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Neo-classical production theory views the firm as a black box (Mas-collel, Whinston and Green, 1995). The neo-classical demand supply equilibrium calculus then assures us that factors of production receive their respective marginal value product. Most of the actual payments to factors of production, both capital and labor, is made through firms. Thus there is a missing link between the propensity of competitive market to allocate to factors of production their respective marginal value product and remuneration received by the factors. The missing link is what goes on inside the firm. Neglect, by economists, of the economic role of organizational dynamics has lately been recognized (Hart, 1989, Demsetz, 1993). Most firms are hierarchic organizations consisting of the "bosses", at the apex, who direct and manage its affairs. Bosses may be owners of capital employed in the firm (capitalists), entrepreneurs or professional managers. It is important to recognize that location at the top end of a hierarchy is not the only attribute of bosses, although it may be a convenient operational definition to identify them. Bosses usually do posses skills not limited to the ability to create and or sustain a hierarchy. Bosses' contributions based on non hierarchy related skills and the hierarchy sustained by them are usually entangled and intertwined. Understanding the nature of economic contribution of bosses and disentangling various strands of it is important to clarify the linkages between dynamics of market and households or consumers, who are the starting point of all neoclassical economic analysis.

Academic discipline and perspective is important for any study of the role of bosses. When we ask, what do bosses do? the management perspective comes to ones mind quite naturally. Management literature is replete with studies and exposition of the role of bosses in different organizations (Barnard, 1938; Simon, 1947; Chandler, 1977). Management perspective is usually preoccupied with how to achieve organizational objectives. Goals and objectives of firms, in a management perspective, are not explicitly tied to variables used for exposition of economic theory. The purpose of an economic theoretical perspective is to make the linkages with economic theoretical variables explicitly. What I propose to focus upon in this paper is the economic perspective.

Understanding the economic role of bosses is naturally embedded in developments on theory of firms. Economic theory of firms have developed mostly during the twentieth century (Williamson, 1993). My objective here is to glean through the literature relevant to an understanding of the economic role of bosses most of which may be embedded in literature on economic theories of the firm but not necessarily limited to them. The following economic roles of bosses have been described in different contexts.

1. Risk sharing (Knight, 1921),

2. Innovation i.e. new combination (Schumpeter, 1934)

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3. Coordination (Coase, 1937), coordination of competing demand for factor inputs and the choice of production function. Coordination between production process and distribution channel i.e. marketing.

4. Metering (Alchian & Demsetz, 197?).

5. Task division (Adam Smith, Marglin, Landes)

6. Discipline and supervision i.e. exercise of power (Marglin) Stephen Marglin (1974) in a seminal article titled "What do bosses do?" looked at the origins and functions of hierarchy in capitalist production.

7. Acquisition and use of knowledge (Demsetz, 1982)

8. Specificity of skills required for a production process i.e. asset specificity (Williamson, 1985).

I take up each of them and briefly review the respective perceptions. I then ask if each of these interpretations and theories can assure us a definite economic result by way of efficiency and allocation.

RISK SHARING

Knight (1921) suggested that risk averse workers may prefer an assured wage. Most business however involve some degree of risk. Thus managers of the firm are in effect assuming the risk associated with the business of a firm and assuring workers a fixed wage irrespective of the financial performance of the firm. Ofcourse this assurance is within limits. For example bankruptcy of the firm would entail loss of job for worker and the implied wage assurance is no more available. To understand the nature of risk sharing role played by bosses let us imagine that workers and bosses all equally bear the risk. Workers usually with lower level of income will be more risk averse. They would want to buy insurance to protect them from pay fluctuations if such insurance was available to buy. However the transaction cost of such an insurance from an external source may be too high. On the other hand bosses may assume some of the workers risks for a suitable premium from the marginal revenue product of workers. To that extent workers pay would be less than their marginal revenue product. In that case bosses have the scope for moral hazard similar to insurance industry malpractices, although at lesser scale.

INNOVATION

Schumpeter (1934) has described the economic role of entrepreneurs. These are people who start new firms or steer existing ones to undertake new combinations of factors to produce an existing product or an altogether new product. They are naturally in positions of control and authrity in the firms. Thus one role that some bosses could be playing is that of a Schumpeterian entrepreneur.

COORDINATION

Ronald Coase (1937) asked the fundamental question about existence of firms. Competetive market is supposed to allocates resources according to tastes of people and automatically achieve the required coordination in production. On the other hand frims operate on a principle of authority and hierarchy. Allocation of factors to different productive tasks within the firm happens by virtue of what the mangers (bosses for our purposes here) decide. No price mechanism is involved unlike in the market. Allocation of resources and the attendant coordination of production achieved by the market takes place through the price mechanism. On the other hand the same functions within a firm are done according to the authority of bosses. Coase conjectured that this must be due to differences in transaction costs. Importance of transaction costs for economic organisation is now well recognized (Williamson and Winter,1993). Thus one of the important contributions of bosses within firms must be coordination. This would include coordination of factors of production and coordination between production process and distribution channel i.e. marketing.

METERING IN CASE OF JOINT PRODUCTION TECHNOLOGY

Joint production technology argument has been used to explain the nature of managerial contribution and justify its claim on residual rewards in a firm (Alchian and Demsetz, 1972).) Alchian Demsetz argue that no authoritarian control is involved in the organization of a farm. The arrangements within a firm of different inputs jointly acting in the production process, according to them is simply a contractual arrangements subject to continuous renegotiation. My view is that the existence of authoritarian control can not be ruled out on the basis of theory. The degree of authoritarianism and its economic effect by giving scope for sticky input prices and fixed costs in the short run are maters of fact to be assessed for different markets at different points of time.

Joint production technology (team production, according to Alchian and Demsetz) is characterized by a multi-input production function which can not be additively separated as functions of each different inputs. In addition all inputs are not owned by the same person.

However the non separability of the production function my be;

1. truly technological,

2. designed such, as a result of capitalist class interest,

3. mandated to be such, in a state largely controlled by capitalists.

A relevant question is the existence of an incentive to design non separable technology or to mandate non separable production systems. My argument is that managers have almost always occupied higher social status and higher income on average, compared to a large number of economic skills. For example Ewing (1996) estimates that being in a position to supervise others brings with it about a 7% increase in pay. Of course this estimate is from United States National Longitudinal Surveys of Youth. This means that most supervisory jobs in this data set would be in the shop floor and not the kind of bosses we have in mind here. However this estimate serves to support the limited point that supervisory work pays more.

Since both social status and income are normal goods there is an incentive for people to create managerial positions to the extent an economy can take it.

There is empirical evidence available from historical studies about technological developments to suggest that design of technology is usually biased by class interests. For example Noble (1984) while examining the social history of industrial automation notes that "The power relations of society, and the position of the designer within them, define to a considerable extent what is technically possible." His study shows how in the area of programmable machine tool automation Caruther's "specialmatic" designed to harness the skill and experiences of shop floor machinists and quick programmability lost out to numerical control. Similarly the record player approach to machine tool automation lost out to numerical control. The record player approach would have been less expensive and more accessible to small firms. It had retained a role for skilled labor in enacting of a tooling operation for the initial record. Numerical control, on the other hand, enabled engineers to transfer design data directly to machine tool instructions (data transference) without any intervention from the shop floor. Although this approach involved much more developmental expenditure and larger research and development period the defense department funding and clout of MIT could secure that. At the stage of marketing again the numerical control system own in view of the backing of big digital computer companies. Noble concludes "Social power and powerful ideas shaped the technology that became numerical control. And in the process they became embedded in that technology to be there after sanctioned by the myth of inevitable technological progress."

In the last case the firm is clearly a product of an authoritarian system and hence authoritarian control is involved.

TASK DIVISION

Stephen Marglin (1974) in a seminal article titled "What do bosses do?" looked at the origins and functions of hierarchy in capitalist production. Marglin started with a very deeply philosophical question emanating from his belief that hierarchical authority is incompatible with self expression in work except for those at the top of the hierarchy. He asked if hierarchical authority is really necessary for high levels of production, or is material prosperity compatible with non hierarchical organization of production?

Marglin's interpretation of the concept of efficiency, particularly the manner of measurement of labor input is note worthy. Traditionally labor input is measured in terms of time. So if a production technology (including its management aspects) were to show higher output using the same number of hours of labor input, compared to some other technology that uses the same amount of capital and raw materials then most people would interpret it as more efficient. Marglin would, instead, include the intensity of effort along with the time dimension to measure labor input. It could be argued that if wage rate reflects the intensity of work effort measuring labor by the hour would be all right. Firstly there is an agency problem. Bosses have an incentive to ask for higher paced work after a wage rate is agreed. Since the transaction cost of changing jobs usually has a significant cost there may always be a lag between the intensity of work extracted by bosses and the intensity represented by the wage rate. It could work in the opposite direction too, if bosses fail to adequately monitor. But Marglin's point is about a different aspect. He uses this definition to evaluate physical

technology. If one physical technology allows higher production per day merely by requiring higher labor input then it is no better than the one it replaces. Then the inference by some economists that changes in economy were due to the impact of technology which had to be adopted because of its efficiency would loose the efficiency link in its chain of argument.

Marglin then takes a fresh look at the economic role of division of labor and the factory system. He questions Adam Smith's view that specialization improves technical efficiency and believes instead that division of labor appeared in order to assure the capitalist a role in the production process. The traditional view about development of the factory system has been that it developed as a consequence of technological innovations which was exogenous to the economic system. Marglin instead believes that the social function of hierarchical work organization brought about by the factory system is accumulation of capital and not technical efficiency, as is usually believed. He cites instances from the past starting with Adam Smith's observations during the eighteenth century to support his argument. David Landes (1986) has criticized Marglin's interpretation of history and dubbed the later's thesis as ideological. and "dream economics". In the following paragraphs I ponder over Marglin's arguments, the historical evidence presented by him, Landes criticism as well as my own understanding of these issues to tease out the nature of contribution by bosses from the emotion laden discussions and expositions that is so characteristic of political economic issues.

Like the definition of technical efficiency, Marglin distinguishes between two different connotations of division of labor i.e. "specialization of occupation and function" and "capitalist division of labor". It is the later i.e. capitalist division of labor, which sustained at least during the preindustrial period, capitalists' intermediary role. Thus when he is criticizing the three advantages of division of labor enunciated by Adam Smith, namely dexterity, reduced set-up cost and scope for innovation, he is referring to the capitalist division of labor as opposed to specialization of occupation and function. Lets look Marglin's argument, Landes counter argument on each of these three.

Marglin takes Adam Smith's own description to contradict the later's theory of increased dexterity brought about by division of labor. Adam Smith informs that pin manufacture was divided up into 18 different tasks. Some firms had different people to perform each of them. But the one visited by Adam Smith himself had ten people. Each person was handling two or three tasks. This implies that division of pin manufacture into 18 distinct tasks by some firms was redundant. The obvious neo-classical response would be that the firms are achieving economic efficiency as opposed to technical efficiency. By dividing up the pin manufacture into different tasks some of which can be done by less skilled labor a firm can combine labor with different skill in the right proportion to minimize cost of manufacture. In fact this is the counter argument of Landes. Marglin argues that if these pin manufactories were achieving economic efficiency by elaborate division of tasks wages for pin industry should have differed between tasks. He cites Ashton's study which reports that wages for adult males was about 20s irrespective of tasks. Similarly the wages women and children did not differ on the basis of tasks. Landes uses the same study and points out that wages of adult males was much higher than the wages of women and children. The firms had divided tasks according to skills differentiated on the basis of sex and age according to the custom of the day. So the division of tasks, according to him, was indeed useful to achieve higher economic efficiency. But economic efficiency aided by inequitable customs of the day is what Marglin is objecting. Excessive capitalistic division of labor allows improvement of economic efficiency by exploiting social inequalities of the time. Hence such division of labor has no place in the

idealized model of market economy where all economic agents are assumed to completely free and equal regarding their ability to enter or not to enter into contracts or market transactions.

About reduction in set up cost due to capitalist division of labor, Marglin argues that it can be achieved by a single person as well if he schedules different tasks for sufficient duration of time. Saving of time is achieved by separation of tasks and duration of activity and not necessarily division of labor. Landes' counter argument is that, although artisans could reduce set up time by serial arrangement of tasks they would not do so in reality. They in turn would engage women, children or illegal aliens to do tasks that can safely be parceled out to them. But why should artisans find women, children or illegal alien to do their job in a market economy unless it is accompanied by barriers to entry into it and inequitable legal system that oppresses women and children?

Smith, Marglin points out, contradicts his own argument of increased propensity to innovate occasioned by division of labor. Smith narrated how intellectual faculty of workers confined to a few very simple operations can be numbed. Thus extensive division of labor, would diminish workman's propensity to invent. This does not, however contradict Adam Smith's analysis of how division of labor can enable design of machinery to perform successive elementary steps. As Landes points out simplification resulting from division of tasks "suggests and facilitates the imitation by machines of manual skills". The result of Smith's own contradiction and Marglin's argument is that extensive division of tasks may be required for experimental purposes while designing machinery or testing alternate production technology. This does not mean that the whole economy has to adopt division of labor to improve propensity of innovation.

Marglin denies any productive role to the marketing effort by capitalists. If there were no division of labor workers would be producing goods finished for final consumption and hence would be able to market it directly. Thus, Marglin argues, the marketing role played by capitalists is sustained by the division of labor only. This is where, I think Marglin's interpretation is wrong. Clearly marketing becomes an occupation by itself as the geographical spread of market for a product increases. A worker producing finished goods may be able to directly sell his art locally. This is precisely what the artisans of preindustrial era did. Landes rightly points this out and cites the example of production by East European serfs under control of local land lords. If marketing was not much of a job the East European lords would have handled it themselves. Instead they chose to give merchants license to trade in their manor and were satisfied with their seigniorage.

So what do we make of this debate? Is division of labor merely a device used by capitalists to create a role for themselves as Marglin believes or as Landes argues, a source of economic efficiency? Unfortunately the two connotations of division of labor described by Adam Smith has not been clearly distinguished by economists thus far. For sake of clarity and distinction from past usage I would use the term *occupational specialization* for division of labor in so far as it means specialization and *task division* to mean excessive division of labor designed purely to simplify and deskill them i.e. Marglin's "capitalist division of labor". Thus when we read Smith's division of labor as occupational specialization the technical and economic efficiency due to it becomes obvious. Clearly the phenomenal growth and development during the nineteenth and twentieth centuries has been accompanied by a proliferation of occupations. So usefulness of occupational specialization makes immediate

sense. Having viewed Adam Smith as the ideological father of market economy, it is quite natural to interpret his division of labor as occupational specialization. But Smith himself appears to have the task division in mind as we can see from his choice of pin manufactory to elucidate the division of labor argument. This tells us some thing about Smith's time and Smith's own intellectual sympathies. Task division must have been widely practiced in eighteenth century Scotland. Smith's sympathies are certainly with the putter outers. His over enthusiasm to make a case for economic advantages of division of labor can be seen from his conjectures while describing his visit to a pin factory with ten workers. He finds that with division of tasks the average production of each worker was about 4800 pins per day. He compares this with productivity of an untrained worker and conjectures that such a person might not be able to produce even 20 or "perhaps not one" per day. How is this comparison relevant? Where is the need to compare productivity of workers experienced in some tasks (and possibly of all tasks since, as Smith informs, each had to do two or three tasks in this factory) of pin manufacturing with worker trained in none? Subsequently, in discussing improved dexterity, Smith gives account of average productivity of an experienced nail maker acting alone as more than 2300 nails per day. Although nail making and pin making are not exactly the same there is a lot of similarity and we know that pins are smaller in size than nails. If we were to imagine the two to be exactly the same then productivity differential between task division and solo operation would be about twice. If we were to allow for the fact that pins weigh much less than nails they might as well have been the same.

The economic inefficiency due to excessive task division and resultant monotony was realized during the twentieth century. This realization led to conscious efforts towards work enrichment. A lot of literature has developed documenting efficiency gains due to work enrichment. These developments give credence to the view that task division was not all that necessary for economic efficiency. Does that mean that task division allowed the capitalists to create work for themselves, as Marglin proposes. I think no. It will be fair to say that capitalists or, to use the terminology of this paper, bosses sustained themselves by playing a variety of economic roles and tools of exploitation. One important role in the present context is marketing. Another important organization tool is division of task that enabled them to encash the advantage out of social inequalities of the day by employing women and children. What else did the division of labor do? It certainly created barriers to entry by workers into the business of putter outers. Does it mean that all forms of task division is exploitative. We can not say so a priori. We must however recognize that task division is vulnerable to excesses in view of its ability to give bosses an advantage over workers. What is the solution? We must constantly watch for instances of excessive task division, examine job descriptions and question their economic rationale. This is precisely what Marglin suggests to workers, although, I think, this is important enough to be a subject of public policy.

DISCIPLINE , SUPERVISION AND ENCASHMENT OF POWER ADVANTAGE

The second hypothesis of Marglin in his paper cited above is that the factory system provides scope for discipline and supervision of workers and exercise of power over them. This in turn enables the capitalist boss to accumulate capital, presumably by getting the workers to exert more than what would be justified by the negotiated wage. Marglin cites studies by various economic historians (Ashton, ; Mantoux, ; Landes,)who recognize that the objective of discipline and supervision was one of the causes for development of the factory

system but believe that the primary cause was technology and machinery. Marglin's difference with these authors is that discipline and supervision was, to start with, the primary cause of development of the factory system. Once the factory system developed and capitalist bosses realized its importance to exercise of power, they had an incentive to orient further technological innovations around the factory. These technical innovations around the factory at a later stage provided the primary sustenance of the factory system. David Landes in his counter arguments recognizes areas of agreement with Marglin in this regard and reiterates his understanding that the technological factors are the primary cause of development of the factory system.

The discipline and supervision achieved by the factory system would make economic sense only if it translates into an income transfer from worker to factory bosses. In other words factory would work as a means of encashment of power advantage enjoyed by the bosses. Differences in power and its exercise was not new to the preindustrial period. Powerful persons had always exacted a trasfer of income from less powerfull to themselves for example the feudal system. Why did the factory system not grow before, if its sole contribution was encashment of power advantage? The answer lies, partly at the least, in the differences in the products and methods of production. The market for manufactured goods were smaller in the earlier period. Agriculture was the major sector. Agriculture is characterised by seasonality of harvests. Most that the feudal lord needed to do to encash his power over the serf was to supervise the harvest. In contrast manufactured goods like textiles etc. involved harvest on a daily basis and hence the need for daily supervision and control from the bosses point of view. However it is important to recognise that the opportunity for profits from manufactured sector would not be there in the absence of a bigger market (assuming that technological innovations in the manufacturing process itself came later). Expansion of market was brought about, among other things by increased transportation activities which again was at least partly, enabled by technological developments in that sector. Thus it is difficult to deny technology its contributory role in development of factories, as it is difficult to overlook the disciplinary aspects of the factory system.

We can reasonably conclude that the initial advantage of the factory system to the capitalist bosses biased subsequent technological innovations around the factory system. David Noble (1984), has shown in the context of developments in automatic machine tools that technological developments are not class neutral. Choice of technological alternatives and decisive steps in the evolution of technology are very much intricately linked with the interests of economic players likely to be affected by it. Thus capitalist bosses preference for the factory system must have influenced later day technological innovations in favor of the factory system. However, it is unlikely that technological innovations are completely determined by a single variable like bosses motives. Whether bosses need for discipline and control was the primary cause of development of the factory system, as Marglin would want us believe, or technological developments was the primary cause, as Landes proposes, I think is besides the point. It is enough to realize that one of the things that bosses gain from an hierarchical organization work is the power to discipline and supervise. The view that it is not the primary reason for existence of hierarchy is not important. If it is one of may causes then it has a potentiality to enable bosses to distribute a part of worker's marginal revenue product in their favor. At least some bosses may find their sustenance purely by such means. Landes recognizes that "not all capitalists played this role (entrepreneurship) well; that's what business competition is all about". But business competition may not be enough to make most capitalists play their role well. Some amount of bargaining, and social accountability might be

useful as well. Hence there is reason enough to watch actual performance of bosses to minimize encashment of this power. In addition it will be worth while to search for technologies that will enable less hierarchic organization of work. This is what Marglin recommends by way of action.

ACQUISITION AND USE OF KNOWLEDGE

Demsetz (1982) points out that knowledge generation and its availability for use is costly. Knowledge generation requires specialization considering the complexity of technological social and legal developments that accompany economic development. Since it is generated by specialization its availability is also characterised by occupational specialization. However use of knowledge for economic activity requires collaboration. Firms provide an institutional frame work for such collaboration. In the process firms turn out to be repository of knowledge relvant to its sphere of business. It is then implied that bosses bring with them different spheres of knowledge.

SPECIFICITY OF SKILLS REQUIRED FOR A PRODUCTION PROCESS

Williamson discusses the exact nature of transaction costs in The economic institutions of capitalism, 1985.

SUMMARY AND CONCLUSION

There are lots of work for bosses to do. For example assume risk, coordinate, innovate, evaluate and keep up to date with relevant knowledge base etc. Put differently people who coordinate, come up with new idea and stake their career for it (entrepreneurs), manage risk or cultivate and apply knowledge on production activities and or manage team production, become bosses by the nature of their work. These positive contributions give credibility to factories and hierarchy. With a tacit understanding of these potential contributions workers concede metering to management. However it is important to recognize that hierarchy, centralised large scale factory based organization work and excessive division of tasks, have buried in them components that can give bosses an unfair advantage. Having secured legitimacy for metering, bosses could use this role to measure their own work favorable to themselves. They can influence, consciously or unconsciously, technological developments to further bias the system in their favor. Layers of technological development, can obscure the connection between work and outcome. The standard neoclassical response to these problems is competition. But this competition is among the elites, the bosses. How does it take care of the relationship between workers and bosses? The neoclassical response would be that nothing prevents workers from being bosses! After all we can always find anecdotal evidence of the "rags to riches" type. The social reality is that class membership is fairly stable. If the "rags to riches" phenomenon were to adequately meet the required level of competition to keep bosses to their legitimate work then the rate of social mobility should be very high. This can not be resolved by theory. We need to check what is the reality.

Unfortunately most authors have chosen to highlight either the contributory or the exploitative role of bosses. This gives an impression that all bosses and all that they do is

either usefull or exploitative. What is required is a component cause model to analyze bosses role.

Theory tells what bosses can do. Historical experience tells us what they did do. But what they do do is what they do. So watch!. Is that all? No. Clearly design and development efforts have been biased towards the factory system, at the least, for more than 200 years. So invest on research and development of technology to reduce centraliszation, minimise joint production and enable household production of goods and services.

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