

Matching Function

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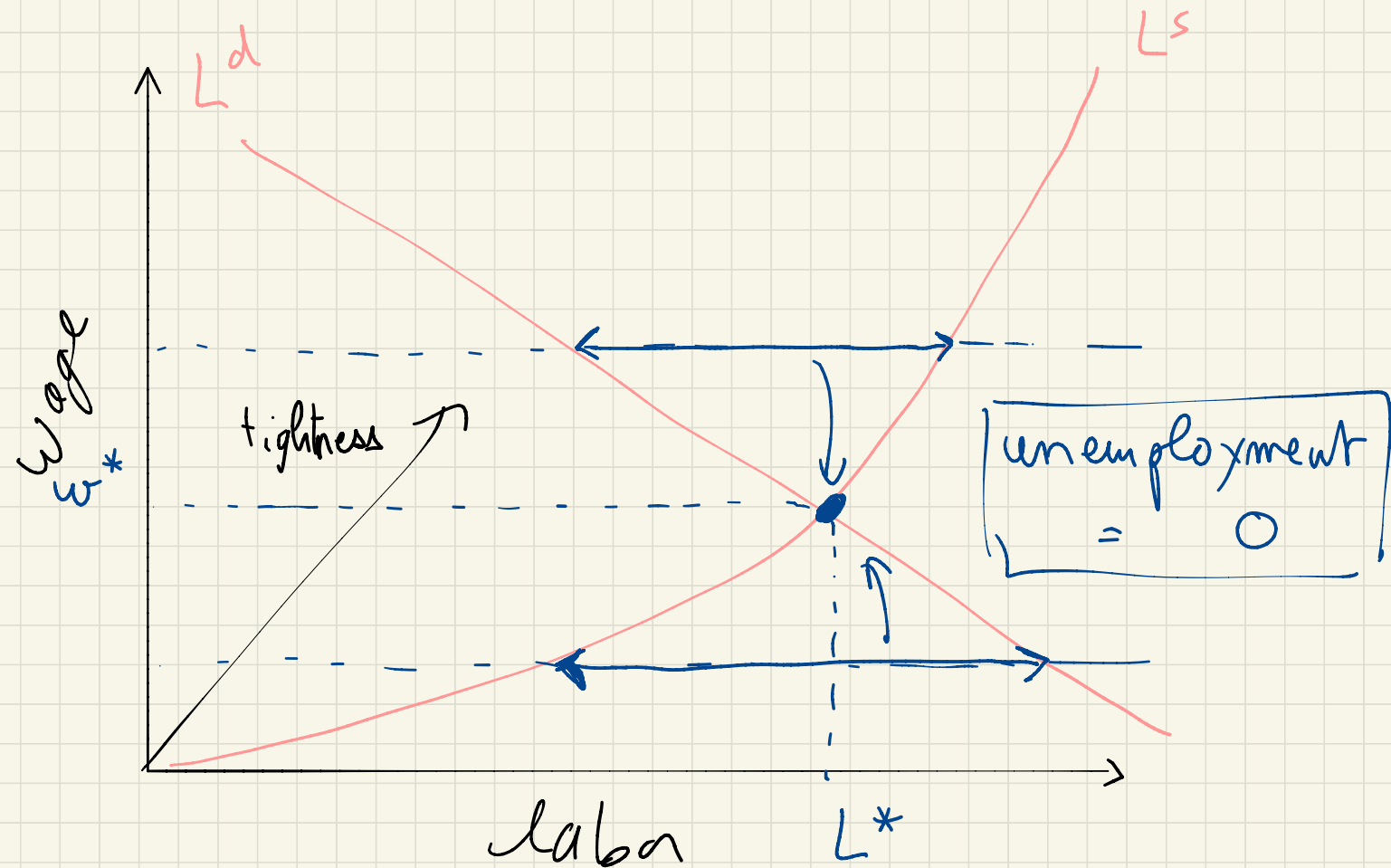
① ~~GDP / growth~~

② ~~inflation~~

③ unemployment

- well-being surveys

- waste of resources



2014

US

children
(< 16 yo)

Total population: 318.9 million



potential workers

Non-institutional civilian
population: 247.9 million

army
prisons



$$UR = \frac{9.5}{155.9} \approx 6\%$$



Civilian labor force
155.9 million

Out of the
labor force
92.0 million

no job
+
do not
want a
job.



- no job
- want job
(search)

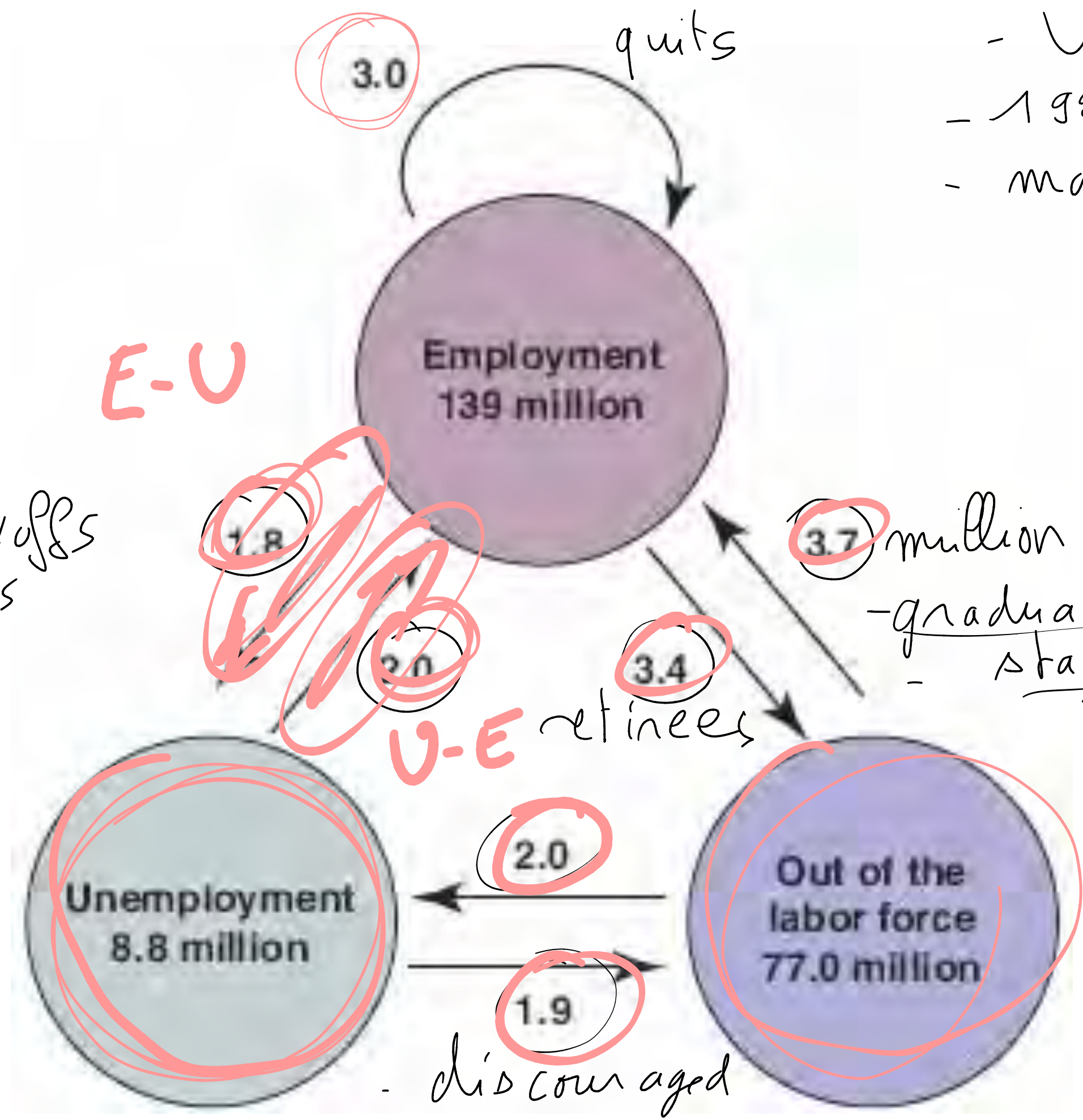
Employed
146.3 million

Unemployed
9.5 million

- US
- 1996-2014
- monthly

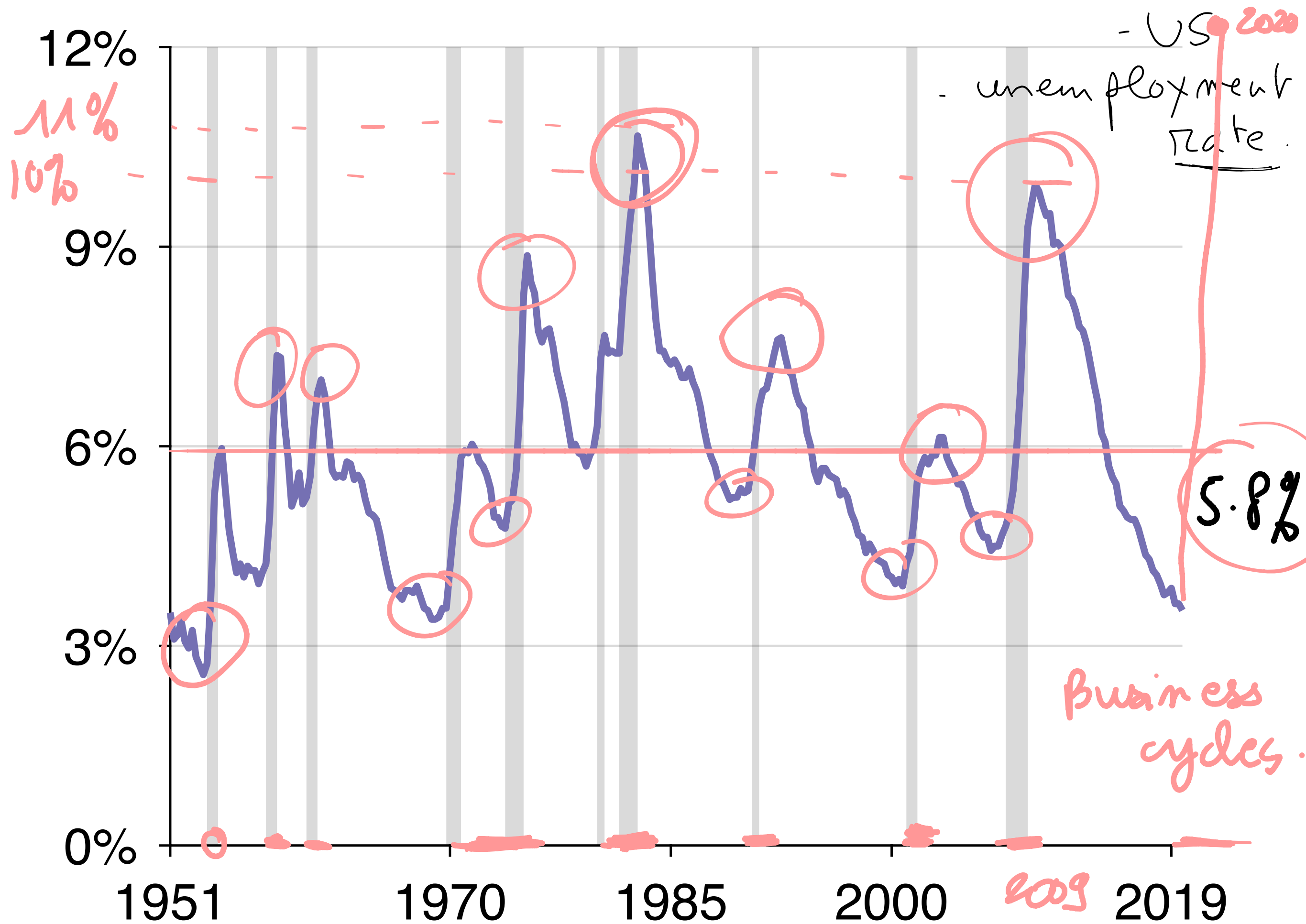
E-U

- layoffs
- quits

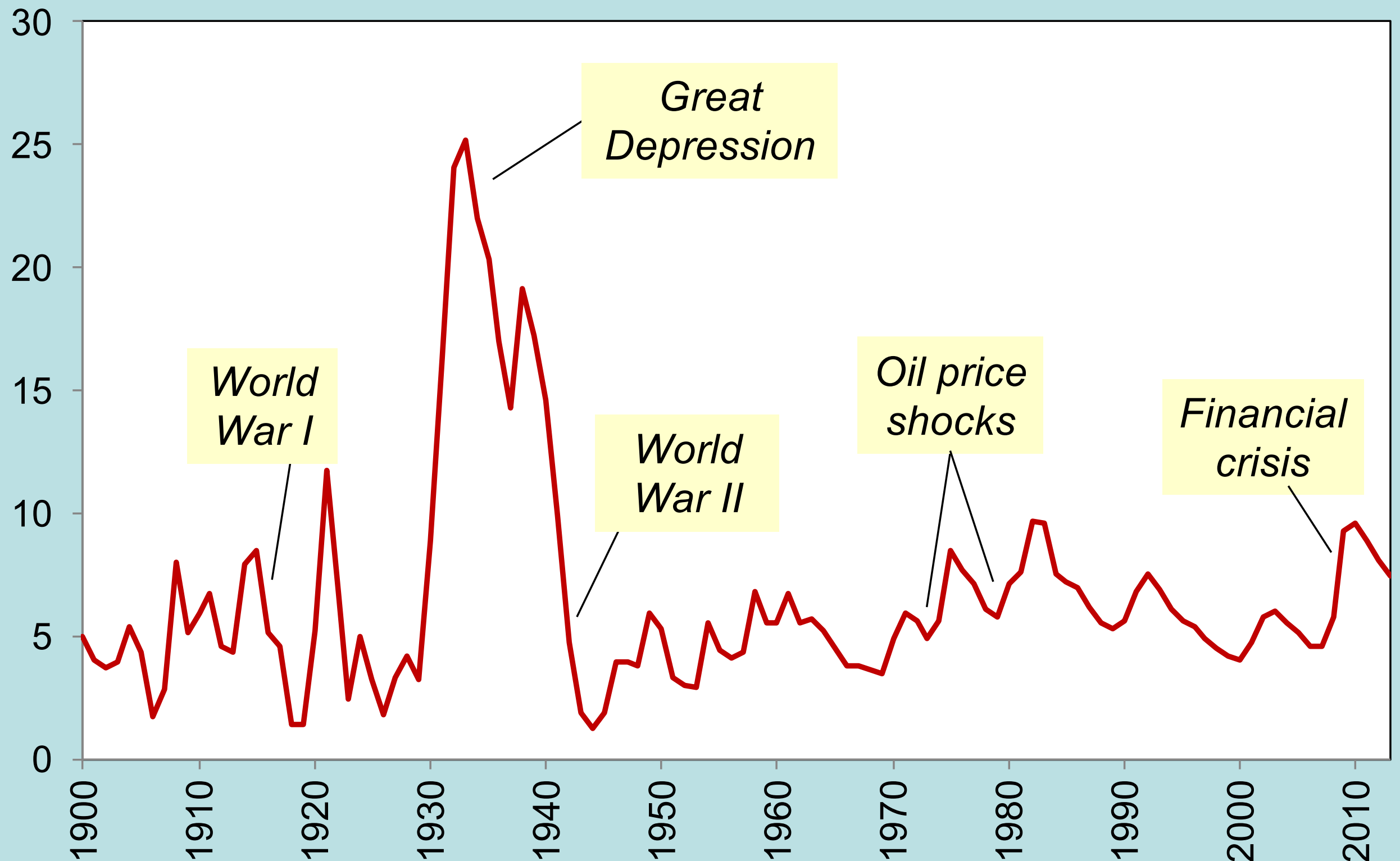


U-E retirees

- discouraged



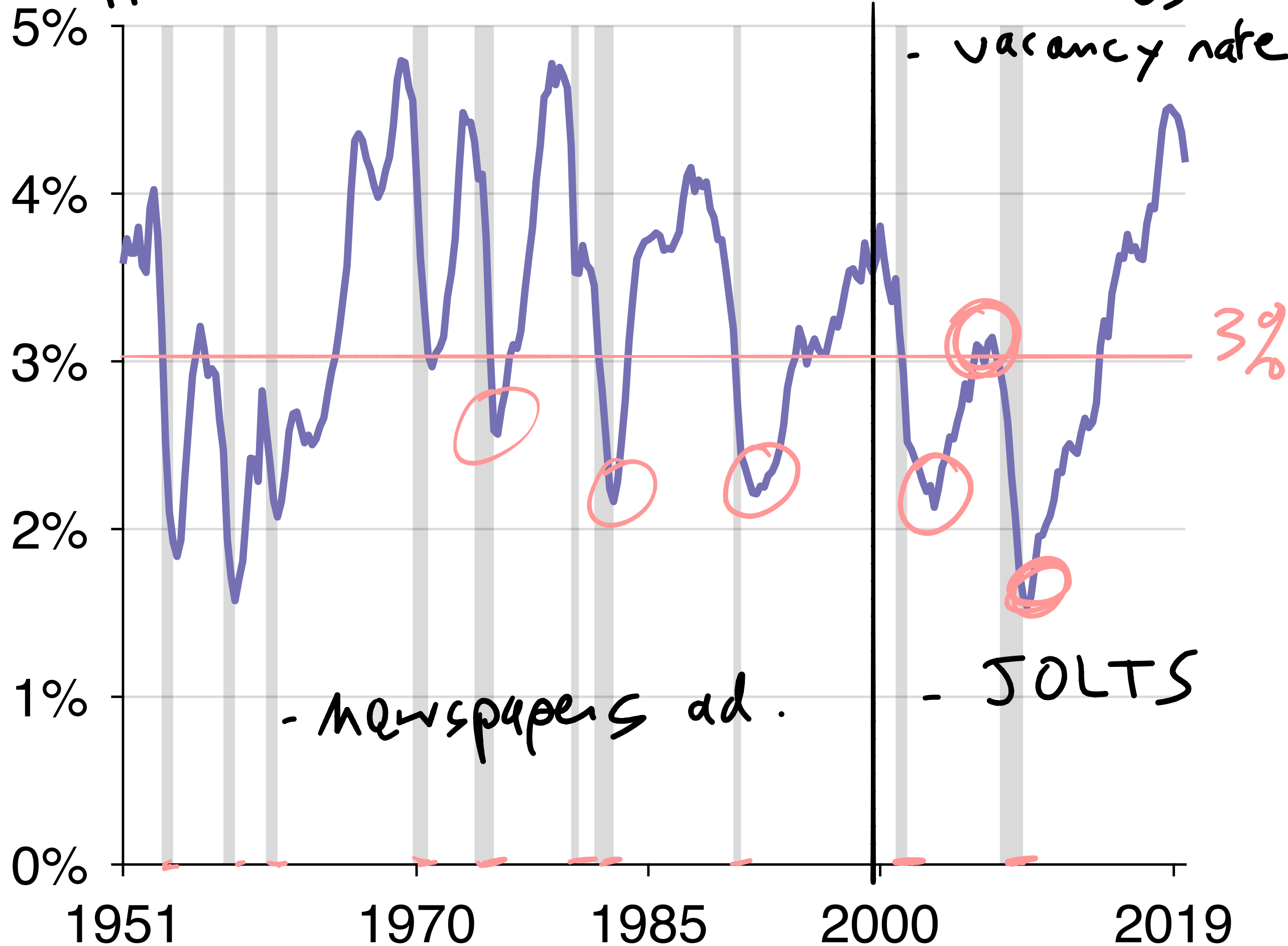
U.S. Unemployment Rate (% of labor force)

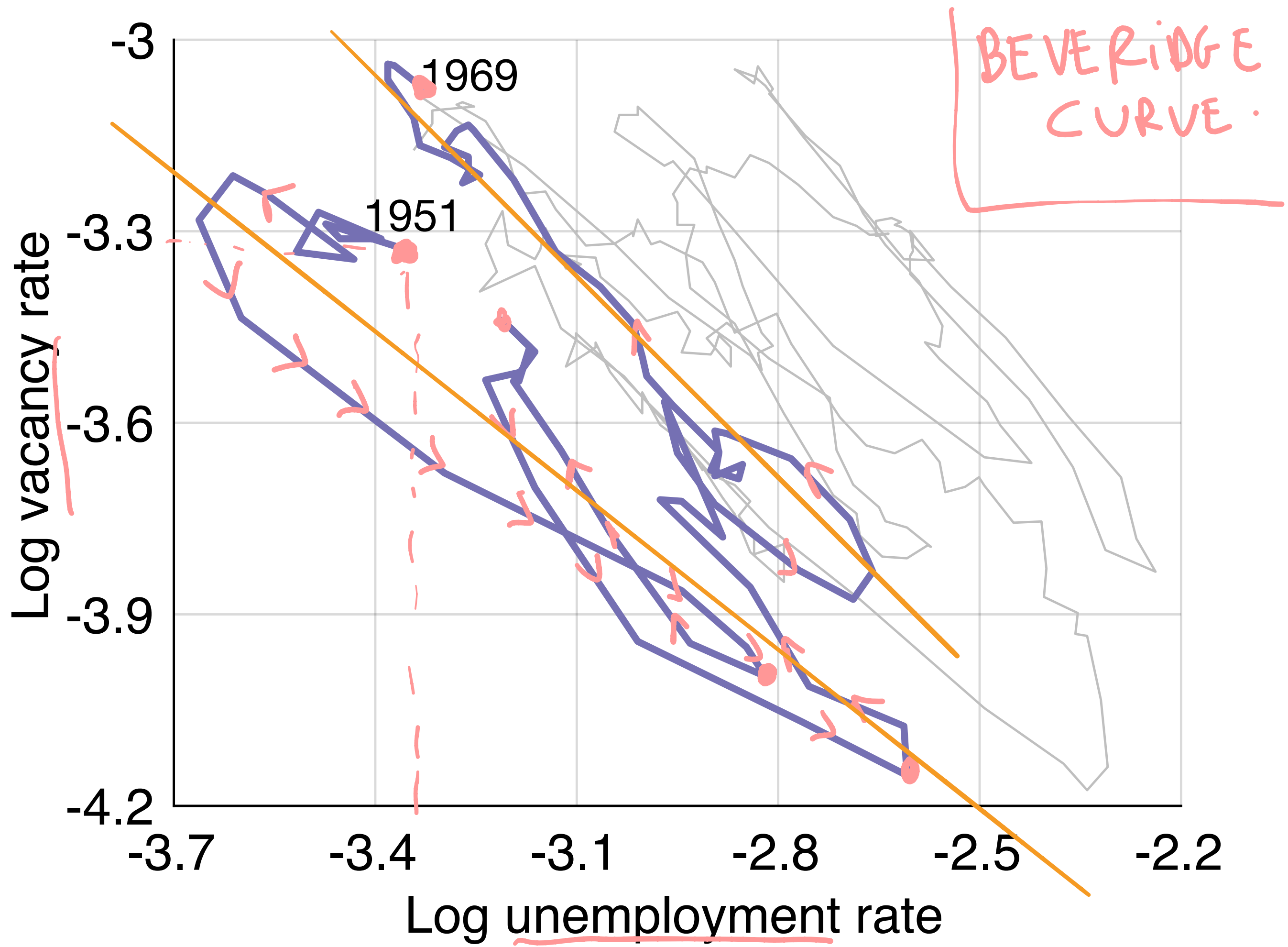


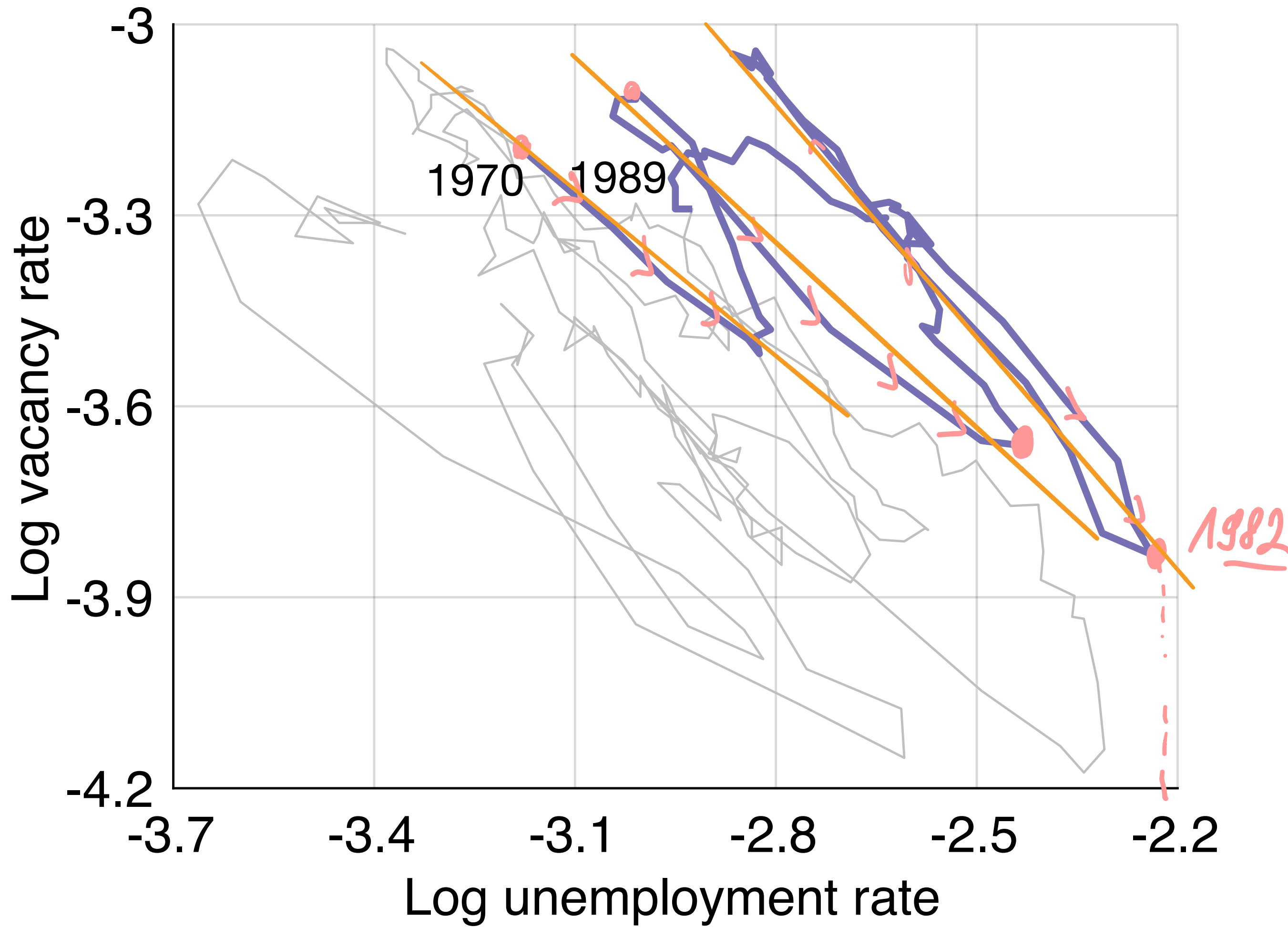
PROCYCLICAL

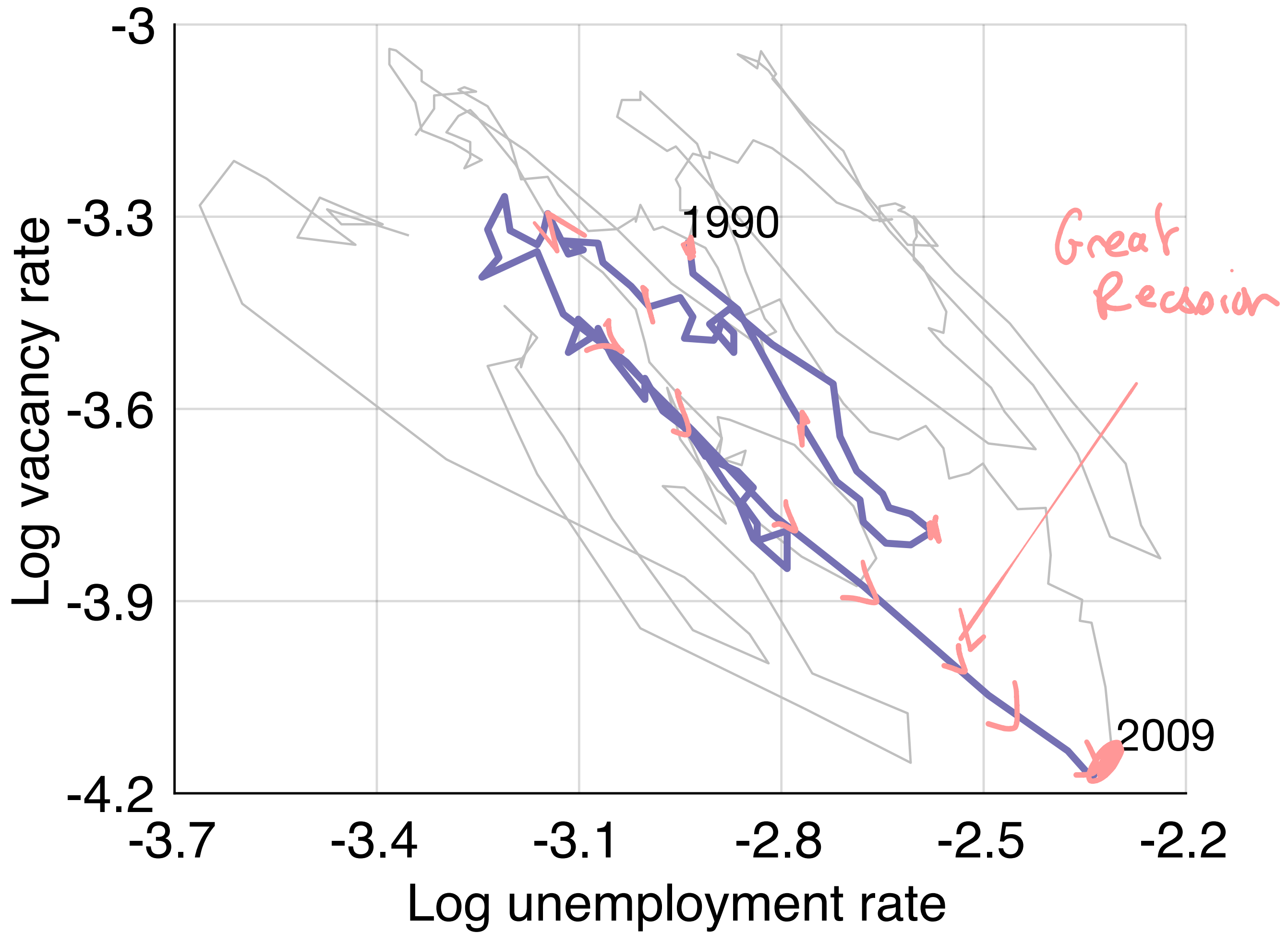
- US

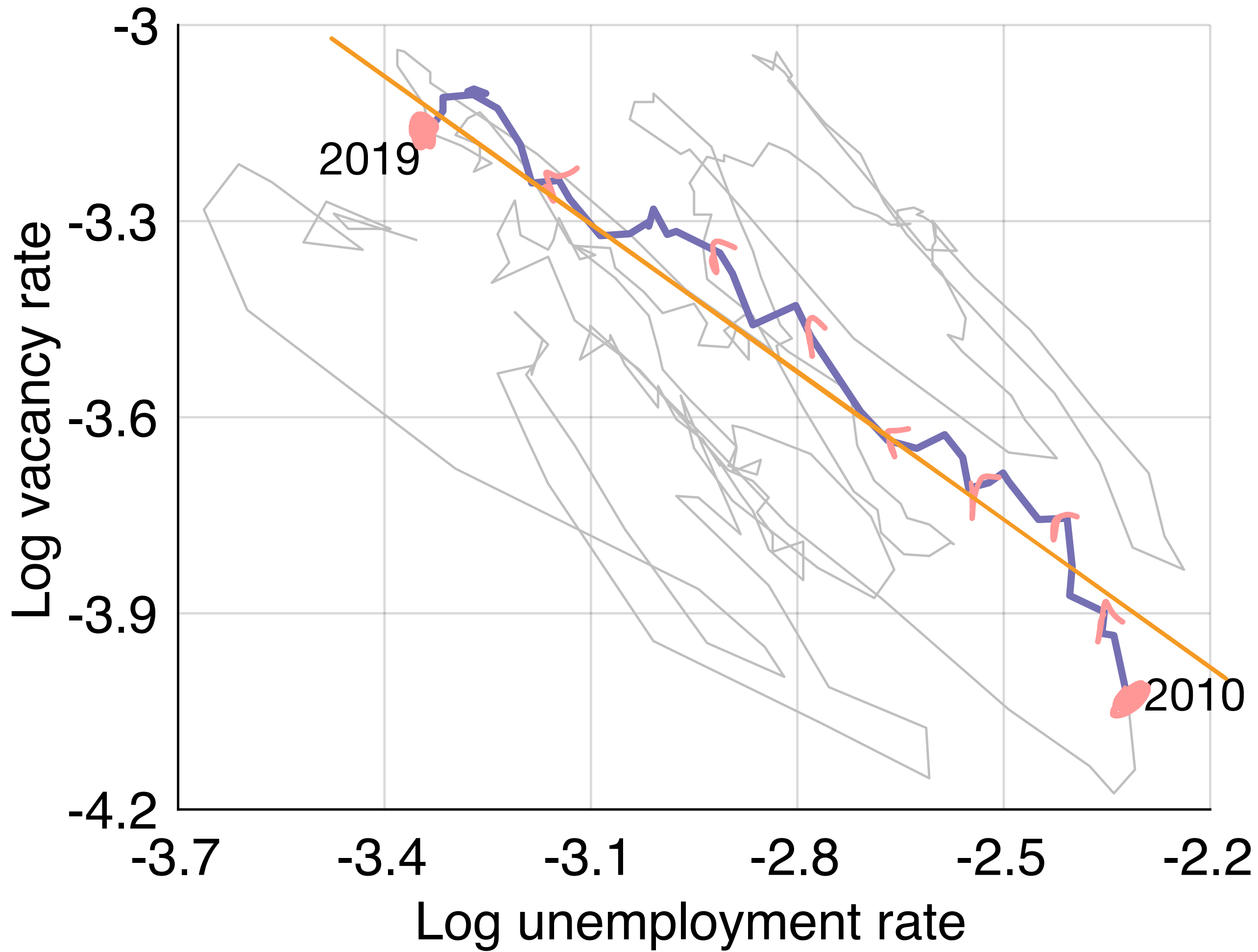
- vacancy rate





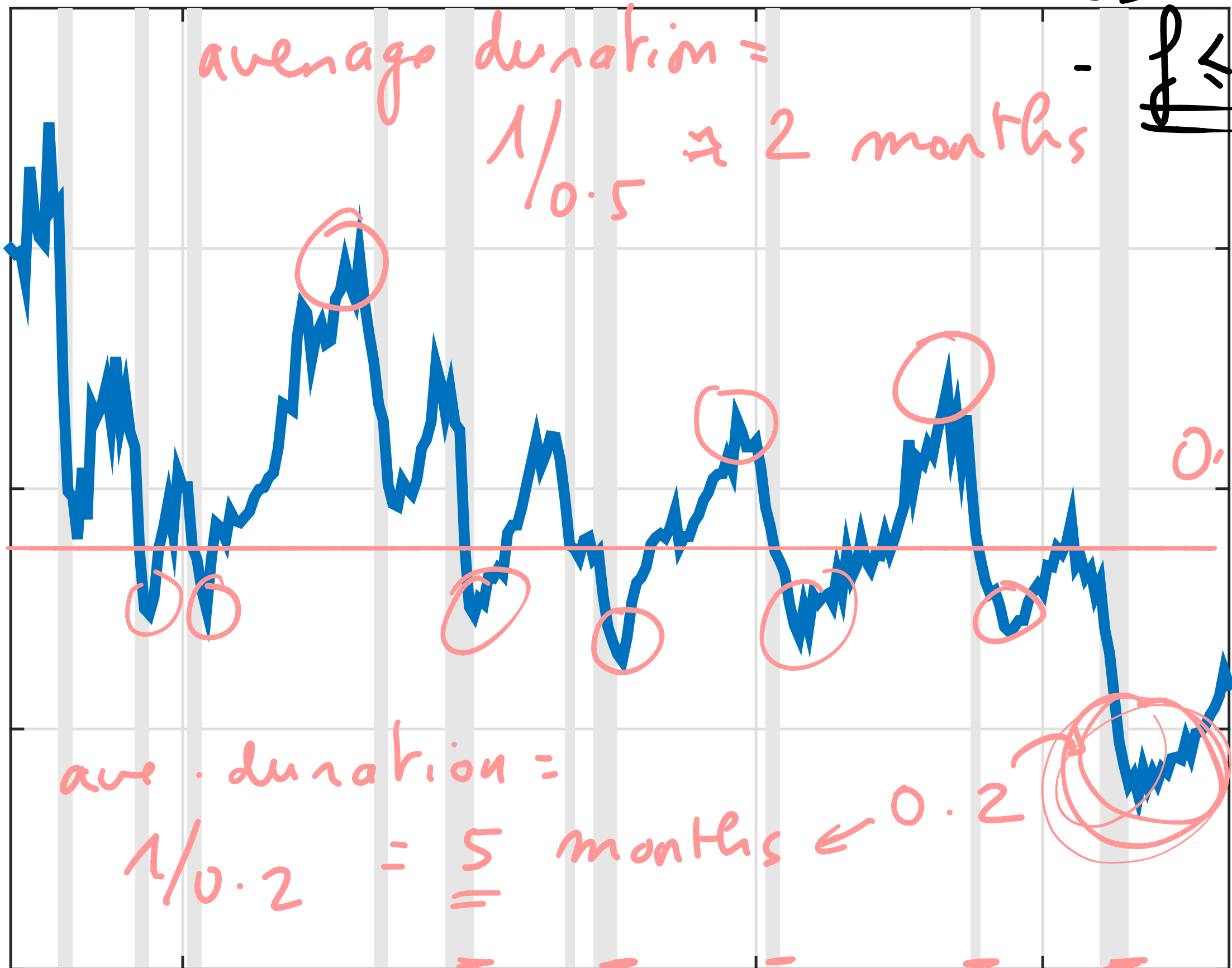






Monthly job-finding rate

1.2
0.9
0.6
0.3
0



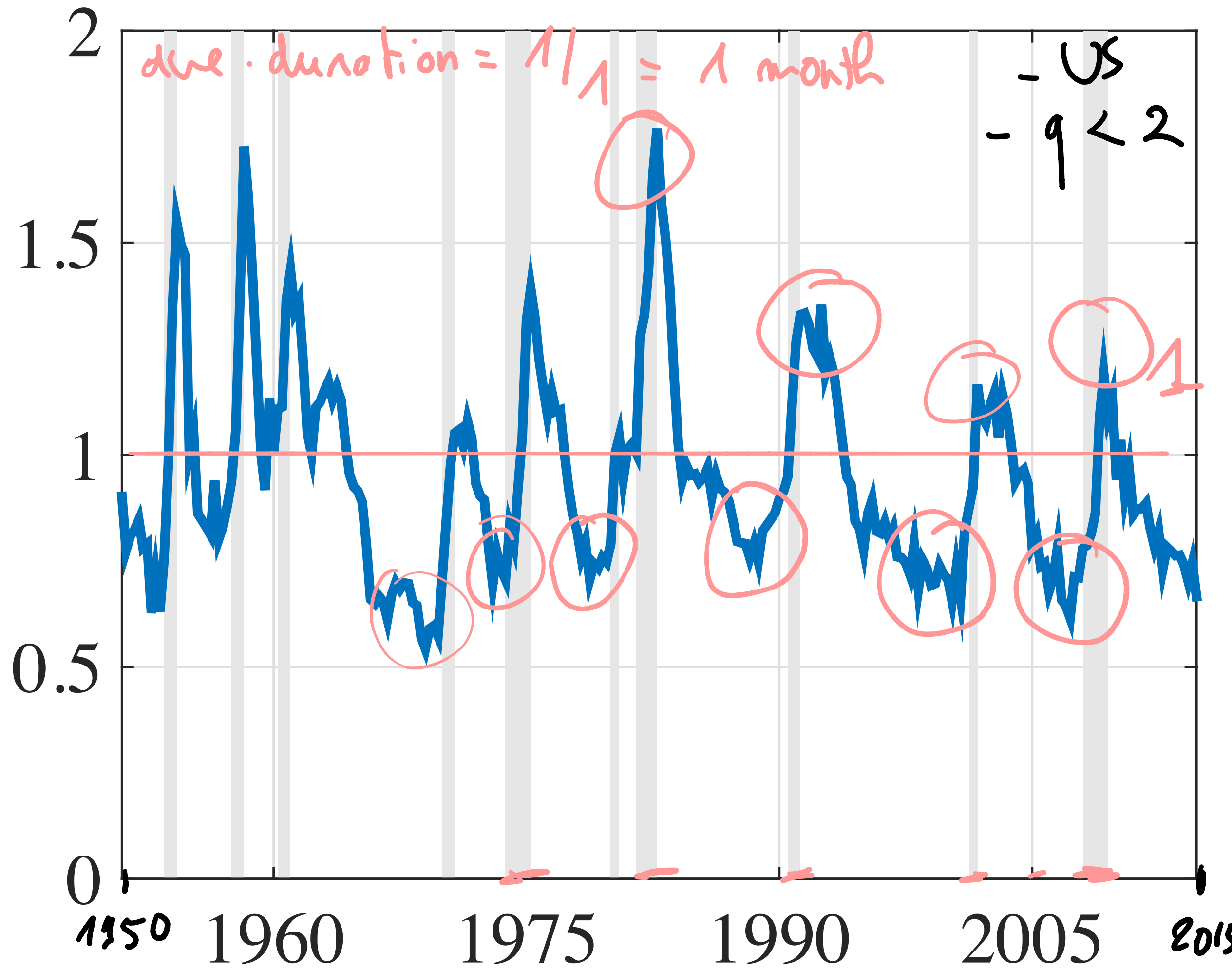
1960

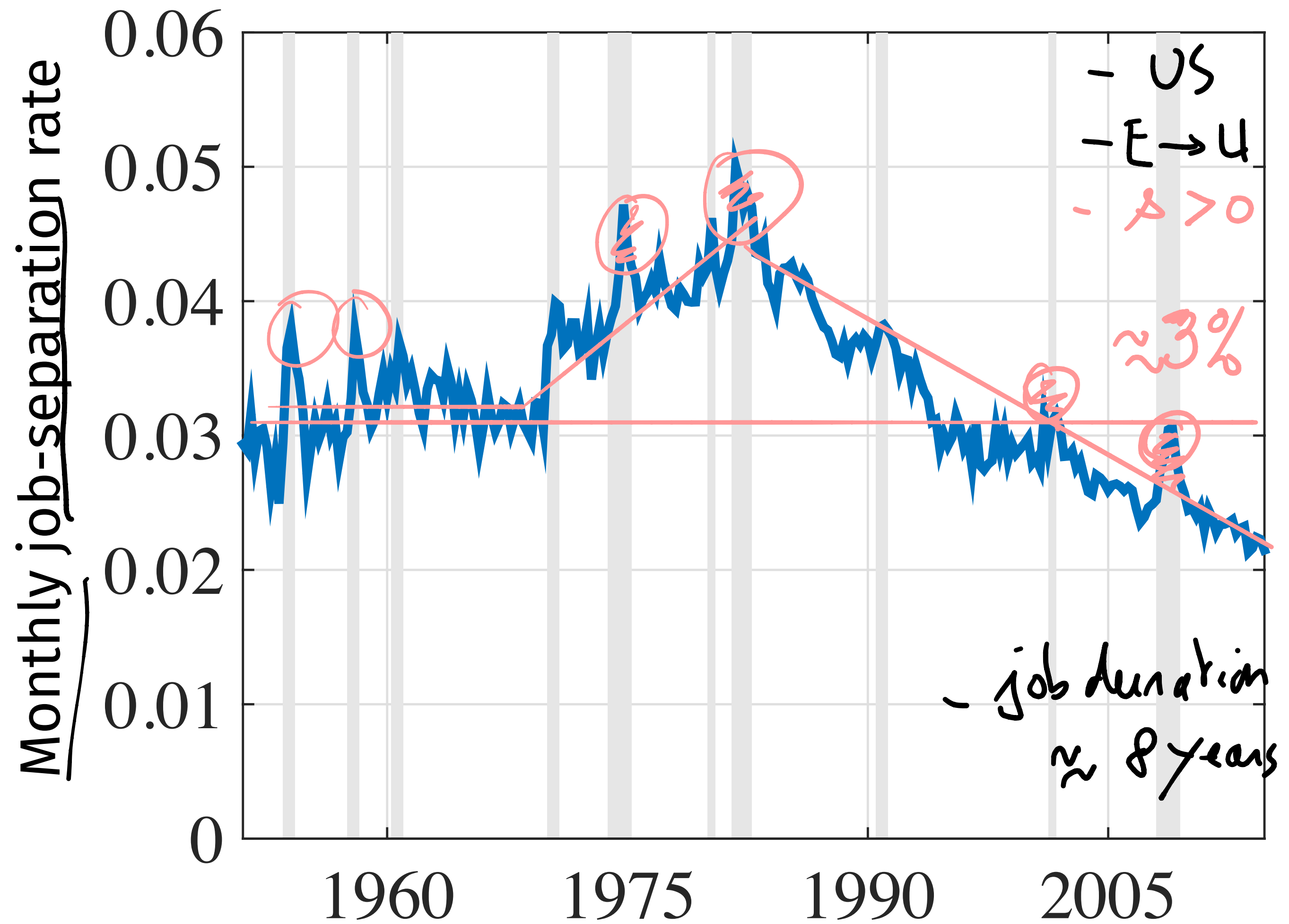
1975

1990

2005

Monthly vacancy-filling rate





matching function: m

- U : # unemployed workers
- V : # vacancies

new matches every month
 $= m(U, V)$

$$(1) \frac{\partial m}{\partial U} > 0$$

$$(2) \frac{\partial m}{\partial V} > 0$$

$$(3) \begin{aligned} m(0, V) &= 0 \\ m(U, 0) &= 0 \end{aligned}$$

(4) constant returns to scale.

$$\forall \lambda > 0:$$

$$m(\lambda U, \lambda V)$$

$$= \lambda m(U, V)$$

example: Cobb-Douglas

$$\begin{aligned} m(U, V) &= \omega \cdot U^\eta \cdot V^{1-\eta} \end{aligned}$$

$\omega > 0$: efficacy
 $\eta \in (0, 1)$: elasticity.

labor market tightness: $\Theta = V / U$

A: m has constant returns to scale.

job finding rate: $f = \frac{m(U, V)}{U}$ ← # new jobs
← # job openings

$$f = \frac{m(U, V)}{U} = m\left(\frac{U}{U}, \frac{V}{U}\right) = m(1, \Theta)$$

CRS $f(\Theta)$

$$f'(\Theta) > 0$$

vacancy-filling rate: $q = \frac{m(U, V)}{V}$

$$q = \frac{m(U, V)}{V} = m\left(\frac{U}{V}, \frac{V}{V}\right) = m\left(\frac{1}{\Theta}, 1\right)$$

$q(\Theta)$

$$q'(\Theta) < 0$$

Relationship between $f(\Theta)$ & $q(\Theta)$:

$$f(\Theta) / q(\Theta) = \frac{m(U, V)}{U} \cdot \frac{V}{m(U, V)} = \frac{V}{U} = \Theta$$

$$f(\Theta) = \Theta \cdot q(\Theta)$$