DISCUSSION PAPER SERIES

DP13481

THE INS AND OUTS OF LABOR FORCE PARTICIPATION

Régis Barnichon

MONETARY ECONOMICS AND FLUCTUATIONS

ISSN 0265-8003

THE INS AND OUTS OF LABOR FORCE PARTICIPATION

Régis Barnichon

Discussion Paper DP13481
Published 23 January 2019
Submitted 18 January 2019

Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

THE INS AND OUTS OF LABOR FORCE PARTICIPATION

Abstract

In this note, I decompose LFPR movements into the contributions of the inflows into participation --the Ins-- and the outflows out of participation --the Outs--. Contrary to conventional wisdom, movements in the outflow rate account for most of the variation of the labor force participation rate: the LFPR increases in tight labor markets because fewer workers leave the labor force, not because more nonparticipants enter. The cyclicality of the outflow rate is in turn mechanically driven by a composition effect: in tight labor markets, job seekers find jobs faster and as a result become less likely to leave the labor force.

JEL Classification: N/A

Keywords: N/A

Régis Barnichon - regis.barnichon@sf.frb.org
Federal Reserve Bank of San Francisco and CEPR

The Ins and Outs of Labor Force Participation*

Regis Barnichon[(a)]

[(a)] Federal Reserve Bank of San Francisco and CEPR

December 03, 2018

Abstract

In this note, I decompose LFPR movements into the contributions of the inflows into participation –the Ins– and the outflows out of participation –the Outs–. Contrary to conventional wisdom, movements in the outflow rate account for most of the variation of the labor force participation rate: the LFPR increases in tight labor markets because fewer workers leave the labor force, not because more nonparticipants enter. The cyclicality of the outflow rate is in turn mechanically driven by a composition effect: in tight labor markets, job seekers find jobs faster and as a result become less likely to leave the labor force.

JEL classification: E24, E32, J6.

*I thank Sylvain Leduc, Nicolas Petrosky-Nadeau and Glenn Rudebusch for helpful comments. The views expressed in this paper are the sole responsibility of the authors and to not necessarily reflect the views of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

1 Introduction

While the labor force participation rate (LFPR) has traditionally been thought as an acyclical variable, recent experience challenges this conventional wisdom. As shown in figure 1, the LFPR of prime-age workers declined sharply during the great recession before rebounding in the past few years. Similarly, during the tight labor market of the late 90s, one can discern a marked uptick in participation.

Understanding the cyclicality of LFPR is not solely of academic interest but also of great policy relevance. For instance, Minneapolis Fed President Kashkari recently argued that the labor pool has not reached its full potential despite a very low unemployment rate, because Americans continued to enter the labor force in large numbers, as evidenced by the rising LFPR or prime-age workers.[1]

While the pro-cyclicality of LFPR would seem to suggest that more workers join the labor force in expansions, this intuitive reasoning can be deceiving and subject to a "stock-flow fallacy" (e.g., Elsby, Hobijn and ahin, 2015). The reason is that the participation rate is a stock determined by large flows of workers in and out of participation.[2] As a result, the LFPR can increase, because of larger inflows into participation and/or smaller outflows out of participation, and the cyclicality of LFPR is, in itself, not enough to draw conclusions about the cyclicality of the participation margin.

This note presents a stock-flow accounting framework to decompose LFPR movements into the contributions of the inflows into participation –the Ins– and the outflows out of participation –the Outs–, paralleling the literature on the Ins and Outs of unemployment (Shimer, 2012).

Contrary to popular belief, the Ins account for little of the variations in LFPR, and LFPR rises in tight labor markets because fewer workers leave the labor force, not because more workers enter the labor force. In fact, the Outs are so dominant that they account for more

[1] Wall Street Journal, Oct. 26 2018

[2] A large literature going back to Kaitz (1970), Perry (1972), Blanchard and Diamond (1990) and more recently Shimer (2012) has shown that the labor market is characterized by large worker flows taking place between employment, unemployment and nonparticipation.

than 80 percent of the variance of prime-age LFPR since 1990.

To better understand the reason for the cyclicality of the outflow rate from participation, I then consider a three state model of the labor market where I split the participation state into two groups: employed and unemployed. Because employed workers are much less likely to leave the labor force than unemployed workers, the outflow rate out of participation can move from a simple composition effect: as the labor market tightens, unemployed workers find a job faster and become mechanically less likely to leave the labor force. This mechanical composition effect in turn accounts for all the counter-cyclicality of the outflow rate, and thus for all the recent procyclicality of LFPR.

2 LFPR across age groups

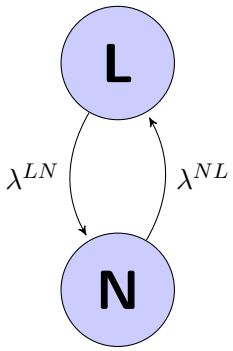
The LFPR is a poor indicator of cyclical movements in the participation margin, because strong demographic trends can mask cyclical movements. In particular, the aging of the population has lowered aggregate LFPR by about 3 ppt since 2006 (Figure 1), because older workers (above 65) have a much lower LFPR than other groups (bottom-right panel).[3] To avoid this problem, this note will focus on the LFPR of prime-age (25-55) workers, shown in the top-right panel. We can see that the LFPR of prime age workers displays some cyclicality, particularly in the last 25 years, and with a marked increase in participation since 2015.

3 The Ins and Outs of LFPR

The US labor market is characterized by large flows with millions of workers switching every month between participation and nonparticipation. Since LFPR movements are determined by the net effect of these flows, the LFPR could rise for two reasons: (i) larger inflows into participation as more workers join the labor force, or (ii) smaller outflows from the labor force.

[3]The effect of population aging can be calculated from a simple shift-share analysis (Barnichon and Mesters, 2018).

I consider a simple stock-flow model of the labor market with two labor market states. People can be either be (i) labor force participants (denoted by L), or (ii) nonparticipants (denoted by N), and flows of workers are continuously taking place between L and N, as illustrated below.



$$L_t - L_{t-1} = \underbrace{N_t \lambda_t^{NL}}_{\text{Ins}} - \underbrace{L_t \lambda_t^{LN}}_{\text{Outs}}$$

Consider a continuous time environment in which data are available only at discrete dates. For $t \in 1, 2...T$, I refer to the interval $[t, t+1]$ as "period t". I assume that during period t, the instantaneous rates at which workers transition between labor market states are constant and given by $\{\lambda_t^{AB}\}$, where λ_t^{AB} is the hazard rate of an individual going from state $A \in \{L, N\}$ to state $B \in \{L, N\}$.

Normalizing by population size,[4] $L_{t+\tau}$, the participation rate at time $t+\tau$ evolves according to the law of motion

$$\begin{cases} \frac{dL_{t+\tau}}{d\tau} = \lambda_t^{LN} L_{t+\tau} - \lambda_t^{NL} N_{t+\tau} \\ L_t + N_t = 1 \end{cases} . \tag{1}$$

With large transition rates between N and L, the LFPR can be well approximated by its steady-state value L_t^* (defined from $\frac{dL_{t+\tau}^*}{d\tau} = 0$), which gives a simple expression for the LFPR as a function of the two underlying transition rates:

$$L_t^* = \frac{\lambda_t^{NL}}{\lambda_t^{NL} + \lambda_t^{LN}}. \tag{2}$$

Expression is similar to the familiar expression of the steady-state unemployment rate

[4]Population growth can be ignored here, because the population growth rate is negligible compared to the magnitude of the transition rates between N and L.

implied by a two-state stock-flow model (Shimer, 2012).

From (2), I can decompose movements in the LFPR into the contributions of the Inflows into participation (the Ins) and the Outflows from participation (the Outs). Specifically, a first-order Taylor expansion of (2) around the mean of the transition rates gives

$$dL_t \simeq \underbrace{(1-L^*)d\ln\lambda_t^{NL}}_{\text{Ins: } dL_t^{Ins}} - \underbrace{(1-L^*)d\ln\lambda_t^{LN}}_{\text{Outs: } dL_t^{Outs}} \tag{3}$$

with $dL_t = L_t - L^*$ and L^* the mean LFPR over the sample period.

Based on (3), Figure 2 decomposes LFPR into the separate contributions of the Outs (green line) and the Ins (blue line). These two components sum to dL_t. The recent uptick in LFPR is *not* due to more workers entering the labor force, in contradiction with the idea that the tight labor market pulled in many workers from the sidelines of the labor market into the labor force (e.g., Breitwieser Audrey and Shambaugh, 2018). Instead, it is due to fewer workers leaving the labor force, i.e., to smaller outflows as participants are now less likely to leave the labor force (Figure 4, upper panel). Interestingly, the same phenomenon took place during the strong expansionary phase of the late 90s: the very high LFPR back then was due to fewer workers leaving the labor force, not to more workers entering the labor force, in contrast to common accounts of that period.

More generally, Figure 2 shows that the cyclicality of LFPR over the past 25 years is mostly due to the Outs. To make this last point more precise, we can explicitly decompose the variance of LFPR by noting (see Fujita and Ramey, 2009) that (3) implies

$$Var\left(dL_t\right) \simeq Cov(dL_t, dL_t^{Ins}) + Cov(dL_t, dL_t^{Outs})$$

or

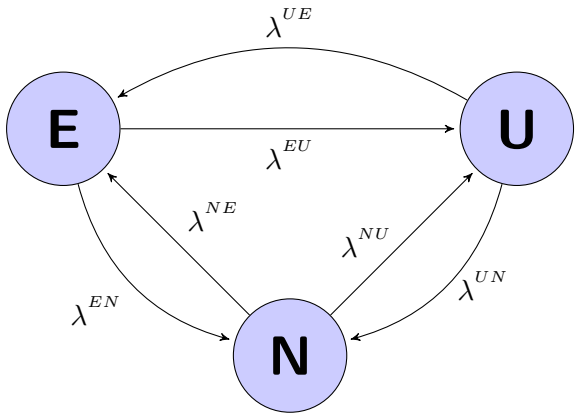
$$1 \simeq \beta^{Ins} + \beta^{Outs}$$

so that β^{Ins} and β^{Outs} capture the contribution of the Ins and Outs to the variance of LFPR.

Table 1 reports the variance decomposition for the full sample period (1976-2018), as well as for the more recent period during which LFPR displayed some cyclicality (1990-2018). The contribution of the Outs stands at above 80 percent over the more recent period. The contribution is smaller over the full period, but only because the Ins played a role for the secular increase in prime-age LFPR in the 80s. But except for that secular contribution, the movements in LFPR are mostly due to the Outs, not the Ins.

4 Understanding the Outs of LFPR

To better understand the reason for the recent decline in the outflow rate from participation, I now consider a three state model of the labor market where I split the participation state L into two groups: Employed (E) and Unemployed (U), as illustrated below.



Going back to our two-state model, the flow rates in and out of participation can be written as

$$\begin{cases} \text{Inflow rate: } \lambda_t^{NL} = \lambda_t^{NU} + \lambda_t^{NE} \\ \text{Outflow rate: } \lambda_t^{LN} = u_t \lambda_t^{UN} + (1 - u_t)\lambda_t^{EN} \end{cases} \tag{4}$$

Expression (4) makes clear that the outflow rate from participation (λ^{LN}) can move for two different reasons:

1. Changes in the transition rates λ_t^{UN} and λ_t^{EN}.

2. Changes in the *composition* of the labor force, coming from movements in the unemployment rate u_t: Since unemployed workers have a higher propensity than employed workers to leave the labor force ($\lambda_t^{UN} \gg \lambda_t^{EN}$), a decline in the unemployment rate mechanically lowers the outflow rate from participation (and thus increases LFPR).

This discussion is too simplistic, because it ignores the fact that the unemployment rate (u_t) is also a function of the six underlying workers flows. However, the intuition is correct, because a similar composition effect takes place through the UE and EU flows: Since employed and unemployed workers are already in the labor force, the UE and EU flows only serve to change the composition of the labor force, which in turn affects the *average* outflow rate from participation.

Using a three state stock-flow accounting framework and proceeding in a similar fashion to (3), I can decompose dL_t^{Outs}, the Outs contribution to LFPR, as follows:

$$dL_t^{Outs} \simeq \underbrace{dL_t^{UE} + dL_t^{EU}}_{\text{Composition effect from U}\leftrightarrow\text{E}} + dL_t^{Other} \tag{5}$$

where dL_t^{Outs} is defined as in (3), dL_t^{UE} and dL_t^{EU} are the contributions of λ^{UE} and λ^{EU} to dL_t^{Outs} (operating through a composition effect), and dL_t^{Other} denotes the contributions of the other four transition rates to dL_t^{Outs}.

Figure 3 plots the results of this decomposition. We can see that all of the recent uptick in LFPR is due to a change in the composition of the labor force driven by changes in the UE and EU flows:

1. As the job finding rate increases (higher λ^{UE}), job seekers are less likely to leave the labor force, because they find a job faster.

2. As the job separation rate decreases (lower λ^{EU}), workers are less likely to leave the labor force, because they are less likely to lose their job.

Interestingly, a similar pattern can be seen in the strong expansionary phase of the late 90s: the high LFPR was due to the large UE rate and the small EU rate (figure 5), which

made the average participant less likely to exit.

Looking ahead, I see little scope for much further gains in LFPR as the U-E and E-U transition rates are now back to their 2006 levels (figure 5).

5 Conclusion

This note presents a two-state stock-flow decomposition of the labor force participation rate. I find that the procyclical movements in prime-age LFPR over the past 25 years are due to the counter-cyclicality of the outflow rate. In tight labor markets, participants are less likely to leave the labor force because they spend less time unemployed.

Additional figures

For information, I plot the transition rates of prime-age workers between L and N (figure 4) and between E, U and N (figure 5).

References

Barnichon, Regis, and Geert Mesters. 2018. "On the demographic adjustment of unemployment." *Review of Economics and Statistics*, 100(2): 219–231.

Blanchard, Olivier J., and Peter Diamond. 1990. "The Cyclical Behavior of the Gross Flows of U.S. Workers." *Brookings Papers on Economic Activity*, 2: 85–155.

Breitwieser Audrey, Ryan Nunn, and Jay Shambaugh. 2018. "The recent rebound in prime-age labor force participation." Brookings.

Elsby, Michael W.L., Bart Hobijn, and Ayegl ahin. 2015. "On the importance of the participation margin for labor market fluctuations." *Journal of Monetary Economics*, 72: 64 – 82.

Fujita, S., and G. Ramey. 2009. "The Cyclicality of Separation and Job Finding Rates." *International Economic Review*, 50: 415–430.

Kaitz, Hyman. 1970. "Analyzing the Length of Spells of Unemployment." *Monthly Labor Review*, 93: 11–20.

Perry, George L. 1972. "Unemployment Flows in the U.S. Labor Market." *Brookings Papers on Economic Activity*, 3: 245–278.

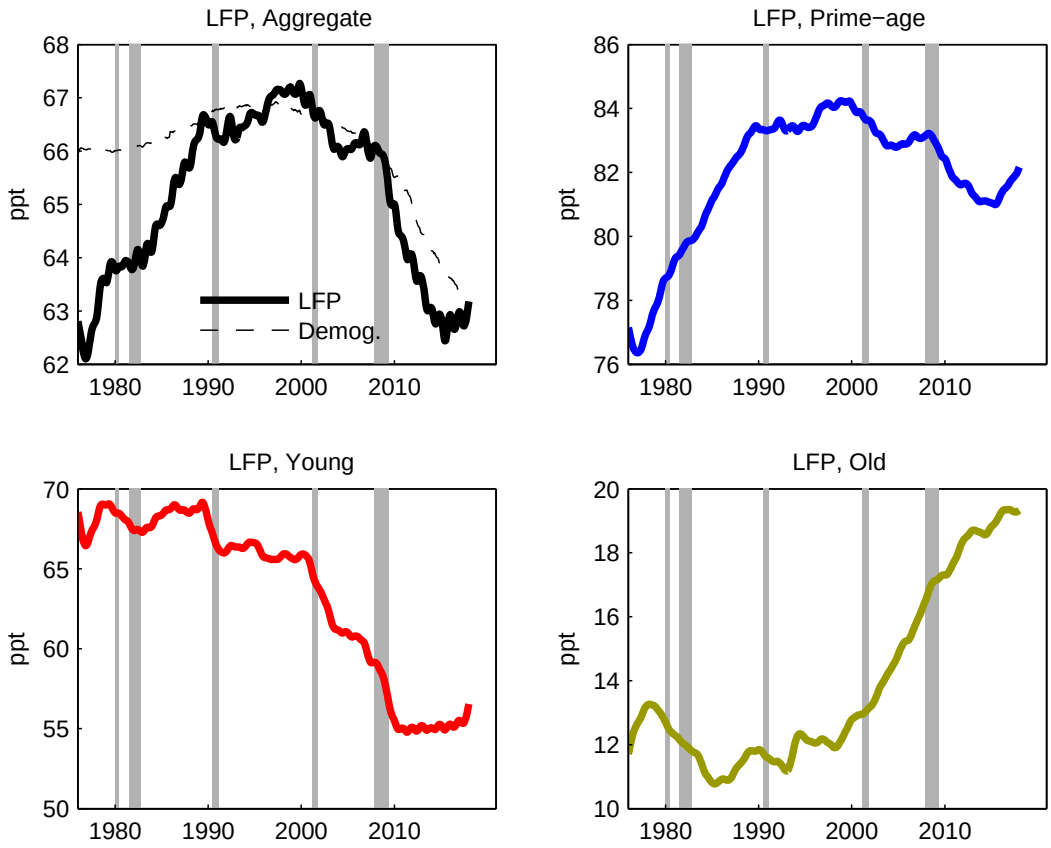
Shimer, Robert. 2012. "Reassessing the Ins and Outs of Unemployment." *Review of Economic Dynamics*, 15: 127–148.

Table 1: Contribution of the Ins and Outs of participation to LFPR variance

	β^{Ins}	β^{Outs}
1976-2018	0.45	0.55
1990-2018	0.16	0.84

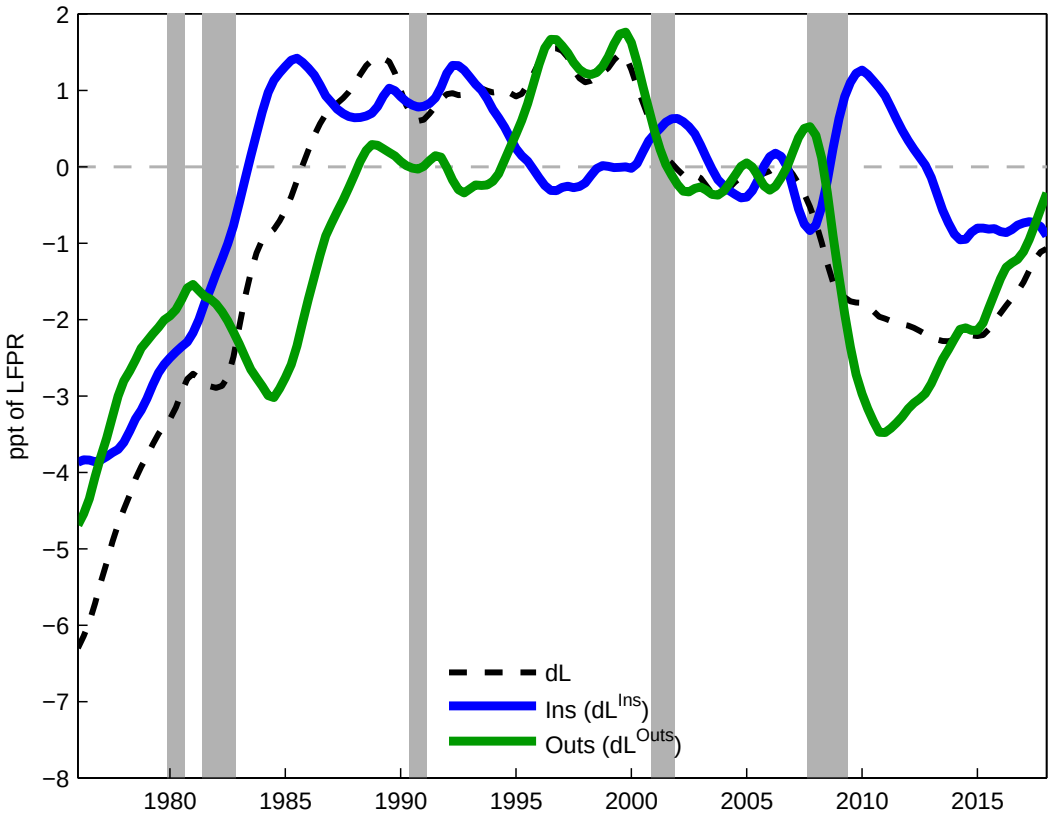
Source: CPS micro data 1976–2018.

Figure 1: LFPR across age groups



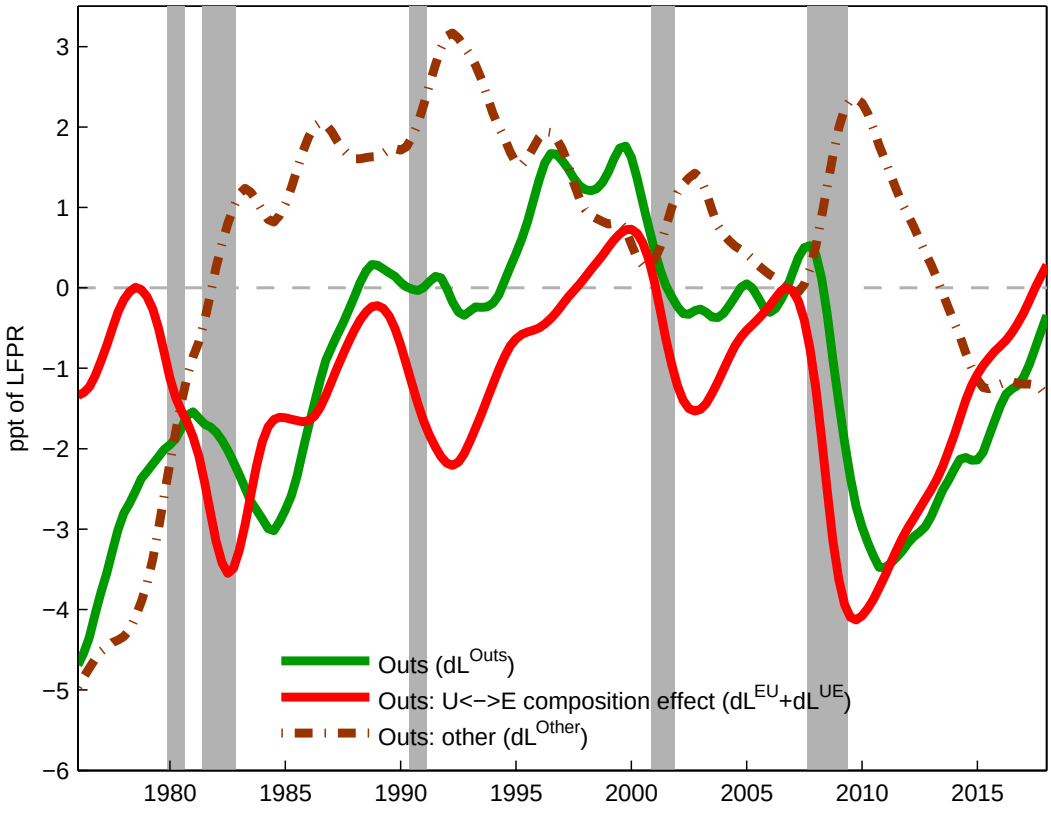
Source: CPS micro data 1976–2018.

Figure 2: The Ins and Outs of prime-age LFPR



Notes: Decomposition of prime-age LFPR (dL, dashed-black line) into the contribution of "Outflows" (dL^{Outs}, green line) and the contribution of "Inflows" (dL^{Ins}, blue line). All series are normalized at zero in 2006 for clarity of exposition.

Figure 3: Decomposing the Outs of prime-age LFPR



Notes: Decomposition of the contribution of outflows to changes in prime-age LFPR (dL^{Outs}, green line) into the contribution of the composition effect coming from EU and UE flows (red line) and the contribution of the other worker flows (dot-dashed brown line). All series are normalized at zero in 2006 for clarity of exposition.

Figure 4: Prime age worker transition rates between L and N

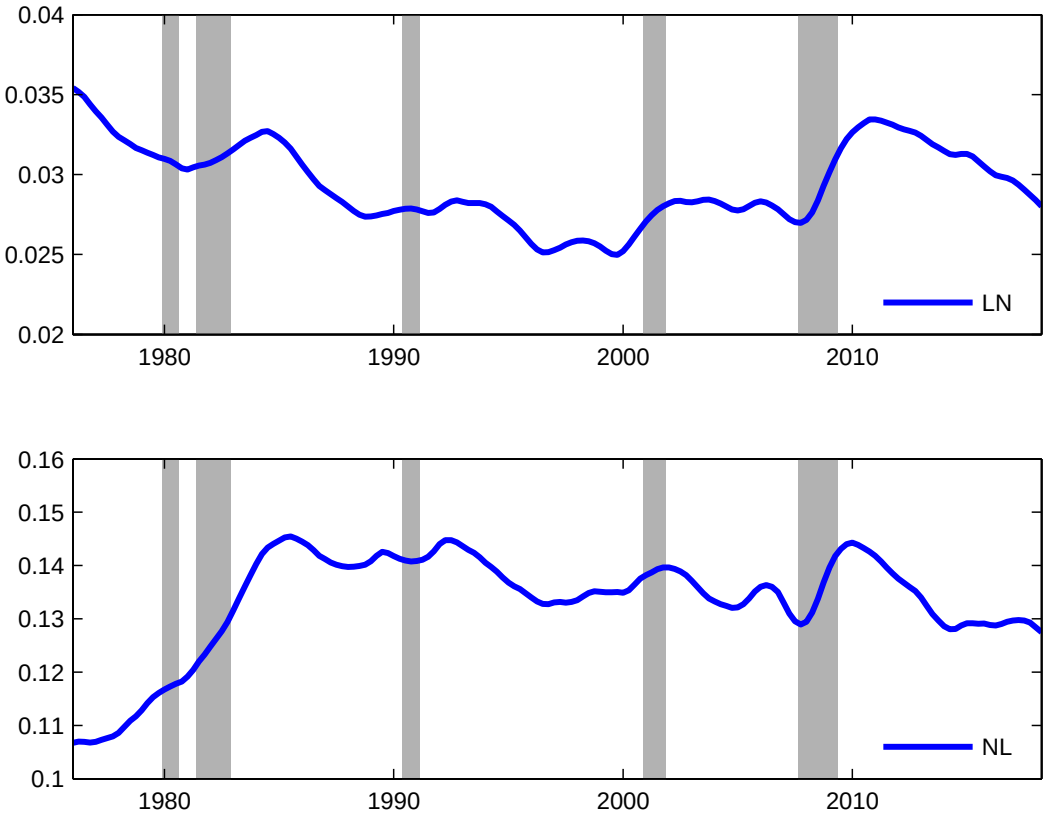


Figure 5: Prime age worker transition rates between E, U and N