

## **Discussion of concepts of efficiency and inefficiency using a two good model of a production possibility frontier (PPF)**

### **Introduction**

Efficiency is usually concerned with the relationship that exists between resource inputs and both the intermediate and final outputs (Devadoss & Song, 2003). When the economic efficiency is adopted then the concerned party should make a choice, which maximizes outcomes derived from the resources allocated to it. Inefficiency occurs when there existence of a possibility of increasing the outcomes through reallocation of resources in a different way to the one in use (McEacher, 2008). Technical efficiency is the relationship between physical resources such as labour and capital and the outcome. A technical efficiency is gotten when a set of resource inputs results in the improvement of the outcome to the maximum possible level (Markusen & Arthur, 1980). When the same or greater outcomes can be obtained without one type of input then the intervention is said to be technically inefficient. Productive efficiency is the maximization of the out for a given cost or the minimization of cost for a given outcome. Allocative efficiency takes account of both the productive efficiency and the efficiency with which the outcomes are distributed.

### **Production possibility frontier**

The production possibility frontier or curve (PPF or PPC) indicates the maximum possible output that an economy can produce at any given moment based on the available resources. An economy that utilizes its resources fully produces on the PPF. For instance in an economy that produces two products say product 1 and 2 the production frontier curve will resemble the one shown below.

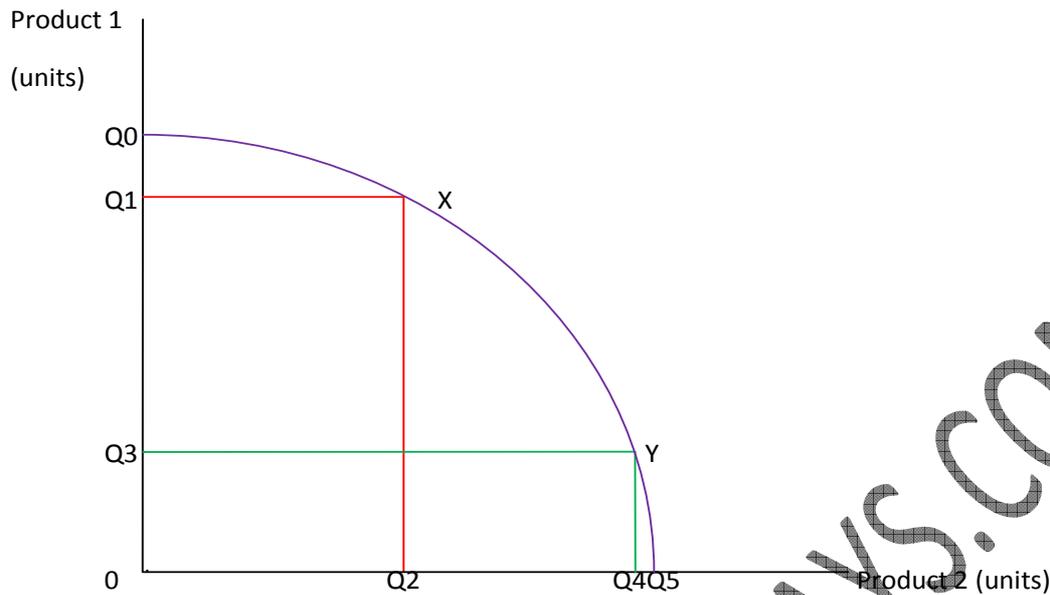


Figure 1: Transferring resources from producing product 1 to production of Product 2 (units)

In this case, if all the resources of the economy such as capital, land and labour are used in the production of product 1 then  $Q_0$  of product 1 will be produced while none of product 2 will be produced (Devadoss & Song, 2003). On the other hand, if all the resources are transferred for production of product 2, then  $Q_5$  of product 2 will be produced and none of product 1 will be produced (Rogers and Richard, 1994). However, if the resources are divided for the production of both product 1 and product 2 then a range of combinations of product 1 and 2 is possible. For instance, at point X the economy is able to produce  $Q_1$  of product 1 and  $Q_2$  of product 2.

However, when the resources are distributed differently to produce products like those at point Y where  $Q_4$  of product 2 and  $Q_3$  of product 1 are produced (Markusen & Arthur, 1980).

All the possible products that are found at any point of the frontier as exemplified by point X and Y are said to be productively efficient since at these points the resources of economy are being

utilized fully. At these points, there is no wastage of resources (Devadoss & Song, 2003). An economy that is productively efficient is only able to produce more of one product at the expense of the other and resources must be shifted from one product to the other (Rogers and Richard, 1994). Thus to produce more of product 1 in our example, resources have to be shifted from production of product 2 to production of product 1. Such a shift of resources results in production of more of product at the expense of product 2. In this case, the amount sacrificed is referred to as opportunity cost. For instance, the opportunity cost of producing the extra Q1-Q3 units is Q4-Q2.

The concept of opportunity cost in economics represents the foregone opportunities. Thus, when a manager makes a strategic decision, the business is led to one direction instead of the other. Such decisions may work sometimes and they may fail other times. For instance, Nokia's decision to specialize in mobile phones and leave other business ventures worked in its favour. On the other hand, the decision of Marks and Spencer to move into America worked against them.

In a free market economy, the decision on the amount of a product to be produced in favour of the other is largely dependent on the forces of demand and supply (Devadoss & Song, 2003). Thus if the demand for product 1 increases more than that for product 2, then more producers will be involved in production of product 1 rather than product 2. Thus, more producers will be attracted to industry 1 than industry 2 because of the great demand for product 1. This is because industry 1 will require more resources to address the increased demand (Rogers and Richard, 1994). The increase in demand for resources by industry 1 will result in increase in the price paid for the resources and therefore resources will be attracted into industry 1 and out of industry 2.

Thus, there will be reallocation of resources. Thus in our example above in figure 1 there will be movement from Y to X.

Sometimes the reallocation of resources may be triggered by a directive of a government thus in such a case the reallocation of resources is not determined by demand but by the orders of the government. This can sometimes result in too much production of some goods than they are consumed and too little production of the required goods.

An economy is productively efficient if it is producing a combination of products on the production possibility frontier (Devadoss & Song, 2003). On the other hand, the economy is productively inefficient if it is operating within the frontier. Production inefficient may result from sub-optimal production practices or decision-making procedures. For instance, diversification of product line can be hampered by technologies and automation of certain process making employees with specialized knowledge to stick to their old jobs instead of moving to new ones (Devadoss & Song, 2003). The production of different products requires different models and this can result in production inefficient since learning of different curves can be much difficult. This may also result from asymmetric information or conflicts of interest in an organization that is decentralized. Thus insufficient management leadership and ability can be the cause of production inefficient. Process immaturity is another cause of inefficient production. Production of goods at point V in figure below shows production inefficiency.

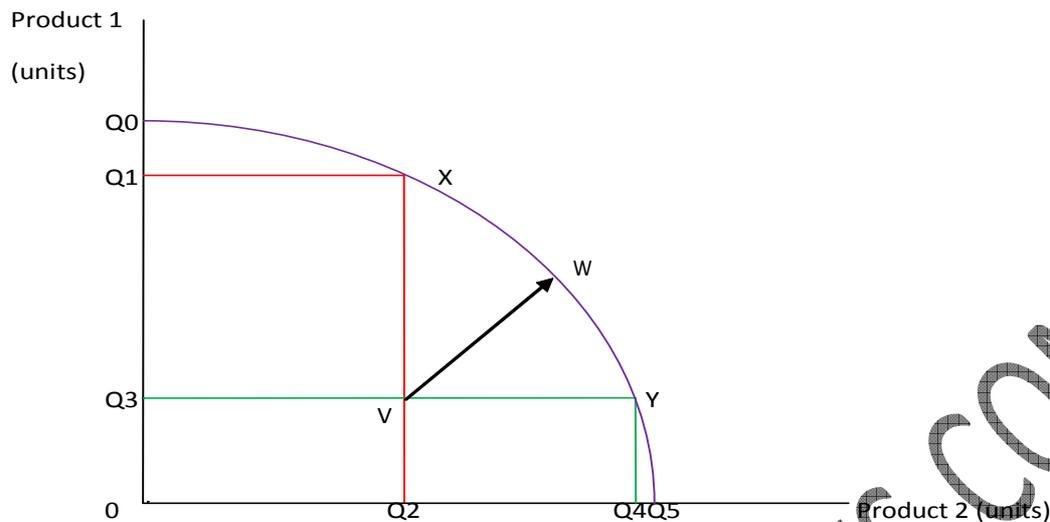


Figure 2: Producing within the production possibility frontier is productively inefficient

This may occur when the available resources are utilized effectively to produce more of both products. As shown in figure 2 if the economy produces at point W instead of point V then both products 1 and 2 produced will be excess. An economy that operates within PPF results in wastage of resources. An economy can operate within PPF if the reallocation of resources is not effective (Devadoss & Song, 2003). The PPF shifts outward when an economy grows. This results in the production of both products increases. Several factors can result in the shift of PPF outward. First, this could be due to training of employees making them more productive. Second, investment in capital goods can bring about such shift (Rogers and Richard, 1994). An increase in population can also result in outward shift of PPF. Finally, technology improvement, which provides better ways of performing tasks, can shift the PPF outward. Consumption outside the PPF is possible through international trade.

### **Assumptions of a two good model of a production possibility frontier (PPF)**

The two good model assumes that the economy produces just two goods. It also assumes that technology and quantity of factors are fixed. On the international trade the model assumes that only two countries are involved (McEachern, 2008). It also assumes mobility of production factors such as labour occurs between sectors and not between countries. It also assumes perfect completion in case of trade. It also assumes constant returns to scale.

### **Importance of the assumptions of the two good model of a production possibility frontier (PPF)**

These assumptions help understand the theory of international trade. Trade helps economies to increase the combinations of outputs that they can consume (Rogers and Richard, 1994). Thus, when two economies have different PPF, each one of them should consume what it can produce. However, international trade allows different economies to specialize in what they are best at producing efficiently and trade for what they do not produce (Markusen & Arthur, 1980).

The assumptions also help us to understand and distinguish between absolute advantage and comparative advantage (Rogers and Richard, 1994). Absolute advantage refers to the ability of one economy to produce more than the other and can be able to produce an amount with limited resources. Comparative advantage refers to the ability of one economy to produce goods at a lower opportunity cost as compared to the other (Devadoss & Song, 2003). Comparative advantage is thus important for trade since it determines specialization and trade. The economy with absolute advantage and comparative advantage can still be involved in trade.

### **Conclusion**

The concepts of efficiency and inefficiency are better understood using PPF. An efficient economy is able to create both absolute advantage and comparative advantage. An economy with comparative advantage allows international trade to take place. This comparative advantage allows specialization hence fostering efficiency in production and at the same time encourages international trade. It allows an economy that has production inefficiency to dispose off excess products in the market. Thus, PPF is an important tool in the understanding of international trade. It can also help an economy to identify its comparative advantage so that it specializes in the production of that product that it has comparative advantage and acquire the other product that it deems not able to produce efficiently through international trade.

### **Reference**

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