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AN OUTLINE OF A THEORY OF THE MATCHING OF PERSONS TO JOBS

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ABSTRACT

This paper proposes a theory of the earnings determination process as the outcome of the matching of persons to jobs. The employment relationship, particularly the employer's control over access to the job, is argued to be of crucial importance for the matching process. When the employer has complete control, that is when the employment relationship is completely open, the matching process assumed in the neoclassical economic theory of the earnings determination will emerge. When the employment relationship is closed, new employees can only get access to vacant jobs and an alternative matching process, called "vacancy competition," will emerge. The different implications of the two contrasting matching processes are outlined.

An Outline of a Theory for the Matching of Persons to Jobs

1. INTRODUCTION

For the large majority of the working population, nearly all income is obtained as earnings from jobs paid by an employer in exchange for work. Differences in earnings can be observed both by characteristics of individuals and by characteristics of jobs. A large body of research has accumulated in both economics and sociology on the relationships among various personal characteristics (particularly education, ability, and background) and earnings. In addition, sociologists in particular have introduced occupation -- presumably a proxy for characteristics of jobs -- as an additional explanatory variable in analyzing income attainment.

Despite similarities in methodology and research design, the research traditions in sociology and economics have quite different intellectual backgrounds. Most empirical research on individual attainment in economics is guided by the dominant school of labor economics -- the neoclassical theory of wage determination, with marginal productivity theory accounting for the demand side and human capital theory taking care of the supply side. In contrast, sociological research on income[1] attainment has its origin in empirical status attainment research. Income is added to status attainment models as the ultimate endogenous variable -- a natural extension of the successful models employed to explain the occupational attainment process. In contrast to economics, there is in sociological attainment research not an explicitly stated conceptual apparatus that informs the choice of variable and the interpretation of parameters in sociological attainment research. That is, while there is a growing body of findings about the magnitude of the influences of various variables on income attainment in sociology, there are few efforts at identifying the mechanisms that account for the influences of personal and job characteristics on earnings.

There is no need for sociologists to develop a unique theory of earnings determination if the neoclassical economic theory adequately accounts for the findings of empirical research. With respect to the favorite independent variable of both economists and sociologists, that is education, human capital theory does provide an interpretation of results. However, neoclassical theory does not provide a rationale for explicitly introducing occupation as an intervening variable in models for the income attainment process. Job characteristics, including those presumably captured by the SEI or prestige scores of occupations, play little or no role in the orthodox economic theory.[2] Still, occupation accounts for a substantial fraction of the explained variance in income attainment models.[3]

The amount of variance added to income attainment models by occupation is not necessarily a strong argument for replacing or supplementing the economic theory. Sociologists have not been able to account for very much variance in income. Research informed by human capital theory (Mincer, 1974) has in fact been able to do much better without including occupation.[4] A measure of socioeconomic status must necessarily show some relation to income, reflecting the between-occupation variance in income that it captures. The observed effect of job characteristics on earnings may in fact reflect the misspecification of sociological models, both with respect to functional form and omitted variables.

There are, however, other reasons for critically evaluating the neoclassical economic theory. The neoclassical theory is powerful, and numerous predictions can be derived from it regarding the earnings attainment process (a list of such predictions is presented by Becker, 1964). Some of these predictions are borne out by empirical observations; some are not. Thurow (1975:56-70) presents a list of deviations from the theory pertaining to the relationship between wages and unemployment, changes in the distribution of earnings, the relationship between the distribution of education and the distribution of income, etc. Numerous others have identified features of the earnings attainment process and of labor markets that deviate from the assumptions and predictions of the neoclassical theory. A review of these challenges to orthodox theory has recently been presented by Cain (1976). Particularly important are those critiques that argue that labor markets are segmented, and stress the differences between so-called primary and secondary jobs (cf., Doeringer and Piore, 1971) — monopoly, competitive and state sectors of industry (cf., Averitt, 1968; O'Connor, 1973; Bluestone, 1970), wage competition and job competition sectors (Thurow, 1975), and internal and external markets (Kerr, 1954; Doeringer and Piore, 1971). These critiques have in common the observation that jobs and job structures differ, contrary to the assumption about the nature of labor markets made by the economic theory. They stress qualitative differences among jobs relevant for the earnings process, and claim to be able to account for the observations that deviate from the orthodox economic theory, as well as to provide alternative explanations for features of the earnings process that can be explained by the orthodox theory. An example of the latter is Thurow's (1975) interpretation of the education-earnings relationship.

Most of the criticism comes from within economics, though there are a few recent examples of research and conceptual elaboration by sociologists pertaining to the issues raised by the segmented labor market theory (Stolzenberg, 1975; Spilerman, 1977; Sørensen, 1977a). Insofar as sociologists are interested in understanding the earnings attainment process -- and much research indicates that this is the case -- the issues are clearly relevant for sociological research, and more so since the alternatives to the neoclassical theory provide a rationale for introducing job characteristics in the income attainment models sociologists are likely to continue to use.

Leaving labor market analysis to economists was not the strategy adopted by classical sociological theorists. Marx and Weber spent lifetimes analyzing the relation between economy and society, and their concerns in many ways parallel the issues raised in recent controversies. Different labor market structures parallel different social relationships of production, and Marx's analysis of capitalist society is an analysis of the implications of the fundamental condition of capitalist production: labor is treated as a commodity bought and sold freely in a market.[5] We will argue in the sequel that this condition parallels the conditions for the orthodox economic theory to hold.

In his analysis of the dynamics of capitalist society, Marx treated labor as a homogeneous abstract category (as is done in classical economics). Though there are occasional remarks concerning deviations from this model and their relevance for class conflict (for example, Capital, Vol. 1, Ch. 14), no systematic analysis is presented. Weber's long analysis of the sociological categories of economic action (Part I, Ch. 2 of Economy and Society) provides, in contrast, numerous concepts relevant for the analysis of "labor market" structures (including non-market relationships), particularly in the sections on the social division of labor. The concepts are highly relevant for the issues raised by the challenges to orthodox economic theory, and some of Weber's basic concepts will be used extensively in this paper.

It is the purpose of this paper to provide a conceptual framework for the analysis of labor markets. Labor markets are arenas for the matching of persons to jobs. The conditions that determine the earnings outcome of this matching process are of primary interest here, particularly the identification of what determines the influence of job characteristics and personal characteristics on earnings. It will be argued that it is the employment relationship that is the crucial determinant of the outcome of the matching process. More specifically, Weber's notion of open and closed social relationships[6] will be used to identify different job structures characterized by different earnings determination processes. The degree of closure, in turn, is seen as determined by the bargaining power of employers and employees.

The next section will formulate some of the basic concepts to be used in the paper. Then follows a description of the neoclassical economic theory as applied to earnings. The job structure assumed in this theory is identified. The absence of this job structure will be argued to result in different matching processes. These matching processes will be argued to represent different points on a continuum determined by the degree of closure of the employment relationship. The causes of variation in the degree of closure will be discussed, and a model of the matching process likely to emerge in closed employment relationships will be formulated. Finally, we will suggest the utility of our argument by indicating the different implications of the two models of the matching process for a number of important issues associated with the study of inequality.

2. BASIC CONCEPTS

Employment relationships are social relationships created in the production of goods and services between an employer (or his agent) and an employee. It is a dominance relationship, but the degree of dominance of the employer over the employee depends on the specific relations between the two parties along three dimensions. First, employment relationships may differ with respect to who disposes of the output from the production process and has rights to the economic returns from production. Second, employment relationships may differ with respect to possession of the nonhuman means of production. Third, employment relationships differ with respect to control of the human means of production,[7] and since we will not be concerned with slavery, this means control over the job, i.e., the role occupied by employees in a technical and social division of labor.

We will concentrate on employment relationships where the employer appropriates the output from the production process and has complete possession over the nonhuman means of production. These are the employment relationships typical of capitalist production. Our analysis will focus on the consequences for the earnings determination process of variation along the third dimension -- that is, variation in control over the job by the employer versus the employee. Two aspects of control over the job may be distinguished. One is control over the activities of the job, resulting in more or less autonomy for the employee; the other is control over access to the job, resulting in a more or less "closed" employment relationship. These two dimensions of control over the job may vary independently. Particularly control over access to the job will be a crucial variable for the analysis of this paper, because of its importance for the emergence of competition among employees.

Control over access to the job will be conceived of here as a continuum. At one extreme, the employee "owns" the job and no one can get access to the job unless the current incumbent voluntarily leaves the job (either for a better job or for retirement), and a vacancy is established. The length of the employment contract is then completely controlled by the employee, and the employment relationship is closed to outsiders. At the other extreme, the employee may replace the incumbent at any time. The employment contract is reestablished in every short interval of time, and the employment relationship is completely open to outsiders.

The employment relationship is established in a matching process. This process will be assumed to involve purposive actors as employers and employees where both parties are attempting to maximize earnings. The earnings of the employer are determined by the value of the product of the job-person combination in relation to costs of production, where the main costs of production of interest for this analysis are the earnings paid to the employee and the costs of supervision.[8] Since employers dispose of the product and obtain their economic returns, the relation between the productivity of the job-person combination and the earnings paid to the employee is problematic, and depends on the nature of the employment relationship. For the analysis, two types of concepts therefore will be needed. One set of concepts describing characteristics of persons and jobs relevant for the employer's earnings, in particular the productivity of the job-person combination, the other set of concepts referring to characteristics relevant for the employment relationship, particularly the employer's control over access to the job.[9]

The value of production is a question of prices of products and quantity produced. Quantity produced in turn reflects the performance of the employee and the technology used, including the technical division of labor adopted. We will first consider concepts relevant for the analysis of employee performance.[10]

Performance reflects the match between the aptitudes and skills of the employee in relation to the requirements of the job, and for a given match the effort of the employee. Skills and aptitudes differ with respect to their type and complexity. Jobs therefore have different training requirements associated with them that will vary with respect to their type and complexity. Complexity, in turn, will be reflected in the length of training needed. Training requirements are important for the determination of the quantity of persons available for the job. In many instances however, no one outside of jobs will be able to fulfill exactly the requirements of jobs. Training on the job then is needed. Such on-the-job training requirements will be argued to be of fundamental importance to the employment relationships. The need for on-the-job training reflects such factors as the specificity of skills needed on the job, the visibility of requirements to outsiders, and the rate of technological change. As with jobs, skills of persons will vary with respect to both their complexity and type, as a result of the kinds and lengths of training persons have received in schools and on the job. Further, persons differ with respect to their ability to acquire new skills. The amount of previous training -- in particular schooling -- provides one indicator of such ability (assuming that those who have already learned a lot will be able to learn more material more efficiently).[11]

Discrepancies between the skill requirements of jobs and the skills possessed by persons result in lower productivity. Such discrepancies, by definition, will exist when training on-the-job is undertaken. Hence, on-the-job training results in costs to the extent that lower productivity affects the earnings of employers, or employees, or both. The allocation of costs between employers and employees is of importance for the employment relationship as skills acquired in specific jobs may not be transferred to other jobs, and costs incurred (by either employers or employees) therefore cannot be recovered.

A perfect match between the skills and aptitudes of persons and job requirements does not guarantee the highest possible level of performance by the employee. The level of effort displayed by the employee is important. This brings into focus the degree of control over the job exercised by the employer vis a vis the employee. As mentioned above, there are two aspects of such control: control over the activities of the job, and control over access to the job. Control over job activities directly enables the employer to regulate performance. This regulation is achieved by the establishment of authority relationships in supervisory arrangements, which provide control over how a task is carried out and the speed with which it is carried out.

Supervision represents a cost to the employer, and its effectiveness depends on the sanctions that may be imposed. Supervisory costs may be assumed to depend on the complexity of the task and on the degree to which the activities of a job are regulated by the activities of other jobs. This points to the fundamental importance of the technical division of labor. The degree of decomposition of complex tasks into simple tasks facilitates supervision as well as increases the rate of output of the production system. Further, the technical division of labor may create interdependencies among tasks (as in an assembly line) that link the performance of the employee to the technical system of production rather than leaving it to the discretion of the employee.

The sanctions that may be imposed in supervision are linked to the second aspect of control over the job: control over access to the job. If the employer has complete control over access, loss of employment is an effective sanction. Further, we will show, in the next section, that when the employment relationship is completely open, competition among employees will ensure that wage rates are directly tied to performance. Hence, employer control over access to the job will not only maximize his ability to regulate performance effectively, but also ensure that the employer's ability to maximize earnings is made directly dependent on performance.

In the absence of complete employer control over access to the job, supervisory costs are minimized by instituting incentives for performance that motivate the employee. We will show that a direct link between performance and earnings is difficult to obtain in this situation. But a link may be created between performance and opportunities for advancement to better jobs. Promotion schedules that link jobs to other jobs in career trajectories serve as motivating devices that will enable the employer to obtain higher levels of performance at lower supervisory costs, in the absence of open employment relationships.

Performance needs to be assessed if incentives are to be applied and sanctions imposed. The quantity produced in a job however cannot always be accurately assessed. The measurability of output is a function of the characteristics of goods produced, and it may also reflect the technical division of labor. Certain products are inherently less measurable, such as certain services and decisions. In addition, in jobs that are highly interdependent in the manner described below, it may be difficult to identify the performance of an individual employee. The link between an individual employee's productivity and his/her earnings clearly depends on how productivity is determined, and for this reason the measurability of output becomes relevant for the earnings determination process.

So far we have only identified concepts relevant for the performance of individual job holders. But the employer's earnings also reflect prices of products which are the output from jobs, where prices in turn reflect the demand and supply schedules of markets. Depending on the earnings determination process, prices may be relevant for the earnings of employers and demand schedules of markets will influence the demand for employees through the derived demand for factors of production, including labor.

Not all products have prices because not all products are supplied to a market. Most jobs in a system of production produce output that forms inputs to other jobs within the same firm. Either because of a lack of measurability or because it is difficult to link the output of a single job (say an administrative service) to overall output, it may be difficult to ascertain the value of output for single jobs. Further, some final products carry no prices because they are not supplied to a market, as is the case with many government services. A lack of prices implies that performance is more difficult to evaluate, and this may influence the relation between earnings and productivity in a manner similar to the lack of measurability of output (which often is related to a lack of prices).

The technical division of labor in relation to technology has been argued to determine the training requirements of jobs and the employer's possibilities of controlling employee performance. Training requirements may be lowered by decomposing complex tasks into simple tasks, and supervisory costs may be lowered by making activities of one job dependent on the activities of other jobs, resulting in a higher degree of interdependence among jobs. For this reason, interdependence among jobs is of importance for employment relationships, but interdependence among jobs also has a direct influence on employment relationships because of its importance for the employer's ability to create or eliminate single jobs. In highly interdependent job structures, single jobs cannot be added or eliminated without affecting other jobs: for example, the number of positions at an assembly line cannot be altered at will, only whole clusters of jobs can be eliminated or altered. Hence the degree of interdependence among jobs fundamentally determines the existence of jobs independently of the incumbent. This will be argued later to be a necessary, though perhaps not a sufficient, condition for the employer to gain control over access to the job.

The description of jobs and job structures so far has only treated characteristics of persons in relation to job requirements, and other aspects of the technical division of labor. One aspect of the social relationships among employees should not be ignored -- the existence of organizations producing collective actions of employees. The existence of such organizations clearly may affect employment relationships and other aspects of the matching process, and we will return later to a discussion of both causes and consequences of unions and similar organizations of employees.

The concepts presented here pertain to jobs and relations among jobs. Some of these characteristics will be captured by the favorite aggregations of jobs used by sociologists, i.e., occupations, since occupations will identify jobs with similar training requirements. Other characteristics are captured by an aggregation into industries that captures variation in derived demand and technology. However, occupation and industry capture only some of the characteristics of job structures relevant for the analysis of the matching process. Hence for the analysis of employment relations and the earnings determination process, jobs and relations among jobs present the more appropriate level of analysis.

This section has presented a list of concepts argued to be relevant for the matching of persons to jobs because of their relevance both for productivity and for employment relationships. The main task of the paper can now be undertaken: this is the task of showing how the matching process shapes the earnings determination process. We will start out by describing the neoclassical economic model for the matching process, and identify the job structure assumed in this model.

3. THE NEOCLASSICAL THEORY OF EARNINGS DETERMINATION

The preceding section identified a number of concepts relevant for productivity and hence for employer's earnings. The purpose of this section is to describe one answer to the question of what determines the earnings the job seeker may obtain. This answer is the one provided by neoclassical economics.

In the economic theory, labor is treated as a factor of production that carries a price, which is a wage rate generated by a labor market as a result of the demand and supply schedules of labor. In the classical theory, labor is treated as a homogeneous category. Hence, population size is the main source of variation in the supply of labor. In addition, already Adam Smith argued that different jobs have different attractiveness that will influence the supply of persons to jobs. As a result, the wage rates will differ so that the most unpleasant jobs carry the highest wages.

Demand for labor reflects the derived demand for products, as reflected in their value. The link between wages and the value of products is established through the concept of marginal productivity. Profit maximizing firms will be in equilibrium when the value of the marginal product equals the marginal cost or price of labor as a factor of production. Employers will add employees until this condition is fulfilled and will realize a gain by doing so. If marginal cost exceeds the value of the marginal product, employers will realize a gain by dismissing employees until the equality between marginal products and values holds. Wage rates are assumed given by the markets and are independent of the actions taken by individual employers. The demand for an aggregate of firms producing similar products — that is, an industry -- will influence the wage rate. Increased demand will lead to an increased value of products and therefore increased wage rates (depending on substitution with other factors) for a given supply. If wage rates increase, this will act as a signal to employees in other industries, and they will seek out employment in the higher paying industry resulting in an off-setting movement of wages. Homogeneous labor will therefore command identical prices in the classical theory, except for the differential introduced by differences in the pleasantness of work. If population growth exceeds growth in demand for labor as predicted by Malthus, the end result will be misery.

The derivations from the classical theory do not square well with reality. Earnings differentials are observed, and they do not seem to be only a question of the dirtiness of jobs. The economic solution is to recognize differentials among jobs, as well as of persons, leading to different supply and demand schedules for different job-person combinations. The neoclassical theory -- in the form of human capital theory -- provides a most influential specification of this solution by focusing on the supply of persons at different skill levels.

Differences in skills, according to human capital theory, determine different levels of productive capacity. This will result in different wage rates. If skills were acquired at no cost, those wage differentials would soon lead to equalizing skill acquisition. But skills are acquired at costs to the person undertaking the training. These costs are partly direct in the form of tuition and living expenses, and partly opportunity costs in the form of earnings foregone. No one should undertake training if the returns to this training, in the form of increased earnings accumulated over the working life, are not at least equal to the costs of training. Technically, the decision about training is made by comparing the lifetime earnings with training (discounted to the time of the training decision) to discounted lifetime earnings without training, plus direct training costs.

If only skills acquired through training are relevant, earnings differentials would be exactly off-setting the differences in training costs. However, it is usually recognized that earnings differentials also capture variations in ability, where ability is used to refer to such characteristics as I.Q., motivation, and creativity. Ability may be incorporated in the theory by recognizing that persons with different abilities have different investment costs and hence need different earnings to induce the undertaking of training. In addition, some aptitudes may be innate and scarce. They will command a rent because of their fixed supply. Finally, some variation in earnings can be attributed to different opportunities for financing training particularly as a result of the unequal distribution of parental wealth in combination with the unwillingness of lenders to take collateral in human capital.

The basic proposition derived from the neoclassical theory is then that differences in earnings reflect differences in the productive capacity of persons as a result of their training, abilities, and opportunities. There may be transient variations in earnings as a result of differences in derived demand in combination with market imperfections; but the basic source of inequality in earnings is unequal endowments in productive capacities among persons. In other words, identical persons are assumed to obtain almost identical earnings, regardless of the characteristics of the jobs they are in.

This theory can be used to account for a number of features of observed earnings attainment processes. Most importantly, it provides an explanation for the relation between education and earnings that interprets education as a source of marketable skills. Also, the theory predicts growth patterns for earnings, where earnings increase rapidly in the younger years and then gradually reach a stable level, with growth after entry into the labor market explained by investment in on-the-job training. Empirically, the theory fares well in accounting for variations in earnings among persons using schooling and time in the labor force (as a proxy for on-the-job training and experience) as the main independent variables (Mincer, 1974).

The human capital theory focuses almost exclusively on the supply side, that is on characteristics of persons. Presumably, the earnings returns to training ultimately are to be explained by a distribution of training requirements for jobs; but variations in demand are, in general, not focused upon in the theory. This reflects the job structure assumed in the theory, that is one of a competitive and perfectly functioning labor market. These and other characteristics assumed in the scenario presented by the neoclassical theory are discussed next. To distinguish the neoclassical theory of the earnings determination process from the alternative model of the matching process that will be formulated in the sequel, we will refer to this theory as the wage competition model (following Thurow, 1975) to emphasize the focus on competition among employees for wages.

3. CONDITIONS FOR THE NEOCLASSICAL THEORY TO APPLY

The neoclassical world assumed in deriving the marginal productivity theory of wages is one where individuals engage in purposive behavior; that is, each individual has an ordered set of preferences and chooses the most preferred position available. Certainty about income, prices, and quality of goods is assumed, as is a competitive and perfectly functioning market. In the derivation of the wage theory, this market for labor is assumed to be like a market for any other good. Further, wage rates clear this market at any period of time, and changes in productivity lead to counter measures so that the quality of marginal productivity and wage rates is upheld.

Of these various assumptions, not all imply marginal productivity theory. The assumption of purposive behavior is a necessary condition for marginal productivity theory to apply, but not a sufficient condition. The assumption about certainty, i.e., full information, is important, and we will argue below that uncertainty about productivity leads to matching mechanisms different from the one predicted by marginal productivity theory. However, certainty is not the most crucial assumption, for uncertainty does not necessarily lead to a violation of basic principles of the economic theory.

We argue that the most important assumption is the assumption of a market for labor with properties like a competitive market for consumer goods. Three features of markets for consumer goods are particularly salient. (1) In a market for goods, the seller completely relinquishes control over the use of the goods to the buyer; (2) goods are supplied with well-defined properties, so that comparisons of prices and properties of goods can be made; (3) goods are divisible, so that any quantity can be bought and sold. Of these, the first assumption will be held to be the most crucial.

In labor markets, workers supply their labor in exchange for wages. However, the employer does not always gain complete control over what is bought. Earlier in this paper, we identified control over the job as a crucial dimension of employment relationships. If employers have complete control over access to the job, they indeed have complete control over the commodity (labor) being bought. If, on the other hand, the employee has control, the employee retains bargaining power over the employment relationship. The situation corresponds to one that would prevail in the exchange of commodities if the buyer was forced to deal only with a single seller for a particular commodity. The exchange relationship would then be insulated from competition from other sellers of that particular good. In a parallel way, the employment relationship is insulated from competition from other workers if the employee has control over the job.

The crucial aspect of control over the job is control over access to the job. A competitive labor market that determines wage rates is one where employers make wage offers and workers bid for employment on the basis of their productivity. The match is made when the marginal productivity demanded equals the wage rate of the employee. This presupposes that any employee paid more than the value of his/her marginal product can be replaced by another who is willing to work at the wage rate that equals marginal productivity; while an employee who is paid less than the value of his/her marginal product can get access to jobs where the wage rate reflects his/her productivity. Only when the employment relationship is completely open will such a clearing of the market through wage rates be possible. Closed employment relationships where new recruits can only get access if the incumbent leaves, insulate incumbents from competition because employers cannot resolve discrepancies between marginal productivities and wage rates by replacing the current employee by someone who is more productive at the same wage rate, or who is willing to work at a lower wage rate.

New recruits to closed employment relationships may engage in wage competition for the vacancies created when incumbents leave their jobs. But by definition there will be great uncertainty about the productivity of new recruits, and this will prohibit attempts to link the value of marginal products to wage rates for new recruits. Later in the paper, we will discuss the implications of this for the matching process.

The uncertainty about the productivity of new recruits is an example of a lack of measurability of productivity. Lack of measurability is a violation of the second requirement of labor markets mentioned above, if they are to be like markets for goods: comparisons of prices and properties of goods can be made. In calculations of marginal productivity it is clearly necessary for outputs from jobs to be measurable. Further, the absence of measurability will be argued below to be one of the determinants of employee control over access to the job. However, measurability is not a sufficient condition for the marginal productivity theory to apply. Even if there is perfect measurability, closed employment relationships will not allow the employer to equate marginal products and wage rates.

The third requirement stated above was that labor, like goods, is a divisible commodity. Employers should be able to continuously adjust to changes in the demand and supply of labor and therefore be able to hire and fire any quantity of labor. This will not be possible when jobs are highly interdependent so that the removal or addition of single jobs is impossible. Interdependent production systems may then lead to persistent inefficiencies. However, indivisibility is of little consequence when employment relationships are closed, as single employees cannot then be removed even if single jobs are removable. Hence divisibility, like measurability, is less of a fundamental requirement than is control over access to the job.

Control over access to the job determines whether competition among employees will take place and hence whether the job structure is as assumed in the neoclassical theory. Control over access was identified as one of two dimensions of control over the job -- the other one being control over the activities of the job. However, if the employment relationship is completely open, there is less need to control activities, since the wage rate will reflect performance, and the threat of dismissal will act as a disciplinary factor. Autonomy on the job is a problem for the employer in closed employment relationships, and we will return to this in the sequel.

The application of marginal productivity in determining wages and earnings ensures the employer that he will operate at maximum efficiency as wages paid directly reflects the productive capacity of the employee. The effort and motivation of the employee need not concern the employers as they can rely on the competition among workers to ensure that any variation in performance is reflected in the wage rate. Clearly it should be in the interest of the employer, other things equal, to gain complete control over access to the job and thus ensure the existence of the job structure assumed in the neoclassical theory.[12]

As open employment relationships benefit the employer, a closed employment relationship is in the interest of the employee. If the employment relationship is completely open and supply/demand schedules remain constant, wage gains can only be made by the employee increasing his/her productive capacity. This will usually involve training costs. Further, variations in earnings produced by changes in supply and demand -- including decreases in earnings -- will occur independently of the employee's actions. Closed employment relationships, on the other hand, insulate the earnings from changes in supply and demand, and assure the employee that if there are opportunities for better jobs they can be utilized, while if there are no such opportunities, the status quo will at least be preserved.

Later in the paper, we argue that closed employment relationships are empirically important. Hence employees are able, under certain conditions, to realize their interest in control over access to the job. The sources of this control are both technological and social. They are discussed in the next section.

4. SOURCES OF EMPLOYEE CONTROL OVER THE JOB

We have described the neoclassical model for matching persons to jobs and argued that open employment relationships are a fundamental characteristic of the job structure assumed in this theory. We also argued, other things equal, that it should be in the employer's interest to have open employment relationships, and in the employee's interest to have a closed relationship. The problem is then to determine under which circumstances employers will relinquish control over the job.

The legal system of capitalist society accords the employer the formal control over access to the job, reflecting the employer possession of the physical means of production and the right to dispose of output. It might be argued that no rational employer should relinquish possession of the job and insulate the employment relationship from competition. However, it is our intention to show, quite to the contrary, that under certain circumstances it is the goal of ensuring the highest possible revenue that makes it necessary for the employer to relinquish control over access to the job. The employment relationship is a power relationship as each party controls something of interest to the other party. It will be our argument that technical and social aspects of the production process may accord the employee control over the employer's ability to realize the highest possible earnings or revenue -- a control that can be used by the employee to realize his/her interest in control over access to the job.

Training requirements of jobs, particularly the amount of on-the-job training that is needed, have been argued by Thurow (1975) -- in his job competition model -- and by the dual labor market theorists (e.g., Doeringer and Piore, 1971) to be of fundamental importance for the emergence of job structures similar to the one that we will argue may result from closed employment relationships. This is indeed a very important reason. However, in this section we will argue for other causes as well. In addition to training requirements, we will emphasize (a) the degree of interdependence among jobs, and the existence of job ladders, (b) the measurability of the output from jobs and autonomy, and (c) the existence of collective action by employees.

Training Requirements

If no one outside of a job has the necessary skills to perform adequately on the job, training must take place on the job. If employers pay for this training in the form of lowered productivity, they have made an investment in the employee, and the employee gains control over access to the job in proportion to the cost the employer incurs by his leaving.

Not all training on the job necessarily leads to greater employee control over the job. Within the neoclassical framework, Becker (1964) argued for the distinction between general and specific on-the-job training. General on-the-job training can be transferred to another job in contrast to specific on-the-job training that produces skills only usable on the job where they are acquired. Employers would not pay for general on-the-job training, since it may increase the productivity of other firms not engaged in providing the training. Hence general on-the-job training should lead to lower earnings for the employee in the training period, and higher earnings later on to compensate for the training costs incurred by the employee. Specific on-the-job training, on the other hand, is borne by the employer and, as argued above, should lead to increased employee control over the job.

Becker relies on marginal productivity theory in deriving the general relationship between skills and earnings, but for the question of the allocation of costs, the theory is not necessary. It is required that one assumes purposive behavior of both parties. If employers paid for general on-the-job training, they would be subsidizing other firms regardless of how earnings were derived. Specific on-the-job training results in lower productivity that represents a cost to the employer, regardless of how earnings are determined.

There is also in the case of general on-the-job training, a source of employee control over the job derived from the on-the-job training requirements. Training on the job is rarely a self-learning process -- co-workers usually provide a large part of the training. This means that if wage competition prevails, these co-workers may be in competition with their trainees once the training is completed. Hence, competition among employees provides an incentive for employees not to provide training. Granting employees greater control over the job is a way for employers to secure that training can in fact take place. This, and not the degree of skill specificity, appears to be Thurow's (1975) major argument for the emergence of job competition, where employment relationships are closed. Doeringer and Piore (1971), on the other hand, argue for the similar concept of primary jobs principally in terms of skill specificity.

Whether because of skill specificity or because of the necessity of having coworkers provide the training, the amount of training to be provided is the determinant of the amount of control gained by the employee. The amount of training required depends in turn on the complexity of the job and the amount of training provided by other agencies, e.g., schools. Schools solve the need for general training without according employees control over the job. Schools cannot however provide training for specific jobs, nor can they provide training for jobs if the training requirements are unknown. Even if employers have the opportunity to transfer training to agencies outside of the firm, such a move takes time; and, since training provided in schools is provided by teachers removed from the production process, the training provided will tend to be inflexible to technological and other changes in training requirements of actual jobs.

In sum, employee control over the job as derived from the training requirements of jobs may be expected to depend on the complexity of the job. For given complexities of jobs, the amount of control should further depend on the degree of specificity of the training required and/or the degree of stability of training requirements. The more specific and the less visible the requirements (as determined, for example, by technological changes), the less likely it is that schools and training on other jobs will reduce the proportion of the total amount of the training required to take place on the job.

These are some of the most important variables related to training requirements of jobs that influence employer control over jobs. They are not however the only job characteristics relevant for the matching process.

The Relation of Jobs to Other Jobs

Two aspects of the linkages among jobs were identified earlier: one is the degree of technical interdependence among jobs, and the other is the linkages among jobs that form career trajectories. Both aspects of job structure have relevance for the employee's ability to realize his/her interests in gaining control over access to jobs.

Interdependence among jobs, created by the technical division of labor, implies, as mentioned, that the existence of some jobs is necessary for the functioning of other jobs. The corresponding separation of the existence of the job from the job holder is a necessary though not sufficient condition for the employee to gain control over the job.

The main impact of interdependence of jobs on the employment relationship is indirect. The degree of interdependence may affect the degree of specificity of training requirements and the visibility of training requirements, and this indirectly affects the employee's ability to gain control over the job. Further, the degree of interdependence may affect the measurability of output and the likelihood of collective action among employees. Both measurability and collective action will be shown below to be important for the employment relationship.

The creation of highly interdependent jobs has contradictory effects on employment relationships. On the one hand, task interdependence usually results in less complex single tasks, and this may be a main motivation for the creation of such job structures. This should facilitate the creation of open employment relationships. On the other hand, interdependence may be a source of employee control over the job, creating a tendency toward closed relations. This is, of course, one important aspect of the contradictory nature of capitalist production as identified by Marx.

The existence of job ladders that form career trajectories will reinforce existing tendencies toward closed employment relationships. Even though employees are in closed employment relationships, serious business downturns and the like may force some employees out of jobs. Persons out of jobs who have spent part of their working career in closed employment relationships and who have obtained on-the-job training in these jobs may seem to constitute a threat to employee control over the job. However, their impact is reduced by two things. First, they usually constitute only a minority of job seekers. Second, the existence of job ladders in connection with closed employment relationships further reinforces employee control over the decision to leave.

Job ladders, we argued above, are introduced partly as a solution to the problem of creating incentives for performance in closed employment relationships, as career trajectories -- represented by promotion opportunities to higher paying jobs -- act to motivate workers who are insulated from competition with persons outside of jobs. However, in order to be effective, promotion opportunities must be available to all. They are not available to all if persons are hired into higher job ladders from the outside. Persons who have been forced out of job competition jobs will often be candidates for jobs at higher job ladders; but in order to keep promotion schedules intact, employers are unlikely to give them access to such jobs. Hence, they are only candidates for jobs at entry ladders, where the rewards provided are not likely to be attractive to job seekers who are already qualified. Even here such job candidates are not attractive to the employers either, since they are likely to disturb training arrangements. Hence, the existence of promotion ladders provides a further insulation of employees against competition from the outside.

Measurability of Output

Calculations of the value of marginal products assume that prices exist and quantities of output can be measured. Maximum efficiency may be obtained if outputs from single jobs can be linked to the value of total output. If prices do not exist, the value of total output is ambiguous; if, furthermore, the quantity of output from single jobs cannot be easily calculated, uncertainty about the value of marginal products of single jobs will exist.

Uncertainty about marginal products due to a lack of measurability should affect the employment relationships. Measurability is never completely nonexistent, or jobs would not exist. Indicators of productivity will be developed even for tasks where the output is impossible to quantify. These indicators are likely to be influenced by the employee's definitions of what are appropriate standards of job performance, since the employer will have to rely on information provided by the employee. The employee's control over information about the job thus represents a resource that may be used to further the employee's interest, and control over access to the job is in his/her interest as described above.

Measurability is, in general, more difficult with jobs where decisions constitute the output. Hence, certain white-collar and managerial employees should gain control over their jobs partly as a result of this lack of measurability. The exception are the very top managerial jobs where the employee may be held accountable for the whole division of a firm or the whole firm. Employee control may then be less in such jobs, and involuntary terminations of employment relationships indeed appear to be more frequent in high managerial jobs than in middle level jobs. On the other hand, such employees have command over substantial resources that may be used to further their interest versus the employer's.

In open employment relationships, autonomy on the job does not affect the earnings determination process since performance variation will be reflected in the wage rate (reflecting the competition among employees). However, autonomy on the job may reinforce other tendencies to closed employment relationships for reasons similar to those that would account for the relationship between measurability and control over the job.

Autonomy means lack of direct supervision. Hence, autonomy is greater, the greater the supervisory costs would be, other things equal and, in general, such costs will be higher the more complex the task and the less measurable the output. But leaving the decision about how a task is carried out and the pace of work to the discretion of the employee clearly provides him/her with a resource that may be used to gain control over other aspects of the employment relationship, particularly control over access to the job.

Collective Action

So far, we have only discussed sources of employee control over the job that are derived from intrinsic characteristics of jobs and the organization of jobs. Employees may, in addition, derive control over their jobs through some kind of collective action -- in particular unionization.

Unionization and similar forms of collective actions are confronted with a free-rider problem. As pointed out by Olson (1965), unions provide public goods that benefit even those who do not contribute to the provision of the good. This has a number of implications when such a good is likely to be provided (e.g., the influence of group size, use of nonvoluntary means of securing contributions, etc.); but most elementary, it is to be expected that the smaller the cost of providing public goods, the more likely they will be provided, other things equal. Employee control over jobs reduces the costs of engaging in collective action concerning employment relationships and the distributions of rewards. Hence the ability to engage in collective action may derive from the same job characteristics that independently produce closed employment relationships, and the collective action then reinforces already existing tendencies.

However, even in cases where wage competition should be expected, collective action may occur; and, as a result of the increased bargaining power of employees, closed employment relationships may be instituted.[13] The benefit to employees of collective actions are greater in such jobs, and if various facilitating circumstances are present -- such as high communication among workers, low upward mobility, similar ideologies, etc. -- unionization and other forms of collective action may emerge and higher employee control over jobs may be derived.

It is argued by the so-called radical critique of the neoclassical theory (e.g., Gordon, 1972) that the job structures that here are argued to emerge as a result of closed employment relationships, are instituted by the employer to prevent the emergence of collective action on the part of employees. The logic is that the differentiation of workers into different job structures weakens worker solidarity and prevents class action by the working class as a whole. Though this may be the consequence of a differentiation of job structures, it is according the employers a great deal of enlightenment to attribute the emergence of closed employment relationships to the need to prevent class action.[14]

Summary

This section has attempted to identify sources of employer control over the job. Major attention has been placed on sources of control in the structure of jobs. The technical division of labor and its associated technology determines training requirements of jobs by differentiating jobs with respect to the type and complexity of the training needed. The on-the-job training requirements have been argued to be an important source of employee control over access to the job. Further, the existence of job ladders that serve as incentives in closed employment relationships, has been argued to reinforce the degree of employee control. The measurability of output and the autonomy of jobs creates uncertainty about productivity, an uncertainty that has been argued to provide employees with a further resource for obtaining control over access to the job.

The relationships among employees resulting in collective action has further been argued to represent an important source of employee control over the job.

Figure 1 presents, in diagrammatic form, the causal scheme we have proposed by indicating the interrelationships among the determinants of the emergence of closed employment relationships.

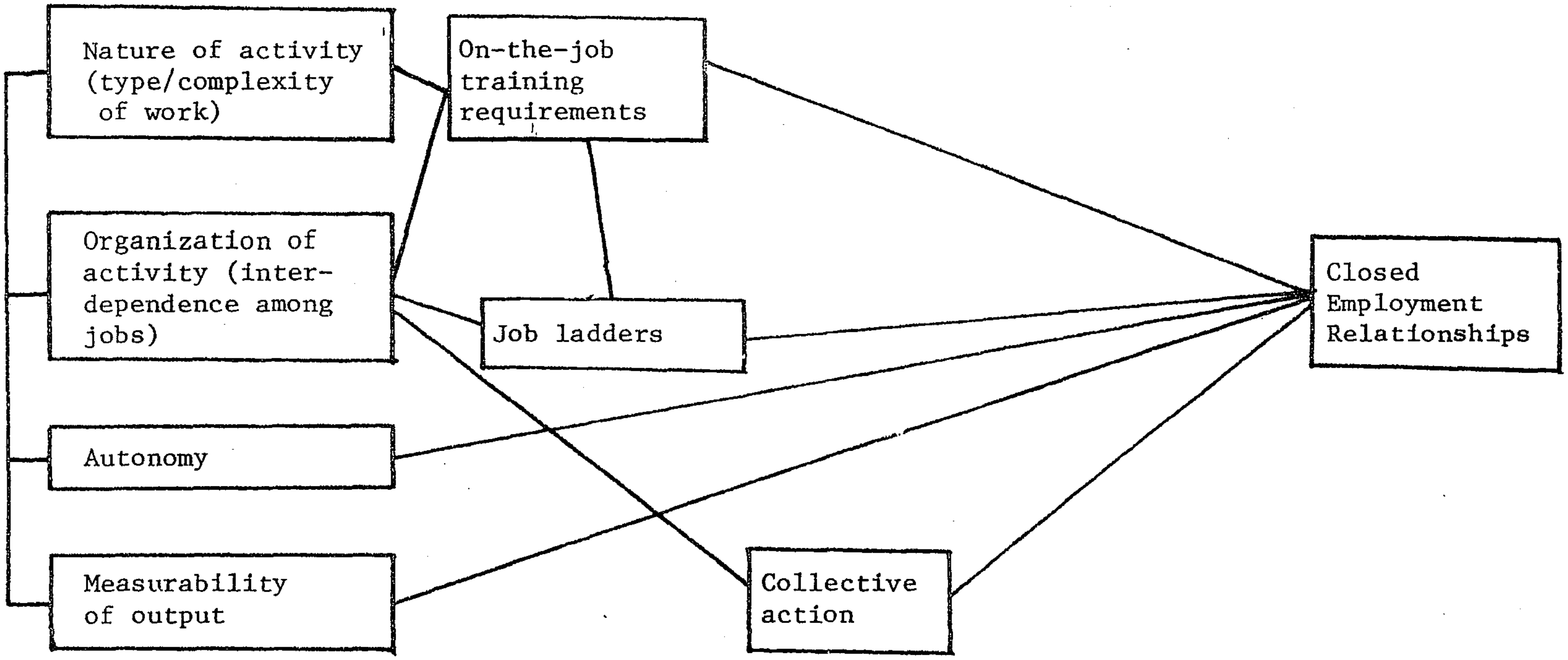

Figure 1. Interrelationships among the determinants of the emergence of closed employment relationships.

This section has been focused on identifying the job structures where the neoclassical model should not emerge. The next section will outline the matching process we argue will result in closed employment relationships in production systems.

5. VACANCY COMPETITION

When employees have control over access to the job (as a result of the technical and social aspects of jobs structures identified above), others can only get access to the job when incumbents leave. Hence, a vacancy must exist for a person to get access to a job. We will refer to the resulting matching process as <u>vacancy competition</u>. We do not wish to argue that this is the only alternative matching process to the wage competition model described by neoclassical economics. At least one other alternative employment relationship can be identified: this is the often met arrangement when employees are directly involved in the disposition of goods to the market, and the "salesman" is paid some fraction of total earnings. But such relationships presuppose that jobs are not highly interdependent and that the "salesman" is primarily involved in the disposition, rather than the production, of goods.[15] Vacancy competition in contrast is likely to emerge in closed employment relationships where jobs are interdependent in a technical and social division of labor around production.

In vacancy competition, as in wage competition, employers are assumed to be concerned about hiring the most productive employee at the least cost. But because of the indeterminate length of the employment relationship and the lack of competition among employees over wages, it will not be possible for the employer to link marginal productivity to the wage rate. This has important consequences for (1) the determination of who should be hired, (2) the determination of earnings, and (3) the organization of jobs in career trajectories. These consequences all follow from the employer's attempt to secure the highest possible return from production when faced with employee control over the job.

In wage competition, the employer can rely on the wage rate as a measure of a person's productive capacity. The employer need only be concerned that the value of marginal productivity equals the wage rate, and he can be indifferent about the relationship between personal characteristics of the employee and his/her productive capacity. In contrast, in vacancy competition, the employer should be very much concerned about the relationship between personal characteristics and productive capacity, because once hired the employee cannot be easily dismissed. Furthermore, it is a person's potential productive capacity that will be of concern, particularly including the person's ability to fulfill the training requirements of jobs. Previous experience, education, and ascriptive characteristics -- such as race and sex -- will be used as indicators of potential productivity; the main requirements are that the indicators chosen are visible and in the employer's experience show some relationship to performance. Based on the information provided by these indicators, the employer will hire the most promising candidate among the available candidates for a job. In other words, access to a vacancy will be determined by a ranking of job candidates. As proposed by Thurow (1975), the situation may be conceived of as one where a queue of job candidates is established for vacant jobs. A person's position in the labor queue will not be determined by his/her absolute level of productive capacity, but by the relative rank order in relation to other job candidates according to characteristics deemed relevant by employers.

As there is a queue of persons for jobs, there will be a rank order or a queue of vacant jobs where the rank order is established by the earnings provided by vacant jobs, the career trajectories they imply, and other characteristics such as status, pleasantness, convenience, etc. The matching process, then, is a matching of the queue of persons to the queue of vacant jobs. The highest placed person in the labor queue will get the best job in the job queue. Changes in the supply of persons with certain characteristics (say a change in the distribution of education) and changes in the availability of jobs at different levels of rewards will change the rank orderings. As a result, whenever there is a change in the labor and job queues, persons with similar characteristics will tend to become hired into different jobs; and persons in similar jobs may have different personal characteristics. The organization of jobs into career trajectories (discussed below) will further reinforce these tendencies.

Wage rates in vacancy competition are characteristics of jobs, and not of persons. The reason is that employment relationships are insulated from competition. As employers have no effective way of enforcing a translation of productivity variations into wage rates, wages will tend to become heavily influenced by institutional forces such as collective bargaining and the desire to preserve traditional relative wage differentials on the part of employees. Internally, wage differentials will reflect the organization of jobs into career trajectories.

The creation of job ladders in internal labor markets is, as mentioned above, a way for the employer to create an incentive structre in the absence of open employment relationships. The organization of jobs into promotion schedules further acts as a screening device inducing low performance employees to leave on their decision by denying or delaying promotion in relation to other employees. To be effective, jobs at the same level in a promotion schedule should provide identical earnings, while jobs at different levels should provide a differential large enough to induce employees to compete for promotion opportunities. This further reinforces the tendency in vacancy competition for earnings to become a characteristic of jobs so that similar jobs provide similar earnings regardless of characteristics of the incumbents.

Actual promotion opportunities are created when persons leave the firm or a new job is added, setting in motion chains of vacancies (White, 1970). The number of job levels, the distribution of jobs at various levels, the seniority distribution of employees, and the demand for products influencing the creation of new jobs (or the elimination of jobs), all interact to produce promotion schedules governing the careers of employees.[16]

In wage competition, a person can only change his/her earnings by changing his/her productive capacities. In vacancy competition, changes in earnings are generated by moves in mobility regimes that are chains of vacancies in internal labor markets. There is, in vacancy competition, no automatic correspondence between the creation of promotion opportunities and whatever changes take place in a person's productive capacity. Employees may get promoted without a preceding change in productivity, and a change in productive capacity need not result in a promotion. This means that the cross-sectional association between personal characteristics and earnings will be attenuated, even though personal characteristics are crucial for getting access to jobs.[17]

In vacancy competition, variations in earnings reflect variations in job characteristics and the organization of jobs in internal labor markets. This is in contrast to the situation in the neoclassical model of wage competition where the primary source of variation is the variation in personal characteristics that determine a person's productive capacity. Some implications of these effects of open and closed employment relationships will be discussed next.

6. IMPLICATIONS

The utility of the theory of the process of matching persons to jobs outlined here may be suggested by the implications for issues related to research and policy on inequality in society. Some of these issues are discussed below to indicate the kind of analysis suggested by the framework suggested here.

Constraints on Growth in Earnings

The two polar models of the matching process suggest different constraints on a person's ability to increase his/her earnings. In wage competition, earnings directly reflect the productivity and hence the skills and abilities of a person. Increases in earnings then are obtained by increasing the skill level of a person, and the major constraint on growth in earnings will be limitations on acquiring additional human capital. In wage competition markets, the amount of training that can be provided in jobs will be low, since on-the-job training as argued above is a major cause of the emergence of vacancy competition. Hence the major source of income inequality among persons lies outside of the labor market, i.e., in the educational and other training institutions that produce skill differentiation.

In vacancy competition sectors, the major constraint on the attainment of income is access to jobs. If no job is available to a person, (s)he will not be able to obtain earnings. Growth in earnings is produced by the utilization of opportunities for mobility to better jobs, and this opportunity structure, not changes in skills, governs the earnings variations over time. The major source of variation in earnings is then the restriction of access to jobs and the level of derived demand that determines the availability of jobs.

The different constraints on growth in earnings in wage competition and job vacancy competition jobs imply that quite different policies will have to be used in an attempt to increase pretransfer earnings of poverty groups. In wage competition sectors, policies aimed at increasing skill levels would presumably be effective either through schooling or -- for those already having entered the labor market -- through various off-the-job training programs. In vacancy competition sectors, policies aimed at altering the demand for labor and removing restrictions (particularly discriminatory ones) on access to jobs would be quite ineffective since such training would not make jobs available.

The rather limited success of manpower training programs suggests that job vacancy competition indeed is predominant in the U.S. economy. More correctly, the fate of such programs suggests that it is indeed difficult to prepare low skilled workers for jobs that demand high skill levels since such jobs, as argued above, tend to be vacancy competition jobs.

Educational Attainments and the Labor Market

In wage competition, job changes in the supply of skills will produce changes in wage rates. For example, if the supply of highly skilled persons increases, and the supply of low skilled persons decreases, the wage rate for highly skilled persons should go down, and the wage rate for low skilled persons should increase.

In the human capital literature, educational attainment is used as a measure of skill level. The growth in educational attainment witnessed in the sixties produced a marked change in the supply of highly skilled versus low skilled workers. In wage competition sectors, one should then expect a decrease in income inequality.

are not affected by growth in educational attainments leading to an equalization of the distribution of education. It is a person's relative position in the distribution of education that counts. Since parents presumably are concerned about securing at least the same position for their offspring as they have achieved, growth in education will feed on itself as more and more education is needed to secure the same relative position.

The seventies would appear to be a crucial period for testing the implications of the two models for the matching of persons to jobs. If wage competition jobs are predominant in the economy, the rapid growth in educational attainments in the sixties should have been accompanied by a decrease in the demand for higher education. If vacancy competition jobs are predominant, no such decrease should be observed. The evidence is ambiguous however. It has been argued that a decrease in the demand for higher education levels indeed takes place as a result of a smaller wage differential between high school and college graduates (Freeman, 1976). On the other hand, it can be argued that the decline in enrollments is only temporary and reflects the disappearance of the incentive to attend college produced by the Vietnam War in the sixties (Sluter, 1976).

Class Conflict

We have argued that the emergence of vacancy competition does not necessarily reflect a lack of purposive behavior -- particularly profit maximizing behavior -- on the part of employers. Instead, this matching process emerges as a result of increased employee control over the job derived from the training requirements of jobs and other sources of control discussed above.

Even if vacancy competition is an accommodation of employers to the features of job structures inducing employee control, it does not follow that employers will not try to change the structure of jobs to reduce employee control and secure the highest possible profits. An analysis of changes in job structures to reveal the extent of this practice constitutes a lacuna in the literature. From a Marxist perspective, Braverman (1974) has, however, argued that such changes constitute one of the major dimensions of class conflict in capitalist society.

Braverman (1974) argues that, contrary to popular belief, there has not been an upgrading of skills in the labor force, but a degrading, as activities associated with single (artisan) jobs have been spread over many jobs, reflecting the capitalist attempt to reduce worker control over the production process and maximize profits. The logic of such a skill-stripping of jobs follows directly from the features of wage and vacancy competition as outlined above.

The evidence for Braverman's (1974) argument is somewhat impressionistic. Particularly the rise of semi-skilled occupations is used to support the argument, as these occupations are argued to require much lower skill levels than the label seems to indicate. The rise of such occupational categories is indisputable, though it is uncertain how much variance in skill levels exists among semi-skilled jobs. Also semi-skilled jobs are exactly the jobs where training on the job is predominant. Finally there are, as we have argued, other sources of employee control than the skill requirements of jobs. Particularly the interdependence among jobs created by decomposing tasks into simple routine tasks may act as a counterforce both because of the employer's reduced ability to eliminate single jobs and because of the bases for collective action created by the interdependence.

It should be the case, though, that profit maximizing employers will attempt to change job structures so as to reduce the chances for vacancy competition jobs to emerge, whenever possible. The main constraint on their ability to do so is the introduction of new technologies which create on-the-job training requirements and the other sources of employee control analyzed above. Any uniform trend toward either one of the two polar models of matching persons to jobs therefore is unlikely to occur.

The argument about skill stripping is based on the assumption of profit maximizing behavior of employers in the short run so that the equalizing of marginal productivities and wage rates in each time period must be achieved through the elimination of employee control over the job. If employers are assumed not to be profit maximizing in the short run, but to be concerned about long term growth and dominance in product markets, then a uniform trend toward vacancy competition can be argued. The reason is that predictability of markets becomes a major concern, in particular the predictability of labor markets. Vacancy competition ensures a stable labor force with mutual concern of employees and employers for the survival and continued growth of the firm. Though maybe inefficient in the short run in comparison with more wage competitive job structures, the long term gains of vacancy competition will outweigh these costs.

6. CONCLUSION

This paper has identified what we argue is a basic determinant of the earnings determination process in the matching of persons to jobs: the degree of control exercised by the employer versus the employee in controlling access to the job. Concrete employer control has been argued to produce the job structure assumed in the neoclassical wage competition model for the earnings determination process. Employee control, in contrast, has been argued to produce a matching process referred to as vacancy competition. The two matching processes have been argued to have quite different implications for a number of issues relating to the study of inequality and attainment processes in society.

The sources of employee bargaining power over control of the job are partly technological and partly social. The technological sources including the technical division of labor (which of course may reflect employer interest in dominating the labor process) lead to a differentiation of jobs with respect to training requirements, where particularly the on-the-job training requirements have been argued to be an important source of employee control over the job. Uncertainty about productivity and supervisory costs have further been argued to provide a source of employee control. The job structures that are likely to emerge when employees have control over the job, in particular the formation of promotion ladders as incentive structures, further reinforce these tendencies to employee control. The major social source of control is collective employee action in the form of unions. Though unions are argued to be more likely to emerge when technology and the technical division of labor already include employee bargaining power over the employment relationship, the gains from unionization are greatest when these technical sources are absent.

The job structures identified in this paper have many similarities to the dual-labor market conception of matching processes. Vacancy competition structures are likely to be similar to the job structures identified as primary jobs (e.g., Doeringer and Piore, 1971). However, the dualist literature has a very descriptive character and there is also some confusion as to whether the labor market segmentation is a segmentation of jobs or of persons (blacks, poor and women in the secondary sector, white skilled workers in the primary sector). The main conclusion derived from this literature is that there are good jobs and bad jobs. The analysis presented in this paper proposes a conceptual framework that identifies where closed employment relationships are likely to emerge and the reason they emerge. Also we have mentioned that high paying jobs are not necessarily all vacancy competition jobs, for example, wage competition may be likely to emerge among managers.

The notion of vacancy competition is as mentioned close to Thurow's conception of job competition. However, in contrast to the analysis proposed in this paper, Thurow relies exclusively on training requirements as a cause of job competition structures. True to the economists' image of the world, the nature of skills and their relation to productivity, not the bargaining power of the two parties to the matching process, is seen as the fundamental source of variation in job structures. We argue that the bargaining power which determines the emergence of open and closed employment relationships has other sources than just skill and training requirements.

The research task identified by this paper is twofold. One set of activities would test the various hypotheses on the sources of closed employment relationships by focusing directly on the technical and social determinants of job security, voluntary job mobility, etc. The other set of activities would focus on testing the different implications of the different job structures for the earnings determination process. The framework for doing so is already available for the wage competition model in the form of the earnings functions suggested by human capital theory. The development of parallel models for the vacancy competition model has only recently begun, though some progress may have been made (e.g., Sørensen, 1977a).

NOTES

[1]It is perhaps indicative of the lack of concern in sociological research for the mechanisms that produce income that the distinction between income and earnings rarely is made.

[2]Adam Smith argued for differences in earnings due to differences in the attractiveness of occupations. Attractiveness could presumably be measured by SEI or prestige scores of occupations. Smith argued for a negative relation between attractiveness and earnings; the main empirical result is the opposite. The anomaly is one of the motivations for introducing human capital theory (see Becker, 1972), but both in the classical and in the neoclassical theory there is otherwise minimal concern for explaining variation in earnings among jobs by characteristics of jobs.

[3]Sewell and Hauser (1975) report that the introduction of occupation increases R^2 in the income equation from .070 to .076. It is not much, but it is the same magnitude of effect as that of the effect of education on income.

[4]Mincer (1974) reports R^2's of .56 for individual earnings using education, experience and number of weeks worked as independent variables.

[5]See the often used quote from <u>Capital</u>, Volume 1: "The historical conditions of its existence (i.e., the existence of capitalism) are by no means given by the mere circulation of money and commodities. It can spring into being only when the owner of the means of production and subsistence meets in the market with the free labourer selling his

labour-power. And this one historical condition comprises a world's history" (Marx, 1961, Vol. I:170).

[6]The definitions are given in paragraph 10 in the section on "Basic concepts" in Economy and Society, Volume 1. "A social relationship . . . will be known as 'open' to those on the outside, if . . . participation . . . is . . . not denied to anyone who is inclined to participate and is actually in a position to do so. The relationship will be known as 'closed' . . . [if] . . . participation of certain persons is excluded, limited or subject to conditions." (Weber, 1947:139). Weber argues that market relationships are open, and gives as an example of a closed relationship the "establishment of rights to and possession of particular jobs on the part of the worker" (Weber, 1947:141). This identification of open relationships with market relationships (for the exchange of labor for wages) and of closed relationships with control over the job by the worker (and the absence of market relationships) will be relied on heavily in this paper.

[7]These aspects of the social division of labor are discussed by Weber in some detail in paragraph 19 of the section on "Sociological Categories of Economic Action." Weber here points out the similar consequences for economic efficiency of slavery and the appropriation of jobs by workers, as the employer "is obliged to make use of his particular labor force. He is not in a position . . . to select according to technical needs, but must utilize those he has without selection" (Weber, 1947:237). These consequences will be a major focus of attention in the sequel.

[8]This ignores the capital intensity of the production process. Capital intensity may be relevant for the matching process since the more capital intensive is production, the smaller a fraction will labor costs be of total costs. This may influence the employment relationship, but to simplify an already complicated argument we will ignore the complication here.

[9]Characteristics of persons are those that determine the employee's productivity. Characteristics of jobs in general involve both characteristics of jobs themselves and characteristics of the relationships among jobs. However, ultimately all characteristics of jobs reflect relational properties, as jobs are positions in a social and technical division of labor. Technical relations to other jobs result in a differentiation of tasks associated with jobs and in certain interdependencies among jobs. Social relations among jobs result in the organization of jobs in firms and within firms in the establishment of employment relationships with the characteristics mentioned above.

[10]The major categories for the dicussion that follows have been identified by Weber: " . . . there are three primary conditions affecting the maximization of calculable performance by labour in carrying out specifications: (a) the optimum of aptitude for the function; (b) the optimum of skill acquired through practice; (c) the optimum of incentive for the work" (Weber, 1947:261).

[11]Persons also differ with respect to their preferences for various characteristics of jobs that may constitute rewards from jobs, such

as status, interesting work, and convenience. These preferences may lead to various types of trade-offs, especially with earnings. Though such preference structures are relevant for a more extended analysis, their impact will be largely ignored here.

[12]Marx has described this job structure as a characteristic of the highest development of capitalist society: "The indifference to the particular kind of labour corresponds to a form of society in which individuals pass with ease from one kind of work to another, which makes it immaterial to them what particular kind of work may fall to their share. Labour has become here, not only categorically but really, a means of creating wealth in general and has no longer coalesced with the individual in one particular manner. This state of affairs has found its highest development in the most modern of bourgeois societies, the United States. It is only here that the abstraction of the category 'labour,' 'labour in general' labour sans phrase, the starting point of modern political economy, became realized in practice." (Marx, 1973:104).

[13]Certain craft unions and professional organizations are able to control almost completely access to jobs by licensing and apprenticeship arrangements.

[14]The argument assumes that capitalists are more interested in preventing class-action than in maximizing profit. That capitalists are interested in preventing class action is not disputed, that they give higher priority to this goal than to efficiency amounts to arguing that the capitalist relations of production are non-contradictory and hence static.

[15]A similar arrangement accounts for the apparent contradiction of the argument presented here exemplified by the existence of wage competition among faculty at elite universities despite tenure. Here the individual scholar, and not the employer (i.e., the university) disposes himself of the products (articles and other contributions) to a competitive market and obtains himself the returns from this activity, i.e., prestige in the profession.

[16]Under certain simplified conditions it can be shown that the growth in attainment produced by promotion schedules have the same form and may be indistinguishable from the growth pattern predicted by human capital theory (Sørensen, 1977b).

[17]A formal derivation of this conclusion and an empirical illustration is presented by Wise (1975).

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