

QUOTA V. TARIFF REDUCTIONS, EQUIVALENCE, AND ECONOMIC POLICY

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I. Introduction

In this paper we are dealing with the aspects of trade liberalisation which give rise to trade effects equivalent to those of *unilateral* reduction in trade restrictions. Thus, here we include actual unilateral reductions of trade restrictions, similar to those applied by Germany in 1956 - 57, when tariffs on industrial imports were reduced by 50 per cent. We also include multilateral reductions in trade restrictions, like those of the Kennedy Round, but we are concerned with those countries which, as a consequence of the reductions, experienced on balance a detrimental effect on their foreign trade account. More specifically, we are interested in the problems of :

1. *Static* equilibrium under two different types of protection; 2. disturbances to this equilibrium which are caused by a reduction in trade restrictions; 3. the breaking point of the «equivalence» between tariffs and quotas, and 4) the policies for the re-establishment of equilibrium.

Thus, we examine the problems facing a tariff reducing country and a quota reducing country, and compare the policies which might be chosen for simultaneous achievement of internal and external equilibrium.

II. Analysis

The effects of the reduction in trade restrictions on the balance of payments and other economic variables, and the multipliers of alternative policy instruments can be studied within the framework of a simple model of static equilibrium in an open economy. For the case of a small country the model consists of the following equations¹ :

1. The variables represent real values; parameters with a subscript denote the relevant partial derivative of the function with respect to the variable in subscript. The bar above a variable indicates that the variable is determined outside the system.

a) The Expenditure Sector :

$$Y = E(Y, r) + \bar{G} + T(t, q, Y, P) \quad (1)$$

$$E_Y > 0, E_r < 0, T_Y < 0$$

$$T_t > 0, T_p < 0, T_q > 0$$

Equation (1) states that real expenditure (Y) is equal to private expenditure (E) plus government expenditure (\bar{G}), plus the balance of trade (T). Private expenditure comprises the two broad categories, consumption and investment, and consequently it depends on real income (Y) and the rate of interest (r). Government expenditure is defined as «budget surplus», that is expenditure minus taxes. The latter for reasons of simplicity are assumed to be independent of the level of income and equal to the expenditure initially. Trade balance (T) is the difference between exports and imports of goods and services. Exports depend on the domestic price level (P) of the exporting country, while imports depend on relative prices, domestic income (Y), and the level of trade restrictions, tariffs (t) or quotas (q). The small country assumption enables us to ignore foreign prices, so that imports are inversely dependent on the domestic price level (P). It is also assumed that the country is protected by tariffs or quotas (but not by both), where for comparisons by increase in quotas we mean increase in protection and decrease in imports, similar to the case of increase in tariffs. Further, for the case of protection by import quotas we assume that both the price effect and the income effect on imports are suppressed, so that the only effect of price changes on the balance of trade is exercised through the export connection. How the degree of protection is determined is not examined; suffice to say that the country is assumed to be in internal and external equilibrium initially.

b) The Monetary Sector :

$$M/P = L(Y, r) \quad (2)$$

$$dM = d\bar{M} + sdB \quad (3)$$

$$L_Y > 0, L_r < 0, s \geq 0$$

Equation (2) is the equilibrium condition for the money market, where M is the supply of money and L is the liquidity preference. The latter depends on the level of income and rate of interest. The balance of payments deficit or surplus (dB) affects the country's money supply. The exact magnitude of this effect depends on the size of s , the country's sterilisation policy. Therefore, the total change in money supply (dM) is partly directly controlled by the country's monetary authority ($d\bar{M}$) and partly determined by monetary policy and the position of the balance of payments.

c) The Production Sector :

$$Y = Y(P) \quad (4)$$

$$Y_P > 0$$

Aggregate supply (Y) is a function of the price level. Equation (4) is in fact the reduced form of the system of equations which describe the production - employment sector of the economy :

$$Y = Y(N)$$

$$Y'_N = \frac{\bar{W}}{P}$$

$$Y''_N > 0, \quad Y'''_N < 0,$$

where N denotes employment of labour and \bar{W} denotes the money wage rate.

d) The Foreign Trade Sector :

$$B = T(t, q, Y, P) + K(r) \quad (5)$$

The balance of payments consists of the current account and the capital account. Capital flows (K) are interest mobile. The small country assumption implies that the domestic rate of interest can be used as the explanatory variable of capital flows ².

From the solution of the system of equations (1) to (5) the effects of changes in protection can be studied by the multipliers. Thus, for changes in tariffs we obtain ³ :

$$\frac{\partial Y}{\partial t} > 0 \quad (6) \quad \frac{\partial B}{\partial t} \begin{matrix} \geq \\ < \end{matrix} 0 \quad (7)$$

$$\frac{\partial r}{\partial t} \begin{matrix} \geq \\ < \end{matrix} 0 \quad (8) \quad \frac{\partial P}{\partial t} > 0 \quad (9)$$

And for changes in quotas we obtain :

$$\frac{\partial Y}{\partial q} > 0 \quad (10) \quad \frac{\partial B}{\partial q} > 0 \quad (11)$$

$$\frac{\partial r}{\partial q} \begin{matrix} \geq \\ < \end{matrix} 0 \quad (12) \quad \frac{\partial P}{\partial q} > 0 \quad (13)$$

2. See, however, Johnson (1966), or Takayama (1969) for justifications of the introduction of additional explanatory variables.

3. For simplicity and without loss of generality we put $P = 1$ initially, and combine equations (2) and (3) into one equation for the monetary sector.

A comparison of multipliers (7) and (11) shows that while an increase (decrease) in quota protection will definitely improve (deteriorate) the balance of payments, the outcome is doubtful if tariff changes are considered. Increase in protection raises the level of income, the price level, and probably the rate of interest. The increase in income under tariff protection affects the balance of trade by the income-induced increase in imports, which is avoided in the case of protection by quotas. Therefore, the income effect on the import side of the balance of trade is, *ceteris paribus*, a possible source of deficit in the balance of payments, when tariffs are increased for protection. However, such a possibility does not seem to occur frequently in practice. Assuming that the equivalence between tariffs and quotas is maintained we now turn to policy considerations in case of reduction in protection. Table 1 presents the signs of the multipliers for fiscal and monetary policy under protection by tariffs and quotas respectively. The ambiguity of the fiscal policy multiplier with respect to the balance of payments constitutes the centre of the problem of our consideration.

Table 1

Variable	FISCAL	POLICY	MONETARY	POLICY
	Tariffs	Quotas	Tariffs	Quotas
Income	+	+	+	+
Rate of Interest	+	+	-	-
Price Level	+	+	+	+
Balance of Payments	+	+	-	-

Multiplier in fact is :

$$\frac{\partial B}{\partial G} = \frac{1}{\Delta} (L_Y T_P - Y_P L_Y K_r + Y_P L_r T_Y) \gtrless 0 \quad (14)$$

Where $\Delta < 0$. Therefore, relation (14) is negative if

$$Y_P L_r T_Y > Y_P L_Y K_r - L_r T_P$$

which by further algebraic manipulation is reduced to :

$$- \frac{T_P}{K_r} \frac{1}{Y_P} - \frac{T_Y}{K_r} > - \frac{L_Y}{L_r} \quad (15)$$

Relating inequality (15) to the differentials of the system of equations (1) to (5) we obtain⁴ :

$$\left(\frac{\partial r}{\partial P} \right)_{(5)} \left(\frac{\partial P}{\partial Y} \right)_{(4)} + \left(\frac{\partial r}{\partial Y} \right)_{(5)} > \left(\frac{\partial r}{\partial Y} \right)_{(2)} \quad (16)$$

4. Where the subscript refers to equation number.

Therefore, for a deficit in the balance of payments as a consequence of expansionary fiscal policy a sufficient condition is that the slope of the balance of payments curve (BB) in the $r - Y$ plane is greater than the slope of the LM curve. This case is illustrated in Diagram 1, where equation (1) is represented by the IS curve, equation (2) by the LM curve, equation (4) by the YY curve, and equation (5) by the BB curve. The BB curve separates the quadrant into the deficits area, and surpluses area, right and left respectively.

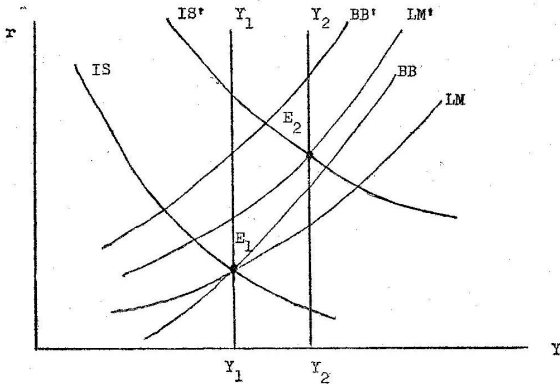


Diagram 1

Starting from overall equilibrium at E_1 an increase in government expenditure shifts the IS curve to IS' . The outcome of the various reactions of the system is the new point of internal equilibrium at E_2 , with higher levels of equilibrium income, prices, and rate of interest. However, the balance of payments is in deficit. If quotas had been used for protection instead of tariffs expansionary fiscal policy would have resulted in a balance of payments surplus. At this point therefore and under the conditions previously specified there is a breakdown in the equivalence of tariffs and quotas.

Policy

In this section we aim at a comparison between the case of quota reductions and the case of tariff reductions within the framework and the limitations of the fixed - target models. The policy question is : how to restore internal and external equilibrium in an economy, whose balance of trade is affected by reductions in trade restrictions.

Formally, the problem consists of two goals, income and the balance of payments, and two instruments, fiscal and monetary policy. Two more variables, the price level and the rate of interest, are considered as equilibrating variables which are allowed to vary in such a way that the desired values of the target variables are achieved. The latter categorisation is, in fact, quite unsatisfactory but since we are not concerned with long-term considerations of stability and growth, this procedure can be justified in the comparative statics framework of the present analysis.

In the model examined the basic difference between reductions in quota restrictions and reductions in tariff restrictions is to be found in the operation of the indirect income effect on the balance of payments. Reductions in quotas will definitely deteriorate the balance of payments, while it is not certain whether reductions in tariffs will improve or deteriorate the balance of payments. Increase in spending under quota protection improves the balance of payments, while under tariff protection and the previously specified conditions deteriorates the balance of payments. Therefore, if the target had been set as the return to full employment with equilibrium in the balance of payments, the policies are indicated by the solutions of the model. Thus for the case of quotas we obtain the «inverted» solutions :

$$dG - \left[\frac{(1 - E_Y) K_r Y_P + E_r T_P - T_P K_r}{Y_P K_r} \right] dY - \frac{E_r}{K_r} dB \quad (17)$$

$$dM - \left(\frac{L_Y K_r Y_P - L_r + MK_r}{Y_P K_r} \right) dY + \left(\frac{L_r - sK_r}{K_r} \right) dB \quad (18)$$

The coefficients for dY in both (17) and (18) are positive, while the coefficient for dB is positive in (17) and negative in (18). Therefore, assigning fiscal policies to the target of full employment and monetary policies to the target of equilibrium in the balance of payments (Mundell, 1962) in order to achieve an increase in the domestic income with constant balance of payments, fiscal policy should be expansionary. The accompanying monetary policy would aim at increase in the money supply for reduction in the rate of interest and the interest attracted capital flows, and for increase in the price level and the subsequent equilibrating effects on the balance of trade. Therefore, in the case of disturbances caused by reduction in quota protection, external and internal equilibrium can be achieved by the right combination of *expansionary* fiscal and *contractionary* monetary policy.

For the case of the tariff protection the «inverted» solutions are :

$$dG = \left[\frac{(1 - E_Y - T_Y)K_r + E_r T_Y}{K_r} \right] dY - \frac{E_r}{K_r} dB \quad (19)$$

$$dB = \left(\frac{L_Y Y_P K_r - L_r T_Y Y_P - T_P + MK_r}{Y_P K_r} \right) dY + \left(\frac{L_r - sK_r}{K_r} \right) dB \quad (20)$$

Where in equation (19) the coefficients of both dY and dB are positive, while in equation (20), for the specific case under consideration both coefficients are negative.

Therefore, in this case for an increase in domestic income fiscal policy should be expansionary and monetary policy contractionary. If the reductions of tariff protection have caused disturbances in the level of output and employment and the balance of payments, equilibrium can be restored by the right combination of *expansionary* fiscal and monetary policies.

III. Comments

We discussed in this paper the similarities and differences of two types of protection and in particular the point at which the «equivalence» of tariffs and quotas breaks down. This is a new approach to the problem of «equivalence» which is usually studied with reference to various types of market structure (Bhagwati, Yadav, Shibata). Having established the breaking point we compared the policy - mix which will restore equilibrium in the economy.

A point of crucial importance for this latter part of the analysis is the question of a clear - cut dichotomy between targets and instruments, or, in general, between endogenous and exogenous variables. But this is a limitation for which no satisfactory and realistic solution can be provided by a fixed - target model ⁵. Therefore, above anything else stands the basic question of whether a fixed - target framework is appropriate for the analysis of problems of this kind. The present analysis provides the answer to the required policy - mix which has to be applied once for the re - establishment of internal and external equilibrium, *before* any further consideration of what will happen to that equilibrium in the future and by what means it could be preserved in the long - run. Therefore, we are faced with a short - term problem which can appropriately be dealt with by a model of comparative statics ⁶.

Within the framework of the analysis and under the adopted set of specific assumptions, we conclude that the policy - mix which a country protected by quotas should use in order to restore internal and external equilibrium departs from the traditionally recommended policy - mix which can still be used by a country protected by tariffs.

5. See (6) for a successful alternative approach.

6. This certainly is not true for cases such as (3); see (6).

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