

Should we reject the natural rate hypothesis?

*December 2017
Haavelmo lecture*

Olivier Blanchard

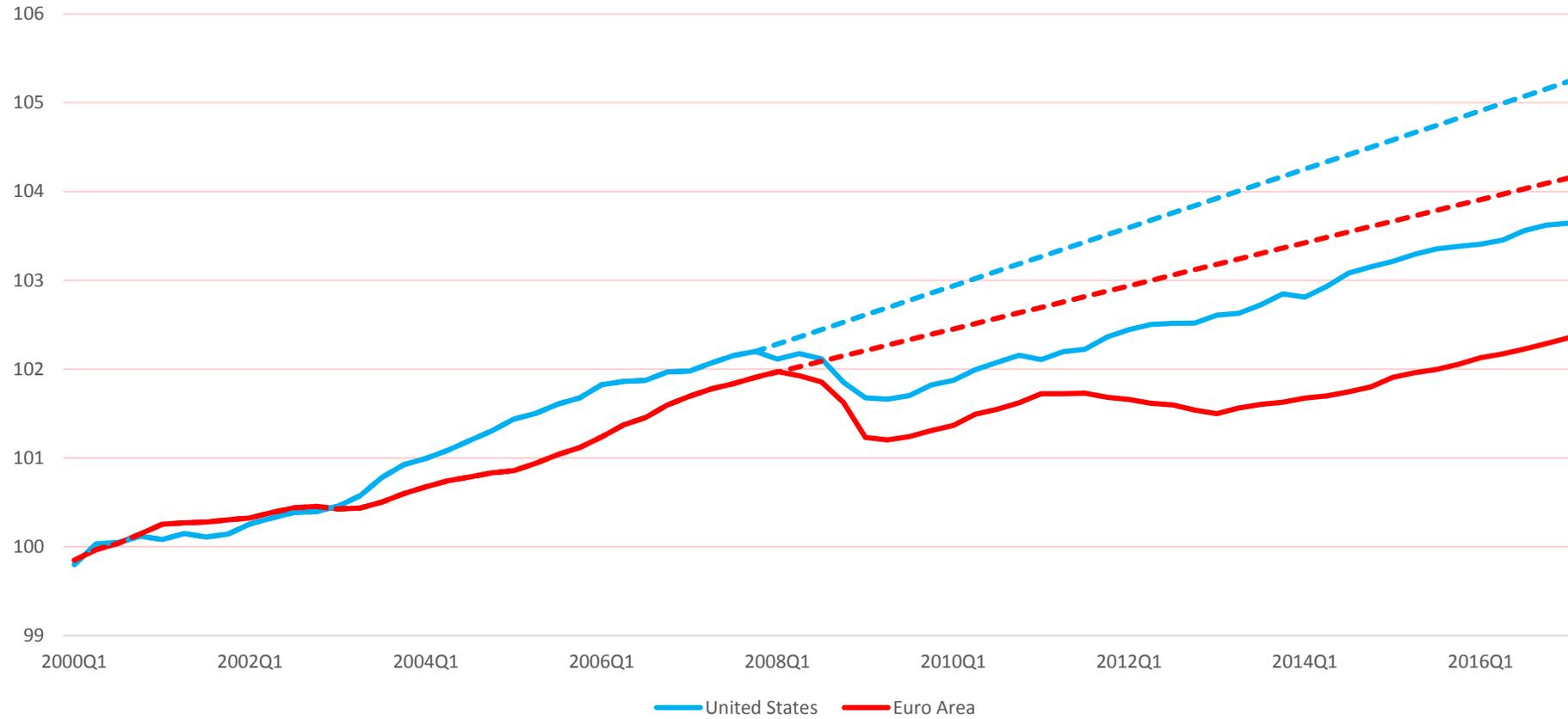
50 years ago: The natural rate hypothesis

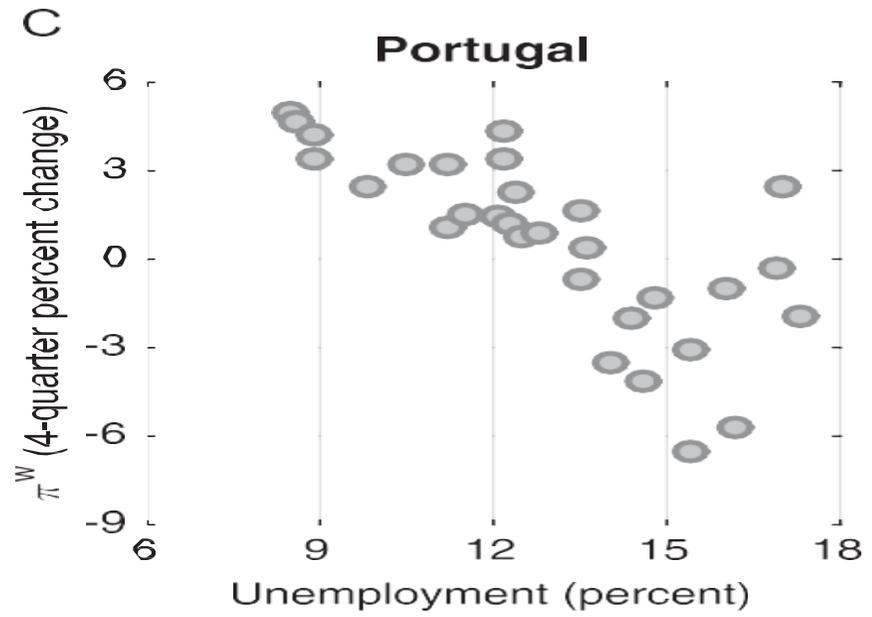
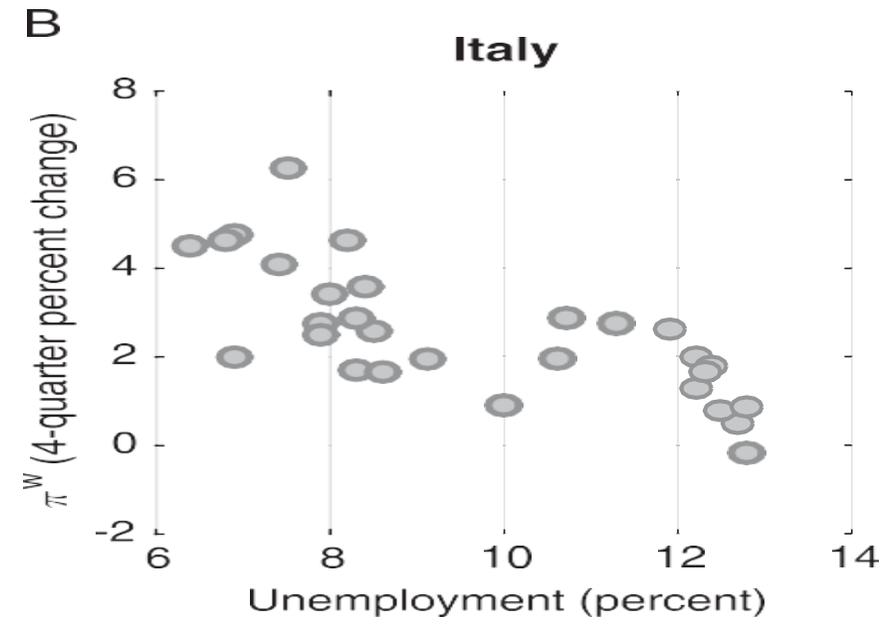
- Friedman's presidential address. 1967
- In effect, application of general long-run neutrality of money proposition
- Two sub-hypotheses:
 - The natural unemployment rate independent of monetary policy.
``Independence hypothesis''
 - Maintaining actual rate below natural rate leads to increasing inflation.
``Accelerationist hypothesis''
- Strong organizing framework, and strong policy implications:
 - Structural versus stabilization policies.
 - Limits to stabilization policies: Booms fully offset by busts
 - Monetary policy can smooth, but no more.

Acceptance, old and new grumblings

- Quickly accepted.
 - Empirically: Increase in Phillips curve coefficient, from 0 to 1.
 - Conceptually: Dominant framework
- Basis for inflation targeting framework.
- But:
 - The disinflations of the 1980s, and hysteresis.
 - More recently:
 - The effects of the Great Financial Crisis on output.
 - The disappearance of the accelerationist Phillips curve.

Advanced Economies log Real GDP and extrapolated trend (Index, 2000=100)





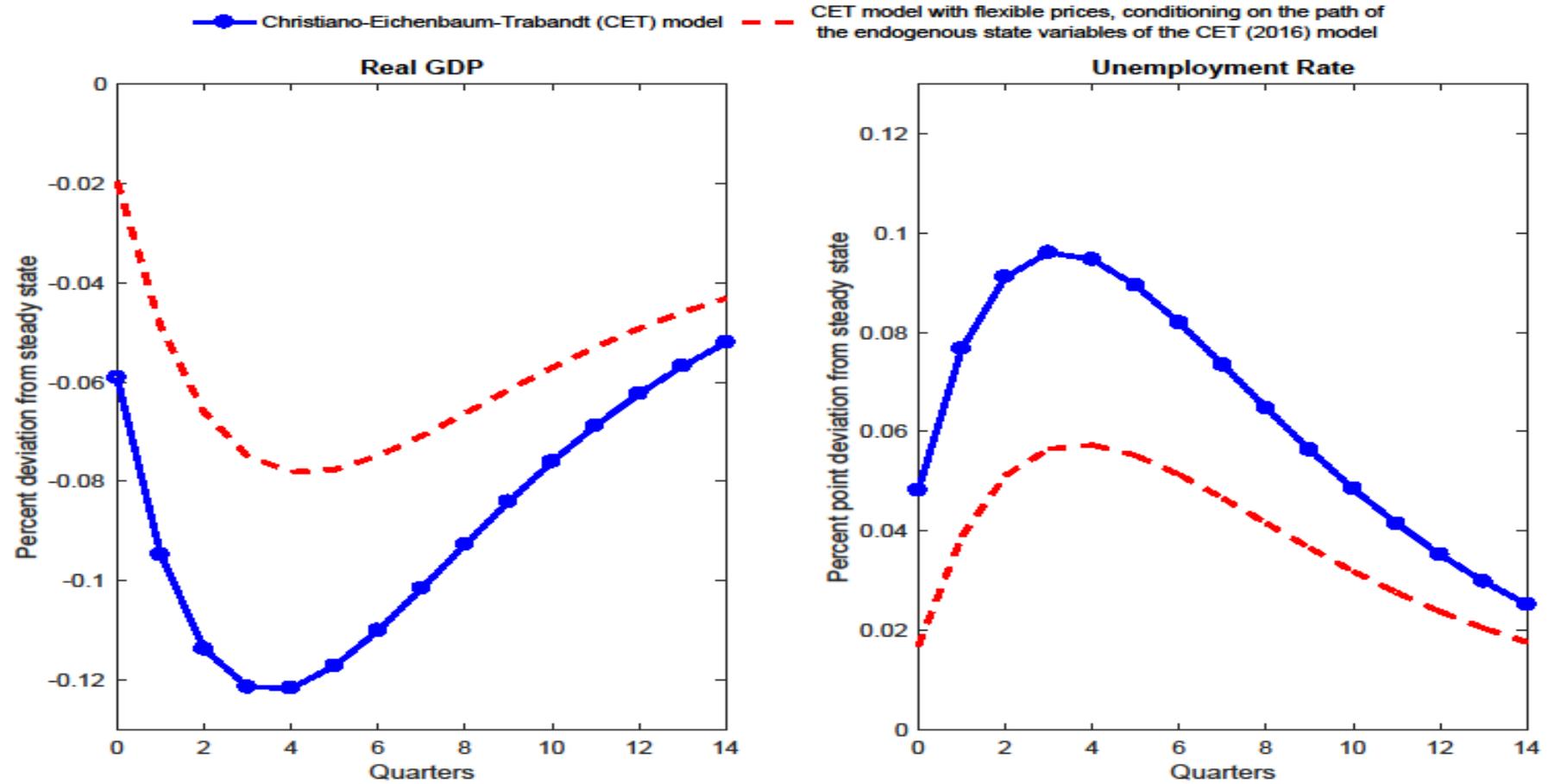
Map

- The independence hypothesis.
 - Persistence versus permanence
 - Macro evidence
 - Micro evidence
- The accelerationist hypothesis.
- Policy implications

1. Persistence versus permanence

- Need to clarify the issues. Discussion often presented as
 - Standard models: zero effect of m pol on potential output
 - versus :
 - Hysteresis: permanent effect of m pol on potential output
- In fact:
 - All models have some, persistent, effect of m pol on potential output
 - Recessions, capital accumulation, potential output
 - State variables. Capital, Unemployment (if matching frictions).
 - Hysteresis models often do not imply permanent effects
 - R&D, TFP, and potential output
 - Disenfranchised workers.
- Bottom line: Issue is the degree of persistence. High or low?

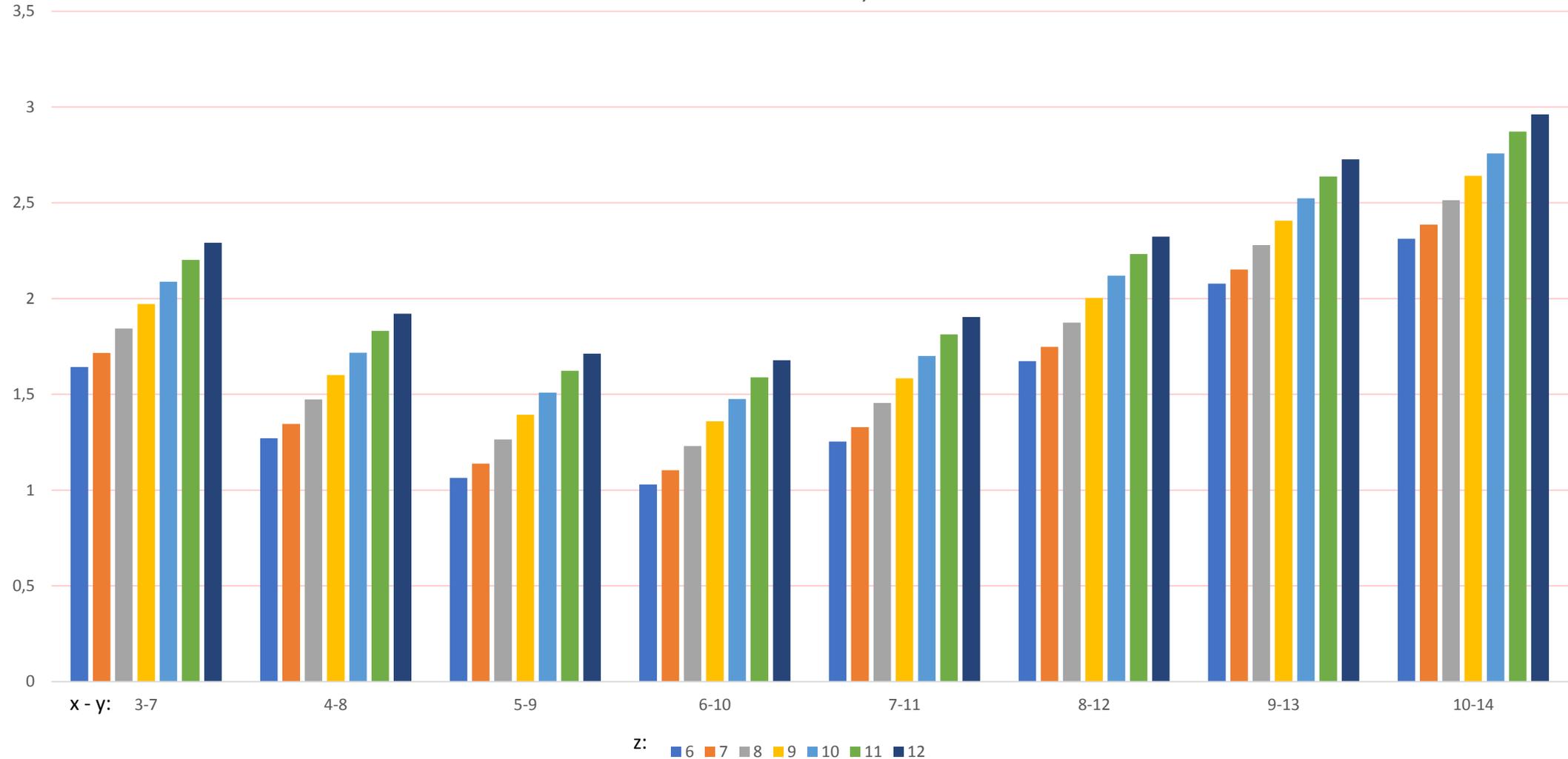
Impulse Responses to a Contractionary Monetary Policy Shock (50 Annual Basis Points)



Macro evidence. Unemployment.

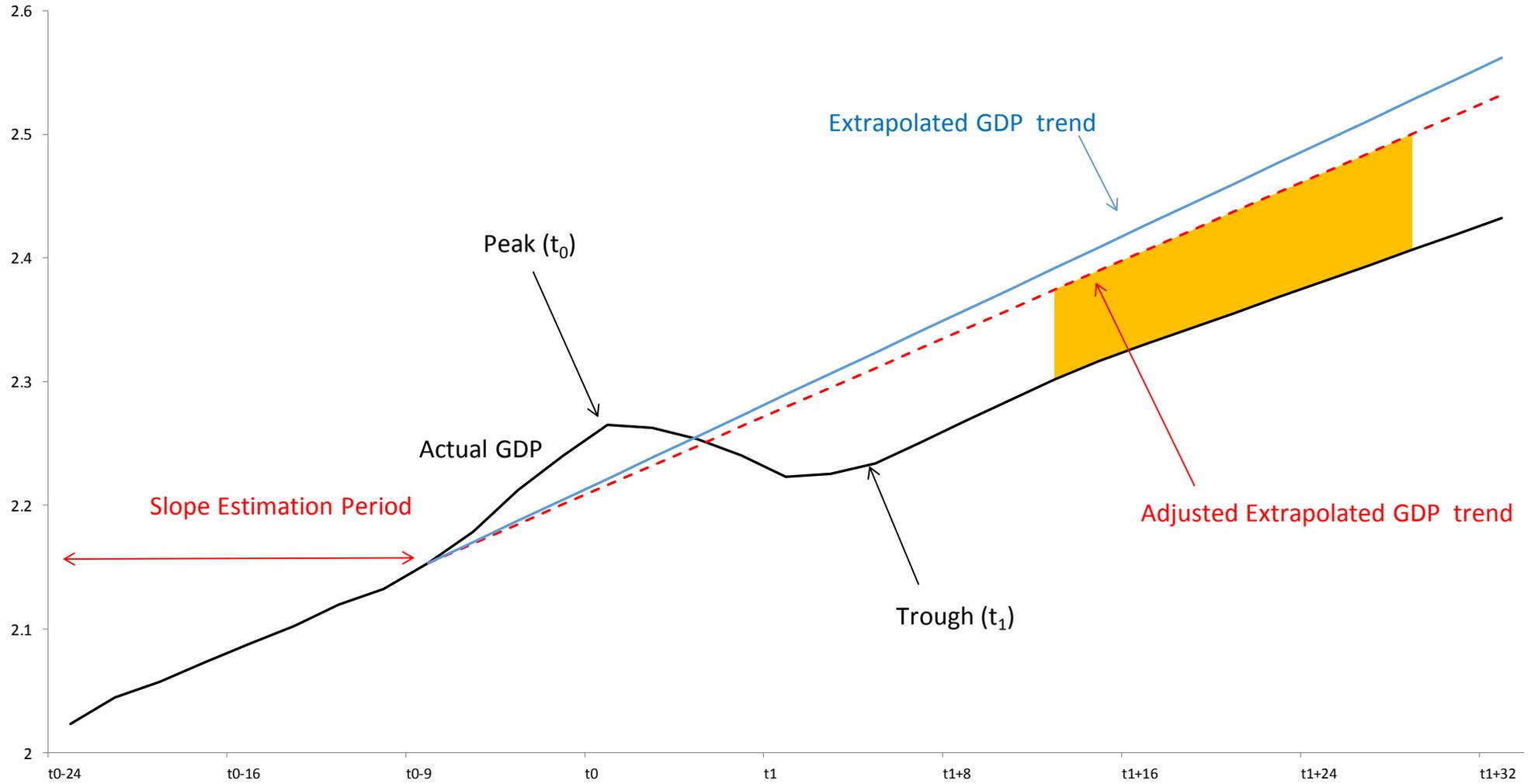
- Effects of monetary policy shocks?
 - Look at recessions caused by intentional disinflations
 - Clearly monetary shocks. Large. Plausibly exogenous
- Data set. 22 advanced economies, 50 years.
 - Identify recessions. 122
 - Caused by disinflation decision. 22.
- Methodology
 - Look at average unemployment rate pre- and post-recession
 - Time intervals. Pre-recession. -2 to -6, ..., -2 to -12
Post-recession. +3 to +7, ..., +10 to +14₉
- Caveats:
 - Time fixed effects, heterogeneity, actual or natural rate?

Disinflation recessions - Change in Unemployment rate
(Average unemployment rate x to y years after the recession - Average unemployment rate 2 to z years before the recession)

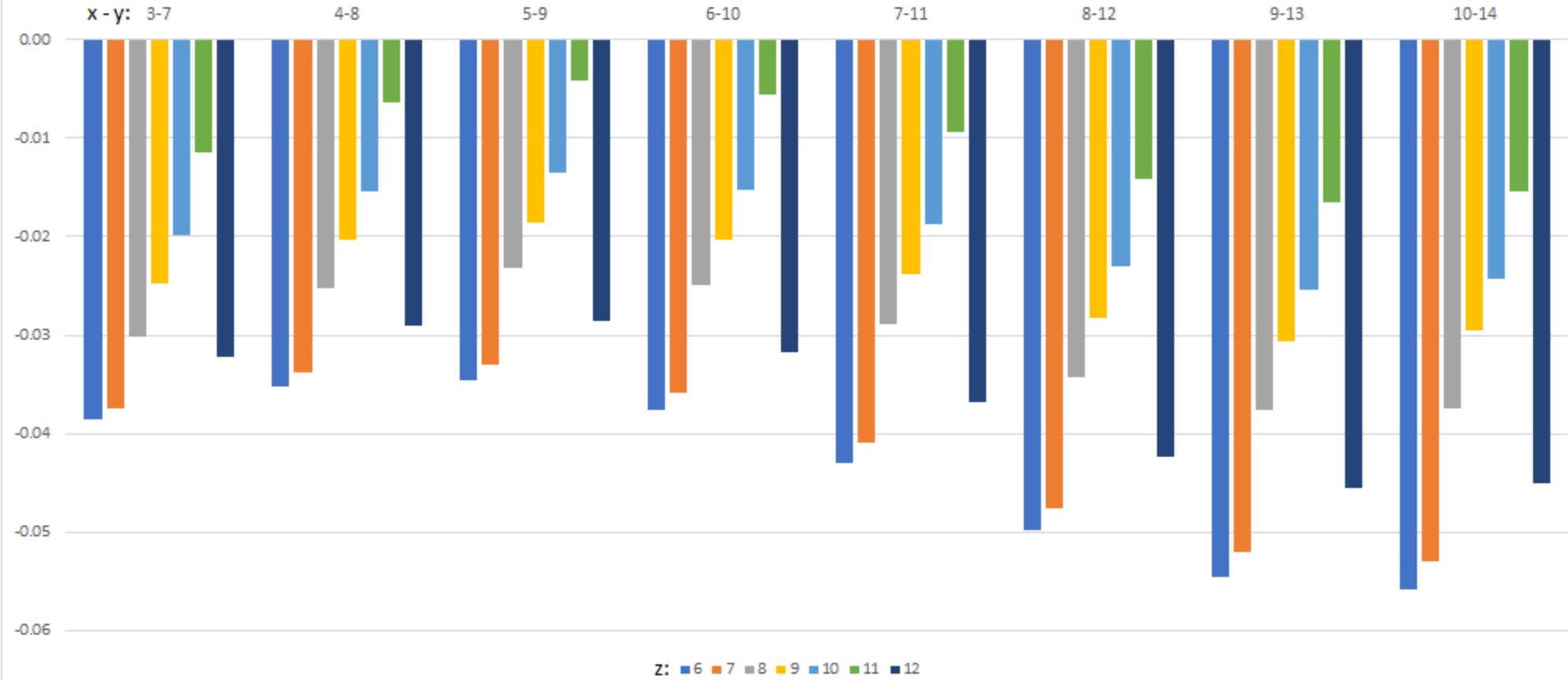


Macro evidence: Output

- Similar approach for output.
 - Why not look at output?
- Compute a pre-recession log-linear time trend.
- Extrapolate.
- Look at post-recession output gap.
- Do it over various pre- and post-recession intervals
- Complication. Underlying decreasing time trend.
 - If not corrected, will find negative output gaps on average
- Evidence.
 - Less impressive than for unemployment
 - Decomposition: employment, productivity



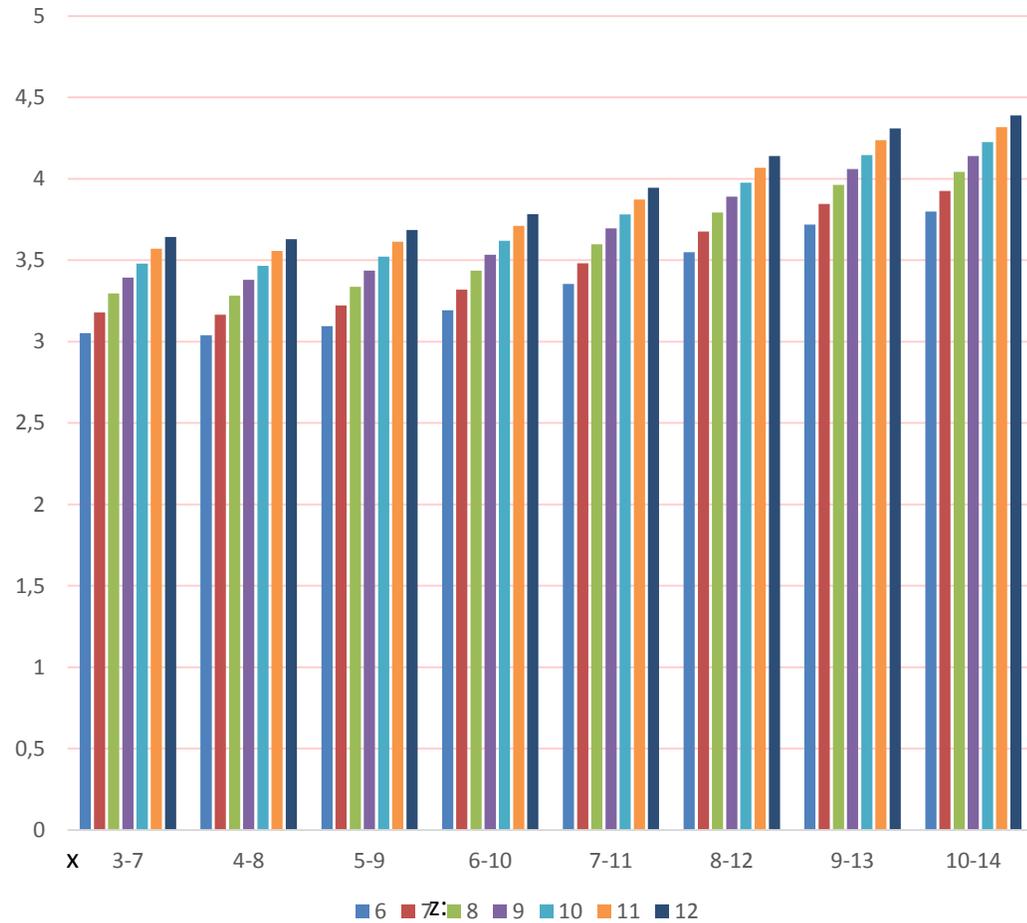
Disinflation recessions - Output gaps by pre-recession/post-recession windows
 (Average output gap x to y years after the recession. Extrapolated trend estimated 2 to z years before the recession)



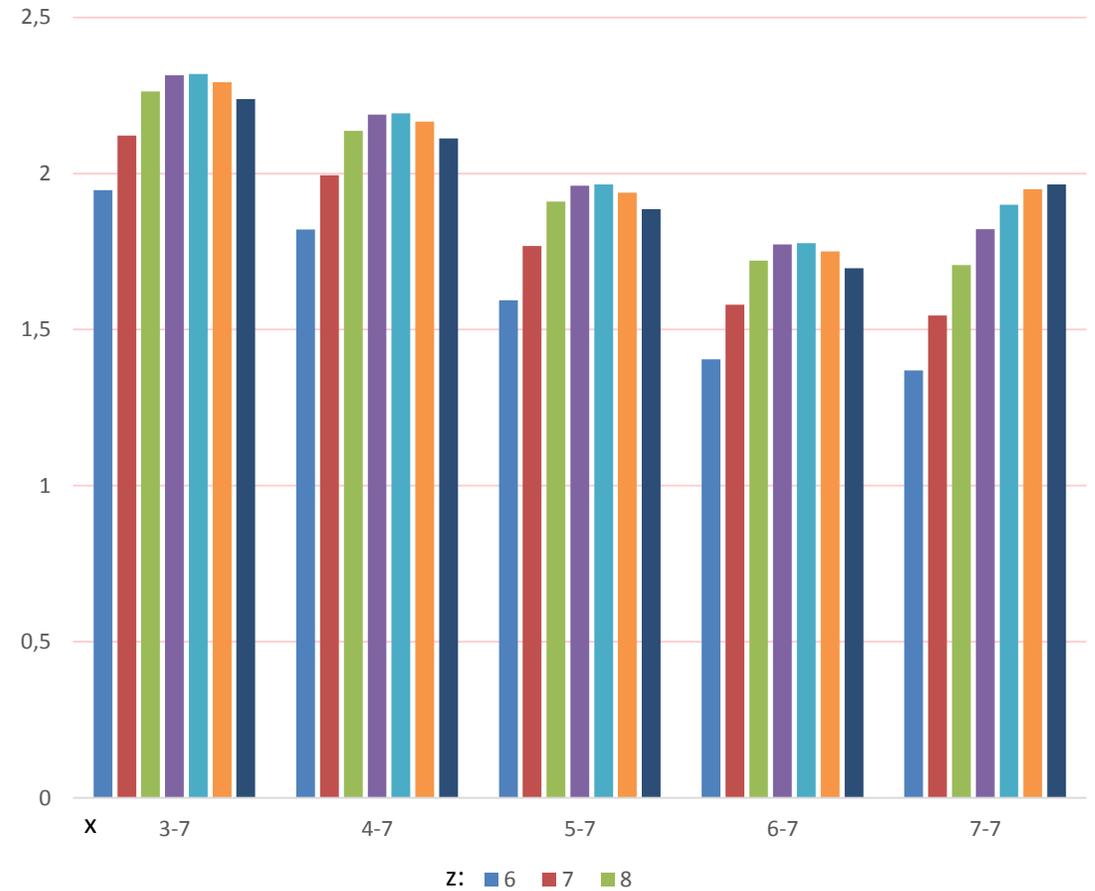
Can we learn from other recessions?

- Can we learn from the other recessions, say, caused by oil shocks, financial crises, etc?
- Yes, with one additional strong assumption:
 - Zero long run elasticity of labor supply/wage curve
 - If so, can look at unemployment. (not output. Why?)
- Evidence.
 - Strong effects for both oil shocks, and financial crises.
 - Similar caveats. Largely bunched in time, so potential time effects.

Oil related recessions



Financial crisis recessions



Note: The 7-7 specification covers 11 out of 21 recessions

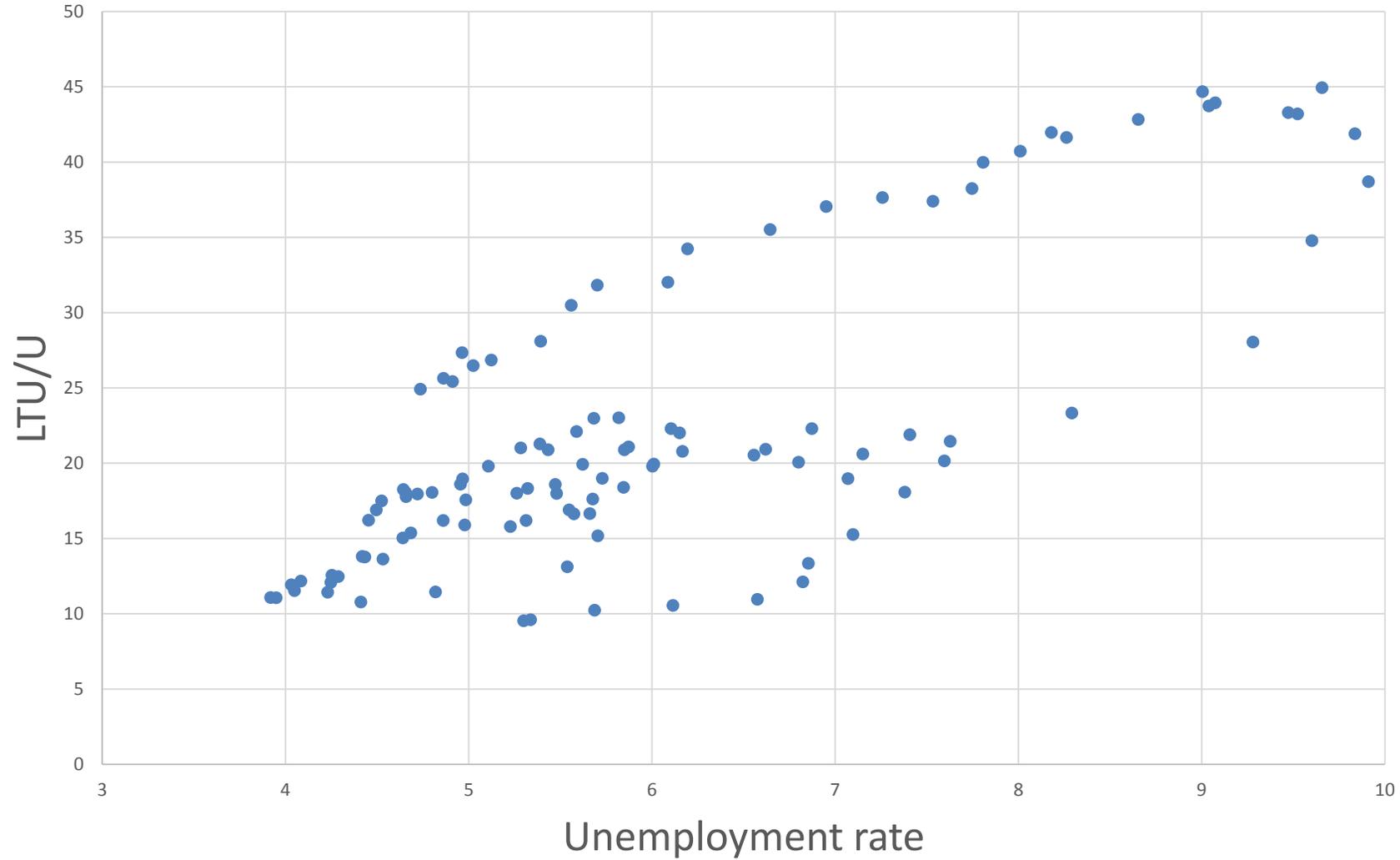
Micro evidence. Persistence channels. 1.

- The initial hysteresis argument (Blanchard-Summers). Insiders
 - Unions set wages. (eventually) do not care about the unemployed members.
 - No pressure of (some) unemployment on wages.
 - Natural rate has a unit root
- Too strong. Unemployment matters
 - Unemployment threat if fired
 - Unemployment threat from hiring unemployed
 - Role of employment protection: Firing/hiring costs
- DMP framework. Now incorporated in some DSGE
- How much persistence?
 - A function of labor market institutions.
 - Employment protection, u benefits, structure of bargaining

Micro evidence: Persistence channels. 2

- Loss of morale, skills, employability.
- Probability of employment if unemployed (CPS):
 - 1 month : 28% if $U < 27$ weeks, 14% if $U > 27$ weeks
 - 15 months : 55% 40%
- No proof of hysteresis however. Best hired first, pool gets worse?
 - Looking at past history of the short-term and long-term u
 - (Abraham et al). Similar employment status 8 quarters before
- If this is the channel, then asymmetric hysteresis.
 - LTU convex in U . *
 - More hysteresis in deep recessions than in booms.

Ratio of long term unemployment against U rate, 1990-2016



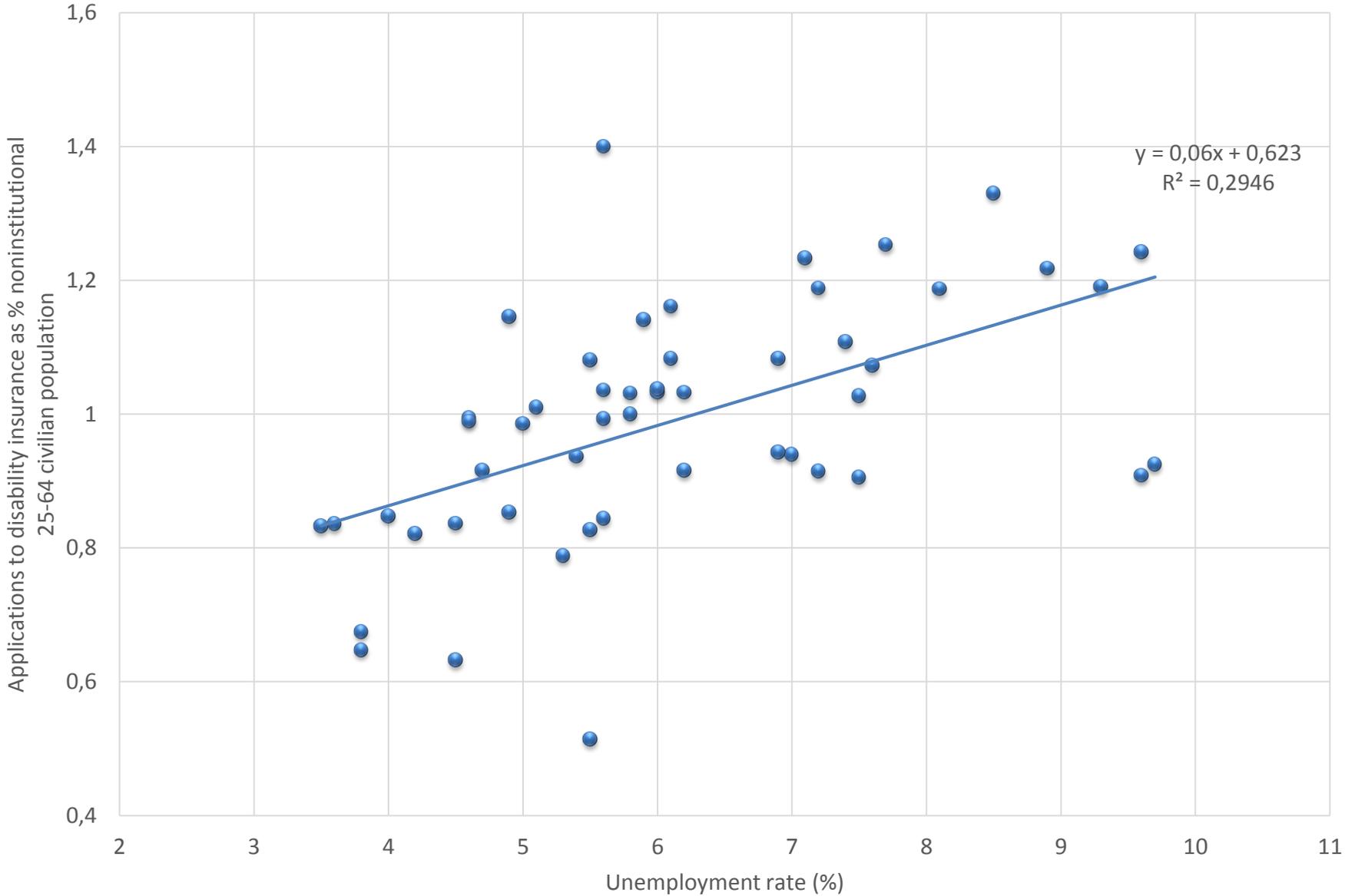
Micro evidence: Persistence channels. 3

Focus at this point on low labor force participation (rather than unemployment rate, which is very low) in the US.

Largely a downward trend, but is there more?

- Evidence from Yagan. 7.2% decrease in LFP for 30-49 cohort in 2007
 - 4.8% due to demographics. 1.8% due to high u in 2007-2009
- The longer evidence from disability insurance
 - Applications highly cyclical. *
 - Once accepted, low probability of coming back.
 - Over last 10 years, 20% ``excess unemployment''
 - 2.4 m applications more. (1.7% of labor force)
 - Acceptance rate: 35%, so 0.8 million. (0.6% of labor force)

Applications to disability insurance vs U rate, 1960-2014



Micro evidence: Persistence channels. 4

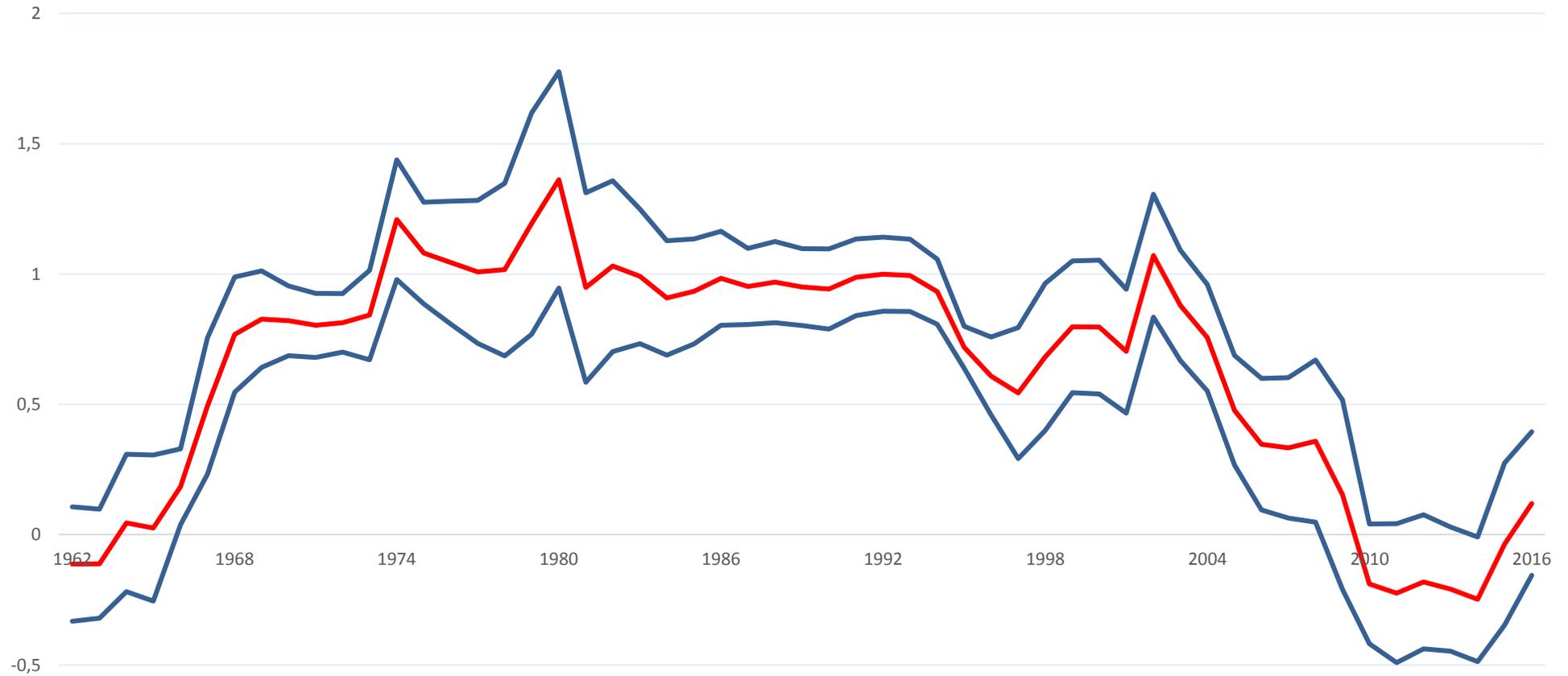
Turning to persistent effects of recession on productivity.

- No evidence that it plays a role in disinflation-caused recessions
- R&D cyclical. But effect of cycle is small. 1% less growth. 1% less R&D.
- Speed of adoption. Evidence. Some cyclical elasticity. Gertler et al.
- Recessions and reallocation. Schumpeterian cleansing or inefficient closures? Foster et al: small positive effect (except during the GFC)

The accelerationist hypothesis

- The simple Phillips curve.
$$\Pi = a \Pi(-1) + b (U-U^*)$$
- Friedman: If try to use the trade off, a will go to 1.
- (Lucas/Sargent. Rational expectations version. NK version.)
- The evidence. Estimation with 15-year rolling sample
 - Dramatic increase after Friedman's address
 - Dramatic decrease since early 2000s.

Lagged inflation coefficient +/- 1 std 15-year rolling samples



Credibility or lack of salience?

- Why has the coefficient decreased back to zero?
 - Credibility? Inflation target, and inflation targeting.
 - Lack of salience? At low, stable inflation, inflation ignored
- How to test? Not easy
 - If credibility, response to core, but not to (headline – core)
 - If salience, response to (headline – core), but not to core.
(e.g. response if price of gas increases/decreases a lot)
- Evidence from behavior of professional forecasters (SPF)
households (Michigan survey).

Table 1: Regressions of professional and consumers' forecasts of inflation

	1981Q3-1995Q4		1996Q1-2016Q3	
	SPF	Michigan	SPF	Michigan
ma_core	0.498*** [0.038]	0.375*** [0.061]	0.547*** [0.052]	-0.111 [0.125]
ma_inflcore	0.125 [0.099]	0.288*** [0.093]	0.077** [0.029]	0.231*** [0.060]
Constant	2.024*** [0.174]	1.873*** [0.267]	1.098*** [0.103]	3.134*** [0.244]
Observations	58	58	83	83
R-squared	0.746	0.66	0.598	0.19

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Policy implications. 1

- Long way from knowing enough. Strength, persistence, asymmetries...
-
- Nevertheless, a simple formalization:

$$(1) \quad y^{*}(+1) = a y^{*} + b (y - y^{*})$$

Pure independence hypothesis: $b=0$.

Pure hysteresis hypothesis : $a=1, b>0$

Realistic models: coefficients in between.

$$(2) \quad \Pi = c(y - y^{*}) + E \Pi, \quad E \Pi = 0 \text{ if } -x \leq \Pi \leq +x, \quad \Pi(-1) \text{ otherwise}$$

Saliency if $x>0$

Policy implications. Inflation/output trade offs

Consider a one-period increase in the output gap, $y - y^* = \Delta$

- If both independence and accelerationist hypotheses hold:
 - Permanent increase in inflation of $c \Delta$
 - One-period increase in output of Δ

- If only independence assumption fails (a, b positive)
 - Permanent increase in inflation of $c \Delta$
 - Increase in output of $\Delta, b \Delta, ab \Delta, \dots$, : Bigger

- If only accelerationist assumption fails ($x > \Delta > 0$)
 - Increase in inflation for one period of $c \Delta$: Smaller
 - One period increase in output of Δ

- If both fail
 - Increase in inflation for one period of $c \Delta$: Smaller
 - Increase in output of $\Delta, b \Delta, ab \Delta, \dots$, : Bigger

Conclusions

- On the independence hypothesis
 - M policy (“demand shocks”) affects potential output/natural rate. a, b positive. But precise values?
 - Macro/micro evidence for highly persistent effects mixed.
 - Most convincing is disenfranchising.
- On the accelerationist hypothesis (or its RE version)
 - Some evidence of lack of salience. Usable?
- On policy implications. Not quite there yet.
 - We really do not know the relevant values of a, b, x
 - Need to work much more on wage bargaining channel.
 - Micro evidence on disenfranchising fairly strong.
- Is the current US labor participation case strong enough?