Chapter 10: Inefficiency

Differences in productivity between countries originate mainly from differences in technology. However, these differences also originate from differences in inefficiency. **Efficiency** is defined as the effectiveness with which factors of production and technology are combined to produce output.

Productivity

Productivity is determined by two things, technology and efficiency. This relation can be written in mathematical terms;

$A = T \times E$

Where A is a measure of productivity, T is technology and E is efficiency. If farmer A has technology twice as good as technology of a farmer B, but is half as efficient as farmer B then both farmers will have the same productivity in the end.

It is easy to understand that some have knowledge that others do not have leading to differences in technology. But it is harder to believe that people would do things that are obviously inefficient.

We will use an example with cross-country data to explain to what extent differences in productivity are explained by differences in efficiency. We will use the countries India and the United States. The growth rate of A in the US over the period 1975-2009 was 0.54% per year.

Suppose that India is G years behind the United States in 2009 in the field of technology and let g be the growth rate of technology in the United States. This will lead to an expression for the ratio of technology in India to technology in the US:

$T_{2009,Inida} / T_{2009,US} = (1 + g)^{-G}$

Given the growth rate of 0.54% and suppose that India would be 10 years behind the US, then the ratio becomes:

$T_{2009,Inida} / T_{2009,US} = (1 + 0.0054)^{-10} = 0.95$

This means that India has technology equal to 95% of the US level. We know that A = T x E. If we combine the productivity equations of both countries we obtain the following formula:

$$\frac{A_{India}}{A_{US}} = \frac{T_{India}}{T_{US}} \times \frac{E_{India}}{E_{US}}$$

Suppose that the productivity ratio, the right-hand side of the equation, is equal to 0.31. When we know this and we know the technology ratio, we can calculate the efficiency ratio of the countries.

$$\frac{E_{India}}{E_{US}} = 0.31 / 0.95 = 0.33$$

This means that India has an efficiency level of 33% of the US level. From this we can conclude that the efficiency gap is most important in determining the productivity gap between India and the US.
The **break-even point** is the technology lag at which technology and efficiency would be equally important in determining the productivity gap.

Case studies

One good example of low output as a result of inefficiency is the former Soviet Union. The Soviet Union was good at accumulating factors of production but was far behind the richest countries technologically.

In 1985, GDP per capita in the Soviet Union was less than one-third of the US level. This was not the result of factor accumulation or technology but was the result of low efficiency.

One cause of this low efficiency was central planning. Central planning may lead to an efficient economy but in practice the central planners of the Soviet Union did not fulfil their jobs. Also the need to meet certain production quotas led to the production of the wrong goods.

Another cause was the lack of incentives for managers and workers. Firms and managers did not have the goal of maximizing profits. This lead to a short supply and firms had no incentives to maintain the quality of their goods produced.

Research in the textile sector has shown that differences in technology were almost completely irrelevant in explaining differences in wages. The reason for this was that the technology used in this industry was almost everywhere the same. The machines made in England were shipped throughout the world leading to identical machines among countries.

The key factor in explaining the wage differences was the efficiency of workers. In the textile industry output was produced by machines combined with workers who tented these machines. Research shows a positive relationship between the machines tended per worker and the weekly wage.

Workers in rich countries were able to tend much more machinery. This was the result of factory organization and labor practices. Workers in poor countries were capable of tending more machines but something about the organization of the economy prevented them from doing so.

Productivity differences between industries can be explained by differences in the organization of production among countries. This leads to different levels of efficiency.

Featherbedding: When employers are forced to hire more workers than are required for production. This is often a result of bargaining power of a union that wants to raise the level of employment.

Types of inefficiency

This section discusses five different ways in which economies can be inefficient.

1. *Unproductive activities*
   This type of inefficiency occurs when resources are moved from productive to unproductive activities. **Unproductive activities** are uses without economic value. The fewer resources are used for productive activities, the less production will be.

   From a society's point of view these unproductive activities are seen as a waste of resources. Some unproductive activities are even illegal, such as theft and smuggling.

   An example of an unproductive activity is rent seeking. **Rent seeking** involves the use of laws and government institutions to bring private benefits.

2. *Idle resources*

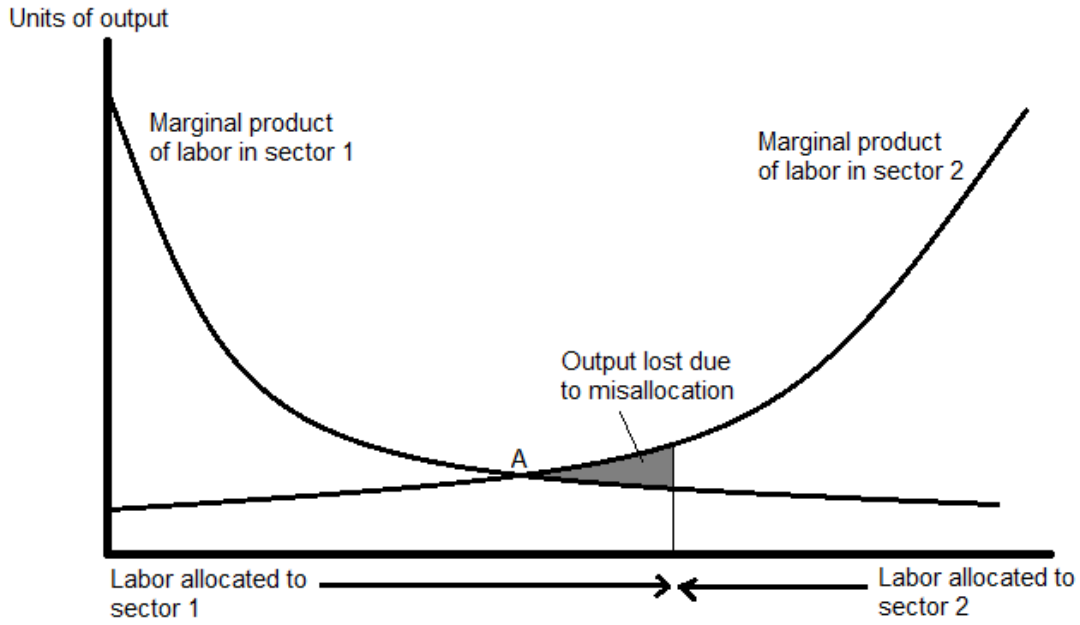
This type of inefficiency occurs when resources are not used at all. This includes both actual unemployment and underemployment (when a worker has a job but spends only a fraction of his work time on producing output).

Underemployment of workers entails a transfer of resources from one person to another rather than the production of more output.

3. *Misallocation of factors among sectors*
The third type of inefficiency is misallocation of factors among sectors. Misallocation occurs when resources are used in producing the wrong things.

Misallocation among sectors is directing resources to the wrong sectors of the economy.

Suppose that there are two sectors in an economy. The optimal allocation of resources is found where the marginal product of labor of sector 1 intersects with the marginal product of labor of sector 2, point A.



When labor is over allocated to sector 1, the marginal products of labor in sector 1 and 2 are not equal. This misallocation leads to a loss of output equal to the shaded triangle in the graph.

There are two possible reasons for this misallocation of resources between the sectors:

- Barriers to mobility. When barriers to mobility exist then wage gaps may exist. The higher the barriers, the larger the gap between marginal products and thus the larger the degree of inefficiency.
- Wages not equal to marginal product. If workers do not receive their marginal products then differences in the marginal products between sectors will not translate into differences in the wages. Therefore workers will not have the incentive to move between sectors.

This type of inefficiency is an important type for the economy. Reallocation of resources among sectors can be a major source of economic growth.

4. *Misallocation of factors among firms*
The fourth type of inefficiency occurs when there is misallocation of factors among firms.

This type becomes important in nonmarket economies and in government owned firms that do not have to make profit. This is because in these firms the wages of the worker are not closely related to the amount of output produced.

In a well-functioning economy resources will move from less productive to more productive firms. This shift of resources increases the profit for high-productivity firms, which will drive less productive firms out of business.

5. *Technology blocking*
   The last type of inefficiency is **technology blocking**. This occurs when a technology could feasibly be used, there are no barriers, but someone deliberately prevents its use. The technology can either be domestic or foreign.

   The most common known technology blocking example is called **Luddites**. The Luddites were skilled artisans in the British textile industry whose households were being destroyed by mechanization.

   Firms may engage in technology blocking if it serves their best interests. However, technology blocking does not always work. Its success depends on the relative power of those who are hurt by a new technology and those who benefit from it.

The study of efficiency points out that the level of efficiency in an economy depends crucially on its institutional structure. If individuals or firms can block technology they will do so. The productivity difference between two societies lies not within the differences in self-interest of its citizens but in its institutional structure.