Why Theory and Identification are Crucial for Doing Good Empirical Work

Illustration Using the Phillips Curve

Valerie Ramey

The Phillips Curve (A.W. Phillips, Economica 1958)

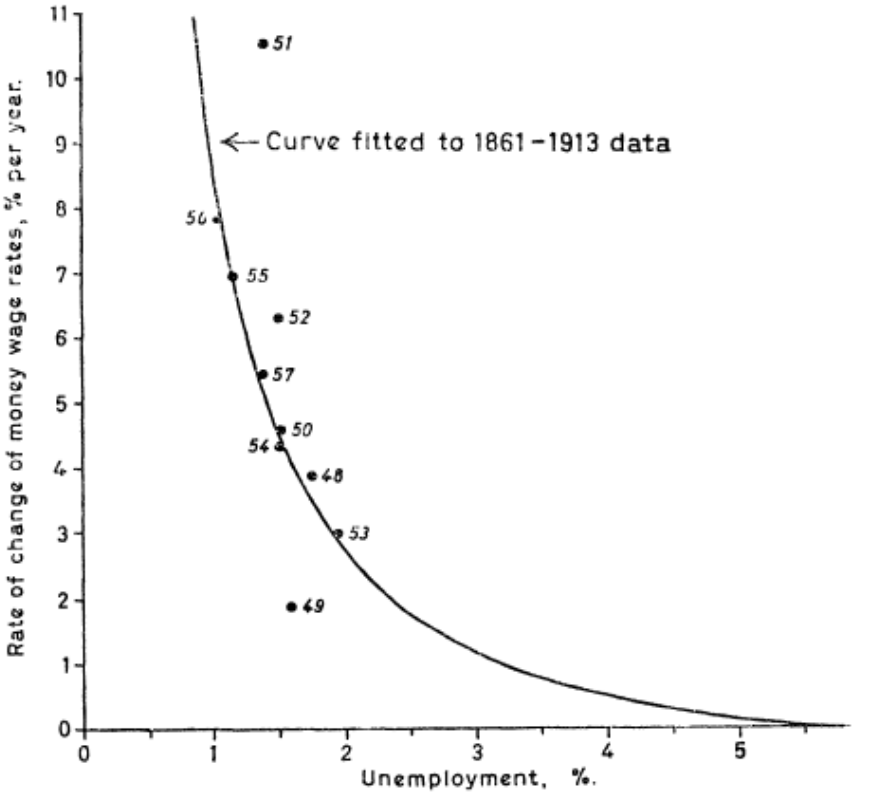


Fig. 11. 1948—1957, with unemployment lagged 7 months

Strong negative relationship between wage changes and unemployment

Conversion to Inflation-Unemployment Relation
Paul Samuelson and Robert Solow, AER 1960

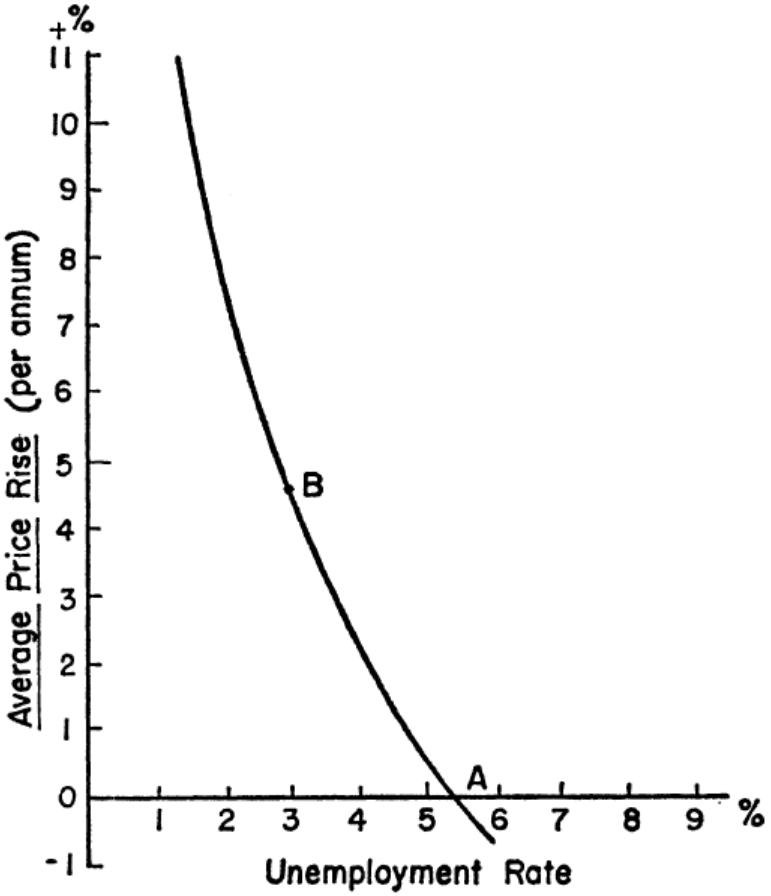


FIGURE 2

MODIFIED PHILLIPS CURVE FOR U.S.

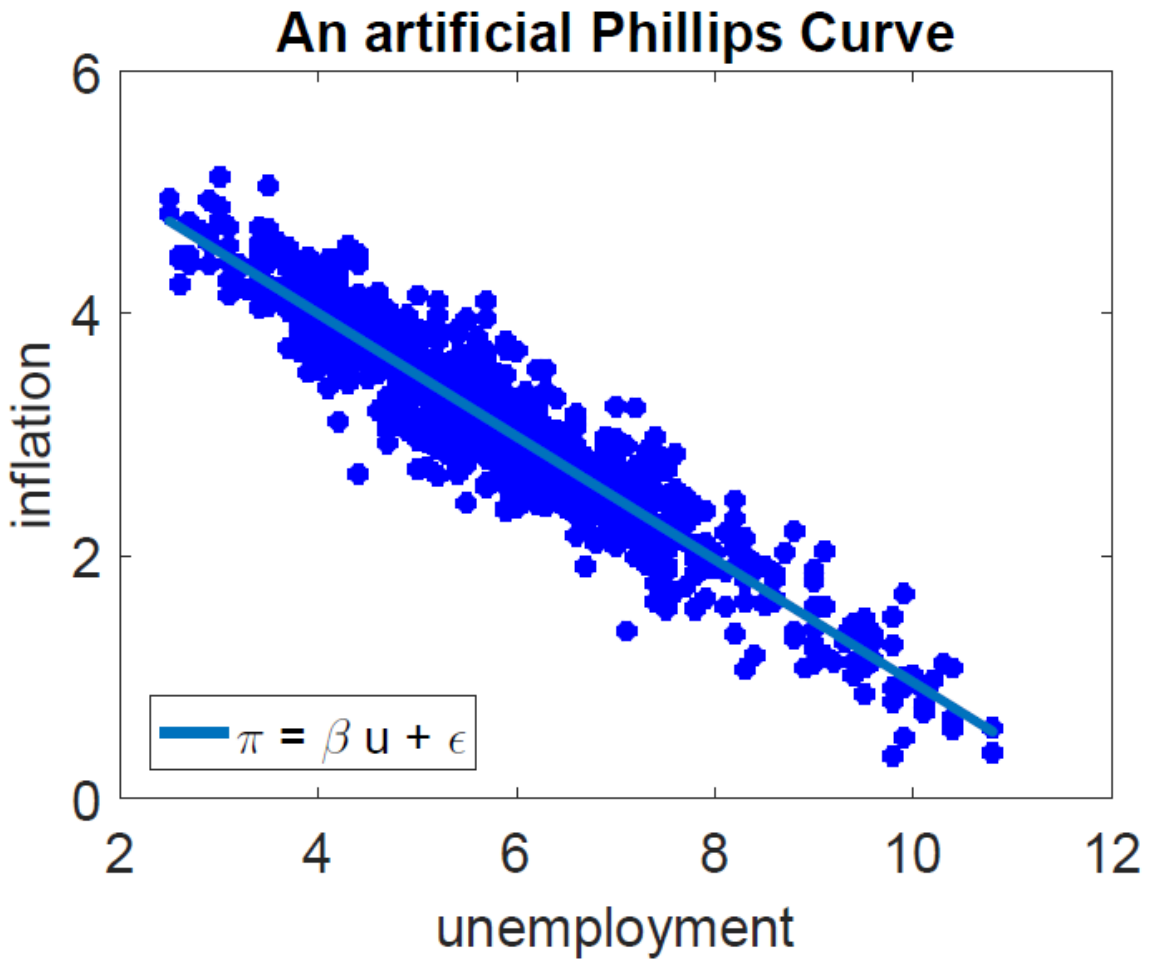
This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

The following slides are excerpted from Harald Uhlig's presentation and Silvana Tenreyro's discussion at the May 2018 "Nobel Symposium on Money and Banking."

Slides and videos are available at:

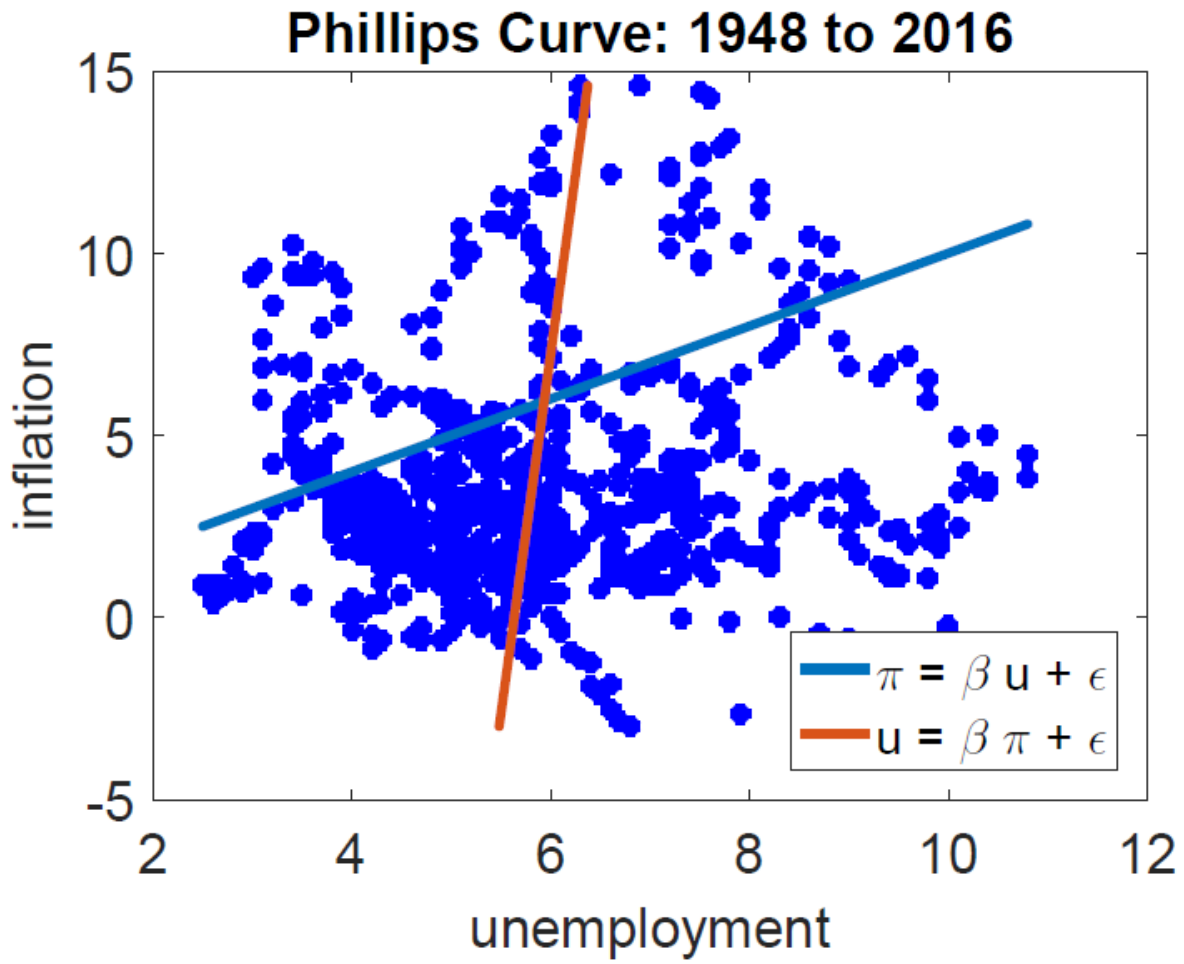
https://www.houseoffinance.se/nobel-symposium/

Classic Phillips Curve: textbook.

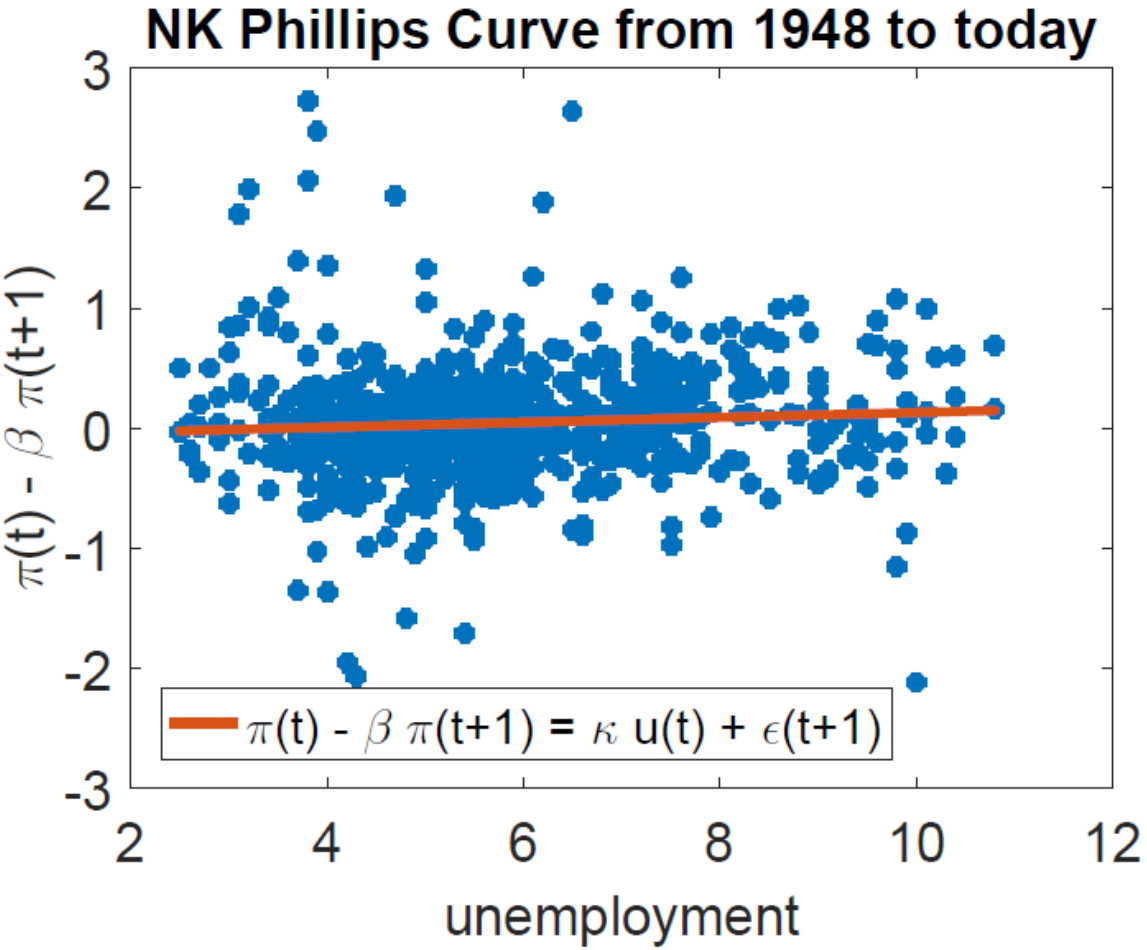


per generating $\pi_t = 6 - 0.5u_t + \epsilon,\ \epsilon \sim \mathcal{N}(0, 0.3^2)$

Classic Phillips Curve: data.



Phillips Curve: NK version.



NK: $\pi_t = \beta E_t[\pi_{t+1}] + \kappa x_t$. Rewrite: $\pi_t - \beta\pi_{t+1} = \kappa x_t + \epsilon_{t+1}$.
Use $x_t = -u_t$, $\beta = 0.99$.

Inflation: bottom line

- Data: no Phillips-Curve tradeoff.
- QDSGE: don't account for inflation with monetary policy shocks.
- The NK / Phillips-Curve-based NK QDSGE models may thus provide a poor guide for monetary policy.

1.1. URGENT: INFLATION AND THE PHILLIPS CURVE

- Inflation follows a seemingly exogenous process, unrelated to measures of slack.
  - Smets and Wouters (2007): shocks to price and wage-markups account for most of the movements in inflation.

"Inflation, in essence, dances to its own music"

- This disconnect between inflation and slack poses a challenge to New Keynesian models, for which the Phillips curve is a key building bloc.

Does it?

- On the contrary: this disconnect is exactly what a New Keynesian model with a welfare-optimizing Central Bank would predict (McLeay and Tenreyro, 2018)

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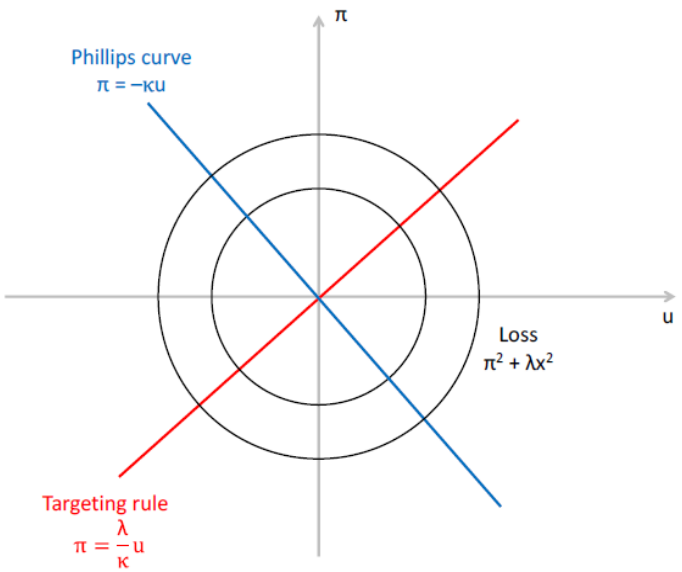
1.1. INFLATION AND THE PHILLIPS CURVE

$Loss = E_0 \sum_{t=0}^{\infty} \beta^t (\pi_t^2 + \lambda u_t^2)$ (Gali 2008 u_t=$-x_t$)



Under discretion

$\min \pi_t^2 + \lambda u_t^2$

s.t.:

$\pi_t = E_t \pi_{t+1} - \kappa u_t + \epsilon_t$ (PC)

Solution: Targeting rule

$\pi_t = \frac{\lambda}{\kappa} u_t$ (TR)

Observed inflation: inherits properties of exogenous shock process:

$\pi_t = f(\epsilon_t)$

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1.1. INFLATION AND THE PHILLIPS CURVE

Under commitment:

$$\min E_0 \sum_{t=0}^{\infty} \beta^t (\pi_t^2 + \lambda u_t^2)$$

s.t.:

$$\pi_t = E_t \pi_{t+1} - \kappa u_t + \epsilon_t \qquad \text{(PC)}$$

Solution: Targeting rule

$$p_t = \frac{\lambda}{\kappa} u_t \qquad \text{(TR)}$$

Observed inflation: inherits properties of exogenous shock process:

$$\pi_t = f(\epsilon_t, \epsilon_{t-1}, \epsilon_{t-2} \ldots)$$

- Formulas: Barro and Gordon (1983)
- New Keynesian framework predicts that equilibrium inflation rates should be uncorrelated with slack, as long as central banks are doing a sensible job
- Challenge for econometricians, not for the model. (McLeay and Tenreyro, 2018)
  - ✓ Well identified studies find a healthy PC. E.g. disaggregated data (regions, countries within a monetary union) help.

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