

EXPORT-PROCESSING ZONES AND INDUSTRIALIZATION: SOME CONSIDERATIONS FROM THE ECONOMICS OF LARGE ORGANIZATIONS

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1. Introduction

Recent industrialization strategies based on export promotion have given rise to export-processing zones (EPZs) in several developing economies. The setting up of EPZs, with their variety of economic incentives, has facilitated the entry of modern foreign corporations or large organizations, engaging in production through joint ventures, a branch or subsidiary. The presence of these corporations has in the past been the topic of numerous debates, aimed at assessing the developmental role of foreign investments. Some of the debated issues relate to wages and employment, working conditions, technology transfer and trade. The need to clarify or resolve these issues is essential at this point, perhaps to lay the groundwork for some cost-benefit studies of EPZs that might be desired at a later phase.

This note aims to clarify some of these issues: I explore some aspects of behavior and decision-making under limited information to help explain some observed labor market phenomena. I also submit that our understanding of some economic issues like technology transfer can be advanced by a resort to an analysis of the allocation process carried out internally by the organization. To achieve this, I look at some aspects of firm behavior including location decisions, use of information, and internal control (see, e.g., Monsen and Downs (1965), Williamson (1973), Spence (1975)). A pervasive theme of the analysis is that efficiency considerations underlie the firm's decision to shift from market to allocation within the organization. The need for information at every level of decision-making is an important element in the analysis.

2. The Firm's Location Decision and the Growth of EPZs

To understand the growth of EPZs, it is useful to start with an examination of the factors affecting the location-choice decision for production purposes. A technical factor conditioning this decision is

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the separability of production processes. If separability holds, a fully-informed firm guided by least-cost considerations or profit maximization will move a production process to an area if the additional cost of moving the process to a new site falls below the additional benefits.

Some factors may arise in the current site which tend to throw the prices of some inputs to a process out of line. For instance, a binding minimum wage legislation or militant trade union activities in the firm's present site can raise the relative price of labor, and if the process in question is labor-intensive, then the firm will be encouraged to relocate that process elsewhere where wages are relatively low.

One empirical phenomenon that seems to lend itself to this analysis is the preponderance on the part of some firms in more developed economies to subcontract some processes to producers in less developed countries. Subcontracting or the so-called development in the periphery has been contributing to the growth of EPZs.¹

To illustrate some of the points raised above, we consider the case of garments. Clearly, the stages of production—cutting, sewing, packaging, and marketing—are separable. Cut garments also lend themselves to ease of transport. The cutting process has been mechanized; however, sewing has resisted mechanization and is very labor-intensive. Garment firms situated in developed economies where wages are quite high, have seen it profitable to subcontract the sewing process to firms in less-developed countries where wages are lower.

Another example is semiconductors. The process of mounting chips on a plane is very labor-intensive and still resists mechanization. It is this job that we observe being subcontracted to firms in EPZs.

3. Information and the Firm

The study of organization stresses the efficiency with which they use information. Informational efficiency is a concern in the management of both human and nonhuman resources. We focus here on the management of human resources.

To understand the need for informational efficiency, it would be useful to add more details to the firm sketched in the preceding section. We have in mind a hierarchical firm with separable production processes. Such a firm includes owners/chief officer, process managers, and workers. The chief officer decides on the amount of nonhuman resources allocated to the various processes. Once these amounts are determined, the process managers decide on how much labor to employ.

¹ For an excellent exposition on subcontracting, see Sharpston (1975).

In large organizations, the objective of the chief officer might not coincide with that of the process manager. The former may be a profit-maximizer while the latter is a lifetime-income maximizer. If such a divergence exists, a problem related to information may arise. The process manager, wanting to go up in the organization, may screen information, allowing only the information favorable to him to reach top management. The chief officer ends up with a problem of making decisions under uncertainty. Under these circumstances, we will observe some form of control being instituted by the chief officer. Performance audit of process managers will be carried out periodically. At the same time, the amount of information about the production structure accessible to the process manager will be limited to some subtechnology. Full information about the entire production structure will reside only in the chief officer.

In the recruitment of labor to be employed, the process manager is faced with some informational problems. At the hiring stage, the ability of workers is unobserved. The process manager then decides to gather information about prospective employees. This procedure involves cost, and if the objectives include minimizing hiring costs, he will institute some procedures to achieve this goal.

Once workers have been hired, the process manager will still be faced with some informational problems. Workers may have a tendency to shirk; he might also want information about productivity of workers on the job to guide him in designing a promotion scheme. With problems of this nature, the process manager may hire supervisors.

The upshot of the preceding discussion is that some form of control will be observed within large organizations, as an adaptation to decision-making under uncertainty. We now explore some implications of these procedures.

3.1. Technology Transfer

Critics of EPZs have pointed out rightfully the limits to technology transfer of a policy designed to attract modern corporations into the zone. From the framework of a hierarchical firm with separable production processes, some explanations are forthcoming.

It is possible for the organization to carry out production, without those involved in the various stages of production (the process managers) having a knowledge of the entire production structure. A process manager needs only to know the subtechnology involved for the production process assigned to him. In this instance, the only possibility for a technology transfer is that involved in a particular process, e.g., that which was subcontracted.

3.2. Selection of Workers

At the time of hiring, the ability of applicants is not observed and the process manager will have to make a decision based on some observed characteristics, like education, experience, score in a skill test, or performance during a period of apprenticeship. Such information is costly to obtain and efficiency considerations are involved in making a decision under uncertainty.

The process manager may be thought of as faced with a probability distribution of worker's ability correlated with some observed characteristics of the workers. This manager has an *a priori* notion of this distribution. To lessen the probability of hiring a low-ability worker, the manager may restrict the sample from which to choose. Thus, if a job requires a high degree of manual dexterity and visual acuity, the search for prospective employees will be restricted to the group with a better joint distribution for the two attributes. If he chooses from a sample of young female workers, the process manager's *a priori* notion about the distribution falls favorably on this subgroup. If his expectations are not realized, the process manager may revise *a priori* notions in future hiring.

3.3. Supervision of Workers

Once the workers are hired, the process manager is faced with another informational problem. He will see to it that workers behave in the interest of his objectives, i.e., they do not shirk.

The motivation for worker shirking comes from the expected returns from shirking—if they are not caught, they draw their full pay, at the same time reaping the leisure from shirking. Recognizing this, the manager hires supervisors and work-quality inspectors.

Supervision and quality control are also costly, and the process manager will undertake these measures if the added cost is less than the expected additional returns. Again, this will have implications on labor hiring—individuals perceived to be less costly to supervise will be hired, using observed attributes like education, sex, union membership etc., in making a decision. Workers with attributes that correlate positively with low cost of supervision will be hired.

The implication for the wage structure is clear: The firm will have an incentive to pay the supervisor more than the workers to avoid a situation where the supervisor, together with the rank and file, shirks.

4. Job Hazards: A Welfare Issue

Job hazards are not unique to firms in EPZs, but they tend to correlate positively with the level of industrial activities. Firms in EPZs tend to be more industrialized than their counterparts outside the zone; hence, it would be useful to address this issue.

Typically, workers have imperfect information about the health and safety implications of their jobs. In some cases, employers may also have little knowledge about potential job hazards, in view of the fact that effects on health, in general, are not soundly established or are still not medically understood. We explore the welfare effects of this issue, focusing on wages and employment.

Consider an extreme case where workers are perfectly informed about the risks inherent to a given job. This presupposes that employers are perfectly informed about the health implications of the jobs and have revealed it truthfully. In cases like this, it would be natural to expect that the more hazardous jobs will involve a compensating differential or a wage premium. At the other extreme, workers may be totally unaware of the hazards attached to a job. This might happen, if employers keep the information private. At the time of hiring, the uninformed workers might settle for a wage just equal to an alternative safe job. Clearly, this represents a loss of welfare on the part of workers—they forego the wage premium that would have accrued to them for voluntarily taking on the job when the hazards attached to the job were rendered public knowledge.

Suppose the employers themselves are unaware of the safety implications of the jobs, perhaps due to a lack or absence of medical understanding of the issues. In this instance, it would be reasonable to expect that workers will develop a learning experience, with a corresponding adaptive behavior. In industries where the hazards are revealed on the job, one might observe a higher quit rate.² One problem that arises, however, is when the health implications of a job reveal themselves only after a long period of time. (To illustrate, consider the case of asbestos fibers being linked to some form of cancer.) There is inefficiency in this sense since workers are not given compensating differentials for taking on the risks. The returns to the workers may be negative if there are medical costs exceeding wages which are privately shouldered.

Consider a case where the health implications are revealed after a long period of time, and wherein employers who clearly understand

²For an analysis of quits as an adaptive mechanism to job hazards, see Viscusi (1979).

the job hazards at the time of hiring hold the information private. This case has given rise to some notion that employers will initiate the termination shortly before the debilitating effects of the job hazards are felt. This notion is of course debatable, but it admits of some empirical tests. One can conduct a comparative study of worker-initiated (quits) or employer-initiated (layoffs) terminations in various industries differing in safety levels. It would be useful to look at turnover data in EPZs and examine how terminated workers come to a particular classification.

As far as job hazards are concerned, it seems important to EPZs that mechanisms be designed that will make firms truthfully reveal the extent of the hazards attached to some jobs. When some employers have better information than workers, there is room for exploiting the value of that information. The latter may be withheld or not truthfully revealed if employers find it to their advantage. In these cases, some incentive-compatible mechanisms might be designed by EPZ regulators.

So far we have looked at the adaptive behavior of workers in the presence of job hazards as if mobility were costless. It is clear, however, that there are direct and indirect costs to quitting a job. In some instances, workers have developed specific skills in a given firm which they can use elsewhere only by incurring efficiency losses. This limits workers' mobility. If unfavorable working conditions persist under a costly-mobility regime, we observe as an adaptive behavior some collective actions taking the form of strikes, walkouts, and slowdowns.

So far, the administrators of EPZs have responded to these collective actions by such diverse measures like banning strikes or prohibiting unionization. It seems clear that these regulatory actions do not correspond to some notion of workers' optima, and it would be useful to restudy them.

5. Concluding Remarks

We have looked at basic issues well known in the analysis of large organizations to help explain some observed labor market phenomena in EPZs. To be of use for policy purposes, a lot of empirical work is required. Specifically, empirical investigations of wage differentials and labor turnovers have been indicated. Since a lot of developing countries appear bent in establishing EPZs as an industrialization strategy, further studies are clearly warranted.

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