

## **Education and training**

**On average a University graduate earns 25% more over the lifetime than a non-graduate.**

**Why?**

- 1) Increased productivity – human capital**  
**Direct application of schooling to labour market (medical degree)**  
**Improving access to or ability to use technologies**
  
- 2) Signalling of inherently higher productivity**

**Policy question**

**Is subsidising the cost of higher education a good investment for the government?**

**Need to know:**

- 1) relationship between education & productivity**
- 2) amount of education investment w/o subsidy**

## The individual investment decision

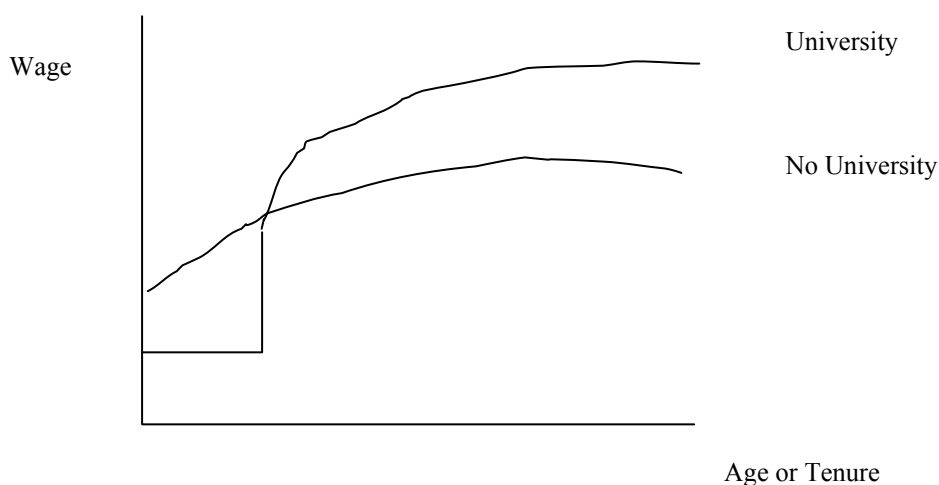
Invest if the net present value of benefits exceeds the NPV of costs, i.e.  $NPV_B > NPV_C$

$$NPV_B = B_0 + \frac{B_1}{1+r} + \sum_{t=2}^T \frac{B_t}{(1+r)^t}$$

**B** is the gap in earnings and other benefits between graduates and non-graduates

$$NPV_C = C_0$$

**Diagrammatically**



## **Nature of benefits**

- 1. higher income**  
on average **25%** greater for graduates
- 2. greater income stability**  
graduates more likely to be in long-term jobs  
graduates able to find work faster after displacement
- 3. non-wage compensation**  
less likely to be in unpleasant jobs - “comfort”  
benefits tend to be higher (pensions, etc.)
- 4. non-pecuniary benefits**  
university social life

## **Nature of the Costs**

- 1. Out of pocket expenses**  
Tuition, fees, and living costs
- 2. Foregone Earnings**
- 3. non-pecuniary costs**  
boring lectures

**The returns and costs of university education will be individual specific (particularly non-pecuniary)**

## **Determinates of education investment in this model**

**The following increase the likelihood that an individual will attend university**

- 1. Individual is future-minded (low  $r$ )**
- 2. Individual is young (high  $T$ )**
- 3. Individual does not expect to leave the labour force (high  $T$ )**
- 4. The costs of college decrease (low  $C$ )**
- 5. The earnings gap increases (high  $B$ ) – role of labour demand shifts**
- 6. The individual has access to capital (low  $r$ )**

## **Implications of the Model**

- 1) Women invest in less education because of greater propensity to interrupt careers**
- 2) Government policies can provide incentives to invest**

**Lower the cost – tuition subsidies**

**Increase access to capital markets - loans**

**Lower marginal tax rates**

- 3) Income inequality provides an incentive to invest**
  - High monetary return to being in top portion of the wage distribution**

- 4) Discrimination can effect the incentives to invest**

## **The signalling model – An Alternative Explanation**

**Higher education has no effect on productivity but signals which workers are productive**

### **Information problem**

- 1. Firms can't directly determine who are high and low productivity workers**
- 2. Firms observe education levels**
- 3. The cost of getting an education is inversely related to productivity**

**Intuition of the Model (model to follow next week)  
Education does not increase productivity, but distinguishes between “good” and “bad” employees**

**Firms offer a higher wage to educated workers**

**In a “separating equilibrium”:**

- 1) the costs of education are higher than the benefits for low productivity workers (do not invest)**
- 2) the costs of education are lower than the benefits for high productivity workers (invest)**