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The Signalling System for Public Enterprises: A Case Study on the Experience of Performance Contracts in Pakistan

Introduction

During the past few decades, improving efficiency in public sector enterprises has been a challenge confronted by various countries. In order to attain this objective, a number of organisational devices and management systems were tailored to conform to the specific requirement of public enterprise management. The concept of the performance contract system was originated in the late 1960s by Simon Nora to improve the public sector enterprises in France. This system, generally known as "**Contra Plan**", although adopted by several enterprises outside France, suffered from a number of difficulties. The development of the signalling system in the early 1980s was a major step forward in evolving the performance contract system. It addressed some of the complex technical issues of evaluating real performance of public enterprise managers. The system was pioneered in the early 1980s almost simultaneously in Pakistan and South Korea. Since then it has been adopted in various modified forms by a number of countries. Both Pakistan and South Korea have now completed 10 years of operation of this system. It is therefore an appropriate time to carry out an analysis of the experience and accomplishments of the signalling system. This study gives an account of the main features of the signalling system's operations in Pakistan and its impact on the behaviour of management and, in turn, on the performance of public sector enterprises. In order to give a detailed account of the operation of the system, a case study of one specific enterprise has also been included.

The study is divided into three parts. Part One comprises the historical background and the main features of the signalling system in Pakistan. It also includes an account of the organisational system of the public industrial sector where the system was installed. Part Two comprises a detailed study of a fertiliser industrial enterprise. This case study attempts to walk through the whole process of evaluation to illustrate all the elements of this exercise. Part Three includes an examination of the impact of this system and its achievement on the public industrial sector in Pakistan.

Part One

In the early 1970s, following a policy of nationalising "basic industries" and the launching of an ambitious investment programme, the size of the public industrial sector in Pakistan rapidly increased. As a result, until the late 1970s, the focus was on expansion and little attention was given to operational efficiency. Consequently, the public industrial sector was frequently characterised by a combination of adverse financial and operational features, i.e. a weak financial structure with imbalanced debt equity ratio; negative or inefficient working capital; slow-moving assets; inefficient material usage; large inventories and slow receivables etc. In the late 1970s, following a change in industrial policy, the Government assigned the task of new investments to the private sector while the activity of the public industrial sector was restricted to its consolidation and the improvement of operational efficiency. In order to attain these objectives, a wide range of re-organisational steps were taken. A number of restructuring measures, such as mergers, close-downs of un-economical units and streamlining the control structure of this sector, etc., were introduced.

After this re-organisation exercise, the public industrial sector was organised on the pattern of a large industrial conglomerate. This conglomerate which included a wide spectrum of industries such as steel; fertiliser; automobile; cement; chemicals, etc., was almost directly controlled by the administrative ministry. Its newly emerged control structure of public industrial sector comprised of about seventy operating enterprises directly controlled by the administrative ministry, namely the Ministry of Production, through eight holding corporations. In order to assist the Ministry of Production, the Experts Advisory Cell (EAC) was created with the objective to develop systems for monitoring; evaluation; planning and restructuring of industries. Almost immediately after its inception, EAC initiated a study to assess the reasons for inefficiencies in public enterprises and to recommend corrective measures. This study discovered that one of the major reasons for persistent inefficiency in public sector enterprises was that there were no institutional arrangements for guiding and evaluating the performance of managers in public enterprises in Pakistan. Nor was there any system of motivating the managers to improve performance. Only a vague method was followed to assess management performance, based on the criteria of maximisation of production, increase in profit and the successful control of labour problems.

This method had many obvious drawbacks. First, profit was measured in the privately relevant rather than publicly relevant sense. Second, it was not really possible to evaluate managers on the basis of profit since, in many cases, profit was mainly determined by the decisions and policies of government, or, by foreign exchange allocations which were again beyond the control of managers. Third, the cost component was totally ignored in emphasising increased production. There was neither any institutional arrangement for evaluating enterprises nor any other

effective follow-up on the achievement of targets in the form of penalty or reward. Generally, the managers of enterprises were not rewarded in pecuniary terms and only modestly in non-pecuniary terms. While most, if not all the corporations, had a well-defined bonus system applicable to workers, top managers were not included at all and middle-level managers only partially. This was due to a government policy under which board members and the top three management tiers were barred from receiving bonuses, and the next five tiers received bonuses only on an inverse sliding scale.

Installation of the Signalling System

During 1981, in order to improve the operational efficiency of the public industrial sector under the Ministry of Production, the Government decided to set up the Signalling System for Public Enterprises. In November 1981, EAC was given the responsibility of setting up the signalling project. The project had the three following components:

(i) A performance information system to measure accurately actual behaviour;

(ii) A performance evaluation system to specify socially desirable behaviour;

(iii) An incentive to reward or penalise managers for their actual performance at the end of the period, i.e, one year.

The development of the system took about three years. During this process, major efforts were made to evolve a performance information system. In 1983, the Government approved the operation of the system but after significantly modifying the original proposal.[1]

The signalling system originally envisaged that social profitability, known as public profitability, should be the primary indicator of performance. Public profits[2] are

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[1] For a detailed account of the system see:

(i) Mehdi I. "The Pakistan Experience of Signalling System" Public Enterprise, ICPE, Ljubljana, 1988, Vol 8.

(ii) Shirly Mary, "Managing State-Owned Enterprises: The World Bank, Washington D.C. 1988, P.34.

[2] Public profitability attempts to assess the total surplus generated by a manager given the capital stock in his hand. For evaluating the real performance of public enterprise efficiency, we arrive at an adjusted profit which not only takes care of public ownership peculiarities of the enterprise but also make alterations in the normal accounting procedure which distort the information concerning the real surplus generated by public enterprises. This adjusted profit is called public profit. The concept of public profit recognises the fact that while a private manager is taking care of only one economic

private profits adjusted for those elements not deemed relevant to a PE. For example, taxes and interest which are private costs but public benefits, are excluded so as not to encourage PE managers to devote time to minimising taxes or the interest arbitrage. In other words, public profitability aims at encouraging managers to maximise net economic benefits judged from the national perspective. However, in approving the signalling system, private profitability rather than proposed public profitability at constant prices was kept as the primary criterion of evaluation. The task of incorporating improvement in productivity in this criterion was left to the professionals in the Cell.

The existing system is based on the principle that at the beginning of the year, performance targets will be negotiated between the individual enterprise management and the EAC. The negotiated targets are converted into an agreement or performance contract signed by the chief executive officers and EAC. During the course of the year, the performance of the enterprise is monitored against the agreed targets, and a performance bonus is awarded according to the level of achievement.

Operations of the signalling system involve the following elements:

- selection of performance criteria;

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factor (private shareholder), the manager of a public enterprise has to keep in view interests of all the domestic economic groups. Public profit is derived from a single period variable social benefits less variable social costs: that is, the value to society of the difference between what the enterprise takes out of the economy (costs) and what is puts back (benefits) in any one period. Public profit, therefore is:

$\Pi = X - R - rk-$

Where

X	= Output at factor cost
II	= Intermediate inputs at purchaser's prices
R	= Factor rental expenses
rk	= Opportunity costs of working capital

Given the fixed capital placed at his disposal, the manager is expected to maximise this variable public profit. Thus, public profitability can be defined as:

$$\text{Public Profitability} = vv \quad \frac{\text{Variable Benefits Less Variable Costs}}{\text{Fixed Costs}}$$

(For a detailed account of this concept see: (1) Jones. L.P. and Sakong, II. "Social Accounting System for Public Enterprises". Seoul: Korea Development Institute. July, 1975; KDI Working Paper No. 7604 and (2) Mehdi, I. "Performance Evaluation of Public Enterprises in "Essays on Relations Between Government and Public Enterprises" ICPE, Ljubljana, Yugoslavia, 1985.

- selection of units by which performance is to be measured (e.g. percentage increase in profitability);

- negotiation and determination of targets to demarcate strong and weak performance. For this, a performance scale (A, B, C, D and E targets) rather than one target, is negotiated so that the unit can be categorised in any of the five grades of performance;

- At the end of the year, based on the audited accounts, the achievement of the units is compared with the original targets. Following this appraisal, units are categorised in one of the five classes so that the pre-determined bonus amount, linked with each grade, can be allocated to their chief executive officers who in turn distribute it among their managers.

The operation of the system is marked by a series of activities spread throughout the year. They are as follows:

PERFORMANCE EVALUATION CYCLE
(Fiscal year in Pakistan commences on 1st July)

Activity	Date
♦ Receipt of budgets from companies/units	April-May
♦ Target setting meetings	May-July
♦ Receipt of audited accounts for the previous year from units/companies	October-December
♦ Information received on diagnostic formats	October-February
♦ Preparation of diagnostic report	February-April
♦ Final Grading	April

The signalling system is supplemented, and to a very large extent its effectiveness is enhanced, by two other managerial systems:

i) Management Information System; and

ii) Corporate Planning System.

Management Information System

In setting up the signalling system, it was considered that an information system should be established which would assist the various levels of control structure by equipping them with timely and appropriate information so that in time corrective action could be taken to achieve the desired results. For this, EAC revamped the existing monitoring system, and a computer-based management information system was established to develop a comprehensive reporting mechanism. This system delivers a required set of information on a monthly basis. The monthly, quarterly and annual reports highlight the shortfalls or distortion in performance to facilitate corrective action and for policy decisions by the decision-makers in the Ministry of Production.

Corporate Planning System

One of the major weaknesses identified during the operation of signalling was that it has only a one-year time horizon. As a result, managers were inclined to take action which showed improvement in a given period, i.e. one year, even if it were at the expense of the long-term health of the enterprises. Therefore, it was considered necessary that the signalling system should be operated with reference to the long-term corporate plan of the enterprises. It was, therefore, vital that a corporate planning system be established to ensure maximisation of return on investment in the long run. Therefore, five-year rolling corporate plans are prepared at the unit/corporation level and the first year is used for budget preparation for the current year.

Part Two

A Case Study of Pak-Saudi Fertiliser Ltd

The objective of this case study is to highlight all the major technical elements of the operations of the signalling system, i.e. to illustrate budget analysis; target negotiation; signing of a performance contract; monitoring during the year and evaluating the enterprises at the end of the year. The study also attempts to identify the levels and trends of the major indicators and sub-indicators to assess the performance; and to narrow down to the trends in real efficiency of the enterprise management.

Pak-Saudi Fertilizer Ltd was incorporated as a public limited company in June 1975. The unit was established with an annual installed capacity of 557,000 m. tons of ammonia. The unit started trial production in April 1980 and went into commercial production in October 1980. As at 30 June 1992, the National

Fertiliser Corporation of Pakistan (Pvt) Ltd held 100 per cent of the ordinary paid-up share capital of Rs 60,000 million.

The mission/aim of the company is to manufacture chemical fertiliser and to market these and other related products, both domestically and abroad. In order to fulfil this aim effectively, the management has set out certain objectives in its corporate plan which are:

(i) to maintain leadership in the domestic industry while ensuring Pakistan's requirements for urea and ammonia are fully met;

(ii) to generate sufficient cash from operations to enable the self-financing of the future development of the business.

During the period FY '83 to FY '93, Pak-Saudi Ltd. experienced a secular rising trend in profit before tax (except for dips in 1987-88 and 1991-92). During this period there was almost a four-fold increase in profit before tax, i.e. RS825 million in the 1993 financial year, as compared with RS191 million in the 1983 financial year. During this period the grade accomplishment of the unit is as follows:

- A grade 7 times
- B grade 2 times
- C grade 1 time

For illustration purposes, let us look at the year 1987-88, where the unit has achieved the profit target but after was awarded a grade 'B' after evaluation.

At the beginning of the year the Pak-Saudi management was asked to submit their proposals and plans for the year. the main features of the Pak-Saudi proposal/budget are summarised as follows:

(Rs in millions)

Description	Budget 1987-88	Last year 1986-87
♦ Net sales	1,290	1,197
♦ Cost of sales	833	692
♦ Gross profit	457	505
♦ Financial expenses	49	66
♦ Profit before tax	392	426

♦ Labour cost	44	39
♦ No. of employees	900	868
♦ Sales volume(urea)	580,00	568,000
♦ Production volume	560,000	587,000
♦ Operating days	320	324
♦ Down time	46	41

The main features of physical cost-consumption ratios were as follows:

Cost-Consumption Ratios

Description	Budget	Last year
♦ Natural gas MBTU/ton	36.01	33.2
♦ Labour cost expenses (Rs in million)	44	39
♦ Financial expenses (Rs in million)	49	49

This proposal/budget was scrutinised in the light of EAC's database, in order to determine the optimal targets for the year (annex). While scrutinising the targets, there were various considerations:

- What was the original objective, designed capacity and expected profit of the unit?
- What has been the performance of the enterprise in the past years?
- What is the achievement level of similar industrial units in other selected developing and developed countries?
- What are the standards achieved by similar industrial units in other selected developing and developed countries?

- What financial and physical constraints are expected to be experienced by an enterprise during the year?

- What is the macro-economic environment which is going to influence the demand and supply position of the inputs and outputs of the enterprise?

Development of Targets

After a detailed examination, EAC's comments and basis of negotiations were worked out. EAC comments on the Pak-Saudi proposal were as follows:

- production in budget decrease by 4.8 per cent;

- operating days reduced from 324 to 320;

- production per day reduced from 1812 tons to 1750 tons;

- sales value increased by 2.1 per cent (also using inventory);

- average monthly salary/employee increase by 9.7 per cent;

- no increase in price of urea;

- price of natural gas increase by 31.7 per cent;

9. Other income decrease from Rs40.5 million to Rs16.0 million due to decline in interest income.

The principles on which the targets are set by the Experts Advisory Cell are:

- Efficient target setting should be carried out in a participatory process. Without this approach, targets tend to take the form of formal directives which are often overtly accepted and covertly resisted.

- Targets should be explicit and clear-cut.

- Targets should be neither too low nor too high. This could give the wrong signals to the managers.

- Each enterprise must be looked at in its own, unique environment.

- Targets for incentives should ensure that the generation of a surplus is worth significantly more than distribution by way of bonus.

- Targets must take into account the social tasks which enterprises are invariably asked to carry out.

After a detailed negotiation which was based on an increase in sales and the conservation of major costs, i.e. energy, raw material, labour and financial charges, a new bottom-line profit was worked out (details in annex).

Profit (Rs in millions)

	Wts	A	B	C	D	E
1. Profitability	0.60	25.02	24.43	23.84	23.48	23.14
2. Physical production (thousand tons)	0.10	580	575	570	565	560
3. Physical energy consumption		424	414	404	398	392
4. Cost of production per ton	0.30	1408.73	1415.26	1421.91	1428.66	1435.55

In order to ensure strict cost conservation, the targets are generally constrained by physical consumption rations in four areas, i.e. raw materials, energy, financial charges and labour. However, in view of the specific production and cost pattern of Pak-Saudi, two costs names natural gas consumption per unit or area production and cost of labour was constrained to Rs33.7 and Rs44.4 million respectively. The two costs were assigned weights as .5 and .25 respectively.

After signing its agreement of targets, the management of the unit is left on its own to make efforts to achieve the given targets. EAC started to monitor the performance during the year so that the ministry can keep a watch on the performance of the unit and take corrective action where it is required. The performance of the unit against the EAC-established targets is monitored through a computerised information system on a monthly basis. It is also examined on a periodic basis in the performance review meetings. The meetings are chaired by the Secretary, Ministry of Production and comprise chief executive officers of units. The review meetings discuss not only the bottom line target achievement but also discuss the cash flow, manpower productivity, production facilities, material utilisation, energy conservation, etc. The bottom line variance is split into the

following areas and the reasons for the position are explained:

- sales volume variance;
- raw material purchase price variance;
- raw material usage variance;
- output price variance;
- trend in inventories;
- trend in production.

The objective of the review meetings is to identify areas which are creating problems in achieving targets and to ascertain whether government can come to the assistance of the enterprise. The review meetings ensure that the enterprise management continue to make efforts to achieve agreed targets. In sum, the targets assist the decision-makers in assessing the unit performance against an established and agreed standard and help managers, if need be, to achieve them.

Actual Achievement Versus Targets

At the end of the year, for the purpose of evaluating the performance of the unit, specially designed diagnostics formats are sent to the unit, so that the detailed information on the factors affecting the performance of the company during the year can be made available to EAC. The idea is to ensure the company is evaluated in the light of the specific controllable factors influencing its performance. At the end of the year based, on the audited accounts and diagnostic formats, the unit's achievement is compared with the original targets.

Criteria	Weight	A	B	C	D	E
Profit before tax (Rs in million)		424.13	414.13	404.13	398.13	392.30
Profitability (%)	0.60	25.02	24.43	23.84	23.48	23.14

Criteria	Weight	A	B	C	D	E
Physical Production (000 m. ton)	0.10	580	575	570	565	560
Cost of production (per ton)	0.30	1408.73	1415.26	1421.91	1428.66	1435.55

The actual achievement of the company against targets is worked out as follows:

Criteria	Actual Achievement	Raw	Weight Score	Weighted	Score Achieved
Profitability (%) PBTX divided by total assets	25.39	1(A)	0.6	(1x.6)	0.6
Physical production (000 m. ton)	580.62	1(A)	0.1	(1x0.1)	0.1
Cost of Production	1416	2(B)	0.3	(2x0.3)	0.6
				Sub total	**1.3**

Evaluation of cost targets

Description	Wt.	Target	Actual	Add back for exceeding target limitations
Raw material Natural Gas (MBTU/Ton)	0.50	33.70	34.36	0.50
Labour Cost (Rs in million)	0.25	42.418	47.531	0.25
				.75

Final score	
Score achieved against profit, production and cost/ton target=	1.30
Score achieved against cost target	.75
TOTAL:	**2.05**

The composite score of Pak-Saudi in terms of profit, production and unit cost works out to 1.3, which would place it in A grade. However, when we take into account the cost constraints the unit has exceeded both in natural gas consumption and labour cost. An addition of their weight, i.e. .75 brings the total score to 2.05. On a scale of 1 to 5 (1 'A' excellent performance; 5 or E, inadequate performance), the company's total score worked out to 2.05 which leads it to grade 'B' and an entitlement of two months' bonus.

Part Three

Effectiveness of the Signalling System

The signalling system was conceived and set up in the government policy environment which placed emphasis on improving PIEs' performance with the assistance of efficient management systems. The signalling system was part of the attempt at the systematisation of management of PIEs. How far this system has been successful in attaining its objectives, requires an in-depth analysis which is beyond the scope of this study.[3] If profit alone is any indicator, the trend of aggregate shows a continuous profit rise (annex). This, indeed, is a result of a number of factors. However, the following manifestations are indicative of the system's achievements:

- managers' attitude towards the system;
- attainment of grades and trend in profitability;
- how far this system has assisted in systematising the management of PIEs.

Managers' attitude to the system

A preliminary survey of the managers' attitude towards the signalling system indicates that it has at least been able to draw their attention to operational efficiency. The CEOs of PIEs are conscious, to say the least, of the year-end evaluation and grading which makes them accountable for their performance. Indeed, the reaction of PIE managers ranges from positive support to scepticism to strong opposition to the system. The reaction of managers to this system divided them into two classes:

[3] For a detailed account of this subject see Jones, L.P. and Mehdi, I. "Signalling System for Public Enterprises in Pakistan". August, 1986.

- managers who are favourably inclined towards this system; and
- managers who are sceptical towards this system.

Managers reacting positively

The reasons for some managers supporting the system are as follows:

- Managers whose units have been generating profit for a number of years had grievances that there was no method and system of acknowledging their achievements. The issue had become important since the workers' bonus was to a large extent determined by the profit-earned performance of the unit and they were getting away with as much as ten bonuses. As a consequence, managers at the junior level were often getting less financial emoluments than some workers. The incentive system provided a method of rewarding bonuses to the officers in profit-earning units.

- Managers of some units, especially those where prices were fixed, found a way of demonstrating their good performance. For instance, in the case of a petroleum unit, in the past their managers had argued that their unit was working at a high level of efficiency. However, the conventional performance indicators i.e., profit, could not demonstrate this as the unit was allowed a fixed return on equity irrespective of its performance. The Stock Exchanges and Chambers of Commerce, while identifying the best companies of the year, ignored this unit since their primary criterion of evaluation was the maximisation of profit. EAC's performance evaluation system initially faced the same problem. However, the Cell, in its efforts to motivate management to improve productivity, evolved a set of criteria of evaluation which, along with targets to maximise profitability (by reducing assets, i.e. inventory and receivables, etc.), assigned weights to conservation of costs. The manager of this unit found a way to demonstrate his achievements. In fact, its chief executive suggested to the representative of the Chambers of Commerce and Stock Exchange that his unit's performance should be evaluated and seen with reference to EAC's evaluation system.

- Generally, it was experienced that the managers of process industries were more enthusiastic to the system than those in the batch industries. One of the reasons for this was that most of the process industries sell in a supply constraint situation where they aim at maximisation of production. As against this, batch processing industries, i.e. engineering sector units etc., are operating in a competitive environment where performance is largely determined by the market. Since marketing is one of the weakest areas of

public sector managers, the managers of these units generally felt uneasy and uncertain while negotiating the target for sales. However, among these units those with a profit-making record found the evaluation system helpful.

4. Reaction towards the system was also very largely dependent on the personality of the managers. Managers who had drive and ambition and endeavoured to establish their goodwill in the market, showed their enthusiasm towards the system. However, these managers were also the most difficult ones with whom to negotiate targets.

Results Produced by the System

The setting up of the incentive-linked performance evaluation system has been an extremely fruitful experience. Although the actual system is quite different from that originally envisaged, the system evolved by the Experts Advisory Cell has proved to be a good starting-point. The system has produced the following positive results:

- The system helps to clarify the perception of managers of their objectives.

- The targets negotiated by the Experts Advisory Cell provide a bench-mark to the Ministry of Production for effective control of the performance of operating units. In the periodic review meetings, the decision-makers, i.e. the Minister and Secretary, use the well-thought out and negotiated targets for effectively monitoring, controlling and regulating the units' performance.

- In-depth ex-post-facto evaluation of operating units has identified a number of problems and shortcomings in the management of our units. A continuous decline in performance, reflected by the consistent low grades of units, indicates the need for a detailed study of the units' problems and prospects, and to identify the requirement of structural changes, such as, mergers, disinvestments, liquidations or diversifications, etc.

- The evaluation system has also highlighted some major shortcomings in the public enterprises management. For instance, it was realised that public enterprise managements should have long-term corporate plans. Consequently, the Experts Advisory Cell initiated a programme to launch a project to install a corporate planning system in the public sector which is now fully operational.

- Finally, the system has created a spirit of improving performance. The incentive to improve varies according to the quality of management. Enterprising and aggressive managements have taken the results of the system much more seriously than others.

Annex I

PROFIT BEFORE TAX AND GRADE ACHIEVED

(Rs in million)

Year	PAK SAUDI	
	PBTX/(Loss)	Grade Achieved
1983-84	191	A
1984-85	197	A
1985-86	234	C
1986-87	570	A
1987-88	468	B
1988-89	446	A
1989-90	588	A
1990-91	894	B
1991-92	826	A
1992-93	826	A

Annex II

PHYSICAL DATA

Description	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
Capacity utilization (%)	104	105	95	108	104	104	106	100	101	92
Production (000 tons)	582	587	528	600	581	585	590	559	562	512
Sales volume of urea (tons)	544	561	578	599	570	588	624	579	552	537
Plant Oper. (No. of days)	320	330	303	330	324	323	328	302	306	290
Production per day (tons)	1819	1779	1743	1818	1791	-	1836	1851	1837	1768

PRETAX PROFIT
(EXCLUDING PAKISTAN STEEL)