Chapter 2

An Overview of the Existing Literature on Incentive Schemes

A survey of existing literature on incentives is beset with the problem of disentangling its diverse aspects which are discussed under the headings like 'incentive contracts', 'principal agent problem', 'incentive schemes', 'efficiency wage', etc. However, in view of the fact that all of them are characteristically not very much different, we would discuss them under the heading 'incentive schemes', which is a more generic term as compared to the other ones. The empirical part of the literature is subdivided into two groups — one is based mainly on statistical testing, and the other is mainly in the form of attitude survey. There is another class of empirical work which is in the form of 'pilot surveys' or detailed field surveys. Because of their importance, the pilot surveys would be given somewhat lengthy coverage in the review. Further, a section of the literature, mainly empirical, is directed to public enterprises; while the rest is concerned with private enterprises. Since our preoccupation is with public enterprises, we would review a larger number of works on public enterprises.

The Chapter is organised in four sections. Section I reviews the existing empirical studies; Section II produces the summary results of some important pilot surveys conducted on a number of public enterprises; and Section III presents a brief discussion of the existing theoretical works.
The foundation of incentive payment system was laid by Taylor (1911) when he described incentives as one aspect of 'scientific management'. According to him, worker's primary aim is to earn as much money as he can. This primitive 'monetary view' of incentives did not last long. Several studies on the eve of the First World War and after began to show the non-monetary aspects of incentive schemes. The publication of Goldmark's 'Fatigue and Efficiency' and the appointment of a Committee on 'Fatigue from the Economic Standpoint' by the British Association for the Advancement of Sciences, in 1913, indicate that reduction of fatigue, rather than obtaining pecuniary incentives, was gradually getting the primary emphasis. Several reports and memoranda on industrial relations, published between 1916 and 1924, were mainly concerned with the effect of hours and physical conditions of work on particular kinds of jobs. Florence, for instance, gave separate hour by hour work and accident curves for different types of work, and analysed all the jobs in a giant factory according to the part played by the worker.

Between the Wars, the enquiries got a turn from the economics and physiology of the industrial relations atmosphere to its psychology, sociology and anthropology. The pioneer in
this direction was Elton Mayo along with his associates at Harvard, who brought out the importance of personal relations and of the group behaviour of workers to job satisfaction. In England, the numerous reports of the Industrial Health Research Board, contemporary with those of Mayo in America, continued to stress the importance of monotony and physical conditions as affecting outputs and accidents in the course of long working hours. However, public opinion was fast getting inclined towards Mayo's contentions.

The theory which Mayo evolved from a series of experiments between 1927 and 1932 at the Hawthorne works of the Western Electric Company in Chicago, states that workers tend to cluster together into informal groups in order to fill a void in their lives and that this void results from a basic need for cooperation and comradeship. In an earlier study (1923-24) at a Philadelphia textile mill, he investigated the problem of excessive labour turnover in a department where work was monotonous and fatiguing. Mayo first prescribed a series of rest periods during the working day and then allowed the workers to do the scheduling of the rest periods themselves, the effect of which was dramatic. Labour turnover fell sharply, productivity shot upward, and the melancholy moods disappeared. Mayo interpreted these results as being partly a matter of eliminating fatigue but mainly due to having allowed the employees to participate in the managing of their own work. The workers were wedded into a group, and what is more, this group evolved into a sort of partnership with management rather than into opposition to it.
Meanwhile, in Soviet Russia, considerable importance was being assigned by the Gosplan on incentive schemes as an instrument of rapid productivity increase in a very short time. As a matter of fact, in the context of the Socialist economy of Soviet Union, the importance of incentive schemes as a means of increasing productivity was considered to be enormous owing to the absence of market mechanism which provides some sort of automatic inducements. As noted by Barker "The planned economy, which does not permit unconditionally free buying and selling of labour on the market, can not count on the operation of a more or less automatically operating system of labour discipline. In this respect, as in others, it is obliged to resort to some kind of substitute for the mechanism which operates the economic system in capitalist conditions. Profitability no longer being the basic criterion for making of decisions, and inter-firm competition no longer existing, substitutes have to be found in ensuring efficient methods of production. A new system of labour discipline appropriate to the operation of a planned economy thus has to be evolved, which will not only replace the basic incentives to efficient work of capitalist labour discipline, but also help to cover the loss of stimulus to efficient production which competition among enterprises and securing of profit represents under capitalism".

As a result of all the measures employed by the Soviet authorities to increase mechanization, rationalization, and intensification of labour, the productivity of labour rose extremely
rapidly, and by 1926 it surpassed pre-war level in industry as a whole. Between 1921 and 1926, annual output per worker nearly trebled. In 1931-32, a wage reform took place, which included the following features:

(a) The range between the rates of the least and the most skilled was widened.

(b) The decreasing curve of percentage increases in pay between grades of skill was abolished, and the pay of the most skilled was made to rise steeply as compared to the next grade below.

(c) Separate scales were produced for time-workers and piece workers, with separate scales for those on heavy work in some cases.

(d) Widespread progressive piece-work rates, in some cases paid even for output within the norm but above a certain percentage of the norm, were used.

By the first quarter of 1932, a whole number of enterprises in the iron and steel industry began to fulfill the production plan, to a considerable extent because of these changes, whereas before the reform not a single enterprise had done so.

A notable feature of the history of incentive schemes in Soviet Union is the 'Stakhanovite movement, which began in 1935 under the leadership of the miner Alexei Stakhanov. This movement very soon acquired the form of a mass-movement as it got followers
all over the country—all trying to smash the existing technological standards of Russian industry and raise the productivity of their labour many times over.

What was specifically new in the Stakhanovite movement was its combination of the initiative of ordinary workers from below with managerial function. Thus Stakhanov's first record raised his productivity 5-10 times, from a level well behind that of Western European miners to twice that of those working in the best Ruhr pits. The Stakhanovites also increased their earnings two, three, and even four times over.

Another notable feature of the Soviet system of incentives is the provision for multiplicity of prizes and honours. As early as 1927, a title "Labour Hero" had been instituted for persons having performed special services in the field of production, scientific activity, and public service, who had worked for a wage for not less than 35 years. They were also granted various material benefits. In December 1938, the title "Labour Hero" was abolished and replaced by the title "Hero of Socialist Labour" and the medals "For Valorous Labour" and "For Distinguished Labour". The highest Soviet order—the Order of Lenin—was awarded to all granted the title of "Hero of Socialist Labour". All these awards were accompanied by material benefits. The institution of "Stalin Prizes" (1939) was used as yet another means of raising the standing and prestige of industrial labour.
Shortly after World War II, the Institute for Social Research at the University of Michigan began a series of studies which were considerably more sophisticated than Mayo's. The focus of the Michigan studies was on the attitudes and behaviour of the first line supervisors and how these affect the productivity of their subordinates. It was found that the "employee-centered" supervisors were much more successful than the "production-centered" supervisors as far as production and productivity were concerned. It looked as if a direct emphasis on getting the work done was the worst way to get it done. The employee-centered supervisors were more concerned with the employees' needs for attention and respect than with productivity itself. Unfortunately, the managements of most of the enterprises were oriented to production-centered supervision. As Likert (1958) pointed out, the management had not recognized that employees were, or could be, assets who deserved as much concern and planning as material assets, and that damage to the morale or motivation of its human assets must be counted as a serious loss.

But the problem with the employee-centered supervision is that it can be carried to an extreme, which means productivity would almost certainly suffer. As Kahn (1960) notes: "by itself, employee-centered supervision may sometimes generate a superficial popularity among the men, although we predict that in time this would be replaced by feelings of aimlessness and lack of accomplishment". As a matter of fact, the Michigan researchers...
have come to think of employee-centered and production-centered styles of supervision as being complementary and not at all incompatible.

Another group of studies, still more sophisticated than those conducted by the Michigan researchers, were by Herzberg (1959) and his colleagues at the Psychological Service of Pittsburgh. The Pittsburgh group, based on interviews with some 200 engineers and accountants who worked for eleven different firms in the Pittsburgh area, drew a distinction between what they called "motivators" and "hygienic factors". A motivator is an influence that usually has an uplifting effect on attitudes or performance. Hygienic factors produce no improvements but rather serve to prevent losses of morale or efficiency. Hygienic factors are prerequisites for effective motivation but are powerless to motivate by themselves. Pay, job security, and working conditions were found to be the hygienic factors. The motivating factors are opportunities to become more expert, freedom to exercise initiative and ingenuity, and opportunity to experiment and to handle the problems involved in the jobs in the way the workers thought fit.

The engineers and accountants, surveyed by the Pittsburgh group, reported that their attitudes had a definite effect on their productivity but that the difference was qualitative rather than quantitative. When they felt positive about their jobs, they put more care, imagination, and craftsmanship into their work; when they felt negative, they did not worry about fine details.
It was also found that there is a natural tendency for the workers to lose interest in the needs which are well taken care of. Today's motivator will become tomorrow's hygiene. There is a sort of pyramid into which needs arrange themselves in order of their importance. Motivation only begins with the traditional incentive rewards; it reaches its full flower in the removal of restrictions, regulations, and controls.

Similar arguments as regards hierarchy of needs were advanced by Maslow (1965), who classified human needs into two broad groups: the higher order needs or Becoming needs (e.g., love, esteem, self actualization, etc.) and the lower order needs or 'Deficiency' needs (e.g., physiological, safety, etc.). The former imply greater biological efficiency; their satisfaction produces more profound happiness, rich inner life, and a feeling of individuality. The Deficiency-needs (D-needs) may be related with monetary incentives, and the Becoming-needs (B-needs) with non-monetary incentives. What follows from Maslow's theory is that, if an incentive is tapping D-needs, the chances of its effectiveness being continued for a good length of time are minimized. This is because, once a deficit is satisfied, a person tends to look for higher order needs (B-needs) and grows indifferent towards the D-needs. It is in this context that the concept of non-financial incentives acquires special significance.

During the 60's, the interest in 'wage-incentives' gradually declined in the advanced countries; while in the developing countries such as Malaysia, Singapore, India, and Ceylone, the interest
was growing fast. Among these countries, India was probably the most enthusiastic in adopting wage incentive methods, as reflected in her third plan (1961-66) Draft. The plan emphasized the need for higher productivity and reduction in the unit cost of production. It put the responsibility on management to provide the most efficient equipment, correct conditions and methods of work, and adequate training and suitable psychological and material incentives for workers. The Draft Outline of the Fourth Five Year Plan (1966) envisaged that 50% of the wage rise should be based on general increases in output. Several studies, particularly in public enterprises, were conducted in India during this period, showing significant favourable impact of incentive schemes on productivity, earnings, unit costs, labour turnover, industrial disputes, etc.

The Institute of Public Enterprises, which conducted a survey on the incentives in public enterprises in 1967, stated that the introduction of the schemes have generally resulted in increased productivity. The Institute made a special reference to the National Coal Development Corporation where the group productivity almost doubled, and the Corporation was able to attain 80% utilization of rated capacity, after the introduction of incentive scheme.

The National Commission on Labour reached the conclusion that "under our conditions wage incentive is the cheapest, quickest, and surest means of increasing productivity". As a point
in evidence, the report mentioned the case of Chittaranjan Locomotive Works in West Bengal where productivity was progressively on the increase. Somani (1961), who conducted a case study of the wage incentive schemes in the cotton textile industry, found that the introduction of a system of payment by results resulted in better use of labour and thereby improvement in labour productivity materially. Satyanarayana (1969), who made an evaluation of the incentive schemes in Heavy Electricals, reported that there was increase in production in all the sectors, and in some sectors the increase was considerable.

During the '70's, a large number of studies on incentive schemes were published in India, the majority of which emphasized the importance of monetary incentives, though recognizing the importance of non-monetary incentives as well. Bashudev Mukherjee (1973), in a study of 14 units in Bombay, found that in the presence of financial incentive schemes there was a positive relationship between wages and labour productivity and in the absence of such schemes, they tended to be inversely related. This finding is very important in that it crystalizes the basic implicit argument of almost all the findings during this period. The fact is that, it is only under a good 'scheme' that the workers would respond positively to an increase in real wage. The 'scheme' includes two basic things — the method of payment, and the environment in which the worker works, i.e., the working condition. Now, working condition and method of payment are nothing but non-monetary incentives. Thus, a certain level of non-monetary
incentives is required for the success of monetary incentives. None of the authors contest this fact. What is at issue is, given the requisite minimum level of non-monetary incentives, would monetary incentives always have a positive impact on productivity? If not, then the question is, under what circumstances and to what degree the monetary incentives are likely to make the workers respond positively to it. The main argument behind the emphasis on monetary incentives in India is the subsistence needs argument. The average wage of an Indian worker being very low, it is perceivable that an Indian worker would like monetary incentives much more than any other incentives. Dolke (1974) has shown that out of 11 studies conducted by different authors on the ranking of job-factors in order of their relative importance among the blue-collar workers, 10 studies found adequate earning to be the most important or second important factor. In another study conducted among 113 supervisors, 137 clerks and 250 skilled workers, Rao and Rao (1973) found that salary was one of the significant independent variables determining job satisfaction. Singh (1971) found wage pattern and working conditions as the most important factors in workers' job satisfaction. In another study, Tripathi (1974), working on a random sample of 1100 workers with mean age of 40 years, most of whom were illiterate, found job permanency and salary as the two most important factors in their job satisfaction. One of the most important works showing the importance of monetary incentives in India is that by Mehta (1978). Based on questionnaire responded by 211 employees of different organizations
attending training courses on participative management, Mehta found that salary was the most important factor determining employees’ satisfaction in life and work. In an excellent article, Dayal (1978) brought out the importance of increase in real wage and bonus in the Indian context, and also showed the lack of a systematic government policy on this issue. According to the author, a rational and systematic wage policy is important because wages perform several important functions in the economy; they are a reward for work as a factor of production; they provide an instrument for allocating manpower between skills, occupations, industries, and regions; they have an efficiency function — output-related earnings tend to improve worker efficiency and serve as an incentive to further effort. Furthermore, wages contribute to the pattern of distribution of national income. Both price-stability and productivity-based wage improvements have been emphasized in the five-year plans, but in fact both of these objectives have been frustrated. Collecting statistics from different sources, the author showed that real earnings in 1964 was slightly below the 1952 level, and in 1972 it was at the same level as 1962. The worker productivity index, however, was going up in most of those years. Further, the share of wages and salaries as a percentage of value added by the manufacturing sector declined from 65% in 1949 to 53% in 1969.

However, there were also a few studies during this decade which highlighted the importance of non-monetary factors. Prominent among these are the studies by Dayal and Saiyadain (1970),
Laxmi Narayan (1973), Sharma (1970, 1979), Pathak (1977), Srivastava (1978), etc. Dayal and Saiyadain (1970), on the basis of a study conducted among 40 technical and non-technical persons, claimed support for Herzberg’s two-factor theory. In a study conducted in the public sector undertakings in India, Narayan (1973) showed that monetary incentives ranked rather low among the factors motivating the managers of these organizations. Sharma (1970) demonstrated that Indian workers are likely to be more concerned with their ego needs than the physiological and safety needs. Other Indian scholars have studied the relationship between job satisfaction and various other personal factors like rural-urban background, level of education, length of service, emoluments and job level (Pathak, 1977; Srivastava, 1978, Sharma 1979).

In Tanzania, the concept of motivation and the means for achieving it underwent radical change during the decade of 70’s. From the moral incentive of "Uhuru Ni Kazi" (freedom is work), the importance gradually shifted to various types of material incentives. After experimenting with material incentives for some time, the government realized the danger of relying on it fully, and hence suddenly switched over to moral incentives of various sorts, including punishments and other deterrents. Following recession of output and productivity in most public enterprises, some of which had become completely unmanageable owing to serious indebtedness, President Nyerere warned that if workers could not look at parastatal organizations as their own
and work for their success and growth, they must be told what would be the fate of their omission. Managers and workers must respect the firms entrusted to them not only because they were providing services to the people but also because they were a source of their bread. The president went on to explain that if public sector enterprises collapsed due to lack of vigilance and positive attitude to work of its workers, then all the managers and workers would also collapse.

Considerable analytical sophistication characterized the works that came up during '80's and early '90's. Rigorous statistical techniques were applied to show the impact of incentive schemes — monetary or otherwise — on productivity. In Germany, Cable and Fitzroy (1980) tested the impact of incentive expenditure (I), profit sharing (π_E), workers' capital (M), and degree of active participation by workers (P), on value added, with the help of a sample of 42 W. German firms. The authors prepared the participation index (P) by a subjective method and included it in the production function* in the form of a dummy variable after dichotomizing the workers into two groups — high participants and low participants. The remarkable result of the study was that the 'participation coefficient' turned out to be positive and highly significant. Eliminating the dummy variable and carrying out separate regressions on the two sub-samples, it was found, applying a Chow-test, that the differences between the

* The authors have used a Cobb-Douglas type production function.
estimates for the two sub-samples were statistically significant, thus serving as a cross check for the validity of the significant coefficient of \( p \) in the combined regression. Another important result to mention is that while combined regression yielded small and insignificant coefficients of \( M, I, \) and \( \pi_E \), separate regressions of the two sub-samples made the coefficient of \( \pi_E \) in the high participation group highly significant. Further, while all the above variables got positive coefficients in the 'high' group, in the 'low' group all of them yielded negative coefficients.

Kumar (1982), applying Mann - Whitney 'U' test on three groups of companies, has shown that there are vast sectoral differences in motivational strategies (which are related with incentive schemes), and that comparatively the public sector companies have less effective motivational strategies than the domestic private and multinational subsidiary companies in India. The study suggests that unlike common belief, the intervention called is more on 'instrumentality' (i.e., the relationship) of reward and punishment to efforts, rather than on overemphasis on satisfaction of needs.

Hirsch and Hausman (1983), in a study of labour productivity in the British and South Wales Coal industry covering the period 1874-1914, have shown, using both OLS method and 'maximum likelihood iterative estimation technique' developed by Beach and Mackinnon (1978), that there exists a significant negative relationship between wages (nominal and real) and output per worker, after accounting for other measurable determinants of labour
productivity. Further, they have also found a significant negative coefficient for a dummy representing strike years; results suggested that productivity in South Wales was 15% lower during strike years, ceteris paribus. Another dummy variable representing the years after 1908 when hours of work per day was reduced to eight by an act, yielded a negative coefficient suggesting that output per worker fell by 6-9% approximately. But an interesting thing to note here is that output per hour of labour increased with reduction in hours of work per day due to increase in intensity of work.

Srivastava (1984) identified the differences in Achievement Motivation (A.M), which refers to the behaviour of an individual who strives to accomplish something and excell others in performance, among private and public sector employees (working men and women). He tested four main hypotheses:

(i) Private Sector men will have higher A.M. than public Sector men.

(ii) Private sector women will have higher A.M. than Public Sector women.

(iii) That there would be significant difference between private and public sector employees, and

(iv) In general, men will have higher A.M. than women.

The sample of the study consisted of 200 employees—50 men and 50 women each from private sector and public sector—randomly selected from Kanpur City. To measure the A.M. the
author used a scale constructed and standardized by Costello (1967). The results showed that among the two sexes, the group of men scored higher on A.M. than the group of women. The men had a mean score of 15.51 as compared to the corresponding figure of 12.39 for women — indicating that the group of men have significantly higher A.M. than group of women (t - value = 7.61).

Among the two sector levels, it was the group of private sector employees that was higher on A.M. than Public Sector employees; while the private sector employees had a mean A.M. score of 15.88, the public sector employees had a score of only 12.02, the difference being significant at .01 level (t - value = 10.16).

Padaki (1984) tested the relationships between job characteristics, psychological states, and motivation. By 'job characteristics' the author means the following: skill variety, task identity, task significance, autonomy, feedback from job, feedback from others, and dealing with others.

The author conducted the study in the four textile mills of Ahmedabad on the supervisory staff working in production departments. 120 technicians were covered in the study. The main duties of a technician in a textile mill are to supervise workers, inspect quality of finished product, co-ordinate the requirements, improve quantity of production, reduce damage, etc. In order to measure the job characteristics, psychological states, and motivation, the Job Diagnostic Survey (JDS) developed by Hackman and Oldham (1975) was used. Each job characteristic was
measured by three items responded on a Likert-type scale. The author found the various job characteristics to have significant relationship with psychological states and motivation. The relationships between job characteristics and psychological states were found to be higher than between job characteristics and motivation. The job design characteristics were not significantly related to satisfaction with pay and security. Satisfaction with security was found to be significantly correlated with task identity, job autonomy and feedback from others. On the other hand, all the job characteristics were significantly correlated with growth satisfaction.

Trivedi and Mookherjee (1989), using tests of Granger-causality* between several variables for public and private enterprises based on aggregative time series data for sixteen years from 1960-61 through 1975-76, showed that in public sector enterprises total factor productivity (TFP) Granger-causes labour's share (L.S), capital-output ratio, and capital-labour ratio; but labour productivity (LP) is completely independent of all these factors — it neither Granger-causes them, nor is it Granger-caused by them. Further, both TFP and LP are independent of labour earnings (LE) in this sector. On the other hand, in the private sector, labour's share Granger-Causes TFP; and both TFP and LP Granger-cause labour's earnings.

Kraft (1991) analysed the efficiency effects of several incentive schemes in a production function framework. Four kinds of incentive schemes were considered — dismissal, efficiency

wage, piece rate, and profit sharing — with particular emphasis on the effects of dismissals. He showed that dismissals have an effect on productivity; however, this relation is non-linear and an internal optimum exists. This result is in accordance with theoretical considerations, as with every dismissal, specific human capital is lost and the workforce becomes demotivated because of the high risk of being fired. Kraft further showed that profit sharing has a positive impact on productivity. Piece rates do not prove to be successful incentives. Profit sharing, as an additional payment to the going wage rate, can be considered as an attempt to circumvent the traditional employer-worker conflict. In a way the strong influence of profit sharing supports the fairness version of the efficiency wage theory. The author says, the flexible incentive scheme (profit sharing) is a substitute for punishment by dismissals. Aside from the incentive effect of profit sharing, an additional advantage of this payment scheme is its downward flexibility in times of reduced demand, which may be the second reason why fewer dismissals take place.

A study by Sharma and Bhasker (1991) examined the motivation of public sector managers by using a measure of job satisfaction. With the help of primary data from 30 public sector enterprises, the authors ascertained the level of motivation of junior and middle level managers and the determinants thereof. The junior and middle level officers of public sector enterprises (PSEs) are responsible for the implementation of decisions of higher levels of management and coordination of interdepartmental
activities, besides carrying out specific job responsibilities assigned to them.

The study was carried out with the help of a specially designed questionnaire completed by 5184 managerial personnel. The constituents of job satisfaction were classified into four broad groups: Individual background; Personality; job characteristics; and Organizational climate.

On the basis of the study, the authors found that the typical junior/middle level manager working in the public sector is 41 years old, is a college graduate or holds an equivalent qualification, has total work experience of 19 years, and his total emoluments are Rs. 4072/- p.m. In terms of personality traits, the typical manager is highly conscientious as well as outgoing, only moderately liberal, and not very aggressive. The manager finds many opportunities for interpersonal relationships. The content of his job is only moderately rich, and he enjoys very little authority in the performance of his work role. The organizational climate affecting these officers offers much scope for improvement. Finally, the level of job satisfaction of these officers is quite modest.

The authors point out that, as all policies of the top management and achievement of organizational objectives necessarily depend on active involvement and motivated behaviour of junior and middle level officers, their lukewarm attitude towards job and the organization, which contribute to poor economic
performance of the public sector, should be a matter of concern to the top management and the government.

II

There are a number of case studies in the form of 'pilot surveys' which require a little more detailed coverage. Hence, we discuss them under a separate section.

Basu (1967) conducted a survey of three public enterprises of West Bengal - Kalyani Spinning and Weaving Mills Ltd., Nadia; Hindustan Cables Ltd., Asansol; and Calcutta State Transport Corporation, Calcutta. Of these, the Hindustan Cables Ltd. belongs to the Central Govt. and the other two belong to the State Government. The main findings of the study are as follows:

Time-scale rates were common in all the undertakings, but a piece rate with a time basis in a limited sphere was practised in the Kalyani Spinning Mills — a State Govt. undertaking. An incentive system of wage payment was present only in the Hindustan Cables Ltd. (HCL). Wage rates in Central undertakings were determined by the joint pressure of national collective bargaining with local adjustments. In State undertakings the influence of collective bargaining was less perceptible; it was usually determined unilaterally by the management using their best discretion.

The time-rate payment was favoured by all public sector employees. The percentage of the workmen interviewed in H.C.L.
and K.S.M. who favoured time rate were 58.55 and 75 respectively. Apprehensions of low job rates were widespread among workers in both central and state undertakings. Backward bending supply curve of effort was present among the workers of H.C.L. and C.S.T.C., the percentages being 28 and 34 respectively. The workers, in general, were against wide fluctuations in their total money income, since such variations upset their family budgets. Even in H.C.L. - the only undertaking covered by an elaborate system of incentive payment — workers were not getting an opportunity to increase output according to their capacity due to widespread administrative lapses.

The existence of fairly high excess capacity in different sections of each unit pointed to the ineffectiveness of incentive schemes in operation. Nearly 61% of the total sections in H.C.L., 81% in K.S.M., and 71% in C.S.T.C. were running under-capacity for reasons beyond the control of the workmen. The efficiency performance in different sections of H.C.L. ranged from 71 to 177 percent of the standard performance. The differences in incentive earnings between workmen of different sections had a spread between Rs. 9.64 to Rs. 218.68. The incentive schemes in the prevalent form, under the existing work environment of the Central and State Undertakings, could not achieve the desired objectives.

The workers, in general, were not found to be in favour of any strictly non-monetary scheme. The sense of belonging and spirit of public service, which alone can motivate the working class towards increased work-efforts under any non-monetary incentive
schemes, were yet to penetrate among the workers of public undertakings. If the scope of non-monetary incentive schemes were extended to include payments in kind, travel grant, and the like, it might have a wide acceptance for the workers in both state and Central undertakings.

The nature of irregularities found among the workers of the public enterprises was almost identical. These were refusal to work, irregular attendance, leaving the workshop without prior permission, gossiping, absenteeism, rough handling of machines, and the making of lame excuses for want of materials. Absence of a tight organisation and presence of very many genuine grievances of the workers along with the pressure of trade unions and general politico-economic atmosphere of the country were the important factors which stood in the way of developing deterrents and punishments to do away with these irregularities, and in this way act as a supplement to the incentive schemes for increasing labour productivity.

The supervisory cadre, who are the link between the management on the one hand and workers on the other, were not satisfied with the existing work environment in their respective units. As regards the level of satisfaction with job of the workers, the findings forthcoming from the workers themselves and their supervisors were fairly corroborative. About 72.9% of the H.C.L. workers, 63% of the K.S.M. workers and 73.5% of the C.S.T.C. workers seemed to be contented workers according to their
own versions. According to the opinion of supervisors in the respective concerns, the percentages of satisfied workers in H.C.L. and K.S.M. were 67.4 and 78.8 respectively.

On the basis of the above findings, the author came out with the suggestion that to enable the incentive system to play a significant role in raising the efficiency of the workers in line with the accepted practice of the industrial countries, the first thing that should be done in public undertakings is to change the basic framework of the conditions prevailing in public undertakings in general. Along with this change, the supervisory cadres are required to be motivated through an elaborate system of incentive along with education. To impart a sense of belonging and a sense of public service, an all out effort should be made, which is a 'sine qua non' for effectiveness of an incentive wage payment under the present state of affairs prevailing in public enterprises. Democratization of the working process in the units with participation of the workers in management is a step in the right direction. An equity in the distribution of benefits through vertical and horizontal coverage of the incentive scheme, which is lacking in the existing system, should not also be overlooked.

Satyanarayana (1974) studied the incentive schemes in the Singareni Collieries Company Ltd. and Hindustan Steel Ltd. The main focus of his work was on the interrelationship between incentives and productivity on the one hand, and between incentives and
earnings of the workers on the other. By the term productivity the author means "the productivity of labour measured directly by quantity, quality and economy of output per worker or small group of workers, or measured indirectly and conversely by rates of absenteeism, turnover, accidents, etc., among large groups of workers". But, for the purpose of his study, he used the concept of output expressed in terms of labour as input, as a simplified definition of productivity. The author made the following findings:

The incentive schemes in the Singareni Collieries Company Ltd. were introduced on a scientific basis with the help of specialist industrial engineers to increase production and productivity. The schemes were formulated after discussing with trade union officials. The schemes were mainly group incentive plans, the group denoting a gang of workers in a process, or fixed by the Industrial Engineering department on the basis of workload studies. The rates of incentive bonus for individual categories of workers were fixed on the basis of a computed performance index:

\[
\text{Performance Index} = \frac{\text{Standard Mandays}}{\text{Actual Mandays}} \times 100.
\]

The maximum incentive bonus fixed in all the incentive schemes was 75% of the basic wage. In order to be eligible for incentive bonus, the individual worker was to put in a minimum attendance of four days in a week. Even though the incentive schemes for the various categories of workers were broadly similar in nature, there were some differences depending upon the needs
and the circumstances of each type of work. In the case of some categories of workers, incentive bonus was paid on the basis of labour performance alone; in other cases, they were based also on cost reduction and improvement in safety. The incentive bonus for supervisory staff was linked not only with labour performance but also with reduction in material cost, safety improvement and reduction in miscellaneous avoidable costs. The maximum rate of incentive bonus decreased with an increase in the basic wage. It was 75% in the case of lowest paid direct production workers, 37.5% in the case of intermediate supervisory staff, and only 20% in the case of upper supervisory staff.

Although production in No. 5 incline had been recording substantial progress from year to year and it had increased by about three times between 1953 and 1966, the overall productivity, in terms of output per man-shift, had been on the decline right from 1960 onwards. There were wide variations, in manshifts taken for producing 1000 tonnes, among various categories of workers. The author inferred that the workers were not motivated by the incentive schemes for the following reasons: they were not convinced of the method of computing incentive bonus; insufficient and irregular supply of sand; lack of storage facilities; bad working conditions obtaining in the mines; insufficient supply of tubs; etc. The shotfirers were paid incentive bonus mainly on the basis of explosive cost reduction. Timber mazdoors were paid incentive to the extent of 15% for 100% improvement in safety as shown by the accident rate. The incentive schemes were indirectly
linked up with absenteeism. The rate of absenteeism was, however, very high at 22.51% in the case of miners and loaders, and very low in the case of surface workers when compared with the all India rate of absenteeism. The incentive bonus, as a percentage of basic wage, had been insignificant in the case of all the categories except coal fillers. In most of the cases, it had generally been on the decline over the years.

In spite of the incentive earnings, most of the workers felt that their living conditions were better earlier. The workers felt that they could improve their performance if only the working conditions and the availability of tubs and other equipments were improved. The workers, on the whole, did not have job satisfaction. They were, in general, against the prevalent incentive schemes. The supervisory personnel were also not happy about the existing incentive scheme.

In Hindustan Steel Ltd., the first incentive scheme, called 'HSL Bonus Scheme', was introduced in December 1961. The need for the introduction of the scheme was felt because the production was much below the commissioned capacity and also to bridge the gap between the supply and demand that was obtaining at that time. The first scheme was essentially a scheme to achieve production targets. It was a group scheme, covering all the employees upto and below the level of General Foreman. In the case of Steel Melting Shop (SMS), the employees were paid incentive entirely on the basis of their own performance; whereas in the case of other
sections, there was an element of 'linkage' in the payment of incentives in the sense that they were paid incentive based partially on their own performance and partially on the performance of SMS. This linkage was expected to bring about balanced production in different sections. The rate of incentive was uniform for all the production sections at a minimum of 10% and maximum of 50% of basic pay for achievement of 100% of production target, which was later-on revised to 70% for an achievement of 120% of the targets. The slabs of performance, to earn a fixed slab of incentive rate, declined with an increase in the level of production. Beyond 100% of the incentive target capacity, the slabs of performance suddenly shot up for earning the same slab of incentive rate. The labour productivity or output per unit of labour was not taken into consideration in giving incentive bonus. The rates of incentives varied with the level of employees. At lower levels, they got a higher rate of incentive bonus and vice versa. The author says that the basis of rewarding incentive bonus to supervisory and executive personnel, based entirely on the performance of production workers, was not sound. The revision of the scheme, which took place in January, 1967, brought about delinkage between various sections in the production department and SMS. As per the revised scheme, incentive slabs of 1% were provided for. There was an attempt at having smaller groups within sections for the purpose of incentive payment.

Dasgupta (1982) studied the impact of the Revised Incentive Scheme (1980) of C.S.T.C. on the overall performance of
C.S.T.C. with the help of such performance indicators as the total and the effective outshedding of buses, average number of kilometers run by a bus, incidence of breakdown, average daily earnings per bus, attendance of workers, the number of passengers carried, absenteeism among the staff, maintenance at the depots, production at the central workshop, etc. He reported that in the year 1981-82, following the introduction of the revised incentive scheme, performance of the staff improved in the depots and the central workshop, and in a limited sense among drivers and conductors. But, there were problems with the other factors like efficiency of the management, the strength and the average age of the fleet of buses, availability of spare parts, overall financial parameters of C.S.T.C., road and traffic conditions, etc. In an attempt to motivate different categories of staff towards production, incentives under the revised scheme have been related not only to collection from the sale of tickets, but also to the scheduled trip completion. For the depot mechanical staff, the basis of incentives has been totally changed from collection levels to trip completion. For the staff at the Central Workshop, incentives have been directly linked up with the corresponding units of production.

The author made the following important recommendations on the basis of his findings. Firstly, a more efficient incentive structure can tackle the problem of absenteeism. The required measures for this are: introduction of 5 workings days a week with compensating higher working hours; internal promotional
opportunity; option of early retirement for the crew with monetary compensation; and strict administrative action against the deliberate absentees. Secondly, there should be a special squad, under the control of the Director of Operation, for attending breakdowns and mechanical problems at the shift-change points. Thirdly, all the officials in the management should be brought under the fold of the incentive scheme. The author strongly suggests the inclusion of even the chairman, the General Manager and the Director of Operations of the C.S.T.C. within the incentive package. Finally, the planning and monitoring of all the aspects of the C.S.T.C. should be made on a comprehensive and regular basis, with the joint participation of the representatives of the management as well as of the different categories of staff.

Hariharan and Ganesan (1990) examined the influence of three personal variables, namely, age, education, and experience on participation in two selected public enterprises in India — Swadeshi Cotton Mills and Sri Bharathi Mills. Both these enterprises are under the control of the NTC. The scheme of Workers' participation in management has been implemented in these two mills. In Bharathi Mills, the scheme was introduced in February 1986 and in Swadeshi Mills, in June, 1987. The employees of these mills participate in the managerial functions through their involvement in the working of bipartite committees and in the decision-making process through these committees. The important bipartite committees introduced in these two mills are: 1) Management
The researchers categorised the employees under five groups, consisting of three groups of workers (unskilled, semi-skilled, and skilled) and two groups of management personnel (supervisors and executives). A sample of 125 employees was selected from each mill. The personal variables taken for investigation were found to have no strong relationship with the level of participation for 'workers'. Education turned out to be an important variable in the case of supervisors, influencing the level of participation. The level of participation of the executives was strongly influenced by the education variable. The other two variables showed some influence when the executives of the two mills were analysed together. In sum, the three personal variables could not help to explain the variations in the level of participation beyond the maximum extent of 46%. Only in case of skilled workers of Swadeshi Mills, these variables explained 95% of variations in participation.
III

The fact that increase in real wage can have an efficiency-inducing effect, was pointed out by Adam Smith far back in the 18th Century. In the middle of the 19th Century, Lord Brassey drew further attention to this connection between wage and efficiency when he enunciated the principle that came to be known as the "economy of high wages", later came to be known as 'efficiency wage hypothesis'. Later, with the popularization by Taylor (1911) of 'wage incentives' as an indispensable aspect of scientific management, keen attention of economists was gradually being drawn towards the efficacy of high wages as an instrument of affecting productivity. Coase (1937) introduced the concept in the field of industrial organization. From Coase onwards, the multidimensional character of wage-incentives was gradually being unfolded. It was being realized by economists that much more effort can be derived from the workers by ingeniously devising methods of payment, rather than simply paying higher wage. This feature of wage incentive was discussed at length by Dobb (1946) who skillfully described various aspects of incentives — including profit sharing and hours of work. Hicks (1963) discussed wage incentives at still greater detail — with particular focus on its macro-economic implications.

The problem of incentives was firmly inserted into economic theory during '70's by Ross (1973) who, in a very sophisticated work, discussed the problem of incentives as the
'Principal Agent Problem'. The two decades — '70's and '80's — are very important in the context of incentive literature since numerous theoretical works on incentives were published during this period under the heading of 'Incentive Contracts'. The Principal-Agent Problem is one aspect of this problem of Incentive Contracts. However, a sharp boundary cannot be drawn defining the range of Principal Agent Problem within Incentive Contracts. Therefore, often the two terms are used interchangeably, and authors discussing basically the same problem discuss it under the two different headings. However, the important point is that beginning from Ross, the theory of incentive contract acquired more and more sophistication in the hands of eminent economists, and numerous articles were published, focusing on different aspects of incentive contracts. Let us discuss some of the works that came up during this period.

In a public sector dominated economy, the importance of the Bonus structure is unquestionable. Fan (1975) discusses a Bonus structure which he claims to be efficient, since there would be no incentive for the management to understate or overstate the normal production capacity or normal profit earning ability. In case of either understatement or overstatement of the normal capacity, the management would earn lower incentive than when it declares the actual normal capacity, based on which the principal devises the Bonus structure.
The hierarchical structure of a firm determines the degree of supervision over the actual production workers, that is, the last layer of the hierarchy. Calvo and Wellisz (1978), in their celebrated article, demonstrate that if the workers can not know for sure the periods when they are not going to be supervised, there is no limit imposed on the firm size by the heights of the hierarchical structure. The firm can go on increasing its profit by increasing the number of hierarchical layers. If, on the other hand, the employees are aware of the times at which they would be monitored or would not be monitored, a limit may be imposed on the firm size by the 'loss of control' arising from such a situation.

The study of relative compensation has become increasingly important. There are two approaches in the literature. The first, from Lazear and Rosen (1981), characterizes the labour market as a tournament, where one worker is pitted against another. The one with the highest level of output receives the winning prize (i.e., the high wage job) while the other gets the losing prize (i.e., the low wage job). By increasing the spread between the winning and losing prizes, incentives are provided to work hard. The second approach from Holmstrom (1982), suggests that if levels of output can be observed, then payments can be based, at least in part, on a team average.

Sometimes the fact that workers live for more than one period allows contracts to be structured in a way that solves
incentive problems. This is the subject of Lazear (1981). The author shows that even in the absence of any on-the-job training or investment in human capital, it pays for the employer to enter into long term wage-employment relationships which pay workers wage rates less than their VMP when they are junior, and more than their VMP when they are senior employees. Four important points emerge from the author's paper: (1) Senior workers are paid higher wages not because they are more productive, but because paying higher wages to them produce appropriate work incentives. (2) The separation between wages and spot marginal products makes the labour supply decision distorted. Hence, efficient employment contracts require hours restrictions. (3) A temporary separation is an extreme form of apparent deviation between desired and actual number of hours worked. Temporary separations bring about an efficient allocation of time. (4) Piece-rate and self employed workers will have flatter and more variable wage rates over the life time than will time rate workers.

In an excellent article, Arrow (1986) defines the different aspects of Principal-Agent Problem. Firstly, problems are created by the complexity of 'fee-function' (incentive contract function) which is required to extract the greatest effort from the agent for a given cost. Secondly, in some cases where Principal-Agent Theory seems clearly applicable, there is very little trace in reality. The physician-patient relation exemplifies the
principal agent relation almost perfectly. The principal (the patient) is certainly unable to monitor the efforts of the agent (the physician). Yet the fee schedule is in no way related to outcome. The third problem is the variety of means of monitoring and the difficulty of defining exactly what they are. Outcomes and even supplementary objective measures simply do not exhaust the information available upon which to base rewards. Lastly, the author points out, "there is a whole world of rewards and penalties in social rather than monetary form. Professional responsibility is clearly enforced in good measure by systems of ethics, internalized during the education process and enforced in some measure by formal punishments and more broadly by reputations".

There is another stream of literature which developed parallelly with the literature on Incentive Contracts, under the name 'Efficiency Wage Hypothesis'. This literature did not highlight so much the contractual element of wage payment as it highlighted the impact of simple wage changes on productivity, employment, growth, etc., via the efficiency-inducing effect of wage. Of course, some of the works discussed a lot about incentive contract (e.g., Bowles (1985)), so that they can be said to be lying on the borderline between incentive contract' and 'efficiency wage'. Let us briefly discuss some of these works.
Eaton and White (1983) demonstrate that some non-zero level of monetaring is necessary to induce agents to supply non-zero effort. The firm's problem, the authors say, is to select a level of monetaring and a compensation package that will minimize the cost of obtaining a desired level of effort, given the cost of monetaring, the agents preferences, and the agent's opportunity cost of accepting employment with the firm. If monetaring is costly enough, an increase in wage and a decrease in monetaring cost will decrease the firm's costs. Hence, the authors use the term "economy of high wages".

Basu (1984) shows that under 'efficiency wage', a profit maximizing firm would not pay wage below a certain level although it can get the same supply of labour at a lower wage. The author arrives at the profit maximizing condition that elasticity of 'e' with respect to 'w' must equal unity in equilibrium, where 'e' denotes the efficiency per hour of standardised labour, and 'w' is the wage rate per hour. The author then shows the possibility of underemployment equilibrium explained by 'efficiency wage', and the possibility of wage-employment trade off in the event of the market-clearing wage lying above the efficiency wage.

Bowles (1985) divides the cost per hour of productive labour into two parts - the wages proper, and expenditure on surveillance labour per hour of productive labour. For example, if for every four hours of production labour one hour of surveillance labour is employed, with same wage per hour, wages
per hour of production labour would be considered to have increased by 25%. Thus, surveillance labour does not appear explicitly as a factor of production. The author shows that for any fixed labour cost per hour, there is a particular combination of production labour and surveillance labour which would extract the greatest amount of work from the worker, i.e., which would ensure the greatest intensity of work per hour of labour. It appears that the employer, who is interested in maximizing the intensity of work per hour, can do better than simply increasing the wages of production labour (which of course reduces shirking and increases the intensity of work) by allocating a fixed labour cost between wages to production labour and to surveillance labour — thus reducing the extent of shirking by resorting to supervision.

Sau (1988) points out that "there is a fundamental distinction between the potential capacity of a worker to do work during a stipulated period of labour time, on the one hand, and the actual amount of work that he does during the same period, on the other." The 'surplus-wage' component of the total wage received by a worker can considerably close this gap. As the wage rate increases from zero upto the subsistence level, labour-productivity increases at a slow rate. As the wage rate crosses the subsistence level and enters the zone of 'surplus wage', labour-productivity increases at a high rate with increase in wage. This pulls up the average productivity of labour. After a critical wage level is reached, labour productivity no longer responds to increase in surplus wage. The curve relating labour productivity with wage rate thus takes almost a logistic shape.