Foreign Aid, Tariffs and Nontraded Private or Public Goods

by

A.G. Schweinberger
Faculty of Economics and Statistics
The University of Konstanz, Germany

January 2000

Keywords: Nontraded Goods, Tied Aid, Public Goods.
JEL classification index F11 and F34.

Address for correspondence:
Albert G. Schweinberger
Faculty of Economics and Statistics
University of Konstanz
Fach D 150
D-78457 Konstanz
Germany
Telefax-No.: ..49/7531/88-4119
Email: Sabine.Richter@uni-konstanz.de

Abstract

The possibility of transfer paradoxes in tariff ridden, small, open, developing countries with a nontraded goods sector is analysed in three models: a (long run) mobile factor model, a (short run) sector specific factor model and a model with public goods. The transfer takes the form of an increase in mobile or sector specific factor endowments. A necessary condition for transfer paradoxes in the mobile factor model is that the import competing industry is intensive in the transferred factor. Transfer paradoxes may occur even if the outputs of the protected and the nontraded good industries fall. In the sector specific factor model (subject to certain conditions and contrary to intuition) transfer paradoxes can be ruled out if the transferred factor is allocated to the industry producing nontraded goods. On the other hand an allocation to the export industry may result in a welfare loss. Finally it is shown that the case for transfer paradoxes is much stronger in models with nontraded private goods than in models with public goods whose production is financed from tariff revenue.

1 Introduction

Probably no other topic has occupied the minds of trade theorists over so many years as the possibility of transfer paradoxes. One example of this preoccupation is the well known controversy between Keynes and Ohlin in the late twenties regarding the burden of the war reparation payments imposed upon Germany after the first world war [see Keynes 1929 (a), (b) and Ohlin 1929 (a) and (b)].

It is interesting to note that the nontraded goods sector played an important part in this debate; however at the same time trade impediments such as quotas or tariffs (in spite of their prevalence at that time) were ignored. Seventy years later there exists a huge literature on transfer paradoxes in distortionfree and distorted economies. Surprisingly nontraded goods play a relatively minor part in this literature inspite of their obvious quantitative significance, for an exception, see e.g. Brakman and Marrewijk (1998, pages 61-67).

However there exists a very rich literature on the welfare effects of transfers in distorted economies, see e.g. Bhagwati et alii (1985) or Turunen-Red and Woodland (1986). The main concern of this literature is to show that transfer paradoxes are a distinct possibility in the presence of distortions even in two country models. Furthermore, see e.g. Turunen-Red and Woodland (op.cit.) or Lahiri and Raimondos (1995), it is argued that the existence

of distortions per se does not imply that Pareto improving transfers can be designed. A reader who is unfamiliar with this literature may consult two useful surveys: Brakman and Marrewijk (op.cit.) or Kemp (1992).

A very recent contribution to the literature on transfer paradoxes is, Yano and Nugent (1999). Yano and Nugent (op.cit.) apparently are the first authors who address themselves to the possibility of transfer paradoxes in small open tariff ridden economies with nontraded goods. The transfer takes the form of an increase in the endowment with capital. The model is a standard mobile factor model with two factors and three goods: two traded goods and one nontraded good. The transfer assumes the form of an increase in the endowment with capital. This implies that the analysis in Yano and Nugent (op.cit) may be interpreted as pertaining to the literature on exogenous and possibly immerising growth. The same holds for the present paper.

Yano and Nugent (op.cit.) state as their main purpose an integration of the insights contained in the literature on transfer paradoxes in international economics with the relevant literature on development economics. Djajic, Lahiri and Raimondos (1999) pursue a similar purpose but in a very different (intertemporal) modelling framework.

Our initial purpose is to extend the theoretical analysis by Yano and Nugent (op.cit.) by explicitely distinguishing long run from short run effects of an increase in the availability of capital on utility and the allocation of factors

to the traded and nontraded goods industries. In the long run model, see the following part 2, capital is perfectly mobile between all industries, in the short run model perfectly immobile. We shall see that under certain assumptions there may be a transfer paradox in the long run but not in the short run (and vice versa). Furthermore it is shown that transfer paradoxes can be ruled out if the government allocates the transferred capital either to the export or the nontraded goods industry in the short run model. To put it more precisely, subject to a certain condition and contrary to intuition, an allocation to the industry producing nontraded goods yields a welfare gain but an allocation to the export industry a welfare loss. The appropriate allocation of the transferred capital depends only upon the relationship between the imported and the nontraded good in terms of substitutability or complementarity. This and other results are driven by the crucial fact that the output of the nontraded good is demandside determined in the long run (mobile factor) model but supplyside determined in the short run (sector specific factor) model.

It is very straightforward to show that in a standard model with two mobile factors (including the capital transferred from abroad) and three goods (two traded and one nontraded) an **increase** in the output of the nontraded good is a necessary and sufficient condition for a welfare gain of the recipient country (provided only that the nontraded good is normal in demand). The results are very different in a sector specific factor model [on the structure of

sector specific factor models, see e.g. Jones (1975) or Woodland (1982)].

The approach of this paper differs significantly from Yano and Nugent's in several ways. First and foremost we make a clear distinction between a short and long run analysis in terms of capital mobility between industries. Secondly, we allow for the fact that the transferred capital is used in an industry producing public goods (see part 4). The latter extension appears especially relevant for developing countries. As we shall see, allowing for the transferred capital to be used in the production of public goods makes for striking differences in the results.

There is yet another important analytical difference. We endeaver to integrate our analysis, as much as possible, with the standard approach to incremental policy analysis. Therefore extensive use is made of concepts familiar from incremental policy analysis, such as Hatta normality, see Hatta (1977).

Last but not least it should be noted that the distinction between the short and long run analysis can be interpreted in terms of the tying of aid, a very active research area, see e.g. Kemp and Kojima (1985) or Schweinberger (1990).

The paper is divided into four parts. In part 2 a simple (long run) version of the mobile factor model is analysed. It is shown that a transfer paradox is consistent with a fall in the output of the imported and nontraded goods. In this model the price of the nontraded good cannot change; the output of the

nontraded good is demandside determined. The main insight is this. There are two facets to the distortion: a wrong allocation of factors between the traded goods industries (the imported good is overproduced) and a wrong allocation of factors between the traded and nontraded goods industries. If the nontraded good is normal in demand it is easy to prove that an increase in its output is necessary and sufficient to rule out transfer paradoxes.

The model analysed in part 3 is a sector specific factor model. The results obtained from this short run model are very different from the results of the long run model of part 2. Part 3 concludes with a comparison of these results and argues that the short run effects of transfers on welfare may be reversed in the long run under very plausible assumptions. These are important considerations which to date have not received any attention in the received literature.

In particular they raise the following question relating to the existence of transfer paradoxes: Can transfer paradoxes in distorted economies always be ruled out if the donor and/or the recipient pursue other appropriate policies?

In the final part, part 4, we allow for public goods. Their production is financed from tariff revenue. Tariff revenue is used to pay for the labour cost arising in the production of the public good. The sector specific capital which is used in the production of the public good is transferred from abroad. The transfer is so to speak tied to the use in the public goods sector (on the theory of tied aid, see e.g.: Kemp and Kojima (1985) Brakman

and Marrewijk (1995 and 1998). Introducing public goods opens up a new perspective for transfer paradoxes [see also the received literature, e.g. Abe (1992), or Kemp and Abe (1994)]. Given the importance of the public sector in many developing countries a model which ignores public goods and the public sector in developing countries can only lead to limited insights.The latter statement seems to us of particular relevance in the context of foreign aid (international transfers) whatever the form the latter assumes.

The main conclusion which emerges from our analysis is that a much stronger case can be made for the occurrence of transfer paradoxes in countries where the transferred capital is used in the private nontraded goods industries than in countries where the transferred capital is an input in public goods production.

2 Transfer Paradoxes in a Long Run (Mobile Factor) Model

To facilitate comparison with the theoretical model of Yano and Nugent (op.cit.) we make use of their notation as much as possible. The mobile factor model with two traded goods, one nontraded good and two primary and domestically mobile factors of production consists of the following equations:

$$E_{p_3}(p_1, p_2, p_3; U) = X_3 \tag{1}$$

$$\begin{aligned} E(p_1, p_2, p_3; U) &= p_1 X_1 + p_2 X_2 + p_3 X_3 + \ldots \\ &\quad \ldots (p_2 - p_2^*)[E_{p_2}(p_1, p_2, p_3; U) - X_2] \end{aligned} \tag{2}$$

$$X_1 = X_1(p_1, p_2; K - a_{K3} X_3, L - a_{L3} X_3) \tag{3}$$

$$X_2 = X_2(p_1, p_2; K - a_{K3} X_3, L - a_{L3} X_3) \tag{4}$$

Equation (1) represents the equilibrium condition in the market for the nontraded good. As is well known, the price of the nontraded good is determined by the prices of the two traded goods and the zero profitability conditions for the two traded goods. The output of the nontraded good is demand determined. $E(\cdot)$ represents an expenditure or minimum cost function of the consumer. Good 1 is exported and good 2 imported.

The second equation is the expenditure income equality. Equations (3) and (4) stand for the supply functions of the traded goods. The arguments $K - a_{K3}X_3$ and $L - a_{L3}X_3$ indicate the supplies of capital and labour to the traded goods industries. The symbols a_{K3} and a_{L3} denote input coefficients of capital and labour in the production of the nontraded good. Note that the input coefficients are fixed because factor prices remain unchanged if the

assumed changes in K (due to a transfer from abroad) do not change the pattern of specialisation in production. A tariff is levied on the imports of good 2. The tariff is $p_2 - p_2^*$. Substituting (3) and(4), into (2) we obtain a model of two equations in two variables: U and X_3.

At this point we define for future reference factor intensities for traded goods industries in terms of the proportions of the total of capital and labour allocated to the traded goods industries.

$$\begin{aligned} \alpha_{L1}^T &= \frac{a_{L1}X_1}{L - a_{L3}X_3}, \qquad \alpha_{L2}^T = \frac{a_{L2}X_2}{L - a_{L3}X_3} \\ \alpha_{K1}^T &= \frac{a_{K1}X_1}{K - a_{K3}X_3}, \qquad \alpha_{K2}^T = \frac{a_{K2}X_2}{K - a_{K3}X_3} \end{aligned} \tag{5}$$

with obvious notation.

Note that the allocation ratios to the traded goods industries add to unity, i.e.: $\alpha_{L1}^T + \alpha_{L2}^T = 1$ and $\alpha_{K1}^T + \alpha_{K2}^T = 1$

Good 2 is defined to be intensive in the use of capital relative to good 1 if:

$$\alpha_{K2}^T/\alpha_{L2}^T > \alpha_{K1}^T/\alpha_{L1}^T \tag{6}$$

After total differentiation of (3) and (4) we obtain the following two expressions which will turn out to be useful:

$$dX_1 = -(\frac{\partial X_1}{\partial \tilde{K}}a_{K3} + \frac{\partial X_1}{\partial \tilde{L}}a_{L3})dX_3 \tag{7}$$

and

$$dX_2 = -(\frac{\partial X_2}{\partial \tilde{K}}a_{K3} + \frac{\partial X_2}{\partial \tilde{L}}a_{L3})dX_3 \tag{8}$$

where: $\tilde{K} = K - a_{K3}X_3$ and

$\tilde{L} = L - a_{L3}X_3$

Expressions (7) and (8) should be interpreted as defining marginal rates of transformation. In the following analysis we shall also make use of the following definition.

Definition 1

Goods 2 and 3 are complements on the supply side if and only if $dX_3 > 0$ implies $dX_2 > 0$. Goods 2 and 3 are substitutes on the supply side if and only if $dX_3 > 0$ implies $dX_2 < 0$.

One of the expressions in the rounded brackets in (7) and (8) may be negative but not both. Of course both expressions may be positive.

We now turn to the derivation of the appropriate Hatta normality condition (see Hatta 1977) by defining first an aggregate excess expenditure function from (2):

$$AE = E(\cdot) - p_1X_1 - p_2X_2 - p_3X_3 - (p_2 - p_2^*)[E_{p_2}(p_1, p_2, p_3; U) - X_2] \quad (9)$$

where: where AE stands for aggregate excess expenditure

We now substitute for X_3, the Hicksian demand function for the non-traded good $E_{p_3}(p_1, p_2, p_3; U)$. The resulting aggregate excess expenditure

function may be referred to as a **constrained aggregate excess expenditure function**. It is constrained by the equilibrium condition for the nontraded goods market.

We are now in a position to define an appropriate **Hatta normality condition**, see Hatta (1977). Hatta normality holds if the constrained aggregate excess expenditure function is increasing in utility starting from zero aggregate excess expenditure.

The Hatta normality condition plays a key part in virtually all incremental policy analysis in tariff ridden economies. If the Hatta normality condition is violated globally, i.e.: if the aggregate expenditure function is declining in utility globally it would be possible to raise utility without bounds (with finite factor endowments). We assume that the Hatta normality condition is satisfied.

We shall prove that if the Hatta normality condition is satisfied then:

$$E_u - t[E_{p_2U} + E_{p_3U}(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3})] > 0 \tag{10}$$

where: $t = p_2 - p_2^*$.

In models without nontraded goods the Hatta normality condition assumes the following well known simple form:

$$E_U - tE_{p_2U} > 0 \tag{11}$$

The interpretation of the additional term in (10):

$$-tE_{p_3U}(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3}) \tag{12}$$

is straightforward. An increase in U raises X_3 from equation (1) if the non-traded good is a normal good. The nontraded good and the imported good are complements on the supply side if the expression in the rounded brackets in (10) and (12) is negative [see expression (8) and Definition 1]. Let goods 2 and 3 be complements on the supply side; then we know that an increase in U implies an increase in X_2 (if good 2 is normal in demand) and therefore an increase in aggregate excess expenditure. Tariff revenue falls because (ceteris paribus) imports fall.

We now proceed to prove expression (10). Totally differentiating the constrained aggregate excess expenditure function with respect to U we have:

$$dAE = (E_U - tE_{p_2U})dU + tdX_2 \tag{13}$$

Expression (13) follows because:

$$p_1dX_1 + p_2dX_2 + p_3dX_3 = 0 \tag{14}$$

from the maximisation of the value of output.

Substituting $dX_3 = E_{p_3U}dU$ from (1) into expression (8) we readily obtain:

$$dX_2 = -(\frac{\partial X_2}{\partial \tilde{K}}a_{K3} + \frac{\partial X_2}{\partial \tilde{L}}a_{L3})E_{p_3U}dU \tag{15}$$

Substituting (15) into (13) we find that

$$\frac{dAE}{dU} = E_U - t[E_{p_2U} + E_{p_3U}(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3})] \qquad (16)$$

This proves expression (10). Q.E.D.

We are now in a position to state and then prove our first main result.

Proposition I

(a) Let Hatta normality, see expression (10), hold. The capital endowment of the mobile factor economy described by equations (1) to (4) increases due to a transfer from abroad. Then transfer paradoxes can be ruled out if and only if:

$$rdK > t\frac{\partial X_2}{\partial \tilde{K}} dK$$

where: r stands for the rental of K.

(b) Transfer paradoxes are impossible if the imported good is labour intensive. Transfer paradoxes occur only if the imported good 2 is capital intensive. Factor intensities are interpreted in terms of allocations of capital and labour as a proportion of total factors allocated to the traded goods industries, see expressions (5).

(c) Assume that the imported good is capital intensive, i.e.:

$$a_{L1}a_{K2} > a_{K1}a_{L2}$$

Then transfer paradoxes can be ruled out if and only if the world price vector (p_1^*, p_2^*) lies within the cone spanned by the input coefficient vectors (a_{L1}, a_{L2}) and (a_{K1}, a_{K2}), i.e.: if and only if:

$$\frac{a_{L1}}{a_{L2}} > \frac{p_1^*}{p_2^*} > \frac{a_{K1}}{a_{K2}}$$

Proof: Totally differentiate the expenditure income equality, expression (2), with respect to U, X_3 and K. The derivative of $p_1X_1 + p_2X_2 + p_3X_3$ with respect to K is equal to r.

This yields:

$$(E_U - tE_{p_2U})dU = rdK - tdX_2 \tag{17}$$

where:

$$dX_2 = \frac{\partial X_2}{\partial \tilde{K}}dK - (\frac{\partial X_2}{\partial \tilde{K}}a_{K3} + \frac{\partial X_2}{\partial \tilde{L}}a_{L3})E_{p_3U}dU \tag{18}$$

see also expression (15).

Substituting for dX_2 into (17) we obtain after rearrangement:

$$\Big\{E_U - t[E_{p_2U} + E_{p_3U}(\frac{\partial X_2}{\partial \tilde{K}}a_{K3} + \frac{\partial X_2}{\partial \tilde{L}}a_{L3})]\Big\}dU = rdK - t\frac{\partial X_2}{\partial \tilde{K}}dK \qquad (19)$$

The coefficient of dU (in the curly brackets) is equal to the left hand side of (10). If Hatta normality holds this coefficient is positive. Hence dU is positive if and only if the right hand side of (19) is positive. Note that $\partial X_2/\partial \tilde{K}$ is positive (negative) if good 2 is capital (labour) intensive and $\partial X_2/\partial \tilde{L}$ is positive (negative) if good 2 is labour (capital) intensive, see expression (5). This follows from an appropriately adapted version of the Rybczynski theorem.

This proves (a) and (b) of Preposition I. To prove (c) one derives $\partial X_2/\partial \tilde{K}$ from the following factor market equilibrium conditions:

$$a_{L1}X_1 + a_{L2}X_2 = \tilde{L}$$

$$a_{K1}X_1 + a_{K2}X_2 = \tilde{K}$$

This yields:

$$\frac{\partial X_2}{\partial \tilde{K}} = \frac{a_{L1}}{|a|}$$

where: $\qquad |a| = a_{L1}a_{K2} - a_{K1}a_{L2} > 0$

Solving the following zero profitability conditions for r:

$$a_{L1}w + a_{K1}r = p_1^* = p_1$$

$$a_{L2}w + a_{K2}r = p_2$$

one obtains:

$$r = (p_2 a_{L1} - p_1^* a_{L2})/|a|$$

Therefore:

$$r - t\,\partial X_2/\partial \tilde{K} = \frac{\left(\frac{a_{L1}}{a_{L2}} - \frac{p_1^*}{p_2^*}\right) a_{L2} p_2^*}{|a|}$$

Let $|a| > 0$, then either:

$$\frac{a_{L1}}{a_{L2}} > \frac{p_1^*}{p_2^*} > \frac{p_1^*}{p_2} > \frac{a_{K1}}{a_{K2}} \qquad or \qquad \frac{p_1^*}{p_2^*} > \frac{a_{L1}}{a_{L2}} > \frac{p_1^*}{p_2} > \frac{a_{K1}}{a_{K2}}$$

$Q.E.D.$

Before we proceed to an interpretation of Proposition I we should have another look at expression (10), Hatta normality. Making use of the identity:

$$E(p_1, p_2, p_3; U) = p_1 E_{p_1} + p_2 E_{p_2} + p_3 E_{p_3} \tag{20}$$

it is easy to show that

$$E_U - t[E_{p_2 U} + E_{p_3 U}(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3})] = \tag{21}$$
$$p_1 E_{p_1 U} + p_2^* E_{p_2 U} + E_{p_3 U}[p_3 - t(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3})]$$

It is well known that in economies without nontraded goods the assumption of normality in demand implies Hatta normality. This is not the case in models with nontraded goods. An additional assumption is needed, namely:

$$p_3 > (p_2 - p_2^*)(\frac{\partial X_2}{\partial \tilde{K}} a_{K3} + \frac{\partial X_2}{\partial \tilde{L}} a_{L3}) \tag{22}$$

Expressions (21) and (22) imply that the following two assumptions imply Hatta normality: (a) all goods are normal in demand and goods 2 and 3 are complements on the supply side, see expression (8) and Definition 1.

The interpretation of Proposition I, part (c) is straightforward. The shadow price of capital is negative if and only if the vector of world market prices $(p_1{}^*, p_2{}^*)$ lies outside the cone spanned by the input coefficients of the traded goods industries. This represents an extension of a well known result (see e.g. Jones 1971).

In our view two interesting questions may be asked at this point:

(1) Are increases in the outputs of industries 2 and 3 consistent with an increase in welfare as a result of the transfer?

(2) Are decreases in the outputs of industries 2 and 3 consistent with transfer paradoxes?

First, with Hatta normality and good 3 being a normal good, it follows from equation (1) that an increase in the output of good 3 raises utility and from equation (19) that an increase in utility may or may not imply an increase in the output of good 2. The output of good 2 definitely increases if goods 2 and 3 are complements on the supply side (see Definition 1) and good 2

is capital intensive. This follows directly from expression (18). Therefore we have shown that increases in the outputs of goods 2 and 3 are consistent with recipient enrichment as a result of the transfer if Hatta normality applies, good 3 is normal in demand and goods 2 and 3 are complements on the supply side (see Definition 1). This is the first counter-intuitive result.

With Hatta normality and good 3 being a normal good in demand, a **decrease** in the output of good 3 implies a transfer paradox. This implies from equation (19) that the output of good 2 must rise. Therefore a fall in the output of good 3 implies (subject to the stated conditions) an increase in the output of good 2. The latter conclusion does not follow if Hatta normality does not (necessarily) hold as in Yano and Nugent (op.cit.). Assume that Hatta normality is (locally) violated. Then a decrease in the output of good 3 (as a result of the transfer) may well imply a fall in the output of good 2. This entails, of course, that an increase in the output of good 1 (the exported good) and a decrease in the outputs of good 2 and 3 may be consistent with transfer paradoxes (in the absence of Hatta normality). This is the second counter-intuitive result.

Both counter-intuitive results are relatively straightforward to explain.

In the Johnson analysis, see Johnson (1967), there was only one distortion; the imported good was overproduced. Only the allocation of factors between the export and import sectors is affected by the tariff. The consump-

tion distortion drops out because the domestic price p_2 does not change, see Schweinberger (1989). In a model with nontraded goods the allocation of factors between the industries producing the imported good and the nontraded goods is also distorted. There is the well known spillover effect of distortions into other markets.

There may be a transfer paradox even if the outputs of goods 2 and 3 fall and therefore the output of good 1 rises if this implies a worsening of the allocation of factors between the industries producing the imported and the nontraded good respectively. This is the key message implicit in the analysis of the welfare effects of a transfer in a model with nontraded goods in a small tariff ridden economy.

Note also to obtain these results we do not need to **assume** Hatta normality. Hatta normality is implied if all goods are normal in demand and expression (22) holds. Expression (22) holds if goods 2 and 3 are complements on the supply side, see expression (8) and Definition 1.

To conclude this part we return to the main result [see Proposition I and expression (19)]. The main contribution of Proposition I is the generalisation of a very well known result first derived by Johnson in Johnson (1967) to nontraded goods. The results stated as Proposition I differ significantly from the results obtained by Yano and Nugent in op. cit.. There are two main reasons for this. Firstly there is a different specification of the model and secondly we make extensive use of Hatta normality.

A correct specification of the long run model reveals that the supply of the nontraded good is demand determined. If the nontraded good is normal in demand a transfer which brings about an increase in the output of the nontraded good can only lead to a welfare improvement. This holds independently of Hatta normality. On the other hand if Hatta normality holds a necessary condition for transfer paradoxes to occur is probably satisfied in many developing countries because the import competing sector may be taken to be capital intensive.

3 Transfer Paradoxes in Short Run (Sector Specific Factor) Models

We now turn to an analysis of the welfare effects of transfers (in the form of capital) in a short run (sector specific factor) model. This raises a very interesting issue which to date has not received any attention in the literature. As one may expect, the welfare effects of the transfer depend crucially upon the sector in which the transferred capital is used. The question which arises in this context is whether there exists an allocation of the transferred capital to the three industries which rules out the occurrence of transfer paradoxes. As we shall see, the answer to this question is in the affirmative, see Proposition II below.

As pointed out in the Introduction it seems of considerable interest to compare the likelihood of the occurrence of transfer paradoxes in long and short run models. We shall argue that under certain conditions there is a distinct possibility that "welfare reversals" may occur, i.e.: that transfer paradoxes are observable in the long run but the welfare effects are normal in the short run (or vice versa). The possibility of channelling the transferred capital to certain industries in the short run also plays an important part with regard to "welfare reversals".

All these issues seem to be relevant to real world problems because there exists ample evidence that a considerable part of foreign aid is tied aid. There are many forms of tying which have already been considered in the literature but apparently the tying of foreign aid in terms of the allocation of capital to a specific industry is something novel.

To answer the questions raised above we make use of the following short run model:

$$E_{p_3}(p_1, p_2, p_3; U) = X_3(p_1, p_2, p_3; K_1, K_2, K_3; L) \tag{23}$$

$$E(p_1, p_2, p_3; U) = p_1 X_1 + p_2 X_2 + p_3 X_3 + tM \tag{24}$$

$$X_1 = X_1(p_1, p_2, p_3, K_1, K_2, K_3; L) \tag{25}$$

$$X_2 = X_2(p_1, p_2, p_3, K_1, K_2, K_3; L) \tag{26}$$

$$X_3 = X_3(p_1, p_2, p_3, K_1, K_2, K_3; L) \tag{27}$$

$$M = E_{p_2}(p_1, p_2, p_3, U) - X_2 \tag{28}$$

Substituting expressions (25) to (28) into (23) and (24) we obtain after total differentiation with respect to K_1, K_2 and K_3:

$$E_{p_3} dp_3 + E_{p_3} dU = \frac{\partial X_3}{\partial p_3} d\, p_3 + \frac{\partial X_3}{\partial K_1} d\, K_1 + \frac{\partial X_3}{\partial K_2} d\, K_2 + \frac{\partial X_3}{\partial K_3} d\, K_3 \tag{29}$$

$$E_{p_3} dp_3 + E_U\, dU = X_3 dp_3 + r_1 d\, K_1 + r_2 d\, K_2 + r_3 d\, K_3 + \ldots \tag{30}$$

$$\ldots + t\Big[(E_{p_2 p_3} - \frac{\partial X_2}{\partial p_3}) dp_3 + E_{p_2 U}\, dU - \frac{\partial X_2}{\partial K_1} d\, K_1 - \frac{\partial X_2}{\partial K_2} d\, K_2 - \frac{\partial X_2}{\partial K_3} d\, K_3\Big]$$

Solving (29) for dp_3 and substituting for dp_3 in expression (30) we readily arrive at:

$$\beta_0\, dU = \beta_1\, dK_1 + \beta_2\, dK_2 + \beta_3\, dK_3 \tag{31}$$

where:

$$\beta_0 = E_U - t E_{p_2 U} + \frac{t(E_{p_2 p_3} - \frac{\partial X_2}{\partial p_3}) E_{p_3 U}}{(E_{p_3 p_3} - \frac{\partial X_3}{\partial p_3})} \tag{32}$$

$$\beta_1 = r_1 - t\frac{\partial X_2}{\partial K_1} + \frac{t(E_{p_2p_3} - \frac{\partial X_2}{\partial p_3})\frac{\partial X_3}{\partial K_1}}{(E_{p_3p_3} - \frac{\partial X_3}{\partial p_3})} \tag{33}$$

$$\beta_2 = r_2 - t\frac{\partial X_2}{\partial K_2} + \frac{t(E_{p_2p_3} - \frac{\partial X_2}{\partial p_3})\frac{\partial X_3}{\partial K_2}}{(E_{p_3p_3} - \frac{\partial X_3}{\partial p_3})} \tag{34}$$

$$\beta_3 = r_3 - t\frac{\partial X_2}{\partial K_3} + \frac{t(E_{p_2p_3} - \frac{\partial X_2}{\partial p_3})\frac{\partial X_3}{\partial K_3}}{(E_{p_3p_3} - \frac{\partial X_3}{\partial p_3})} \tag{35}$$

The coefficient of dU in expression (31) is assumed to be positive. This should be regarded as a Hatta normality condition, [see expression (32)]. The expressions for β_1, β_2 and β_3 consist of three terms. The first term represents the standard factor expansion effect, i.e.: the rental. The second term indicates the direct effect of the increased factor availability on tariff revenue (the price of the nontraded good is assumed to remain unchanged). Both these terms can also be found in the long run analysis, see part 2, expression (19). The third term only occurs in the short run analysis. It stands for the indirect effect on tariff revenue of an increase in factor availability. It captures the effects of a change in p_3 on tariff revenue.

We now state the definition for net substitutes or complements as definition 2.

Definition 2

The imported good 2 and the nontraded good are **net substitutes** if:

$$E_{p_2p_3} - \frac{\partial X_2}{\partial p_3} > 0$$

and net complements if:

$$E_{p_2p_3} - \frac{\partial X_2}{\partial p_3} < 0$$

These are well known standard definitions. The expressions for β_1, β_2 and β_3 have the following remarkable property: whatever the relationship between goods 2 and 3 in terms of net substitutability or complementarity, there exists at least one of β_1, β_2 and β_3 which is positive. This property is easy to prove. We know from Jones (1977) that:

$$\frac{\partial X_3}{\partial K_1} < 0, \frac{\partial X_3}{\partial K_2} < 0 \quad and \quad \frac{\partial X_3}{\partial K_3} > 0 \tag{36}$$

From this follows that if goods 2 and 3 are net substitutes then $\beta_1 > 0$. If, on the other hand, goods 2 and 3 are net complements, then $\beta_3 > 0$. We have therefore proven the following Proposition II.

Proposition II

Assume that Hatta normality holds in the short run (sector specific factor) model described by equations (23) to (28), i.e. $\beta_0 > 0$, see expressions (31) and (32). Foreign aid assumes the form of a transfer of capital. There is no tying of the use of capital to a certain industry by the donor country. Then there always exists an allocation of the transferred capital to the industries so that transfer paradoxes can be ruled out. If the imported good and the nontraded good are net substitutes, see Definition 2, the transferred capital should be allocated to the exporting industry (good 1). If the imported good

and the nontraded good are net complements, see Definition 2, the transferred capital should be allocated to the nontraded goods industry.

Proof: see expressions (31), (32), (33) and (35) and Definition 2. Q.E.D.

Proposition II is useful because it can readily be generalised to any finite number of traded goods and because the informational requirements for the government appear relatively modest.

In interpreting Proposition II we have focussed up to now on the possibility of achieving a welfare improvement for the recipient country by allocating the transferred capital to a specific industry and thereby reducing the twin distortions of a wrong allocation of factors between the export and import competing industry and the two trading goods industries on the one hand and the nontraded good industry on the other. This is one possible interpretation. Another is to assume that the donor country ties the transfer of capital to the capital being used in one industry only. What is interesting about the latter interpretation is that tied aid may be preferred by the recipient country to untied aid. There is another reason why tied aid may in this case be preferred to untied aid. If the tying is undertaken by the donor it is less likely that the production agents will attempt to try to influence the decision making of the domestic government by means of costly political activities such as lobbying. To conclude this part we turn to an analysis of the possibility of "welfare

reversals" of transfers in the short and long run models.

At this point a comparison of the results of the long run analysis in part 2 and the short run analysis in part 3 is appropriate. In the short run model we have shown that transfer paradoxes can be ruled out unless the transfer is tied to industry 2 (if the government can decide upon the allocation of the transferred capital).

On the other hand, if both traded goods are produced in the long run equilibrium before and after the transfer of capital, factor prices and therefore the factor intensity condition and the cone condition are given by technology and the world market prices which remain unchanged by assumption. If $|a|$ is positive and $\frac{p_1^*}{p_2^*} > \frac{a_{L1}}{a_{L2}}$ it follows from Proposition I(c) that we have a case of recipient impoverishment, i.e.: a transfer paradox in the long run.

Considering Propositions (1) and (2) we can readily derive a set of sufficient conditions for **welfare reversals** in the short and long run models. To make this statement rigorous one would have to carry out an analysis of the transition of the short run to the long run equilibrium and derive stability conditions. This is omitted because of lack of space (stability is assumed). A very useful dynamic analysis of the transition from the short run to the long run equilibrium in an economy with involuntary unemployment can be found in Neary (1982).

An interesting implication follows from this comparison of the results of the short and long run analysis. If welfare reversals occur it is important

to carry out policies which either promote or impede capital mobility. If welfare reversals occur in the real world it would appear to be imperative for the government to pursue industrial and structural policies which either promote or reduce the mobility of capital between the industries. This raises a number of important issues which are beyond the scope of this paper. Last but not least it should be noted that the results stated as Propositions I and II are directly relevant to the debate on booming sectors and deindustrialisation, see Corden and Neary (1982) and the relationship between the two well known strands of literature on transfer paradoxes and immiserizing growth, see Srinivasan and Bhagwati (1983).

4 Public Goods and Transfer Paradoxes

Nearly every developing country has a relatively large public sector. Private and/or public goods are produced in the public sector. Their production is financed from governmental income, such as tariff revenue. A paper forcussing on the welfare effects of a transfer to developing countries should take into account the public sector. The reason for this is simple: if the transfer takes the form of capital it seems extremely likely that at least part of this capital will be used in the public sector.

There exists a relatively small literature on the welfare effects of transfers if the proceeds of the transfer are used to finance the production of public goods [see e.g. Abe (1991) and Hatzipanatou and Michael (1995)].

One should, of course, interpret the transfer of a factor of production as a form of tied aid. This follows because it is implicitely assumed in e.g. Yano and Nugent (op.cit.) or this paper that the factor of the production capital cannot be sold in world markets to transform it into goods or other factors. The literature on tied aid is relatively large, see e.g. Kemp and Kojima (1985), Schweinberger (1990), Lahiri and Raimondos (1995), or Brakman and Marrewijk (1996). A very useful survey can be found in the recent book Brakman and Marrewijk (1998).

What distinguishes the present approach from the received literature is: (a) the modelling of the financing of the production of public goods or to put it precisely the financing of the labour cost (of public goods) and (b) the form of the transfer: capital as a factor which is specific to the public good industry in small open economies.

The model with public goods consists of the following six equations:

$$NE(p_1, p_2; G; U) = p_1 X_1 + p_2 X_2 + wL^G \tag{37}$$

$$wL^G = (p_2 - p_2^*)[NE_{p_2}(p_1, p_2; G; U) - X_2] \tag{38}$$

$$G = G(L^G, K^G) \tag{39}$$

$$w = \frac{\partial R(p_1, p_2, L - L^G, K_1, K_2)}{\partial (L - L^G)} \tag{40}$$

$$X_1 = X_1(p_1, p_2, L - L^G, K_1, K_2) \tag{41}$$

$$X_2 = X_2(p_1, p_2, L - L^G, K_1, K_2) \tag{42}$$

where: N stands for the number of households

L^G labour (the mobile factor) used in the production of the public good

G the output of the public good

w the wage rate

L the endowment with labour

K^G the amount of capital used in the production of the public good and

$R(\cdot)$ an appropriately defined **private** sector revenue function.

The production function of the public good is constant returns to scale and strictly quasi concave. The symbol K^G stands for the existing transfer from abroad. It increases exogenously. The model of six equations in six

variables, X_1, X_2, w, G, L^G and U can be reduced to a model of two equations in two variables L^G and U by substituting expressions (39) to (42) into (37) and (38) where appropriate.

This yields:

$$NE[p_1, p_2; G(L^G, K^G); U] = p_1 X_1(p_1, p_2, L - L^G, K_1, K_2) + \ldots \tag{43}$$
$$p_2 X_2(p_1, p_2, L - L^G, K_1, K_2) + w(p_1, p_2, L - L^G, K_1, K_2) L^G$$

and

$$w(p_1, p_2, L - L^G, K_1, K_2) L^G = \tag{44}$$
$$(p_2 - p_2^*)[NE_{p_2}(p_1, p_2; G(L^G, K^G), U] \ldots$$
$$\ldots - (p_2 - p_2^*) X_2(p_1, p_2, L - L^G; K_1, K_2)$$

Totally differentiating equations (43) and (44) with respect to K^G we obtain:

$$(NE_G \frac{\partial G}{\partial L^G} + L^G \frac{\partial w}{\partial L^P}) dL^G + NE_U dU = -NE_G \frac{\partial G}{\partial K^G} dK^G \tag{45}$$

$$D dL^G - tNE_{p_2 U} dU = tN \frac{\partial E_{p_2}}{\partial G} \frac{\partial G}{\partial K^G} dK^G \tag{46}$$

where: $L^P = L - L^G$ and

$$D = w - L^G \tfrac{\partial w}{\partial L^P} - t(N \tfrac{\partial E_{p_2}}{\partial G} \tfrac{\partial G}{\partial L^G} + \tfrac{\partial X_2}{\partial L^P})$$

Note that in deriving (45) and (46) we have made use of the fact that:

$$w = p_1 \frac{\partial X_1}{\partial L^P} + p_2 \frac{\partial X_2}{\partial L^P}$$

Rather than solving the model algebraically we proceed with a diagrammatic analysis in the space U and L^G.

The following derivatives follow from (45):

$$(\frac{dU}{dL^G})_I = \frac{-A}{NE_U} \tag{47}$$

and

$$(\frac{dU}{dK^G})_I = \frac{-E_G \frac{\partial G}{\partial K^G}}{E_U} \tag{48}$$

where: $A = NE_G \frac{\partial G}{\partial L^G} + L^G \frac{\partial w}{\partial L^P}$

Since the public good is underproduced $E_G < 0$.E_G stands for the so called marginal willingness to pay.

From standard assumptions:

$$(\frac{dU}{dL^G})_I > 0 \quad and \quad (\frac{dU}{dK^G})_I > 0 \tag{49}$$

The corresponding derivatives from (46) are:

$$(\frac{dU}{dL^G})_{II} = \frac{D}{tNE_{p_2U}} \tag{50}$$

and

$$(\frac{dU}{dK^G})_{II} = \frac{-\frac{\partial E_{p_2}}{\partial G}\frac{\partial G}{\partial K^G}}{E_{p_2U}} \tag{51}$$

Expressions (50) and (51) cannot be signed without further assumptions.

Assumption I

D, $\partial E_{p_2}/\partial G$ and E_{p_2U} are positive.

The assumption that D is positive can be interpreted in terms of a ceteris paribus stability condition for the budget deficit of the government. D is positive if a ceteris paribus increase in L^G implies an increase in the budget deficit. The budget deficit is the difference between the left and right hand sides of (38). This assumption is, of course, an analogue to the Hatta normality condition. The assumption that $\frac{\partial E_{p_2}}{\partial G}$ is positive states that an increase in G increases the demand for the imported good. It is generally assumed in the received literature on public goods, see e.g. Raimondos and Lahiri (1997), that the utility function is separable in the consumption of private and public goods. In this case an increase in the availability (consumption) of the public good only has an income effect. An increase in the output of the public good is equivalent to an increase in income. If good 2 is normal in demand the consumption of good 2 should rise. It would therefore appear

that **Assumption I** is reasonable. Given Assumption I we know that:

$$(\frac{dU}{dL^G})_{II} > 0 \; and \; (\frac{dU}{dK^G})_{II} < 0 \tag{52}$$

We are now in a position to proceed to the diagrammatic analysis: We have argued above that $\left(\frac{d\,U}{d\,L^G}\right)_I$ and $\left(\frac{d\,U}{d\,L^G}\right)_{II}$ are both positive if Assumption I holds. However we cannot determine on a priori grounds if

$$\left(\frac{d\,U}{d\,L^G}\right)_I > \left(\frac{d\,U}{d\,L^G}\right)_{II}$$

or

$$\left(\frac{d\,U}{d\,L^G}\right)_I < \left(\frac{d\,U}{d\,L^G}\right)_{II}$$

We shall prove below that subject to the following Assumption II the equilibrium is stable if and only if:

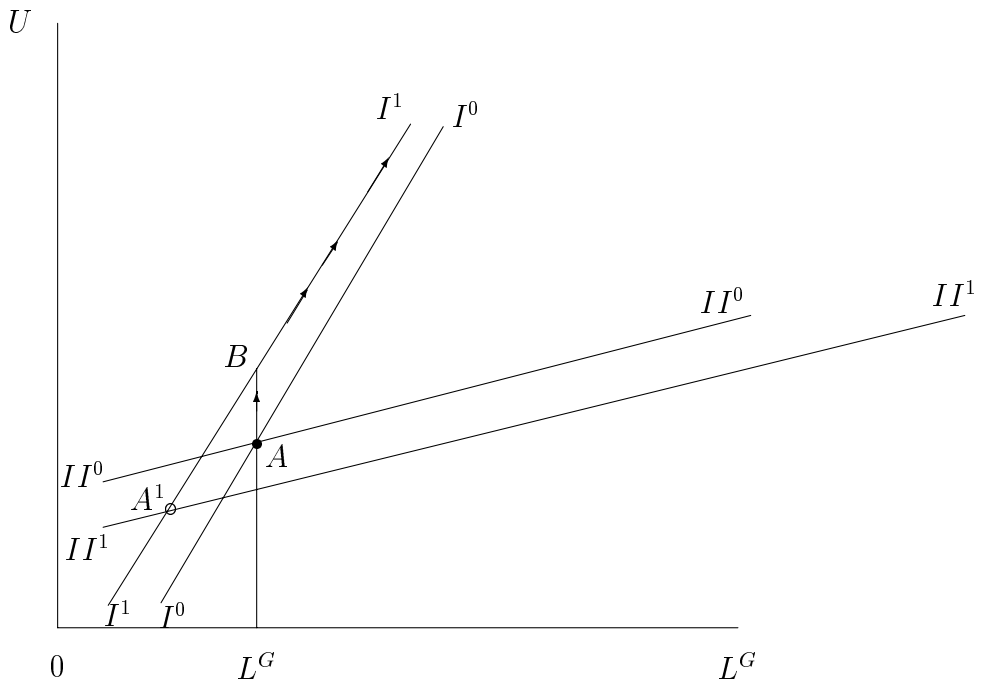
$$\left(\frac{d\,U}{d\,L^G}\right)_{II} > \left(\frac{d\,U}{d\,L^G}\right)_I . \tag{53}$$

Assumption II

An increase in K^G implies an instantaneous adjustment in household spending so that equation (43) is always satisfied. However L^G does not adjust instantaneously. Therefore expression (44) may not be satisfied (temporarily).

We shall now show that Assumption I and II imply that (53) holds.

Figure 1:



In drawing Figures 1 and 2 we make use of expressions (49) and (52). Note also that in Figure 1 we have assumed that

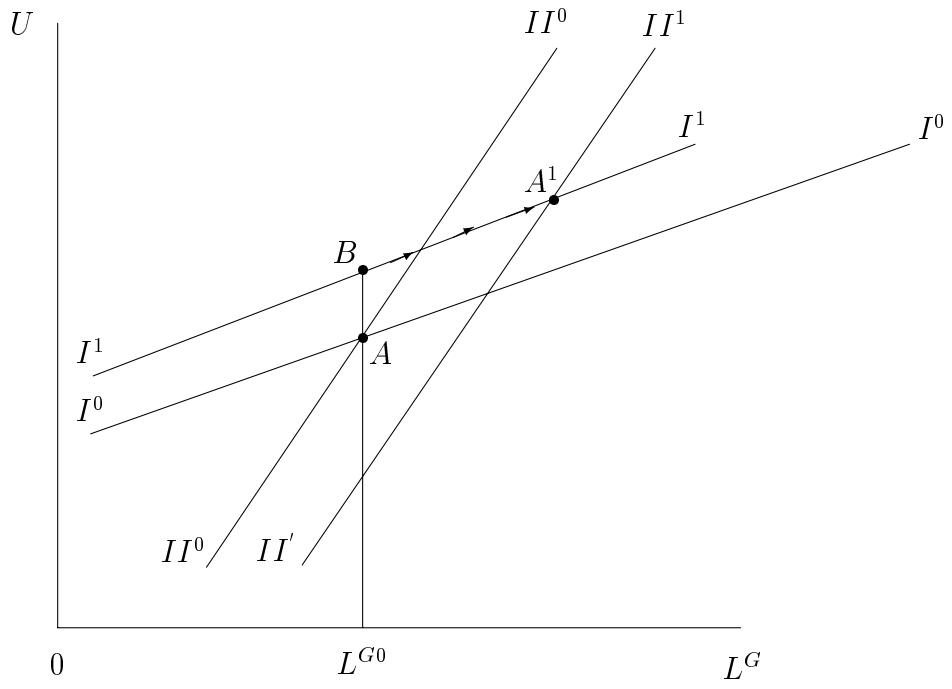
$$(\frac{dU}{dL^G})_I > (\frac{dU}{dL^G})_{II} \tag{54}$$

however in Figure 2

$$(\frac{dU}{dL^G})_{II} > (\frac{dU}{dL^G})_I \tag{55}$$

An inspection of Figures 1 and 2 shows that in the standard comparative static analysis we can only conclude that there is a transfer paradox if (54)

Figure 2:



applies and there is no transfer paradox in the case of (55). However an appropriate dynamic analysis demonstrates that subject to Assumptions I and II transfer paradoxes can be ruled out. To obtain this result we only have to postulate that it is more difficult to adjust L^G than total spending of households on private goods. The readers attention is now drawn to Figure 1. If L^G is fixed and spending adjusts as K^G rises the economy moves from A to B. At B there is a budget surplus for the government. B is to the left of II^1. The government therefore decides to increase L^G. The upshot of all this is that comparing Figures 1 and 2 the economy will never reach A^1 on Figure 1 but move steadily towards A^1 on Figure 2. From an appropriately defined

Correspondence Principle it follows that the relationship between the slopes must be as shown on Figure 2 [see expression (55)]. Note also that since equation (43) is always satisfied because private spending and utility adjust instantaneously it follows that the adjustment path to the new equilibrium at A^1 coincides with I^1.

The preceding derivation and conclusion is now formalised as Proposition III.

Proposition III

Let Assumption I hold. Further assume that the increase in K^G (foreign transfer) calls forth a rapid response in private spending and therefore utility but a sluggish response in L^G (the amount of the labour force employed in the public sector), see Assumption II. Furthermore let the equilibrium be stable. Then the foreign transfer (increase in the input of capital in the production of the public good) must raise the welfare of the small open economy with a public sector described by equations (37) to (42).

Proof: see the argument preceding Proposition III.

At this point it should be emphasized that the assumption that D is positive is not necessary for Proposition III. It is straightforward to show

that a negative D in conjunction with the other assumptions also implies that transfer paradoxes can be ruled out. An interesting extension of the preceding analysis would be to vary the number of households N and determine how this affects the results. Unfortunately this has to be omitted because of lack of space.

5 Conclusions and Extensions

As explained in part 1 one of the gaps in the generally comprehensive literature on the welfare effects of transfers until very recently was the analysis of the occurrence of transfer paradoxes in small open tariff distorted countries with nontraded private and public goods. This statement holds a fortiori if the transfer takes the form of a transfer of capital (a factor of production) which may or may not be tied to a certain industry. Yano and Nugent (op.cit.) have attempted to close this gap. However they fail to distinguish between the short and long run analysis which is the main focus of this paper. Similarly they do not consider the possibility that the transferred capital is used in the production of a public good where the production of the public good is financed from tariff revenue. Again this seems to be of fundamental importance especially in developing countries. Yano and Nugent argue that the occurrence of transfer paradoxes is more likely if the transferred capital is

used in the nontraded good industry. If the latter is the case we have shown, see expressions (31), (32), (33) and (35), that (subject to Hatta normality) transfer paradoxes can be ruled out in the short run model if the imported good and the nontraded good are net complements. Furthermore in this case transfer paradoxes can occur only if the imported and the nontraded goods are net substitutes.

There are many other results stated as Propositions I to III which are driven by the important distinction between the short and long run analyses. Especially we have been able to show that there always exists an allocation of the transferred capital to the export industry or the nontraded goods industry such that transfer paradoxes cannot occur, see Proposition II.

Transfer paradoxes may, of course, still occur if the sector specific capital becomes mobile over time. But the mobility of capital can undoubtedly be reduced by appropriate governmental policy. Conversely, there may be transfer paradoxes in the short run, for example because of tying by the donor, but normal welfare effects in the long run. In this case policies which increase the mobility of capital should be implemented. This kind of reasoning is aimed at correcting one of the main shortcomings of the received literature on transfer paradoxes. Why should a government continue to accept recurring foreign aid (whatever its form) if it leads to a welfare loss? Surely, the emphasis must be shifted to an analysis of implementing simultaneously other policies which ensure that transfer paradoxes cannot occur.

Most importantly, using the work by Johnson (Johnson 1967) as a benchmark, the analysis has revealed that in a model of a small tariff ridden economy and nontraded goods the existence of the tariff implies generally that both the allocation of factors between the two traded goods industries and the traded and nontraded goods industries is distorted. An increase in the output of the import competing good and the nontraded good is consistent with a welfare improvement and a decrease in both outputs with a welfare loss. This is the key contribution of the long run (mobile factor) model and holds a fortiori in the short run model. Formally the spillover effect of the tariff into the market for the nontraded good is reflected in a different form of the Hatta normality condition and a different form of the output effect, see expressions (19) and (31) to (35). This entails that generally speaking we cannot conclude that transfer paradoxes are more likely if the transferred capital is used in the nontraded good industry instead of the export industry. This is one of the key conclusions of the paper. It is counterintuitive because it is often presumed that an investment in an export industry necessarily increases exports and trade and therefore must be desirable (relative to an investment in the industry producing nontraded goods).

Finally, it seems essential to consider that the transferred capital is used by the government in the production of public rather than private goods. This statement holds a fortiori in a model with many different households. We have shown that the occurrence of transfer paradoxes can be ruled out

subject to reasonable assumptions if the transferred capital is used in the production of public goods. This result which contrasts sharply with the conclusions reached in parts 2 and 3 (where only private nontraded goods are considered) seems of particular relevance to developing countries.

In conclusion several important possible extensions should be pointed out. First and foremost it would seem imperative to extend the analysis to involuntary employment and a multihousehold economy. A political economy perspective is especially relevant to developing countries. The allocation of the transferred capital to one or more industries by the government is certainly subject to considerable pressure by vested interest groups. If the political activities of vested interest groups use up considerable resources (which are diverted from productive uses) it would seem suggestive that transfer paradoxes are more likely because of additional efficiency losses. What is of particular interest in this context is again the distinction between a short and long run analysis. It is generally agreed that it is much more difficult and costly to organise owners of mobile factors than owners of immobile factors into special interest groups.

Last but not least it should be pointed out that the short and long-run models analysed in this paper are not based upon an explicit dynamic analysis. The analysis of the short and long-run welfare effects of capital transfer in a small open tariff ridden economy with nontraded goods may, of course, be carried out in an explicit growth model framework. This is undoubtedly an

interesting task, however it remains to be seen whether clear cut results are obtainable.

Figure 1:

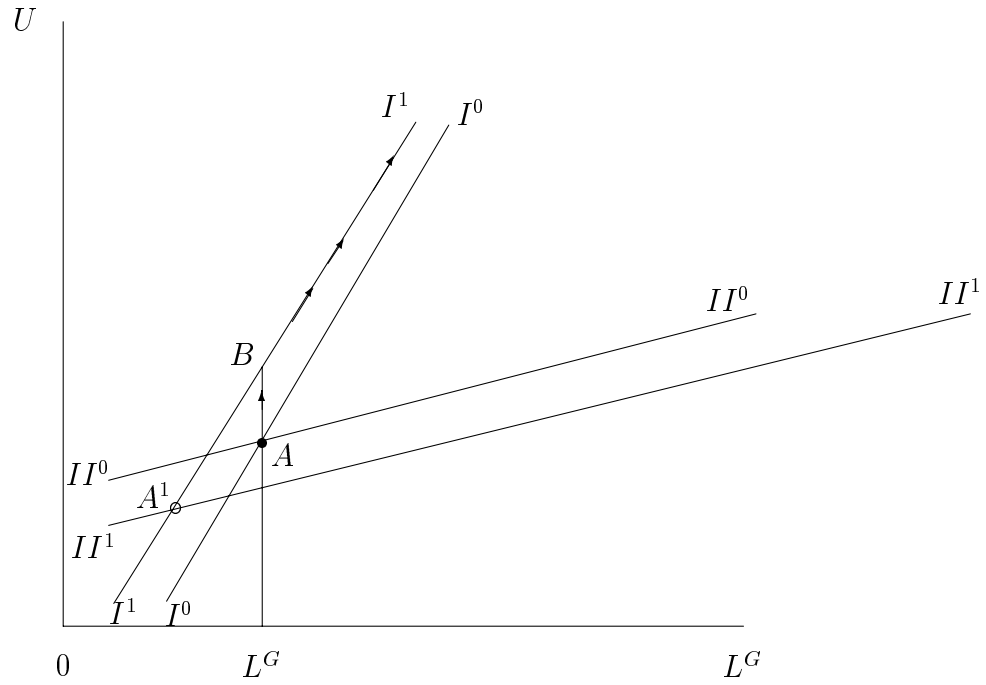
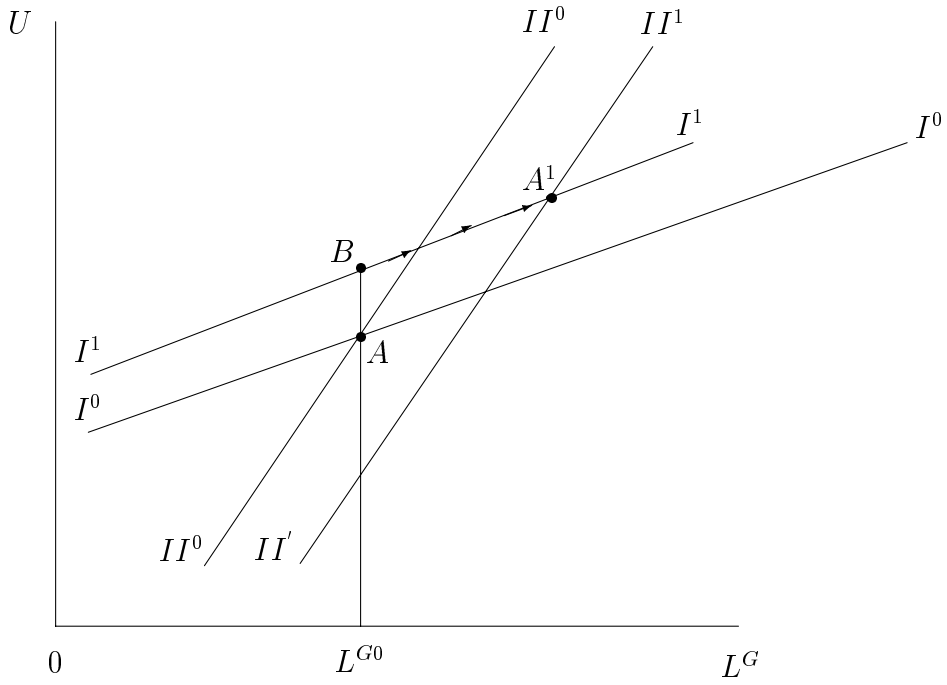


Figure 2:



References

Abe, K. (1992): "Tariff reform in a small open economy with public production", *International Economic Review*, 33, 209-222.

Bhagwati, J.N., Brecher, R. and Hatta, T. (1985): "The generalised theory of transfers and welfare: exogenous (policy imposed) and endogenous (transfer induced) distortions", *Quarterly Journal of Economics*, 3, 697-714.

Brakman, S. and van Marrewijk (1995): "Transfers, returns to scale, tied aid and monopolistic competition", *Journal of Development Economics*, 47, 333-354.

Brakman, S. and van Marrewijk (1998): "The Economics of International Transfers", *Cambridge University Press.*

Corden, M.W. and Neary, J.P. (1982): "Booming Sector and Deindustrialisation in a Small Open Economy", *Economic Journal*, December 1982, 825-48.

Djajic, S., Lahiri, S. and P. Raimondos (1999): "Foreign Aid, Domestic Investment and Welfare", *Economic Journal*, Vol. 109, 698-708.

Hatta, T. (1977): "A theory of piecemeal policy recommendations", *Review of Economic Studies*, 44, 1-22.

Hatzipanayotou, P. and Michael, M. (1995): "Foreign Aid and Public Goods", *Journal of Development Economics*, 47, 455-467.

Johnson, H.G. (1967): "The Possibility of Income Losses from Increased Efficiency or Factor Accumulation in the Presence of Tariffs", *Economic Journal*, March 1967, 77, 151-154.

Jones, R.W. (1971): "Distortions in factor markets and the general equilibrium model of production", *Journal of Political Economy*, 79, 437-459.

Jones, R.W. (1975): "Income Distribution and Effective Protection in a multicommodity trade model", *Journal of Economic Theory*, II, 1-15.

Kemp, M.C. and Kojima, S. (1985): "Tied Aid and the paradoxes of donor enrichment and recipient impoverishment", *International Economic Review*, 26, 721-9.

Kemp, M.C. (1987): "More on the welfare economics of foreign aid", *Journal of the Japanese and International Economics*, 1, 97-109.

Kemp, M.C. (1992): "The static welfare economics of foreign aid: a consolidation", in Savoie and Brecher (eds.): 289-314.

Kemp, M.C. and Abe, K. (1994): "The transfer problem in a context of public goods", *Economic Letters*, 45, 223-226.

Keynes, J.M. (1929a): "The German Transfer Problem", *Economic Journal*, 39, 1-7.

Keynes, J.M. (1929b): "The reparation problem: a discussion II, the rejoinder", *Economic Journal*, 39, 179-82.

Lahiri, S. and Raimondos, P. (1995): "Welfare effects of aid under quantitative trade restrictions", *Journal of International Economics*, 39, 297-313.

Lahiri, S. and Raimondos, P. (1998): "Public good provision and the welfare effects of indirect tax harmonisation", *Journal of Public Economics*, 67, 253-67.

Neary, J.P. (1982): "Intersectoral capital mobility, wage stickiness and the case for adjustment assistance", *in: Bhagwati(ed.), J., Import competition and Response*, University of Chicago Press.

Ohlin, B. (1929a): "The reparations problem: a discussion, transfer difficulties, real and imagined", *Economic Journal*, 39, 172-83.

Ohlin, B. (1929b): "Mr. Keynes' view on the transfer problem: a rejoinder from Professor Ohlin", *Economic Journal*, 400-404.

Schweinberger, A.G. (1989): "Foreign Capital Flows, Tariffs and Welfare: a Global Analysis", *Canadian Journal of Economics*, XXII, No. 2, May, 310-327.

Schweinberger, A.G. (1990): "On the welfare effects of tied aid", *International Economic Review*, 457-462.

Srinivasan, T.N. and Bhagwati, J.N. (1983): "On transfer paradoxes and immiserizing growth", part I, *Journal of Development Economics*, 13, 217-222.

Srinivasan, T.N. and Bhagwati, J.N.(1983) : "On transfer paradoxes and immiserizing growth", part II, *Journal of Development Economics*, 15, 111-115.

Turunen-Red, A.D. (1982): "International Trade and Resource Allocation", *Journal of International Economics*, 25, 249-69.

Woodland, A.D. (1982): *International Trade and Resource Allocation*, Amsterdam: North Holland.

Yano, M. and Nugent, J.B. (1999): "Aid, Nontraded Goods and the Transfer Paradox in Small Countries", *American Economic Review*, 89, 431-449.