Unemployment meets inflation

EC 235 | Fall 2023

Materials

Required readings:

- Blanchard, ch. 8.

Prologue

Prologue

After studying the labor market and how it influences wage- and price-setting behavior, it is time to connect (un)employment and *inflation*.

Whenever the price level rises in a *consistent* and *generalized* way, we may say that an *inflationary* process is taking place.

And one of the ways in which we can study this phenomenon is through what happens in the *labor market*.

Inflation and unemployment

Inflation and unemployment

Recall the *wage-setting* relation:

$$W = P^e \cdot F(u, z)$$

So far, we have not explicitly assumed a form to the function *F*.

Let us start by a *linear* form:

$$F(u, z) = 1 - \alpha u + z$$

Inflation and unemployment

$$F(u, z) = 1 - \alpha u + z$$

where α captures the *strength* of the effect of unemployment on wages.

Then, the price-setting relation becomes:

$$W = P^e(1 - \alpha u + z)$$

Inflation and unemployment

And recall the *price-setting* relation:

$$P = (1 + m)W$$

Using the wage- and price-setting equations together:

$$P = P^e(1 + m)(1 - \alpha u + z)$$

... And this expression gives us a relation between the *price level*, the *expected price level*, and the *unemployment rate*.

Inflation and unemployment

In case we want to replace the price level by the *inflation rate*, π, and the *expected* inflation rate, π^e, we end up with

$$\pi = \pi^e + (m + z) - \alpha u$$

What are the effects of:

- A rise in the markup rate, m?
- An increase in expected inflation, π^e?
- A decrease in the unemployment rate, u?

The Phillips curve

The Phillips curve

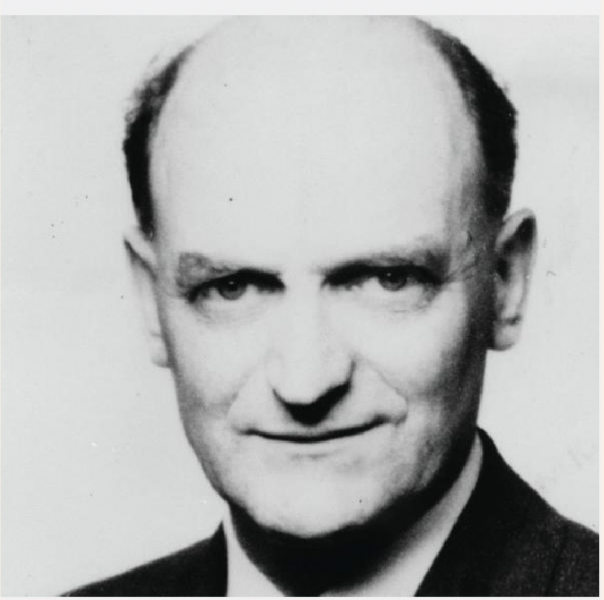
For a better understanding of what is to come, it will be convenient to include *time indexes* in our previous inflation equation:

$$\pi_t = \pi_t^e + (m + z) - \alpha u_t$$

where the subscript *t* refers to the *present* period; *t-1* to the previous period, and so on.

The Phillips curve

In 1958, A. W. Phillips (1914–1975) empirically found that low rates of unemployment were associated with high rates of inflation, and high unemployment with low inflation.



This relationship has since been referred to as the *Phillips curve*.

The Phillips curve

Link to original paper

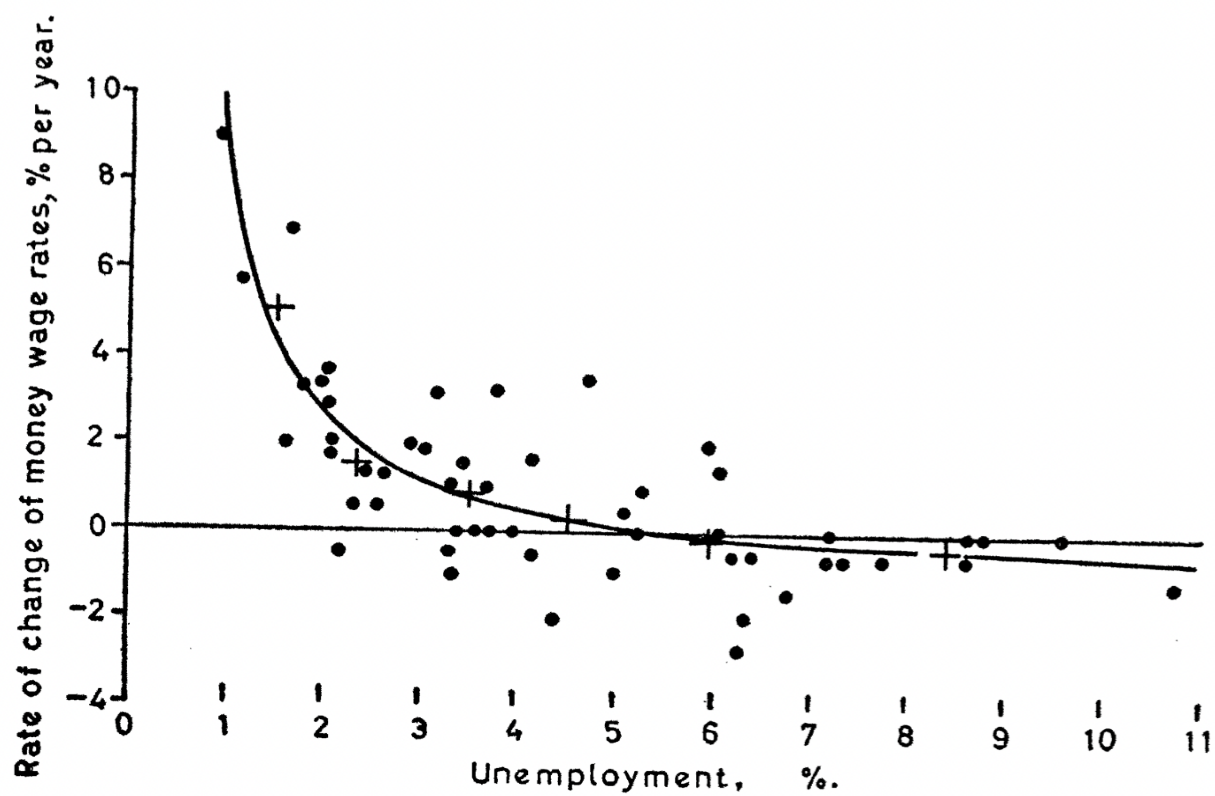


Fig.1. 1861 – 1913

The Phillips curve

From the Phillips curve equation:

$$\pi_t = \pi_t^e + (m + z) - \alpha u_t$$

Assume, first, a *stable* scenario, with no persistent change in the price level.

This can be represented by $\pi^e = 0$.

Then, it becomes

$$\pi_t = (m + z) - \alpha u_t$$

The Phillips curve

The Phillips curve

But then...

The Phillips curve

Why did the original Phillips curve change?

We need to bring back π^e.

Now,

$$\pi_t^e = (1 - \theta)\bar{\pi} + \theta\pi_{t-1}$$

The Phillips curve

When $\vartheta = 1$, we have:

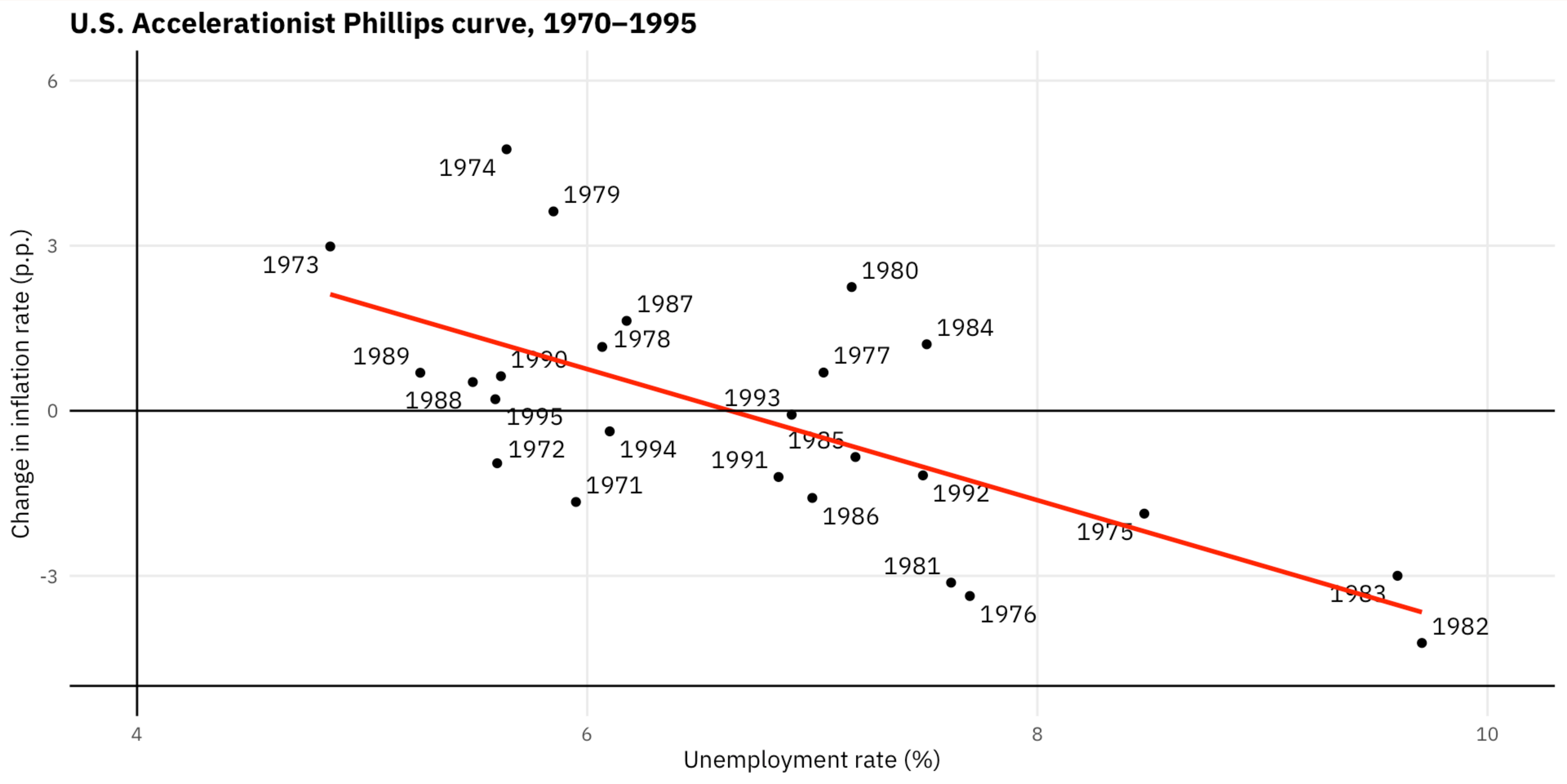
$$\Delta\pi_t = (m + z) - \alpha u_t$$

where $\Delta\pi_t = \pi_t - \pi_{t-1}$ is the *change in the inflation rate*.

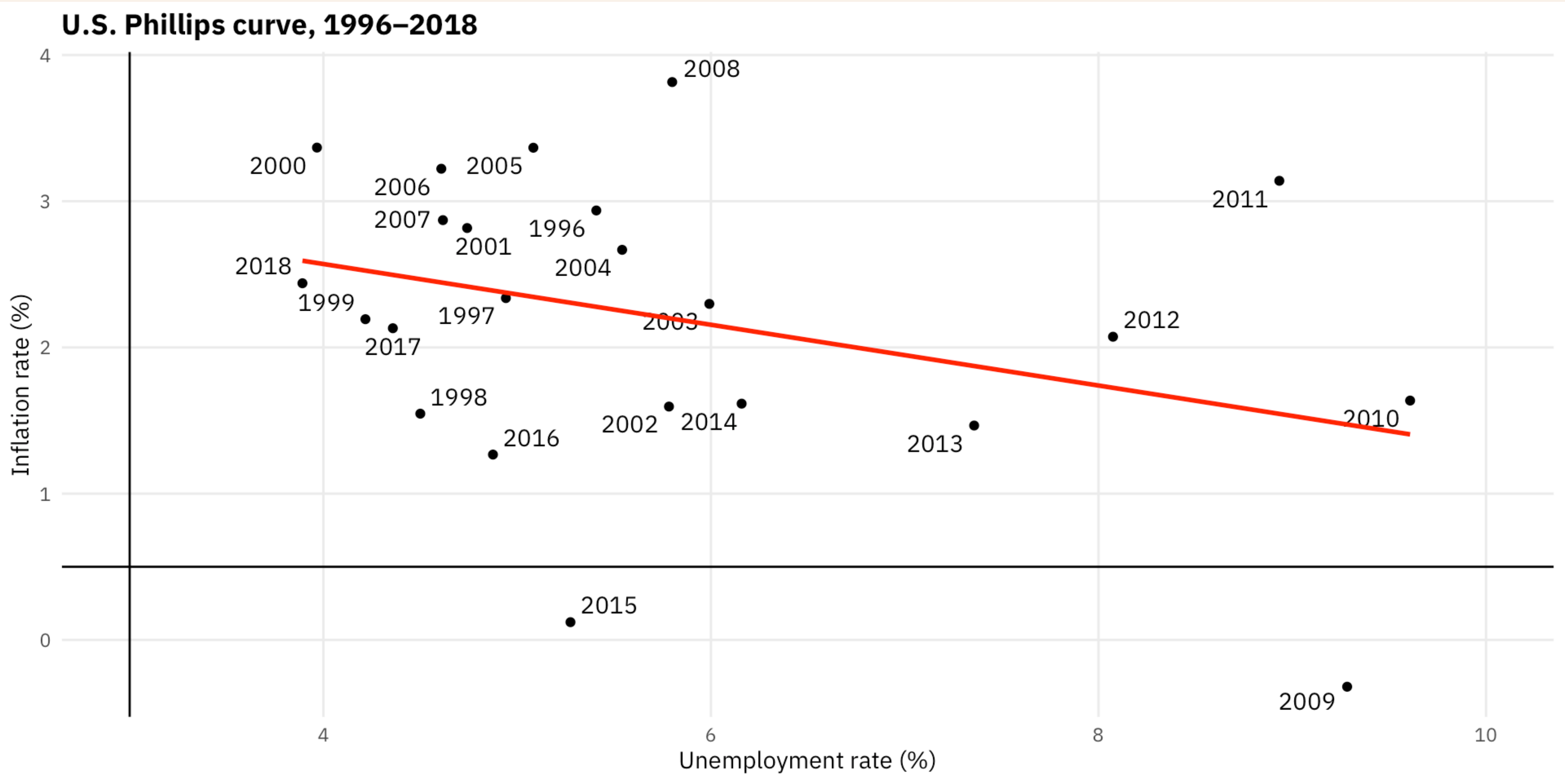
High unemployment leads to *decreasing* inflation; *low* unemployment leads to *increasing* inflation.

This version is known as the *accelerationist* Phillips curve.

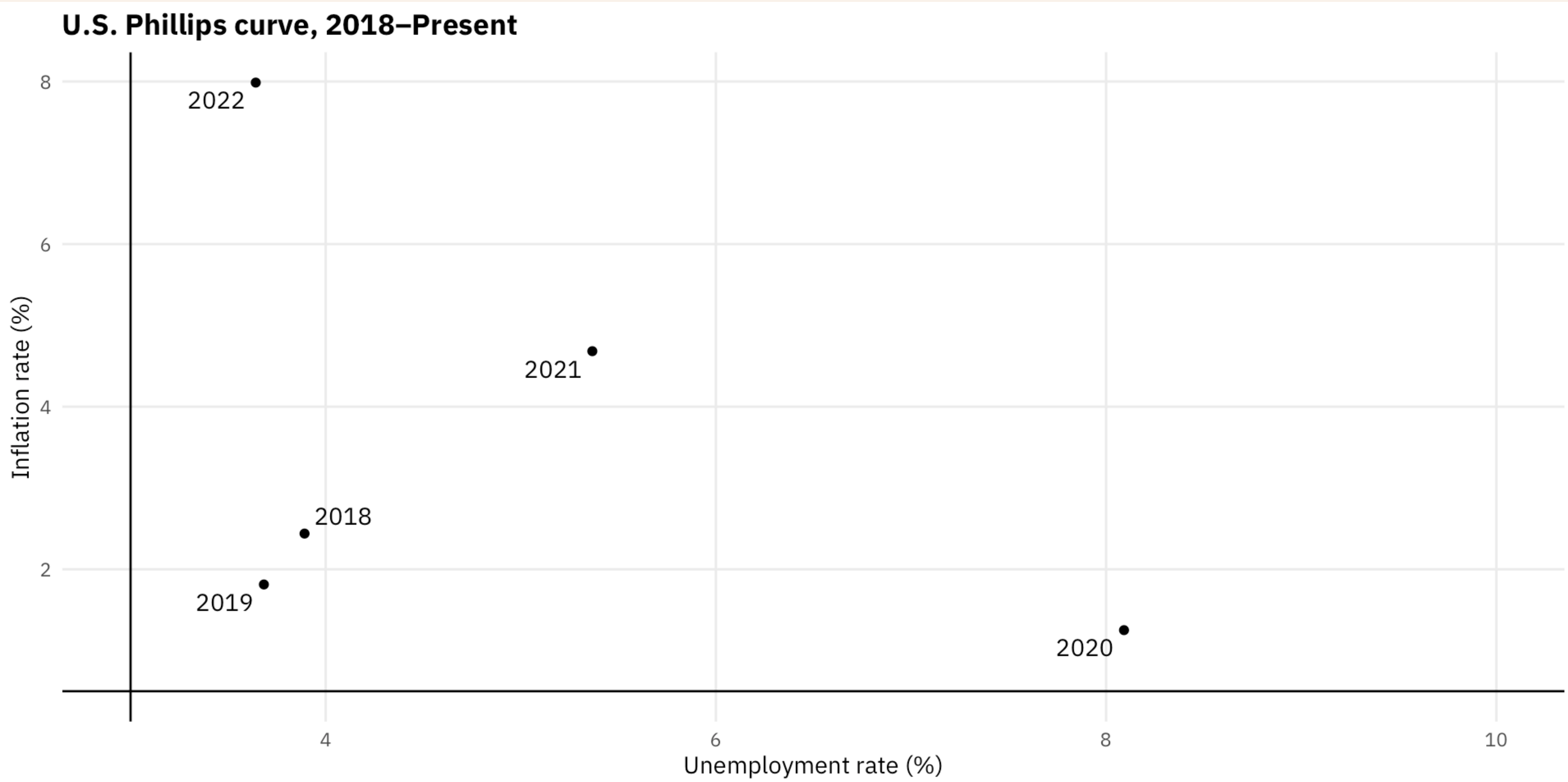
The Phillips curve



The Phillips curve



The Phillips curve



The “natural” rate of unemployment

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When we studied the labor market, we defined the *natural rate of unemployment* as the unemployment rate at which the actual price level (P) is equal to the expected price level (P^e).

Applying back this idea with our Phillips curve equation, we have $\pi = \pi^e$:

$$0 = (m + z) - \alpha u$$

The “natural” rate of unemployment

and the *natural rate of unemployment* (u_n) is given by

$$u_n = \frac{(m + z)}{\alpha}$$

What does this relation imply for *unemployment* and *inflation*?