1 Job Search and the Beveridge Curve

The labour markets has frictions and the match between workers looking for a job and firms looking to hire a worker is not instantaneous nor certain. In the market there is a certain number of vacancies V and a certain number of unemployed workers U. Similarly, we define vacancy rate as v and unemployment rate as u. Consider now the ratio $\theta = v/u$: θ measures the "tightness" and when it is high it means that there are relatively more vacancies than unemployed workers.

1.1 Matching Function

Actual match depends on the number U of unemployed workers looking for a job and the number V of vacant firms looking for a worker to hire. The number of matches is determined by a function $M()$ representing the matching technology. Assuming constant return to scale we can specify the following function:

$$M = M(U, V) = KU^{\beta}V^{1-\beta}$$

The parameter K measures the technology of matching.

If we divide by the individuals looking for a job (U) we have the probability λ of finding a job:

$$\lambda = \frac{M}{U} = m = K\left(\frac{V}{U}\right)^{1-\beta}$$

where u is the unemployment rate and v is the vacancy rate. Given that $\frac{v}{u} = \theta$ we have

$$\lambda = K\theta^{1-\beta}$$

Moreover we imagine that existing jobs are destroyed with a probability γ.

In equilibrium unemployment must be stable and then (defining employment as E and $U = L - E$):

$\dot{U} = \gamma(L - U) - \lambda U$

and an equilibrium is reached for $\dot{U} = 0$, that is, for $\alpha U = \gamma(L - U)$: dividing both side of the latter by L we have:

$\lambda u = \gamma(1 - u)$

$u = \dfrac{\gamma}{\lambda + \gamma}$

and then (given the equation for λ):

$u(\lambda + \gamma) = \gamma$

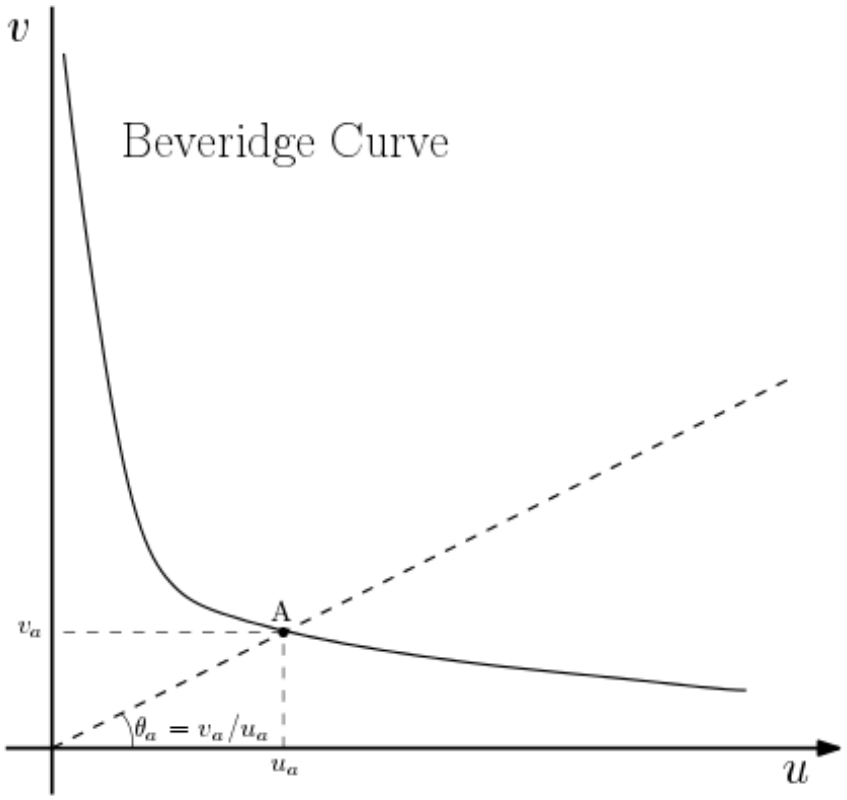
$u\theta^{1-\beta} + \gamma u = \gamma$

$u\left(\frac{v}{u}\right)^{1-\beta} + \gamma u = \gamma$

$v^{1-\beta} = \dfrac{\gamma(1 - u)}{Ku^{\beta}}$

$$v = \left(\frac{\gamma}{K}\right)^{\frac{1}{1-\beta}} \frac{(1-u)^{\frac{1}{1-\beta}}}{u^{\frac{\beta}{1-\beta}}}$$

which defines the Beveridge curve (Figure 1). Note that Beveridge curve is decreasing in fact, from the above v is decresing in u. All points along the beveridge curve could be equilibrium point: in fact, outside that curve we have that $\dot{U} \neq 0$ and thus unemployment change. In order to determine the actual point along the curve we need to know the value of θ and we therefore need a model that explains how θ is determined.



Curve.png

Figure 1: Beveridge Curve