Phillips curve

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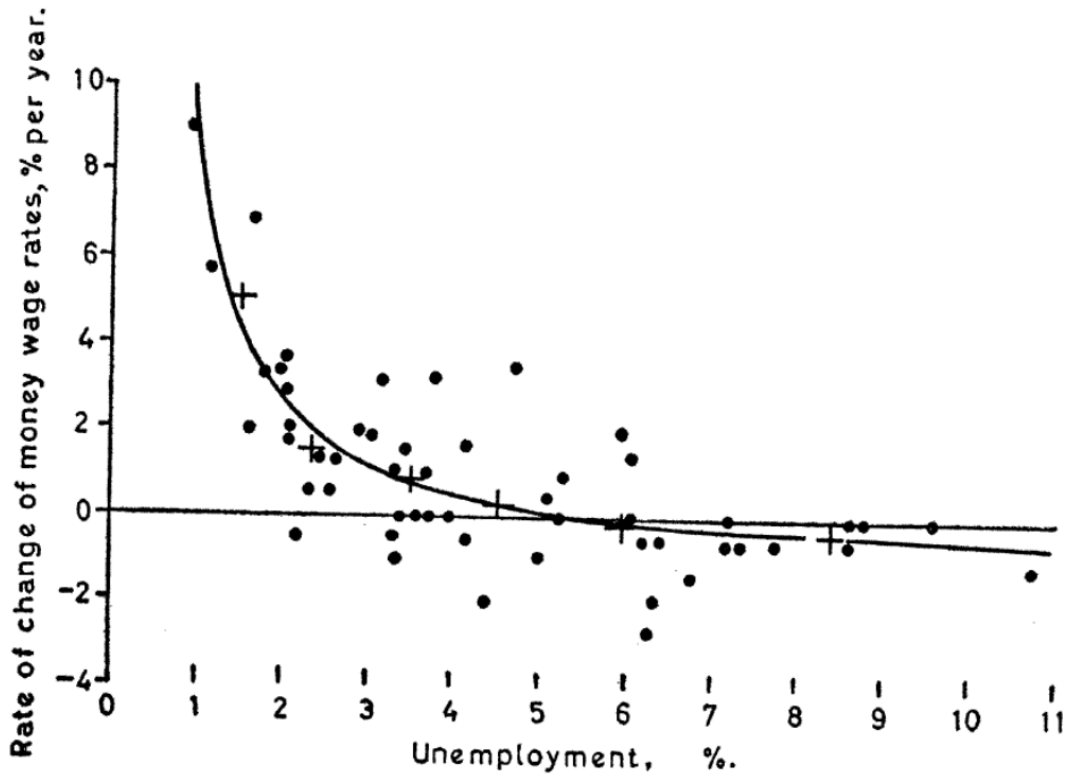


Fig.1. 1861 – 1913

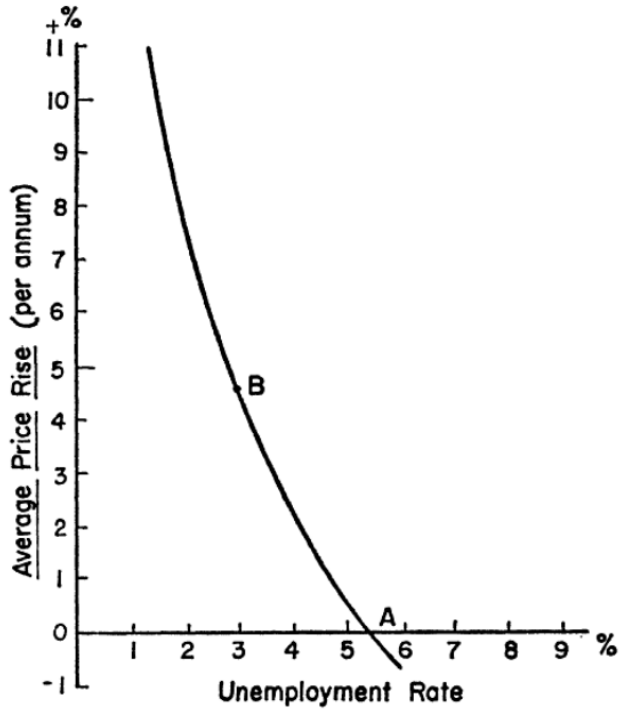
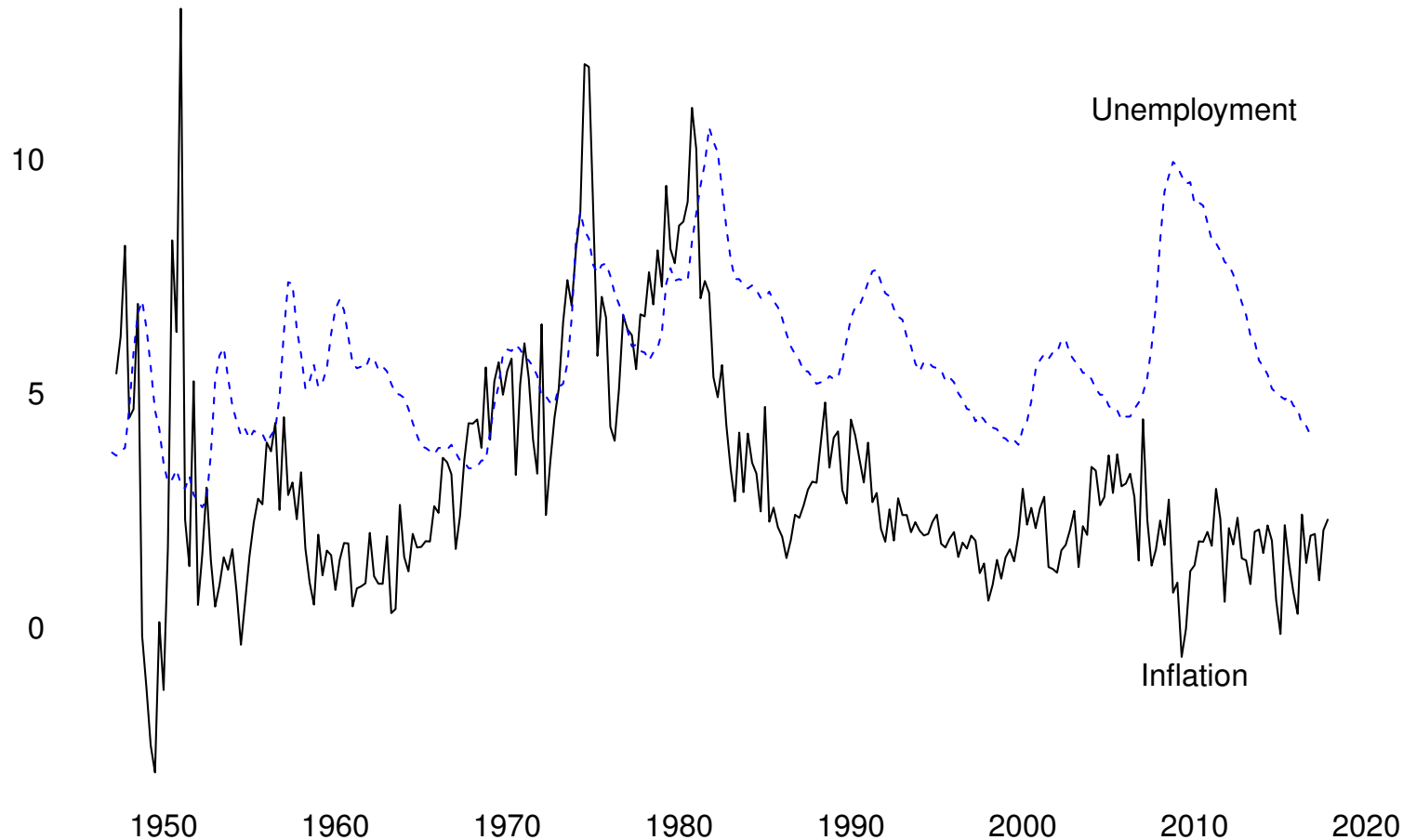
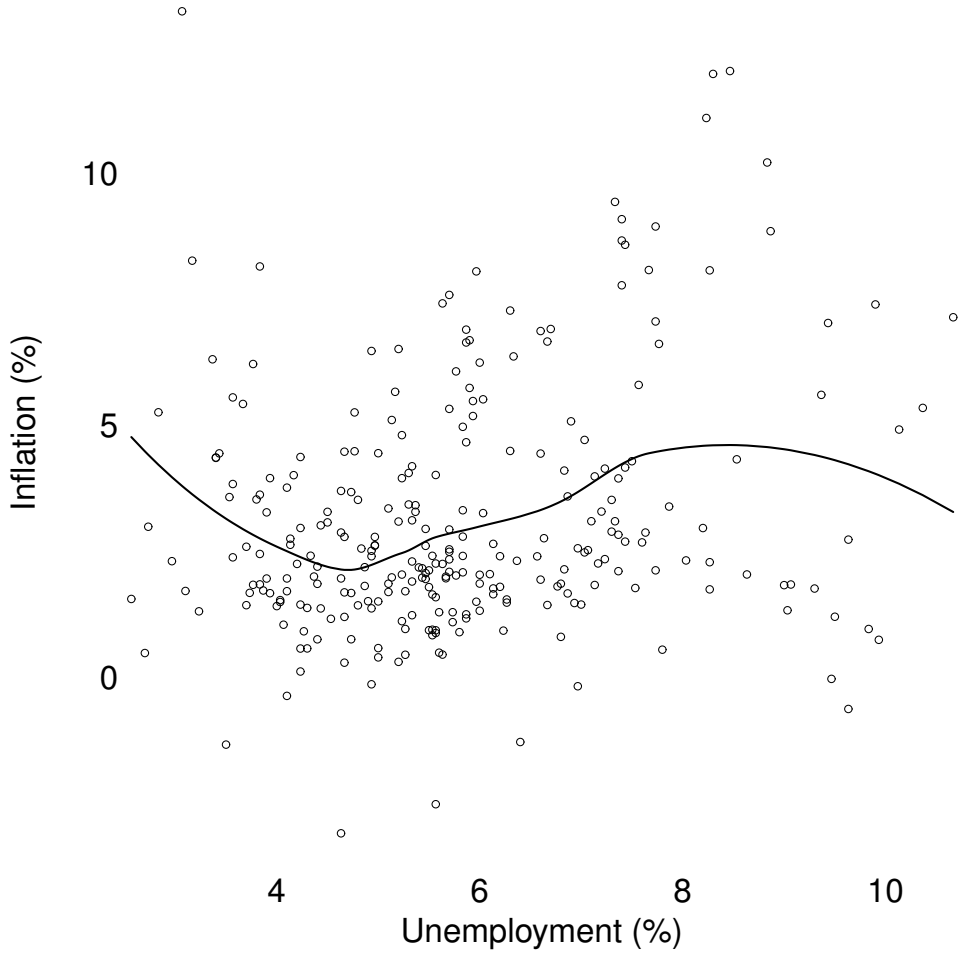


FIGURE 2

MODIFIED PHILLIPS CURVE FOR U.S.

This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.


Unemployment
Inflation
10
5
0
1950
1960
1970
1980
1990
2000
2010
2020


10
5
0
Inflation (%)
4
6
8
10
Unemployment (%)

Peterson Institute conference "Rethinking Macroeconomic Policy"

- Brainard: inflation generated by process unconnected to unemployment
- Blanchard: still exists, hard to pin down
- Summers: agnostic
- Draghi: ...

Keynesian economists

$$\pi_t = \alpha - \gamma U_t \tag{1}$$

Friedman

$$\pi_t = -\gamma(U_t - U^*) + \mathbb{E}\pi_t \tag{2}$$

Accelerationist Phillips curve

$$\mathbb{E}\pi_t = \pi_{t-1} \tag{3}$$

$$\pi_t = \pi_{t-1} - \gamma(U_t - U^*) \tag{4}$$

1. $U_t < U^*$: increase in π
2. $U_t > U^*$: decrease in π

Non-Accelerating Inflation Rate of Unemployment (NAIRU)

$$\pi_t = \sum_{i=1}^{N} \beta_i \pi_{t-i} - \gamma(U_t - U^*) \tag{5}$$

U^* is unknown but can be estimated

$$\pi_t = \alpha - \gamma U_t + \sum_{i=1}^{N} \beta_i \pi_{t-i} \tag{6}$$

Estimate natural unemployment rate from

$$\alpha - \gamma U^* = 0 \Rightarrow U^* = \frac{\alpha}{\gamma} \tag{7}$$

Implications for policy analysis

1. Inflation: highly inertial; shock t takes long time to disappear
2.

$$\mathbb{E}\pi_t = \pi_{t-1} \tag{8}$$

Backward-looking: hard to decrease π without increase U

Best course of action: let monetary policy reduce π gradually over time

Critique of Keynesianism

$$\pi_t = \mathbb{E}\pi_t - \gamma(U_t - U^*) \tag{9}$$

Only $U_t \neq U^*$ when there is unexpected inflation $\pi_t \neq E\pi_t$

IF expectations are rational, then

- Unexpected inflation is random and unpredictable
- No room for systematic predictable stabilisation
  - No PC; little central bank can do

RE advocates believed that monetary policy had little to do with business cycles

Blanchard et al. (2015)

$$\pi_t = \theta_t(u_t - u_t^*) + \lambda_t \pi_t^e + (1 - \lambda_t)\pi_{t-1}^* + \mu_t \pi_{mt} + \epsilon_t \quad (10)$$

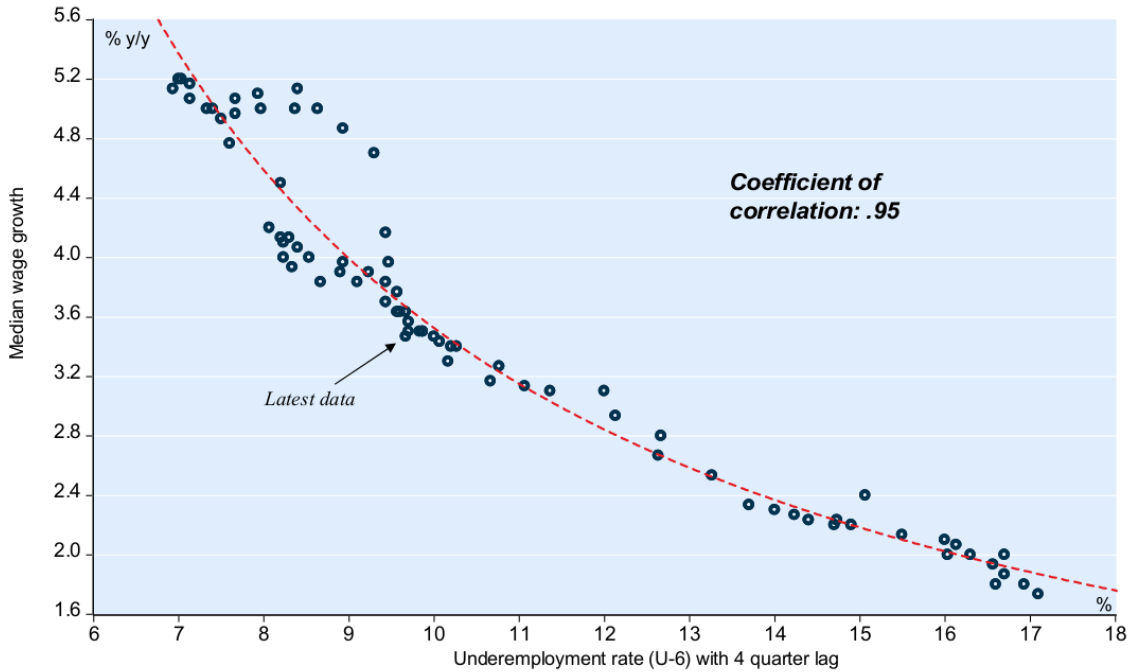
$$\pi_t^e = a_t + \beta_t \pi_{t-1}^* + \eta_t \quad (11)$$

Inflation determined by unemployment, but also by

1. Inflation expectations
2. Inflation history
3. Import prices
4. Random shock

U.S.: With the right variables, the Philips curve works

Phillips curve defined as relationship between underemployment rate and median wage growth (1998-2017,quarterly data)



NBF Economics and Strategy (data via BLS and Atlanta Fed)