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**The Social Costs of Economic Growth:
A Theoretical Depiction**

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ABSTRACT

Under certain features of less developed countries (LDCs), it is shown that external diseconomies of government affecting private production sector, and of private production sector affecting consumers must be accounted for in growth or development. The fundamental equation of sources of growth accounting if modified to include these negative effects may show a lower growth rate of total output.

The required genuine social, political and institutional reforms that will at least reduce these external diseconomies are noted but the problem of who will carry these out is left unresolved since this belongs to the realm of normative economics.

THE SOCIAL COST OF ECONOMIC GROWTH: A THEORETICAL DEPICTION

By

Casimiro V. Miranda, Jr.*

In the case of political,
and even of religious leaders, it is
often very doubtful whether they have
done more good than harm.

ALBERT EINSTEIN

I. Introduction

That government or the public sector, besides the deleterious effects of the activities of some private producers or firms, maybe a negative externality or external diseconomy in private production or even in consumption activities has never been considered and taken into account especially in macroeconomic growth. To be sure, the government's activities are assumed to be always a positive effect in the production process, hence the effects of external diseconomy is taken for granted. This effect is assumed to be already reflected in economic growth, and even in economic development. This maybe true of developed industrialized countries where corruption and government inefficiency and private production external diseconomies are almost nil since they are internalized by serious regulatory measures. However, in many less developed countries (LDCs) today, government activities are seen to have more negative than positive effects on private economic activities making it necessary to take them into account in reckoning macroeconomic growth. Likewise, untrammelled private sector activities have negative effluents that must also be taken into account. Consider the following:

(1) Consider the fact that social unrest and political instability are common features of many less developed countries today. This very conspicuous restiveness of the people in these LDCs may just be a manifestation at the surface of a much deeper problem - that the governments of these countries are more of a harmful than of beneficial effect in their lives. The people of these LDCs may rather have less than more government intrusion in their legitimate production and consumption activities. It maybe worth noting that this restiveness of the people is endemic to many LDCs in Africa, Central and Latin America and, South and Southeast Asia.

2) In a relatively recent news in the Philippines - the typical LDC which will be the example and focus of this study - multinational corporations (MNCs) pulling out of the country gave the following reasons:

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a. Lack of, or poor infrastructural support, e.g. poor roads and bridges, reliable power supply, etc. which impedes or slows down the movement of goods resulting in higher production costs, which in turn weakens their global competitiveness.

b. Lack of, or poor access to telecommunications systems which impedes or slows down (intra and inter-sectoral) business transactions.

c. Inadequate water supply which negatively directly affects the production process.

We may add here the time-consuming and tedious bureaucratic process that obviously slows down if not actually hinder business transactions and other activities.

There is only one obvious result of all these problems besetting MNCs in particular, and the private production sector in general, namely, that all of these items mentioned above result in higher costs and lower output levels. This in turn makes the economy less competitive whether domestically or globally since all of these raise costs resulting in higher prices which hurt both the producers and the consumers.

It must be noted that graft and corruption in government are at the very roots of these problems. For instance, inadequate infrastructure support, and inadequate or poor telecommunications facilities, etc. are results of substandard materials and other inputs in road construction, telecommunications facilities, water facilities, etc. which happen because in between government contracts with the constructors and the construction of these facilities, there is the grease money that government officials must exact which impels the constructors to minimize cost by providing these substandard goods and services which, in turn, are what the government provides the people. Similar reason applies to the time-consuming, tedious bureaucratic process in almost all levels of the government which delays business transactions and raises costs or reduces the output levels of the private sector.

In view of these arguments versus government activities, one conclusion emerges namely, that government activities may enter private producers' or firms' and, even consumers' activities as an external diseconomy. As such therefore, government activities must be taken into account in the growth process of many LDCs to reflect a more accurate picture. The growth rates of these LDCs may no longer be reflected by just the statistical growth rates. The statistical growth rates of the GDPs or GNPs of these countries require adjustment through an accounting of these external diseconomies from both the public sector and the private sector.

The two main types, defined in terms of the direction of the effect (emitter to affected party or parties), of the external diseconomies that shall be looked into are public sector or government G to the private sector or producers P (i.e. $G \rightarrow P$) and, producer to consumer (i.e. $P \rightarrow C$). The effects of the social costs of these types of external diseconomies are then incorporated in the equation of the sources of growth accounting.

II. Government as Emitter of External Diseconomy ($G \rightarrow P$)

While it is not the case that government as emitter of external diseconomy affects all sectors of society especially the producers or the private sector, what is claimed here is that most of the producers or firms or industries are negatively affected. The government that is considered here, to reiterate the thrust of the previous section, is graft-ridden, and inefficient as purveyor of public goods and services and whose programs are perceived by the private sector to inflict more harm than good to them so that the effect is to raise their social marginal cost which if they - the affected producers or firms or industries - have to take into account, will decrease their output level and concomitantly, the level of employment. Under these circumstances, we look at the negative effects of the external diseconomy and the social costs involved.

To begin with, the government's production function is

$$G = G(K, L) \quad (1)$$

where G is public goods and services produced and supplied by the government to all entities of society - producers and/or consumers - K is capital, and L is labor.

There are essentially two ways of depicting the intrusion of G as an externality in the economy. One is putting G in the aggregate production function while the other is putting G only in the production functions of the affected private producers or industries. The former however, gives the wrong idea that G is an external diseconomy to the entire private production sector, including the consumers, which has been discussed elsewhere in this paper as not necessarily the case. Thus the second way is adopted i.e., to look at G as a negative externality to only some or most but not all private producers or industries in the economy.

This calls for a distinction between the total level of G and that which emits external diseconomy to affected producers. Let this be $\hat{G}$ such that conceptually $\hat{G} \leq G$.

Consequently, the production function of the i th producer or industry affected by G is

$$Q_i = A_i Q_i(K_i, L_i, \hat{G}_i), \quad i = 1, 2, 3, \dots, n < N \quad (2)$$

where Q_i is the output and the i th producer or firm or industry, A_i is its technological progress term, K_i its capital stock, L_i its employed labor, and $\hat{G}_i$ the negative intrusion of G in its production function; $n < N$ simply means that not all of the private producers or industries are affected by the negative effluent of G .

Since G is public goods and services, then

$$G = G_1 = G_2 = G_3 = \dots = G_N \quad i = 1, 2, 3, \dots, N \quad (3)$$

Of course (3) does not necessarily mean that the extent of the effect of G on the producers' or firms' or industries' or their use of G is equal. (3) simply means that the public goods and services G are purveyed to all sectors of society.

Accordingly, in close parallelism to (3),

$$\hat{G} = \hat{G}_1 = \hat{G}_2 = \hat{G}_3 = \dots = \hat{G}_n \quad (4)$$

From (2), the marginal product (marginal effect) of $\hat{G}$ in the i th producer is $MP_{\hat{G}_i} = \partial Q_i / \partial \hat{G}_i > 0$ so that $\partial Q_i / \partial \hat{G}_i$ is the marginal damage $MD_{\hat{G}_i}$ of $\hat{G}$ on the i th producer, i.e.

$$MD_{\hat{G}_i} = \partial Q_i / \partial \hat{G}_i \quad (5)$$

Summing over i , we have

$$MD_{\hat{G}} = \sum_{i=1}^n MD_{\hat{G}_i} = \sum_{i=1}^n \partial Q_i / \partial \hat{G}_i \quad (6)$$

where $MD_{\hat{G}}$ is the social marginal cost of $\hat{G}$ in all of the affected producers or industries. Consequently, the Samuelson efficiency condition for the optimal quantity of public goods, $\sum_{j=1}^N MB_{G_j} = MC_G$, where MB_{G_j} is the marginal benefit from G of the j th producer

and MC_G is the marginal cost of providing the public goods and services G , needs to be amended to include (6), the negative effect of $\hat{G}$. Thus for the economy as a whole,

$$\sum_{j=1}^N MB_{G_j} - \sum_{i=1}^n MD_{\hat{G}_i} = MC_G$$

or,

$$\sum_{j=1}^N MB_{G_j} = MC_G + \sum_{i=1}^n MD_{\hat{G}_i} \quad (7)$$

(7) simply means that there are entities, especially producers, in the economy as a whole that are negatively affected by $\square$ and this must be deducted from the total marginal benefit or added to marginal cost if the external diseconomy of $\square$ were to be corrected.

III. Producer to Consumer ($P \rightarrow C$) External Diseconomy

An important type of external diseconomy that needs to be taken into account in an economy's overall growth is the producer to consumer ($P \rightarrow C$) type due to its common occurrence in LDCs. In the Philippines this includes the deadly effects of indiscriminate and illegal logging activities, the improper waste disposal by producers or firms that results in diseases and death especially in the immediate surroundings of these producers or firms, illegal method of fishing (the so-called "dynamite fishing"), improper disposal of toxic and disease-carrying wastes by hospitals, among others. The economy's overall growth is misleading if these are not accounted for since they are social costs that need to be compensated, or a deduction from the output of emitters if these were to be corrected since they make social marginal cost to become greater than private marginal cost so that if appropriate adjustment of the total output (GDP or GNP) of the economy were to be made, the result would be a lower level of total output or lower growth rate than that which is reported.

To begin with, consider the production function of the F th emitter (producer or firm) of the external diseconomy,

$$Q_F = A_F Q_F(K, L), \quad F = 1, 2, 3, \dots, p \quad (8)$$

where K is the non-labor input (capital or land, or some composite measure of both including all other non-labor inputs), L is labor input, and A_F is the producer's technological progress term. The producer's use of its K input produces its output Q_F that generates the harmful effluent. It should be noted that the emitter in this case may or may not be the same as the producer or firm in (2) who are affected by the government's external diseconomy.

Now, let

$$U_q = U_q [X_{kq}; Y_{kq}(Q_F)], \quad k = 1, 2, 3, \dots, m; \quad q = 1, 2, 3, \dots, r \quad (9)$$

be the utility function of the q th consumer affected by the externality. $X_{kq} \geq 0$ is the quantity of the k th good or service ordinarily consumed by consumers, while $Y_{kq} > 0$ is the quantity of the k th medical good or service (medicines, physician's services, hospital services, etc.) which the q th individual must consume due to the disease or physical harm inflicted on him by the effluent of the F th producer. Thus Y_{kq} represents the ailment contracted by the q th individual the severity of which rises with Q_F .

K may be used in (9) in lieu of Q_F but Q_F is more in keeping with the previous section and will be used in the derivation of the amended fundamental equation of sources of growth accounting.

As a quantitative representation of the affliction caused by Q_F , Y_{kq} has the advantage of being readily measurable empirically. With Y_{kq} as the ailment, its marginal utility to the q th individual or consumer must be negative, that is, from (9), $\partial U_q / \partial Y_{kq} < 0$ depicts the fact that it is the decrease in the quantity of medical goods and services consumed that indicates the turn for the better of the affliction. An important distinction

$$\partial U_q / \partial Q_F = \frac{\partial U_q}{\partial Y_{kq}} \frac{\partial Y_{kq}}{\partial Q_F} < 0 \quad (10)$$

between the goods or services X_{kq} and Y_{kq} should be noted. While some or all of X_{kq} can be zero, Y_{kq} is strictly positive due to its imperative nature.

With no external diseconomy in production, the optimality condition in a competitive economy for the F th producer is,

$$MB_{Q_F} = MC_F \quad (11)$$

where MB_{Q_F} is the marginal benefit that society derives from the output Q_F , and MC_F is the F th producer's marginal cost of its production of Q_F . However, with the external diseconomy emitted by F , (11) must be rewritten to account for the externality as follows:

$$MB_{Q_F} = MC_F + \sum_{q=1}^r MD_{Q_F q} \quad (12)$$

Hence, the total or economy-wide marginal damage is,

$$MD_{\hat{Q}} = \sum_{F=1}^P \sum_{q=1}^r MD_{Q_F q}, \quad (13)$$

so that economy-wide, the amendment to (11) is,

$$\sum_{F=1}^P MB_{Q_F} = \sum_{F=1}^P MC_F + \sum_{F=1}^P \sum_{q=1}^r MD_{Q_F q}, \quad (14)$$

where $MD_{Q_F q}$ is the marginal damage inflicted by the output Q_F of the F th producer on the q th party and is shown in (12). Thus, at the socially optimum level of Q_F the social marginal cost after taking into account the external diseconomy is the right-hand side of (14).

IV. The Fundamental Equation of Sources of Growth Accounting with External Diseconomy

Let the aggregate production function of the economy take the form

$$Q = Af(K, L, \hat{G}, \hat{Q}) \quad (15)$$

where Q is the economy's total output (GDP or GNP), A is the technological progress term, K is the capital stock, L is labor, $\hat{G}$ is government's output of goods and services that emits external diseconomy, and $\hat{Q} = \sum_{r=1}^R Q_r$ is the composite measure (in value terms as in real GDP or GNP) of the total output of the emitters of the external diseconomy. $\hat{G}$ and $\hat{Q}$ will account for the external diseconomies' effect on the rate of growth of total output.

Taking the total differential of (15) we have

$$dQ = dAf(K, L, \hat{G}, \hat{Q}) + A \left[\frac{\partial Q}{\partial K} dK + \frac{\partial Q}{\partial L} dL + \frac{\partial Q}{\partial \hat{G}} d\hat{G} + \frac{\partial Q}{\partial \hat{Q}} d\hat{Q} \right]$$

Dividing through by Q and since $\Delta A/A$ is a residual, and using the notation " Δ " for discrete change we have $\Delta Q/Q = \Delta A/A + (MP_K/Q) \Delta K + (MP_L/Q) \Delta L + (MP_{\hat{G}}/Q) \Delta \hat{G} + (MP_{\hat{Q}}/Q) \Delta \hat{Q}$, where MP_K is the marginal product of K , MP_L is the marginal product of L , $MP_{\hat{G}} = MD_{\hat{G}} < 0$ is the economy wide marginal damage of $\hat{G}$ shown in (6), and $MP_{\hat{Q}} = MD_{\hat{Q}} = \sum_{F=1}^F \sum_{q=1}^Q MD_{Q_F q} < 0$ is the economy-wide marginal damage of $\hat{Q}_F$ shown in (13).

Multiplying the second, third, fourth, and fifth terms on the right-hand side of above by K/K , L/L , $\hat{G}/\hat{G}$, and $\hat{Q}/\hat{Q}$ respectively and substituting r , the remuneration per unit of K for MP_K , the wage w for MP_L , $P_{\hat{G}}$ the shadow price of a unit of $\hat{G}$, for $MD_{\hat{G}}$, $P_{\hat{Q}}$ the shadow price of a unit of $\hat{Q}$, for $MD_{\hat{Q}}$ we have

$$\Delta Q/Q = \frac{\Delta A}{A} + \frac{rK}{Q} \frac{\Delta K}{K} + \frac{wL}{Q} \frac{\Delta L}{L} + \frac{P_{\hat{G}} \hat{G}}{Q} \frac{\Delta \hat{G}}{\hat{G}} + \frac{P_{\hat{Q}} \hat{Q}}{Q} \frac{\Delta \hat{Q}}{\hat{Q}} \quad (16)$$

Under constant returns to scale the sum of the relative shares in total output Q of

$$1 = \frac{rK}{Q} + \frac{wL}{Q} + \frac{P_G \hat{G}}{Q} + \frac{P_Q \hat{Q}}{Q}$$

the independent variables K , L , $\hat{G}$, and $\hat{Q}$ is equal to unity, i.e. or, correspondingly, $a + b + c + d = 1$, so that (16) finally takes the form

$$\Delta Q/Q = \Delta A/A + a(\Delta K/K) + b(\Delta L/L) - c(\Delta \hat{G}/\hat{G}) - d(\Delta \hat{Q}/\hat{Q}) \quad (17)$$

since $MD_{\hat{G}} < 0$, and $MD_{\hat{Q}} < 0$.

(17) is the version of the fundamental equation of the sources of growth accounting that includes the uninternalized external diseconomies generated by $\hat{G}$ and $\hat{Q}$. Clearly, the rate of growth of total output $\Delta Q/Q$ must be less than what it is without the external diseconomies from $\hat{G}$ and $\hat{Q}$.

V. Summary and Conclusion

An attempt is made to show that both the negative effects of external diseconomy of government on some, if not all producers or firms, and the negative effects or external diseconomy of some, if not all producers on consumers need to be taken into account in the growth or development performance of many LDCs today to reflect a more accurate picture of what is going on behind the process. These external diseconomies are the inevitable social costs of the economic growth or development in many LDCs with features listed under Sec. I of this study, in addition to these negative externalities' distortionary effects on what would otherwise be a more competitive economy.

With these results, the obvious recommendation that can be made is to drastically reduce these external diseconomies and this can only be done by a genuine and meaningful social, political, and institutional reforms wherein improvement in the economic process will naturally follow. The only problem with this is that people after all make up society and its political and institutional processes which are suggested to be reformed by those who come from such a society and its political and institutional make-up. So the question boils down to this, who will be those members of society who will genuinely and meaningfully institute the much-needed social, political, and institutional cleansing to bring these external diseconomies down to zero? This study cannot provide the answer since it belongs to the domain of normative economics.