{-1} \Delta \mathbf{s}_{t-1} + \mathbf{P}_t (\mathbf{P}_t + \mathbf{P}_{t-1})^{-1} \times [2\Delta \mathbf{d}_t + \Delta \mathbf{P}_t (\bar{\mathbf{s}}_t + \bar{\mathbf{s}}_{t-1})]$$

## A novel flow decomposition III

For fixed transition probabilities, the state vector  $\mathbf{s}_t$  converges to the flow-steady-state

$$\bar{\mathbf{s}}_t = -\mathbf{P}_t^{-1} \mathbf{d}_t$$

An additive decomposition of changes in  $\mathbf{s}_t$

$$\Delta \mathbf{s}_t = \mathbf{P}_t (\mathbf{I} + \mathbf{P}_{t-1}) \mathbf{P}_{t-1}^{-1} \Delta \mathbf{s}_{t-1} + \mathbf{P}_t (\mathbf{P}_t + \mathbf{P}_{t-1})^{-1} \times [2\Delta \mathbf{d}_t + \Delta \mathbf{P}_t (\bar{\mathbf{s}}_t + \bar{\mathbf{s}}_{t-1})]$$

Movements in the *lfpr* are determined both

- ▶ by the flow transition probabilities in  $\mathbf{P}_t$
- ▶ by the distribution of workers in  $\mathbf{s}_t$ , across *all three* labor force states, not just those between in and out of the labor force.

## A novel flow decomposition III

For fixed transition probabilities, the state vector  $\mathbf{s}_t$  converges to the flow-steady-state

$$\bar{\mathbf{s}}_t = -\mathbf{P}_t^{-1} \mathbf{d}_t$$

An additive decomposition of changes in  $\mathbf{s}_t$

$$\Delta \mathbf{s}_t = \mathbf{P}_t (\mathbf{I} + \mathbf{P}_{t-1}) \mathbf{P}_{t-1}^{-1} \Delta \mathbf{s}_{t-1} + \mathbf{P}_t (\mathbf{P}_t + \mathbf{P}_{t-1})^{-1} \times [2\Delta \mathbf{d}_t + \Delta \mathbf{P}_t (\bar{\mathbf{s}}_t + \bar{\mathbf{s}}_{t-1})]$$

Movements in the *lfpr* are determined both

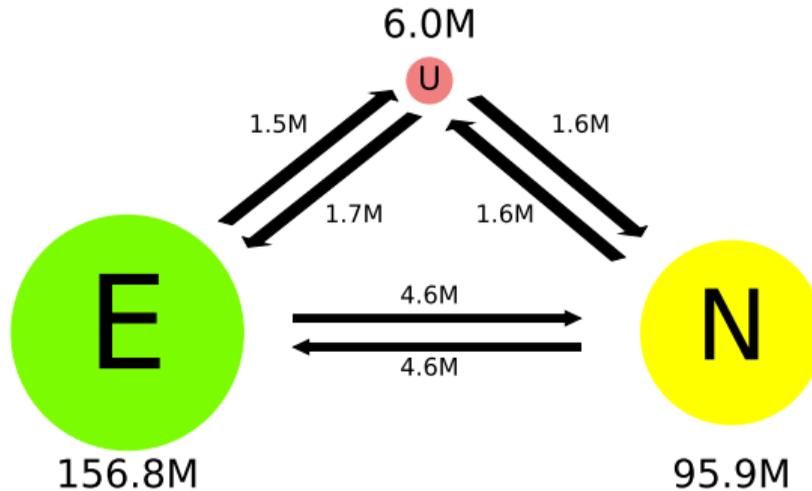
- ▶ by the flow transition probabilities in  $\mathbf{P}_t$
- ▶ by the distribution of workers in  $\mathbf{s}_t$ , across *all three* labor force states, not just those between in and out of the labor force.

Past and current flows between  $u_t$  and  $e_t$  play a role in shaping labor force participation dynamics.

# Labor market flows

## Labor Force Flows: Nov 2018

Monthly observations; seasonally adjusted

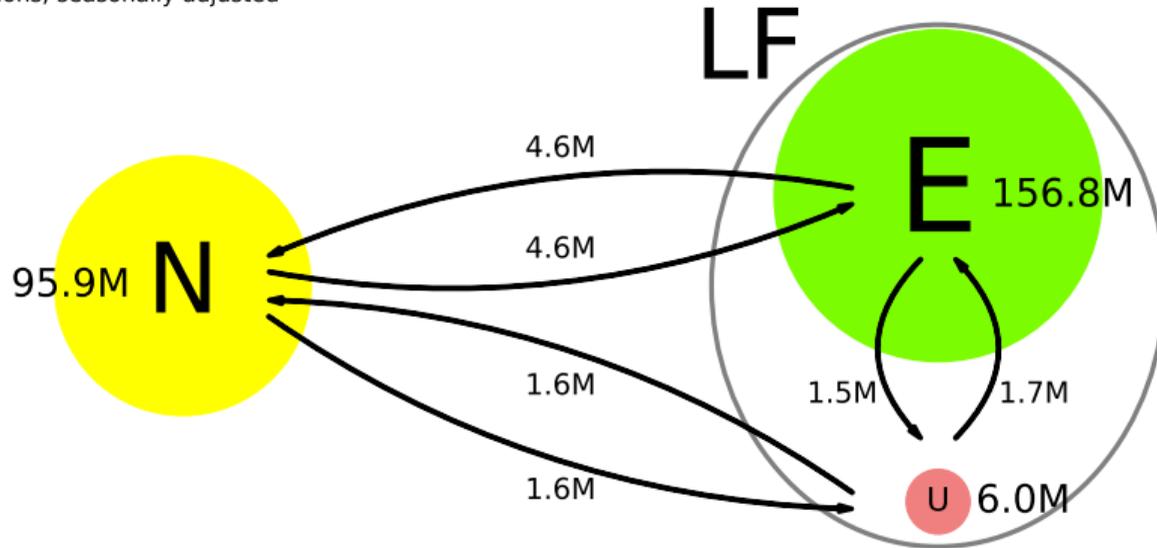


Source: Bureau of Labor Statistics

# Flow origins of participation

## Flow Origins of Participation: Nov 2018

Monthly observations; seasonally adjusted



Source: Bureau of Labor Statistics

## Decomposing the *lfpr* movements: 1990-2018

Implement the decomposition for the period from January 1990 to October 2018 using gross flows data from the CPS.

## Decomposing the *lfpr* movements: 1990-2018

Implement the decomposition for the period from January 1990 to October 2018 using gross flows data from the CPS.

Group gross worker flows into three categories:

- ▶ labor force *exit*:  $p_{e,n}$  and  $p_{u,n}$
- ▶ labor force *entry*:  $p_{n,e}$  and  $p_{n,u}$
- ▶ within-labor-force *churn*:  $p_{u,e}$  and  $p_{e,u}$

## Decomposing the *lfpr* movements: 1990-2018

Implement the decomposition for the period from January 1990 to October 2018 using gross flows data from the CPS.

Group gross worker flows into three categories:

- ▶ labor force *exit*:  $p_{e,n}$  and  $p_{u,n}$
- ▶ labor force *entry*:  $p_{n,e}$  and  $p_{n,u}$
- ▶ within-labor-force *churn*:  $p_{u,e}$  and  $p_{e,u}$

Calculate the contribution of each of these three groups of flows to the percentage point difference between the *lfpr* in each month and that at its peak before the Great Recession in January 2007.

# Flow decomposition of the change in the *lfpr*

## Change in Labor force participation rate decomposed

Monthly observations; seasonally adjusted; Percentage point change since January 2007; Total

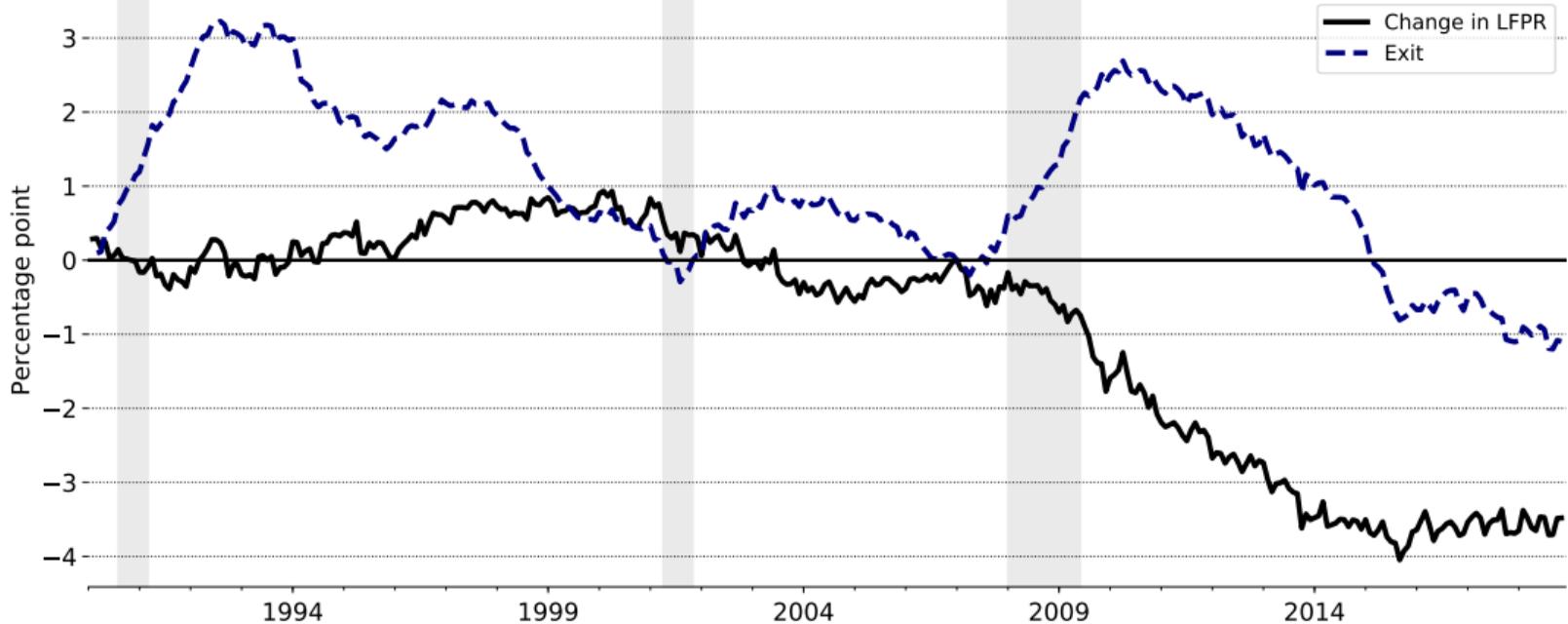


Source: Bureau of Labor Statistics

# Flow decomposition of the change in the *lfpr*

## Change in Labor force participation rate decomposed

Monthly observations; seasonally adjusted; Percentage point change since January 2007; Total

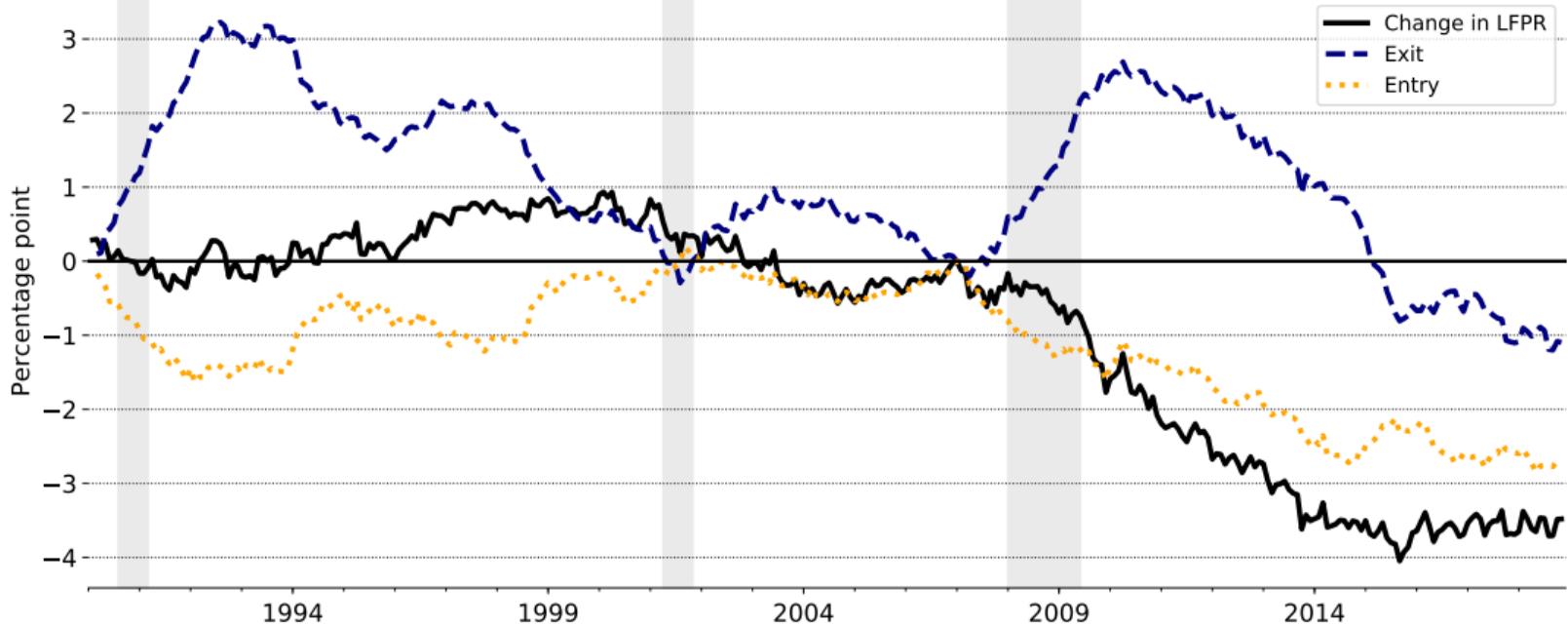


Source: Bureau of Labor Statistics

# Flow decomposition of the change in the *lfpr*

## Change in Labor force participation rate decomposed

Monthly observations; seasonally adjusted; Percentage point change since January 2007; Total

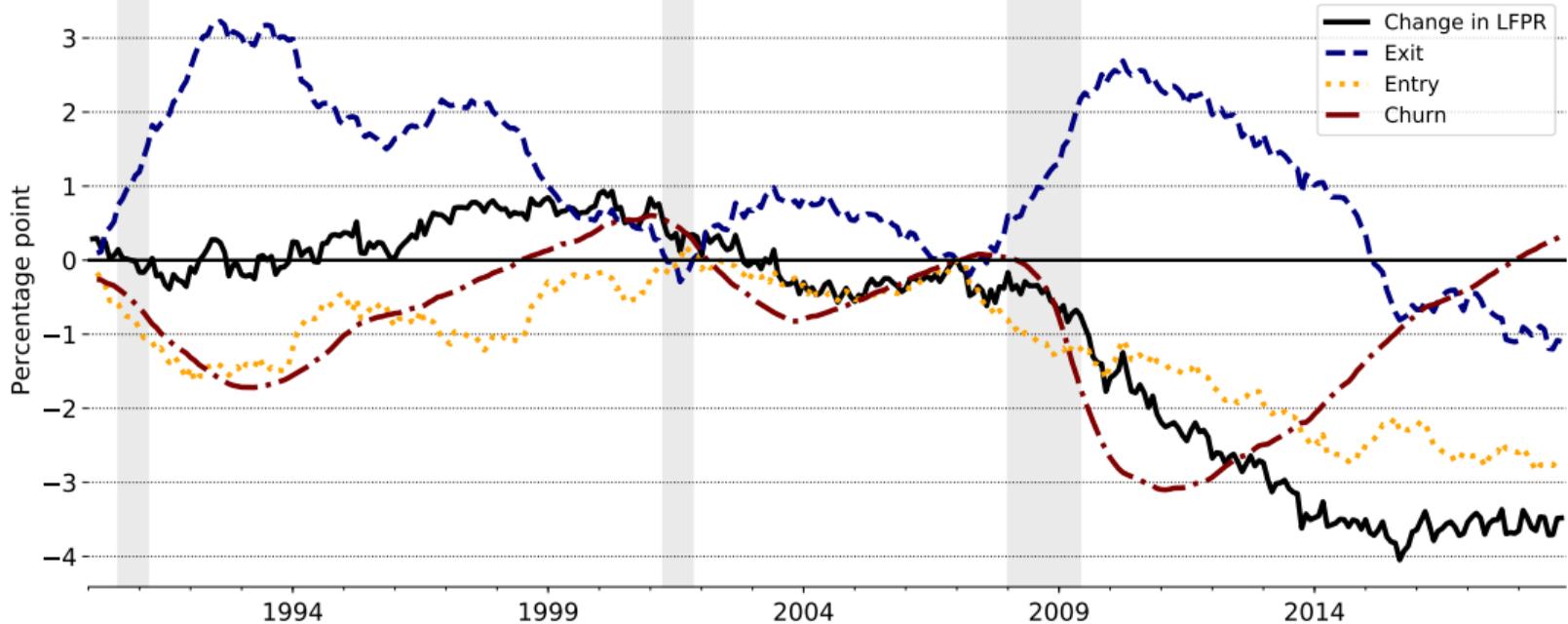


Source: Bureau of Labor Statistics

# Flow decomposition of the change in the *lfpr*

## Change in Labor force participation rate decomposed

Monthly observations; seasonally adjusted; Percentage point change since January 2007; Total



Source: Bureau of Labor Statistics

# The role of *entry and exit*

Entry:

- ▶ The contribution of labor force entry is acyclical. *lfpr* →

# The role of *entry and exit*

Entry:

- ▶ The contribution of labor force entry is acyclical. *lfpr* →

Exit:

- ▶ Labor force exit rates fall during recessions. *lfpr* ↑

# The role of *entry and exit*

Entry:

- ▶ The contribution of labor force entry is acyclical. *lfpr* →

Exit:

- ▶ Labor force exit rates fall during recessions. *lfpr* ↑

Elsby, Hobijn and Şahin (2015): the majority of recessionary declines in labor force exit rates from unemployment can be explained by compositional shifts in the pool of unemployed workers toward individuals who are relatively more attached to the labor force.

# The importance of *labor force attachment*

Within-labor-force churn between employment and unemployment accounts for the *majority* of the procyclicality of the *lfpr*

During recessions:

- ▶  $E \downarrow$  and  $U \uparrow \rightarrow$  no immediate effect on the *lfpr*
- ▶ The degree of attachment of the labor force declines since  $p_{u,n} \gg p_{e,n}$

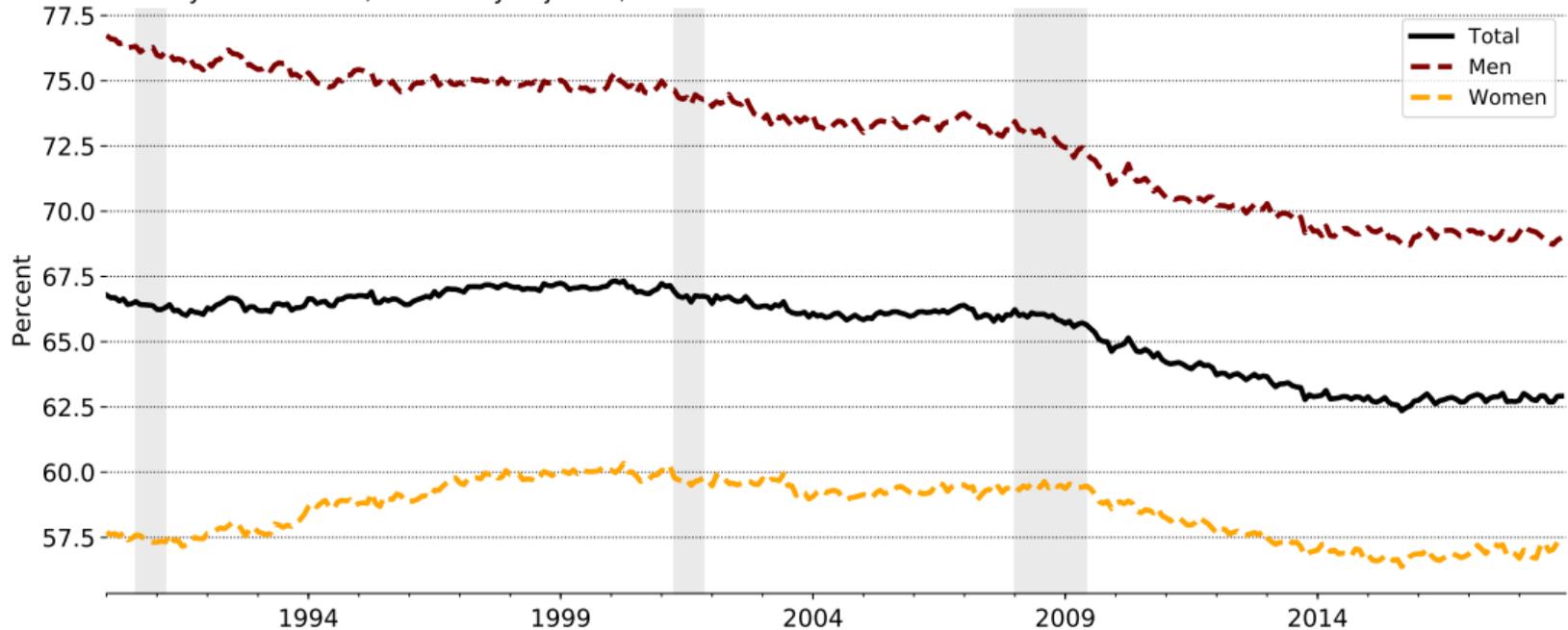
Flows between  $E$  and  $U$  contribute to increases in the unemployment rate and puts downward pressure on participation:

$$u \uparrow \quad \text{and} \quad lfpr \downarrow$$

# lfpr trends by gender

## Labor force participation rate

Monthly observations; seasonally adjusted; share of CNI 16 and over

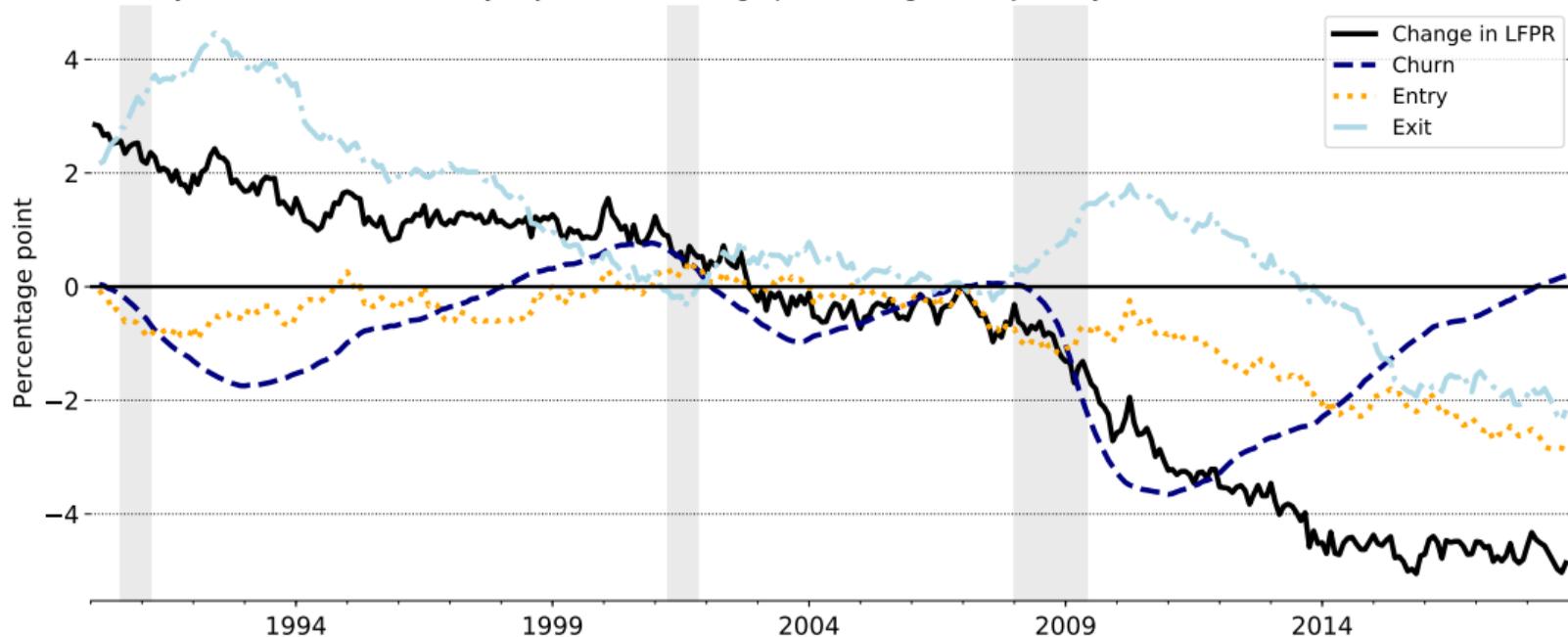


Source: Bureau of Labor Statistics

# Flow decomposition of the change in the *lfpr*: Men

## Change in Labor force participation rate decomposed

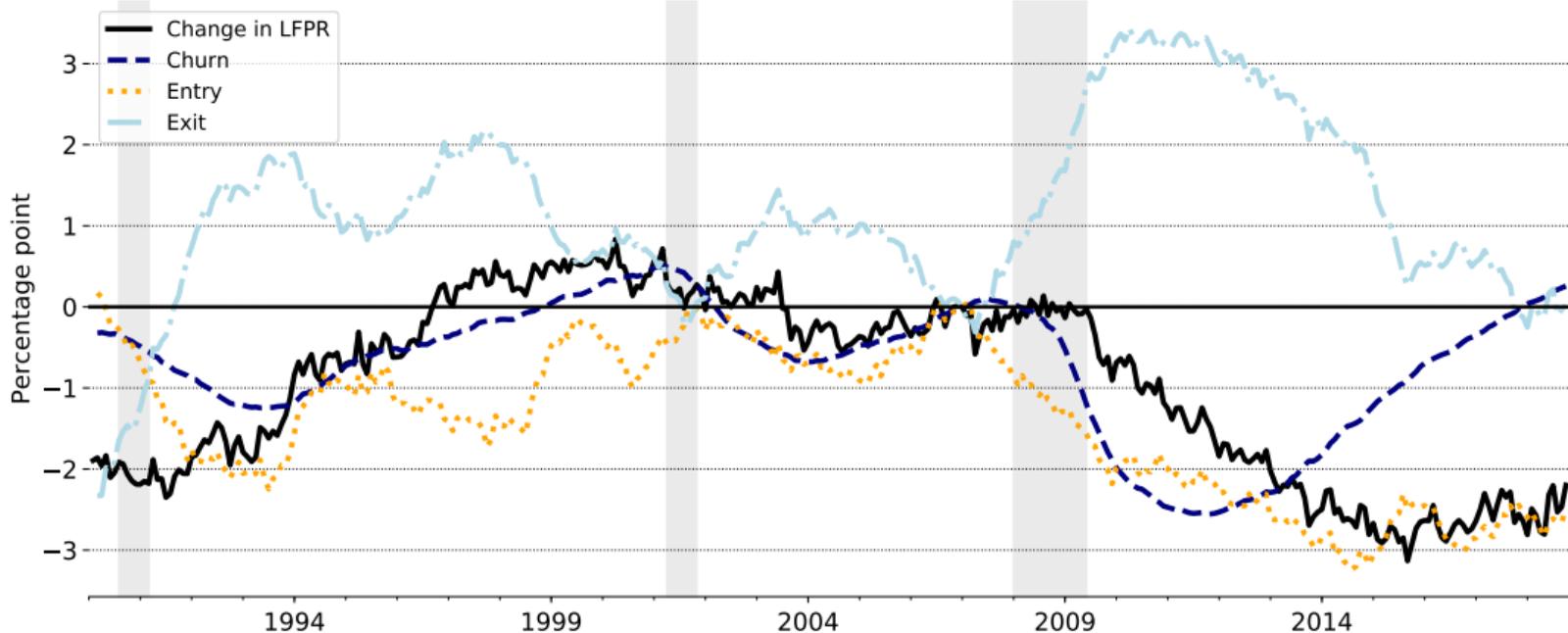
Monthly observations; seasonally adjusted; Percentage point change since January 2007; Men



# Flow decomposition of the change in the *lfpr*: Women

## Change in Labor force participation rate decomposed

Monthly observations; seasonally adjusted; Percentage point change since January 2007; Women



Source: Bureau of Labor Statistics

## Flow origins of *lfpr* trends

Men:

- ▶ Majority of the decline in male participation rates can be traced to the exit margin. Rises in rates of labor force exit among men can account for around 4 percentage points of the 7-percentage-point decline since 1990.
- ▶ Declines in labor force entry an important driver since 2007.

## Flow origins of *lfpr* trends

### Men:

- ▶ Majority of the decline in male participation rates can be traced to the exit margin. Rises in rates of labor force exit among men can account for around 4 percentage points of the 7-percentage-point decline since 1990.
- ▶ Declines in labor force entry an important driver since 2007.

### Women:

- ▶ Almost all of the rise in female participation rates in the 1990s can be accounted for by falling rates of labor force exit.
- ▶ The recent decline in female participation mostly due to declines in labor force entry.

## Outlook for participation

Main finding: business cycle fluctuations mostly affect the participation rate through the exit and churn components while labor force entry is driving the longer-run trend in participation.

## Outlook for participation

Main finding: business cycle fluctuations mostly affect the participation rate through the exit and churn components while labor force entry is driving the longer-run trend in participation.

- ▶ Within-labor market churn that captures the effect of improvements in labor market conditions is very close to zero both for men and women → little room for improvement in the churn component.
- ▶ Similarly the cyclical adjustment in the exit component has been mostly completed with this component being flat recently.

## Outlook for participation

Main finding: business cycle fluctuations mostly affect the participation rate through the exit and churn components while labor force entry is driving the longer-run trend in participation.

- ▶ Within-labor market churn that captures the effect of improvements in labor market conditions is very close to zero both for men and women → little room for improvement in the churn component.
- ▶ Similarly the cyclical adjustment in the exit component has been mostly completed with this component being flat recently.

We expect future movements in the labor force participation rate to be mostly shaped by the slow-moving downward trend in the contribution of labor force entry.