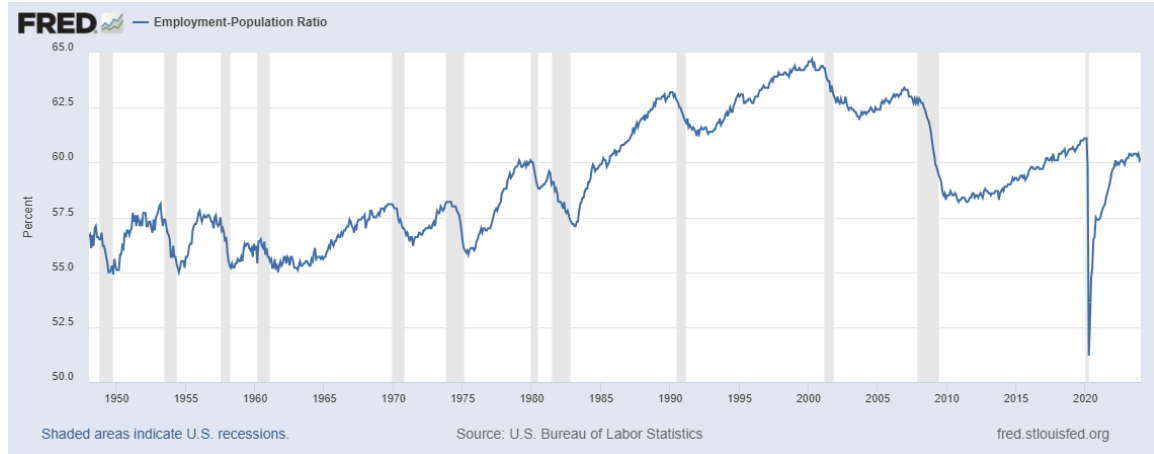


## The Unemployment Rate and the Labor Force Participation Rate

“When you hear 4.9 and five-per-cent unemployment, the number’s probably twenty-eight, twenty-nine, as high as thirty-five—in fact, I even heard recently forty-two per cent.”

Who said this? It’s not a crazy approach. <https://fred.stlouisfed.org/series/EMRATIO>



However, it’s not how the “U3 Civilian Unemployment Rate” is defined. To be unemployed under that definition, a person has to meet two conditions:

- 1) Not have any paid employment
- 2) Be actively looking for work.

As such, the definition of unemployment commonly used in economics refers to people who are trying to find jobs, but haven’t been able to do so yet. In a big economy, there’s always going to be a few people who have lost jobs (fired, quit, employer went out of business) and who haven’t found a new job yet. We’re never going to see this go to zero, and for the US economy, it generally converges to around 5% over time (higher in recessions, lower when economic growth is very strong and the economy is booming).

The unemployment data come from surveys and there are a number of interesting issues.

- Adults are counted as either employed, unemployed, or “out of the labor force.”
  - Most of the people who are out of the labor force are not looking for paid work; they are retired, taking care of family members, in school, or on personal spirit quests or something.
  - However, some of the people who are “out of the labor force” are what are known as “[marginally attached](#)” workers. They fall into two groups.
    - “**Discouraged workers**” would very much like to have paid jobs, but don’t believe that they would be able to find anything if they put in the time and effort it would take to find a job right now.
    - There are also workers who don’t consider themselves discouraged, have worked or tried to get work in the past year, but

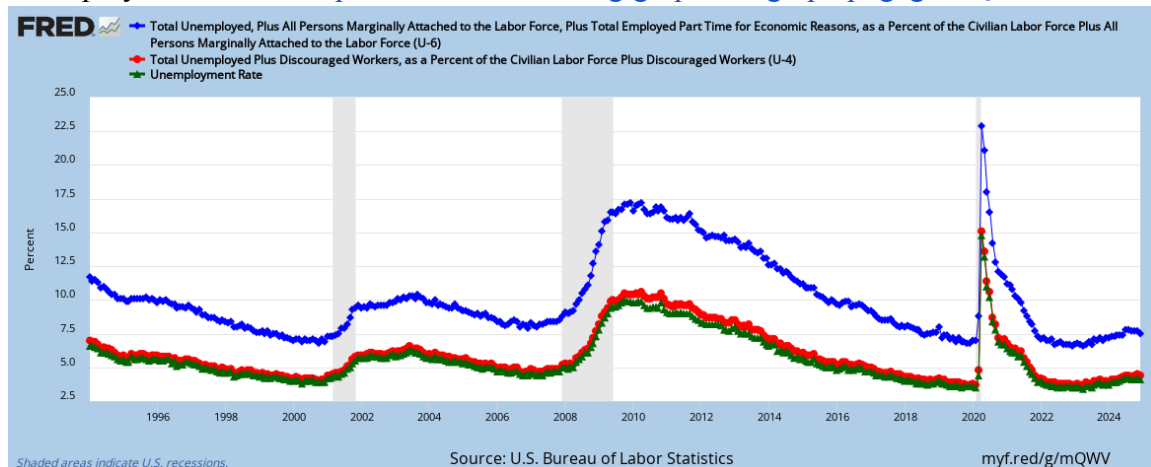
for various reasons have not tried to get a job in the past four weeks (as required to be counted as unemployed).

- Among people who are counted as employed, many of them are not satisfied with their situation. They are often considered “*underemployed*.”
- Some workers have part time jobs, and are fine with it; that’s all they time they want to work and it’s enough income for their needs. However, other part time workers would strongly prefer to be employed full time. They are called “**part time for economic reasons**.”

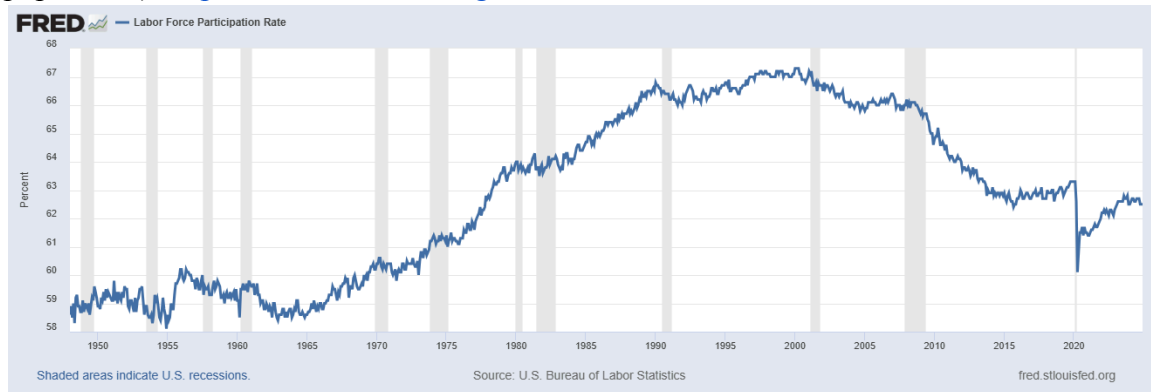
There are several frequently used ways to measure the unemployment rate, depending on how discouraged and underemployed workers are treated, but all of these measures move similarly.

You can see all these measures graphed as unemployment rates, that is people out of jobs in the numerator (by various definitions), and the denominator is the “**labor force**,” with is the “number of people in jobs plus the number of people actively looking for jobs.”

Regardless of how the unemployment rate is computed, the series move similarly over time, where low unemployment by one measure is similarly low unemployment by any other measure. For simplicity, most economic analysis focuses the U3 Civilian Unemployment Rate. <https://fred.stlouisfed.org/graph/fredgraph.png?g=mQWV>



Economists also often look at the “Labor Force Participation Rate” (LFPR).  
 $LFPR = (\text{People in jobs} + \text{People not in jobs but looking for jobs}) / (\text{Working age population})$   
<https://fred.stlouisfed.org/series/CIVPART>



Two old exam questions:

1. Let's pretend that the town of Springfield (Population = 16) has the following residents. The nuclear power plant employs Mr. Burns, Smithers, and Homer full time although it is rare to see Homer actually do any work. Krusty the Clown and Sideshow Mel work on television, but Sideshow Mel is currently looking for a better job as a late night talk-show host. Sideshow Bob is looking for a job but his criminal record has so far kept him from getting any offers. Flanders, Moe, and Apu are self-employed. Marge is the hardest working person in Springfield but she does not have paid work since she is a housewife. Barney would love to work but, let's face it, no one will hire him so he just sits around Moe's tavern and drinks. Principal Skinner and Ms. Hoover work for the government as school employees. Patty works full time at the DMV but Selma only works there part time, putting in at most five hours per week and spends the rest of her time smoking and looking for a better job. Dr. Nick lost his practice in a malpractice suit and is now searching the help wanted ads for a new job. What is the unemployment rate in Springfield?

Unemployed = Able, working age people with no job at all who are looking for work.

Labor Force = Working age people with any kind of job + the Unemployed

Unemployment rate =  $(\text{Unemployed}) / (\text{Labor Force})$

2. What is the Labor Force Participation Rate in the town of Springfield described above?

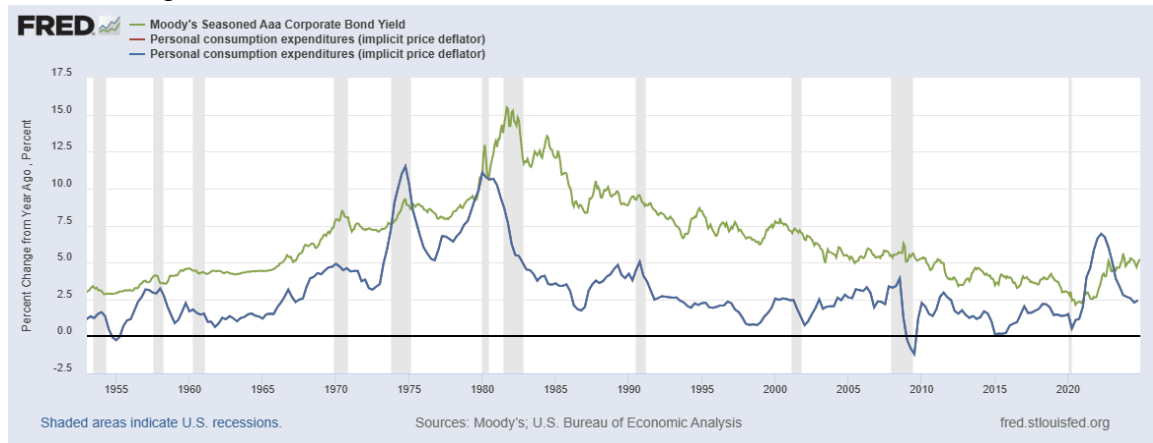
Labor Force Participation Rate =  $(\text{Labor Force}) / (\text{Working Age Population})$

## The Fisher Equation

What is the relationship between inflation and interest rates? The credit for figuring this out goes to Yale Economist Irving Fisher (1867-1947).

<https://fred.stlouisfed.org/graph/?g=IaB9>

Nominal corporate bond interest rate versus the inflation rate



Suppose that you have \$100 in your savings account, and that it earns a 5% interest rate. At the end of a year, you will have \$105, that is, \$5 more than you did at the beginning. This \$5 is a **nominal gain**, that is, it is the increase in the amount of money you have. However, of more interest to you would be how much more stuff you could buy with your \$105 now, than you could have bought with your \$100 a year ago. How has your purchasing power changed in terms of actual stuff you can buy?

If prices stay the same (the inflation rate = 0%), you would be able to buy 5% more stuff! In other words, your **real purchasing power** would have risen by 5%, and you would have earned a **real interest rate** of 5%.

However, if prices rise by 5% over the course of that year, how much has your real purchasing power changed?

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What if prices rose by 3%? How much has your purchasing power risen?

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What if prices rose by 9%? How much has your purchasing power risen?

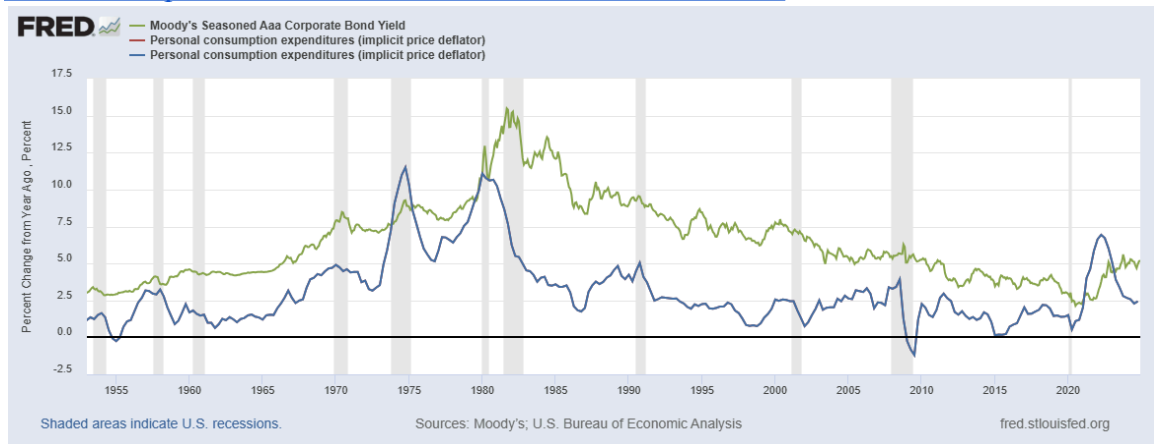
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Fisher Equation:

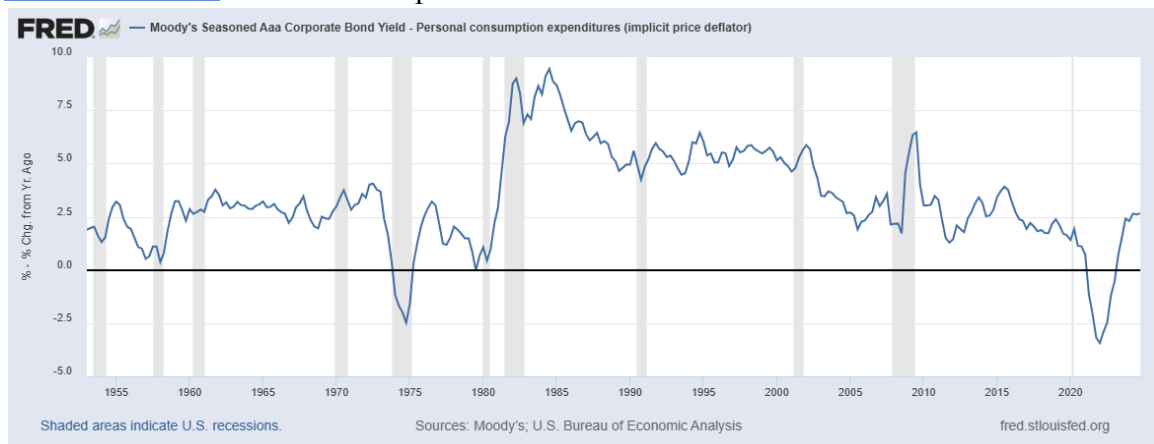
Expected Real Interest Rate = Nominal Interest Rate - Expected Inflation

$$r = i - \% \Delta \text{Price Level}$$

### Nominal corporate bond interest rate versus the inflation rate



### Real interest rate = Nominal corporate bond interest rate versus the inflation rate



### Data sources

CPI Price Index (kind of boring.) <http://research.stlouisfed.org/fred2/series/CPIAUCNS>

Unemployment <http://research.stlouisfed.org/fred2/series/UNRATE/12/10yrs>

Labor Force Participation Rate ("Civilian")  
<http://research.stlouisfed.org/fred2/series/CIVPART>

### ANSWERS

Working:

Burns, Smithers, Homer, Krusty, Mel, Flanders, Moe, Apu, Skinner, Hoover, Patty, Selma (12)

Not working but looking: Bob, Nick (2)

Not working, not looking: Marge, Barney (2)

Unemployment rate =  $(\text{Bob} + \text{Nick}) / (12 + (\text{Bob} + \text{Nick})) = 2/14$

Labor Force Participation Rate =  $(12 + (\text{Bob} + \text{Nick})) / (\text{Working age labor force}) = 14/16$

## Using Price Indexes Examples

**Example 1:** Back in 1913, the price of a Model T Ford was \$500. That sounds insanely cheap, but was it? The price of everything was lower back then so a car can only be said to be cheap if it is cheap relative to other goods. So by the standards of our current price level is it cheap? In 1913, the “Consumer Price Index” or CPI was 9.9 (in “1982-1984 dollars”, that is using an index based upon the years 1982 to 1984 and equal to 100 on the average over those years), now the average level of prices, the  $CPI_{2019}$  is 305.

So if the average level of prices has grown from 9.9 in 1913 to 305 now, then a dollar today has only about 1/30th the purchasing power it had in 1913. Another way to say this is that \$500 in 1913 would have a purchasing power that is 30 times as great as \$500 today.

How much money would it take today to have the purchasing power of \$500 in 1913? It would take

$$\begin{aligned} & (\text{Historical Price}) * (\text{Growth of price level}) \\ &= \$500_{1913\$} * (305/9.9) = \$500 * 31 = \$15,500. \end{aligned}$$

So \$500 in 1913 is equivalent in purchasing power terms to about \$15,500 today. \$15,500 doesn't sound like much to pay for a new car, but that's about what you would pay for a Hyundai Accent or Ford Fiesta, and those are *much* better cars than the Model T in terms of any mechanical test you can imagine (fuel economy, handling, speed, comfort, safety, etc). So it seems that the price of a cheap car (and the Model T was the cheap car of its era) has actually fallen over time.

**Example 2:** In 2018, *Black Panther* had box office receipts of \$700 million dollars, making it the largest grossing fictional film set in Africa, more even than *The Lion King*, which grossed \$423 million back in 1994. However, the price level back in 1994 was 146 and in 2018 it was 245. So, adjusting for inflation, which movie really brought in the most revenue?

In 2018, the price level was almost 68% higher ( $245/146 = 1.68$ ) than in 1994, meaning that, on the average, things cost about 68% more now. But did *Black Panther* bring in nearly 70% more revenue than *Lion King*? As a ratio of their revenues, ( $\$700 \text{ million} / \$423 \text{ million} = 1.65$ ), *Black Panther* brought in only 65% more dollars at a time with prices were about 68% higher.

Another way to say this is, what if the price level in 1994 had been the same as in 2018? How much would the original *The Lion King* have brought in?

$$\begin{aligned} & (\text{Historical Price}) * (\text{Growth of price level}) \\ &= \$423 \text{ million}_{1994\$} * (245/146) = \$423 \text{ million} * 1.68 = \$710 \text{ million} > \$700 \text{ million} \end{aligned}$$