TAX EVASION AND INCOME DISTRIBUTION

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TAX EVASION AND INCOME DISTRIBUTION

It is often argued that tax evasion is responsible for worsening income distribution.[1] However, this is not necessarily the case. Tax evasion may improve vertical equity among income brackets if the evasion is more widespread in lower income brackets than in higher income brackets. Similarly, evasion of commodity taxes will tend to improve vertical equity provided that the evasion of commodity taxes on goods largely consumed by relatively poor people is greater than the extent of evasion on goods purchased mainly by rich people.[2] It does not, however, necessarily follow that evasion will improve vertical equity in the circumstances described above, since equity further depends on how the benefits from public expenditure financed through tax revenue are distributed across income classes. However, in a situation where public expenditure, financed through tax revenue, is spent in such a way that larger benefits from public expenditure accrue to higher income groups than to lower income groups, evasion will necessarily improve vertical equity, provided that evasion is greater at lower income levels than at higher income brackets and or evasion of commodity taxes on goods largely consumed by poor people is greater than the extent of evasion on goods mainly purchased by rich people.[3]

In subsequent paragraphs, an attempt is made to explore the effect of evasion on income distribution algebraically in three different situations: First, the entire range of public expenditure is in the form of transfer payments which are distributed according to government policies, and hence benefits from such public expenditure are independent of the prevailing income distribution. Secondly, public expenditure is devoted entirely to public investment whose benefits accrue in proportion to the existing income distribution. The third case is the situation where public expenditure is partly transfer payments and the remaining part is public investment. It may be noted that there is one assumption common to all three situations: public expenditure is financed solely by tax revenues, that is, there is a balanced budget.

Situation I : Public Expenditure as Transfer Payments

Suppose there are two income groups YP_1 and YP_2: where the per capita income of people in the income group YP_1 is less than that of people in the income group YP_2; that is, people in the income group YP_1 are poorer than the people in the income group YP_2. The people in the income groups YP_1 and YP_2 are paying taxes T_1 and T_2 respectively. Thus, the total tax revenue $T(=T_1+T_2)$ is available for public expenditure: where $T_1=t_1T$ and $T_2= t_2T$; $t_1 + t_2 = 1$; that is, t_1 and t_2 are the respective ratios of taxes paid by the income groups YP_1 and YP_2 to total tax revenue. Further, the people are respectively receiving B_1 and B_2 benefits from public expenditure in the form of transfer payments; where $B_1 = b_1T$ and $B_2 = b_2T$; $b_1 + b_2 = 1$; that is, b_1 and b_2 are the ratios of benefits of income groups YP_1 and YP_2 to total public expenditure. Thus the public expenditure is apportioned between two income groups on the basis of the ratios b_1 and b_2.[4] Their magnitudes depend on government policies and are independent of the prevailing income distribution.

Thus, the effective disposable income of the people in the income groups YP_1 and YP_2 can be set out as follows.

$$\hat{Y}_1 = Y_1 - T_1 + B_1 \quad (7a)$$

$$\hat{Y}_2 = Y_2 - T_2 + B_2 \quad (7b)$$

where $\hat{Y}_1$ and $\hat{Y}_2$ are the total effective disposable incomes of income groups YP_1 and YP_2 respectively; Y_1 and Y_2 are the total gross incomes of the income groups YP_1 and YP_2 respectively.

The public expenditure thus distributed (B_1 and B_2) may be considered to be progressive if $(B_1-T_1) > 0$ and $(B_2-T_2) < 0$, that is, if poor people are getting more than what has been paid by them by way of taxes and rich people are receiving benefits less than what has been paid by them in the form of taxes, irrespective of the tax structure, that is, regardless of whether $T_1/Y_1 \gtrless T_2/Y_2$. Vertical equity will improve if (B_1-T_1) rises and (B_2-T_2) declines. Now the conditions under which evasion will improve or worsen vertical equity can be shown.

In the presence of evasion, suppose people in income groups YP_1 and YP_2 are evading taxes to the extent of E_1 and E_2 respectively, that is, total tax evasion $E(=E_1+E_2)$ is taking place in the economy. The government is getting tax revenue (T-E), which is, by assumption, equal to the total volume of public expenditure. The benefits from public expenditure are now apportioned between the two income groups YP_1 and YP_2 as indicated below.

$$B_1' = b_1 \ (T-E) \quad (8a)$$

$$B_2' = b_2 \ (T-E) \quad (8b)$$

Thus, in the presence of tax evasion, the effective disposable incomes of people in income groups YP_1 and

YP_2 will be as follows.

$$\hat{Y}'_1 = Y_1 - T_1 + E_1 + B'_1 \qquad (9a)$$

$$\hat{Y}'_2 = Y_2 - T_2 + E_2 + B'_2 \qquad (9b)$$

Vertical equity will improve if

$$\hat{Y}'_1 > \hat{Y}_1 \qquad (4a)$$

and $$\hat{Y}'_2 < \hat{Y}_2 \qquad (4b)$$

Replacing the terms $\hat{Y}'_1$, $\hat{Y}_1$, $\hat{Y}'_2$ and $\hat{Y}_2$ by their values, Inequalities (4a and b) will take the following form.

$$(Y_1 - T_1 + E_1 + B'_1) > (Y_1 - T_1 + B_1) \qquad (4'a)$$

and $$(Y_2 - T_2 + E_2 + B'_2) < (Y_2 - T_2 + B_2) \qquad (4'b)$$

Rearranging the terms in both Inequalities after cancelling the same terms on both sides, Inequalities (4'a and 'b) can be reduced to the following form.

$$E_1 + B'_1 > B_1 \qquad (4''a)$$

and $$E_2 + B'_2 < B_2 \qquad (4''b)$$

Replacing the terms B'_1, B_1, B'_2 and B_2 by their respective values, Inequalities (4"a and "b) can be rewritten as shown below.

$$E_1 + b_1 (T-E) > b_1T \qquad (5a)$$

and $$E_2 + b_2 (T-E) < b_2T \qquad (5b)$$

That is

$$E_1 - b_1E > 0 \qquad (5'a)$$

and $$E_2 - b_2E < 0 \qquad (5'b)$$

Dividing both sides of Inequalities (5'a and 'b) by total tax evasion E, gives

$$E_1/E - b_1 > 0 \qquad (6a)$$

and $$E_2/E - b_2 < 0 \qquad (6b)$$

or

$$e_1 - b_1 > 0 \qquad (6'a)$$

and $$e_2 - b_2 < 0 \qquad (6'b)$$

where $e_1 = E_1/E$, is the ratio of evasion attributable to relatively poor people to total evasion; and $e_2 = E_2/E$, is the ratio of evasion attributable to relatively rich people to total evasion. Therefore, $e_1 + e_2 = 1$.

Thus, Inequalities (6'a and 'b) specify the conditions that evasion improves (or worsens) income distribution if $(e_1-b_1) > 0$ and $(e_2-b_2) < 0$ [or $(e_1-b_1) < 0$ and $(e_2-b_2) > 0$].

However, the condition laid down by Inequality (6'a) implies the second condition laid down by Inequality (6'b) as well.[5] Thus, it may be concluded that evasion may improve (worsen) vertical equity if the proportion of evasion (e_1) attributable to relatively poor people is higher (lower) than their share of benefits (b_1) derived from public expenditure [or if the proportion of evasion (e_2) attributable to relatively rich people is lower (higher) than their share of benefits (b_2) derived from public expenditure].

Some additional conclusions about the effect of evasion on income distribution can be derived from Inequalities (6'a and 'b). This can be shown as follows.

Inequalities (6'a and 'b) can be rewritten in the following form:

$$e_1/b_1 > 1 \qquad (7a)$$

$$e_2/b_2 < 1$$

Therefore

$$e_1/b_1 > 1 > e_2/b_2 \qquad (8)$$

That is

$$e_1/b_1 > e_2/b_2 \qquad (8')$$

Since

$e_1 = E_1/E$; $e_2 = E_2/E$; $b_2 = B_2'/(T-E)$ and
$b_2 = B_2'/(T-E)$.

Therefore,

$$E_1/E_2 > B_1'/B_2' \qquad (8'')$$

Multiplying both sides of Inequality (8") by T_2'/T_1' gives:

$$\frac{E_1}{E_2} \times \frac{T_2'}{T_1'} > \frac{B_1'}{B_2'} \times \frac{T_2'}{T_1'} \qquad (9)$$

$$\frac{E_1/T_1'}{E_2/T_2'} > \frac{B_1'/T_1'}{B_2'/T_2'} \qquad (9')$$

where $T_1' = T_1 - E_1$ is the tax revenue collected from relatively poor people; and $T_2' = T_2 - E_2$ is the tax revenue collected from relatively rich people.

The right hand side of Inequality (9') is an index of the bias of the government's expenditure policy in relation to the tax collected from different income groups. The index indicates that the said policy is progressive, proportional or regressive if the value of the index is, respectively, greater than, equal to, or less than 1.[6] The left hand side of the Inequality indicates the ratio of the rate of evasion (here the rate of evasion means evasion as a proportion of the tax contribution of the specified group) in the lower income group, YP_1 to that in the higher income group, YP_2.

The first conclusion which emerges from the foregoing analysis is: in the case of a regressive public expenditure policy, not only does the higher rate of evasion in the lower income group YP_1 compared to the higher income group YP_2 lead to an improvement in income distribution, but an equal rate of evasion ($E_1/T'_1 = E_2/T'_2$) in both income groups will also lead to an improvement in income distribution. Even a lower rate of evasion in the lower income group YP_1, compared to income group YP_2, may also improve vertical equity provided that the Inequality (9') is satisfied.

The conclusions derived in the proceding paragraph lead to the following apparent paradox. Assume that there is a situation where poor people (income group YP_1) are evading relatively more taxes than richer people (income group YP_2) with respect to the tax paid by each income group. Then the government may consider changing its present progressive public expenditure policy to a regressive policy (with respect to the taxes paid by each income group) to compensate the richer people. However, such a step may in fact, contrary to the government's intentions, tend to improve vertical equity even further, since the value of the index in the right hand side of expression (9'), (which will be more than one in the case of a progressive public expenditure policy), will come down to less than one in the case of a regressive public expenditure policy, while the value of the left hand side index in the same expression will remain more than one.

The second conclusion is that in the case of progressive and proportional public expenditure policies ($B'_1/T'_1 \geqslant B'_2/T'_2$), tax evasion will improve vertical equity if and only if the evasion rate in the lower income group YP_1 is greater than that in the income group YP_2 and the condition laid down by expression (9') is satisfied.

The effects of evasion on income distribution will now be analysied in the situation where all public expenditure is on public investment.

Situation II : Public Expenditure as Public Investment

The second situation is defined to be the case where all public expenditure is on public investment, whose benefits accrue among people according to their share in national income, that is, according to the prevailing income distribution. Let, $a_1 : a_2$ be the pre-tax and pre-evasion income share of people in the income groups YP_1 and YP_2 respectively where $a_1+a_2 = 1$. For simplicity, it is, in this case, assumed that there is no private investment. The people in the income groups YP_1 and YP_2 have c_1 and c_2 as their respective marginal propensities to consume (mpc), where $c_1 > c_2$, assuming that poor people's mpc is higher than rich people's mpc.

The total income in the economy will be given by:

$$Y = c_1(Y_1 - T_1) + c_2(Y_2 - T_2) + T \qquad (10)$$

where $c_1(Y_1 - T_1)$ is the poor people's consumption expenditure; $c_2(Y_2 - T_2)$ is the rich people's consumption expenditure; and T is the government's expenditure.

Since

$$Y_1 = a_1 Y; \; Y_2 = a_2 Y; \; T_1 = t_1 T; \text{ and } T_2 = t_2 T$$

Therefore, equation (10) can be modified as follows:

$$Y_1 = c_1(a_1Y-t_1T) + c_2(a_2Y-t_2T) + T \qquad (10')$$

or

$$Y_1 = c_1a_1Y-c_1t_1T + c_2a_2Y-c_2t_2T + T$$

Solving for Y:

$$Y = \frac{T(1-c_1t_1- c_2t_2)}{(1-c_1a_1 - c_2a_2)} \qquad (11)$$

where Y, the level of income, will be equal to the public expenditure times some constant $(1-c_1t_1-c_2t_2)/(1-c_1a_1-c_2a_2)$.

The income thus derived on the basis of equation (11) will accrue to income groups YP_1 and YP_2 according to the ratios a_1 and a_2, that is, the prevailing pre-tax and pre-evasion income distributions. However, the net of tax situation in the absence of evasion will be as shown below.

For the poorer group $YP_1 = a_1Y - t_1T$ (12a)

For the richer group $YP_2 = a_2Y - t_2T$ (12b)

where Y is given as in equation (11).

However, in the presence of evasion, E, where $E = E_1 + E_2$, the income-expenditure equation (10') will be changed and take the following form:

$$Y' = c_1(a_1Y'-t_1T+E_1) + c_2(a_2Y'-t_2T+E_2) + (T-E) \quad (13)$$

Since

$$e_1 = E_1/E \text{ and } e_2 = E_2/E$$

Therefore,

$$Y' = c_1(a_1Y'-t_1T+e_1E) + c_2(a_2Y'-t_2T+e_2E) + (T-E) \quad (13')$$

where $c_1(a_1Y'-t_1T+e_1E)$ is the group YP_1's expenditures; $c_2(a_2Y'-t_1T+e_1E)$ is the group YP_2's expenditure; and $(T-E)$ is the magnitude of public expenditure in the presence of evasion. Equation (13') can be solved for Y' as follows:

$$Y' = \frac{T(1-c_1t_1-c_2t_2) - E(1-c_1e_1-c_2e_2)}{(1-c_1a_1 - c_2a_2)} \quad (14)$$

Thus, in the presence of evasion, the level of income will be changed, and the income Y'[7] will accrue to the two income groups YP_1 and YP_2 according to the ratios: a_1 and a_2. Moreover, the effective disposable income of both groups in the presence of evasion will also change as shown below:

For the poorer group $YP_1 = a_1Y'-t_1T+e_1E$ (15a)

For the richer group $YP_2 = a_2Y'-t_2T+e_2E$ (15b)

where Y' is given as in equation 14.

Vertical equity will improve if

$$(a_1Y' - t_1T + e_1E) > (a_1Y - t_1Y) \tag{16a}$$

and

$$(a_2Y' - t_2T + e_2E) < (a_2Y - t_2T) \tag{16b}$$

Inequalities (16a and b), after cancelling same terms in both sides of each Inequality can also be written as follows:

$$a_1Y' + e_1E > a_1Y \tag{16'a}$$

and

$$a_2Y' + e_2E < a_2Y \tag{16'b}$$

That is,

$$e_1E + a_1(Y' - Y) > 0 \tag{16''a}$$

and

$$e_2E + a_2(Y' - Y) < 0 \tag{16''b}$$

Replacing the values of Y' and Y in Inequality (16"a), the Inequality can be reformulated as follows:

$$e_1E + a_1\left[\frac{T(1-c_1t_1-c_2t_2)}{(1-c_1a_1-c_2a_2)} - \frac{E(1-c_1e_1-c_2e_2)}{(1-c_1a_1-c_2a_2)} - \frac{T(1-c_1t_1-c_2t_2)}{(1-c_1a_1-c_2a_2)}\right] > 0 \tag{16'''a}$$

or

$$e_1E + a_1\left[\frac{-E(1-c_1e_1-c_2e_2)}{(1-c_1a_1-c_2a_2)}\right] > 0 \qquad (16''''a)$$

or

$$e_1 - \frac{a_1(1-c_1e_1-c_2e_2)}{(1-c_1a_1-c_2a_2)} > 0 \qquad (17a)$$

$$e_1 - a_1m > 0 \qquad (17a)$$

or

$$e_1/a_1 > m \qquad (17'a)$$

where

$$m = \frac{(1-c_1e_1 - c_2e_2)}{(1-c_1a_1 - c_2a_2)}$$

The second term in Inequality (16''''a) indicates that the difference between total income Y', in the presence of evasion and Y in the absence of evasion (Y'-Y), is equal to -mE, that is, Y' is less than Y by the tax evaded times·m, where m is some constant which will always have a positive value.[8] Therefore, Inequality (16''b) can be solved straightaway by substituting the value of (Y'-Y) by -mE as shown below:

$$e_2E + a_2(-mE) < 0 \qquad (16'''b)$$

That is

$$e_2 - a_2m < 0 \qquad (17b)$$

or

$$e_2/a_2 < m \qquad (17'b)$$

Vertical equity will improve (or worsen) if the following Inequalities are satisfied (or not satisfied):

$$e_1/a_1 > m \qquad (17'a)$$

and $$e_2/a_2 < m \qquad (17'b)$$

Thus

$$e_1/a_1 > m > e_2/a_2 \qquad (18)$$

It has already been proved that $e_1/a_1 > 1$ implies $e_2/a_2 < 1$ and vice-versa (see note 5). Further when, if e_1/a_1 is greater than (or less than) one, then the value of m is less than (or greater than) one.[9]

This implies that, if $e_1 > a_1$, then vertical equity will improve provided that e_2/a_2, whose value is less than one, is less than the positive fraction m, whose value is also less than one. However, $e_2/a_2 < m$ will automatically be satisfied if the condition, $e_1/a_1 > m$ is satisfied.[10] Therefore, the latter Inequity is sufficient to lay down the condition for an improvement of vertical equity.

Similarly if $e_1 < a_1$, then vertical equity will worsen. The reason is that, $e_1 < a_1$ will satisfy the conditions $e_1/a_1 < m$ and $e_2/a_2 > m$, since $e_1 < a_1$ will make the value of m greater than one leading to $e_2/a_2 > m$ (see Note 10).

Inequalities (23'a and 'b) yield some additional information. For example, these Inequalities indicate that if Re.1 is spent by the government, income increases by Rs.(1 x m). Expression (23'a) indicates that the share of people of income group YP_1 in an increase of incomes will be a_1m. Therefore, if e_1, that is, the share of evasion of income group YP_1, is higher than their share in the increase of incomes (a_1 m), vertical equity will improve.

Now the effect of evasion in the third situation can be analysed.

Situation III: Public Expenditure is Partly Transfer Payments and Partly Public Investment

Compared to the two earlier cases, this is a more general case. In this situation both transfer payments and public investment have been taken into account in the income-expenditure equation for analysing the impact of evasion on income distribution.

In this situation it is assumed that some part of total tax revenue is spent as transfer payments (TR), that is, TR = rT; where r is the ratio of transfer payments to total tax revenue; and the remaining part of T (TI) is spent on public investment, that is, TI = (1-r)T. The people in both income groups YP_1 and YP_2 are receiving transfer payments according to the ratios $b_1:b_2$. That is, $B_1=b_1TR = b_1rT$; and $B_2= b_2TR = b_2rT$; and thus, $b_1 + b_2 = 1$. The size of b_1 and b_2 is, as mentioned earlier, independent of the prevailing income distribution but is dependent on government policies, while the benefits generated from public investment depend on the prevailing income distribution (pre-tax and pre-evasion) $a_1:a_2$, where $a_1 + a_2 = 1$, as explained in the preceding sub-section. In this case also as in the preceding case, it is, for simplicity, assumed that there is no private investment.

Now the total income in the economy, when evasion does not exist, will be as given below:

$$Y = c_1(a_1Y-t_2T+b_1rT) + c_2(a_2Y-t_2T+b_2rT) + (T-rT) \qquad (19)$$

Solving for Y:

$$Y = \frac{T(1-c_1t_1-c_2t_2) - rT(1-c_1b_1-c_2b_2)}{(1-c_1a_1-c_2a_2)} \qquad (20)$$

The net incomes of the two income groups YP_1 and YP_2 can be set out as follows:

For the poorer group $YP_1 = a_1Y-t_1T+b_1rT$ (21a)

For the richer group $YP_2 = a_2Y-t_2T+b_2rT$ (21b)

where Y is given as in equation (20).

However, in the presence of evasion E, where $E = E_1 + E_2$, the income expenditure equation (19) will be changed, and can be written:

$$Y' = c_1 \; a_1Y'-t_1T+E_1+rb_1(T-E) \quad + c_2 \; a_2Y'- t_2T+E_2+rb_2(T-E) \quad + \; T-E-r(T-E) \qquad (22)$$

Since

$$E_1 = e_1E \text{ and } E_2 = e_2E$$

Therefore,

$$Y' = c_1a_1Y'-c_1t_1T + c_1e_1E + rb_1c_1(T-E) + c_2a_2Y' - c_2t_2T + c_2e_2E + rb_2c_2(T-E) + T-E-r(T-E)$$

Solving for Y'

$$Y' = \frac{T(1-c_1t_1-c_2t_2)-E(1-c_1e_1-c_2e_2)-r(T-E)(1-c_1b_1-c_2b_2)}{(1-c_1a_1-c_2a_2)} \qquad (23)$$

The income Y', derived on the basis of equation (23) will accrue to income groups YP_1 and YP_2 according to the ratio $a_1:a_2$. Further, the effective disposable income of both groups in the presence of evasion will be as shown below:

For the income group:

$$YP_1 = a_1Y' - t_1T + e_1E + rb_1(T-E) \quad (24a)$$

For the income group:

$$YP_2 = a_2Y' - t_2T + e_2E + rb_2(T-E) \quad (24b)$$

Where Y' is given as in equation 23.

Vertical equity will improve if

$$a_1Y' - t_1T + e_1E + rb_1(T-E) > a_1Y - t_1T + rb_1T \quad (25a)$$

and

$$a_2Y' - t_2T + e_2E + rb_2(T-E) < a_2Y - t_2T + rb_2T \quad (25b)$$

Inequalities (25a and b), after cancelling similar terms in both sides of each equation, can be written as follows:

$$a_1Y' + e_1E - b_1r\,E > a_1Y \quad (25'a)$$

and

$$a_2Y' + e_2E - b_2r\,E < a_2Y \quad (25'b)$$

That is

$$a_1\,(Y'-Y) + E(e_1-b_1r) > 0 \quad (25''a)$$

and

$$a_2\,(Y'-Y) + E(e_2-b_2r) < 0 \quad (25''b)$$

For greater simplicity, the terms Y and Y' in Equation (25"a) may be substituted for by their respective values given in equations (20 and 23) respectively as follows:

$$E(e_1-b_1r) + a_1\left[\frac{T(1-c_1t_1-c_2t_2)}{(1-c_1a_1-c_2a_2)} - \frac{E(1-c_1e_1-c_2e_2)}{(1-c_1a_1-c_2a_2)} - \frac{r(T-E)\ (1-c_1b_1-c_2b_2)}{(1-c_1a_1-c_2a_2)} - \frac{T(1-c_1t_1-c_2t_2)}{(1-c_1a_1-c_2a_2)} + \frac{rT(1-c_1b_1-c_2b_2)}{(1-c_1a_1-c_2a_2)}\right] > 0 \qquad (26a)$$

or

$$E(e_1-b_1r) - \frac{a_1E((1-c_1e_1-c_2e_2) - r(1-c_1b_1-c_2b_2))}{(1-c_1a_1-c_2a_2)} > 0 \qquad (26'a)$$

If

$$\frac{1-c_1e_1-c_2e_2 - r(1-c_1b_1-c_2b_2)}{1-c_1a_1-c_2a_2} = m'$$

Then

$$E(e_1-b_1r) - a_1m'E > 0 \qquad (26"a)$$

or

$$e_1-b_1r > a_1m' \qquad (27'a)$$

The second term in Inequalities (26'a) and (26"a) indicates that the difference between total income (Y') in the presence of evasion and total income (Y) in the absence of evasion, (Y'-Y), is equal to -m'E. Therefore, Inequality (25"b) can be solved by substituting the value of (Y'-Y) by (-m'E) as shown below:

$$E(e_2-b_2r) - a_2m'E < 0 \qquad (26b)$$

or

$$e_2-b_2r < a_2m' \qquad (27b)$$

Thus, vertical equity will improve (or worsen) if the following Inequalities are satisfied (or not satisfied).

$$(e_1-b_1r) > a_1m' \qquad (27a)$$

and

$$(e_2-b_2r) < a_2m' \qquad (27b)$$

or

$$e_1 > a_1m' + b_1r \qquad (28a)$$

and

$$e_2 < a_2m' + b_2r \qquad (28b)$$

The left hand side terms in Inequalities (28a) and (28b) indicate that if Re.1 is evaded in the economy, then e_1 and e_2 are the gains from evasion to the people in the income groups YP_1 and YP_2 respectively. The right hand side terms in Inequalities (28a and b) denote respectively the gains to the people in the income groups YP_1 and YP_2 from public expenditure of Re.1, which would otherwise have been made by the government if the amount of tax evaded (Re.1) had been realised. The public expenditure of Re.1 would have generated Rs.m' income through public investment and Rs.r through transfer payments, that is, $(a_1m' + b_1r)$ and $(a_2m' + b_2r)$ would have been the respective gains from public expenditure to the people in the income groups YP_1 and YP_2. Therefore, it can be inferred that vertical equity improves (or worsens) if the gains from evasion are greater than (or less than) their gains from public expenditure[11] for the poorer YP_1 and similarly for the richer group YP_2 if the gains from evasion are less than (or greater) their gains from public expenditure.

The foregoing analysis demonstrates that evasion may either improve or worsen vertical equity, contrary to the often repeated argument that evasion inevitably tends to worsen vertical equity. Further, the analysis shows that the effects of evasion on income distribution depend firstly, on the prevailing pre-tax and pre-evasion income distribution; secondly, on the proportion of tax evaded by different income groups; and thirdly, on government policy regarding the distribution of transfer payments among different income groups.

In addition, it may be noted that evasion does not adversely affect horizontal equity in all cases. For example, horizontal equity will not be affected if evasion is practised by each member of a particular income group at the same rate: that is, the canon of horizontal equity is not violated if every tax payers is underpaying taxes by the same percentage of his income. This is contrary to the excessively sweeping proposition stated by Chelliah, who wrote that "unchecked evasion, of course, violates the principle of horizontal equity".[12]

NOTES

1. See for example: D.K. Rangnekar (1971), "Note of Dissent" Direct Taxes Enquiry Committee: Final Report, Government of India, Ministry of Finance, New Delhi, pp. 249-51; K.N. Kabra (1982), The Black Economy in India, Chanakya Publications, New Delhi; Government of India, Ministry of Finance (1985). Aspects of the Black Economy in India, pp. 390 and 403-4.

2. Recently some empirical studies supported this this proposition. A study on the magnitude of sales tax evasion on different commodities shows that the magnitude of evasion on commodities which are largely consumed by poor people, like millets, cereals, non-hydrogenated edible oil, washing soap and so on, is higher than on commodities like hydrogenated edible oil, toilet soap, cement, chemical fertilizer and so on. See Tables 3.1 to 3.9 in Shekhar Mehta (1985). "An Analysis of Tax Structure and Tax Evasion in Rajasthan: 1960-61 to 1975-80", unpublished thesis, Jawaharlal Nehru University, New Delhi. It can be further corroborated by the facts relating to evasion in the case of real estate duty revealed in the recently published report on the "Black Economy"in India, which said: "Properties with lower absolute value tend to be under-valued significantly and systematically more (in percentage term) than higher valued properties". See Government of India, Ministry of Finance (1985), Aspects of the Black Economy in India, p. 236; for the same matter, see, A. Kumar (1985), "Black Money Menace I," Business Standard, May 7.

3. Later, it has been shown that in other cases too, evasion may tend to improve vertical equity in the presence of regressive public expenditure policy.

4. Here it is also assumed that the distribution of public expenditure will not reverse the situation; that is, poor people will not become rich and rich people will not become poor.

5. This can be demonstrated by deriving Inequality (6'b) from Inequality (6'a) as follows:

$$(e_1 - b_1) > 0 \qquad (6'a)$$

In the above Inequality, e_1 can be replaced by $(1-e_2)$, since $(e_1+e_2) = 1$.[1] Thus,

$$(1-e_2-b_1) > 0$$

or

$$e_2 < (1-b_1)$$

Since

$$b_1 + b_2 = 1$$

Therefore,

$$e_2 < b_2$$

In fact $(e_1-b_1) > 0$ implying $(e_2-b_2) < 0$ is a property of the balanced budget.[2] In the situation of a deficit budget this need not hold.

6. The distribution of public expenditure can also be stated in terms of the proportion of public expenditure with respect to the income of different income groups. It can be illustrated briefly as follows. Inequality (8") can be multiplied by Y_2/Y_1 instead of T'_2/T'_1, then the Inequality can be written in the following form:

$$\frac{E_1/Y_1}{E_2/Y_2} > \frac{B'_1/Y_1}{B'_2/Y_2}$$

The right hand side of the above Inequality is an index of the bias of the government's expenditure policy in relation to the income of different income groups. This index also indicates that the said policy is progressive, proportional, or regressive if the value of the index is · 1. The distribution of public expenditure thus defined will lead to the same conclusion about the effects of evasion on income distribution as is drawn from the concept of public expenditure distribution defined in the main text.

However, the 'index in respect of taxes paid by different income groups' is preferred in explaining the effects of evasion on income distribution, since more than one value of the 'index in respect of incomes of different income groups' will not convey that the public expenditure policy of government is progressive, if government is receiving more taxes from poor people than the benefits rendered to them.

7 The income Y' in presence of evasion will be less than the income Y in absence of evasion, since evasion E will depress public expenditure. The reason is that the evaded income will be spent by the evaders according to their mpc, while the government would have spent the full amount if the evaded part of taxes had been realised. Thus, the ultimate result of evasion will contract total income.

8 The value of m will always be positive, since the numerator $(c_1e_1 + c_2e_2)$ and denominator $(c_1a_1 + c_2a_2)$ in the expression of m will be less than one. The reason is that, c_1 and c_2 are both proper franctions that are less than one and are positive. Thus $(c_1e_1 + c_2e_2)$ and $(c_1a_1 + c_2a_2)$ are the weighted averages of c_1 and c_2. Therefore, neither $(c_1e_1 + c_2e_2)$ nor $(c_1a_1 + c_2a_2)$ can be greater than or equal to unity.

9. This can be shown as follows: The value of m, which is $(1-c_1e_1-c_2e_2)/(1-c_1a_1-c_2a_2)$, will be less than one if the numerator is less than the denominator. Now it can be proved that it is possible if $e_1/a_1 > 1$.

Since

$$e_1+e_2 = a_1+a_2$$

Thus

$$e_1-a_1 = a_2-e_2 \qquad \text{(i)}$$

But

$$c_1 > c_2$$

Multiplying equation (i) by c_1 on the right hand side and c_2 on the left hand side gives

$$c_1(e_1-a_1) > c_2(a_2-e_2) \quad \text{iff } e_1/a_1 > \qquad \text{(ii)}$$

Therefore

$$c_1e_1+c_2e_2 > c_1a_1+c_2a_2$$

Thus

$$1-c_1e_1-c_2e_2 < 1-c_1a_1-c_2a_2$$

Thus, the numerator will be less than the denominator if $e_1/a_1 > 1$.

10. This can be proved as follows: The condition $e_2/a_2 < m$ will be satisfied if the difference between e_2/a_2 and m is less than zero. That is,

$$e_2/a_2 - m < 0 \qquad \text{(i)}$$

That is

$$\frac{e_2}{a_2} - \frac{(1-c_1e_1-c_2e_2)}{(1-c_1a_1-c_2a_2)} < 0$$

$$e_2(1-c_1a_1-c_2a_2) - a_2(1-c_1e_1-c_2e_2) < 0 \qquad \text{(ii)}$$

$$e_2(1-c_1a_1) - c_2a_2e_2 - a_2(1-c_1e_1) + c_2a_2e_2 < 0$$

$$e_2(1-c_1a_1) - a_2(1-c_1e_1) < 0$$

$$\frac{e_2}{a_2} < \frac{(1-c_1e_1)}{(1-c_1a_1)} \qquad \text{(iii)}$$

Dividing and multiplying the first term of Inequality (iii) by c_1 gives

$$\frac{c_1e_2}{c_1a_2} < \frac{(1-c_1(1-e_2))}{(1-c_1(1-a_2))} \qquad \text{(iv)}$$

That is

$$\frac{c_1e_2}{c_1a_2} < \frac{(c_1e_2 + (1-c_1))}{(c_1a_2 + (1-c_1))}$$

Let, $k_1 = c_1e_2$ and $k_2 = c_1a_2$

Then

$$\frac{k_1}{k_2} < \frac{(k_1 + (1-c_1))}{(k_2 + (1-c_1))} \qquad \text{(v)}$$

Since k_1 k_2, that is implied from $e_1 > a_1$, and $(1-c_1)$ is a positive fraction, therefore, Inequality (v) will be satisfied. Thus the above Inequality implies that e_2/a_2 will be less than m in the case where $e_2/a_2 < 1$ or $e_2 < a_2$. Similarly, if $k_1 > k_2$, that is, $e_2 > a_2$ (or $e_1 < a_1$), then Inequality (v) will be reversed. That is,

$$\frac{k_1}{k_2} > \frac{(k_1 + (1-c_1))}{(k_2 + (1-c_2))} \Rightarrow \frac{e_2}{a_2} > m$$

11. Here, public expenditure includes both public investment and transfer payments.

12. R.J.Chelliah (1959). Fiscal Policy in Under-developed Countries, George Allen and Unwin Ltd., London, p.121.

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