

ANALYTICAL TOOLS OF INTERNATIONAL ECONOMICS

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It has been clearly specified in the literature that international economics deals with those international forces which influence the economic transactions between the countries. In nutshell International economics governs the behavior of international trade which is a special case of inter-regional trade. In order to have greater insight into the subject matter of international economics, We need to understand certain analytical tools that are commonly used in the study of international economics.

1. **Production Possibility Curve(PPC)**
2. **Community Indifference Curves**
3. **Offer Curves**
4. **Isoquants, Isocosts And Equilibrium**
5. **IS And LM Curve And General Equilibrium**

Production Possibility Curve

Modern Economists use an important tool of modern Economics known as production possibility curve for solving the basic problems of an economy. We explain below the production possibility curve and production possibility schedule.

According to Lipsey, "**Production Possibility curve is that curve which shows the possible combinations or two goods that can be produced by an economy, given available resources and technology.**" The production possibility curve is based on the fact that the requirements of an economy are unlimited, whereas the resources are limited. We cannot produce all those

commodities, which we need. Hence the *law of scarcity prevails in the economy*. The economy will have to make a choice 'between the different alternatives. In a full employment economy, in order to increase the production of a particular commodity, the resources have to be diverted from other sectors. If the economy decides to use all its resources in the production of Guns, it cannot produce any Butter. Similarly, if whole of the resources are devoted to the production of butter, it will not be in a position to produce any guns. Yet another possibility is that it devotes a part of resources to the production of guns and a part of resources to the production of butter. Thus various production possibilities can be there. If such possibilities are portrayed in a schedule or diagram then the schedule is known as production possibility schedule and the curve derived on this base is known as production possibility curve.

Assumptions

Following are the assumptions of production possibility curve.

- (i) **The amount of resources available in the economy is fixed**-It means that the quantity of land, labour, capital etc. remains fixed as we move from one combination of goods and services to the other.
- (ii) **Two Goods**-Only two goods x (Say Butter) and y (Say Guns) are produced in different proportions in the economy.
- (iii) **There is no change in technology**-It means that as an economy shifts from one allocation to another there are no changes in the techniques of production used in the production process.
- (iv) **All resources are fully employed**-It implies that there are no unused resources. All available resources are fully employed. It further means that society is producing the maximum output it can produce.
- (v) **All resources are perfectly mobile**-They can be reallocated from the production of one commodity to that of another.
- (vi) **All resources are efficiently employed**-It amounts to that productivity of resources cannot be raised further by changing allocation or by changing technique. It means that the society is producing the maximum it can produce under the given conditions.
- (vii) **When resources are diverted from one product to another their efficiency**

declines and law of Diminishing Returns Operates.

Construction of Production Possibility Curve

Before the construction of a P. P. curve, we should prepare a production possibility schedule.

Production Possibility Schedule: Production Possibility Schedule is that schedule which shows that alternative production possibilities of two sets of goods with the given resources and techniques of production. Suppose, in an economy, only two goods are produced. Let these goods be Guns and Butter. Guns are symbolic of defence goods and butter of civilian goods. Every economy has fixed amount of resources at a particular point of time. The two extreme options available to an economy are: (a) When all resources are used for production of guns only and (b) when all resources are used for production of butter only. Besides these two, a large number of other options are available in which resources are partly used for guns and partly for butter. Suppose following are all the options available to an economy. (Table 1.1)

Table 1.1 Production Possibility Curve

Combination	Guns (thousands)	Butter (thousand kg)	Marginal Rate of Transformation = $\frac{\Delta \text{ Guns}}{\Delta \text{ Butter}}$
A	10	0	
B	9	1	1G : 1B
C	7	2	2G : 1B
D	4	3	3G : 1B
E	0	4	4G : 1B

The table showing all the available options is termed as Production Possibility (or PP) Schedule. In this schedule five production possibilities have been shown which are the result of different factor combinations. First and fifth are extreme possibilities wherein only one good is produced.

Other three possibilities represent combination of two goods. It is clear from the table that as we increase the production of Butter, the production of Guns fall rapidly. In the second stage by increasing the production of butter by 1000 kg., the production of guns falls by one thousand In the third stage 2 thousands in the fourth 3 thousands and finally production of guns falls to 5 thousands.

It becomes clear from the schedule that if workers producing guns are transferred to the production of butter they will not be able to produce butter with same efficiency as shown in production of guns. Their productivity falls and marginal cost of production rises. As more and more workers are transferred, efficiency keeps on falling and marginal cost keeps on rising. The change in marginal cost on account of transfer of resources is indicated by Marginal Rate of Transformation (MRT). The concept of MRT is explained below.

Marginal Rate of Transformation (MRT)

MRT measures the ratio of units of one good sacrificed to obtain an additional unit of the other good. In our above example MRT is measured by the ratio of guns sacrificed to the additional units of butter obtained.

$$\text{MRT} = \frac{\text{Guns sacrificed}}{\text{Butter obtained}}$$

In our example MRT is increasing. It is because the guns have to be sacrificed at an increasing rate every time to obtain an additional unit of butter. For the first unit of butter only one gun is sacrificed. For the second unit of butter 2 guns are sacrificed.

MRT is a measure of opportunity cost of producing additional one unit of a commodity. In our PP schedule above, MRT measures opportunity cost of producing one unit of butter in terms of units of guns sacrificed. For example when $\text{MRT} = 2$ guns: 1 butter, it means that to produce additional one unit of butter, the society has to pay the cost by losing the opportunity of producing 2 units of guns. We find in our example that MRP increase as we produce more butter. It is because of our assumption that resources are not equally efficient in production of both

goods. Therefore, as we produce more and more units of butter we have to sacrifice units of guns at increasing rate.

Diagrammatic Presentation of a P.P. Curve

Let us illustrate the P.P. curve with the help of P.P. schedule. We can get a PP curve by plotting PP schedule on a graph. Butter is represented on X-axis and guns on Y-axis. The five combinations A, B, C, D and E are plotted and joined. This gives us the PP curve AE. (Fig. 1.1)

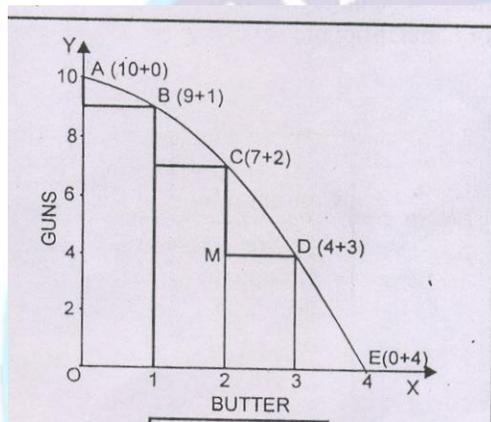


Fig. 1.1 Production Possibility Curve

The PP curve AE is defined as the locus of different combinations of the maximum quantities of the two goods that can be produced in an economy from the given amount of resources, which are fully and efficiently employed. A PP curve is a production map of an economy. PP curve is also known as the transformation curve or production possibility frontier.

The measure of slope between two points of a PP curve is the measure of MRT. The slope equals $\Delta Y / \Delta X$. This is also the measure of MRT. For example, when the society moves from combination C to combination D, it sacrifices CM units of guns to produce MD extra units of butter. MRT equals CM / MD which is also the slope of PP curve between C and D. The slope *i.e.* MRT, increases as we move downwards along the curve from A to B, B to C and so on.

This increasing slope (*i.e.* increasing MRT) gives the concave shape to the PP-Curve.

From the diagram we observe two characteristics of a Production Possibility curve.

- (a) **Slopes downwards to the right**-This indicates that society must give up some units of one good to produce additional units of the other good.
- (b) **Concave from the origin**-This indicates that MRT increases as resources are transferred from one good to another. MRT increases because all resources are not equally efficient in production of both the goods. As resources are shifted from guns to butter, MRT increases and so increases marginal cost.

Change in PP Curve with Change in Assumptions

The main assumptions on which a PP curve is based are:

1. The amount of resources is fixed.
2. No change in technology.
3. Resources are fully employed.
4. Resources are most efficiently-
- employed.
5. Resources are not equally efficient in production of all goods.

What happens to the PP curve if these assumptions change? Let us take the change in each assumption one by one and examine their effect on PP curve.

- (I) **When resources increase** When resources increase, more of both goods can be produced. The given PP curve is based on the assumption that if we produce more of one we have to sacrifice something of the other because resources are fixed. So, a PP curve is associated with fixed resources. If resources change the PP curve shifts. When resources increase PP curve shifts to the right. If resources decrease PP curve shifts to the left.

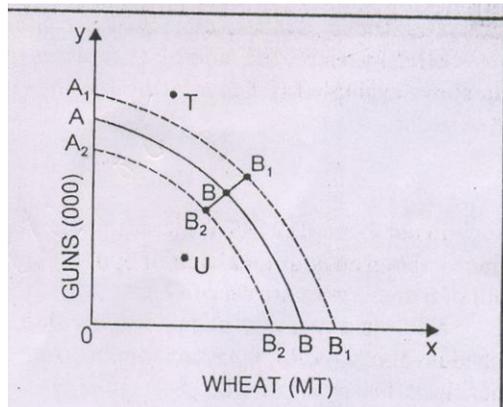


Fig. 1.2 Impact Changes in Resource Position

In the diagram-1.2. AB is the given PP curve. When resources increase PP curve shifts to A1B1. When resources decrease it shifts to A2B2.

- (II) **When technology advances-** A PP curve is also based on the assumption that there is no change in technology as we move from one combination of output to another. What happens when technology advances? It has the same effect as the effect of increase in resources. We can produce more of both goods. As such PP curve shifts to the right as A1B1 in Figure 1.2.

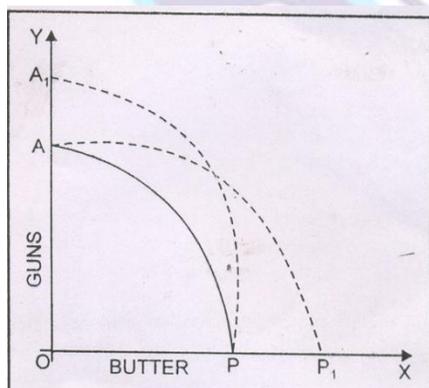


Fig. 1.3 Impact of Change in Technology

There is another Possibility as shown in Fig. 1.3. Suppose the technical change affects the

production of only one of the commodities say butter. It would mean that with the help of available resources, the economy can produce the same quantity of guns and more of butter. The new production possibility curve will be AP_1 curve. Similarly, if the technical change affects only the production of Guns so that more of Guns can be produced with the help of given resources, the new production possibility curve will be A_1P .

- III) When resources are not fully employed :** When resources are fully employed, the actual production takes place on a point somewhere on PP curve. When some of the resources are unemployed, actual production of one or of both the goods would be less. In this situation, the combination of the two goods produced will lie somewhere below the PP-Curve. Point U (in Fig. 1.2) represents one such situation. Therefore, when resources are not fully employed there is no change in PP curve but actual production takes place somewhere below the curve.

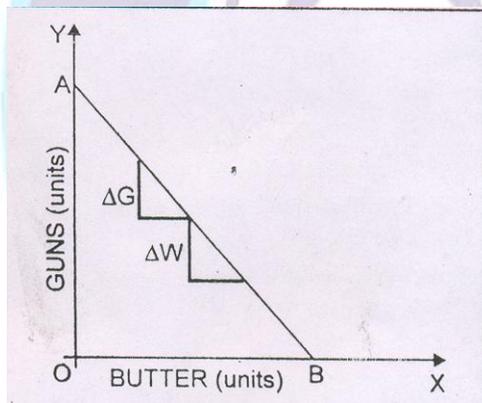


Fig. 1.4 PPC with constant cost

- (IV) When efficiency of resources increases :** Suppose there is advancement in technology which leads to a more efficient way of combining resources. It has the same effect as that of increase in resources, and leads to an upward shift of PP curve
- (V) When all resources are equally efficient in production of all goods Or PP curve with constant costs.**

In this situation, diverting resources from production of one good to another has no effect on the efficiency of these resources. All resources produce all goods equally efficiently. The productivity of workers in producing guns is the same as their productivity in producing butter. Suppose, initially 2 units of guns are sacrificed to produce one additional unit of butter. If all resources are equally efficient in production of both the goods, we can get one extra unit of butter by sacrificing just 2 units of guns every time neither more nor less'. It means that MRT remains constant at '2 guns: 1 butter' on every point of PP curve. The measure- of MRT equals the slope of PP-curve. Since MRT is constant, the slope is also constant. When slope is constant, PP curve is a downward sloping straight-line curve.

MRT is nothing but the marginal cost of producing an additional unit of butter expressed in terms of sacrifice of units of guns. Since MRT is constant, marginal cost of producing more butter is also constant. Therefore, under constant cost conditions, a PP-curve is a straight line sloping downwards from left to right.

Uses of Production Possibility Curve

The Production possibility curve is used for many analytical purposes. Some of them are given below:

1. **The Notion of Scarcity-** The production possibility frontier gives us the idea about the scarce resources of the economy and thereby explains that production cannot be raised beyond a certain limit. The resources available to mankind both human and non-human are scarce in relation to wants and the solution lies in economizing the resources. Production possibility curve depicts various combinations of two goods, which an economy or a producer can produce at a particular time with, given resources.
2. **Problem of Choice-** Production possibility curve is useful to solve the problem of choice, which is vital in Economics. It tells us that the available resources can be put to various uses; *e.g.* with given resources, we can either produce butter or guns. Similarly we can put to use these resources either in the production of food and cloth (for present generation) or in the production of machines, dams, bridges (for future generation) and so

forth.

3. **Test of Efficiency-** The production possibility curve also acts as a test of efficiency as is evident from the table given below:

Combination	Position	Test of Efficiency
A, B, C, D, E	On the PP Curve	Technologically Efficient
U	Below the PP Curve	Technologically Inefficient
T	Above the PP Curve	Technologically Infeasible

4. **Analysis of Economy's Central Problems-**The production possibility frontier also helps us to make clear the three basic problems of economic life: What, How and For Whom?

Analysis of Central Problems Through Production Possibility Curve or Production Possibility Curve and Solution of Basic Problems

The concept of production possibility curve is very useful in understanding some of the basic problems facing an economy. Out of the six central problems, four can be represented on a PP curve. For instance:

1. The Problem of 'What to Produce'?

This is the first central problem related to the selection of commodities to be produced by an economy. It is also known as the problem of allocation of resources. This is represented on movement along the PP curve. The different points on a PP curve represent different possibilities of allocation of resources. Consider the points B and C on the production possibility curve PP1 in figure 1.5.

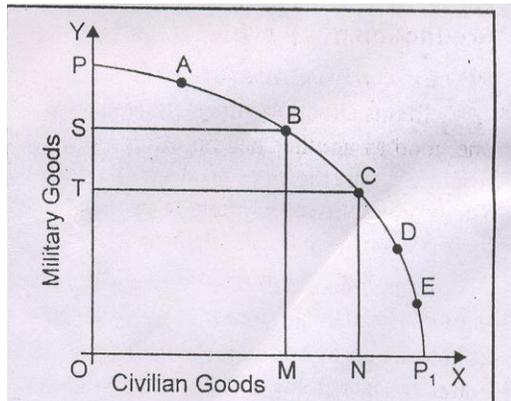


Fig 1.5 PPC Revealing What to Produce?

These points represent different combinations of military goods and civilian goods, which can be produced by the economy. Apart from points B and C, there are other points on the curve, which give us attainable combinations of military goods and Civilian Goods. Given the condition that the economy is using all its resources in the most efficient possible manner. We have to find out as to which particular combination of military goods and civilian goods the economy will select. It is obvious that the economy will like to choose that combination which is in line with its national policies. If the country is a peace loving one, it will select C or any point between C and P. On the other hand, a country ruled by a dictator or a country having imperialist designs will probably choose a combination like B or any other combination offering more of military goods compared with civilian goods.

If we study Figure 1.5 closely, it becomes clear that to increase the production of civilian goods, it is necessary to reduce the production of military goods. If production of military goods is to be kept at a high level, then it automatically implies that only a small quantity of civilian goods can be produced. For example, the economy chooses point B as the production combination, then OS amount of military goods and OM amount of civilian goods can be produced. A movement away from point B to Point C means that production military goods will be reduced from OS to OT and that of civilian goods will increase from OM to ON. Therefore, to achieve an increase in production of civilian goods by an amount equal to MN, the economy will have to sacrifice ST

amount of military goods. In the terminology of Economics this can be expressed by stating that the opportunity cost of producing civilian goods equal to MN is amount of military goods.

2. How to Produce?

Second basic problem of an economy is 'how to produce'. This problem is that of selecting the technique of production also known as the problem of choice of technique. If a country does not use the correct technique of production, its actual production will be less than the potential one.

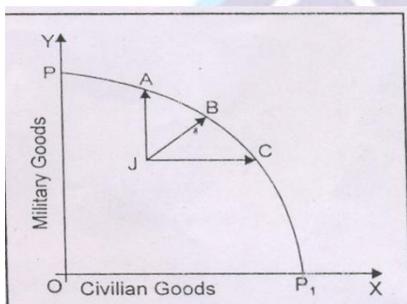


Fig. 1.6 PPC Revealing How To Produce?

In Fig. 1.6, If the country is producing at point J, it is possible that the choice of technique is not correct. We assume that labour, capital and other factors of production are being utilized in the economy and the distribution of resources is inefficient. Yet, if the actual production is still less than the potential, it undoubtedly implies that there is some defect in the technique of production chosen. Two other reasons, which can account for actual production remaining less than the potential one, are the inefficiency in the distribution of factors of production among alternative uses and unemployment of labour and other factors of production. In any country the more inefficient is the distribution of resources, the further away in the inward direction will be the actual production combination from the production possibility curve and nearer to the point of origin. If efficient technique of production is used and if all resources fully and efficiently employed, production will take place on some point of PP curve and not below. It is clear from points A, B or C on the PP curve. An efficient technique of production is the technique, which uses that combination of resources which maximizes output or minimizes cost for a given output.

3. For Whom to Produce

Economy's third basic problem is 'for whom to produce'? Either butter should be produced for

civilians or guns for the military purpose. The shape of production possibility curve as per the economy's requirements. Basically for whom to produce or how the national product is being distributed is not directly revealed by the production possibility frontier. However we can get some knowledge regarding this. If such production is constructed in which necessities are represented on one axis and luxuries on the other? We can know from the actual position of the economy on this curve that how the national output is being distributed or in other words for whom it is produced? As *shown*. in fig. 1.7 AB is the original P.P. frontier. If more of military goods are produced then the shape of P.P. curve will be A1B and if more of butter is produced for civilians then the shape of P.P. curve will be like AB1. Thus from the shape of a P.P. frontier we can get the idea regarding economy's menu of choice or for whom production takes place in an economy.

Conclusion

In India including several other developing countries such as China, for example, for several decades, the expected impact of an increase in **income** on outflow of foreign exchange was marginal, though this impact is getting stronger with increasing globalisation of our economy. The explanation for this changing state of affairs lies in an increasing role being assigned to market forces in the Indian economy. Similarly, India is placed in such a situation that a large volume of foreign exchange flows in on account of remittances by NRIs and Indians working abroad, which means that an increase in our national income is associated with an increased inflow **rather than an outflow** of foreign exchange. **Similarly**, we can think of several petroleum exporting countries where an increase in their export earnings is likely to lead to an increased outflow of capital into deposits with foreign banks, and similar other investments. Thus the model presented above of foreign exchange flows may need several adjustments to bring it **close to reality**. The outcome **however** is likely to differ from economy to economy.

References

1. P.A. Samuelson, "Social Indifference Curves", QJE, Feb 1956
2. James E. Meade, A Geometry of International Trade, George Allen and Unwin, 1952.
3. W.W. Leontief, "The Use of Indifference Curves in the Analysis of Foreign Trade", QJE, May 1933.
4. Bo Sodersten, International Economics, Chapters I and 2.
5. Dominick Salvatore, International Economics, 7th Edition, Chapters 3, 4.
6. G. Haberler, The Theory of International Trade. 1936.
7. Jacob Viner, Studies in the Theory of International Trade, Harper and Brothers, 1937

