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Performance Evaluation for Public Enterprises

Leroy P. Jones

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Public Enterprises

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ABSTRACT

1. Like a private enterprise, a public enterprise must be evaluated.
 - a. Improving the operational efficiency of public enterprises (without raising prices or increasing investment) is important: a 5% improvement could finance a 50%-150% increment in expenditures on education in representative LDCs.
 - b. Improving performance evaluation is a critical component of a systematic reform package to improve operational efficiency: without performance evaluation you cannot provide incentives or delegate autonomy.
2. A public enterprise must not be evaluated like a private enterprise.
 - a. Conventional private profit is unfair to the nation because it can improve when the country is worse off and vice versa; it is unfair to managers because it moves due to factors over which managers have no control.
 - b. Most alternatives to profit are even worse; partial indicators fail because they ignore some benefits and/or some costs; multiple indicators fail because of asymmetric counting of benefits and costs.
 - c. What is right about profit is its structure (benefits - costs); what is wrong about private profit is the way those costs and benefits are measured.
3. A public enterprise should be evaluated by starting with private profit and making a series of adjustments to:
 - a. make it fair to the nation by:
 - i. conversion from private to publicly relevant accounting categories, by recognizing that some private costs are public benefits (e.g. taxes), and vice versa;
 - ii. conversion from market to shadow prices, recognizing that public and private valuations differ; and
 - b. make it fair to managers by:
 - i. focusing on trends rather than levels, recognizing the many industry-and enterprise-specific constraints;
 - ii. clearly distinguishing between price and quantity changes, usually with more weight attached to the latter, recognizing that managers often have little control over prices.

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I. OVERVIEW

Public enterprise inefficiency imposes great costs in terms of forgone social welfare. For example, improving the real operating efficiency of the public enterprise sector by only five percent without changing prices or making new investment would:¹

- (a) In Egypt, free resources amounting to about 5% of GDP, equivalent to 75% of all government direct taxes, or enough to triple government expenditures on education;
- (b) In Pakistan, free resources amounting to 1% of GDP, equivalent to half of direct taxes, or enough to increase government expenditures on education by 50%;
- (c) In South Korea, free resources amounting to 1.7% of GDP, or over one billion dollars in 1981; and,
- (d) In The People's Republic of China, free resources worth eleven billion dollars, which would fund a 150% increase in government expenditures on education, health, culture and science.

¹ Leroy P. Jones, "Improving the Operational Efficiency of Public Industrial Enterprises in Egypt" (Report for the U.S. Agency for International Development, August 1981). _____, "Efficiency of Public Manufacturing Enterprises in Pakistan". (Report for Pakistan Ministry of Production and World Bank, February 1981). _____, "Comments on Development of a Performance Evaluation System for the Korean Public Enterprise Sector," (Seoul: Korean Development Institute, June 1980).

The magnitudes of these potential gains may surprise some readers, but the existence of the premised inefficiencies will shock no one. Critics and defenders of public enterprise will, of course, differ in their analysis of the problem. Economists writing in the Austrian, property rights, Chicago and related traditions, stress that the root of the problem lies in the separation of ownership from control. That is, managers are unlikely to make the difficult decisions to improve efficiency if they do not share in the resulting benefits. Their solution is to marry ownership and control through privatization on the capitalist model. This paper is sympathetic to this conservative analysis of the source of the problem, but suggests an alternative solution, namely the introduction of a signaling system to guide and motivate managers to act in the interest of society as a whole.

Such a system has three major components. The first is a performance evaluation system, in which national goals are translated into explicit enterprise objectives and quantified in a performance criterion. The second is a performance information system, in which actual achievements are monitored. The third is an incentive system, in which the welfare of managers and workers is linked to national welfare by a pecuniary or non-pecuniary bonus system based on achievement of particular target values of the criterion variables.

In this paper, the link between performance evaluation and efficiency is first elaborated upon (Sections II-IV). The body of the paper then specifies the elements of such a system. A basic indicator of efficiency is

first derived (Sections V and VI) and then modified to account for some of the exogenous factors beyond the control of management (Section VII). Given a criterion (a metric) which is broadly applicable across enterprises, it remains necessary to establish criterion-values (standards), which demarcate "good" from "bad" performance and which vary according to the specific circumstances of individual enterprises (Sections VIII and IX).

The next step is to extend the system to allow for non-commercial objectives and for dynamic effects (innovation and growth). The earlier focus on static operational efficiency is justified by the argument that its improvement takes first priority. That is, an enterprise which is not using its existing resources efficiently is not a likely candidate for new resources and is unlikely to have the ability to make a maximum contribution to non-commercial objectives. Nonetheless, it remains essential to incorporate indicators of non-commercial and dynamic performance (Sections X and XI).

Performance evaluation is not confined to providing a bottom-line judgement, but also involves diagnosis to understand sources of problems and achievements. Diagnostic indicators are therefore discussed briefly in Section XII.

Performance evaluation of public enterprises is not a simple matter and a workable system cannot be imposed arbitrarily from above overnight. Rather, it must be the product of an evolutionary process involving both enterprise managers and government supervisors. Accordingly, a phased system of implementation is proposed (Section XIII).

II. THE IMPORTANCE OF PERFORMANCE EVALUATION

Internationally, many of the problems of the public enterprise sector are traceable to inadequacies in performance evaluation. This is not surprising. Public enterprise goals are difficult to specify due to the problems of multiple objectives (including commercial versus non-commercial) and plural principals (different control organs having different perceptions of what the goals should be). If goals cannot be specified, then "good" performance cannot be distinguished from "bad", managers cannot be rewarded on the basis of performance, and inefficiency can result.

What if the goal area were eliminated in a soccer football league and no alternative means of keeping score were substituted? What would be the effect on the quality of play? Initially, players might continue to exhibit their old skills through professional pride or force of habit. Eventually, however, new forms of behavior might be expected to emerge. Selfish show-boating might yield rewards in crowd applause without its old penalty of reduced teamwork and scoring. Movement without the ball would cease as the old costs of being out of position would have been eliminated. Being out of condition would incur few penalties and practice might become perfunctory or canceled altogether. The coach would have little reason not to indulge his whims and play his favorites regardless of their skills. Better players would yearn for recognition and the satisfaction of playing to win, and would move to other leagues and be replaced by weaker players. At best the game would become quite different -- akin to a Sunday afternoon game of frisbee at the

beach -- pleasant and occasionally incorporating some spectacular moves, but with marginal appeal to competitive, goal-oriented individuals. In terms of efficiency, one can imagine the results if a member of this league were to play a competitive game with a conventional team.

While the situation of public enterprises is by no means as bleak as this little analogy might suggest, it remains true that organizations without meaningful quantifiable objectives have great difficulties in controlling efficiency. Compare government agencies and private enterprises in this respect. The outputs of government departments are generally difficult or impossible to quantify: how do you measure the performance of the Ministries of Finance or Defense? For private enterprises, on the other hand, long-term profits and growth provide quite reasonable first approximations to performance. The relative difficulty with which performance can be measured is one major piece of the explanation of the widespread view of governments as inefficient.

Public enterprise is a hybrid, sharing characteristics of public governmental institutions and private enterprise. Like government, some of its goals (non-commercial, for short) are difficult to quantify; like a private enterprise, some of its objectives (commercial, for short) are readily quantifiable. If "poor" commercial performance can be readily explained away in terms of "non-commercial" objectives and if no effort is made to distinguish between legitimate reasons for poor commercial performance (e.g., government pricing policies) and illegitimate reasons (e.g., incompetence leading to high costs), then even the quantifiable objectives lose their power

for guidance, motivation, evaluation and control. The enterprise then in effect becomes just like a government agency rather than a hybrid. The public enterprise manager plays a game without a score.

For some public enterprises this is perhaps inevitable. In a regional development bank the non-commercial objectives may so outweigh the commercial ones that quantification is not feasible. For most public enterprises, however, the bulk of their services to society come through their commercial activities and systematic performance evaluation becomes feasible.

In short, most public enterprises are in fact evaluated like a public institution (which is to say, not all) and if they are to be made more efficient, they must be made more like private enterprises, with quantified performance indicators to serve as a first approximation to performance. This is not to say that they are to be evaluated like a private enterprise, but rather that, like a private enterprise, they must be evaluated.

III. AUTONOMY AND DECENTRALIZATION

Performance evaluation is critical in its own right, but its importance is compounded because it is a precondition to reform of the autonomy structure as a whole. When asked how to improve their efficiency, many public enterprise managers respond: "Give us clear objectives, then give us the autonomy to pursue those objectives, and judge us by the results". They are

right in linking the signaling system to autonomy, because without clear objectives and an incentive system, autonomy cannot be delegated.

To illustrate, consider the determination of the level of working capital. In a private enterprise, the power to set the level of working capital is almost invariably delegated to the chief executive officer by the shareholders and the Board of Directors. The assumption is that the manager will keep as much working capital as necessary for efficient operation, but no more, since the funds could otherwise be used to generate income directly (in economists' jargon, he will acquire working capital only up to the point where its marginal cost equals its marginal revenue product). The reason that this is a safe assumption is that the manager is judged and rewarded on the basis of profit, which will rise or fall (in part) according to the correctness of decisions on the level of working capital. The board can therefore exercise its control function by examining outcomes (profit) rather than the process by which the outcome is generated.

If, on the other hand, the manager has little or no reason to be concerned with raising the profit of the firm, then he might not be expected to make the correct decision on the level of working capital. He might divert funds from more productive uses by keeping levels of inventory and cash far beyond the level necessitated by prudent management, thus reducing risk and avoiding difficult decisions. It is, after all, easier to keep all your funds in a checking deposit account than to constantly shuttle them between short and long-term interest-bearing deposits. Similarly, it is much easier to maintain high levels of input inventories than to manage a "just-in-time"

delivery system. In such situations, the shareholder cannot wholly delegate the working capital decision.

In the case of public enterprise there are two reasons for government involvement in the working capital decision. The first is macroeconomic control of the aggregate level of credit. This, however, could be better accomplished by setting an overall credit ceiling to be allocated by price rationing. This effective delegation using market mechanisms would fail, however, if it were feared that managers would take "too much" regardless of the price. As a result of this second reason, various representatives of the government -- often high level -- find themselves involved in trying to take detailed decisions as to just what constitutes legitimate working capital levels for individual firms. The difficulties are that the process is time consuming, that the ministries often lack the information and the business expertise to know just what levels are "reasonable" and that scarce ministerial talent could be better used elsewhere. In sum, by any standard of modern management, the working capital decision should be delegated to the enterprise, but given the inadequacies of the signaling system it often cannot be.

The foregoing is merely one illustration of two general propositions. The first is that a policy of increasing reliance on market forces -- "getting the price right" -- is bound to fail unless accompanied by measures to ensure that enterprises are motivated to respond to the signals provided by those prices. The second is that when the principal cannot control outcomes, he must control processes. Delegation of operational process decisions to an

agent presupposes effective control of outcomes. This in turn requires that desirable outcomes be quantified and that there is some incentive mechanism to insure that the manager cares about the outcome. In sum, if more decisions are to be delegated to the enterprise, then there must be reform of the signaling system to insure that those decisions are made in the public interest. If autonomy is to be efficiently and permanently delegated to the enterprise, then accountability must be insured by a signaling system which specifies and rewards socially desirable behavior.

IV. LESSONS FROM INTERNATIONAL EXPERIENCE

If logic is clear in showing the need for a signaling system, international experience is equally clear in demonstrating the obstacles to implementing such a system. Space does not permit a detailed examination of this experience, but only a summary of its lessons.

Internationally, the evolution of public enterprise signaling systems follows a surprisingly predictable pattern. In the first phase, there is no explicit system. This may be for reasons of ideology ("from each according to his ability; to each according to his need") or bureaucratic precedence ("civil servants don't get bonuses; why should managers?"). In the U.S.S.R., for example, this phase lasted from 1917 to about 1932, when the second phase

was entered with bonuses paid, but according to very unsophisticated performance criteria.²

At the beginning of Phase Two, success is typically measured by some simple partial indicator such as quantity of production.³ This leads to abuses, because managers are not motivated to provide quality products or to reduce costs. Over time, additional indicators are added to reflect these other considerations and a system of multiple indicators evolves. These can become quite elaborate, and are often superficially appealing, but generally suffer from a basic structural flaw. This can be seen from a simple example. Assume that success is measured by three indicators: output, profit and labor productivity (value of output per worker). Further assume that from one year to the next, an enterprise changes in only two ways: the real value of its output increases and the real value of raw materials consumed rises by an equal amount. From the point of view of the nation, the enterprise is doing neither better nor worse. There is more of one good (the output), but less of another (the input) and the two changes precisely offset one another in terms of welfare. However, two of the three indicators increase, and the enterprise is rewarded. The problem is that the increase in output is credited three times (it raises all three indicators), while the increase in costs is debited only once (only profit falls). Because of this asymmetric counting of costs

² See: Alec Nove, "Microeconomic Problems," in The Soviet Economy (New York: Praeger, 1969), pp. 171-181.

³ For a detailed and illuminating critique of Phase Two problems, see: Janos Kornai, Over-centralization in Economic Administration (Oxford: Oxford University Press, 1959).

and benefits, it is quite easy for the enterprise to be rewarded for actions which make society worse off.

The lesson of Phase Two is that performance criterion must meet what I call fundamental principal of performance evaluation, namely that all benefits and all costs must be counted once and only once. Partial indicators fail because they ignore some benefits or some costs. Most multiple indicator systems fail because they weight benefits and various costs components asymmetrically.

Phase Three occurs with a shift to a criterion which meets the fundamental principle. Only a small class of indicators meet this criterion. One is profitability (variable benefits less variable costs over fixed costs). Another is the French Global Productivity of Factors. In the U.S.S.R., an attempt at entering Phase Three was made with the 1965 reforms⁴, announced by Kosygin in a speech including the following:

"The size of profits characterizes, to a considerable extent, the contribution made by an enterprise to the country's net income, which is used for the expansion of production and the improvement of the people's well-being."⁵

⁴ See: E.G. Liberman, "Plans, Profits and Bonuses," in Pravda (September 9, 1967); reprinted in Planning, Profit and Incentives in the U.S.S.R. (Volume I), edited by Myron Sharp (White Plains: International Arts and Sciences Press, 1966), pp. 79-87.

⁵ Kosygin, "On Improving Industrial Management, Perfecting Planning and Enhancing Economic Incentives in Industrial Production" Izvestia (September 28, 1965). Reprinted in Sharp, cited above.

In this view, what is wrong in a capitalist society is not the concept of profit, but who receives it.

The main point of this review of international experience is that there is no simple alternative to profitability as the basis of a performance evaluation system for public enterprises. To ignore this lesson, however, is no guarantee of success, as much more needs to be done to achieve the transition to Phase Three. The remainder of this paper suggests some of the necessary considerations.

V. OBJECTIVES AND PERFORMANCE CRITERION

A performance criterion is simply a quantifiable expression of the objectives of the enterprise. Since public enterprise objectives are multiple, does it necessarily follow that multiple criteria are necessary? The answer is no. Multiple objectives can be routinely handled by aggregation if they are individually quantifiable and if agreement can be reached on the relative weights to be assigned to each. The simplest private company has multiple objectives in the form of maximizing benefits and minimizing costs for each of its various outputs. A composite performance indicator can be created by applying positive weights (prices) to each of the benefits (outputs) of operation and negative weights to each of the costs (inputs) and adding them up. The result is a single indicator called profit, but which is constructed by weighted addition of multiple subsidiary indicators.

The problem with constructing a performance criterion for public enterprise is not that its objectives are multiple, but that some of the objectives are difficult or impossible to quantify, and that agreement cannot be reached on the tradeoffs (relative weights or prices) to be used in aggregation. In dealing with these problems, it is useful to think in terms of two sets of objectives: commercial and non-commercial. Commercial objectives are similar to those of private firms and reflected (albeit imperfectly, as will be explained below) in commercial accounting procedures. Non-commercial objectives concern external effects of enterprise operations (e.g., the benefits of opening up a backward area, or the costs of pollution) which are not reflected in private accounting procedures. Non-commercial objectives are particularly troublesome because they are typically difficult to quantify (e.g., the benefits of opening up backward areas) and/or difficulty to put weights on (the degree of pollution can be measured in terms of various particulate counts, but it is ask easy to convert this to dollars and cents).

Fortunately, for purposes of performance evaluation, the problem of non-commercial objectives can be substantially reduced by recognizing that many non-commercial objectives are existential rather than operational. That is, they are achieved by the very existence of the enterprise and do not alter operational goals. They affect investment decisions but not operating decisions. Project evaluation criteria are altered, but not performance evaluation criteria. For example, the decision to build an integrated steel mill might be influenced by such non-commercial objectives as the desire for national autonomy in a strategic material. Nonetheless, once the plant has

been built, the non-commercial objective has been achieved (so long as steel is produced) and the remaining operational objectives are only commercial -- to produce as much steel as possible at minimum cost. Similarly, a plant may be located in a backward region in part to achieve the non-commercial objective of regional equity, but once it is built, this objective has been achieved and strictly commercial considerations dominate.

In both of the foregoing cases, of course, the commercial success of the enterprises will presumably be less than for enterprises built without reference to non-commercial objectives. Assuming for the moment that profit captures commercial objectives, this is equivalent to saying that the enterprise will be expected to earn a lower commercial rate of return. Nonetheless, the operational goal is still to maximize that rate of return (or minimize the loss). The level of profit which represents "good" performance will be lower, but profit remains the criterion.

The foregoing example leads to the important methodological distinction between a general performance criterion and a particular criterion value (or target). The first step in performance evaluation is to select a criterion (e.g., profitability) which allows firms to be ranked on a continuum. The second problem is to select a criterion value (e.g., ten percent) which differentiates "good" from "bad" performance. A separate section below will be devoted to the problems of determining criterion values. Here we are still in the first stage (searching for an appropriate criterion), and the point is only that many non-commercial objectives are existential and can be ignored in constructing an operational criterion for dealing with commercial objectives.

A subsequent section deals with the problem of adjustments for remaining operational non-commercial objectives.

VI. ENTERPRISE PERFORMANCE CRITERION: PUBLIC PROFIT

Assume an enterprise has no non-commercial operating objectives. Does it follow that standard private accounting profit serves as a performance criterion? The answer is emphatically "no". Publicly relevant profit is quite different from privately relevant profit for two sets of reasons: first, publicly relevant accounting categories are different from privately relevant categories; second, publicly relevant prices differ from privately relevant prices.⁶

Accounting differences occur because private costs are often public benefits and vice versa. As one example, consider corporate income taxes. There is a private cost and a private manager should be rewarded for reducing taxes in favor of increasing dividends and/or retaining earnings. For a pure public enterprise, however, taxes are not a cost but merely one form in which the benefits are distributed to the government shareholder. A public manager should be neither rewarded nor penalized for reducing taxes while increasing dividends, retained earnings or the depreciation allowance. This is not to say that the distribution of the enterprise's disposable surplus is

⁶ For more detailed critiques of private profit, see: Amartya Sen, "Profit Maximization." Text of lecture at Kerala University (Trivandrum, March 31, 1970).

irrelevant, as there are important financial and motivational implications.⁷ Rather the point is that the purpose of performance evaluation is to encourage the maximization of the socially relevant profit, and the determination of the distribution of that surplus is a separate question. Taxes are a privately relevant cost but not publicly relevant; therefore, public performance should be measured before taxes, and private performance after.

As a second example of the divergence between public and private relevance, consider a situation in which a manager takes advantage of multiple interest rates to borrow from one government bank at, say six percent, while depositing in another government bank at, say twelve percent. The shareholders of a private firm should certainly reward a manager for such interest arbitrage activity, but from the standpoint of a government shareholder, such behavior should be neither rewarded nor penalized.⁸ This sort of arbitrage constitutes a private benefit but a public transfer.

A third illustration is given by a large South American public manufacturing firm which moved from large losses to significant profits in a single year. However, investigation revealed that this was due largely to:

⁷ See: Malcolm Gillis, Glenn Jenkins, and Donald Lessard, "Public Enterprise Finance in Developing Countries: Towards a Synthesis", in Public Enterprise in Developing Countries, edited by Leroy Jones with Richard Mallon, Edward Manson, Paul Rosenstein-Rodan and Raymond Vernon. (New York: Cambridge University Press, 1983). Also, see: Leroy Jones, "Determinants of the Debt/Equity Ratios in Public Enterprises" (paper presented at United Nations Conference on "Investment Decision-Making in Public Enterprise", International Center for Public Enterprise in Developing Countries, Ljubljana, Yugoslavia, October, 1980.).

⁸ Recall the assumption that both banks are wholly public. If they are foreign, then the conclusion is reversed, and if they are wholly or partially held by private domestic parties, the conclusion might be modified.

- (a) conversion of government debt to equity on the balance sheet, thus reducing interest payments;
- (b) the government making other interest payments directly to foreign lenders on behalf of the company; and,
- (c) the enterprise capitalizing interest payments on construction in progress.

The first two actions made the company better off but the government and its banks worse off by an identical amount, and the third action made no one better off in any real sense. Despite the fact that the nation as a whole was no better off, private profit rose for all three reasons.

These are but three of many examples of differences between publicly and privately relevant accounting categories. All arise because the private manager is charged with looking out for the interests of only one economic actor (the shareholder) while the public manager should be concerned with the interests of all domestic actors. The performance indicator which reflects this broad interest will be termed "public profit". Briefly, it is defined as single-period variable social benefits less variable social costs; that is, the difference in the value to society between what the enterprise takes out of the economy (costs) and what it puts back in (benefits) in any one period. More precisely, this is the quasi-rent generated by the fixed capital owned and operated by the enterprise, or:

Production

- Intermediate Inputs
- Employee Wages and Other Benefits
- Rental Payments
- Opportunity cost of Working Capital.

Alternatively and equivalently, in terms of a standard profit and loss statement, public profit is:

Sales

- + Inventory Charges
- Manufacturing Costs
- Administrative and Selling Costs
- Total Employee Costs
- + Depreciation and Amortization Allowances
- Opportunity Cost of Working Capital

The second source of divergence between public and private performance criteria lies in the relevant prices.⁹ Often, an enterprise is forced to sell its output in a price-controlled market where the price to the enterprise is less than what society is willing to pay; or, it is allowed to acquire imported inputs at a preferential exchange rate below the real value of the

⁹ For a more detailed treatment of the price problem see: Glen Jenkins and Mohamed Lahouel, "Evaluation of Performance of Industrial Public Enterprises: Criteria and Policies." (Paper presented at UNIDO Expert Group Meeting on the Changing Role and Function of the Public Industrial Sector in Development, Vienna, October 1981).

foreign exchange to society. In both cases, the actual price received or paid is the relevant price for shareholder evaluation of private enterprise since these are the prices which determine private returns. From the viewpoint of a government shareholder as custodian of all national resources, on the other hand, the relevant price is that which reflects economic scarcity. In principle, the solution is simple: revalue the accounts using shadow prices, just as is common with project evaluation.

In practice, shadow pricing is unlikely to occur. Shadow prices are complex and controversial at best and it would take a government with great faith in economists to fire a powerful retired general, politician or bureaucrat based on whether the shadow multiplier for unskilled labor was, say 0.1 or 0.7. My own judgment is that the first-best solution of actually making market prices reflect social scarcity is more likely to become reality than the second-best solution of using shadow prices to evaluate performance. If neither the first nor second-best solutions are likely to eventuate, then how can public enterprises be evaluated?

Fortunately, there is a practical operational way out of the dilemma. It will be argued in Section VII that prices are generally beyond management's control and in Section IX that the best available standard for evaluating enterprise 'A' in year 't' is provided by the same enterprise in year 't-1'. It follows that for control purposes, managers should be evaluated on the basis of the trend in public profit at constant prices.

If this conclusion is accepted, then the solution to the shadow pricing dilemma follows directly from the empirical observation that while the levels of public profits will differ when evaluated at shadow as opposed to market prices, the trends will generally be similar. Consider the simplest possible case of an enterprise with only one output and no inputs. The trend in public profit would then be a quantity index of outputs which differs by only a monotonic transformation when evaluated at shadow as opposed to market prices. In this extreme case the two trends are strictly identical. Introduction of multiple outputs and inputs eliminates this simple identity, because of the usual index number problem. Nonetheless, it seems reasonable to assume, and there is some empirical evidence to suggest, that the resulting differences will generally be minor. In sum, the suggestion here is that the trend of public profit at constant market prices can provide a useful and practical approximation to the theoretically ideal, but practically unobtainable, trend at constant shadow prices. The logic is similar to that used when looking at the trend in real GNP per capita as a measure of the trend in national welfare. The approximation can be further improved if major differences between market and shadow prices are captured through the introduction of a "social adjustment account", as will be explained in Section X below.

VII. MANAGEMENT PERFORMANCE CRITERION

Many factors which determine enterprise performance are beyond the control of managers. The quantity of capital a manager has to work with and

its quality (technology) and age affect relative performance, but were determined in previous periods, usually by someone other than the current manager. Prices are usually set by the government or by world or domestic market forces outside the control of management. Decisions such as hiring workers or procurement procedures affect performance, but in a public enterprise may be circumscribed by government policy. For such reasons, a clear distinction must be made between enterprise performance and managerial performance. There are four steps in the process.

The first step is to make a standard adjustment for two readily quantifiable exogenous factors -- price changes and the quantity of capital. Simply divide public profit by the quantity of fixed capital and convert to constant prices. The resulting indicator -- public profitability at constant prices -- is greatly superior to public profit (though still imperfect) as a measure of managerial performance and should be routinely computed as part of a performance evaluation system for all enterprises.

For some enterprises, a second step of industry-specific quantitative corrections can be taken. Engineering data on the effects of scale, vintage and technology can sometimes be used to generate adjustment factors for the quality of capital. Low capacity utilization due to shortages of inputs or inadequate demand can sometimes be corrected for by an "as if" expansion factor.

A third step is to recognize that often one of the best ways to correct for a wide variety of enterprise-specific exogenous factors is to divide

through by the achievement of the same enterprise in previous years. That is, by focusing on the trend in performance one certainly controls for the quality of capital and to some extent for the nature of output and input markets.

The fourth step is to have a review meeting in which managers are allowed to "explain" their level of performance. Even after a superb job is done of measuring performance, there will remain non-quantified factors affecting the result. The aim of quantification is not to replace the final judgment of superiors, but to aid it. The evaluation exercise quantifies as much as possible, and thus reduces the scope for discussion, but does not eliminate the need for individual judgments to account for special circumstances.

All of these steps (except the first) can be alternatively (and probably better) treated by incorporation into the criterion value specification, since they are necessarily industry or enterprise-specific.

VIII. SETTING ENTERPRISE-SPECIFIC CRITERION VALUES

Given the choice of any performance criterion (be it private profit, public profit, labor productivity, capacity utilization, miles per gallon, seconds per hundred yards, or anything else) as appropriate for evaluating a particular endeavor, then the still more difficult task remains of selecting a particular criterion value. While the criterion establishes a scale, the criterion values establishes the points on the scale which distinguish "bad"

from "average" from "good" performance. Consider sprinters. The natural performance criterion is seconds per hundred yards. The criterion remains valid for men, women, children, senior citizens, and those in wheelchairs; what differs is the standards (criterion values) which distinguish meritorious performance. Similarly for public enterprises. Public profitability is an appropriate indicator for a manufacturing company whether it is located in a major port or in a remote and backward province; but, whereas a five percent performance might be "good" in the region which is far from the source of imported raw materials, it might be "bad" in the port where there are negligible transport costs for raw materials.

The function of the criterion value, then, is to allow for the plethora of enterprise-specific constraints which effect the ability of a particular unit to generate public profit. The number of such factors being large, this is no simple task. The sources of information which can assist in setting criterion values include:

1. comparison with similar firms elsewhere;
2. comparisons with the same firm in previous years;
3. professional judgments by third parties;
4. professional judgments at the ministry level; and
5. professional judgments at the enterprise level.

If there are a large number of similar units operating in similar circumstances, then the problem is mechanical. Simply collect data on relevant variables for a sufficiently large number of units, estimate a

regression plane (preferably of the "outer-bound" form) and individual unit performance is measured as a deviation from that norm (plane). If the number of observations is large relative to the number of discriminatory variables, this is a practical approach. A rowing race is run annually in Cambridge in which participation of different age groups is desired. Historical data on rowing time and age are collected, a regression is run, the effect of age on time is estimated, a correction factor in "seconds per year" is generated, participants actual times are accordingly adjusted to yield age-corrected times and awards are given on this corrected time. This allows seventy-year-olds to compete against twenty-year-olds.

The difficulty with this approach for public enterprises is that the number of "similar" enterprises is usually small. A country may have one integrated steel mill and only two oil refineries. It may have four public fertilizer plants but their technology may be sufficiently different to preclude direct comparisons.

The number of observations can be increased by international comparisons, but now the number of control variables increases geometrically. One country may have a sister plant of apparently identical size and technology in another country. Knowledge of its performance is of course useful in forming a judgment as to the first plant's performance, but there is no way to run a definitive regression because of differing national conditions. Similarly, in evaluating cement and fertilizer, it is essential to know that the international standard for operating days is 330 and that many LDCs in fact achieve these figures. However, other exogenous factors

(notably, the availability, quality and price of energy) differ, making global comparisons difficult. The point is that while comparisons with other domestic or foreign plants can serve as useful partial aids to judgment in setting criterion values, they are in themselves insufficient.

How then is a "similar" enterprise to be found as a basis for comparison? In the entire world, the enterprise most similar to enterprise 'A' this year is generally enterprise 'A' last year. This leads to the use of last year's performance as the starting point for a criterion value against which this year's performance is judged. The focus is on the trend in performance rather than the level. While this is a step in the right direction, it is not a final solution, for two reasons. First, even for a single enterprise things change from year to year. Most importantly, prices change. As already noted, this can (and should) be treated mechanically by shifting to constant price evaluations. However, other changes (e.g., in demand conditions or the availability of inputs) also affect performance and cannot be treated so simply. Moreover, a second factor needs to be considered, namely, that the room for improvement varies from unit to unit. In a plant which has historically been poorly run, a twenty percent improvement in the indicator might require the same level of managerial effort and skill as that required to produce a two percent improvement in the indicator of a plant that has always been well run.

In sum, inter-temporal and inter-enterprise comparisons are essential inputs into the process of setting criterion values, but in the end a subjective professional judgment is required. Third-party evaluations can

sometimes by used for this purpose. For a new firm, the project proposal provides some standards. It is also possible to commission detailed internal evaluations by consultants, but this is expensive and should probably be confined to weaker firms. In most cases, the ultimate target will have to be arrived at through negotiation between the enterprise and the government.

IX. THE DISCLOSURE BONUS AND CRITERION VALUES

The people with the best information as to what is feasible for a particular enterprise are the managers of that enterprise. Unfortunately, their unbiased judgment is generally not forthcoming because it is in their interest to have a low target. A manager negotiating a performance target with the Ministry naturally stresses all the difficulties and tries to achieve the lowest possible target so as to increase the ease of its accomplishment. The resulting process of negotiation between enterprise and ministry, well known in Eastern Europe, will normally result in a target which is below the real potential of the enterprise.

To induce managers to reveal their own best estimate of enterprise potential, a "disclosure bonus" system can be used. Briefly, the process is as follows:

- (1) the ministry uses its best judgment to set a target criterion value and an associated target bonus level;

- (2) the enterprise is then free to adjust the target criterion value, and if it does so, then the bonus is adjusted in the same direction by an amount calculated according to an adjustment formula; and
- (3) the actual enterprise bonus may be above or below the adjusted target bonus depending on whether actual performance is above or below the adjusted target criterion value.

The system is described in more detail in Figure One.

The purpose of the disclosure bonus is to induce managers to:

- (1) give their best estimate of enterprise potential at the beginning of the period; and to
- (2) proceed to do their best during the period, regardless of their original estimate.

In a single period case with no uncertainty, this is strictly accomplished, as suggested by the examples in Figure One, and proven elsewhere.¹⁰ The danger of a ratchet effect remains (this year's performance alters next year's proposed target/bonus relationship), but this can be reduced by setting targets several years in advance. This is not feasible for price-dependent criterion values, but may be feasible for constant-price criteria. Uncertainty is an unavoidable problem. The disclosure bonus is thus not a panacea, but does provide a useful aid in determining criterion values.

¹⁰ M.L. Weitzman, "The New Soviet Incentive Model", The Bell Journal of Economics (Spring 1976), pp. 251-257.

Figure One

THE DISCLOSURE BONUS

THE SCHEME

A. Variables

B ≡ Bonus

T ≡ Target (any criterion, say profitability)

α ≡ Overfulfillment factor

τ ≡ Underfulfillment factor

β ≡ Bonus adjustment factor

G ≡ Superscript for planning value set by government

E ≡ Superscript for planning value set by enterprise

A ≡ Superscript for value actually achieved

B. PROCESS

1. Government announces α, β, τ subject to constraints that:

$$0 < \alpha < \beta < \tau < 1.$$

2. Government assigns preliminary B^G and T^G .
3. Enterprise chooses own T^E , which automatically yields a new bonus according to the formula:

$$B^E = B^G + \beta (T^E - T^G)$$

4. At the end of the period, the actual bonus is either:

$$\begin{aligned} B^A &= B^E + \alpha (T^A - T^E) \text{ if overfulfillment; or} \\ &= B^E + \tau (T^A - T^E) \text{ if underfulfillment.} \end{aligned}$$

EXAMPLE

- A. Purpose: to give a heuristic demonstration that under this scheme, it is in managers' best interests to both:
1. tell the truth (i.e., to reveal the T^E they think best represents enterprise potential); and
 2. do their best (i.e., to maximize T^A regardless of what they predicted at the beginning of the year).

This assumes perfect knowledge (by managers) and no ratchet effect.

B. Parameters

1. Let : $\alpha = .30$; $\beta = .60$; $\tau = .90$
2. Assume:
 - T^* = 100 (the actual technologically possible maximum)
 - T_{t-1} = 80 (last year's accomplishment)
 - T^G = 90 (government thinks enterprise can do 10 better than last year)
 - B^G = 5 (bonus for doing 10 better).

C. Alternative Strategies and Associated Pay-Offs

Bonus

1. Do nothing (accept $T^G = 90 = T^E$ and actually produce $T^A = 90$). 5
2. Do not negotiate but do best (accept $T^G = 90 = T^E$ but produce $T^A = 100$). 8
3. Negotiate downward but over-achieve (set $T^E = 85$, but produce $T^A = 100$). $6\frac{1}{2}$
4. Brag and do best (set $T^E = 110$, but produce $T^A = 100$). 8
5. Tell the truth and do best ($T^E = 100$ and produce $T^A = 100$). 11

X. ALLOWING FOR NON-COMMERCIAL OBJECTIVES: SOCIAL ADJUSTMENT ACCOUNTING

How are operational non-commercial objectives to be dealt with? The central proposition is that they must be either dealt with explicitly or ignored altogether. Otherwise, the entire signaling system breaks down, and with it, the basis for a sensible autonomy structure. If a manager is allowed to get away with arguing that his poor commercial performance is due to pursuit of vague, unquantified non-commercial objectives, then it becomes impossible to distinguish between legitimate and illegitimate reasons for losing money. It is then impossible to hold managers accountable for achievement of either commercial or non-commercial objectives, and therefore undesirable to delegate autonomy.

If this proposition is accepted, then the question is how achievement of non-commercial objectives is to be quantified and incorporated into the performance evaluation system. It must be recognized that this is not a simple task and few countries have dealt with the problem successfully.

One straightforward solution is to eliminate the problem by simply denying the validity of non-commercial objectives in public enterprises. Any worthwhile non-commercial responsibilities are to be hived-off to separate public institutions, leaving public enterprises free to operate according to strictly commercial principles. Some observers simply despair of ever imposing effective commercial discipline on an enterprise which has recourse to non-commercial objectives as an excuse for poor commercial performance.

This separation of commercial and non-commercial objectives is not uncommon in practice (e.g., it is explicit in contemporary Chile and implicitly in much of the South Korean public enterprise sector).

Ignoring operational non-commercial objectives (or transferring them to another agency) may well be a superior strategy as compared to the common nihilistic practice of recognizing both objectives but holding managers accountable for neither. It may well be a step in the right direction, but a further step is possible. This involves quantifying the costs and/or benefits of meeting non-commercial objectives and entering them explicitly into the enterprise accounts - a process I will call social adjustment accounting.

One variant of social adjustment accounting is reflected in the French "Program Contract" system. The basic principle is that the enterprise should pursue only commercial objectives unless specifically instructed to the contrary by the government. In such a case, a bargain is struck as to the incremental costs incurred in meeting the stated objectives, and the enterprise is compensated by this amount. The obvious advantage of this system is that it allows pursuit of legitimate non-commercial objectives, but controls illegitimate pursuits by subjecting them to an open discussion of costs (and thus of the tradeoffs) involved.

One technical feature of this particular variant should be noted. Costs are measured rather than benefits. In principle, of course, the ideal solution would be to base compensation on the benefits, allowing the enterprise to earn a social profit on the difference between benefits and

costs, and permitting decentralized, non-bargained decision making. The problem with this is obviously that most non-commercial benefits are difficult or impossible to measure. One does not attempt to measure the benefits of having a military unit of a particular sort: rather one measures the costs and asks only whether the (unmeasured) benefits are greater than the costs, not how much greater. Alternatively, and more commonly, one compares the costs of different methods of achieving a particular sets of benefits. Similarly, for the benefits of keeping open a factory in a backward area, focusing on costs is a practical second-best alternative to measuring both benefits and costs.

The second variant is similar to the first in being based on a negotiated agreement as to the costs of meeting legitimate non-commercial objectives; it differs in that the compensation is not actually paid. Instead, the expenditure is entered not as a cost above the public profit line, but as a transfer below the line. That is, the expenditure is treated as a dividend paid in-kind to the government. The quantum of public profit is not affected by the non-commercial activity, but some of that profit is distributed in-kind rather than as taxes, dividends or retained earnings.

Managers would naturally prefer the compensated to the uncompensated variant, because of the financial impact on retained earnings. Nonetheless, assuming the firm is financially viable, the uncompensated version is simply a form of internal cross-subsidization which avoids the unnecessary circular step of transferring funds up to the center as taxes and dividends, only to be returned as subsidies. The important point is that in both variants, a

conscious decision is made as to which non-commercial objectives are worth the cost and which are not.

Social adjustment accounting can also be used to deal with incorrect prices on major inputs and outputs. If fertilizer is sold ex-factory at low prices as a result of conscious government decision to subsidize farmers and/or wage-goods, then the enterprise can be compensated by a per unit subsidy. Similarly, if the factory is receiving underpriced natural gas or electricity, then a per-unit tax can be levied to make the price faced by the firm approximate real economic value. This is of course a cumbersome second-best alternative to simply setting the right price in the first place, but in some situations it may be the only politically or bureaucratically feasible way to ensure that managers receive correct signals as to economic scarcity. If so, then it is desirable that the tax/subsidy combinations should be actually compensated, but they could also be uncompensated (via the below-the-line distribution method) if financial viability is not threatened. In the latter case the output subsidy would be credited to sales, the input debited under manufacturing costs, and the net effect entered per contra as a social dividend (levy), implicitly paid (received) in-kind. Public profit would then reflect the real economic surplus generated by the enterprise and managers could be rewarded according to their real contribution to society, independently of whether or not the right prices were actually paid.

The ultimate variant of social adjustment accounting is to create an entire set of shadow accounts altering each and every accounting entry by a multiplier reflecting the divergence between market and economic prices.

While such an exercise is theoretically ideal and has major utility in research, it is unlikely to be feasible as an actual control device. If not, then the social adjustment account is a practical means of capturing the most important benefits of the theoretical ideal.

Remaining non-commercial benefits which are deemed critical can be evaluated in qualitative terms and entered into the system as supplementary indicators. This is discussed further in Section XII.

XI. ALLOWING FOR DYNAMIC EFFECTS

A major weakness of any single-period performance indicator (be it private or public profit, labor or total productivity) is that it ignores future effects. An enterprise is a living organism and many current decisions impose costs in the present period which are associated with offsetting benefits in the future. Deferring maintenance can increase output and reduce costs this year at the expense of lower output and higher costs next year. Current expenditures on research, training and planning increase costs in the present but generate benefits in the future. Single-period indicators capture only one side of the benefit/cost calculations for decisions which impact on more than one period. Performance indicators which only consider current flows can thus lead managers to neglect the future by devoting inadequate attention to innovation, planning, consumer good-will, and maintenance.

This problem is often more acute in public enterprises. In private enterprise it is less likely that the future will be sacrificed to the present for several reasons. In an owner-operated firm the self-interest of the decision-maker will lead him to value the future. When ownership is divorced from control, long managerial tenure and deferred managerial compensation (stock options) can tie decision-maker interest to future effects. Finally, the value of shares traded on the stock market is heavily determined by investor perception of future effects. For public enterprises in LDCs, however, management is divorced from capital, tenure is typically brief, there is no deferred compensation, and shares are either not traded at all or traded in an imperfect market where government-imposed dividend policies dominates as a determinant of value. Accordingly, performance evaluation systems for public enterprises must explicitly incorporate indicators of future effects if innovation, planning, maintenance, etc., are to be encouraged.¹¹

What is needed are answers to questions such as the following:

1. Is preventive maintenance adequate?
2. How rapid is implementation of investment projects?
3. Does the company have a coherent and up-to-date corporate plan?
4. Is the company devoting adequate attention to research and development?
5. Are training and motivation of personnel adequate for the future needs of the company?

¹¹ For an example of the negative impact of single-period performance on evaluation, see: Joseph Berliner, The Innovation Decision in Soviet Industry, (Cambridge: M.I.T. Press, 1976).

Answering such questions will necessarily be a subjective process. One approach is to use a five point rating scale from "inadequate" to "superior". Initially, most companies might be rated at the mid-point level of "adequate" with attention devoted to identifying a few of the best and worst performers.

The set of relevant questions, and the weight attached to each, will vary from company to company. Many companies will have no ongoing investment projects, but for those which do, the rate of progress will be an important indicator of performance.

XII. AN INDICATOR SYSTEM

Three sorts of performance indicators are necessary:

1. Primary Indicator: (public profitability) covers static operational efficiency plus any non-commercial or dynamic effects which can be valued in monetary terms;
2. Supplementary Indicators: Cover dynamic effects and non-commercial effects can only be rated, but not monetized;
3. Diagnostic Indicators: used to explain movements in the primary indicator (e.g., capacity utilization, inventory turnover).

Diagnostic indicators must not be given independent weight in the evaluation process. Otherwise, the evils of multiple counting occur. They are important, however, in explaining performance trends and identifying causal factors. Supplementary indicators, on the other hand, must be given independent weight. They are not duplicative of the primary indicator, since they only cover factors left out of the primary indicator because monetary quantification is not feasible.

An example of the use of diagnostic indicators is given in Table Two. The last column gives changes in values between 1980 and 1981. Overall, it shows that the company's contribution to the nation (public profit) declined by 0.45 billion pesos. Reading up the column we see that this was due primarily to increases in the cost of working capital (0.36 billion), and secondarily to an increase in wages (0.08 billion). There was also a major decline in production (-1.24 billion) but this was almost exactly offset by reduced consumption of intermediate inputs (-1.23 billion) so that the net change in value-added (or gross national product) was negligible (-0.01 billion).

We next ask whether these changes were due principally to price or quantity changes. This is particularly important since price movements are largely outside the control of management, who can only affect quantities. The first two columns of the table allow this question to be answered by decomposing the value change into its price and quantity components. Starting at the top of the table, we observe that while output prices rose (0.44 billion), input prices rose even more (0.53 billion) so that the net effect on

value-added was unfavorable (-0.10 billion). At this level, prices on average moved against the firm, more than offsetting the nominal decline in value. In quantity terms, therefore, value-added actually increased (by 0.9 billion). This is equivalent to saying that the enterprise's contribution to real GDP rose by 0.09 billion, but that this was more than offset by unfavorable price movements, so that the contribution to nominal GDP actually declined slightly (by 0.01 billion).

Moving down the table, we see that the major sources of decline in public profits -- namely increasing costs of working capital and labor -- were entirely due to price effects. The real quantities of both inputs actually declined slightly during 1981, but price increases more than offset these savings.

Overall then, the decline in the public profits (-0.46 billion) is more than explained by unfavorable price movements which on balance cost the company 0.52 billion pesos. Looking only at the effect of quantities, -- the variables within the control of management -- the company actually contributed 0.07 billion pesos more to the economy in 1981. Additional questions could of course be added by examining more detailed breakdowns of the items already discussed.

Figure Two:

SOURCES OF CHANGES IN PUBLIC PROFITS

(billions of pesos)

	Profit Change		
	Due to Changes in		
	Quantities + Prices	=	Value
	_____		_____
Production	-1.68	0.44	-1.24
- Intermediate Inputs	-1.76	0.53	-1.23
_____	_____	_____	_____
= Value Added	0.09	-0.10	-0.01
- Wages and Benefits	-0.01	0.08	0.08
- Rentals	0.06	-0.06	-0.00
- Op. Cost of Working Capital	-0.04	0.40	0.36
_____	_____	_____	_____
= Public Profits	0.07	-0.52	-0.46

XIII. IMPLEMENTATION OF A SIGNALING SYSTEM

Performance evaluation is not a simple task in private enterprises and it is all the more complicated in public enterprises. In addition to appreciation of the technical analytic issues alluded to above, it requires a high-level political/administrative decision that a signaling system should be implemented, a willingness to pay performance-based bonuses, an information system for monitoring performance, and a communication system in which the process and its results are discussed and modified in meetings between representatives of the enterprises and the government. A system unilaterally and suddenly imposed from above without input, cooperation and appreciation of the operating units is likely to fail.

The message of this paper is therefore emphatically not that performance evaluation is a simple task. Rather, the goal has been to suggest how to avoid common errors. Privatization is one way to improve efficiency by linking it to management interests. Performance evaluation is another.

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