

Macroeconomic Variables: Employment and Unemployment¹

The media probably pays more attention to the unemployment rate than any other macroeconomic variable. The concept is simple. The labor force is everyone who would like to work at the prevailing wage. Within the labor force there are the employed and the unemployed. The unemployment rate is then:

$$UE = \frac{Unemployed}{LaborForce} \quad (1)$$

There are important distinctions among the unemployed. Macroeconomists often divide them into three groups:

1. Frictional employment is the normal unemployment that results from a healthy, stable economy. People may endure a spell of unemployment because they want to change jobs or careers, or relocate. Some employees will perform poorly, and firms like the New York Jets may thus fire them, rendering them unemployed. Some firms will fail, independent of the state of the economy, leaving their employees at risk of unemployment.

Policy makers do not worry too much about frictional unemployment. In addition to being normal, much of it is voluntary where the unemployed have chosen to begin a spell of unemployment.

2. Structural unemployment is the unemployment that results from fundamental changes in the nature of the economy. In the United States, for example, the manufacturing sector has decreased in scale as the service sector has increased. These changes render workers in declining sectors unemployed.

Like, frictional unemployment, structural unemployment is part of a healthy economy. If it never existed, then we would still ride our horse and buggies past the local blacksmith, on our way to our monthly bleeding at the doctor's. Structural unemployment, however, is involuntary and often does enormous harm to those afflicted by it. Often, replacement jobs in declining sectors

¹These are undergraduate lecture notes. They do not represent academic work. Expect typos, sloppy formatting, and occasional (possibly stupefying) errors.

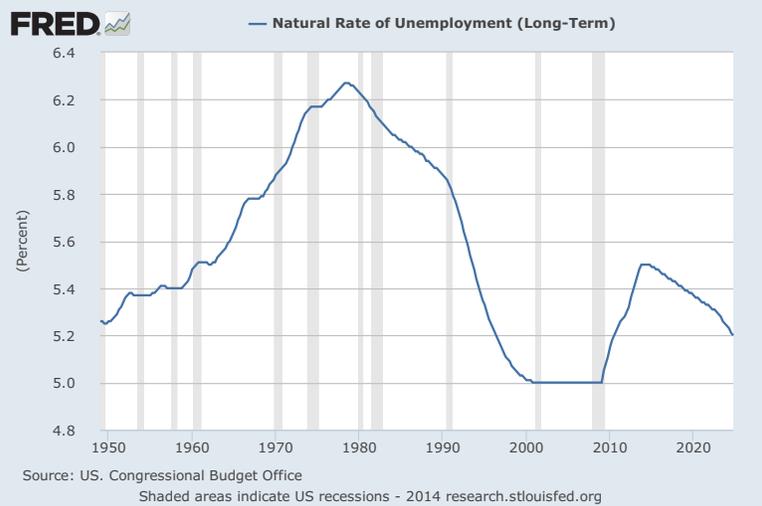
are unavailable and the households' prospects never fully recover. But economists tend to advocate for measures assisting the structurally unemployed rather than trying to prevent structural unemployment.

Technological progress has caused a large loss of manufacturing jobs throughout the United States.² This structural unemployment is a major issue in political elections, especially in regions like the Midwest that have been especially hard hit.

The *natural rate of unemployment* is the sum of structural and frictional unemployment. The Congressional Budget Office currently estimates the natural rate at 5.2%. Full employment, a major goal of policy makers, is often interpreted as attaining this figure. Eliminating unemployment is not a goal because doing so would interfere with the normal workings of a healthy economy.

The natural rate of unemployment is not constant across countries or over time. Figure 1 shows the Congressional Budget Office's estimate for the United States since 1949:

Figure 1: Natural Rate of Unemployment



The OECD has estimated unemployment rate for different economies. Whereas the United

²Globalization and free trade are often blamed but the evidence strongly suggests technological change is the main driver.

State is about 5%, the Eurozone is closer to 8%, with some countries, like Spain, being much higher. Japan's natural rate is probably closer to 3-4%. A number of factors influence the natural rate:

i. The level of employment protection. In some countries, like the United States, firms are able to fire employees simply because it is profitable to do so. Other countries, including many in Europe, make this much harder, sometimes by requiring generous severance packages. When it becomes very hard to get rid of an employee, firms become more reluctant to hire them in the first place.

ii. The generosity of the welfare state. Longer lasting and more generous unemployment compensation make spells of frictional unemployment less costly.

Note that 1-2 do not inevitably result in policy implications such as unemployment compensation being a bad idea. The point is instead that these policies have costs and we must carefully consider the tradeoffs involved.

iii. Technology. Sometimes, technological progress results in a lot of structural unemployment. Other times, it does not. Furthermore, technology might make searching for new jobs easier (think online job site as opposed to print newspaper classifieds), possibly causing a decline in frictional unemployment.

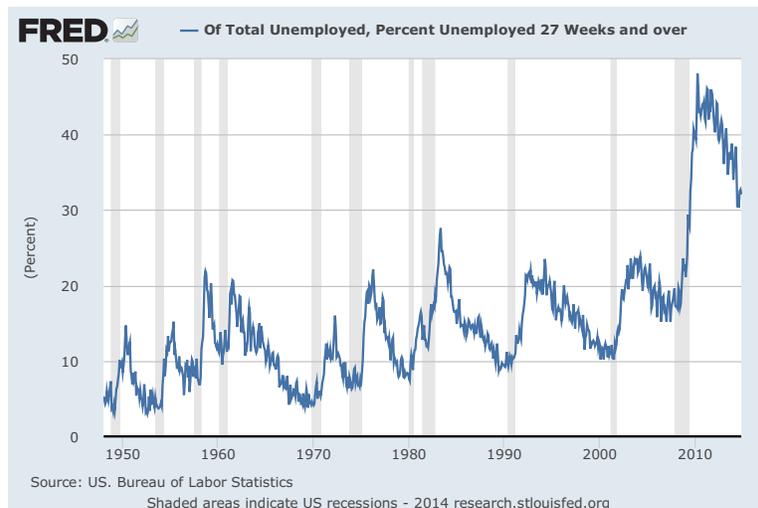
iv. Cultural factors. How willing are households to relocate? Is lifetime employment with a single firm viewed as a virtue?

And now, the third and final type of unemployment. 3. Cyclical unemployment. This is the unemployment that results from the business cycle. It is involuntary, and of great concern to policy makers who seek to eradicate it.

Many of the social costs of unemployment are obvious. In addition, however, long term unemployment (typically defined as a spell lasting at least 6 months) brings especially severe consequences to those afflicted. Their unemployment benefits might run out. They risk the erosion of their skills and a possible stigma when seeking future employment. An underreported aspect of

the Great Recession was the increase in long term unemployment. Figure 2 shows that the share of unemployed who were long term unemployed was far higher than at any time since 1950:³

Figure 2: Long Term Unemployment



Another important variable is the labor force participation rate. This is simply the labor force divided by the adult population. Recently, this figure has declined. This may be (and was during the Great Recession and its aftermath) a sign of a bad labor market. But a decline in this figure could be innocuous, such as more people wanting to go back to school. Figure 3 shows the recent history of the labor force participation rate:⁴

Measuring Unemployment

Actually measuring unemployment is surprisingly complicated. The Bureau of Labor Statistics uses survey data from firms and households, the latter being the more widely reported measure. The adult population is placed into one of the following categories:

- a. Fully employed. The cutoff is 30 hours per week.

³Source: St Louis Fed.

⁴Source: St Louis Fed.

Figure 3: Labor Force Participation Rate



b. Unemployed and actively seeking work.

c. Discouraged workers. These are unemployed workers who have given up searching.

d. Underemployed for Economic Reasons. These are people who are working fewer than 30 hours per week but who would prefer to work more.

e. Underemployed for Other Reasons. This would include part time workers who do not want to be full time. Students with part time jobs are a prime example.

f. Others not in the labor force. This includes the military, the incarcerated or institutionalized, retirees, and homemakers.

The baseline unemployment rate, known as U-3, defines the labor force to include only the employed and unemployed actively seeking work. Consider the following example:

The labor force is 120 in 2014 and 105 in 2015. The unemployment rate is thus $\frac{20}{120} = 16.6\%$ in 2014 and $\frac{10}{105} = 9.5\%$ in 2015. A decline in the unemployment rate is usually seen as good news, and it is if it results from the unemployed becoming employed. But I set this scenario up to illustrate another possibility. Here, employment has decreased: 5 employed workers have

Table 1: Unemployment in 2014 and 2015

	2014	2015
Employed	100	95
Unemployed	20	10
Discouraged Workers	10	20
Underemployed for Economic Reasons	5	10
Others	50	50

become underemployed for economic reasons. 10 unemployed workers have left the labor force by becoming discouraged workers. The labor market has gotten worse, not better, despite the decline in U-3.

This is not just a theoretical possibility. U-3 in the U.S. has declined from a local peak of 10% to 5.8% as of November 2014. A good part (but not all) of this comes from unemployed workers leaving the labor force as reflected by Figure 3. There have been several recent occasions where U-3 has fallen despite a weakening labor market.

Figure 4 shows the U-3 unemployment rate over time:⁵

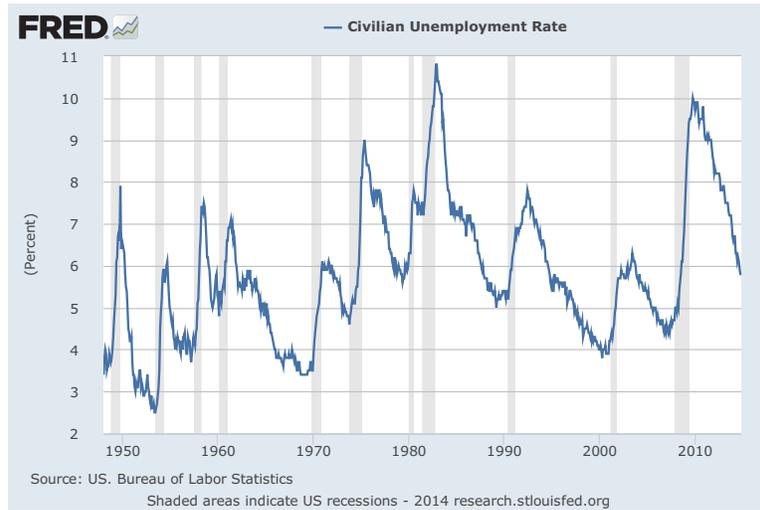
The limitations of U-3 are well known. The Bureau of Labor Statistics thus reports alternate measures of unemployment. One of these is U-6. This makes two changes to U-3. First, it redefines the unemployed to include those who are discouraged workers or underemployed due to economic reasons. The latter group is the larger of the two. Second, it adds these groups to the labor force as well.

In our example, U-6 equals $\frac{35}{135} = 25.9\%$ in 2014 and $\frac{40}{135} = 29.6\%$ in 2015. The U-6 rate is always higher than U-3.⁶ It also better captures the worsening of the labor market in our example. U-6 does have disadvantages, however. Because it involves harder classifications (such as under-

⁵Source: St Louis Fed.

⁶The 5.2% estimate of the natural rate would have to be adjusted upward using the U-6 criteria.

Figure 4: U-3 Unemployment Rate



employed for economic reasons vs. underemployed for other reasons), its measurement error is bigger.

Figure 5 shows the U-6 unemployment rate over time:⁷

Figure 5: U-6 Unemployment Rate



⁷Source: St Louis Fed.

As of November 2014, the U-6 unemployment rate was 11.4%. Its local peak was 17.2% in April 2010.

If we only look at the U-3 unemployment rate, which is the most reported figure, we might conclude that the U.S. labor market is mostly recovered from the recent Great Recession; U-3 is only about a half percentage point above its natural rate. But much of its recent decline is due to a reduced labor force. Also looking at the labor force participation rate and U-6 paints a more complete picture. The labor market is much better than it was during and immediately after the Great Recession. But it still has a significant ways to go to recover to pre-recession levels.

As bad as the Great Recession was, it pales in comparison to the Great Recession where U-3 peaked at 25% in 1933. Neil Andrews estimates that U-6 peaked about 37%.⁸

An Attempt to Model Unemployment Gone Horribly Wrong

Macroeconomics did not emerge as a distinct field until the 1930s. Prior to this time, unemployment would have been modeled using purely microeconomic tools. We will briefly imagine a world without macroeconomics by trying to explain unemployment using simple supply and demand.

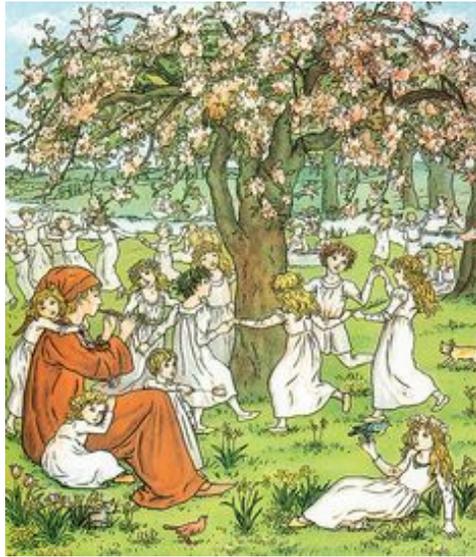
Households supply labor. We will assume that households choose to supply more labor as the wage increases.⁹ Supply is thus upward sloping. We will also assume that firms choose to hire more workers as the wage falls. Labor demand is thus downward sloping

Graph: Supply and Demand

⁸Andrews, N. "Unemployment 1930's vs Today." *Mimeo*

⁹In some cases, households might supply more labor as wages fall because they need to work more hours in order to make a given amount of income. But I leave this issue to ECO 101 and 260. It is not important for this example.

Figure 6: A World Without Macroeconomists



Note that the vertical axis is the wage (the price of labor) and the horizontal is employment (the quantity of labor).

Involuntary unemployment is the difference between people who want to work at the market wage, and those are actually able to. Graphically, it is supply less demand. In equilibrium, however, these curves are at the same place and involuntary unemployment thus equals zero. So all unemployment is voluntary, the unemployed could find work if they wanted to, but they decide the equilibrium wage is too low. This is a strained explanation during good economic times. It becomes silly during events like the Great Recession. To make it during the Great Recession was moronic (that didn't stop some people).

Macroeconomics emerged because events like the Great Depression cannot be explained using simple microeconomics. Obviously, something is missing. We will examine what that is when we look more closely at the theory of business cycles.