

Pre-recording:  
*Monetary policy effects in SR and LR*

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# Monetary policy in the long and short run

# Quantity theory of money

Traditional to start a discussion of the effects of monetary policy with some form of the following equation

$$M_t V_t \equiv P_t Y_t \quad (1)$$

where  $M_t$  is the quantity of money,  $V_t$  the velocity of its circulation,  $P_t$  the general price level and  $Y_t$  real output.

Equation (1) is an *identity* (always true by definition)

- Holds regardless of CB targeting interest rate,  $i_t$ , or  $M_t$
- Boring unless theory restricts behavior of at least one variable

# Long run classical dichotomy

Long run 'classical dichotomy' / 'money neutrality'

- In long run,  $Y$  and  $V$  are determined by non-monetary factors
- Thus,  $M$  and  $P$  move 1:1 in the long run

Economists agree about very little but...

- The *long run* classical dichotomy is arguably an exception
- LR growth determined by 'supply' factors - not monetary
- In LR, monetary factors influence *nominal*, not *real* variables
- LR correl. between  $M$  and  $P$  very high (often  $\approx 1$ ) in data

# Long run classical dichotomy

*'there is no long-run trade-off between the rate of inflation and the rate of unemployment'*

- Taylor (1996)

# Long run classical dichotomy - Minor caveats

**Side note:** Are there caveats to this?

- Zero lower bound  $\Rightarrow$  monetary policy may be constrained in low inflation environment
  - Could negatively impact real performance of economy
- High inflation often associated with volatile inflation
  - May increase risk and suppress investment
  - Distortions in tax system may interact with this
- Some recent research suggest the impact of monetary policy may be *much* longer than previously thought
  - See work [here](#)

But the LR classical dichotomy is nevertheless generally accepted

- See this nice article on the history of the [Phillips Curve](#)

# Fisher equation

Pre-crisis, it was rare for central banks to use  $M_t$  as an explicit policy tool

- Instead set short term nominal interest rate,  $i_t$  as 'intermediate target'
- Given 'money demand', the central bank adapted money supply so market clears at desired  $i_t$
- **Side note:** We will discuss unconventional monetary policy later in the course



# Long run classical dichotomy and the Fisher equation

In this context, the 'quantity equation' is less intuitive - instead the 'Fisher equation' is useful to aid understanding

$$i_t = r_t + E_t[\pi_{t+1}] \quad (2)$$

where  $i_t/r_t$  is the nominal/real interest rate and  $\pi_t$  is (net) inflation. The (long run) classical dichotomy implies that  $r_t$  is unrelated to monetary factors

- $i_t$  and inflation move 1:1, conditional on  $r_t$
- If  $r_t$  changes without a change in  $i_t$  inflation adjusts
- In a classical model (see Galí Ch. 2) the policymaker cannot affect  $r_t$

# Short run interaction of real and nominal factors

In the shorter run, the classical dichotomy is not broadly accepted

- Reassuring, given the amount of time academics, practitioners and central banks spend debated and deciding on monetary policy!

# Short run interaction of real and nominal factors

Using various techniques, there is strong evidence that monetary policy affects real activity in the short run

- Narrative methods
  - Friedman+Schwarz (1963), Romer+Romer (1989, 2004)
- Vector Autogressions with 'identified' monetary policy shocks
  - Christiano, Eichenbaum and Evans (2003)
- High frequency analysis of Fed surprises
  - Jarocinski+Karadi (2020), Bauer+Swanson (2023) - and refs therein
- Estimated structural models
  - Often building on frameworks like Smets and Wouters (2003, 2007)
  - Richer versions of the NK models we study during this course

# Causality and the influence of monetary policy

Why do people emphasize identifying policy shocks/surprises?

- Derives purely from policymaker - not economy - and thus closer to a 'natural experiment'
- Then estimate propagation of shock through economy
  - If  $M_t$  is the tool, **does it affect  $M/P$  and real activity**, rather than passing 1:1 into prices? - Recall 'quantity theory'
  - If  $i_t$  is the tool, **does it affect  $r_t$  and real activity**, rather than passing 1:1 into  $E_t[\pi_{t+1}]$ ? - Recall Fisher equation

# Identifying monetary policy shocks and their effects

*On three occasions the System deliberately took policy steps of major magnitude which cannot be regarded as necessary or inevitable economic consequences of contemporary changes in money income and prices. Like the crucial experiments of the physical scientist, the results are so consistent and sharp as to leave little doubt about their interpretation. The dates are January-June 1920, October 1931, and June 1936-January 1937*

- Friedman and Schwarz, 1963, p.688

# Identifying monetary policy shocks and their effects

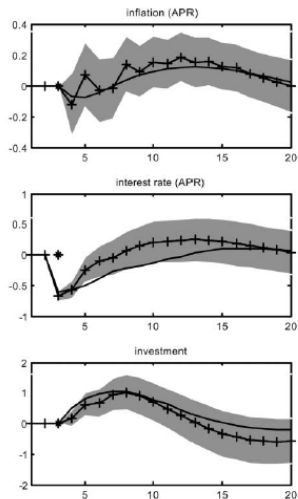
*There was another major anti-inflationary shock to monetary policy on October 6, 1979. In effect, the Federal Reserve decided that its measures over the previous year had been unsuccessful in reducing inflation and that much stronger measures were needed. Although the shift in policy was to some extent presented as a technical change, the fact that it was intended to lead to considerably higher interest rates and lower money growth was clear. For example, "the Committee anticipated that the shift ... would result in ... a prompt increase ... in the federal funds rate"*

- Romer and Romer, 1989, p.142

*While researchers have disagreed on the best means of identifying policy shocks, there has been a surprising consensus on the general nature of the economic responses to monetary policy shocks. **A variety of VARs estimated for a number of countries** all indicate that, in response to a policy shocks, output follows a hump-shaped pattern in which the peak impact occurs several quarters after the initial shock.*

- Walsh, 1998, p.31 in the old edition (emphasis mine)

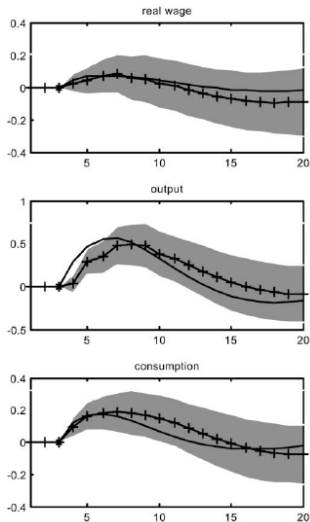
# Vector Autoregressions



Subset of IRFs from CEE (2005)



# Vector Autoregressions



Subset of IRFs from CEE (2005)

# Evidence from unconventional policy?

Difficult to use VARs to assess of unconventional policy **on economy**

- VARs are quite data-intensive (not many observations on QE)
- See [here](#) (paper by a KBS academic) for an example of an attempt
- Examining effect of QE on asset prices (at least at high frequency) is easier
- QE did seem to affect important asset prices on impact