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CONTRACTUAL ARRANGEMENTS, EMPLOYMENT AND WAGES IN RURAL LABOR MARKETS: A CRITICAL REVIEW

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FOREWORD

Over the past forty years in most South and Southeast Asian countries the labor force has grown at an increasing rate. Moreover, the proportion of this labor force that is in agriculture has declined only modestly. In India it has actually remained constant, at about 70 percent. At the same time, real rural wage rates have not risen rapidly, and in some regions they may have fallen.

Consumption studies, nutrition surveys, and micro and macro poverty studies have repeatedly drawn our attention to the tragic nature of the lives led by huge numbers of rural people whose major source of income is their labor power. Studying labor relations and the mechanisms that determine wages, employment, and earnings in rural areas is crucially important to improving the welfare of the poor. Recognizing this fact, the Agricultural Development Council (A/D/C), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the Ford Foundation sponsored a conference on "Adjustment Mechanisms in Rural Labor Markets in Developing Areas," which was held at the ICRISAT Research Center, in Hyderabad, India, August 22–24, 1979.

Although improving the lot of poor people was a paramount concern of the conference, the authors of this monograph as well as other conference participants were vitally concerned with the need of all development theories in which agriculture plays a significant role for empirically validated models of the rural labor market. The track record of economists in this regard is not good. Conference discussions revealed not only that existing theories lack sufficient empirical testing but that researchers are clearly not in agreement as to the value of individual theories.

Development economists of the 1950s and 1960s were concerned with the rural work force primarily as a source of labor

for nonagricultural sectors of the economy. Stylized facts of rural labor markets were built, as assumptions, into elaborate models of the intersectoral transfer process of labor without careful prior investigation of the empirical validity of such facts. Some of the theoretical models of rural labor markets that were later built to justify these unvalidated facts are intellectual curiosities at best. With the availability of new and improved data, the 1970s have witnessed much more careful empirical work.

In organizing the conference, Hans Binswanger and Mark Rosenzweig hoped to contribute to the integration of theory and research in two ways. They hoped not only to integrate economic theory with empirical research but to bring about a rapprochement between economic theory and research and theory and empirical investigation in other social sciences. The conference papers and discussions demonstrated that some progress has indeed been made toward the first of these goals. However, the goal of integrating social with economic theories has yet to be achieved. Much remains to be done to attain a better understanding of both the causes and the consequences for workers of social institutions and customs such as caste and sexual discrimination in labor.

The A/D/C is grateful to the authors of this monograph for devoting their creative energies and hard work to organizing the Hyderabad conference and for following the conference up with this scholarly and thought-provoking contribution to the literature on labor and other factor markets in rural areas—a literature of which the many excellent conference papers have also become a part.

A. M. WEISBLAT

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Chapter 1

INTRODUCTION

In recent years the economic development literature has shifted its focus to the rural sector of developing countries. Attention has turned from outlining the macro process of economic development to attempting to understand the role of institutions as well as the behavior of individuals and families in rural areas. In part this shift reflects the fact that the bulk of developing country populations live in the rural sector. In addition, the recent generation of a large array of data sets—from intensive village studies to large-scale national surveys—along with advances in computer technology have facilitated more precise descriptions of these settings as well as provided the material that can be used to test assumptions, models, and hypotheses and thus to promote scientific progress.

The models and theories of the developing country rural economy that have evolved over the past thirty years have in general sought to do one of two things. Either they have tried to account for the existence of certain *stylized facts* that appeared to contradict the implications of competitive models, or they have attempted to provide the theoretical underpinnings for the assumptions that characterize the macro *surplus labor* models (Lewis, 1954; Ranis & Fei, 1961) that have dominated the development literature. Among the most popular stylized facts taken as data are (1) the coexistence of high unemployment and rigid wages, or discrepancies between the marginal product of labor and wage rates; (2) negative correlations between output per acre and farm size; and (3) the existence of share tenancy.

The papers presented at the A/D/C–ICRISAT Conference on Adjustment Mechanisms of Rural Labor Markets in Developing Areas, held in Hyderabad, India, in 1979, departed somewhat from the foregoing tradition.* These papers focused primarily on

*These papers, cited in the text by an author's name followed by "CP1979," are listed under "References" on page 61.

the determination of the earnings of individuals in rural sectors of South and Southeast Asian societies, societies who share certain characteristics yet vary sufficiently to provide the contrasts that help illuminate the more fundamental regularities of rural labor markets. Although the papers' approaches and perspectives varied widely, one of their unifying themes was the characterization of the extent to which markets for the important factors of production in the agrarian setting operate, in particular labor markets, according to the principles of the supply–demand, competitive model. A second theme was the exploration of the nature of the sometimes unique institutional features of rural markets—sharecropping, other contractual arrangements, or even "institutional" wage rates: Do these features represent barriers to the efficient operation of markets? Are they optimal, albeit second-best, responses to exogenous, technically determined constraints on markets (market failure)? Or are they reflections of collusive or otherwise exploitive power relationships? By examining the underlying causes of institutional arrangements and the way such arrangements vary across different rural economic environments, the conference papers addressed an important policy question: how flexible is the response of institutional arrangements, as well as of labor market wages and earnings, when there are fundamental changes in the supply of or demand for factors?

Much of the variation in rural wages and contractual terms examined in the conference papers covered periods of five to fifteen years. General theories of development such as those of Lewis or Ranis and Fei, however, are concerned with trends of real rural wages over a much longer term. Such general models are silent on the behavioral and institutional features of the rural sector. However, the wage determination and contractual choice theories of rural markets do not and cannot explain very long-term trends because they treat the structure of technology and the sectoral composition of output as fixed. These theories also largely ignore the determinants of reproductive processes and of the investments in human capital that underlie population growth and the growth and composition of the labor force. The conference out of which the present essay has evolved specifically excluded from its agenda these very important issues—issues on

which research must ultimately provide the linkage between the detailed, short-run models and evidence discussed here and a richer, general theory of economic development.

Although the conference in Hyderabad focused on the labor market, it is clear that employment and labor earnings are affected by characteristics of markets that do not directly involve labor. In a world of perfect markets for all factors of production (including credit and insurance), a person's annual income would simply represent the employment of his or her factor endowments valued at the market rate per unit. In such a world, the initial distribution of endowments among people—for given tastes and aggregate quantities of each factor—would uniquely determine the distribution of income among people. Moreover, production—total output—would be not only maximal but unrelated to the distribution of factor ownership. Production techniques would be identical on all farms facing the same market environment and operating the same quality of land; for example, because output and employment per acre would be unrelated to farm size, barring scale economies, productive efficiency could not be improved by a rearrangement of factor uses or distributions. To explain labor earnings in a world of perfect markets with a given distribution of endowments requires that one explain the returns to each factor (wage rates, rent), a task for which the competitive supply–demand model has proved a powerful tool. The failure of one or more markets, however, would have important implications for the distribution of earnings and productive efficiency and would probably mean that more complex models would be required to understand earnings determination. An important, unresolved question is whether such models can outpredict the simpler, competitive models when only some markets are imperfect or absent.

Attention to market failure, however, is important not only for understanding the determination of earnings and the achievement of productive efficiency. As we will discuss, and as many of the rural labor market conference papers suggested, it may also help us to understand the existence of and changes in the labor market's many and diverse institutional arrangements—different types of contracts and labor recruitment strategies and the interlinking of labor and one or more factors of production

within one transaction.[1] Indeed, because of the general nonindependence, or interrelatedness, of all factor markets, market failures anywhere in the rural sector may have a significant effect on labor market earnings or arrangements even if the market for labor operates perfectly. In these circumstances, explaining earnings requires information beyond the determination of wages and labor supply.

This monograph presents a critical review of the existing literature on labor and other factor markets in rural areas. In particular, we look at the various models and theories of labor markets and tenancy with attention to the issues of absent markets, market failure, collusive power, and the interdependence of markets. A central theme arising from the review of these models and theories is that an understanding of institutional arrangements or imperfections in any one market (e.g., the labor market) requires attention to the imperfections in or constraints on other markets (e.g., the land or credit markets). We do not attempt an impartial treatment of all perspectives but emphasize the major lines of thought and recent empirical studies that are closely related to the rural labor market conference. In addition, we discuss some important themes that we think the literature has neglected and, in concluding, we consider what, the conference papers and discussions may suggest for future work on rural labor markets.

[1]Braverman and Srinivasan (CP1979) define interlinked contracts as "transactions in more than one commodity or service made between the same pair of individuals and linked in an essential way" and add that "delinking the contracts would be infeasible or costly for at least one party" (p. 4).

Chapter 2

THE PEASANT HOUSEHOLD AND THE LABOR MARKET

The theoretical and empirical literature that deals with the employment of labor and the determination of wage rates in rural areas of developing countries has been shaped by concern with two major issues: How sensitive is aggregate agricultural output to the removal of agricultural laborers? and, Are there aspects of the rural labor market that bar the attainment of productive efficiency within agriculture? The first issue arises out of an essential assumption of some popular macro development models that, in the initial stages of industrialization, agricultural output will remain invariant in the face of the transfer of labor from agriculture to industry.[2] For the most part, the theoretical literature has focused on positing rural labor market structures and/or models of peasant behavior that could make this surplus labor assumption true. Similarly, the empirical literature has been concerned with testing the validity either of this development model's assumption or of those assumptions of the theoretical models of rural labor market behavior that were developed to rationalize the development model's assumptions.

Two basic lines of thought characterize the surplus labor models of rural agriculture. The first assumes that rural labor can be withdrawn from the agricultural labor market because there are large pools of unemployed or underemployed rural workers. The theoretical problem is to reconcile large-scale unemployment or under-utilization of laborers with a nonzero wage for labor. The second line of thought seeks to explain the assumed insensitivity of agricultural output to the number of available laborers by distinguishing between that number and total labor supplied; this approach focuses on the labor-supply behavior of the peasant household as well as on labor market structure.

[2]The literature on planning models and benefit–cost analysis of projects is also centrally concerned with the issue of the opportunity cost of withdrawing labor from agriculture.

Nutrition and Efficiency Wages

The most influential surplus labor model that explains the coexistence of idleness and constant wages is the nutritionally based efficiency wage hypothesis elaborated first by Leibenstein (1957) and later by Mazumdar (1959), Wonnacott (1962), Mirrlees (1975), and Stiglitz (1976). This model assumes that at low levels of income there is a technically determined, positive relationship between nutritional levels and labor effort per unit of time (or per laborer).[3] Given certain (weak) assumptions about the shape of the income–effort relationship, there is a unique wage—the *efficiency wage*—that minimizes the cost per unit of labor effort.[4] If farmers in surplus labor economies are to maximize their profits they must hire laborers until the marginal value product of total effort (or efficiency units) hired is equal to the efficiency wage. In such a setting some workers will be left unemployed. They may be willing to work at a wage lower than the efficiency wage but, owing to the reduction in effort associated with lowered wages, it is not profitable for farmers to hire them no matter how much wages per unit of time are bid down. Given profit maximization, large numbers of laborers relative to the amount of land, and the assumed (nonbehavioral) relation between level of nutrition and effort, it is clear that unemployment and positive—even high—wage rates will coexist. Moreover, removal of laborers from this system will affect neither output nor wage. If, of course, the marginal value product of the last laborer hired exceeds the efficiency wage and no more idle laborers are available, the wage rate will rise and the conventional supply–demand framework will pertain.

The problem with the profit-maximizing nutritional wage version of the efficiency wage model, of course, is that in conditions of abject poverty, the unemployment equilibrium described cannot be long run, for unemployed workers will have no means of survival. Two additional assumptions must thus be made to avoid a Malthusian result. Leibenstein (1975) assumes that, because of social pressures, landlords will collude to lower wages, *sacrific-*

[3]As Bliss and Stern (1978) stress, a relationship that is not technical is almost impossible to test empirically.

[4]The theory assumes that labor can be measured in efficiency units. As Binswanger (1978, Appendix 5-1) has pointed out, this may not be possible when there are more than two factors of production.

ing profits and total output in order to support more people in the economy. He thus provides a rigorous definition of underemployment, if not a realistic model of the rural economy: those additional people who obtain wage work as a result of the collusive wage reduction below the profit-maximizing (efficiency wage) level are underemployed in the sense that their transfer out of agriculture would not lower output. Stiglitz achieves the same result by assuming that family farms have egalitarian concerns about the consumption of family members, but his model does not consider what happens to wage workers with no land.

In both versions of the nutritional wage theory (because at any given time consumption determines labor effort supplied to work), utility maximization and profit maximization are incompatible. Equalizing consumption among workers (Leibenstein) or between workers and nonworkers in the family (Stiglitz) lowers effort and thus profits. Moreover, in both models the subtraction of laborers actually *increases* output since average consumption, and thus total effort, rises. As a result, the marginal product of labor is negative even though wages are positive.

Another way to deal with the issue of the possible starvation of unemployed, landless workers is to assume that the unemployed have a fall-back option in self-employment activities—for example, hunting, gathering, or nonagricultural enterprises like mat weaving—that assure them survival at a lower utility than the agricultural wage. Such a model can indeed account for the coexistence of unemployment and a positive wage. However, because the marginal product of unemployed workers must be positive, they cannot be withdrawn to the industrial sector at zero cost. Furthermore, the supply of such workers will not be infinitely elastic at a wage equal to their marginal product in hunting and gathering: limits on the hunting and gathering grounds will imply that withdrawal of some of the self-employed will lead to a higher marginal product, in self-employment, of the remaining workers.

The third means of "saving" the nutritionally determined efficiency wage model is to assume that it holds seasonally (Rodgers, 1975). During times of the year when labor demand is very low, the efficiency wage is the floor below which wage rates do not fall despite high (seasonal) unemployment. At other times, when labor demand is relatively high, the conventional supply–

demand framework holds. Based on a careful review of the nutrition literature, however, Bliss and Stern (1978) conclude that the technical relationship between nutritional intake and effort must be weak over short periods of time because the human body stores nutrients. It is unlikely, therefore, that a nutrition–effort association has any bearing on daily wage contracts. Furthermore, restricting the nutritional wage theory to slack-season labor market phenomena clearly limits its empirical importance and, in the absence of estimates of the relationship between technical wages and the nutrition–effort ratio makes it more difficult to detect its relevance. Empirically, year-long open unemployment appears not to be a marked phenomenon in rural labor markets (Hansen, 1969; Paglin, 1965; Rosenzweig, 1980). However, the absence of such open unemployment would seem consistent both with some versions of the efficiency wage model and with conventional competitive, market theories.

Rodgers (1975) has attempted the most ambitious tests of the nutritional wage framework, exploiting one of the theory's implications not emphasized by its advocates, namely, that employers will pay attention to workers' actual consumption. Thus, workers with dependents will need higher nutritional wages than unattached workers. Similarly, workers from landed households—households with rental income from land—would be better fed than landless workers and thus would supply the same effort as the latter but for a lower wage.[5] Rodgers finds that in the group of Bihar villages from which he has data, average wage rates for the *area* are higher where households are primarily Moslem, that is, where women tend not to be workers. Although this evidence is consistent with the notion that employers pay higher wages to males who have more dependents, it is also predicted by the supply–demand model in which male and female laborers are substitute factors in production. Rosenzweig's (CP1979)

[5]Bliss and Stern (1978), however, show that this prediction holds only for two regions with separate labor markets. In one such region all workers have land; in the other all workers are landless. If landless and landed workers coexist in the same region, the prediction is ambiguous. Furthermore, Bardhan (1979c) builds a model in which no nutritional efficiency relation exists but in which monopsonistic employers face recruitment costs (which are themselves a position function of the unemployment rate). If appropriate assumptions are made about recruitment cost differences among workers, Bardhan's model makes the same prediction about wage differences among workers as does the nutrition theory. His model is one example of the situation in which an efficiency–wage relation arises out of nonnutritional considerations.

study of Indian district-level data based on a supply–demand framework indicates that both male and female wage rates in agriculture are higher where Moslem households are prevalent. The hypothesis of *individual* heterogeneity in wages as a function of land ownership or number of dependents is rejected in Rosenzweig (1980). The hypothesis is also inconsistent with the uniformity of wages for daily paid adult workers found (for a given sex and operation) by Bardhan and Rudra (1981) in West Bengal villages, by Binswanger et al. (CP1979) in semiarid India, and by White and Makali (CP1979) in West Java villages.

Rodgers also points out that the nutritional wage theory might account for labor tying arrangements if effort is a function of sustained nutritional intake. But long-term employment contracts that exceed a few weeks are not very common in the South and Southeast Asian context (Bardhan & Rudra, 1981; Binswanger et al., CP1979; White & Makali, CP1979). When such contracts are entered into they seem to relate to the demand for specialized skills on an assured basis—such as bullock driving or herding—and to workers' need for credit and problems of adequate collateral (Bardhan & Rudra, 1981; Bhalla, 1976; Binswanger et al., CP1979). Moreover, nutritional considerations cannot explain the absence of long-term contracts for female workers.[6] Given the generally lower wage rate for women, nutritional considerations should apply to them as well as to men.

Efficiency wage relations, when based on other than nutritional grounds, have been applied primarily to the nonagricultural sector. Can such relations be applied to agriculture as well? With workers of equal productivity, the efficiency wage relation could be based on *morale* effects, whereby workers receiving higher absolute wages put forth more effort. In such a model, survival of unemployed workers could be assured if employed workers from landless households shared their incomes with unemployed household members; in this case, however, the efficiency of the worker would not depend on his or her own nutritional intake. To our knowledge, the only efficiency wage model that can account for both the coexistence of unemployment and

[6]Bhalla (1976) notes an exception in Haryana where, after the green revolution and the advent of substantial wage and income rises, women were also offered longer term contracts. But this finding clearly cannot be attributed to the wage–nutrition relationship.

positive wages and a zero cost of withdrawing labor from agriculture is based on such a morale effect of absolute wage levels on effort. However, this model has not been subjected to careful theoretical or empirical analysis and may be untestable.

In particular, an absolute morale–wage relationship has been simply postulated, rather than derived from theoretical reasoning or empirical observation. It might be equally "reasonable" to postulate morale relationships where effort depends on relative wages among different classes of workers or among different seasons. Clearly, such versions would have implications that would differ from those of the efficiency wage theory based on absolute wage levels. The fact that the precise way in which morale effects arise has a strong impact on model predictions and testability can be illustrated by two more nonagricultural models that lead to a relationship between wages and efficiency and thus to the coexistence of unemployment and positive wages. These models involve *labor turnover* and *information constraints*. The labor turnover model (Stiglitz, 1974b) is based on the notion that firms paying higher wages have lower labor turnover. Thus raising wages from a low level could initially reduce turnover sufficiently to also reduce efficiency labor cost. However, in agriculture most labor is on a casual or daily basis (Binswanger et al., CP1979; White & Makali, CP1979); for casual labor to be so important, the costs of labor turnover must necessarily be low. As a result, the turnover model would appear to have limited applicability in agricultural labor markets.

A second model of an efficiency wage relationship is based on the possible screening function of wages (Weiss, 1980). If laborers are heterogeneous—that is, if they have different levels of inherent efficiency—high quality workers should have high opportunity costs in some self-employment activities, whereas low wage workers should have low opportunity costs. Thus at very low wages, the pool of applicants consists of only the lowest quality workers. As wages rise to progressively higher levels, the pool will start to contain workers of higher quality. If firms have no way of distinguishing between high and low quality workers and of paying them accordingly, they will draw at random out of the applicant pool. Raising wages produces a work force of higher quality, which brings us back to the predictions of the efficiency wage theory. In a peasant agricultural setting, where

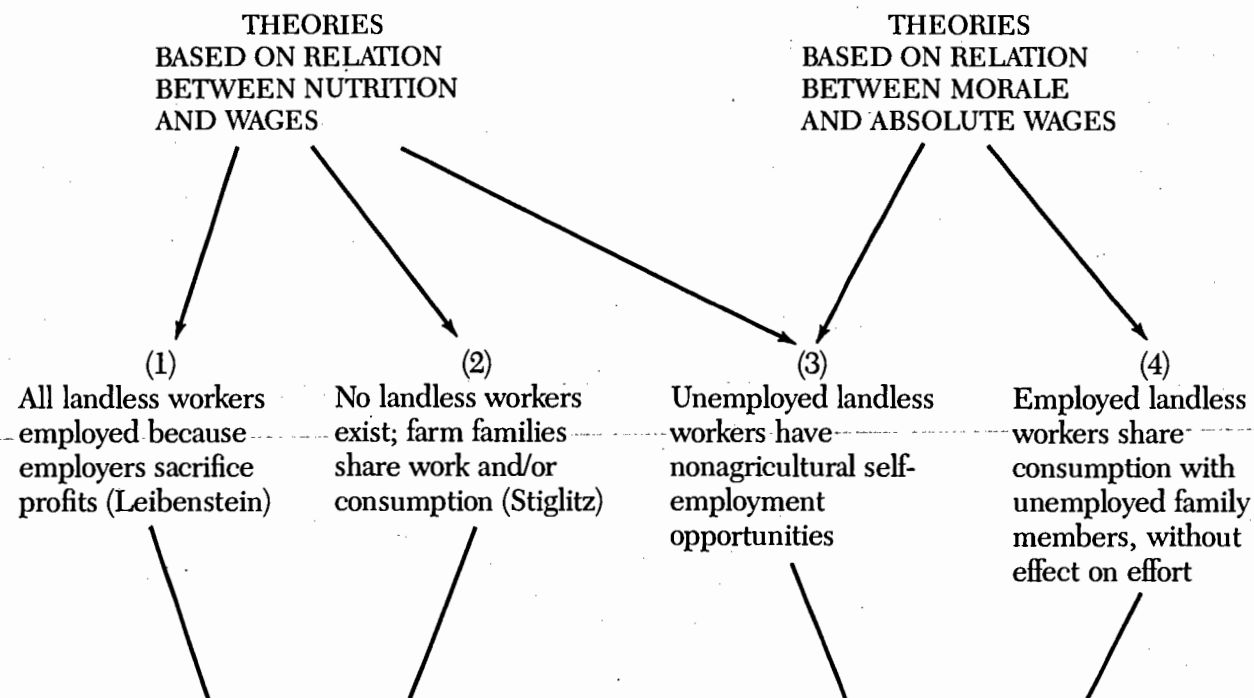
labor is largely casual, the model is difficult to apply since information about the quality of laborers resident in the village accumulates over time and is widely shared. Moreover, information can be acquired at low cost: a worker can be hired for one day only. Note that in this model, unemployed (but self-employed) workers also have a positive marginal product and thus cannot be withdrawn from rural areas at zero cost. In the second major section of this paper we will examine a similar model, by Newbery and Stiglitz (1979), based on screening of potential tenants.

The assumptions and implications of the nutrition and morale versions of the efficiency wage hypothesis are summarized in Figure 1. Note that the turnover and screening versions are unlikely to apply in a peasant agricultural setting and are therefore not included in the figure. Columns 1 and 2 represent the nutritional wage models of Leibenstein and Stiglitz. Both of these models rely on either landlord or worker altruism to achieve equilibrium. This equilibrium is characterized by underemployment rather than by open unemployment, and rural output increases as rural labor is withdrawn. When efficiency wage relations are justified on nutritional grounds, an equilibrium with excess applicants can exist only if the landless unemployed have some nonagricultural self-employment opportunities in the rural areas that can prevent them from starving (see column 3). If the efficiency wage relationship is based on morale effects, however, the landless unemployed can either rely on such self-employment or share in the consumption of their employed family members (see column 4). The latter is not possible under the nutritional wage version without a loss in output.

Excess-applicant equilibrium is possible in the variants of the efficiency wage hypotheses shown in columns 3 and 4 of Figure 1. However, it is only in the morale–wage model with sharing (where morale effects depend on absolute wage levels—see column 4) that rural output (agricultural and nonagricultural) is invariant in the face of the withdrawal of workers. Thus the latter is the only true labor surplus model.

No variant of the nutrition–wage model is likely to describe the behavior of rural wages or employment in Asia because nutritional intake is unlikely to affect effort appreciably in the

Figure 1. Major Efficiency–Wage Theories and Surplus Labor in Agriculture



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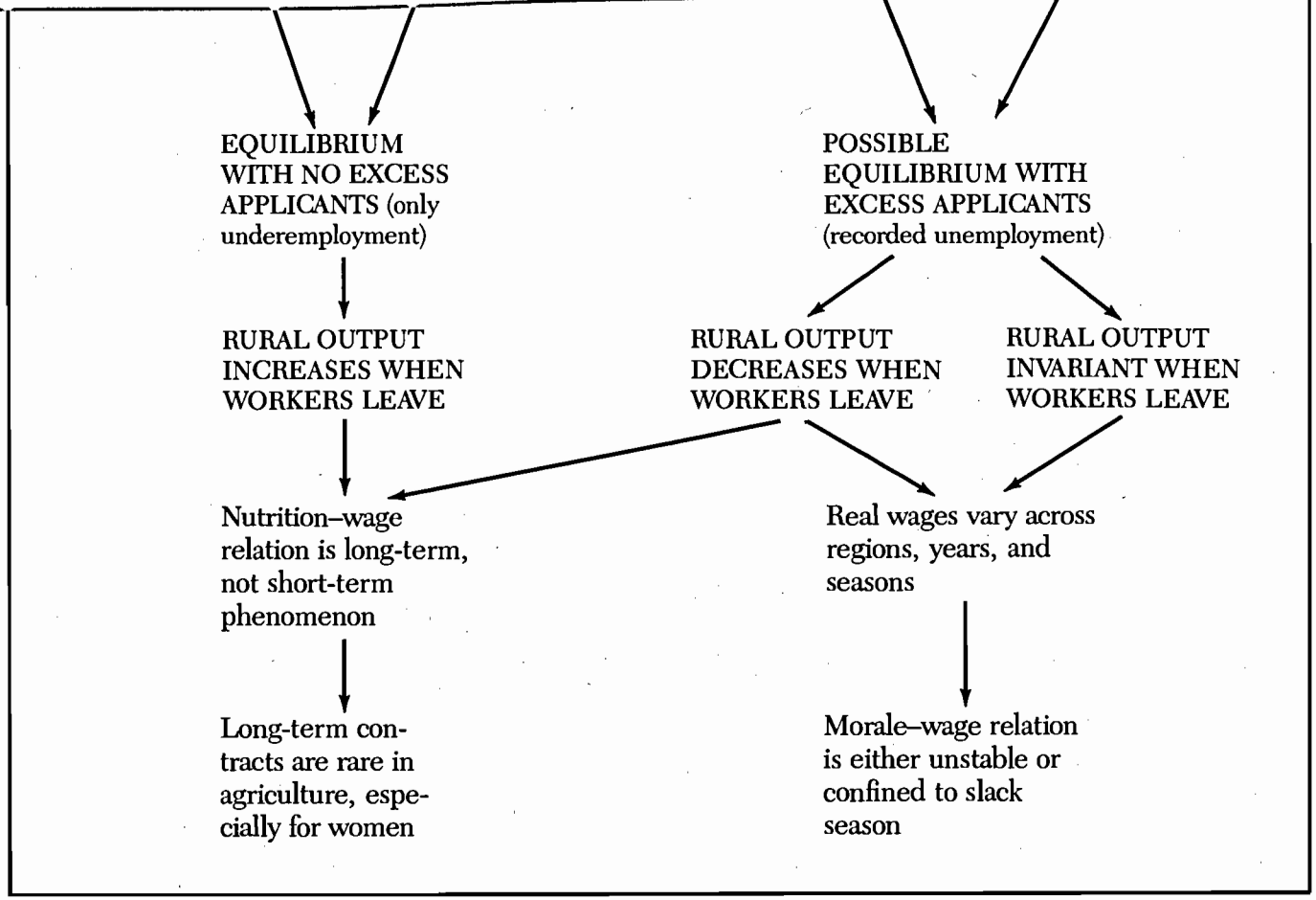

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short run and, particularly in the case of female labor, only short-term (daily) labor arrangements are common.

As we will see in the next section, incentives to greater effort can be provided to workers through a variety of sharing contracts rather than simply by means of an absolute wage. Furthermore, the wage–morale–effort relation is very difficult to detect. Since wages vary sharply across seasons, this relation either is not stable or applies only to the slack season. If the relation is unstable the question becomes, What factors determine the relation at any time? Unless such factors have a stable impact on the relation, the theory is untestable and/or useless.

Our review suggests that major empirical facts remain poorly understood. By standard definitions, open unemployment is a reality in rural areas even though year-round unemployment rates appear to be low. However, seasonal unemployment rates are often much higher. Such rates also appear to vary substantially over the course of the year and to be inversely correlated with observed wage rates (Krishna, 1976; Ryan & Ghodake, CP1979). The partitioning of the effect of seasonal variation in labor demand into adjustments of wage rates and of unemployment rates cannot yet be understood or explained by any of the theoretical frameworks proposed.

Labor Supply and Market Structure: The Duality Hypothesis

The alternative route to rationalizing the possibility that agricultural laborers will have a zero marginal product requires distinguishing between labor time supplied and laborers. If the withdrawal of one family member (always or on average) leads other family members to increase their work such that total work supplied equals that formerly supplied by the family, total output will remain constant. Thus the marginal product of labor time can be positive while the marginal product of an individual laborer is zero. Lewis (1972) evidently subscribes to this view. The theoretical issue then is, What model of the peasant *family* could account for this behavior? The empirical focus is on family labor supply determinants.

Following a long tradition of models of peasant farm families (see Chaynov, 1966), Sen (1966) proposes a model in which the

family unit consists of workers and nonworkers who jointly maximize a family welfare function that contains, as arguments, each worker's leisure time and each family member's consumption. The family owns a fixed plot of land. Farm output and income are a function solely of total family labor time; family labor time cannot be sold in the market nor can labor time be purchased. Assuming separability of the family utility function, Sen shows that when the number of workers is reduced, farm output remains invariant only if the marginal utilities of both consumption and leisure are constant in the relevant range so that the marginal rate of substitution between leisure and consumption is a constant.

Although the Sen conditions may or may not be plausible, it is important to note that they pertain to a farm household totally isolated from the labor market; indeed, the model assumes the absence of any rural labor market whatsoever. For households in which (identical) family members work for wages, however, the marginal rate of substitution between leisure and consumption is equal to the market wage rate; the latter varies independently of the individual household's behavior. Sen's condition that marginal utilities of leisure and consumption remain constant would thus lead to an indeterminate solution within the relevant range for a household with wage workers.

The inapplicability of the Sen conditions to households with wage earners—or in economies in which all households participate in the labor market—illustrates the importance of carefully choosing assumptions about the rural labor market in predictions of peasant behavior, not the impossibility of completely compensating family labor supply behavior. Such compensation can arise in standard utility maximizing household models. For example, in a landless household that consists of identical workers with dependents (nonworkers), reducing the number of family members (or the work time of one family member) will reduce the income (consumption) of every member but not the real value of time, which is the cost of leisure relative to the price of goods. In this case, remaining workers will compensate according to the magnitude of the income effect on leisure, which is entirely an empirical issue. On the other hand, in a model with nonidentical wage workers (males and females, for example), it can easily be shown that the response of male (or female) work time

to an exogenous change in female (or male) work time is equal to the ratio of the cross-compensated wage effect to the own-compensated wage effect. That is, the direction of response depends on whether male and female leisure time substitute for or complement one another in the family welfare function. Both United States labor supply studies (Schultz, 1980) and Rosenzweig's (CP1979) Indian study suggest that this cross wage effect on labor supply is negative. Thus the creation of nonfarm employment will result in an increase in the agricultural work time of opposite sex family members; that is, some compensation takes place. However, none of these studies—nor Barnum and Squire's (1979) recent study, which assumes that family members are identical—indicates that family labor supply response will fully compensate for a reduction in the family labor force.

Sen's assumption of nonparticipation by households in the labor market, if true, has a number of other important implications. First, among households with identical plots (size and quality) of land, the marginal product of labor will differ according to households' preference orderings and demographic structure. In the absence of a well-developed market for land, these differential, "subjective" equilibria will be inconsistent with the achievement of productive efficiency. Second, among households that cannot trade labor, increases in the price of output can lead to reductions in time worked (the dominance of the income effect) and thus in output supplied. This situation contrasts with that of the well-functioning market for all inputs (including labor), in which the price elasticity of output on individual farms must be positive.

If large farm households can participate in the labor market while small family farms cannot, as long as the land rental market is also absent a *dualistic* agricultural economy results. This extreme dualistic assumption—that some farms maximize profits and utilize hired landless laborers whereas other, small farms use only family labor and do not participate in the agricultural labor market—is neither a necessary nor a sufficient condition for surplus labor. However, it is a popular explanation for the well-documented observation that small farms employ more labor per acre than large farms. (For a recent review of the literature on the latter point, see Rudra & Sen, 1980.) In this model, the cost of labor (wages) to big farms is likely to exceed the

marginal rate of substitution between leisure and goods on isolated, small farms. As Sen points out, however, equilibrium in this "strong" version of labor market dualism requires the additional assumption that there be no transactions in land, since large landowners could increase their profits by leasing small plots of land to families, taking advantage of families' low opportunity cost of labor. Given the failure of two markets, land and labor, a dualistic agricultural structure clearly is inefficient. The empirical evidence, as presented by Paglin (1965) for India and Hansen (1969) for Egypt and as confirmed by almost all the empirical studies reported on at the rural labor market conference, strongly rejects this extreme form of dualism in the Asian context. Members of small farm households appear to participate substantially in the labor and land rental markets as both buyers and sellers.

Given the pervasive evidence on interfarm labor mobility within labor markets, more subtle hypotheses—which we will characterize as representing "weak" dualism—have been put forward to account for size differentials in output per acre in terms of labor cost discrepancies across large and small farms. The argument is that, given the uncertainty of agricultural production, employers of labor or sellers of labor from small farms (who may be the same persons) will be unwilling to make large future labor commitments; there appears to be only a limited market for contingent labor contracts (Bardhan & Rudra, 1981). As a result, most labor is hired on a daily basis. Moreover, as Binswanger et al. (CP1979) and White and Makali (CP1979) have shown, because of interfarm differences in the timing of operations, workers work for many employers during the year. Transaction costs associated with job search are thus quite high in the casual labor market, and there is substantial resorting of employers and employees each day. It is thus not surprising if the probability of finding employment or finding enough laborers on any given day is not equal to one. On small farms where people are primarily sellers of labor, days when workers cannot find market employment may be spent working on the land, up to the point where the marginal value of the utility of leisure, rather than the market wage, equals the marginal product of labor effort. On large farms, on days when not enough laborers can be found at the market wage rate, the marginal product of

labor will exceed the market wage. Owing to these frictions—or transaction costs—in the labor market, therefore, over the year the marginal product of labor can be lower on small farms than on large ones.

An important contribution made by the papers presented by Ryan and Ghodake (CP1979) and P. Bardhan (CP1979) at the Hyderabad conference is the computation of unemployment probabilities for wage labor. These researchers found that the proportion of working days on which sellers of daily agricultural labor reported that they could not find wage work was 13–14 percent for male workers. (For female workers, included in Ryan's study, the figure was 21 percent.) Bardhan (1979b) also reports evidence that the probability of wage employment tends to influence the market participation behavior only of women, not of men. Ryan & Ghodake (CP1979) have constructed a direct test of the "weak" dualism hypothesis—the hypothesis that average opportunity costs of labor are greater on large farms than on small ones, where this cost for the small farm household is assumed to be the product of employment probability and wage. They find mixed results for male labor but confirmation for female labor because of the latter group's greater measured involuntary unemployment.

The phenomenon of frequent job matching and associated transaction costs is, of course, only one of the ways in which the rural labor market may depart from the perfectly competitive model. Others, consistent with the weak dualistic or *wage gap* assumption, are prejudice against wage employment—small farmers may "dislike" such employment, and there may be social pressures against it among certain groups or castes—and employer costs of supervising hired workers. The latter is akin to scale diseconomies if one assumes that hired workers are used only if family labor time is insufficient to drive the marginal product down to the market wage. Again, however, the inefficiencies associated with these labor market imperfections could be circumvented if the market for land were functioning perfectly. Indeed, as we will discuss later, a major motivation for sharecropping is the problem of supervising hired labor (in the absence of a land *sales* market).

In summary, we note that strong dualism—that is, the absence of a rural labor market—is not necessary to achieve the

labor surplus result of the Sen model. Maximizing models of the farm household in a perfectly competitive market setting can lead, theoretically, to fully compensatory labor supply behavior. The issue is entirely an empirical one, and the estimates by Rosenzweig (CP1979) and by Barnum and Squire (1979) indicate less than full compensation. Thus neither strong nor weak dualism is either necessary or sufficient to yield the surplus labor result. Either assumption leads only to divergent opportunity costs of labor and therefore to differential factor use across farm sizes. Although there is little evidence to support strong dualism, both strong and weak dualism must assume that the land rental market contains at least some imperfections. As we will see, the tenancy literature that we discuss next addresses this topic.

Chapter 3

TENANCY, SHARECROPPING, AND OTHER CONTRACTUAL ARRANGEMENTS

The literature that we have just reviewed, on the determination of wages and employment, takes the distribution of land as exogenously given—that is, it assumes that the sales or rental market for land is absent. In the rural economy, however, it is a fact that some labor is combined with land, not by the temporary sale of labor services but by the temporary acquisition of land. It is clear that the terms and arrangements associated with the market for land have a significant effect on the earnings of rural households and the production of aggregate output. Four of the papers presented at the recent rural labor market conference—two theoretical (Braverman & Srinivasan, CP1979; Jaynes, CP1979) and two empirical (Jodha, CP1979; Roumasset, CP1979)—are part of a rapidly expanding literature on contracts that combine labor (and/or other factors of production) with land when certain factor markets are absent or incomplete. In general, the many theoretical models this literature proposes focus on two primary issues: First, what are the efficiency characteristics of a contract that provides laborers with a share of total agricultural output, an important contractual arrangement in the rural economy? Second, how do the welfare levels or earnings of such sharecroppers compare with those of laborers who work only for wages—that is, what determines the contractual terms?

Recent Tenancy Models[7]

If the sales market for land is absent or involves very high transaction costs, landowners can hire all cooperating factors of production, including bullocks and management, in quantities that are optimal for their own land. Landowners can

[7]For other reviews of the literature discussed in this section see Bell and Zusman (1979), Newbery and Stiglitz (1979), and Bardhan (1980).

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then rent out any nonland factors owned that are in excess of these optimal quantities. Productive efficiency—that is, equal factor ratios on all farms with land of equal quality—can still be achieved. Thus the absence of a sales market for land is not sufficient to force the use of tenancy. However, the institution of tenancy and the market for tenancies do substitute for the sales market. When there are no scale economies, at least one other factor market must be absent before the temporary rental of land becomes a necessary tool to achieve the most efficient factor ratios for all factors of production and all agents. The absent or incomplete markets (which involve high risks or high transaction costs) may be those for insurance, family labor, bullocks, or managerial skills.

Beginning with Adam Smith, economists have long been occupied with the question of whether sharecropping, one form of tenancy, is a productively efficient system of cultivation as compared with either self-cultivation with the help of wage labor or fixed rent tenancies. The classical economists, including Marx, understood sharecropping as an adjustment to the absence of markets or to market failure—in particular, the markets for credit and capital. Within a setting of imperfect markets, and on the premise that it is difficult to supervise labor, these economists viewed sharecropping as an improvement over wage labor because of its positive incentive effect. Because they share in the output, workers have an incentive to provide more labor than they might provide under a wage contract unless supervised very closely. The classical economists also recognized, however, that sharecropping provides the workers with less incentive to work than a fixed-rate tenant or an owner-cultivator would have. As discussed formally in Marshall's famous footnote, on an exogenously given area of land and with a given share of output, the worker receives only a fraction of his marginal product, that fraction being equal to his or her share. (As Jaynes, CP1979, shows, Marshall's theory of sharecropping was a complete classical theory, and the footnote illustrates only the incentives problem.) The classical economists also understood that the same incentives problem applies to all other inputs and especially to long-term investments in land quality. As a result, they

regarded the long-term tenancy at a fixed rate as a superior system to sharecropping if a country's or region's level of development permitted it.

Cheung's (1968, 1969) work set the stage for the recent sharecropping literature in terms of the major reasons for share tenancy and the major issues to be addressed. His work both attacked the negative efficiency (incentive) implication of sharecropping and broadened the scope of inquiry of the sharecropping literature to include discussion of the manner in which size of tenancy and share of crop are determined. All writers from Cheung onward have regarded both tenancy size and share level as endogenous to a particular model, while they have taken the wage rate as exogenously given. Contractual terms, but not the wage rate, are thus determined by economic forces, and the equilibrium solution to the contract choice problem involves maximization by both landlord and worker. The worker's equilibrium requires that "of the set of contracts available in the economy, there [exist] none which the individual worker prefers to the one which he has" (Stiglitz, 1974a, p. 222). And landlord equilibrium implies that "there exists no subset [of the available contracts] which the landlord prefers to the subset which he employs" (ibid.).

Cheung also assigned *risk* and *risk aversion* a much larger role in determining share tenancy than others have accorded them. He did not include them, however, in his formal model. Clearly, under a wage labor system all the risks of cultivation are borne by the owner–cultivator; owner–cultivator income is the residual after payment of production costs at fixed wages. Under a fixed-rate tenancy, tenants bear all the risk since their income is the residual after payment of a fixed rent. Under share tenancy, however, the risk is divided between tenant and owner in proportion to the crop share of each.

As Jaynes (CP1979) has shown, however, Cheung's model achieves its efficiency outcome because it simply assumes away two problems—the negative incentives of sharing and the difficulty of monitoring effort. If these problems did not exist, we would not observe share tenancy. Thus Cheung must indeed introduce risk, risk aversion, and transaction costs in order to explain the existence of the contracts his

formal model explores under conditions in which such sources of market imperfections do not exist.

With respect to risk aversion motivation for sharecropping, Newbery (1975b) and Reid (1976) have shown that, with constant returns to scale, sharecropping provides no risk-sharing benefits that landlord and worker could not achieve by dividing a plot of land "into two subplots, one of which is rented out at a fixed rental R and the other is operated by the landlord who hires labor at a wage W" (Newbery & Stiglitz, 1979, p. 314). Thus a model in the Cheungian tradition—that is, one without problems of worker incentives—does not explain the existence of share tenancy, even in the presence of production risk and risk aversion. Sharecropping can, however, be a means of risk avoidance under more complex characterizations of risk. Newbery and Stiglitz (1979) have demonstrated that with a second independent source of risk, such as wage rate risk in the labor market, share contracts are superior to a mixture of wage and fixed-rent contracts. If there are no incentive (monitoring) problems or economies of scale but there are multiple sources of risk, the sharecropping contract acts as the necessary instrument to achieve productive efficiency; that is, it prevents rather than creates an inefficient allocation of resources.

Another class of tenancy models focuses on the costlines of labor supervision as a cause of sharecropping—the *Marshallian inefficiency.* One of Stiglitz's (1974a) models assumes costly supervision: the landlord sets the size of the tenancy just like the share, taking into account the impact of tenancy size on the tenant's input decision. The landlord can prevent the tenant from renting any other land or from working for wages, or he can include these restrictions in the contract and monitor and enforce them.[8] The landlord thus has an extra

[8]Bardhan and Srinivasan (1971) developed a similar model, but they did not allow the landlord to control tenancy size. Newbery (1974) has pointed out that in their model, with incentive effects, full employment equilibrium could not exist since tenants would attempt to rent land until its marginal product was zero; that is, there would be excess demand for land. Braverman and Srinivasan (CP1979) show that in Stiglitz's model, when landlords cannot control plot size there may in fact be an optimal share level that elicits the level of effort at which landlord profits are maximized but that gives sharecroppers a higher utility level than in the labor market. Just as in the efficiency wage models, therefore, an equilibrium with excess supply of tenants may exist.

control instrument and can, by means of maximization, control the contractual terms in such a way as to limit the tenant to his or her reservation utility—that is, the wage rate. Of course, given the effort monitoring problem, productive efficiency cannot be achieved in this model.

Braverman and Srinivasan (CP1979) have extended the Stiglitz model of costly supervision so as to allow tenant and landlord to engage in a simultaneous share-cum-credit contract, the credit being used for the tenant's consumption. Such a tied contract becomes superior to an untied contract if the landlord has access to credit from third parties at lower rates of interest than the tenant can obtain. The landlord sets four contractual terms: crop share, tenancy size; rate of interest to be charged the tenant, and proportion of credit requirements that the tenant borrows from the landlord. Given that the landlord has two extra instruments available, the landlord can almost always hold the tenant to the utility level the latter would obtain as a wage laborer. As a result, policies like tenancy reform or provision of credit to tenants at lower than market rates cannot improve the tenant's utility level. Nothing less than land redistribution, intervention in several markets, or rising alternative wage levels can improve tenants' welfare.

In the models discussed, costly supervision arises because of imperfect information. Information is asymmetrically distributed between landlord and tenant because only the tenant can know how much effort he or she will provide; the landlord cannot know this at sufficiently low cost. And a central planner, who shares the landlord's lack of information, cannot improve on the existing allocation. Such improvement can be achieved only if the central planner has cheaper means of monitoring effort than the landlord, which, in agriculture, is not likely. Alternatively, the central planner will have to redistribute land to tenants in order to overcome their inability to buy land in the land market, which inability has led to their status as tenants. Such a policy, however, will also improve efficiency in a decentralized economy. As long as the underlying constraints on information or land transfer remain in place, the share tenancy equilibrium achieved is optimal with respect to these constraints; that is, it is a second best optimum, relative to the set of informational constraints assumed in the model. This point is an important recurrent theme in the literature.

A problem that the models we have discussed so far fail to address explicitly is the coexistence in the same region of all forms of contracts: owner cultivation, share contracts, and fixed rent contracts. Moreover, *tenancy ladders* appear to be important in both developed and developing countries: workers first become sharecroppers, then fixed-rent tenants, and finally acquire land of their own. (For a discussion of this phenomenon in the United States, see Reid, 1979.)

There are three explanations for the coexistence of tenurial contractual arrangements: (1) differences in risk aversion; (2) screening of workers of different quality, and (3) market imperfections for inputs other than labor. But differential risk aversion cannot account for the tenancy ladder, since there is little reason to expect the same person to become completely risk neutral as he or she becomes older, even if the person accumulates assets. (According to Binswanger, 1980, Sillers, 1980, and Walker, 1980, complete risk neutrality appears to be extremely rare among rural populations in developing countries.) It must be recognized, therefore, that workers differ in other respects, such as ability, management skills, and capital endowments.

If productivity per hour of work differs among otherwise homogeneous workers but the productivity differences are known only to the workers and cannot be observed by the landlord without cost, landowners or workers face a screening cost.[9] In this case, Hallagan (1978) and, independently, Newbery and Stiglitz (1979) have shown that the choice of contract conveys information about workers' perception of their abilities. "Individuals who believe they are most productive [as workers] will choose the rental contract; individuals who believe they are very unproductive will choose the wage contract and those in between will choose the share contract" (Newbery & Stiglitz, 1979, p. 323). Each class of workers prefers its respective contract. Utility levels for the more able workers are higher than the levels they could achieve in a labor market without screening. Again, since information is asymmetrically distributed between landlord and workers, productive efficiency cannot be achieved. The implicit screening by means of contract choice again represents

[9]This problem is similar to that found in screening models in the wage labor market, which can result in an efficiency wage relationship for average worker quality. Here, however, the screening instrument is a contract with complex terms, not a wage rate.

a second best improvement in efficiency over the situation without tenancy contracts. This model leads to coexistence of contracts but not to a tenancy ladder unless workers move to higher efficiency classes as they grow older. (Note that the model considers only one type of efficiency—that of raw labor. Managerial efficiency is more likely to increase with age, however.)

The clearest route to the tenancy ladder, the social differentiation of laborers, and different types of tenants is through absent markets or imperfect markets for inputs other than labor. Indivisibilities of inputs lead to economies of scale, and Newbery and Stiglitz (1979) point out that economies of scale can make sharecropping attractive in the absence of incentive effects, if there are risks in production. Indivisibilities arise in the case of bullocks or other capital equipment if rental markets are deficient. Bullock rental markets may be absent or poorly developed if there is lack of flexibility in the timing of bullock operations, such as seeding.[10] Such inflexibility makes reliance on rented bullocks too risky. Indivisibilities may also arise in management skills, as in the case of the Bell–Zusman models (we consider their most recent, 1980 model later), in which landlords can get access to tenants' managerial skills only be renting land to them.

Credit market imperfections constitute the third major explanation for the coexistence of different contractual arrangements and are built into a capital rationing model without incentive effects by Jaynes (CP1979). In Jaynes's model, each contractual form (wage cultivation, sharecropping, or fixed-rent tenancy) requires a fixed amount of the landlord's supervisory time for each unit of land allocated to the contract in order to overcome incentives problems. Nevertheless, imperfect markets lead to the possibility of co-existence of all forms of contracts and, because tenants and landlords have varying factor endowments, to a differentiation of the terms of contracts among different tenant–landlord pairs. In sharp contrast to models where tenants are not differentiated by labor skills, untradable management skills,

[10]Bliss and Stern (1981) attribute the existence of sharecropping in the North Indian village they studied largely to imperfect bullock markets, and they show that bullock ownership is an essential requirement for renting land. Jodha (CP1979) confirms this for semiarid India by showing that tenancy is closely associated with the equalization of bullock/land ratios across farms studied. Bhalla (1976) shows that Haryana villages distinguish between tenancies and other long-term labor contracts paid by a crop share on the basis of whether the laborer or the landlord provides the bullocks.

or capital endowments, the models with differentiated labor describe the welfare level of tenants as no longer the exogenously given reservation utility level offered in the wage labor market. Different forms of contracts are available to different people because they allow them to make better use of their unique endowments, which (because of market imperfections) could otherwise be used only in a less efficient way. Thus contracts improve tenants' utility levels.

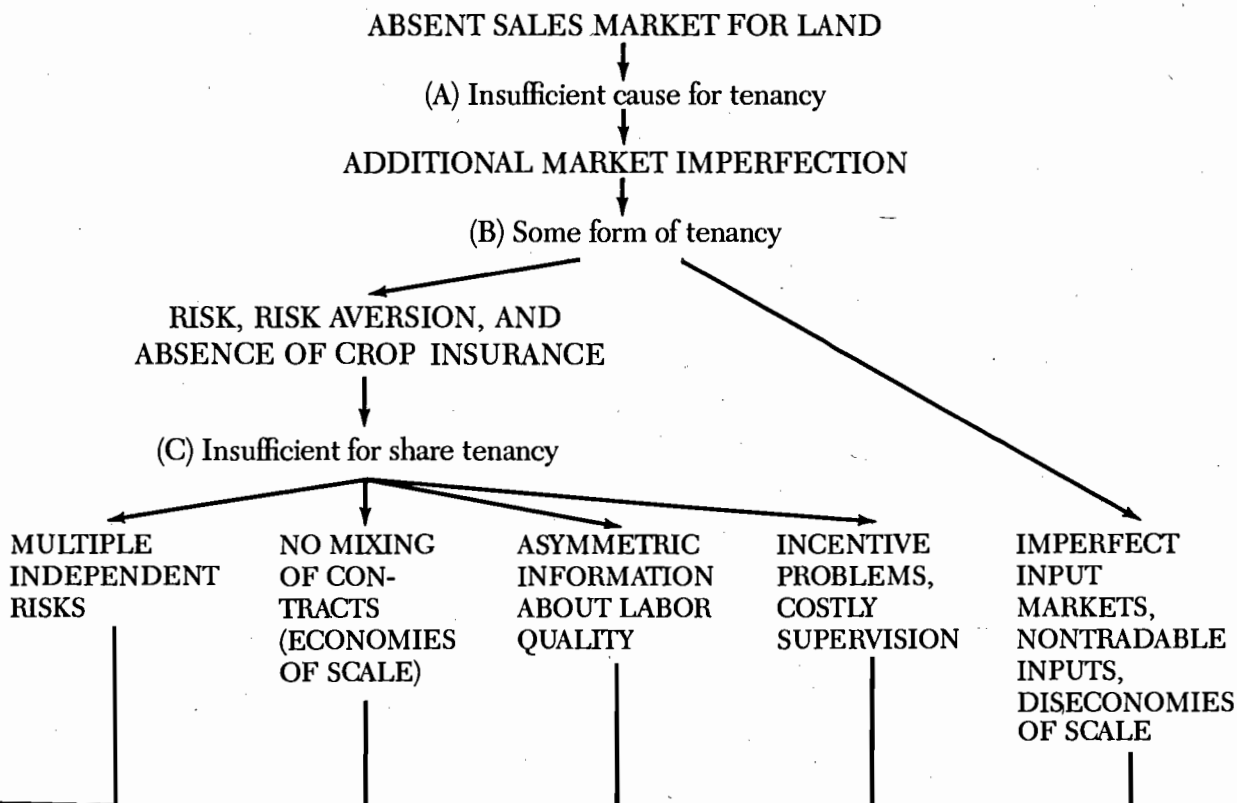
In their most recent theoretical model of bargaining, Bell and Zusman (1980) consider risk, incentive effects, and four factors of production: (1) land that is tradable only through tenancy, not in a sales market; (2) labor that is freely mobile among share tenancy, fixed-rent tenancy, and the outside labor market; (3) fertilizers or other modern inputs, also freely tradable in a perfect fertilizer-cum-credit market; and (4) management capacity of the tenant, which can differ across tenants and is completely nontradable. As we have already noted, a landlord can get access to the latter factor only by renting land to tenants. Clearly this fourth factor could instead stand for (or in addition include) other nontradable components of the tenant's endowment such as bullocks or even female family labor (as in Bangladesh, where Cain, Khanam, and Nahar, CP1979, suggest that female workers are permitted only very limited work outside their own farms). Output share, input share, fixed rental rate, and tenancy size are all determined in a bilateral, monopolistic bargaining process in which landlords and tenants each have some power, such power being determined by their relative numbers and by the levels of their respective endowments. Thus Bell and Zusman's model can accommodate all levels of landlord power, from pure monopoly to large-number competition. In many parts of the world, tenants can deal with a large number of landlords. Equilibrium is reached when it is impossible to improve one's utility by signing other contracts, in the case of a landlord, or by changing landlords, in the case of a laborer. The inputs of labor, fertilizer, and management are tenants' discretionary variables. Clearly, the tenant's welfare in this model will be higher than the utility level he or she could achieve as a pure wage worker. The possession of management skills gives the tenant some bargaining power unless there is only one landlord and an infinitely elastic

supply of tenants; in such a case, management is no longer a scarce factor.

As summarized in Figure 2, the theoretical literature of tenancy suggests that several alternative combinations of reasons explain the institution of sharecropping. In order to explain the existence of some form of tenancy, not only must the land sales market be riddled with imperfections but a second market imperfection is also required (conclusion B). When risks are present and crop insurance is absent, the mixing of fixed-rent contracts with wage labor cultivation can substitute for the absent insurance market (conclusion C). Only when the mixing of contracts is impossible or uneconomical (because of economies of scale in cultivation) does it become necessary to use the added instrument of sharecropping to substitute for the absent insurance market (conclusion E). The extra instrument of sharecropping is also required when mixing of contracts is feasible, but there are independent sources of risk (conclusion D). In this case, as long as incentives problems are absent, sharecropping is instrumental to reach productive efficiency. Only second best optima, however, can be reached if risk is combined with economies of scale, asymmetric information about labor quality, costly supervision, or imperfections in input markets (conclusions E, F, G, and H, respectively). Note that problems of risk and information probably lead to the input market imperfections in the first place. In these latter cases, though full efficiency cannot be achieved, sharecropping represents not a barrier to efficiency but an instrument that leads to improved efficiency in the face of market imperfections that would lead to even greater inefficiency in the absence of sharecropping.

With respect to welfare considerations, in all of these partial equilibrium models the tenant is at least as well off as a wage laborer for the simple reason that the tenant will not accept a contract if it does not offer him or her a gain over and above that level. In many models, however, the tenant cannot gain utility beyond the exogenously given wage laborers' level. In models that have no supervision costs and that reach productive efficiency, this results from tenant competition for tenancies and from the fact that landlords have the power to monitor and enforce all input levels. But it is not the institution of the share

Figure 2. The Routes to Sharecropping



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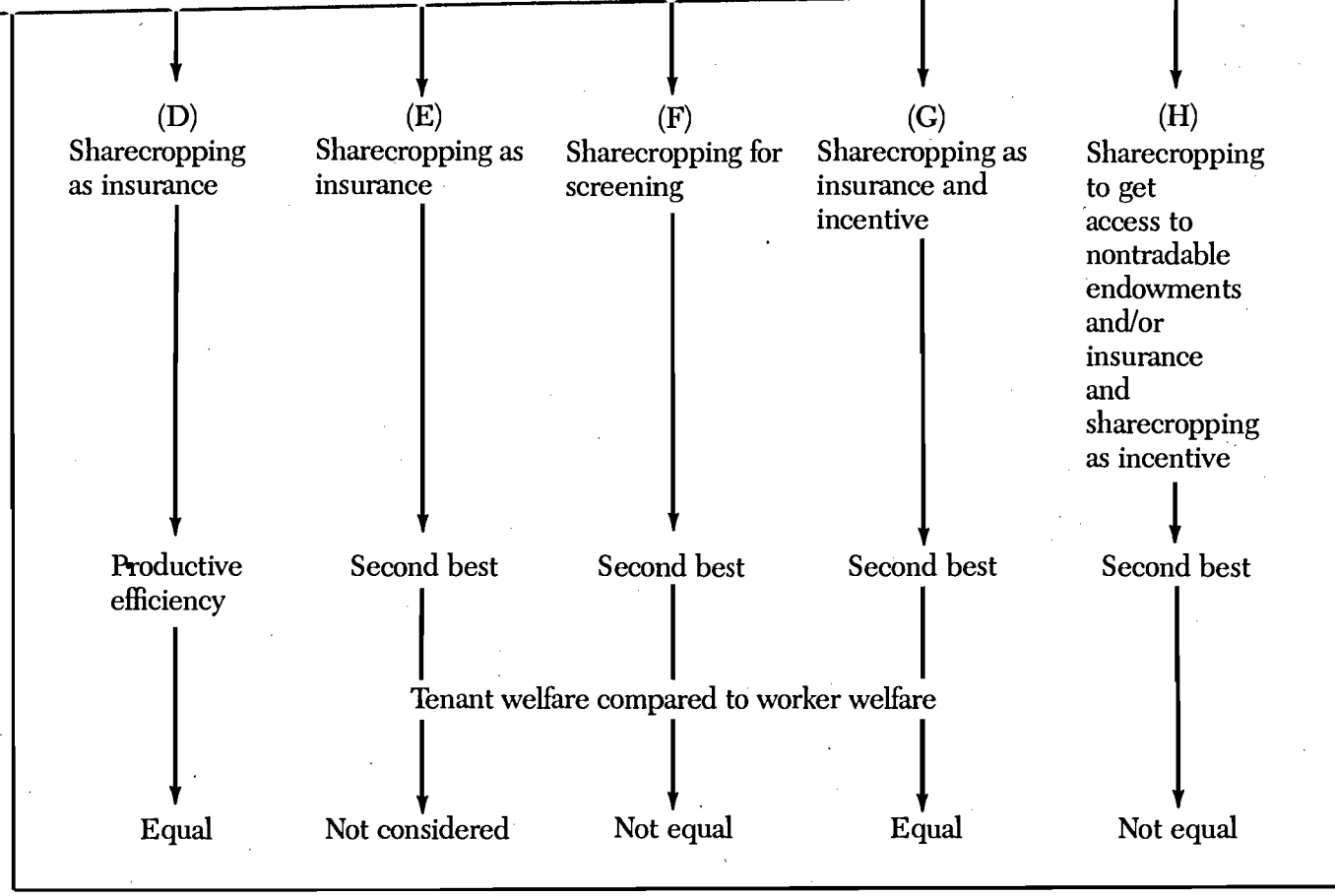

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contract that prevents tenants from improving their welfare; rather, it is the assumed, infinitely elastic supply of workers—and thus tenants—that forces this result. Only exogenous rises in wage levels—owing, for example, to more nonagricultural labor demand—can lead to improvement in workers' welfare.

The foregoing conclusion holds even when incentive effects are present and tenants are differentiated, as long as landlords have sufficient power to restrict tenants' choices, as in Stiglitz's (1974a) or the Braverman–Srinivasan (CP1979) models. In both models, once tenants accept the contract terms, landlords can prevent them from working for other landlords or in the labor market. Clearly, landlords must be able to conspire among themselves in order to compel laborers to accept such conditions. It is not the share contract per se or the tying of share and credit contracts that enable landlords to squeeze tenants; landlords have some form of monopoly power. Binswanger et al. (CP1979) show this clearly in an empirical study of tied labor–credit transactions, and Braverman and Stiglitz (1981a) provide a corresponding theoretical discussion.

Tenants' welfare can be better than that of wage laborers only if tenants have something to offer that landlords cannot get except through the tenancy contract and only if landlords cannot conspire together over contractual terms. In the Newbery–Stiglitz model, tenants offer labor skill; landlords cannot assess this without recourse to tenancy. In Jaynes's model, tenants offer untradable capital inputs and in the Bell–Zusman model, management skill. In all three models the tenant, as a simple laborer, cannot obtain the returns to these factors of production; that is, the tenant cannot easily rent out his or her extra labor skills, management skills, or capital endowments.

Variations and Changes in Contractual Arrangements

In this section we review recent empirical studies of contractual arrangements and terms. For the most part, authors of empirical tenancy studies have not set such studies up to discriminate between precisely formulated models. Nevertheless, groups of models share some general implications that can be used to check each modeling approach for its fit with reality. As these

implications pertain to any contract involving labor, we will review all such contracts, not just share contracts.

According to the theories we have reviewed, contracts allow people to make better use of specific individual endowments in imperfect markets and to arrive at combinations of income, effort, and risk that reflect both their endowments and their tastes. As one would expect, in environments with heterogeneous labor (see section on "Neglected Themes") and market imperfections, many different types of contracts coexist in small regions, and contract terms vary among people, across regions, and over time. According to several empirical studies (Bardhan & Rudra, 1981; Bhalla, 1976; Binswanger et al., CP1979; Clay, 1976; White & Makali, CP1979), one can find, within the same village, a number of different types of labor contract—daily time wage; daily piece wage; daily harvest share payment; contractual group payment, based on piece rates, to resident or migrant groups of laborers; and sometimes a bewildering variety of longer-term contracts. The same sources document even greater varieties of contracts across villages and regions. Moreover, the coexistence of share and fixed-rate tenancies is widespread.

Sharecropping terms are generally assumed to be fixed, most often at 50 percent of harvest gross output. But although the 50/50 split is common and, in many areas, the dominant arrangement, a wide variety of arrangements are found within small geographic areas or even within villages (Bardhan & Rudra, 1980; Jodha, CP1979; Mangahas, 1975). Furthermore, even a formal 50/50 split may hide many variations. Crop byproducts (often up to 15 percent of crop value) may accrue entirely to either owner or tenant; nonlabor inputs may be shared differently from output or from labor; and output may be divided before or after costs of seed, fertilizer, and harvest labor are deducted. For example, if output is divided after harvest costs are deducted, tenants can increase their share by participating in the harvest. Thus as Bell (1977) points out, the 50/50 split of the main product hides many complexities and may lead to substantially different splits in value added, depending on the full set of sharing rules.

Virtually all models of tenancy suggest that contractual terms move against tenants as wages fall. Roumasset (CP1979) cites scattered evidence for Indonesia and Bangladesh and presents

cross-sectional regressions for selected crops in the Philippines that are consistent with this hypothesis. Kikuchi, Cordova, Marciano, and Hayami (1979) cite Philippine sources that indicate that when Central Luzon haciendas were opened for cultivation early in the century, land with zero or low fixed rentals was given to tenants in exchange for land clearing. As population density grew, however, share payments became more prevalent and share levels increased.

Changes in wage rates should be reflected in changes in the terms or the mix of labor contracts available. A decline in wages, for example, should be reflected in contract terms or mixes that imply either lower income, increased effort, or increased risk, or a combination of all three. Three studies bear directly on this issue: Clay (1976), Bhalla (1976), and Kikuchi, Hafid, and Hayami (CP1979). Clay documents a declining real wage situation in Bangladesh accompanied by shifts in the contract mix from the fairly common use of harvest share payments to more frequent use of cash payments and of harvesting contracts with gangs of migrant workers. These shifts implied reduced real wages. Clay reports statistically significant relationships between the bewildering variety of harvest shares paid in the same year and in the same sets of villages and three independent variables (yield, labor requirement, and output price): Shares are lower the higher the yield of the plot, the higher the labor requirement (i.e., the length of work and earnings), and the higher the price (or quality) of the grain harvested. Clay also notes, however, that these variables explain only a small portion of the observed variance.

Bhalla's (1976) study of green revolution areas in Haryana that had rising real wages stresses shifts in the contractual mix toward longer-term contracts for men and, to a lesser extent, for women. These shifts were associated with higher incomes and reduced risks. Bhalla attributes this trend to increased labor demand, increased demand for timeliness of operations, and attempts by employers to subvert the increased bargaining power of laborers as a group by fostering more one-to-one relationships, cemented by credit and other side benefits.

Bardhan (1981), Bardhan and Rudra (1981), and Binswanger et al. (CP1979) explain a number of the variations in the incidence and nature of long-term labor contracts observed cross-

sectionally by (1) relative demand for securing timely labor, which differs across areas and according to technology used; (2) labor demand relative to labor supply in local areas; (3) credit requirements of landless laborerers, who lack suitable collateral to obtain credit from formal lenders or traditional money lenders; and (4) alternative employment and borrowing opportunities that arise in the slack season in rural works programs or temporary migration. The Bardhan (1981) paper builds a model along these lines and offers a statistical analysis of 1956–1957 Agricultural Labor Enquiry data for 38 zones of India. The multiple regression analysis used cannot be considered a causal model, but its results are consistent with the view that the securing of timely peak-season labor in tight labor markets may be the most important factor determining the use of long-term contracts.

Kikuchi et al. (CP1979) document declining real wage payments in Java in villages characterized by technological stagnation and increasing labor supply. Real wages were reduced by two factors: First, harvest shares underwent an initial modest reduction. Second, and more important, although at the beginning the harvesting operation was open to all who wanted to join, access to it was then restricted to villagers and, finally, to people who were directly invited to join. Moreover, weeding and other labor became requirements for joining the harvest; thus for a given harvest share and given risk, the worker had to contribute increased working time and/or effort. Note, too, that this arrangement amounted to the worker providing the farmer with credit in the form of the labor cost of weeding.

Tenancy models that rely on credit constraints for both landlord and tenant predict that changes to technologies with higher purchased-input requirements should lead to more cost sharing. Hanumantha Rao (1975) cites a number of cross-sectional studies to this effect, and Bhalla's (1976) rare time series study offers supportive evidence. In addition, in eastern India, where technical change has been much slower than in other parts of the country, Bardhan and Rudra (1980) show that the higher tenants' shares in input costs are, the higher their output shares are. Roumasset (CP1979) also reports this finding.

Technological and risk characteristics of crops should also influence the choice between share and fixed-rent tenancy. Hanumantha Rao (1971), in a cross-sectional study of Andhra

Pradesh, shows fixed rents to predominate for the highly profitable crops—tobacco, chillies, and sugarcane—that require high skill and large amounts of purchased inputs and are characterized by risky markets.[11] Rice, on the other hand, was cultivated primarily under share tenancy. Hanumantha Rao attributes this difference to the scope for entrepreneurial decision making permitted by the first set of crops and to tenants' desire to appropriate the full returns of their management input. As the preceding section of this paper suggests, capital constraints on owners may favor the leasing of lands for crops with high purchased-input requirements to larger tenants with good access to capital. Such a phenomenon would be consistent with Hanumantha Rao's finding of a larger farm size among fixed-rent tenants.

Finally, another prediction implicit in many recent tenancy models is that landlord shares should be higher on higher quality land because such land commands a higher implicit land rent. Roumasset (CP1979) confirms this prediction for the Philippines, and Jodha (CP1979) presents some evidence for semiarid India. Roumasset also finds that shares vary systematically with the crop: the more profitable and less labor intensive crops command a higher landlord share.

Empirical Studies on the Efficiency of Sharecropping

A major question raised by the tenancy models reviewed here is the extent to which incentives problems arising in share contracts can be overcome by agreements about or control of labor and other inputs. Empirical inquiry into this issue is directed not to finding out whether incentives problems exist—because they certainly do—but to discovering (1) the means by which such problems are overcome and (2) the extent to which they are overcome, as indicated by the presence or absence of differences in input and output intensities between sharecropped and owned farms or plots.

Recently, Castillo (1975) and Singh (1981) have surveyed a number of studies of these issues in the Philippines and South

[11] Hanumantha Rao's findings are confirmed by an analysis of more aggregative data (Singh, 1981). Note also that rents fixed in terms of produce predominate for trade (plantation) crops such as tea or coconut, where price risks are especially high relative to yield risk.

Asia, respectively. Both writers find that there is widespread supervision by landlords of harvests and of the sharing of the harvest to ensure adherance to contract terms. Moreover, many landlords seem to participate significantly in cultivation and input decisions. Such participation gives rise to opportunities for both determining and supervising the use of nonlabor inputs and for checking labor inputs more closely. The sharing of fertilizer and other purchased inputs is another means of reducing incentives problems and/or controlling input levels.

None of the studies reviewed report either direct agreements, between landlords and tenants on labor input, or direct supervision of labor input. Most important, controlling labor input indirectly by manipulating the size of the plot given to the tenant is not common; in most regions, tenants typically rent land from more than one landlord, and members of tenant households work for wages. Thus it seems unlikely that an individual landlord would be able to manipulate plot size by restricting a tenant family to working exclusively on the landlord's plot. (For the most careful investigation of this issue, see Bardhan & Rudra, 1980.) These findings contrast with the assumptions of the Stiglitz (1974a) and Braverman and Srinivasan (CP1979) models discussed earlier.

A large number of studies have attempted to document differences in input and output intensities between sharecropped and owned farms and/or plots. At best, when farm size effects are controlled for, most studies find only very minor differences; that is, they suggest that incentive problems are largely overcome. However, on very small farms in West Bengal, Andhra Pradesh, and Punjab, Chakravarty and Rudra (1973) and Chattopadhyay (1979) found input and output levels somewhat lower under sharecropping than under owner-occupancy. And small sample studies in Bihar (Bell, 1977), Haryana (Bagi, 1979a, 1979b), and Bangladesh (Hossain, 1977) show that value of output on owned plots is somewhat higher than it is on the same farmers' tenanted plots. In Bihar this effect was due primarily to higher cropping intensities and the planting of higher valued crops on owned land. This finding is consistent with Singh's (1981) investigation of a 1970–71 national probability sample from rural India in which differences between owned and tenanted plots occurred only in West Bengal, Bihar, and Orissa.

Sharecropping and Innovation

It has long been alleged that sharecropping, alone or in combination with linked transactions in credit, acts as a barrier to innovation. Our theoretical discussions cast serious doubts on such a view. If contractual arrangements are by and large efficiency enhancing in a static context with several market imperfections, one should expect that when innovations promise new income streams—that is, increase utility possibilities for the population as a whole—new or revised institutional arrangements will emerge to overcome barriers that prevent the realizing of such new streams. The view that sharecropping (or tenancy, more generally) retards innovation may arise from the observation that small farmers are usually later adopters. It is true that tenants are often (though not always) small farmers, and as our discussions have suggested, they may be severely capital constrained. These conditions, which cause adoption lags, may often be confused with sharecropping. Moreover, the view that sharecropping may retard innovation—because landlord and tenant each receive only a portion of outpout and thus neither may be willing to carry the costs—has a long tradition. The most extreme version of this theme is found in Bhaduri's model (1973) of tied sharecropping and credit transactions, which gained popularity and influence long before it was subjected to rigorous empirical test.

In Bhaduri's model, referred to as a model of *semifeudal production relations,* a number of variables either are exogenously given or are entirely under the control of monopolistic or collusive landlords. These variables are crop share, tenancy size, rate of interest the landlord charges the tenant, amount of effort the tenant expends on the land, and the technology of production used by the tenant. The tenant's only discretionary variable is the amount he or she must borrow from the landlord for consumption. The tenant's consumption level is assumed to be at an exogenous subsistence level given by an alternative wage. There is no risk, and incentive effects of the share contract are not considered.

This model argues that landlords may wish to withhold profitable innovations: innovations that raise output will increase both the landlord's rental income and the tenant's income from

cultivation. At the same time, since there is only consumption credit, tenants' increased income will enable them to reduce their indebtedness to the landlord, and the landlord's income from money lending will be reduced. The model does not consider the fact that most agricultural innovation increases the demand for purchased inputs and, as a result, for credit!

The major theoretical criticism of Bhaduri's model comes from Newbery (1975a), who points out that if some of the contractual terms are not exogenous but rather under the landlord's control, the landlord has the power—by other means—to extract from the tenant all the surplus generated by the innovation; thus the landlord would be better off to do so, rather than withhold the innovation. "The basic point is that if the landlord has sufficient monopoly power to exploit the peasant and to withhold the innovation then he ought to have sufficient power to extract the extra profits generated by the innovation" (Newbery, 1975a, p. 270).[12] The Braverman–Srinivasan model (CP1979) reinforces this point, showing that in a much more complex world in which landlords have extensive power over share contract and credit terms, they need only one instrument of control, namely the plot size, to extract all rents from tenants.[13]

On the empirical side, not a single study of adoption of high yielding varieties that adjusts for farm size effects has shown

[12]We will return to monopolistic power in a later section. In order to support the hypothesis that landlords will choose to withhold innovation rather than to extract rents by other means, one must show empirically that it is easier to collude to ban an innovation and to enforce such a collusive agreement than it is to enforce other contractual terms.

[13]Under certain theoretical conditions, it is obviously possible that an innovation's net effect on landlord's income will be negative (the usual technological treadmill problem). This point is elaborated in Braverman and Stiglitz's (1981a) recent theoretical investigation of utility-based models that are more general than the Bhaduri model. These researchers find that, even if innovations increase utility possibilities for landlords and tenants, the competitive market equilibrium after an innovation can be such as to leave landlords worse off. In such a case, it may be to their advantage to conspire to withhold the innovation, unless they can appropriate the surplus generated by the innovation in some other way. Second, Braverman and Stiglitz find that technical change may alter labor productivity in such a way that it may pay even individual landlords to withhold an innovation because their optimal contract under the new technology would lead to reduced tenant effort and lower landlord shares. These researchers also show that innovations, depending on their risk-return characteristics, may lead to either an increase or a decrease in the tenant's demand for consumer credit. Thus Bhaduri's conclusions are not as totally implausible as Srinivasan (1979) has argued.

serious adoption lags on tenanted or sharecropped farms or plots (Castillo, 1975; Singh, 1981). Moreover, Bardhan and Rudra's (1980) extensive survey of villages in eastern India—the very region Bhaduri had in mind when he constructed his model—provides data that contradict the major assumptions and conclusions of Bhaduri-type models. Similar inconsistencies were found in a survey in Bangladesh (Rahman, 1979) and in a study of semiarid tropical agriculture (Jodha, CP1979).

Chapter 4

NEGLECTED THEMES

The literature's evident preoccupation with surplus labor, labor market dualism, and the rationalization of contractual arrangements has led to the neglect of a number of important issues and features of the rural labor market. Among these areas—many of which were addressed by the papers presented at the Hyderabad conference—are (1) the dynamics, or flexibility, of labor market characteristics, institutions, or arrangements; (2) the heterogeneity of labor, particularly as seen in the role of women in the labor market; (3) the geographical mobility of laborers; (4) the power of monopoly and its sources; (5) the impact of risk and credit market imperfections on labor relations; and (6) the applicability of the conventional demand–supply or competitive models of labor markets to the low-income rural economy.

Dynamics

The development literature is centrally concerned with the evolution in real agricultural wage rates over time, since such changes not only are an important reflection of the progress of economic development but provide evidence in support of or against surplus labor, macro development models. Evidently, because in many areas of the less developed countries and as far back as the eighteenth century real wages have fluctuated around a basically stagnant trend (Bhattacharya & Roy, 1976), the view that wages and contractual terms are institutionally fixed has pervaded thinking about the process of development. This view has diverted attention from the analysis of the causes of variation, over both space and time, in wages and contract terms.

Geographical variations in nominal wages, real wages, and contract terms are pervasive in South and Southeast Asia. Within themselves, such variations are not inconsistent with the view that wages and contract terms are fixed by custom or by cultur-

ally determined subsistence norms. If pressed hard, most holders of this view would probably also allow that institutional wage and contract norms at least partially reflect the very long-term economic forces that affect a particular region. They would probably also argue, however, that institutional rigidities are very strong—that is, that changes in economic conditions could have only very long-run effects on such norms. Under this view, norms adjust so slowly that for practical planning, modeling, and development policy purposes one might as well ignore changes in them. Moreover, partial explanation of cross-sectional variations in terms of regional supply and demand forces, even if successful, would still be quite irrelevant.

Since geographical differences are consistent with flexible as well as rigid wages, the question becomes whether changes in demand and supply forces are reflected in changes in wages and contractual terms within relatively brief periods of time. This question can be answered only by longitudinal investigations. A finding that wages and contractual arrangements change rapidly would undermine explanations of wage and earnings determination that rely on institutional or cultural rigidities. Of course, culture and institutions may still be important determinants of wages, since these factors can affect the supply of or demand for labor.

From *Agricultural wages in India* and other, more scattered (but possibly more carefully collected) data sources we know that, for a day of standard length and in money terms, agricultural wages vary substantially not only regionally but annually and seasonally. Money wages are not real wages, and controversies over what exactly has happened to real wages continue (Bardhan & Srinivasan, 1974; Griffin, 1974; Jose, 1974; Lal, 1976a).[14] At any rate, it is clear that real wages are not constant. They have risen sharply and rapidly in the Punjab and other

[14]The reasons for the weak statistical evidence and the continued controversies over real wages are twofold. First, in most countries there has been no sustained secular trend in real rural wages that is easy to document, and fluctuations in wages are interpreted differently, depending on the cost of living deflators used. Second, three factors make constructing one or more rural wage series difficult: labor is heterogeneous; contracts offered to a single broad group of laborers are heterogeneous; and simultaneous payments in cash, kind, and food result in severe valuation problems. Of these factors, probably the heterogeneity of contracts has led to the most severe conceptual difficulties.

areas where the green revolution has led to increases in labor demand. On the other hand, in Bangladesh they fluctuated widely around a falling trend over the 27 years prior to 1975. In that year, owing to the disturbances of partition and a series of natural calamities, they were roughly 30 percent or more below the level of the late 1960s (Ahmed, 1981; Clay, 1976). These data for what is possibly the poorest country of the world thus sharply contradict efficiency wage theories, whose major implication is the fixity of a wage floor. White and Makali (CP1979) present the first (albeit still scanty) evidence, based on Indonesian data, that at the village level, real wages vary considerably, both seasonally and annually, in ways that are largely consistent with supply and demand interpretations.

The foregoing are only a few examples of variations observed over time that are inconsistent with institutional views. Also inconsistent with these views are the sharp seasonal variations in wage rates that are well-known from many aggregative studies and further documented by Ryan and Ghodake (CP1979) and White and Makali (CP1979). In the section on "Variations and Changes in Contractual Arrangements" we have already reviewed four studies that indicate that contractual arrangements for wage payments tend to respond rather rapidly to changes in economic forces (Bhalla, 1976; Clay, 1976; Kikuchi et al., CP1979; Kikuchi et al., 1979).

Clearly a great deal of work is required to understand the causes of wage and contractual changes. For example, it is not known why in certain areas adjustments typically take the form of changes in contract terms, whereas elsewhere terms remain unaltered but there are shifts in the relative importance of different types of contracts. More generally, as economic development is inherently a dynamic process, to predict its consequences and/or to understand how to foster development clearly requires the study of change.

Heterogeneity of Labor, Wages, and Earnings

Both the theoretical and the empirical literature on rural labor markets have tended to ignore the heterogeneity of labor. Theoretical discussions focus on "the" rural wage, and empirical studies often average male and female wage rates to create one

wage (see, for example, Bardhan, 1979b; Barnum & Squire, 1979; Rodgers, 1975). However, four dimensions of heterogeneity among rural laborers appear important: (1) hired versus family field workers, (2) manager–entrepreneur versus field worker, (3) age differences, and (4) sex. As we have already noted, it may be important to distinguish between hired and family labor in determining the demand for land and productive efficiency. Family members should have fewer incentives to shirk than hired laborers—if not because of the formers' altruism, because of their participation in farm profits. This is one reason why (1) farms that employ primarily family labor (small farms) can be more efficient than large farms, which must hire and supervise nonfamily workers (sharecroppers); and, (2) sharecropping is so prevalent. The fact that managerial skill is a distinct input in agriculture is also relevant to the issue of the relative efficiency of large and small farms. Although Paglin (1965) finds that the market for field labor functions well, his data nevertheless indicate that large farms employ fewer inputs per acre than small farms. Paglin explains this finding by suggesting that families with large landholdings and/or high incomes have less "motivation" to be efficient. This hypothesis implicitly assumes, however, that there is neither a market for managers or managerial skills nor a rental or sales market for land. The absence of a managerial market is puzzling because, although there may be problems (costs) associated with discerning the marginal contribution of an individual field worker, the performance of a farm manager can be readily evaluated; there is a "bottom line" for managers associated with farm profitability. As the assumed absence of a market for managerial skills may play an important role in tenancy (Bell & Zusman, 1976), this segment of the rural labor market clearly needs more attention.[15]

A little-studied topic related to the distinction between managers and field laborers is occupational mobility over the life cycle. In particular, little is known about the typical earnings and occupations profile over the life cycle of a person in the rural labor market or about the probability that a landless worker will become a manager and/or own land. The existence of such a

[15]Castillo (1975) reports Philippine census results that indicate that only 0.1 percent of farm operators are hired managers, covering less than 5 percent of operated area.

tenancy ladder suggests that that there may be substantial life cycle mobility in some rural labor markets, as does Binswanger et al.'s (CP1979) finding that labor contractual arrangements are typically different for the young and for the mature worker. Binswanger et al.'s village level evidence and Rosenzweig's (CP1979) data also suggest, however, that age is not importantly related to wage rates among casual field laborers; and life cycle advancement in earnings is thus likely to be a function of the acquisition of specialized skills, access to or ownership of land or other assets, or changes in sectoral location.

The role of children in the rural labor market, found to be quantitatively important by Hansen (1969) in Egypt and Cain (1977) in Bangladesh, has also received little attention. India district-level data studied by Rosenzweig and Evenson (1977) and Rosenzweig (CP1979) indicate that both the supply of and demand for child labor are quite sensitive to levels of adult, sex-specific wages as well as to child wages. Moreover, Rosenzweig and Evenson found that both children's schooling and parental fertility varied significantly with the relative market values placed on the labor services of adults and children. Labor market arrangements and patterns, as they pertain to age groups, thus have an important effect on the long-run quantity and quality of the labor force as well as on the contemporaneous distribution of earnings.

To date, the role of women in the rural labor market has also been given little attention. Two of the papers presented at the Hyderabad conference—Cain et al. (CP1979) and K. Bardhan (CP1979)—undertook an intensive examination of the question of why female patterns of employment and wage rates, in terms of specific work tasks or occupations, differ so markedly from male patterns and wage rates in the rural labor market. The studies by Binswanger et al. (CP1979) and Ryan and Ghodake (CP1979) document these evident differentials, and P. Bardhan (CP1979) and Rosenzweig (CP1979) examine the separate labor supply behavior of women and men. All these studies suggest that in developing as in developed countries, rural labor markets exhibit differential patterns of male and female employment and earnings. Female wages are generally lower and female unemployment rates are higher (K. Bardhan, 1977, CP1979; Ryan & Ghodake, CP1979), and women are absent from certain seg-

ments of the labor market. Indeed, in Bangladesh (Cain et al., CP1979), women seem not to participate in field labor at all, apparently because of social restrictions legitimized on religious grounds. (But note that in Indonesia, Moslem women do a lot of field work; religion alone evidently is not a sufficient explanation of the lack of participation by Bangladesh women.)

In many areas of India (K. Bardhan, CP1979), the fact that higher class women do not perform field labor is closely associated with caste-related taboos. In semiarid India, men but not women are hired according to long-term field labor contracts,[16] and in general women have access to contract work paid on a piece rate basis or to temporary migration only through male members of their families (Binswanger et al., CP1979; Breman, CP1979). These patterns cannot easily be explained either by the division of labor associated with childbearing and household production or by market productivity differentials. Moreover, the evidently more restricted occupational and farm-to-farm mobility of women as compared with men has implications for production efficiency and creates difficulties in making welfare evaluations of rural labor market mechanisms.

Geographic Dispersion of Wages and Mobility

One of the most important but neglected features of rural labor markets is the geographic dispersion of wage rates within sex and skill categories (Hansen, 1969; Rodgers, 1975; Rosenzweig, 1978). Although the evidence suggests that at least for males, mobility between farms and tasks within geographical areas is high (that is, dualism is absent), these geographical wage disparities suggest limited geographic mobility of labor. In addition to the problems associated with information flows, two causes appear important: asymmetric information and the virtual absence of a sales market for land. With respect to the first cause, the problem of shirking (with associated supervisory costs) will make landowners reluctant to contract with wage workers or tenants

[16]This practice may occur generally throughout the subcontinent. Bardhan and Rudra (1981), for example, did not interview women who were regular field workers.

who are complete strangers; asymmetric information thus contributes to geographical immobility by reducing the private returns to migration. An imperfect sales market for land, however, increases the private costs of any permanent, long distance move that involves an entire household, since such a move may entail a significant capital loss. Immobility here does not imply absence of choice; instead, it may reflect a second-best ajdustment to the informational and land market problems. This is another example of how the characteristics of one market (land) affect the attributes of another market (labor).

Determining how responsive labor flows across geographical areas are to wage disparities is as important as understanding the sources and causes of immobility. Breman (CP1979) provides an example in which the incentives associated with seasonal disparities in geographical wage rates lead to the temporary migration of laborers. The moves Breman describes are organized by middlemen who also help to solve the asymmetric information problem and provide credit to groups who seem to have difficulties obtaining it through other channels. Although the misery and the poor working conditions described by Breman are undoubtedly appalling, this institutionalized migration clearly augments both participating workers' income and total agricultural output under the constraints of production seasonality and high ratios of workers to land.

Most studies of migration in developing countries have focused on the implications of rural–urban flows for urban or rural development (Lipton, 1980; Sabot, 1981). Dhar's (CP1979) study is one of the first to study nonseasonal (permanent) migration, by males, to and among rural areas in India. Dhar finds that although interstate mobility is not high, interdistrict mobility is considerable; people migrate to areas where there are better opportunities, as measured by wages and unemployment. Rosenzweig (CP1979), studying wage determination, treats each district as a distinct labor market and reports micro data that show that men from households owning land and women from all households tend to be less geographically mobile than men from landless households. But the study of the important role of geographical mobility in both earnings inequality and production is still at its very beginning.

Sources of Market Power

Competitive market outcomes can result in extremely low wages and/or in adverse contractual terms if labor supply is large relative to demand. Thus even extremely low wage levels do not necessarily indicate either market failure or the prevalence of monopolistic or monopsonistic exploitation. In addition, as we have discussed, the linking of contracts is not necessarily a source or indicator of market power. However, the assumption that inbalances in market power are a basic cause of poverty in rural areas underlies much thinking about rural labor markets. Even so, only a few studies have been concerned with identifying and quantifying the gains appropriated by different social groups arising out of monopolistic power. And a more careful theoretical characterization of differences in competitive and monopolistic equilibrium in a world with contracts has only just begun (Braverman & Stiglitz, 1981b).

The spatial distribution of agriculture and the high travel or migration costs (in terms of money, time, and/or capital losses) discussed earlier make the exercise, by landlords, of local monopolistic power a distinct possibility. This possibility is particularly strong where one or a few large owners confront many workers or potential tenants in a small geographic area. In most South and Southeast Asian countries, land-holdings vary greatly in size. Unlike South America or the postbellum United States South, however, these countries have very few large ownership holdings of, say, 100 ha or more. Outside of the tea, rubber, and sugar plantations operated with permanent hired labor forces, such extensive ownership holdings are confined largely to Pakistan and some areas of Bihar. It is in these areas that one ought to look for monopolistic power of owners and for constraints imposed by owners on tenancy size and outside labor market involvement. In areas with smaller holdings it makes more sense to look at oligopolistic or oligopsonistic power of a few owners and at the resulting wage-setting or contract-setting behavior (Bardhan & Rudra, 1981). The monopolistic power relationship of large owner over small tenant is also undermined by the possibly increasing phenomenon of *reverse tenancy* documented in many studies, in which small owners rent land to larger landowners.

Studies of informal collusion by employers or landlords to fix wages or contractual terms are very rare. The common assumption that contractual terms are fixed by custom may have diverted the attention of many researchers from this topic, or perhaps monopolistic collusion has simply been taken for granted (Griffin, 1974). In five of the six villages they studied, Binswanger et al. (CP1979) observed attempts to fix either daily or regular farm servants' wages. However, these researchers also report a widespread recognition, by employers and workers, that *daily* wages are virtually not controllable by collusion. Clay (1976), Bardhan and Rudra (1981), Kikuchi et al. (1979), and Kikuchi, Hafid, and Hayami (CP1979) studied the process by which daily wages or contract terms are altered and did not find much indication of collusive behavior. Thus there is little evidence, in the market for daily labor, of important departures from competitive behavior.[17] Moreover, as we have discussed, there is virtually no evidence for the landowner's capacity to control tenants' involvement with other landlords, other employers, or other lenders, the crucial monopolistic power instruments for the Stiglitz (1976), Braverman and Srinivasan (CP1979), and Bhaduri (1973) models.

Workers' organizing into unions represents, in part, their attempt to increase their collective power vis-à-vis employers. In India, however, efforts to organize rural labor unions (which are often affiliated with political parties) have been confined to Kerala, Tamil Nadu, and West Bengal. And it is only in limited areas of Kerala that unions have enjoyed stability and growth over an extended period (Alexander, 1978; Beteille, 1972; Jose, 1976). More widespread is sporadic, unorganized agitation by workers

[17]In one of their six villages, Binswanger et al. did find evidence of employers' highly successful collusive behavior in setting contractual terms of *annual farm servants*. This collusion was facilitated by the unusual isolation of the village from outside temporary or permanent labor opportunities and by the village community's disparagement of the caste group primarily involved in the contracts. Bardhan and Rudra (1981) also find what looks like Stackleberg-type leadership behavior in a number of daily wage markets in West Bengal: employers appear to follow a single leader in their wage revisions.

A somewhat different issue is extra-economic coercion to extract unpaid labor commitments from worker/debtors or tenants. In eastern India, Bardhan and Rudra (1980, 1981) show that such unpaid labor commitments are rare. Also, very little is known about the use of individual violence or threats thereof to enforce contract terms such as labor commitments or debt repayments. In some of the villages studied by Binswanger et al., employers, money lenders, and village officials used to beat workers or debtors with impunity, but such practices have become very rare.

(Bardhan & Rudra, 1981; Bhalla, 1976), and there is evidence that landowner organization is particularly important in areas where labor movements have been strong (Alexander, 1978; Beteille, 1972). Throughout South and Southeast Asia, however, rural labor movements appear weak and unimportant in comparison with labor unions in industrial sectors. Moreover, although the history of these limited rural labor movements has been fairly well documented, little is known about their effectiveness in raising earnings—the product of employment and wages.

The lack of evidence for the conditions that are required for monopolistic power or that indicate successful collusion does not, of course, deny that wage and contract terms reflect the relative bargaining strengths of (1) entire social groups, whose strengths arise out of relative demand and supply; or (2) individuals, whose strengths arise out of comparatively unique characteristics and endowments that are tradable only in imperfect markets for factors of production. Systematic investigation of these issues has only just begun.

Risk, the Credit Market, and Labor Relations

A number of the studies we have cited provide fairly detailed data on the prevalence of different types of labor transactions that are linked to credit. These studies also suggest that lenders' collateral requirements and certain borrowers' lack of suitable collateral both play important roles in determining the kinds of labor or tenancy contracts in which such borrowers can engage. Although the evidence in this area is still scanty, it suggests not only that bullock requirements are important in determining access to tenancy contracts, as discussed earlier, but that capital and bullock market imperfections play a much more important role in determining contractual terms than any but the latest formal models have assumed. But capital market imperfections are themselves very poorly understood, although they must be closely related to the structure of production and to market risks faced by farmers and, hence, lenders. Our ignorance is due partly to the great difficulty of collecting accurate data on the terms and collateral requirements of informal credit transactions.

Where transactions are linked with credit, little is known

about the relation between the amount and terms of credit, on the one hand, and additional terms of labor or tenancy contracts, on the other. Bardhan and Rudra (1981) show that in 86 out of 110 villages studied in West Bengal, loans could be taken for future labor commitments: "In 58 of these villages the number of days in which the loan is repaid by the laborer is calculated at a wage rate which is below the market wage rate prevailing at the time of repayment" (p. 93). Repayment at slightly lower than the market wage rate is also found by Rahman (1979) in Bangladesh. And in a regression analysis of wages of regular farm servants in one of their villages, Binswanger et al. (CP1979) found some evidence that workers receiving loans at lower than the usual interest rate also received higher wages. That is, within an individual contract, a person's relative bargaining strength appears to be reflected in both wage payments and credit terms. Jodha (CP1979) finds some link between the giving of loans *by tenants to owners* and owners' higher input shares. The classical economists and the most recent tenancy models attach great importance to credit market imperfections as a source of tenancy arrangements, and the link between credit and longer-term labor contracts is clearly empirically important. More research effort is urgently required here.

Testing the Demand–Supply Framework

Given the data problems endemic in the study of low-income countries, it is not surprising that the literature records almost no attempts to estimate and test the most developed of the alternative models of the rural labor market—the demand–supply model. The data requirements are formidable, as one important implication of this model is that the employment level of each factor of production depends on the prices of all other factors. Three of the papers presented at the rural labor market conference—those by Rosenzweig (CP1979), P. Bardhan (CP1979), and Evenson and Binswanger (CP1979)—represent some of the first attempts to estimate the constituent components of the demand–supply model using rural labor market data from a low-income country (see also Barnum & Squire, CP1979, for a formal approach and Lal, 1976b, and K. Bardhan, 1973, for informal applications).

The Evenson–Binswanger study (CP1979) uses modern duality theory to parameterize and estimate the demand, in India, for labor as well as for other major factors of agricultural production—land, bullocks, fertilizer, Because they derive their specifications from an underlying model of profit maximization, the authors are able to obtain estimates of the responsiveness of labor demand to changes in wage rates, output price, and other factor prices and to test the behavioral restrictions associated with profit maximization. Rosenzweig (CP1979) focuses on labor supply behavior and also bases his specifications on an optimizing model, which permits him to test implied behavioral restrictions. Both P. Bardhan (CP1979) and Rosenzweig estimate the supply and demand functions for labor jointly (in a simultaneous equation, general equilibrium system), treating the distribution of land as exogenously given but treating wages and employment as endogenous variables.

The estimates of all three papers discussed call into question the basic assumptions of the surplus labor models, suggesting that reductions in labor supplied will significantly increase agricultural wages and that the variability in wage rates over time and across space is explained to a considerable degree by variations in demand for and supply of labor. The three studies also suggest that household and farm behavior in developing countries is not markedly different from that observed in high-income countries and that the competitive model of the labor market cannot be readily rejected, even though all the studies indicate (and rely on) a significant degree of geographical immobility. In addition, Rosenzweig's study suggests that male and female wage differentials in rural agriculture are greatly affected by sex differences in demand and supply as conditioned by both economic and cultural factors.

These three econometric studies of employment and wages ignore the institutional labor market complexities that were the focus of many of the other papers presented at the Hyderabad conference; in particular, the three studies abstract from issues of tenancy. Future work within the supply–demand framework is thus likely to be concerned with two tasks: a better integration of the land, credit, and labor markets; and testing for the importance of additional modeling of greater institutional detail, nonwage contractual terms, and conditions pertaining to the employment of labor.

Chapter 5

CONCLUSIONS

The literature on rural labor markets in low-income countries appears to be characterized by two major inconsistencies, the first between theory and fact, the second among models that describe different aspects of the rural economy. With respect to the first, the pervasive regional, annual, and seasonal variations of wages revealed in almost all empirical studies contrast with both the obsessive preoccupation of wage determination models with justifying fixed wages and the assumptions imposed by theoretical models of contractual choice. The contractual choice models and the special labor-surplus and dualistic models have been formulated in part because of the presumed inadequacy of market-oriented supply–demand models to provide an adequate means of determining employment, wages, and earnings in rural areas. But from such areas we have no convincing evidence to contradict the implications of this basic approach to rural wages and employment, whether in the most rudimentary form or in the form of a more complex econometric model.[18]

It is important to recognize, however, that labor contracts have welfare dimensions other than that of the implicit or explicit wage. Such contracts may act as insurance devices or they may allow people to make better use of their unique capabilities or endowments in otherwise inadequate markets. Supply and demand frameworks are neither designed nor able to predict how contractual terms or the mix of contracts available will change as labor demand, supply, or technology changes. Thus they cannot predict the full welfare consequences of such changes; that is, their likely effects—for groups of people who have endowments

[18]Supply and demand frameworks appear to have substantial explanatory power in terms of the direction of changes in wages, earnings, and contractual rewards. However, it is difficult to say how well they predict the magnitudes of changes because we lack a criterion for the meaning of "well." We do not yet have in empirically testable form—which would allow us to compare different models' predictive powers—alternative theories of wage/earnings determination that take the contractual realities into account.

that are not easily tradable—on effort, risk, and capital gains or losses.

In a longer-run perspective, economic development is associated with improvements in transport, travel, communication, and information facilities. These improvements in turn remove some of the underlying information, risk, and credit market imperfections and create new markets. The demand and supply framework, which takes markets as given, cannot predict the sequence in which such markets will emerge or their distributional consequences. Since the construction of transport and communication infrastructure often involves the public sector, better models are indeed required to shape policy so that the patterns of emerging markets can be influenced in an informed way.

Progress toward a richer, integrated theoretical framework that can deal with the complexities associated with market failures as well as the determination of wages and other contractual terms has been hampered by the evolution of theory along two, mutually inconsistent paths. The rural wage determination models developed so far assume the complete absence of a land rental or sales market; that is, they take land distribution as exogenously given.[19] The contractual choice models, on the other hand, treat the wage rate as exogenously given, while concentrating on land and credit market transactions; thus they have little to say about the determination of earnings or employment. The strength of contractual choice models lies in their clarification of the efficiency and equity implications of contracts and in their identification of the underlying causes of the market imperfections that lead to the contracts. These models also suggest the difficulties associated with policy intervention in single-tenancy or credit markets that is aimed at curing symptoms or apparent deficiencies in such arrangements. Without this integration of all the major interrelated markets—land, labor, credit—into a single, coherent rural model, however, we will be severely

[19]Bardhan's (1979a) two-season model is an exception. But it determines only peak-season wages. Slack-season unemployment, and the crop share are exogenously given. The fixity of the crop share in particular is inconsistent with the assumed strong monopoly power of landlords in the tenancy markets.

handicapped in attempting to predict the consequences of economic development in the rural sector.

We have been arguing for more modeling work when apparently there is already a confusing overabundance of models. But many of these models are not helpful in sharpening our understanding of the rural economy or in predicting its behavior because some of their crucial assumptions are clearly contradicted by simple observation of rural realities. At best, such models can sharpen our intuition by forcing us to work out the logical implications of counterfactual assumptions. Models must certainly make simplifying assumptions that are at variance with the complexities of the real world. However, this should not be taken as an excuse for assumptions that crucially determine the conclusions of the models but that are specifically and pervasively rejected, by empirical studies.

In part, the proliferation of models and the lack of attention to testability stems from the lack of good data. Such data are now becoming more prevalent, however; thus we can turn our attention to winnowing out models that are counterfactual or that perform badly as predictors. The studies we have reviewed show what can be done with patience and persistence. The successful prediction of change over time is the sharpest test of a model or theory, particularly a theory of economic development. We need to focus more attention on generating good panel data or resurveying old samples in order to accelerate the transformation of models into knowledge.

We conclude with the reminder that the models or frameworks that are reviewed here and that form the bases for the analyses reported in the papers presented at the rural labor market conference are models of institutions and behavior in existing rural markets, not models of economic development. Explanations of the long-term changes associated with development must be found, ultimately, in models that explicitly treat the reproductive and technological behavior that leads to the long-term evolution of supply and demand. Attention has recently turned to the study of decisions that have long-term consequences—decisions about human capital investment, fertility, health, technical change, and agricultural intensification (see, e.g., Behrman & Wolfe, 1980; Binswanger & Ruttan, 1978;

Boserup, 1965; Darity, 1980; Harris, 1971; Rosenzweig & Evenson, 1977; Rosenzweig & Schultz, in press). Such decisions, however, are themselves conditioned by the outcomes and institutional arrangements in rural factor markets. The integration of market and household behavioral models within an explicit dynamic framework enveloping all sectors of an economy has yet to come.

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Its purposes remain unchanged from those stated in its original Certificate of Incorporation. These are "charitable, scientific and educational and are designed to stimulate and support economic and related activities important to human welfare."