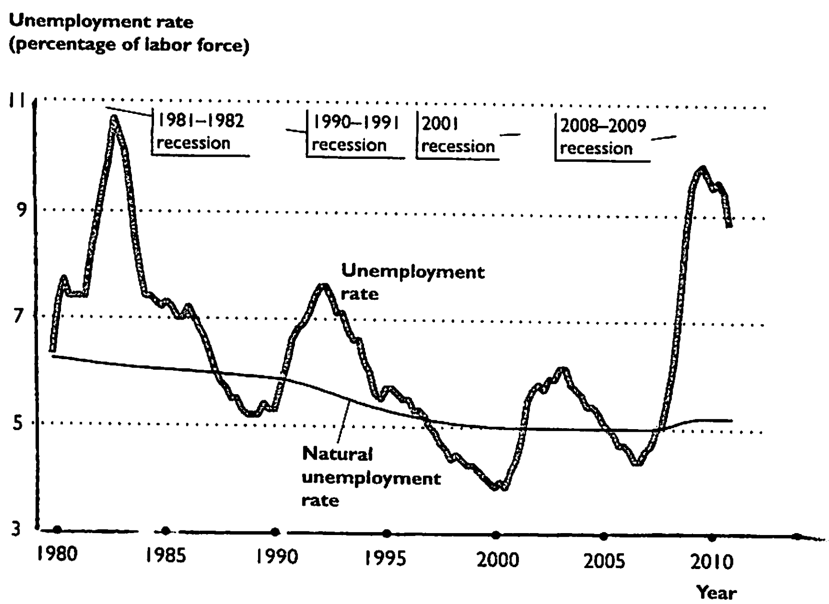
Econ. 1A. Chapter 6. **A note on the relationship between UR (U-3) and the output gap**

On p. 157, Figure 6.6 shows the relationship between UR and the output gap. Bade and Parkin explain their graphical presentation as:

"As the unemployment rate (UR) fluctuates around the natural unemployment rate (NUR) in part (a), the output gap – real GDP (RGDP or Y) minus potential GDP (Yp) expressed as a percentage of potential GDP, i.e., output gap = [(Y-Yp)/Yp]x100%] – fluctuates around a zero output gap in part (b).
When the unemployment rate (UR) exceeds the natural unemployment rate (NUR), real GDP (Y) is below potential GDP (Yp) and the output gap is negative, i.e., [(Y-Yp)/Yp]x100%] < 0.
When the unemployment rate (UR) is below the natural unemployment rate (NUR), real GDP (Y) is is above potential GDP (Yp) and the output gap is positive, i.e., [(Y-Yp)/Yp]x100%] > 0."

FIGURE 6.6

The Relationship Between Unemployment and the Output Gap



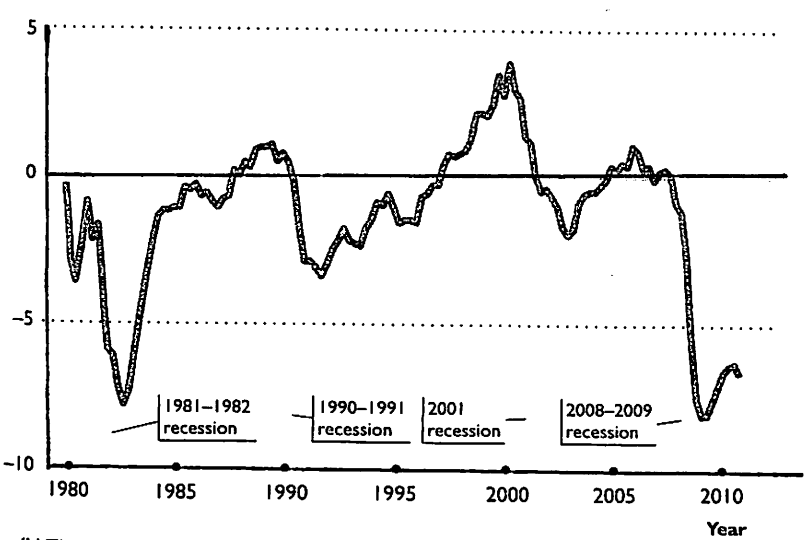
(a) Cyclical and natural unemployment

As the unemployment rate fluctuates around the natural unemployment rate in part (a), the output gap—real GDP minus potential GDP expressed as a percentage of potential GDP—fluctuates around a zero output gap in part (b).

When the unemployment rate *exceeds* the natural unemployment rate, real GDP is below potential GDP and the output gap is negative (red sections in both parts).

When the unemployment rate is *below* the natural unemployment rate, real GDP is above potential GDP and the output gap is positive (blue sections in both parts).

The natural unemployment rate shown in the graph is the Congressional Budget Office's estimate. It might turn out to be a substantial underestimate for the years since 2008.



(b) The output gap

Since Figure 6.6 illustrates how our economy works, we have to really understand economic meaning behind this figure. To this aim, first, we must understand the following economic terms.

(1) **Full employment**: When there is no cyclical unemployment or, equivalently, when all the unemployment is frictional, or structural, or seasonal. Note that UR = NUR ≠ 0

(2) **Unemployment rate** (UR): The percentage of the people in the labor force who are unemployed.

(3) **Natural unemployment rate** (NUR): The unemployment rate when the economy is at full employment. Or, the percentage of the people in the labor force who are in (a) frictional unemployment, (b) structural unemployment, and (c) seasonal unemployment. Note that NUR ≠ 0

(4)**Potential GDP** (Yp): The value of RGDP when the economy is at full employment. Or, when UR = NUR.

(5) **Output gap**: RGDP (Y) minus potential GDP (Yp) expressed as a percentage of potential GDP (Yp), i.e., output gap = [(Y-Yp)/Yp]x100%]

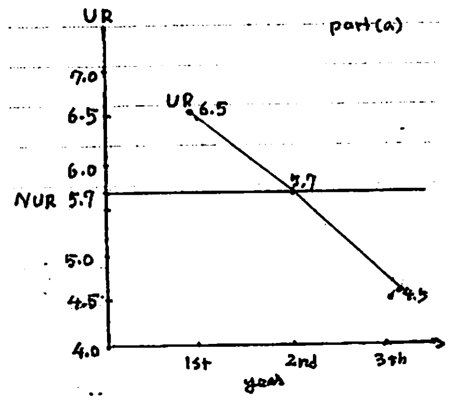
From Figure 6.6: (a) and (b), we can now see

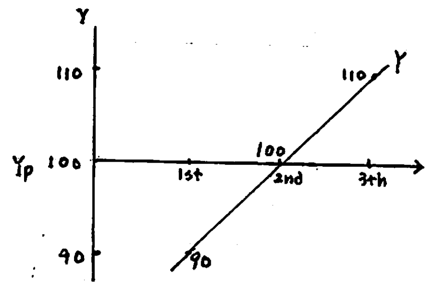
(1) When UR > NUR, Y < Yp and the output gap is negative, i.e., [(Y-Yp)/Yp]x100% < 0, (why?)
(2) When UR < NUR, Y > Yp and the output gap is positive, i.e., [(Y-Yp)/Yp]x100% > 0, (why?)
(3) When UR = NUR, Y = Yp and the output gap is equal to zero, i.e., [(Y-Yp)/Yp]x100% = 0, (why?)

Example: Relationship among Y (RGDP) and Yp (potential GDP) and output gap

Assume that NUR = 5.7%

Year	NUR	Yp	UR(U-3)	Y
1	5.7%	100	6.5%	90
2	5.7%	100	5.7%	100
3	5.7%	100	4.5%	110





Year	Output Gap = [(Y-Yp)/Yp]x100%.
1	[(90-100)/100]x100% = -10%
2	[(100-100)/100]x100% = 0%
3	[(110-100)/100]x100% = 10%