Econ 352 - New Keynesian Economics: Sticky Prices
(See Williamson Ch. 14)

Trevor S. Gallen

Introduction

▶ We worked out the real intertemporal "real business cycle" model

▶ It could explain some of the data, but had some observations that may or may not have been in contrast with data

▶ Little scope or justificadtion for government to affect economy

▶ Little scope for monetary pollicy

▶ Now we're going to take that model and add one twist: sticky prices

STICKY PRICES

► Now, we're going to assume that firms have "sticky prices"

► There are several justifications for sticky prices:

   ► Menu costs–it costs money (or cognitive costs) to change prices

   ► Contracting-costs are updated periodically

   ► Consumer anger at rising prices/coordination

NEW KEYNESIAN MODEL

▶ New Keynesian Model is same as our previous model, rather than $Y^s = Y^d$ determining r^*, the central bank sets r and there may be a shortage in the output (Y) market

▶ And therefore the labor (N) market

▶ Let's look graphically

New Keynesian Model

(a) Current labor
(b) Current goods
(c) Money
(d) Production
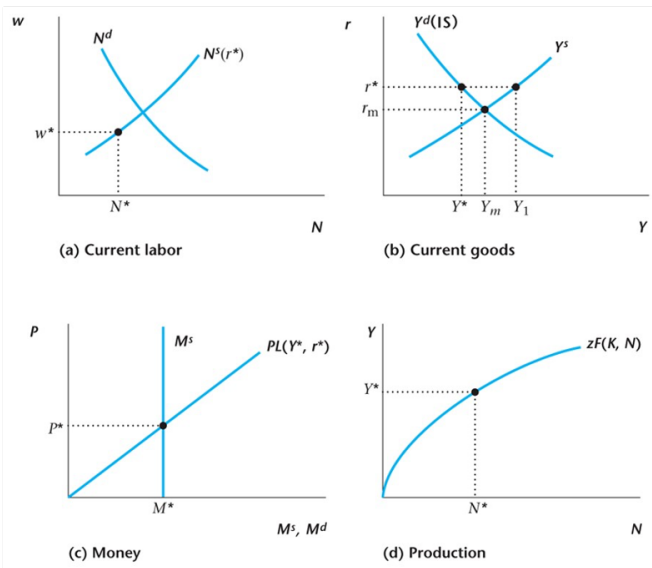
$r^* \to Y^d \to N \to w$, and given Y and r, have M and P

NEW KEYNESIAN MODEL

▶ Ok, so we broke our model a little via allowing the central bank, rather than the market, to choose r (P doesn't move to clear markets, because sticky)

▶ One way of thinking of this is that:
  ▶ Before, $Y^s = Y^d$ set r, and $N^s = N^d$ set w
  ▶ Now, r is set, Y_d determines Y, and Y determines N^d

▶ In some sense, we replace the Y^s curve to be horizontal (set by r) and the N^d curve to be vertical (set by Y, which was set by r).

▶ One way to make sense of this is to have firms be making a little profit, so they're willing to supply at whatever (set) price there is ("monopolistic competition" can do this)

▶ So what can govt do?

A Decrease in the Real Interest Rate in the NK Model

(a) Current labor

(b) Current goods

(c) Money

(d) Production
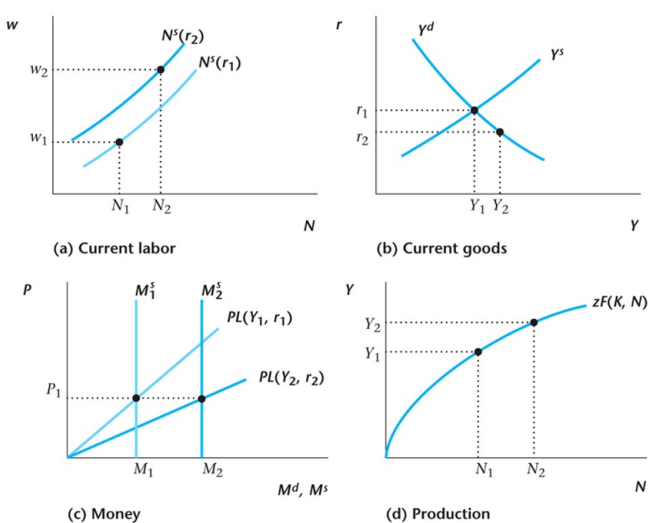
Two ways to describe what's happening here

A Decrease in the Real Interest Rate in the NK Model

▶ Govt lowers r, which increases Y, which increases N (but decreases N^S) and M^d, so M^s must increase and w decrease. N increased but N^s decreased, raising wages

▶ Or, money supply increases, which drives down interest rates ($M^s = M^d$). As interest rates fall, demand rises, raising the real wage and employment

▶ Flipped what we controlled: r in the first case, M in the second, but they're joined by $M^s = M^d$.

▶ Money is no longer neutral (in the short run)

▶ Note that in the long run, however, prices aren't fixed, and so we get back to our old real model

Government Stabilization

▶ Now we have a model in which the government (central bank in this case) can affect the economy

▶ Should the government try to "stabilize" fluctuations in Y?

▶ If prices are too high (or r_1 is too high so output gap), then govt can fix by setting right r (or right P via M^s)

▶ Alternatively, govt can increase demand (increasing r, so economy not in disequilibrium)
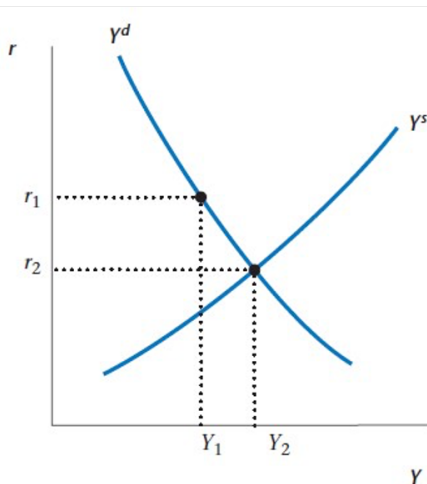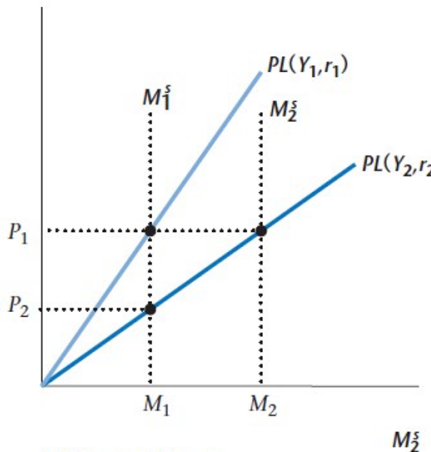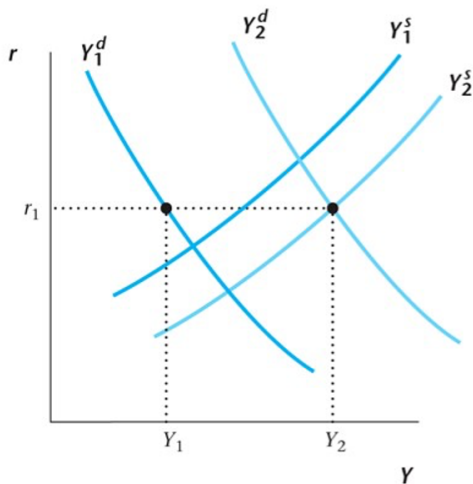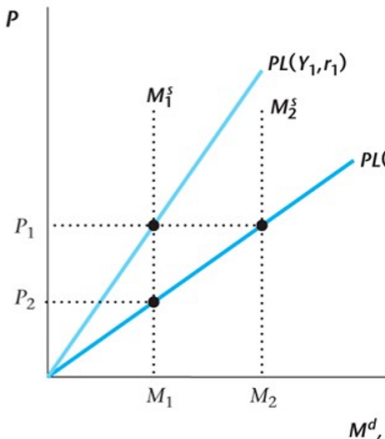
(a) Current Labor   (b) Current Goods

If prices too high, could wait for them to drift down over time, or fix by choosing right M (or r) in short run

Fiscal Policy can "fix"

(a)

(b)

If r too high, can shift out demand until markets clear

COMPARING FIXES

▶ Both solutions start with observation: there is an "output gap" because r artificially high

▶ Monetary policy fixes this by increasing M/lowering r

▶ Fiscal policy fixes this by increasing Yd until r is the equilibrium (r fixed)

▶ Fiscal policy is entire Y^d increase (Ch. 11), so C and I don't increase, where for monetary, C and I increase

▶ Okay, we have the theory–how is the data on the NK model?

CAN WE REPLICATE THE DATA?

▶ Assume central bank wants to minimize output gap (make sure $Y^d = Y^s$)

▶ Now take a positive and persistent TFP shock to z, which shifts out Y^d and Y^s, Y^s more

▶ But if r doesn't move to clear interest rates, then output gap–interest rates too low

▶ Interest rates should fall

▶ Monetary policy fixes this by increasing M/lowering r

▶ Fiscal policy fixes this by increasing Yd until r is the equilibrium (r fixed)

▶ Fiscal policy is entire Y^d increase (Ch. 11), so C and I don't increase, where for monetary, C and I increase

▶ Okay, we have the theory–how is the data on the NK model?

Persistent TFP Increase
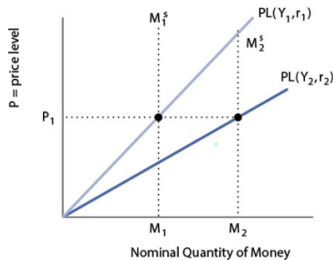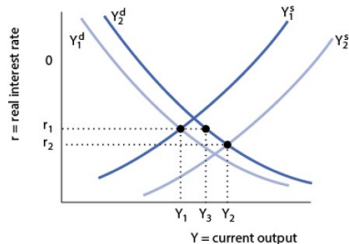
Y^s and Y^d increase, and output gap increases, so central bank should lower r (increase M) and clear markets.

CAN WE REPLICATE THE DATA?

- If the central bank is clearing markets, we'll look like a market-clearing model

- E.g. same as our real model!

- Can't necessarily tell these apart

The Zero Lower Bound

▶ As discussed before, we can't cause r to be lower than 0 (otherwise people just use money)

▶ Before, central bank was switching M and B in open market operations–now same thing

▶ Let's think about a shock to credit frictions

The "Liquidity Trap"
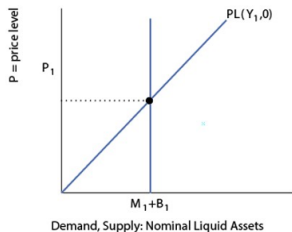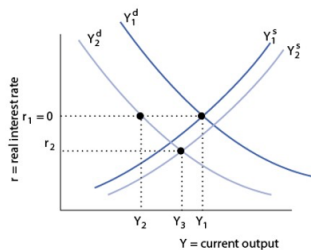
Credit frictions decreases Y^d, but r can't fall, so Y falls much more. $L(Y, 0)$ means $M^s = M + B$
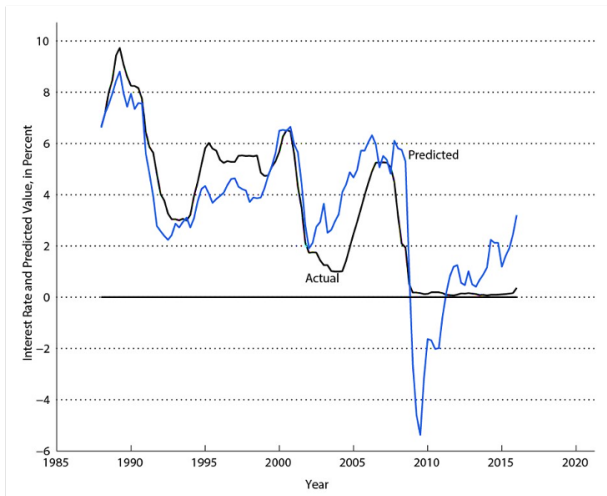
The Taylor Rule

▶ Some suggest rules-based policy for r might be useful

▶ For instance, if Y is GDP, Y^* is market-clearing output, i is inflation, i^* is target inflation, might get:

$$R = 2 + \beta_2(i - i^*) - \beta_1(Y - Y^*)$$

▶ Where β_1 and β_2 are some weights we put on deviations

▶ When output is too low, then lower interest rate, when inflation too high, raise it

▶ Puts a balancing of inflation and market-clearing motivations into a single, expected tradeoff

▶ Let's see how it does!
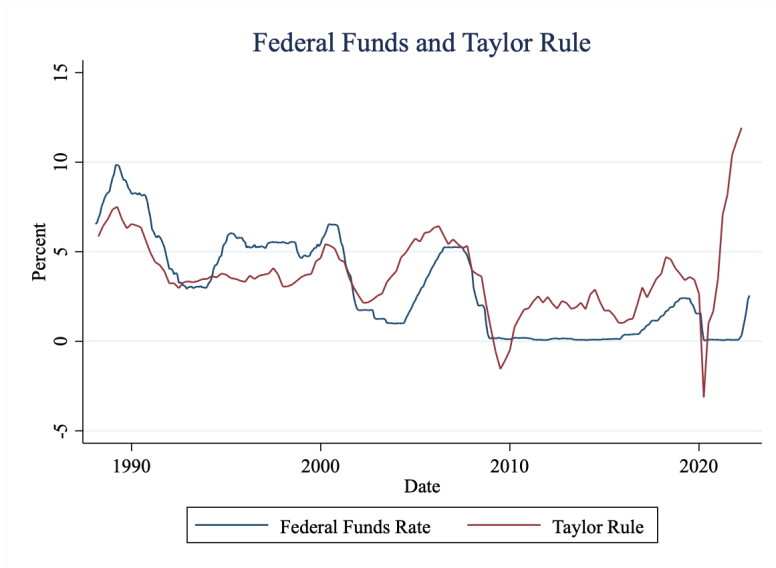
Taylor Rule Explains 1988-2007 pretty well!

Williamson Taylor Rule
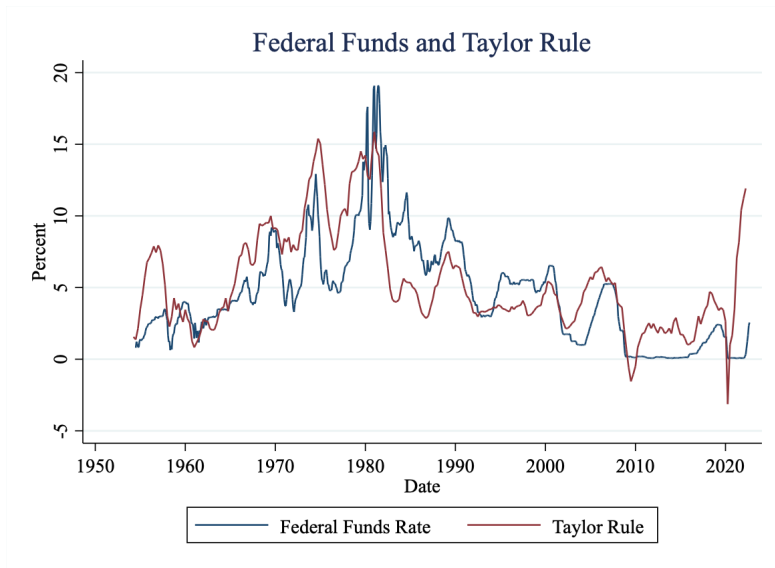
Taylor Rule (1988-2016)

Federal Funds and Taylor Rule
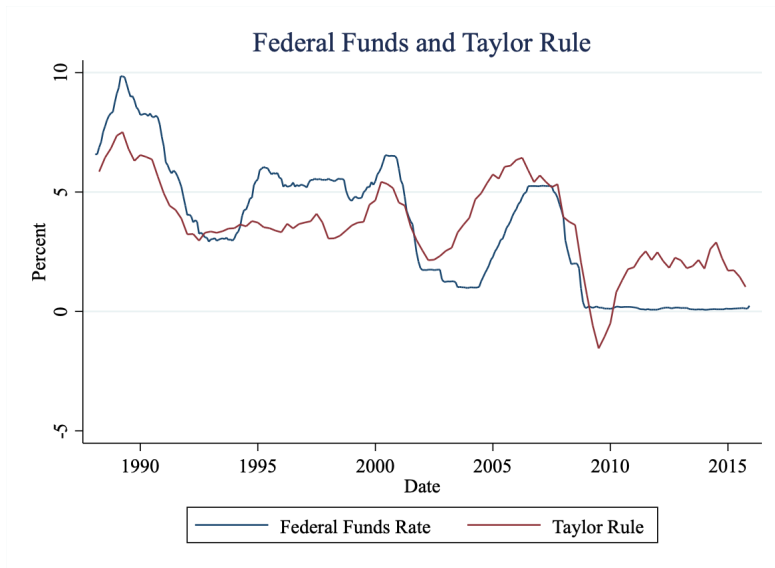
Our version is quarterly, but similar

Taylor Rule (1988-2022)

Federal Funds and Taylor Rule

Seems like history demands *way* higher interest rates!

Taylor Rule (1954-2022)

Federal Funds and Taylor Rule

When Taylor Rule higher than FFR, expect inflation!

Keynesian Criticisms

- NK models simply assume sticky prices

- But why are they sticky? And how sticky are they?

- Similarly wages: why don't wages drop if there are unemployed people?