M.A. ECONOMICS

SEM II

PAPER II
International Economics

Optimum Tariff , Part II (Optimum Tariff Rate)

E-CONTENT PREPARED BY

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The Optimum Tariff Formula

The economists and financial administrators have remained concerned with determining the rate of tariff that can ensure the improvement in terms of trade consistent with the maximization of welfare. They have preferred to call such a rate of tariff as the optimum rate of tariff. The economists, including Robert Heller, Scammel and Kindelberger have attempted to work out a precise formula for specifying the optimum rate of tariff.

Kindelberger has stated the formula for optimum tariff in the following form:

$T_O = 1/ (e-1)$

Here T_O denotes the optimum rate of tariff and e stands for the elasticity of the offer curve of the foreign country at the specific point.

The co-efficient e or the elasticity of offer curve can be measured as below:

$$e = \frac{-(\%\ \text{Change in Imports})}{(\%\ \text{Change in Exports}) - (\%\ \text{Change in Imports})} - 1$$

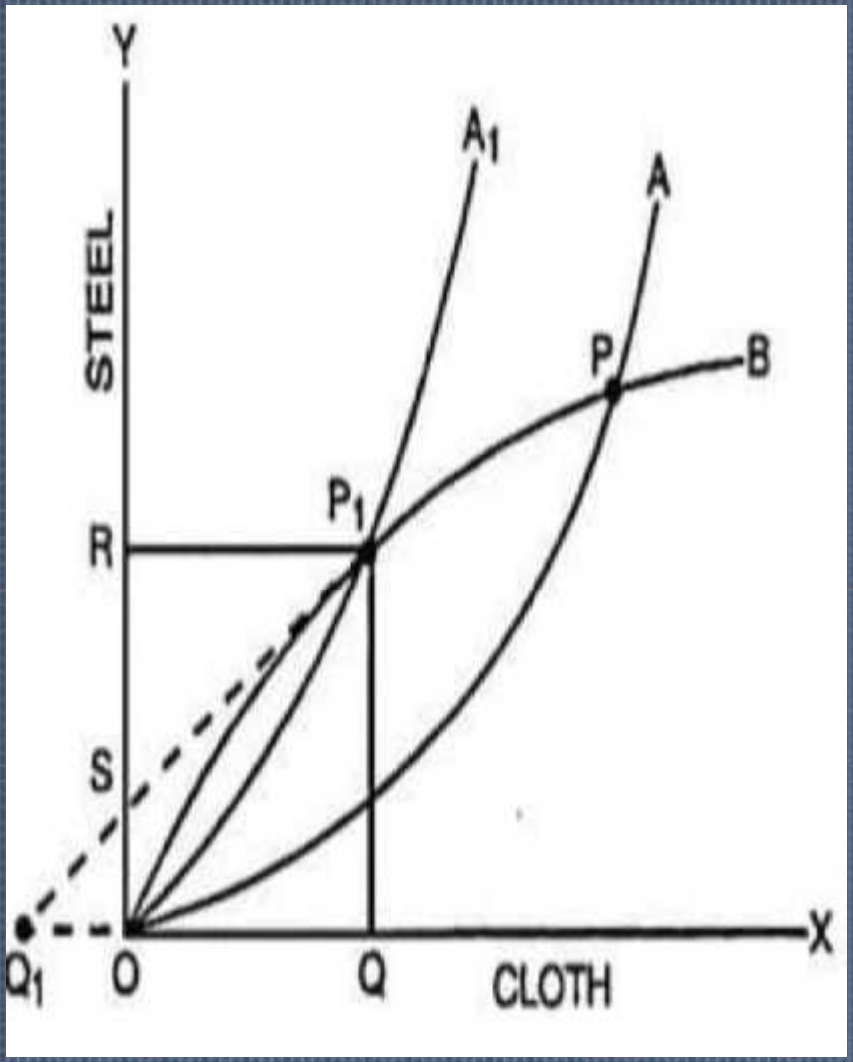

FIG 1

The rate of optimum tariff can be derived geometrically with the help of Fig. 1. In Fig. 1, OA is the offer curve of tariff-imposing home country A and OB is the offer curve of the foreign country B. P is the original point of exchange and P_1 is the point of exchange subsequent to the imposition of tariff. It is assumed that P_1 is the point of optimum tariff.

The slope of the offer curve at point P_1 is measured by the tangent drawn to OB at P_1. It meets the horizontal scale produced in the backward direction at Q_1. The optimum tariff at P_1 is (OQ_1/ OQ). As OQ = RP_1, therefore, the optimum tariff can be expressed as OQ_1/RP_1. Since the Δs SQ_1O and SP_1R are similar, OQ_1/ RP_1 equals OS/SR.

$$\text{Thus } T_O = \frac{OQ_1}{OQ} = \frac{OQ_1}{RP_1} = \frac{OS}{SR} = \frac{OS}{OR - OS}$$

$$= \frac{1}{\frac{OR - OS}{OS}} = \frac{1}{\frac{OR}{OS} - 1}$$

Since $\frac{OR}{OS} = e$, therefore the optimum tariff at P_1 can be expressed as

$$T_O = \frac{1}{\frac{OR}{OS} - 1} = \frac{1}{e - 1}$$

The relationship between the elasticity of offer curve (e) and optimum tariff (To) can be shown through Table 1.

Table 1: Relationship between e and To

Elasticity of offer curve (e)	Optimum Tariff Rate (T_O)
1	$T_O = \frac{1}{e-1} = \frac{1}{1-1} = \frac{1}{0} = \infty$
2	$T_O = \frac{1}{e-1} = \frac{1}{2-1} = \frac{1}{1} = (\text{or } 100\%)$
3	$T_O = \frac{1}{e-1} = \frac{1}{3-1} = \frac{1}{2} = (\text{or } 50\%)$
4	$T_O = \frac{1}{e-1} = \frac{1}{4-1} = \frac{1}{3} = (\text{or } 33.33\%)$
5	$T_O = \frac{1}{e-1} = \frac{1}{5-1} = \frac{1}{4} = (\text{or } 25\%)$
10	$T_O = \frac{1}{e-1} = \frac{1}{10-1} = \frac{1}{9} = (\text{or } 11.11\%)$
:	:
∞	$T_O = \frac{1}{e-1} = \frac{1}{\infty-1} = \frac{1}{\infty} = (\text{or zero})$

From the Table 1 it follows that the optimum tariff rate that can maximise welfare goes on diminishing as the co-efficient e increases and vice-versa. It implies that there is an inverse relation between the elasticity of the offer curve of country B and the optimum tariff rate for country A. In the extreme situation, when the elasticity of the offer curve of foreign country is infinite the tariff-imposing home country will fail to bring about an improvement in its terms of trade. This can be shown through Fig. 2.

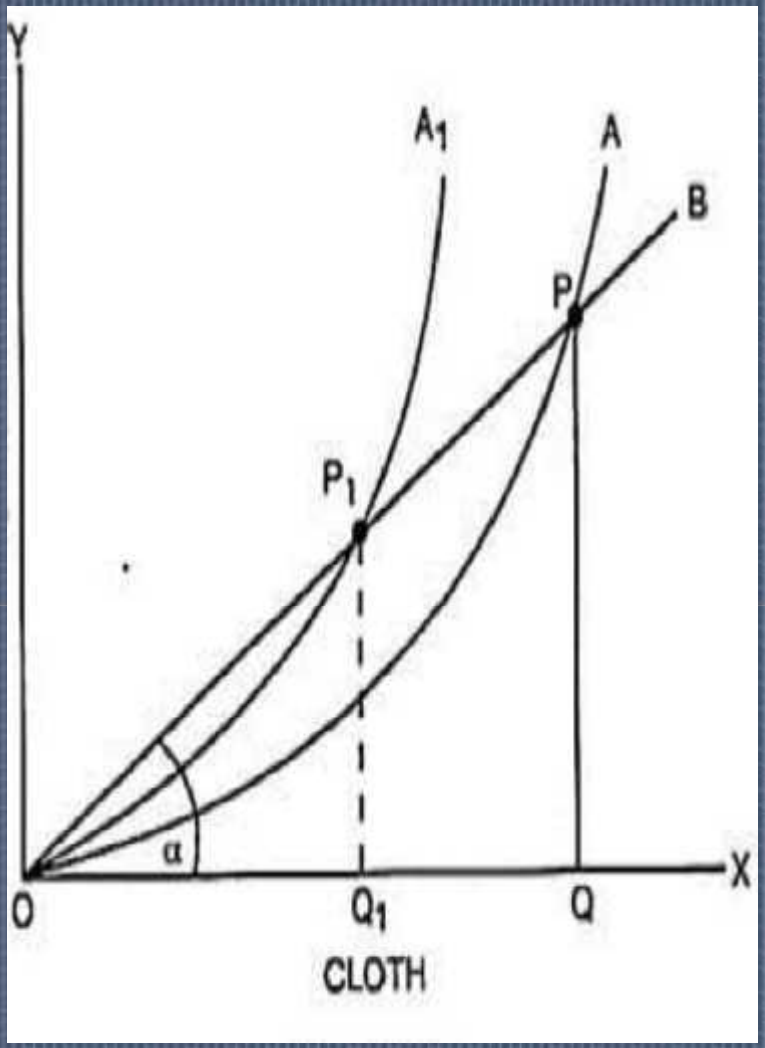

FIG. 2

In Fig. 2, OA is originally the offer curve of country A and OB is perfectly elastic (e = α) offer curve of country B. The exchange takes place at P and country A imports PQ quantity of steel in exchange of the export of OQ quantity of cloth.

The TOT at P for country A = (Q_M/Q_X) = (PQ/OQ) = Slope of Line OP = Tan α. As country A imposes tariff, its offer curve shifts to OA_1. In this case, exchange takes place at P_1 where P_1Q_1 quantity of steel is imported against the export of OQ_1 quantity of cloth. The TOT for country A at P_1 = (Q_M/Q_X) = (PQ_1/OQ_1) = Slope of Line OP_1 = Tan α_1.

Slope of Line OP_1 = Tan α.

Since TOT at P and P_1 are both measured by constant Tan α, the home country cannot improve the terms of trade through tariff. There is only reduction in the volume of trade and consequent decline in the level of welfare. If the above exceptional case is left out, the offer curve of foreign country can assume the elasticity less than unity, equal to unity and more than unity. The implications of such magnitudes of e upon the terms of trade and welfare (or optimum tariff on the whole) can be discussed through Fig. 3.

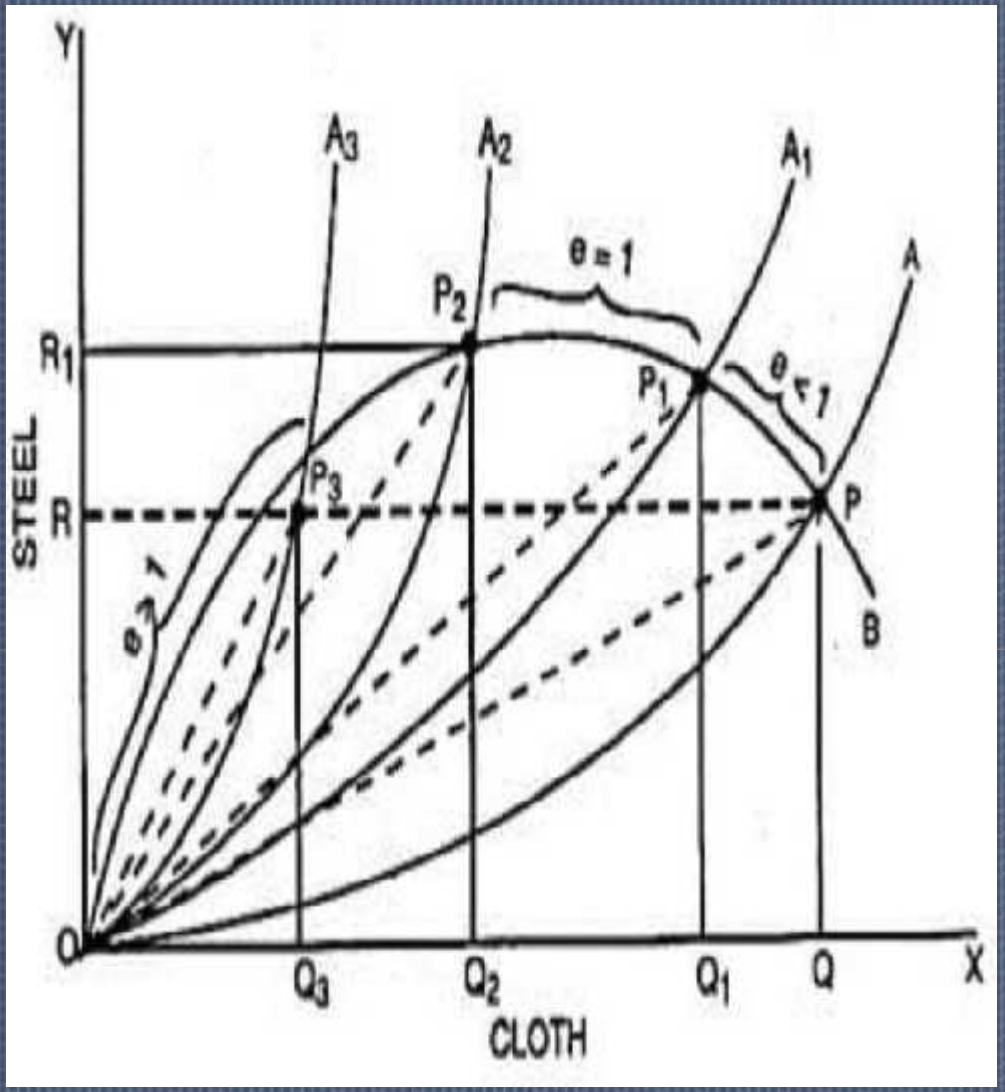

FIG. 3

In Fig. 3 OA is originally the offer curve of home country. OB, on the other hand, is the offer curve of foreign country B. The entire span of this curve consists of three elasticity ranges. In the OP_2 range, the elasticity is greater than unity ($e > 1$). In the P_2P_1 range, the elasticity is equal to unity ($e = 1$). In the PP_1 range, the elasticity is less than unity ($e < 1$).

- On the opposite, it is better for the home country to move from P to P_1 where the elasticity of offer curve of country B is less than unity ($e < 1$). The increase in tariff in this situation, improves the terms of trade, on the one hand and raises the level of welfare, on the other. A move from P_1 to P_2 through further increase in tariff is still better from the point of view of home country. The tariff increase, in the range P_1P_2 where $e = 1$, ensures a further improvement in the terms of trade along with an increase in the level of welfare. From the above figure, it follows that as long as foreign country's offer curve is less than unit elastic or unit elastic, it is worthwhile for the home country to raise tariff and thereby improve the terms of trade and increase the level of welfare.

- As long as the offer curve of the foreign country is more than unit elastic, it is desirable for the home country to lower tariffs; suffer adverse terms of trade but, at the same time, achieve a higher level of welfare. It can now be concluded that the point of optimum tariff lies somewhere over that region of foreign country's offer curve where the co-efficient e is equal to unity.

SOURCE OF STUDY MATERIAL

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