TERMS OF TRADE EFFECT IN NATIONAL ACCOUNTS*

By YOSHIMASA KURABAYASHI**

1. In what follows we shall discuss the presentation of terms of trade effect within the framework of national accounts. The issue has been taken up by R. C. Geary and G. Stuvel. Based on the method proposed by the Technical Working Group the secretariat of the United Nations has once calculated national gains or losses due to changes in terms of trade for major countries.[1] After a brief review of principal features of these works a more systematic and symmetrical approach will be proposed. Subsequently numerical examples compiled from national accounts statistics for numbers of countries and calculated by this new approach will be shown.

2. The network of national and international transactions is conveniently summerized in the following inter-flow matrix.[2]

		(1)			(2)	
	·	C_1	I_1*	U_{12}	C_{12}	
(1)	Y_1	·		Y_{12}	G_{12}	
	D_1	S_1	·			B_{21}
	U_{21}	C_{21}		·	C_2	I_2*
(2)	Y_{21}	G_{21}		Y_2	·	
			B_{12}	D_2	S_2	·

Note: (1) indicates the domestic economy, while (2) stands for the rest of the world.

Notations appeared in this matrix are listed below:

C_1: current expenditure on goods and services within the domestic economy.

I_1*: gross domestic capital formation in the domestic economy

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** Assistant Professor (*Jokyōju*), Institute of Economic Research

[1] R. C. Geary, "Problems in the Deflation of National Accounts: Introduction", *Income and Wealth*, Series IX, London 1961, pp. 3-8. G. Stuvel, "Asset Revaluation and Terms of Trade Effects in the Framework of the National Accounts", *Economic Journal*, June 1959, pp. 275-292. United Nations, *World Economic Survey 1963, I, Trade and Development: Trends, Needs and Policies*, New York 1964, pp. 284-306.

[2] For the theoretical reasoning of the matrix presentation of national accounts, see G. Stuvel, *Systems of Social Accounts*, Oxford 1965 and my, "A Note on the Basic Concepts of National Accounts", *Hitotsubashi Journal of Economics*, February 1966.

Y_1: factor income accrued within the domestic economy and paid to its normal residents
D_1: capital consumption in the domestic economy
S_1: saving in the domestic economy
U_{12}: flows of intermediate products from the domestic economy to the rest of the world
C_{12}: flows of goods and services for consumption from the domestic economy to the rest of the world
Y_{12}: factor income accrued in the rest of the world and paid to the domestic economy
G_{12}: income transfer from the rest of the world to the domestic economy
B_{21}: increase of lending of the rest of the world to the domestic economy
U_{21}: flows of intermediate products from the rest of the world to the domestic economy
C_{21}: flows of goods and services for consumption from the rest of the world to the domestic economy
Y_{21}: factor income accrued in the domestic economy and paid to the rest of the world
G_{21}: income transfer from the domestic economy to the rest of the world
B_{12}: increase of lending of the domestic economy to the rest of the world
C_2: current expenditure on goods and services for consumption within the domestic economy
I_2^*: gross domestic capital formation in the rest of the world
Y_2: factor income accrued in the rest of the world and paid to the rest of the world
D_2: capital consumption in the rest of the world
S_2: saving in the rest of the world

Consolidating relevant international transactions into one row and column respectively, the national accounts for the domestic economy are represented in the matrix form as follows:

	(1)	(2)		
(1)	·	C_1	I_1^*	$U_{12}+C_{12}$
	Y_1	·		$Y_{12}+G_{12}$
	D_1	S_1	·	B_{21}
(2)	$U_{21}+Y_{21}$	$C_{21}+G_{21}$	B_{12}	·

(1) $M_1+D_1+Y_1^d=X_1+I_1^*+C_1^n$
$M_1=U_{21}+C_{21}$, $Y_1^d=Y_1+Y_{21}$
$X_1=U_{12}+C_{12}$, $C_1^n=C_1+C_{21}$
(2) $C_1^n+S_1+G_1=Y_1^d+Z_1$
$Z_1=Y_{12}-Y_{21}$, $G_1=G_{21}-G_{12}$
(3) $I_1^*+L_1^n=D_1+S_1$
$L_1^n=B_{12}-B_{21}$
(4) $X_1+Z_1=M_1+G_1+L_1^n$

In the same way the national accounts matrix for the rest of the world is given below:

	(1)	(2)		
(1)	·	$U_{12}+Y_{12}$	$C_{12}+G_{12}$	B_{21}
	$U_{21}+C_{21}$	·	C_2	I_2^*
(2)	$Y_{21}+G_{21}$	Y_2	·	
	B_{12}	D_2	S_2	·

(1)′ $M_2+D_2+Y_2^d=X_2+I_2^*+C_2^n$
$M_2=U_{12}+C_{12}$, $Y_2^d=Y_2+Y_{12}$
$X_2=U_{21}+C_{21}$, $C_2^n=C_2+C_{12}$
$(M_2=X_1,\ X_2=M_1)$

(2)′ $C_2^n+G_2+S_2=Y_2^d+Z_2$
$Z_2=Y_{21}-Y_{12}$, $G_2=G_{12}-G_{21}$
$(Z_2=-Z_1,\ G_2=-G_1)$

(3)′ $I_2^*+L_2^n=D_2+S_2$
$L_2^n=B_{21}-B_{12}(L_2^n=-L_1^n)$

(4)′ $X_2+Z_2=M_2+G_2+L_2^n$

3. Geary's argument is presented in a summarized way as follows. For the simplicity of argument the system of national accounts of the domestic economy (1)-(4) is rewritten so that G_1 may be included in relevant terms in the accounts (2) and (4).

(i) $M_1+D_1+Y_1^d=X_1+I_1^*+C_1^n$

(ii) $C_1^n+S_1^*=Y_1^d+Z_1$ $\quad(S_1^*=S_1+G_1)$

(iii) $I_1^*+N_1=S_1^*+D_1$

(iv) $X_1+Z_1=M_1+N_1$ $\quad(N_1=L_1^n+G_1)$

Reflection will show that the replaced system of national accounts (i)-(iv) can be transformed into a system of national accounts in real terms if an appropriate deflator is selected for Z_1.[3] His argument is concerned chiefly with the account (iv). Suppose the account (iv) is expressed in real terms whose deflations are separately made by individual deflators. The balance of the account (iv) is apparently disturbed by these deflations. Facing this situation two questions must be solved simultaneously. The first is a selection of deflator for the Z_1. And the second is to discover the method of restoring the balance of the account (iv) in real terms. Geary's rule for the selection of Z_1's deflator answers the first question. It is put forward below, putting

$$CS_1=X_1-M_1=N_1-Z_1 \quad \text{or} \quad N_1=CS_1+Z_1\,.$$

(Case 1) If $CS_1<0$ and $Z_1>0$ then Z_1's deflator is p_2, where p_2 is the export price of the rest of the world.

(Case 2) If $CS_1>0$ and $Z_1<0$ then Z_1's deflator is p_1, where p_1 is the export price of the domestic economy.

(Case 3) If $CS_1>0$ and $Z_1>0$ then Z_1's deflator is p_1 and p_1 is also the deflator of N_1.

[3] In particular, see R. Stone, *Quantity and Price Indexes in National Accounts*, Paris 1956, pp. 90-93.

(Case 4) If $CS_1<0$ and $Z_1<0$ then Z_1's deflator is p_2 and p_2 is also the deflator of N_1.

Similar argument is applied to the national accounts for the rest of the world which is written by the following form:

(i)' $M_2+D_2+Y_2^d=X_2+I_2^*+C_2^n$

(ii)' $C_2^n+S_2^*=Y_2^d+Z_2 \quad (S_2^*=S_2+G_2)$

(iii)' $I_2^*+N_2=S_2^*+D_2$

(iv)' $X_2+Z_2=M_2+N_2 \quad (N_2=L_2^n+G_2)$

Putting

$$CS_2=X_2-M_2=N_2-Z_2 \quad \text{or} \quad N_2=CS_2+Z_2,$$

hence

$$CS_2=M_1-X_1=-CS_1, \qquad N_2=-(CS_1+Z_1)=-N_1,$$

the rule for the selection of Z_2's deflator follows:

(Case 1)' If $CS_2<0$ and $Z_2>0$ ($CS_1>0$ and $Z_1<0$) then Z_2's deflator is p_1 (Z_1's deflator is p_1).

(Case 2)' If $CS_2>0$ and $Z_2<0$ ($CS_1<0$ and $Z_1>0$) then Z_2's deflator is p_2 (Z_1's deflator is p_2).

(Case 3)' If $CS_2>0$ and $Z_2>0$ ($CS_1<0$ and $Z_1<0$) then Z_2's deflator is p_2 (Z_1's deflator is p_2) and p_2 is also the deflator of N_2 (p_2 is also the deflator of N_1).

(Case 4)' If $CS_2<0$ and $Z_2<0$ ($CS_1>0$ and $Z_1>0$) then Z_2's deflator is p_1 (Z_1's deflator is p_1) and p_1 is also the deflator of N_2 (p_1 is also the deflator of N_1).

An adjustment term which indicates changes in terms of trade should be inserted for restoring the balance of the account (iv) in real terms of the domestic economy or the rest of the world. The term is expressed by $\bar{T}_1$ for the domestic economy and by $\bar{T}_2$ for the rest of the world. The account (iv) in real terms of the domestic economy is written by

(5) $\bar{X}_1+\bar{Z}_1+\bar{T}_1=\bar{N}_1+\bar{M}_1,$

where the barred variables stand for the deflated values obtained from the rule stated above. Similarly for the rest of the world, the account (iv)' in real terms is

(5)' $\bar{X}_2+\bar{Z}_2+\bar{T}_2=\bar{N}_2+\bar{M}_2.$

The following property for $\bar{T}_1$ and $\bar{T}_2$ is easily derived:

(6) $\bar{T}_1+\bar{T}_2=0 \quad \text{or} \quad \bar{T}_2=-\bar{T}_1.$

$\bar{T}_1$ or $\bar{T}_2$ is called the real gain or loss due to changes in terms of trade for the domestic economy or the rest of the world, and the resulting real gain or loss for the domestic economy is expressed below.

$$(7)\quad \begin{cases} \text{if } X>M \text{ then } \bar{T}_1=\dfrac{M}{p_2}\left(1-\dfrac{p_2}{p_1}\right)=\bar{M}\left(1-\dfrac{p_2}{p_1}\right) \\ \text{if } X<M \text{ then } \bar{T}_1=-\dfrac{X}{p_1}\left(1-\dfrac{p_1}{p_2}\right)=-\bar{X}\left(1-\dfrac{p_1}{p_2}\right), \end{cases}$$

where $\left(1-\dfrac{p_2}{p_1}\right)$ or $\left(\dfrac{p_1}{p_2}-1\right)$ stands for the unit real gain.

4. As a point of departure for his argument Stuvel divides each entry of a system of national accounts (i)–(iv) by a common deflator P which stands for the general price level. The following system of national accounts in real terms is derived by this deflation:

(8) $\bar{M}_1+\bar{D}_1+\bar{Y}_1^d=\bar{X}_1+\bar{I}_1^*+\bar{C}_1^n$

(9) $\bar{C}_1^n+\bar{S}_1^*=\bar{Y}_1^d+\bar{Z}_1$

(10) $\bar{I}_1^*+\bar{N}_1=\bar{S}_1^*+\bar{D}_1$

(11) $\bar{X}_1+\bar{Z}_1=\bar{M}_1+\bar{N}_1$

where

$$\bar{M}_1=\frac{M_1}{P},\quad \bar{D}_1=\frac{D}{P},\quad \bar{Y}_1{}^d=\frac{Y_1{}^d}{P},\quad \bar{C}_1{}^n=\frac{C_1{}^n}{P}$$

$$\bar{S}_1{}^*=\frac{S_1{}^*}{P},\quad \bar{I}_1{}^*=\frac{I_1}{P},\quad \bar{N}_1=\frac{N_1}{P},\quad \bar{X}_1=\frac{X_1}{P},\quad \bar{Z}_1=\frac{Z_1}{P}$$

Putting

$$\bar{I}_1{}^*=\frac{I_1{}^*}{p_i}\quad\text{and}\quad \bar{C}_1{}^n=\frac{C_1{}^n}{p_c},$$

(8)-(11) are rewritten as

(12) $\bar{D}_1+\bar{Y}_1{}^d+\bar{M}_1+(\bar{M}-\bar{M}_1)=\bar{X}_1+(\bar{X}_1-\bar{X}_1)+\bar{I}_1{}^*+(\bar{I}_1{}^*-\bar{I}_1{}^*)+\bar{C}_1{}^n+(\bar{C}_1{}^n-\bar{C}_1{}^n)$

(13) $\bar{C}_1{}^n+(\bar{C}_1{}^n-\bar{C}_1{}^n)+\bar{S}_1{}^*=\bar{Y}_1{}^d+\bar{Z}_1$

(14) $\bar{I}_1{}^*+(\bar{I}_1{}^*-\bar{I}_1{}^*)+\bar{N}_1=\bar{S}_1{}^*+\bar{D}_1$

(15) $\bar{X}_1+(\bar{X}_1-\bar{X}_1)+\bar{Z}_1=\bar{M}_1+(\bar{M}_1-\bar{M}_1)+\bar{N}_1$

It is easily shown that the following system of national accounts in real terms can be derived if and only if P is identical with the *GDP* deflator:

(12)′ $\bar{D}_1+\bar{Y}_1{}^d+\bar{M}_1=\bar{X}_1+\bar{I}_1{}^*+\bar{C}_1{}^n$

(13)′ $\bar{C}_1{}^n+\bar{S}_1{}^*=\bar{Y}_1{}^d+\bar{Z}_1+\triangle C_1{}^n$

(14)′ $\bar{I}_1{}^*+\bar{N}_1=\bar{S}_1{}^*+\triangle I_1{}^*+\bar{D}_1$

(16) $\triangle C_1{}^n+\triangle I_1{}^*=\triangle M_1-\triangle X_1$

(15)′ $\bar{X}_1+\bar{Z}_1+\triangle M_1-\triangle X_1=\bar{M}_1+\bar{N}_1$

where

$$\triangle C_1{}^n=(\bar{C}_1{}^n-\bar{C}_1{}^n),\quad \triangle I_1{}^*=(\bar{I}_1{}^*-\bar{I}_1{}^*),\quad \triangle M_1=(\bar{M}_1-\bar{M}_1),\quad \triangle X=(\bar{X}_1-\bar{X}_1)$$

In fact, the relation (17) is held if and only if P is the *GDP* deflator of the domestic economy.

(17) $$(\bar{D}_1+\bar{Y}_1{}^d)=(\bar{D}_1+\bar{Y}_1{}^d)=\frac{D_1+Y_1{}^d}{P}=\frac{I_1{}^*}{p_i}+\frac{C_1{}^n}{p_c}+\frac{X}{p_1}-\frac{M}{p_2}$$

The system of national accounts in real terms (12)′-(15)′ and (16) immediately follows from the system (12)-(15) if the relation (17) is established.

A particular attention is called to the equation (16), which indicates the transfer of purchasing power due to changes in terms of trade. Trade gain for the domestic economy is written by

(18) $$\bar{T}_1=\triangle M_1-\triangle X_1=\bar{M}\left(1-\frac{p_2}{P}\right)-\bar{X}\left(1-\frac{p_1}{P}\right)$$

In the same way the trade gain for the rest of the world is easily calculated. It is worth while to note that the sum of both gains does not become zero, i.e.

(19) $\bar{T}_1+\bar{T}_2\neq 0$ or $\bar{T}_2\neq-\bar{T}_1$,

because no symmetrical or asymmetrical relation is held between the *GDP* deflator of the domestic economy and that of the rest of the world. (19) amounts to say that the trade gain due to changes in terms of trade of the domestic economy in Stuvel's sense is not necessarily well compensated by the trade loss of the rest of the world suffered from relevant changes in terms of trade.

5. Two arresting features are contained in the preceeding arguments. First, it is easily revealed that in Geary's argument the amounts of exports and imports are not taken into account simultaneously for the calculation of the trade gain or loss. In fact, apart from the variable which expresses the terms of trade, the real gain or loss for the domestic economy in (7) is solely determined by the amounts of either imports or exports. On the contrary Stuvel's calculation of trade gain or loss in (18) includes both the amounts of exports and imports. Second, in Stuvel's argument the trade gain appeared in the domestic economy cannot be cancelled out

the equal amounts of the trade loss suffered from the rest of the world. The lack of this kind of symmetrical relation is not observed by the corresponding calculation of trade gain or loss in Geary's argument.

A more systematic and symmetrical approach is consequently required for overcoming these difficulties. Whatever forms of calculation for the trade gain or loss may be selected, the following requirements must be fulfilled:

1. For the calculation of trade gain or loss (a) the trade gain of the domestic economy must be compensated by the equal amounts of the loss on the side of the rest of the world. (b) the amounts of both exports and imports must be simultaneously and explicitly taken into account for the computation of trade gain or loss.
2. For the selection of price deflator p_N, it must be chosen so that the deflated N of the domestic economy may be counterbalanced by the corresponding deflation of N of the rest of the world.

The first condition of the heading 1. is equivalent to the second condition in the sense that the former implies the latter while the latter implies the former.

6. Suppose that p_N is expressed in a form of harmonic mean in terms of p_1 and p_2:

$$(20)\quad p_N=\frac{1}{\alpha\frac{1}{p_1}+(1-\alpha)\frac{1}{p_2}} \qquad 0\leqq\alpha\leqq1$$

The following restrictions are reasonablly imposed on α:

(1) If there are no exports of the domestic economy, p_N can be regarded as p_2. In other words it amounts to say the fact that α becomes zero. If there are no imports of the domestic economy, p_N can be regarded as p_1, in other words it amounts to say the fact that α is equal to one.

(2) As apparent from the structure of the inter-flow matrix described above, exports of the domestic economy are imports for the rest of the world and vice versa. The selection of α must be symmetrical form respecting X_1 and M_1.

The following argument

$$(21)\quad \alpha=\frac{X_1}{X_1+M_1} \qquad 0\leqq\alpha\leqq1$$

is symmetrical with respect to X_1 and M_1. It also satisfies the condition (1). Putting (21) into (20), it is easily derived that

$$(22)\quad p_N=\frac{X_1+M_1}{\bar{X}_1+\bar{M}_1}$$

α is the parameter that indicates the dependence of the domestic economic activities on the international trade. In fact, aside from the international flow of financial claims, the economy may be termed the imports dependent economy if $0<\alpha<\frac{1}{2}$. On the contrary, the economy may be termed the exports dependent economy if $1>\alpha>\frac{1}{2}$. If $\alpha=1$ the economy may be termed the entirely exports dependent economy, while the economy may be termed the entirely imports dependent economy if $\alpha=0$. The case in which the domestic economy has no international trade relations is disregarded for this classification.

Supposing that p_N in (22) is also applied to Z_1 as a deflator, the rest of the world account for the domestic economy is expressed in the same expression as

(*) $\bar{X}_1+\bar{Z}_1+\bar{T}_1=\bar{N}_1+\bar{M}_1$

where $\bar{T}_1$ is the term which indicates the trade gain or loss due to the variation of terms of trade and is easily calculated by the following formula

$$(23)\quad \bar{T}_1=\bar{X}_1\left[\frac{1}{\alpha+(1-\alpha)\frac{p_2}{p_1}}-1\right]-\bar{M}_1\left[\frac{1}{(1-\alpha)+\alpha\frac{p_1}{p_2}}-1\right].$$

As p_N has a symmetrical property regarding with X_1 and M_1, it is shown that $\bar{N}_1$ and $\bar{T}_1$ derived from (*) and (23) respectively satisfy the conditions of 1. and 2. in the section 5.

Putting

$$(24)\quad \alpha=\frac{\bar{X}_1}{\bar{X}_1+\bar{M}_1},\qquad 0\leqq\alpha\leqq 1,$$

if we suppose that p_N is expressed as a convex linear combination of p_1 and p_2,

$$(25)\quad p_N=\alpha p_1+(1-\alpha)p_2,$$

the virtually same conclusion as (22) and (23) can be drawn. But (20) is preferred to (25) as the argument for the deflator of p_N. Being a kind of implicit price deflator, p_N in its original sense must be expressed as a form of current year weighted harmonic mean of p_1 and p_2. p_N in (25) differs from this expression in that it is a base year weighted arithmatic mean.[4]

7. In order to show numerically the trade gain or loss due to changes in terms of trade national accounts data are collected and compiled for as many countries as possible. The data are entirely collected from the United Nations' *Yearbook of National Accounts Statistics*. The data for each individual country are arranged according to major expenditure components of *GDP* and compiled into the list of tables which are itemized by the expenditure components of *GDP* in current prices and constant prices respectively. The expenditure components of *GDP* expressed in national currency unit are converted into the U. S. $ by means of the official exchange rate. The list of countries for which the national accounts data are compiled is shown in the end of this paper as appendices. Those countries are divided into two major categories, i. e. developing countries and developed countries. So-called the centrally planned countries are entirely excluded from this compilation. Developing countries are further broken down according regions. Same principle for breaking down of countries is applied to developed countries aside from the fact that the western European countries are subdivided by EEC and EFTA regions.

Utilizing the national accounts data thus compiled for each individual country the results of computation concerning the trade gain due to changes in terms of trade in the fifties are listed in Tables 1, 2 and 3. Table 1 is calculated from the formula (7) and indicates the trade gain in Geary's sense. Table 2 is calculated from the formula (23) which is proposed by the author. Table 3 is calculated by means of (18). According to (17), the *GDP* deflator of individual country is used for P in (18). Table 3 indicates the trade gain in Stuvel's sense.

[4] It should be noted that p_N defined in (20) or (23) does not possess the property of an implicit price deflator in the strict sense, for (20) or (23) is by no means subject to any accounting relation. But the mere fact that p_N in (20) or (23) is expressed either as a harmonic mean of p_1 and p_2 or as an arithmatic mean of p_1 and p_2 states that p_N in our argument is derived from p_1 and p_2

Althougn M. R. Courbis has proposed (23) for the formula of selecting p_N in his elaborate analysis of the national accounts in real terms, it appears that he has paid little attention to this property of price deflator above pointed out. For this matter, see M. R. Courbis, "Comptes Économiques Â Prix Constants", *Études et Conjoncture*, Juillet 1964, pp. 5-76.

TABLE 1

unit: million dollars in 1960 prices

	51	52	53	54	55	56	57	58	59
101	0.2	−0.3	2.5	−10.7	−8.0	−11.9	9.6	−11.5	−38.0
103	−58.2	−17.7	26.7	−15.9	47.6	105.2	−26.1	−84.2	−27.6
104	40.2	16.5	−35.3	−108.8	231.5	334.5	222.3	52.6	56.0
105	12.6	6.4	18.2	25.4	19.8	22.3	20.4	12.1	0.4
106	0.05	0	−0.02	−0.03	0.01	−0.01	0.05	0.02	0.02
108	27.1	31.7	36.3	48.6	44.6	58.4	44.5	19.4	−2.8
109	10.9	12.8	17.3	16.1	12.6	16.0	6.6	5.4	1.4
110					295.3	291.3	214.7	110.5	1.3
115	215.6	167.5	207.2	337.1	383.7	261.3	27.1	139.9	119.6
206				1.3	1.6	0.5	0.2	−1.0	0.1
209					9.5	1.1	−1.2	11.0	6.5
211	−25.6	−19.1	−16.3	−10.5	−12.7	−8.8	−8.7	−9.9	−6.0
212						144.2	9.6	−63.9	4.2
302	7.1	−98.6	−71.9	−6.3	35.9	−6.7	−41.6	−21.2	0
303	−9.4	−9.6	−17.2	−14.5	−16.2	−17.8	−24.6	−46.6	−22.8
304	157.1	−207.4	−205.3	−85.9	−230.5	−192.8	−320.6	−211.6	−111.0
306	5.2	0.1	11.5	9.2	7.5	4.6	−6.5	13.1	47.9
307			−13.1	−5.7	−1.5	−21.9	−15.5	−15.7	−9.5
401	−2.5	1.2	3.4	9.7	11.3	28.2	1.5	0.3	0.1
402	−0.8	−0.4	6.5	13.6	2.1	2.4	2.5	9.3	3.5
502			−24.0	−23.2	15.8	2.8	20.7	13.6	5.4
011			−80.4	−114.7	−23.2	74.3	6.6	102.9	−82.1
012	−882.9	−416.0	−136.6	−157.0	−99.9	−16.3	−134.6	−140.7	−40.8
014	−973.2	−715.4	−545.5	−815.6	−913.0	−298.9	−956.3	−388.2	−264.9
015	−57.9	−107.5	−68.0	4.2	−119.2	−125.4	−307.4	−83.3	−100.0
016		−84.3	−84.0	−72.9	−12.0	7.0	−78.0	−101.8	15.3
021	−66.9	−20.4	−67.0	−82.6	−24.7	−38.9	−49.5	−2.8	−3.2
022	−153.7	−97.3	−75.4	−49.3	−45.6	−28.0	−80.4	−48.8	52.2
023	181.4	127.3	6.7	−5.8	62.1	171.2	150.1	5.1	12.3
024		−14.8	−3.3	−47.0	−18.9	17.7	−7.3	−10.0	20.1
025	75.8	−18.6	−64.5	−68.5	−23.1	−35.2	−67.3	−33.3	−23.9
027	−1220.9	−675.5	−483.0	−660.0	−669.9	−251.6	−253.8	199.8	186.2
034	−61.0	−31.3	3.2	−29.0	−7.4	−26.7	−41.7	−9.2	13.5
041	−678.2	−743.2	−336.5	−913.0	−684.3	−673.0	−220.0	361.3	249.3
042	−76.1	327.6	102.9	110.2	256.9	233.8	6.5	−130.4	23.5
051	−326.0	−320.0	−242.1	−344.2	−303.6	−280.7	−446.9	−248.1	−4.0

TABLE 2

unit: million dollars in 1960 prices

	51	52	53	54	55	56	57	58	59
101	0.3	−0.3	2.2	−11.0	−8.8	−12.0	11.3	−12.6	−36.5
103	−56.9	−16.7	26.9	−15.0	42.8	96.7	−28.2	−87.4	−26.4
104	39.9	45.2	−35.0	−110.2	242.5	311.3	203.9	49.3	51.0
105	12.7	6.4	18.2	25.4	20.8	25.1	22.0	12.3	0.5
106	0.04	0	−0.03	−0.03	0.01	−0.01	0.04	0.01	0.01
108	27.2	29.0	32.4	47.0	44.4	61.5	49.7	22.3	−3.0
109	9.4	12.4	16.2	16.5	13.6	15.4	7.2	5.6	1.4
110					281.6	291.5	228.6	116.0	1.3
115	173.4	147.5	178.9	284.8	309.9	219.0	24.1	129.4	106.9
206				1.3	1.7	0.5	2.0	−0.9	0.1
209					9.3	1.2	−1.2	10.2	6.7
211	−24.4	−18.3	−15.9	−9.7	−12.5	−7.6	−8.2	−10.3	−6.0
212						143.7	10.5	−70.0	4.1
302	6.7	−107.3	−73.5	−5.6	31.9	−6.7	−44.4	−21.7	0
303	−11.2	−11.7	−21.1	−20.2	−19.6	−22.8	−29.8	−58.2	−28.6
304	171.8	−207.4	−209.5	−88.0	−238.8	−230.5	−398.1	−255.6	−125.7
306	5.4	0.1	12.1	9.7	8.5	4.8	−7.5	13.9	43.3
307			−21.2	−9.5	−7.8	−39.5	−27.4	−26.2	−14.8
401	−2.8	1.2	3.8	9.9	12.6	30.2	1.7	0.3	0.2
402	−1.4	−0.7	10.0	19.4	3.2	3.6	2.8	13.0	4.6
502			−26.5	−25.3	17.8	3.2	23.1	14.8	5.9
011			−81.2	−118.6	−22.8	73.7	6.6	100.0	−83.0
012	−884.9	−424.1	−134.6	−146.8	−91.8	−16.3	−142.7	−142.7	−36.7
014	−908.7	−657.0	−481.9	−728.9	−853.6	−820.0	−863.2	−352.5	−244.6
015	−61.6	−123.6	−76.3	4.4	−128.0	−134.1	−323.1	−81.7	−95.5
016		−78.9	−80.1	−73.7	−11.9	7.3	−79.8	−98.3	14.8
021	−77.7	−20.0	−62.7	−79.2	−25.8	−37.3	−48.1	−2.7	−3.1
022	−155.7	−96.0	−74.5	−50.6	−45.0	−27.9	−79.0	−46.9	51.9
023	178.8	127.5	7.1	−6.2	64.4	170.0	148.5	5.3	12.5
024		−16.3	−3.7	−53.1	−21.0	19.5	−8.5	−11.3	23.1
025	73.0	−18.6	−63.4	−69.2	−23.5	−35.6	−67.9	−33.5	−23.9
027	−1451.0	−768.8	−553.1	−750.5	−768.9	−281.5	−283.2	−223.4	211.3
034	−78.4	−34.5	3.6	−32.5	−8.7	−30.0	−44.3	−10.1	14.9
041	−630.0	−720.0	−350.0	−930.0	−700.0	−650.0	−200.0	360.0	260 0
042	−76.9	311.0	104.0	110.7	263.6	249.1	7.0	−135.7	24.9
051	−283.6	−303.7	−243.7	−318.9	−283.9	−291.4	−455.3	−228.9	−3.8

TABLE 3

unit: million dollars in 1960 prices

	51	52	53	54	55	56	57	58	59
101	−312.7	−264.0	90.0	−30.2	−89.2	−18.6	−245.4	−127.7	−18.9
103	−58.9	−21.8	28.0	−30.1	11.7	91.9	−42.0	−91.0	−22.0
104	42.0	15.6	−32.1	−111.8	259.1	294.7	200.1	73.6	56.4
105		6.6	18.3	75.4	19.4	21.5	19.6	12.1	−0.7
106	0.04	0	−0.03	−0.03	0.01	−0.01	0.04	0.01	0.01
108	27.1	30.3	33.5	47.1	44.4	60.9	49.3	22.3	−2.6
109	10.8	12.9	16.3	16.6	14.2	15.7	6.6	5.6	1.4
110						291.1	204.3	111.6	1.8
115	169.9	149.6	186.4	303.0	333.8	245.1	86.2	150.6	104.0
206								−1.0	−0.05
209					9.4	1.1	−1.1	10.5	6.7
211				−9.5	−12.3	−6.8	−7.7	−10.8	−5.9
212						144.0	7.3	−70.7	3.8
302	17.4	−117.5	−74.7	−1.1	32.2	−6.8	−46.7	−21.2	0.4
303	−26.6	−27.8	−31.1	−42.6	−26.8	−24.5	−29.2	−46.2	−41.6
304		−207.8	−213.2	−110.6	−277.0	−373.6	−567.9	−297.7	−105.8
307			45.8	38.1	34.0	−61.0	11.7	3.3	14.1
401	−7.3	−0.6	2.3	9.7	11.5	29.1	−0.1	0.4	0.4
402	92.2	−16.2	−6.3	−17.6	−60.0	−62.9	−49.0	−7.8	−1.4
502			−24.0	−23.2	14.1	−1.4	19.3	12.6	4.7
503		2.4	19.5	28.3	22.5	14.4	30.2	27.3	29.2
011			−89.8	−140.5	−11.6	79.6	2.9	108.9	−83.7
014	−749.9	−464.4	−267.5	−506.2	−697.7	−587.0	−595.6	−225.6	−203.0
015	−151.7	−298.6	−181.4	−36.3	−174.5	−183.3	−368.9	−75.7	−91.6
016		48.5	−13.7	−82.4	−0.8	−34.3	−106.8	−81.6	22.6
021	−132.8	−18.0	−50.5	−71.6	−36.0	−28.9	−41.7	3.5	−2.7
022	−165.8	−85.8	−69.2	−61.0	−39.2	−28.5	−72.1	−39.7	51.9
023	190.1	126.7	−17.3	−28.9	48.4	173.2	153.5	−2.3	11.6
024		−18.6	1.6	−52.0	−23.0	16.7	−1.6	−8.7	27.5
025	138.0	−12.0	−50.5	−78.0	−40.8	−44.0	−74.0	−38.6	−25.0
027	−3391.2	−1824.3	−1240.7	−1350.0	−1372.6	−622.9	−582.2	156.9	168.2
034	−163.1	−46.5	−6.0	−44.5	−27.6	−38.9	−49.3	−11.5	15.1
041	−241.8	−581.7	−479.9	−971.5	−754.3	−499.4	52.2	362.4	264.5
042	−95.8	358.0	91.8	107.7	244.9	195.0	−30.9	−152.4	19.7
051	22.7	−215.8	−252.3	−253.4	−204.8	−345.8	−473.2	−206.9	9.0

Comparing these results more closely it is observed that no marked differences of results arise between Table 1 and Table 2. Certain reservation is still required for insisting that there exists a fairly good coincidence of results between Table 1 or 2 and Table 3. Although more detailed analysis is required for drawing definite conclusions from the results, it may be tentatively pointed out that in the fifties developing countries as a whole have not suffered from such significant losses due to changes in terms of trade that necessitate compensatory international aids by developed countries.

APPENDIX 1. Country Breakdown for Developing Countries

100 Latin America
- 101 Argentina
- 102 Brazil
- 103 Chile
- 104 Colombia
- 105 Costa Rica
- 106 Ecuador
- 107 El Salvador
- 108 Guatemala
- 109 Honduras
- 110 Mexico
- 111 Nicaragua
- 112 Panama
- 113 Paraguay
- 114 Peru
- 115 Venezuela
- 116 Other Latin America

200 Africa
- 201 Algeria
- 202 Morocco
- 203 Sudan
- 204 United Arab Republic
- 205 Kenya
- 206 Tanganyika
- 207 Uganda
- 208 Congo (Leopold Ville)
- 209 Ghana
- 210 Nigeria
- 211 Mauritius
- 212 Rhodesia and Nyasaland
- 213 Other Africa

300 Far East
- 301 Burma
- 302 Ceylon
- 303 China (Taiwan)
- 304 India
- 305 Pakistan
- 306 Philippines
- 307 Republic of Korea
- 308 Thailand
- 309 Other Far East

400 Middle East
- 401 Cyprus
- 402 Israel
- 403 Other Middle East

500 Other Developing Countries
- 501 British Guiana
- 502 Jamaica
- 503 Trinidad Tobago
- 504 Others of Other Developing Countries

600 Total of Developing Countries

APPENDIX 2. Country Breakdown for Developed Countries

000 Western Europe

010 EEC
- 011 Belgium
- 012 France
- 013 Luxembourg
- 014 Federal Republic of Germany
- 015 Italy
- 016 Netherlands

020 EFTA
- 021 Austria
- 022 Denmark
- 023 Norway
- 024 Portugal
- 025 Sweden
- 026 Switzerland
- 027 United Kingdom

030 Other Western Europe
- 031 Finland
- 032 Greece
- 033 Iceland
- 034 Ireland
- 035 Spain
- 036 Turkey

040 North America
- 041 United States
- 042 Canada

051 Japan

060 Australia, New Zealand and South Africa
- 061 Australia
- 062 New Zealand
- 063 South Africa