Economics 21 **Spring 2016**

Labor Market Model

The labor market forms the core of the supply side of the economy. Blanchard has a relatively sophisticated labor market model, but we are going to make it a little more realistic.

Blanchard's Price Setting Equation is:

$$P = (1 + m)\cdot \frac{W \cdot N}{Y} = (1 + m)\cdot \frac{W}{A}$$

where:

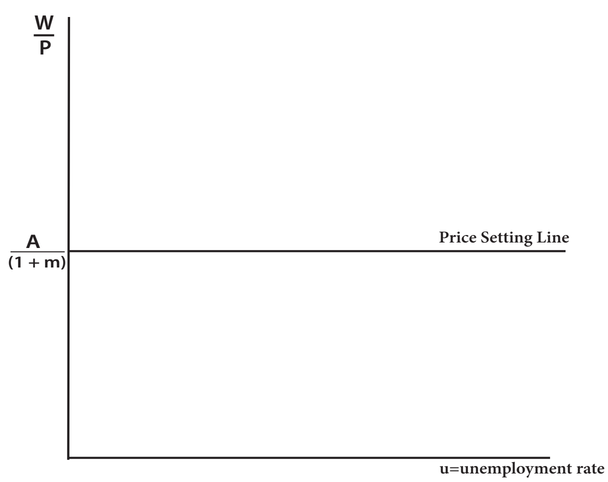
1) m is the markup[1], and empirically it is about .4
2) W = nominal wages, N = number of workers, and Y = output (GDP), and
3) A = Average Product of Labor = Y/N

The term W/A is called unit labor costs, so for Blanchard, prices as a "markup" on unit labor costs. Since m is approximately .4, prices are 1.4 times unit labor costs.

If we invert this equation, we get Blanchard's Price Setting Line:

$$\frac{W}{P} = \frac{A}{(1+m)}$$

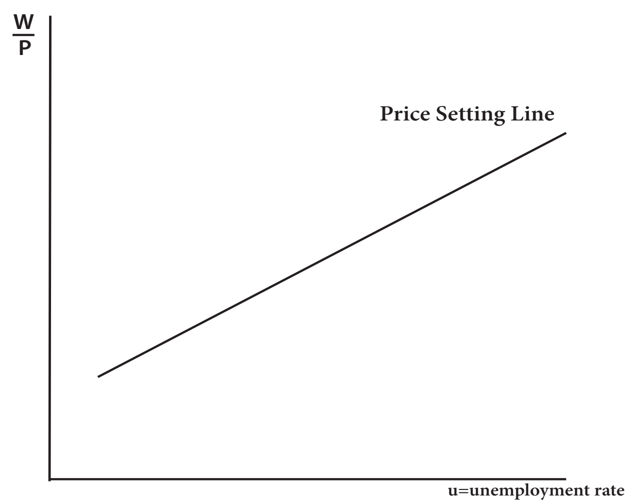
It is horizontal when plotted in (W/P,u) space as shown below:



---

[1] In the 5^{th} Edition, m is μ

This results in some unintuitive (and probably false) predictions, such as, if workers have more negotiating power, the WS line (not shown) shifts out, but the only effect is a higher unemployment rate and no increase in their real wage. We are going to alter the model by making the markup m a positive function of GDP. The rationale comes from Supply and Demand: when GDP is higher, there is more demand for goods and firms can raise their prices relative to their costs. If the markup is a positive function of GDP, then it is a negative function of the unemployment rate. So, as the unemployment rate increases, GDP falls, and prices fall relative to unit labor costs, so the Price Setting Line slopes up in (W/P,u) space:



In derivatives, the slope is:

$$\frac{\Delta W/P}{\Delta u} = -\frac{A}{(1+m)^2} \cdot \frac{\Delta m}{\Delta Y} \cdot \frac{\Delta Y}{\Delta u} > 0$$

where:

$\Delta m / \Delta Y > 0$ and $\Delta Y / \Delta u < 0$

The Price Setting Line shifts up whenever:

1) A increases or,
2) m decreases for reasons **other than** an increase in u.

This is the only change we will make to the Blanchard Labor Market Model, but it has profound implications. Now, if workers have more negotiating power, the WS line shifts out, the unemployment rate and the natural unemployment rate increase (as in Blanchard's original model), but the real wage increases as well.

Now for Our Model

New Price Setting Line:

(1) $$\frac{W}{P} = \frac{A}{(1+m[u])}$$

where m is a negative function of u, $\Delta m / \Delta u < 0$.

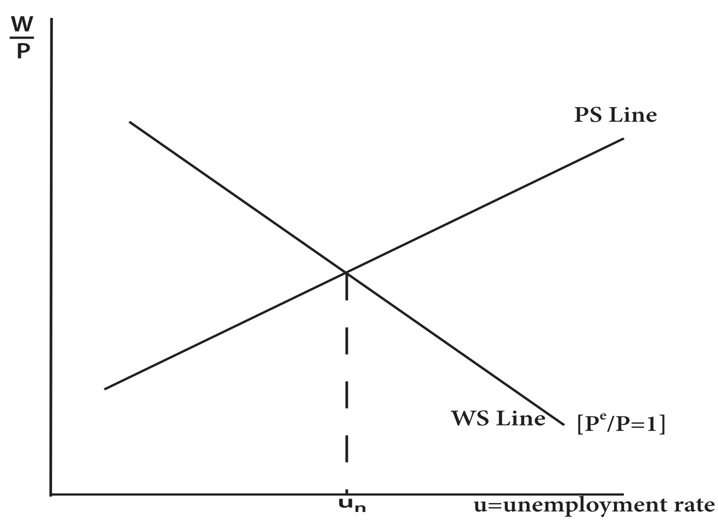
Wage Setting Equation:

(2) $$W = P^e \cdot A^e \cdot F[u,z]$$

which implies the **Wage Setting Line**:

(3) $$\frac{W}{P} = \frac{P^e}{P} \cdot A^e \cdot F[u,z]$$

where $\Delta F / \Delta u < 0$ and $\Delta F / \Delta z > 0$



To get more specific than the graph above, we need to specify what the F[u,z] function looks like and to deal with the fact that the model is now non-linear because u is in the denominator of equation (1).

In Chapter 8, Blanchard specifies $F[u, z] = 1 - \alpha \cdot u + z$, which we will use here. To make the model linear, we will approximate $1/(1+ m)$ by $1- m$. Finally, we need to specify a relationship between m and u, which will be:

(4) $m = m_0 - u$

where m_0 is the part of m that shifts the Price Setting Line (Be careful: m_0 up, shifts the PS line down).

With these simple formulas, the **Price Setting Line** is:

$$(5)\quad \frac{W}{P} = A \cdot (1 - m_0 + u)$$

and the **Wage Setting Line** is:

$$(6)\quad \frac{W}{P} = \frac{P^e}{P} A^e \left[(1+z) - \alpha u \right]$$

So, these are two linear equations in the two endogenous variables W/P and u, and they can be solved to create the Reduced Form Equations.

Reduced Form Equations:

$$(7)\quad u = \frac{\frac{P^e}{P}\frac{A^e}{A}(1+z) + m_0 - 1}{1 + \alpha \frac{P^e}{P}\frac{A^e}{A}}$$

$$(8)\quad \frac{W}{P} = \frac{\left[\alpha \cdot (1 - m_0) + (1+z)\right]\frac{P^e}{P} A^e}{1 + \alpha \cdot \frac{P^e}{P}\frac{A^e}{A}}$$

These two equations are nobody's idea of a good time. We can, however, look at the special case where all expectations are correct (ie. $P=P^e$ and $A=A^e$) then:

$$(9)\quad u_n = \frac{z + m_0}{1 + \alpha}$$

$$(10)\quad \frac{W}{P} = \frac{\left[\alpha \cdot (1 - m_0) + (1+z)\right] A}{1 + \alpha}$$

The idea that A^e might not equal A is a relatively new idea in macroeconomics. It has been used to explain why inflation and unemployment were so high in the 1970's and why they were so low in the 1990's. Because the idea is new, there is no consistent usage of the concept across economists (or even in the Blanchard text itself). Some economists say that the economy is only at the natural rate of unemployment when both expectations are realized (as Blanchard does on p.

273), and some say that even if A^e does not equal A, the economy can be at the natural rate if $P^e = P$ (as Blanchard does on pp. 275-276).

WE will adopt the second usage, so for us, the economy is at the natural rate whenever $P^e = P$ regardless of the relationship between A^e and A. But the unemployment rate is different when $A^e \neq A$ than when $A^e = A$, so we will view these different unemployment rates as different natural rates of unemployment as Blanchard does in Figure 13-6 on p. 276. So by this interpretation, deviations of A^e from A cause changes in the natural rate of unemployment; whereas, under the first interpretation, they would only cause deviations of the actual unemployment rate from the natural rate (but not change the natural rate itself). I hope this isn't too confusing (obviously, Blanchard himself got confused).