

Unlocking an organisation's potential: the X-efficiency approach

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Introduction:

Neoclassical economic theory focuses on allocative efficiency. Its concern is with the allocation of resources in society. In the world of neoclassical economics firms do not exist as *organizations*. Speaking metaphorically the firm behaves as a “black box”. Neoclassical economics does not look inside the black box. The neoclassical theory of the firm comes down a one person enterprise buying inputs, including labour inputs, in the spot market, in other words to a production function. Labour is seen as being akin to any other input, raw materials or components coming in standardized units.

There have been several departures from this position over the past fifty years.

The first was an attempt to postulate a more complex objective function. Thus instead of simple profit maximization it was argued that sales, growth rate and managerial emoluments also matter in determining the behaviour of firms. However the unitary decision maker of standard neoclassical theory was maintained and interactions between individuals within the organization not considered. This work is associated with Baumol, Marris, and early Williamson.¹

The next major development was the Carnegie School which was characterized by bounded rationality, satisficing, multiplicity of goals, sequential attention to goals, standard operating procedures, coalition formation, and organizational slack. The basic thrust of the Carnegie School was the relaxation of the postulate of maximization and of a unitary decision-maker. However they did not give a theory of how coalitions are formed, who gets into a coalition and why, who stays out and so on.²

The third development comes from the work of Ronald Coase and the later Oliver Williamson which focused on Transactions Costs. Together with the closely related Agency Theory this development gave the rationale for the existence of firms as organisations. Agency theory contributed to design of incentives and. But neither of these approaches looked at the interactions between individuals in organisations.³

A fourth development arose out of the work of Harvey Leibenstein. We will focus on it here.⁴

Leibenstein's theory of X-efficiency:

Starting out as a development economist Leibenstein criticized mainstream economics on focusing exclusively on allocative efficiency to the exclusion of other types of efficiency. He focused on a hitherto undefined type of efficiency which he called X-efficiency. He argued that improvement in X-efficiency is a source of increased output, much more so than with allocative efficiency.⁵

The source of X-efficiency is because the relationship between inputs and outputs is not a determinate one. This could be because:

Contracts for labour are incomplete
Production function is not fully specified
Not all factors of production are marketed.

Of these three Leibenstein focuses on the first. As he puts it: “it is one thing to purchase or hire inputs” quite “another thing to get a pre-determinate output from them.”

It should be noted that inputs here could mean both human resources and material inputs. What matters is the amount of work that one can get from the human resources when acting on their own or in combination with other resources. Some firms are better at doing this than others. In this respect Leibenstein is a precursor to the later “organizational capabilities” literature in strategic management.⁶

Since the production function is not determinate we cannot assume cost minimization. The actual level of unit cost depends upon the degree of X-efficiency which in turn depends upon motivational factors as well as upon the degree of competitive pressure. The response to such factors forms a significant part of the residual in economic growth.

The firm consists of individual interactions between individuals and determine the final outcome namely level of performance (unit cost). The basic micro unit is the individual. Individuals are selectively rational. Individuals behave as they would like to and also as they feel they must. In other words they have to make a compromise between what they would like to do if there had no sense of obligation and the pressures they feel because of their sense of obligation. So individuals in organizations are subject to self imposed constraints. Leibenstein calls this “constraint concern.” Whereas constraint concern comes from within, individuals are also subject to pressure from the environment. Pressure is defined as the feelings of disutility of the consequences that can be imposed by the outside world for disregarding constraints. Thus constraints are internalized as well as imposed. Thus this notion of internalization which is basic in sociology and psychology is introduced in economics.⁷

The firm according to Leibenstein is an entity composed of individuals who:

- Are on employment contracts which are incomplete;
- Have to interpret their relationship to the firm or job;

- Recognize their relationship to various groups within the firm
- Function within a hierarchical structure
- Respond to articulation of firm aims to some degree (from very low to very high)

Interpreting their job comes down to deciding upon their “effort position” namely a subset of possible activity-pace-quality-time bundles. In the choice of an effort position there will be a distribution between the self-interest of the individual as against the interest of the firm.

The lower the degree of constraint concern the greater will be that effort position will reflect self interest of the individual and less it will reflect devotion to firm interests.

The individual is unlikely to hit upon his permanent effort position straightaway. He will come to it through a process of trial and error. Once reached the effort position is unlikely to change easily. The effort position congeals into habit. A shift from one position to another will not take place unless pressure to change reaches a certain threshold.

Thus instead of the simple maximizing behaviour of economic agents of neoclassical theory we have a theory of behaviour that incorporates social norms. And this is at two levels: first individuals have a feeling of obligation, and second they are subject to constraining influences of others. These constraints can be traditional constraints, vertical constraints and horizontal constraints.

The relationship between the individual and the firm:

Employment contracts are incomplete in the sense that the payment side is well specified but the effort side is either not specified or specified in terms of some lower boundary. Firms can offer monetary rewards as well as working conditions including career opportunities. But there is no clear correspondence between firm offers and the amount of effort employees’ offer in return. For each type of offer by the firm there is a range of responses by the employee.⁸

The relaxation of the maximization assumption implies that managers will not necessarily try to get the most out of their employees. So each side has options.

For employees there are three basic options:

Maximum commitment
Peer group standard
Self centred behaviour

The firm similarly has three strategies:

Offer wages and working conditions that maximize benefit to employees
Accept the peer group standard
Minimize the cost per unit

The latent adversarial relations between the two sides will result in a prisoner's dilemma solution. But this is not necessarily the only option. Other combinations would be Pareto optimal but how do we get there and stay there?

This can happen if there are certain norms. Norms and conventions provide coordinated solutions when there is more than one outcome possible. They have a positive economic value if coordinated solutions are economically superior to uncoordinated ones. A variety of coordinated solutions from the prisoner's dilemma to reciprocal exchange of full commitment can materialize.

The stability of existing conventions can be explained by habit and also the fact that the gain to any individual in shifting conventions is likely to be less than the cost of attempting to persuade everyone to change. Once they are established in an "effort position" they respond to a flow of signals from within the organization as well as from without.

Leibenstein argues that the greater the degree of competition in the environment the greater the need for the organization to reduce costs. Management will then put pressure on workers to increase effort. Since workers are ensconced in a certain effort position a certain threshold level of pressure has to be applied before there is any change. However excessive pressure could have the opposite effect of non-cooperation. Much depends upon the norms governing employment: the employment relation and the characteristics of the hierarchy.

Employment relations:

Leibenstein wrote on the different aspects of the employment relation and effort motivation under varying management regimes. Three particular types of control and reward systems were identified and organizational design characteristics

A. The first is where the employment contract is very specific. This is akin to a market like situation. The relationship is "arms length" There is a clear sense of quid pro quo. There is a strict division of labour, well defined jobs monitored through tight performance controls and work rules. The relationship between employer and employee is limited. Worker incentives and rewards are of the extrinsic variety. Under this form of employment relationship employees are predicted to work to rule and offer only perfunctory co-operation without any extra effort.

B. The second is where the employment contract is more relational...the association between the employee and firm is no longer arms length but involved. It would also be of long term duration. Workers and employers are no longer exchangeable at zero transactions costs. There is an internal labour market with opportunities for career progression. The worker accepts authority and complies with the directives of management. Personnel policies in such organizations involve development of rules relating to selection training and promotion.

C. The third form of human organization is inspired by Japanese management system with its clan type control. There is long term reciprocity between organization and employees. Organizational goals and individual goals are highly congruent. Goal congruence is a substitute for extensive monitoring, and as a result monitoring costs are lower. There are extensive mechanisms of socialization.

These three can be summarized as “market like”, bureaucratic and clan. The term “Market like” instead of markets is used as this is still an employment contract. A pure market exchange will mean that it is across the organisation’s boundaries. However market like employment contracts can be easily converted to pure market contracts by outsourcing. The term “clan” used here comes from the work of Ouchi on Japanese management systems.⁹

Leibenstein on the hierarchy:

Leibenstein devoted an entire book on organizations.¹⁰ His focus however was mainly on the consequences of competition. Most firms operate under conditions of modest competition. There is a great deal of “slack” or “X-inefficiency”. Increased competition results in the firm’s management putting pressure on the employees for increased performance. How they react to this pressure is the theme of his book *Inside the firm*. Leibenstein however did not look at different types of organizations. We shall do so here.

Organizations come into existence because of the efficiencies arising out of the division of labour. Division of labour requires co-ordination of the specialized activities. Coordination can be achieved by using prices. This is indirect coordination through the market mechanism. But when prices prove inadequate because of incomplete or asymmetric information direct coordination is required.

Organisations then are vehicles of conscious coordination. There are two basic approaches to coordination. Either one focuses on behaviour of the subordinates that is tell them what they are to do and how, or one focuses on their outputs that is sets targets for them and leaves it to them how they achieve the targets. In addition one can chose to formulate standards; thus direct supervision is replaced by standardisation of procedures and output targets take a quantitative form.

However sometimes it may be difficult if not impossible to set quantitative or even qualitative targets. This arises when knowledge of how to perform the task rests with the subordinate. The emphasis then shifts to careful selection of the employee. Either we look at the skills he possesses or the values and norms he holds or both. Generally in advanced economies the skills are acquired in specialised institutions. But to get people with the right values the organisation has to have elaborate means of socialisation.

Thus the fundamental mechanisms of coordination are:¹¹

- o Direct supervision

- Standardisation of procedures
- Standardisation of output
- Standardisation of skills
- Standardisation of norms

All these five mechanisms of coordination are vertical in nature that is are mechanisms that superiors use to coordinate the work of subordinates. They presuppose that subordinates do not interact with one another. But individuals generally do not work in isolation. They work as groups or teams. So the to the preceding five mechanisms we need to add a sixth namely:

- Mutual adjustment

In real life organisations all the mechanisms of coordination are used in some degree albeit one or two might predominate. This has lead to one popular writer on organisations, Henry Mintzberg, to speak of a distinctive organisational configurations centred around a particular mode of coordination. However here we will stick to the more traditional distinction of mechanistic and organic organisational forms. The mechanistic type is deemed to be appropriate when the organisation's task environment is held to be stable and the organic form when it is uncertain.¹²

Characteristics of mechanistic organisations:

- High emphasis on specialisation
- Superiors at each level seek to integrate performance of immediate subordinates
- Rights and obligations precisely defined and assigned
- Authority, control are legitimate and hierarchical in nature
- Assumed that necessary knowledge for reconciliation of functions is at top
- High levels of vertical interaction between superior and subordinate
- Communication emphasises directions and orders
- Obedience to authority (superiors) expected

Characteristics of an organic organisation:

- Low emphasis on standardisation
- Emphasis on specialised knowledge and their contribution to overall tasks
- Individual task activities are continuously refined through interactions with peers
- Responsibility loosely defined; problems cannot be passed up or down
- Commitment to the organisation broadly defined
- Authority, control not based strictly on contractual obligations but derived from common interests
- Knowledge and competence distributed throughout the organisation
- High levels of lateral interaction; consultation instead of command
- Communication content emphasises information and advice
- Commitment to goals more important than obedience to authority

The mechanistic organisation uses standardisation of procedures as the principal mechanism of coordination at the lower levels supplemented with direct supervision. At the higher levels the structure is less rigid and direct supervision often with face to face contact (meetings) will be the rule.

The predominant coordination mechanism in the organic form is mutual adjustment both within work groups and teams and between teams. As the job parameters are constantly shifting because of changes in the task environment standardisation of procedures has limited scope. Also as knowledge of the problems and how to solve them are at lower levels of the hierarchy the top management can at most have a very general oversight function; their principal role is in the selection of key personnel and in the communication of a vision for the enterprise.

X-efficiency theory applied to the workings of mechanistic and organic forms:

Division of labour may have the advantages of increasing returns but there is a flip side. One is the cost of coordination. This explains why organisations do not grow indefinitely. Transactions costs are offset by administrative costs. But there are also costs associated with motivational losses.

Motivational losses are discussed in conventional organisation behaviour theory but are restricted to discussing the losses due to drudgery (the negative side of “scientific management” techniques). But Leibenstein stresses the motivational losses arising out of conflict of interest (which he calls the “invisible losses”). This is Leibenstein’s unique contribution.

These losses are at the horizontal level and at the vertical direction. On the horizontal level losses to efficiency arise because of free rider incentives or because of adversarial feeling between those at one level and those at the level above. At the vertical direction motivational losses occur because of a lack of connection to organisational purposes. Thus the hierarchy creates vertical distance between individuals. It also separates groups and may encourage free riding within groups.

The hierarchy handles motivational losses through the various mechanisms of coordination. It can try to minimise discretion through the creation of bureaucratic procedures (standardisation of procedures) or through ever closer direct supervision (scope of this is limited in large organisations). These procedures can be supplemented by rewards and punishments. Alternatively it can set targets with deviation from targets can be subject to sanctions.

Another approach would be to instil a feeling of commitment to organisational objectives (use of the coordinating mechanism of standardisation of norms). This requires elaborate mechanisms of socialisation which does not come easily.

Leibenstein argues that in general the performance of an organisation depends upon how individuals affiliate with each other.

If affiliations are positive horizontally for adversarial objectives and antagonistic vertically this would be a source of inefficiency.

If affiliations are primarily positive vertically then the outcome will depend upon whether the conventions in the company result in cooperative vertical groups or factions.

An ideal situation would be if vertical groups are connected through commitments that reflect mutuality of interest and a sense of common objectives. Also cooperation between different vertical groups can be achieved through the actions of top management which mediates and distributes rewards between different vertical groups in a manner seen to be equitable.

Real companies will have a mixed record; but if enterprises are sheltered from intense competition they can survive with internal inefficiency.

When competition intensifies pressure will be put and the nature of the organisation's response will depend upon how the different groups relate to the organisation.

Mechanistic and organic forms

Mechanistic organisations generally try to reduce discretion at lower levels. At higher levels there would be greater discretion and the work even if subject to some supervision by superiors will not be as governed by routine. Mechanistic organisations will show some "organic" features at higher levels.

Generally the more routine and clearly specifiable the task, the easier it is a) to replace the individual by another and b) to remove the job from the organisation altogether namely to outsource it.

Thus lower level positions in such firms would tend to be subject to market discipline. The individual is recruited on the basis of very specific requirements and let go at the first sign of downturn. The employment contract will be "market-like" in nature. The relations with the superiors will be adversarial. The final effort position will reflect individual worker sensibilities towards their peers and free riding may be mitigated to some extent. Thus there may develop conventions that set the effort position at slightly higher than the spot market exchange.

The higher level "managerial" positions will be characterised by an upward career path. Here the employment contract will have an emotional content and there will be a greater degree of commitment towards the organisation. The differences in the nature of the employment contract will aggravate the relations between management and workers.

Within the management group identifications are likely to develop along functional lines with the consequent factionalism this will be an additional source of inefficiency.

The commitment of senior personnel to the mechanistic organisation has come under severe strain because of downsizing and de-layering. The B type employment contract is now moving towards an A type one. Because of the individualist work ethic of managers and the more isolationist setting of managerial work compared to lower grade work horizontal alliances are less likely to occur and the individual would retreat to an isolationist mode.

Given the limitations of the mechanistic organisation, Leibenstein looks to the Japanese style of management as a more viable alternative. But cultural features are most difficult to replicate.

Organic structures have very much lower levels of routine and standardised procedures compared to the mechanistic form. Control is at the input stage. Very careful selection has to be made of personnel. The essential feature of such structures is decentralised decision making along with cross-functional linkages. Individuals are expected to take an organisation wide view rather than be parochial. Individuals must also be committed to the organisation.

How is the commitment to be achieved? Commitment on the part of the employee presupposes a similar commitment on the part of the firm towards the employee. Here again Leibenstein finds an example of this in the Japanese organisation. These organisations are characterised by entry at a low level for all and a life time employment guarantee. A single common entry point results in a shared experience. It also means that all employees have a not dissimilar life time emoluments. Not only are the salary differentials low but most employees pass through the same stages with the difference in position and salary coming only towards the end of the working life. Thus there are no great inequalities and all equally subscribe to the organisation's goals.

But how can this be generalised to non Japanese settings? The current trend is towards greater salary differentials and short term contracts. Certainly professional competence is respected. But such individuals will be more oriented towards their profession and towards themselves than towards the company. This could lead to a situation where team work, the defining feature of the organic structure, begins to suffer.

Conclusion:

Leibenstein is perhaps the only economist who has addressed themes which have been traditionally the preserve of management theorists. It is not that economists have not written on the firm but the approach has been either focused on transactions costs and the reasons for the existence of the firm or agency theory and the design of incentives. Leibenstein specifically looks at the strategic interactions of individuals within the organisation using elementary game theoretic concepts. Borrowing from psychology he makes level of "effort" as a factor to be explained rather than be taken as a given. In this he is covering the same ground as writers on organisational behaviour who make motivation and leadership their focus.

Curiously his work has been totally ignored by organisation theorists and stand in danger of neglect by economists.

¹ Baumol: *Business behavior, value and growth*, Marris *Managerial Capitalism* and Williamson "A model of rational Managerial Behavior" in Cyert and March *A behavioral theory of the firm*

² Kalman Cohen and Richard Cyert *Theory of the firm* and Cyert and March *A behavioural Theory of the Firm*

³ Coase "The nature of the firm" *Economica* 1937 pp 386-405

⁴ For a comprehensive review of Leibenstein's lifetime contribution see Dean and Perlman "Harvey Leibenstein as a Pioneer of our Time" *The Economic Journal*, 1998, pp 132-152

⁵ Leibenstein "Allocative efficiency vs X-efficiency" *American Economic Review* 1966 pp 392-415

⁶ For an introduction see R. M. Grant "The resource base theory of competitive advantage" *California Management Review* 1991 pp 114-135

⁷ Leibenstein "Aspects of the X-efficiency theory of the Firm" *Bell Journal of Economics* 1975 pp 580-606

⁸ Leibenstein and Weirmair "X-efficiency, managerial discretion and te nature of employment relations in Dlugos, Dorrow and Weirmair *Mnagement under differing labour market and employment systems* 1988 pp 79-94

⁹ Ouchi "Markets, bureaucracies, clans" *Administrative Science Quarterly* 1980 pp 129-141

¹⁰ Leibenstein *Inside the firm: the inefficiencies of hierarchy* Harvard University Press 1987

¹¹ The terms used here are from Henry Mintzberg. For a popular introduction see *Mintzberg on Management* 1990

¹² The classic statement was given by Tom Burns "Industry in a new age" *New Society* 1963