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Farmland leasing and contract choice in Michigan: The influence of social distance

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FARMLAND LEASING AND CONTRACT CHOICE IN MICHIGAN: THE INFLUENCE OF SOCIAL DISTANCE

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ABSTRACT

FARMLAND LEASING AND CONTRACT CHOICE IN MICHIGAN:
THE INFLUENCE OF SOCIAL DISTANCE

By

Kent R. Gwilliam

Choice of the share crop (as opposed to cash rent) form of contracting in agricultural leasing has been the subject of debate for years. Traditional economic theory has held that the practice is (in theory) fundamentally flawed and leads to inefficiency and inappropriate allocation of resources. Scholars have remained puzzled by the persistence of the practice and have made numerous attempts to produce models that would explain its popularity.

This study explores the influence of social relationships (termed social closeness) on the choice of contract. The model created demonstrates that individuals with social closeness will choose the share crop form of contract. The benefits of this type of agreement are cost savings and income enhancement.

Data to test the hypotheses was collected by conducting a mail survey of landlords and tenants in Michigan. Testing was done using a logit regression model.

It was found that social relationships influence the choice of contract. Responses of landlords in particular showed evidence that interaction on a social basis and interpersonal relationship were correlated with the choice of the share crop form of contract. In the case of tenants, the

attitude, experience and willingness of the landlord to contribute more than just land to the agreement were correlated to the choice of the share agreement.

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CHAPTER I

INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction

Two in every five acres of US farmland is under some kind of lease agreement. Understanding the issues and implications of leasing can make an important contribution to the adaptability and well being of US agriculture. The efficiency of share cropping agreement versus cash rent has long been the subject of debate due to apparent conflicts between theory and practice. This study adds a new dimension. The motivation for leasing and the choice of contract will be examined particularly with regard to the social relationship between the landlord and tenant.

When a landholder faces a change in circumstances such that the farming of the land is no longer consistent with his/her interests, a decision must be faced. Either the land can be sold, left idle, let to a tenant or the owner can hire custom work done. Leaving the land idle is rarely an economically sound choice. Choosing to sell the land may pose other problems. Land is not liquid. Land markets, though traditionally stable, have recently been subject to considerable instability, interfering with marketability. Furthermore, the land owner may want to retain ownership of the land for investment, personal or tax reasons.

On the other hand, an ambitious farmer may be motivated to expand his or her land base in order to achieve a more efficient use of resources, expand

operations, or take advantage of market fluctuations without taking ownership of the land. Lack of capital, desire for mobility, or interest in accommodating the needs of family members no longer in a position to farm can motivate a potential tenant to turn to leasing as an alternative to ownership.

For the landlord, securing a good tenant is no small matter. In addition to annual income, the landlord knows that soil maintenance and conservation practices depend on the attitude of the owner and/or occupant of the land and the level of commitment to investment in the future. The owner of the land is assumed to have a vested interest in the land and maintenance of the value of that investment. The tenant on the other hand tends to be motivated by current term profit potential. It is not difficult to envision that such differences in interests can lead to some conflict and/or controversy in establishing and maintaining lease agreements.

Furthermore, the scene is complicated by the emergence of two alternative modes of leasing. For one, there is the traditional share leasing agreement (sometimes referred to as share cropping) under which the tenant pays the landlord a portion of the crop either in kind or the equivalent in cash after the crop is sold. The other alternative is a cash rent agreement where the tenant pays a fixed fee for the use of the land, usually in advance of the cropping season. The different agreements necessarily foster different sets of economic incentives.

The share leasing agreement, in particular, has perplexed students of economics for a number of years. The source of much of the confusion stems from the analytical approach of economists and the assumptions underlying the traditional

economic model. Strictly speaking (in the language of economics), when a landlord engages a tenant, the rent paid for the use of the land partially or wholly recompenses the landlord for foregone returns from the use of the land. Provisions may also be made to account for any depreciation, time and effort in servicing the lease, and whatever economic profits are forthcoming given the conditions of the market subject to the terms and conditions of the lease.

Conflicts arise between theory and practice which are generally acknowledged in the literature, but not resolved (Cheung 1969, Heady 1947, Sutinen 1975). These include: 1) the disincentives to production on the part of the tenant, 2) the difficulty associated with monitoring the maintenance of the soil (or lack thereof), 3) the difficulty associated with monitoring of conservation practices, and 4) the inefficiency associated with performance of maintenance and conservation practices separately from the routine cultivation and farming of the land.

No line of thinking has emerged to dominate the field. It is intended that this study will gather valuable empirical data to be used in evaluation of hypothesized links in the development of a theory of leasing. Concurrently, it is anticipated that practical information will be generated to contribute toward the preparation of a handbook on leasing. This document should prove useful to those faced with the prospects of leasing and desiring educational and conventional information on the subject.

The author has observed that the interests of landlords and tenants may conflict as each tries to optimize returns under a lease agreement (see also Schickele

1941). Of particular interest are the long range effects on the fertility of the soil and preservation of the environment (Ervin 1983, 1986, Dillman 1982). It appears that there is a relationship between the attitude of the tenant and the performance of fertility maintenance, soil conservation and environmental protection investment. This attitude may be directly related to the expected length of anticipated tenure or specifically related to the interest the individual has in the welfare of the other party in the leasing agreement, or both. Ultimately the prevailing attitude may lead to the kind of contract chosen.

1.2 Problem statement

Behavior exemplary of temporary (versus permanent) land tenure will have negative effects on efficient use of the productive assets, specifically the maintenance and care given to the soil and the environment. Though behavior of the permanent tenant (including landowners) can be less than ideal due to constraints in time, resources and knowledge, the behavior of the temporary tenant is expected to be substantially worse. In principle, the terms and conditions of the lease agreement may be drawn up in such a way as to encourage the short term tenant to exhibit behavior similar to that of a permanent tenant. However, in practice, the contract is necessarily incomplete because of uncertainty and monitoring (transaction) costs.

Despite it's significance, detailed knowledge and understanding of agricultural leasing in the U.S. does not exist at the present time. To the author's knowledge only two books have been written on the subject, one by Steven N. S. Cheung in

1969 and another by J. M. Currie in 1976. Each attempts to address the leasing issue theoretically, but neither offers solid empirical data to substantiate the theoretical claims[1]. And, though numerous articles have appeared on the subject, the broad observation by this author is that the existing theoretical explanations have failed to provide a consensus, or generally accepted basis, for the choice of the share cropping agreement.

Current (traditional) models have limited capacity to explain and predict tenant (and landlord) behavior. Further understanding of leasing and leasing behavior is crucial to analyze policy issues concerning land ownership, land use, land values and farm finance. The traditional model needs to be supplemented with such things as the tenant's reputation, commitment to family or friendships, personal integrity, credible penalty threats on the part of the landlord, and incentive programs which may all influence the behavior of the tenant.

In anticipation of a better understanding of the attitudes and behavior associated with tenure and contract choice this study was conceived. The objectives of this study are:

1) Seek a solution to the conflict between theory and practice,

2) Improve the data on leasing in Michigan, and

1

As this work is being concluded and prepared for binding it has come to the author's attention that a new book on contract choice has come out. The authors' work has been cited herein but it would be appropriate to acknowledge that the book was not available at the time of this study (see Hayami and Otsuka 1993).

3) Examine the contribution of the concept of social closeness in contractual agreements.

The following pages will detail the work of reviewing previous studies, conception and examination of a model of leasing, formalization of testable hypotheses, organization and execution of a survey of individuals involved in the leasing of farmland in Michigan (both landlords and tenants), collection and analysis of the data, and examination of the results and ensuing conclusions.

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

The incidence of leasing accounts for between thirty-five and forty percent of the nation's farmland and has remained fairly constant over the years. Fluctuations do occur with the most noticeable being a tendency for the amount of farmland under lease to rise when farmland prices are falling. Given the magnitude of the practice of leasing of farmland, considerable interest is generated in leasing agreements and the potential for impact on national production of food and fiber. In order to set the ground work for this study of contract choice in leasing agreements, the following pages will examine previous work by other authors. Of particular interest will be other attempts to explain the behavior of landlord and especially tenants.

2.2 Historical setting and emergence of leasing

Ever since Jacob contracted for the off color offspring of the cattle as compensation for his services in managing Laban's herds and flocks, students of the economy have grappled with the conflicts of interest between landlord and tenant. Adam Smith (1805) argued that the tenant's rent, paid to the landlord, discouraged any investment by the tenant in durable factors of production. He compared it with

a tax which interfered with productivity. A prevailing position of early writers was that tenure, particularly share tenant agreements such as the widely adopted *metayage* (share-cropping) system in France, constituted a curse to the land, the economy and the citizens. Among others, Richard Jones (as quoted by D. Gale Johnson, 1950) attributed widespread poverty of the rural citizens to this tenure system which discouraged input use and consequently lowered productivity.

Economists remained perplexed by the persistence of the share crop tenancy and began to examine the reasons for its popularity. John Stuart Mill (1920) took the position that the *metayage* system was theoretically sound but that the concurrent problems were due to imperfections. Alfred Marshall (1920) encouraged the use of cash, versus share, rent (showing that an optimal solution could be achieved by adjusting the fixed and share proportions of the contract), in order to avoid the theoretical conflict of interest. Later Schickele (1947) Heady (1947) and D. Gale Johnson (1950) began to propose conditions under which the share contract might be considered as efficient as cash rent. Nevertheless, these proposed solutions, and others that have followed, have not found overwhelming favor in the literature. Numerous models have been proposed. However, for the most part, inconsistency with empirical data or use of assumptions foreign to the environment found in the field, have left the profession less than convinced.

2.3 Areas of Focus

Five major questions have dominated the discussion of tenure. The first of these receives disproportionately little attention. Questions 2-5 were identified and listed by Newberry and Stiglitz (1979) and again by Allen (1985):

1. Why doesn't the landowner farm the land personally, or sell it?

2. What is the reason for the persistence of sharecropping and coexistence of types of lease contracts (share, cash, and mixed)?

3. Why does the share leasing agreement decline with development?

4. What causes lower productivity under share leasing agreements? Or, does the share agreement necessarily correspond with lower productivity?

5. How is share split determined?

The second question has received most of the attention and continues to dominate the discussion in the literature. This author takes issue with the third question since this does not seem to be the case in U.S. agriculture (see Johnson *et al* 1987).

As with many others, the focus of this study will be on question number two. In seeking answers to this question, it is expected that some understanding will be brought to bear on questions three through five. Question one will be addressed only briefly. Prior to addressing these questions, a brief review of terms and definitions is provided.

2.4 Terms and Definitions

The tenure terms have applied to a broad spectrum of contractual agreements and contracting parties with a variety of resources. Landlords consist of owners of property with an interest in securing a tenant that will occupy, manage, care for, or husband the asset (usually land) in the place of the landlord and render to the landlord a compensation for the use of the assets. Tenants cover an even broader category of individuals. The medieval European description characterizes tenants as peasant laborers. In more modern US agriculture, the tenant could be best described as an entrepreneur, an owner of specialized productive assets, labor, and managerial skills. In any event, the tenant exhibited two common characteristics 1) he/she is entrusted with a stewardship over assets that are owned by the landlord, and 2) receives compensation resulting directly from the proceeds of production rather than a fixed wage.

Tenants will be distinguished from hired laborers by the latter characteristic. Where a majority (over 50%) of the engaged party's income or compensation, relative to the contract or agreement, is derived directly from and varying with the proceeds of production, the party is considered to be a tenant. Otherwise the party will be considered a hired laborer. Both tenants and hired labors may share the former characteristic of stewardship, however, perhaps not to the same degree.

Because this depiction leaves the definition of the tenant open to a broad range of individuals, researchers have been at liberty to further define and specify the characteristics of the "tenant" according to the nature of the study or model at hand.

For example, Bogue (1964) reports that a prominent midwestern landlord in the late 1800's classified tenants relative to personal holding of property. Ottoson (1955) distinguished between crop and livestock share-tenants, citing different incentive sets for tenants involved in different assets. Lucas (1979) points out a distinction between share tenants who make payment "in kind" and those who render cash payment to the landlord. He points out that the "in kind" payment elicits a focus on *quantity* production while money payment encourages the tenant to focus on quality as well. Of course, it is not uncommon for a distinction to be made between cash-lease and share-lease tenants.

Cheung (1969) in attempting to model conditions in Taiwan, chose to classify the tenant as a landless, laborer without assets. Others adopting this definition include Baron (1981) and Boxley (1971). Several studies in India portray the tenant as a landless peasant (see for example, Bardhan 1979 and Rao 1971). By contrast, a recent study in Nebraska and South Dakota (Johnson *et al.* 1987) found that the farmer-tenant dominating the rental market in the US owned some land as well as having a substantial investment in farming equipment.

For this study, the following set of terms will be used to identify and distinguish tenure classifications:

Owner Operator	One who farms only the land he/she owns.
Tenant--	
Part Owner	One who owns some land and rents additional land from others.
Full Tenant	One who farms only the land he/she rents (does not own any land).
Landlord:	Owns land and leases to one or more tenants. May be *part time* landlord --still farming some land, *absentee* landlord --one who does not live in the same county as the land under lease. An *institutional* landlord usually either a firm, government body, or possibly community organization such as an Indian tribe.

This set of definitions seems to have been adopted as the norm in the current literature, including the Census of Agriculture (1987) classifications, with only syntax difference. An example of syntax variation would be Allen and Lueck (1990) who employ the term farmer instead of tenant in the their description of the party renting the land.

The common factor is, however, that the tenant comes to the lease agreement with some capital. It may be human capital in the form of skills, time, or willingness to incur risk, real capital in the form of operating funds, or physical capital in the form of machinery and equipment, often a combination of all three. He or she contracts to compensate the landlord for the use of leased assets while anticipating a return on the invested real, physical and/or human capital. A functional model of leasing should therefore capture this aspect of return on investment to the leasing parties.

2.5 Purpose: Why Rent?

2.5.1 For the landlord

The landlord may choose to retain ownership of the land but not wish to farm it personally. Reasons for this might include, but are not limited to the following:

a) Illiquidity

b) Tax incentives

c) Hedge against inflation (Baron 1983)

d) Engage the professional services and/or skills of the tenant.

e) Share risk

f) Sentimental value

2.5.2 For the tenant

On the other hand, the tenant desires to lease farmland as an alternative to ownership. Reasons for this position might include:

a) lack of capital

b) cost of assets (cheaper to rent than own)

c) mobility

d) gain experience under the guidance of a retired farmer

e) share risk

f) unavailability of land for purchase

2.6 Contract Choice

In order to understand the traditional thinking on the various contracts and the corresponding theoretical implications, the next section will be devoted to a review of the characterization of tenure in the literature. As mentioned above the choice of contract question has seemed to dominate the literature.

2.6.1 Early Models

Adam Smith has been credited with the formulation of what will be termed the traditional model which was later adopted and formalized by Alfred Marshall (1920). The simple depiction of the landlord tenant relationship (discussed below) together with the implications for behavior by the tenant and landlord, have persisted for a long time. Still the theoretical predictions of the model result in paradoxical outcomes when compared to observed practices and empirical studies. Numerous variations and reformulations have been proposed with no emergence of a dominant line of thinking to supersede the traditional model. These will be examined below, beginning with a discussion of efficiency in tenure, the driving force behind the theoretical constructs.

2.7 The Traditional Models

In this section we will examine a number of models that appear with some frequency in the literature.

2.7.1 The efficiency question

The vast majority of the literature on agricultural leasing is motivated by the theoretical issue of efficiency in determining contract choice. The hypothesis, regarding the performance of the tenant with respect to employment of productive inputs, is that the share tenant will choose variable inputs that result in an inefficient use of the available resources (see Otsuka and Hayami 1988.) This characterization of the landlord tenant relationship is established theoretically, assuming the tenant's incentive to equate marginal revenue and his own marginal product which is merely a share of total output. The tenant has control over variable inputs and chooses a level of output that is below that which the landlord would have chosen. This is best portrayed by a careful examination of the traditional model.

2.7.2 Advalorem tax or share model

The traditional approach is to compare the expected performance of the tenant under crop-share and lump sum rental agreements. Under crop share agreements the tenant contributes to the landlord a portion of each unit of output. The result is similar to an *ad valorem* tax. And, as in the *ad valorem* tax model, the profit maximizing point of output occurs (i.e. equates marginal cost and marginal revenue) at a lower level of output for the managing (before tax) firm. Consequently, theorists conclude that the profit maximizing share-tenant will choose a reduced level of inputs, lowering output.

The graphic representation (See Figure II- 1) demonstrates that under the crop share agreement, the tenant is expected to equate marginal revenue with marginal cost. If marginal value product (MVP) is depicted by AQ_3, and BQ_3 represents the tenant's MVP, then given constant marginal cost (MC) of inputs line DC, the tenant is expected to apply variable inputs X until the marginal cost per unit of X is equal to the marginal return at input point Q_1 yielding output E. This results in a lower level of output than that which would be chosen by the landlord (Q_2 input level yielding output C) and consequently an inefficient allocation of resources (see Schickele 1941, Heady 1947, Johnson 1950, Issawi 1957, Georgescu-Roegen 1960, Adams and Rask 1968, Boxley 1971, Newberry 1974, Reid 1976, Braverman and Stiglitz 1986 and Otsuka and Hayami 1988).

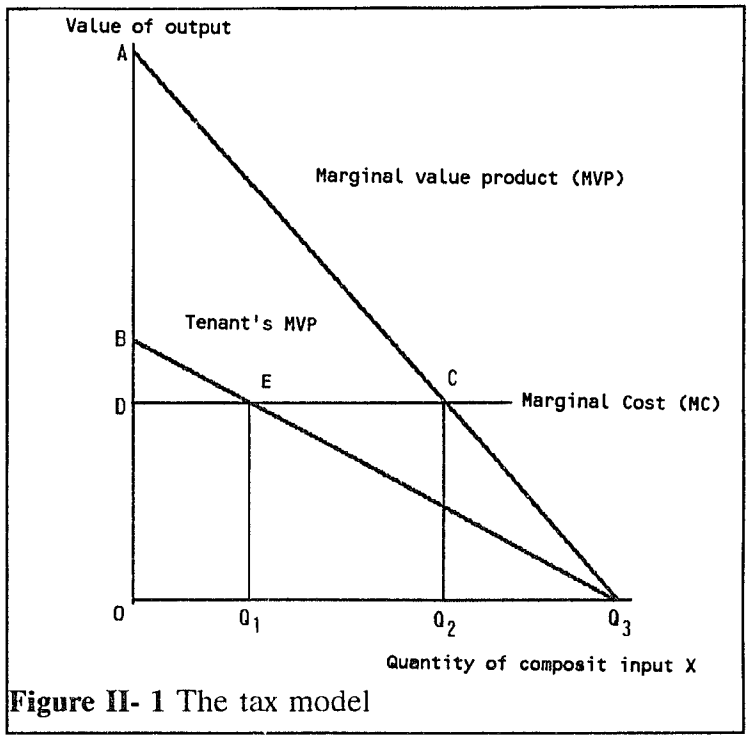

Figure II- 1 The tax model

To further demonstrate the application of this model, the motivation of the tenant is considered. Under a share lease agreement, the tenant supplies a variable input, usually depicted by labor available in completely divisible, uniform units.

Faced with the reality of receiving only a portion of each unit of output per each unit input of labor, and assuming diminishing marginal returns to the variable input, the tenant will attempt to equate the value of the marginal product with marginal cost.

2.7.2 Lump sum model

For comparison, let us consider the model often viewed as the efficient case: a tenant with a cash lease. First the following variables are defined:

L : proportion of tenant's labor employed on leased land.
$0 \leq L \leq 1$
A : number of acres rented (could also be viewed as all fixed inputs)
q : output which is a function of labor and land, $q = q(L,A)$
c : per acre cash rental
w : wage rate of labor (exogenous)

The price of the output q is normalized to unity. The tenant's income y is then expressed as:

$$y = q - cA + w(1 - L) \tag{1.1}$$

This leads to the familiar maximization result in which the first order conditions equate marginal revenue (marginal product of labor) with the wage rate:

$$q_L' = w \tag{1.2}$$

Next the case of the share tenant is considered. Income for the tenant is given

as:

$$y = (1 - \alpha)q + w(1 - L) \tag{1.3}$$

where α is the landlord's rent ($0 \leq \alpha \leq 1$) to be paid as a share of output. Using this model, the optimal level of labor input (L) by the tenant would occur where marginal cost of L and marginal return to L are equated. The first order conditions then result in:

$$(1 - \alpha)q_L' = w \tag{1.4}$$

Since the return to the tenant is now less than the market wage rate, and assuming that the return to labor is a declining function, the tenant will choose to reduce the amount of variable input L. He will attempt to equate the cost of effort to returns equivalent to the market wage rate w. Optimal behavior by the tenant would then result in reduced output to the extent of the output elasticity of the labor input (Drake 1952 and Braverman and Stiglitz 1986). This result is considered to be an inefficient use of resources, the efficient case being expressed in equation (1.2).

2.8 Problems with the Traditional Models

The tax model as formulated to this point, raises a number of questions. First, is does not answer the question of labor allocation between the technically equivalent leasing agreement and working for the market wage. The implication is that there

is some incentive for the tenant to allocate all labor to the leasing agreement. Consequently, it does not answer the question of contract choice, implying that the share tenancy agreement is illogical.

Second, there is a problem of labor allocation between parcels of land owned and leased. Most individuals that lease farmland in the US own some land (Johnson, *et al.* 1987). Farmers realize that timing of planting and harvest are often extremely crucial to the success of the crop. The tax model assumes that all units of labor are equal and are uniformly distributed. It would stand to reason that the tenant will have an incentive to allocate prime time to owned land where the full value of the crop is his to keep. Leased cropland, especially share-leased, would receive second priority and therefore the value of crops from leased land would be relatively lower. This should be especially evident when conditions are less than ideal, threatening crop failure (Holstrom *et al.* 1985).

Third, the theoretical predictions are not supported empirically. Otsuka and Hayami (1988) have compiled an impressive list of empirical studies. Their data demonstrates that, based on yields, there is no statistically significant difference between output on owner versus tenant operated farms. However, they do show that there appears to be a difference relative to the value of the output.

Further, the tax model raises the question of resource allocation. On the one hand, according to traditional economic theory, the (Marshallian) economically efficient allocation is expressed in the model where the rent is a lump sum. Marginal input use is equated with marginal output. The choice of the tenant is then to

evaluate the returns to farming and then either pay the lump sum rent or work for the market wage. In a perfect market in equilibrium, one would expect to find the earnings of the tenant and wage earner to be equated, assuming either no risk or equivalent risk to the respective alternatives. This outcome would then be evaluated against the relative earnings from leasing a given parcel of land on a share basis. The tenant's choice would equate all three possibilities in this simplified environment.

Similarly, the landlord is faced with finding the means of achieving the optimal use of the asset, land. Shaban (1987) maintains that a major failing of the traditional approach is that researchers tend to neglect the fact that the landlord is an actor in the leasing agreement. Specifically, if the landlord is not able to realize returns by share leasing greater than or equal to that expected under a cash lease, then the landlord will choose the cash lease.

The tax model predicts that the tenant will equate the value of marginal inputs and outputs. The implication is that this is the same result that the landlord would reach were he/she to farm the land personally. The economic model assumes that the contribution to production of the fixed asset, land, is known and constant yet nearly all of the authors consulted refer in some way to the differences in productivity attributable to use and/or abuse of the land. However in the traditional model, the change in output is attributed solely to the application of variable inputs.

Early researchers, true to economic custom, held rigidly to the theory and thus, the traditional model. They attempted to explain away the empirical evidence (Heady and Kehrberg 1952). But, more recent empirical evidence has failed to reject

the hypothesis that there was no reduction in production levels on farms operated by tenants (Johnson, *et al.* 1987).

2.9 Elements that remain unexplained by the tax model and its variations.

Why does the share lease arrangement remain so popular (Dillman and Carlson 1982)? Johnson *et al.* (1987) found that 75% of Nebraska leases and 62% of South Dakota leases used the share rather than cash leasing arrangement. If indeed it is inefficient what incentives prescribe its choice? Or, is it that the assumptions that would lead to a theoretically efficient result are not borne out in practice? Bernat (1987) concludes:

> Neither the traditional version of the tax-equivalent model, in which the operator is a landless tenant, nor the screening view appear to be very relevant to U.S. agriculture. . . The traditional tax-equivalent model requires market imperfections that either do not exist in the modern U.S. economy or are relatively insignificant.

Furthermore, were the landlord motivated to participate in sharing all production inputs in similar proportion to output share, why do we not observe the landlord either contributing labor or compensating the tenant for a share of the labor expenditure? One possible explanation proposed by Bernat (1987), which bears further consideration, is the notion that many agricultural crops may not lend themselves to marginal variations in labor inputs. That is, the inputs are better viewed as complements. Indeed, a situation approaching an all or nothing prospect is common, causing the marginal returns to labor to be either very great or insignificant such that the term *marginal* returns has no meaning.

Empirical evidence only partially supports the tenure-ladder variant of the screening hypothesis. Full tenants tend to be younger than part or full owners (Johnson *et al.* 1987). However, the fact that many operators frequently rent under both cash and share contracts and go back and forth between the two alternatives, frustrates the idea of a progression from one to the other.

2.10 Proposed Answers to the Theoretical Paradox and Contract Choice

As mentioned previously, the majority of the studies consulted in the literature attempt to provide answers to the seemingly paradoxical conditions that remain between the accepted theory and the limited empirical evidence. These attempts include such things as revising the assumptions, adding new assumptions, adding conditions or constraints, or attempting to modify the theory. Each approach has some merit as well as some shortcomings. This discussion is introduced by an input sharing solution.

2.10.1 Input Sharing

Schickele (1941) and later Heady (1947) proposed an alternative to the results of the traditional share model. They suggested that if inputs were shared by the landlord and tenant in the same proportion as outputs, the incentive problem leading to reduced input levels could be avoided and the "perfect" or "ideal" socially optimal lease would result (see also Castle 1952). Adams and Rask (1968) demonstrated this

effect geometrically with a model that has gained acceptance as the appropriate depiction of the share-lease paradox (see Figure II- 2).

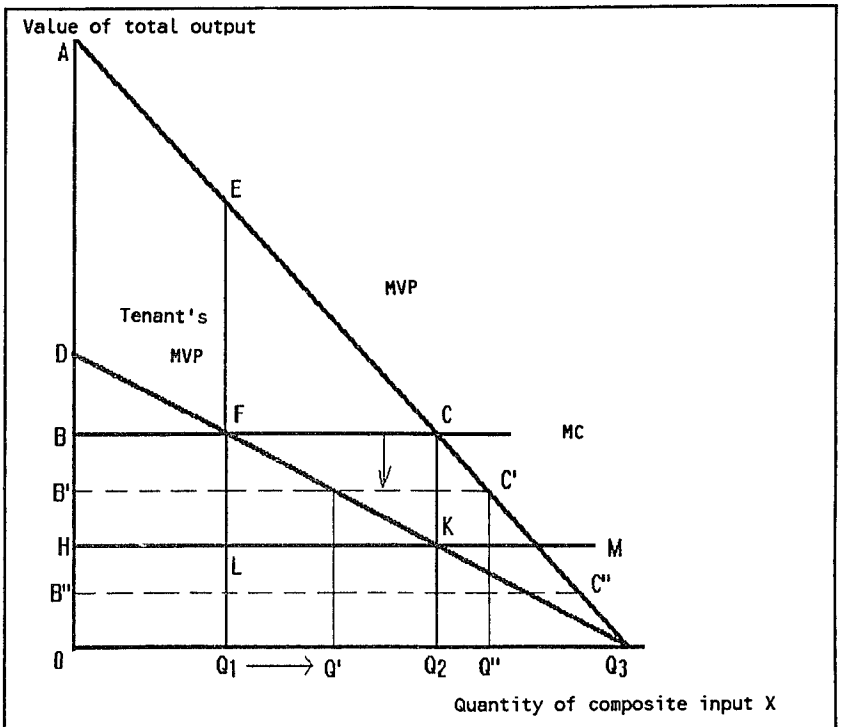

Figure II- 2 The effects of sharing input costs to resolve the share lease paradox.

Their model assumes a 50-50 output share lease with no cost sharing. The line indicated as AQ_3 represents the marginal value product (MVP) of output to the firm as input X_1 (such as labor) is varied. Land and other factors of production being held fixed. The line BC represents marginal factor cost (MFC) of input X_1 to the firm. The owner-operator (or tenant paying a lump sum rent) is expected to choose Q_2 level of variable input X_1 to equate MVP with MFC.

Line DQ_3 then represents the effective MVP realized by the tenant. And, the tenant is expected to choose Q_1 level of input X_1, or a reduced, inefficient output level. The argument is that if the landlord were to share input costs at the same proportion as the sharing of output (the "ideal lease"), the tenant's MFC schedule

would be *HM*. Now the incentive exists for the tenant to choose Q_2 input level which maximizes profits with respect to X_1.

The model readily indicates that the tenant has an economic incentive to adopt the Q_2 level of variable input. However, the incentives faced by the landlord are not so clear. Participation in variable costs (X_1) requires the landlord to contribute the equivalent of area *BGKH*, receiving in return increased revenues of *FEGK*. The conclusion is that unless the latter area exceeds the former, the landlord would be unwilling to participate. Adams and Rask qualify this by adding that empirical verification would be required to establish preferences. Otsuka and Hayami (1988) are much more aggressive in their attack of this result, claiming that for the most part it would require that the landlord be ". . . an altruist, who, as a benevolent patron, supports the income of poor clients at the expense of his income."

A disturbing implication of the cost sharing model as proposed is the fact that in order to realize the optimal point indicated, Q_2, *all* variable costs would need to be shared, *including* the cost of the tenant's labor. It is not clear to this author why previous studies have failed to address the implications of the landlord paying for a portion of the tenant's labor. For example, Heady (1947 p.670) for reasons unknown to this author, omits labor from his list of variable inputs. Only Boxley (1971) and Schickele (1941) and more recently Shaban (1987) acknowledge this point in the literature. Each discusses it briefly but neither offers a solution. Boxley and Schickele seem to take the position that this is an exception to the model that must

be simply taken into account. In any event, labor remains a major variable input, a choice variable under the ownership of the tenant.

2.10.2 Empirical and Practical Questions

Interestingly there has been little empirical work done to verify the predictions of the Adams and Rask model. A prior study by Berry (1962) which fielded opinions of farmers in South Dakota revealed that tenants and landlords both expressed willingness to share the cost of fertilizer and, under some conditions, seed. However, both groups strongly resisted the idea of sharing the cost of things like fuel, hired labor, and repairs to machinery. Berry offered the explanation that further sharing tended to imply a partnership rather than rental agreement, something that was less appealing to the agents. Other studies indicate a willingness by landlord to participate in sharing fertilizer, seed and chemical costs (Shaban 1987, Johnson *et al.* 1987).

Further reflection on the nature of the inputs considered by Berry, suggests that there is a direct correlation between the willingness of the parties to share input costs and the degree of either liquidity or substitutability of the actual inputs shared. For example, fertilizer is purchased in large quantities involving one or possibly two expenditures which are easy for the landlord to observe and verify. When purchased in bulk it is not uncommon for it to be premixed to the purchaser's specifications according to land fertility and intended crop. Handling is expensive. These conditions tend to limit or at least reduce the liquidity of the commodity on the resale

market and thus the incentive to steal.

Furthermore, fertilizer application to the land and or growing crops takes place as a relatively infrequent event. Once applied, the fertilizer can neither be removed nor transferred to another purpose. Hence it has no marketable value. By comparison, fuel is purchased frequently, has many alternative uses, and has, as well, a resale value.

In connection with the issue of sharing of inputs and outputs one must also consider the proportion or division of shares. The Adams and Rask model (above) adopted the conventional theoretical Marshalian approach of the time, which precedent has persisted in the literature. However, Heady (1947) noted:

> It is common knowledge, of course, that share rents vary between certain wide areas. Even then, the discrete breaks in [proportion of] share rentals between broad regions cannot conform accurately to the gradual decline in economic rent resulting from increased transportation costs or less favorable weather. However, numerous studies have indicated that uniform rental shares tend to exist within areas which are fairly homogeneous in respect to prices and weather but widely heterogeneous in respect to soil resources.

What causes the variation?

Newberry and Stiglitz (1979) proposed an argument to support the traditional 50-50 share split. Allen (1985) demonstrated a similar condition. In the section under risk (below) a result by Robison and Barry (1987) is examined which further supports the 50-50 split. However, the empirical work by Johnson *et al.* (1987) shows decided support for Heady's regional differences. This author will argue that the relative contribution of the parties will influence the contract choice and the share

split. It is a question of return on invested resources. Brown and Atkinson 1985 base their conclusions relative to contract choice on the entrepreneurial ability of the tenant, a type of resource contribution.

2.10.3 The Equal Efficiency Models

In answer to the problems relative to the share tenancy model discussed above, Cheung (1969) posited that the root of the problem could be found in the use of partial equilibrium analysis. The traditional model does not account for the supply side in the economy. The argument is that if potential tenants are plentiful and are competing for limited available land, there will be a tendency to agree to contractual agreements that specify labor inputs beyond the marginal equation of the tenant.

Prior to Cheung, D. Gale Johnson (1950) challenged the notion that equilibrium output would occur at Q_1 (see Figure II- 1 page 15) since the landlord would not be satisfied with this solution. More recently Shabin reiterated this argument maintaining that the landlord would not tolerate this level of output and would settle for the cash lease instead. This model resolves the problem of comparing all forms of tenancy in general equilibrium.

2.10.4 Cheung Model

Steven Cheung assumes (1) the firm's output level is uncertain due to some random factor of production such as weather, (2) the contracting parties are averse to risk, (3) the contractual alternatives are either a pure wage contract, a pure rental

contract, or a pure share contract, (4) transaction costs are zero or the same for all forms of contracting, and (5) all other means of shifting the risk are too costly (1969 p68).

By adopting these assumptions Cheung takes the position that equilibrium conditions, in a world of perfect competition, will result in equal return to the landlord from cash and share leased land. Similarly, tenants will be indifferent to share leasing or wage rent since each will generate merely the marginal product of labor (Adams and Rask 1968, Boxley 1971 & 1972, Gisser 1969, Kim 1972, and Scott 1970). Competition among renters will ensure that labor supplied would be equal to the labor engaged under a wage contract with no shirking. Indeed, Cheung assumes that if the level of labor expenditure is specified in the agreement that no shirking will occur.

2.10.5 The Screening Approach

The screening approach attempts to explain contract choice by incorporating into the tax model additional assumptions. It also recognizes a degree of differentiation of the variable inputs. For example, labor is divided into skilled (managerial) and nonskilled. Tenants are assumed to possess nonskilled labor and varying degrees of skilled labor. Landlords on the other hand have only skilled labor. Furthermore, output is a function of both types of labor.

Asymmetric information about the ability of the tenant, on the part of the

landlord, motivates the landlord to offer a variety of wage, share, and cash contracts. The tenant, by choosing the contract to maximize net returns, reveals skill level and resources. In turn the landlord enjoys optimal returns by complementing the contribution of the tenant with managerial skills where appropriate (Halagan 1978).

The prediction, therefore, is that screening will lead to wage contracts by tenants possessing no managerial skills, cash rent contracts by highly skilled tenants, and share contracts by tenants with limited management skills (Allen 1984). Brown and Atkinson (1985) surveyed landlords and tenants in Indiana and demonstrated that under share agreements significantly more decisions were shared by landlord and tenant than under cash rent agreements. They suggested that this finding supported this idea of self selection proposed by Halagan (1978) as well as the agricultural ladder theory. What they did not disclose is the location of the landlords (present versus absentee), degree of managerial ability possessed by the landlord, and the relative disposition for cooperation. The theory thus assumes that the landlord has, and is willing to provide, the necessary management skills. Where the landlord is not able to contribute, output will be reduced on land under share and wage contracts (Allen 1985). The practice of use of contract types to induce self selection resulting in screening of tenants is not readily observed in U S agriculture.

Furthermore, the screening approach assumes at the outset that skill levels are not observable. Johnson *et al.* (1987) found that the most prominent category of agricultural tenants in the US were part owner operators, a group that by occupation, necessarily possess highly developed managerial skill levels. Nevertheless, this group

participates in both share and fixed rent contracts, a fact that remains unexplained by the screening viewpoint.

Furthermore the fact remains that skill levels are not necessarily invisible to landlord. This is further complicated by the fact that the self selection model is static or would propose that tenants re-negotiated contracts in each period, with past history becoming invisible once again. Empirical evidence, again from the Nebraska - South Dakota study reveals that the parties to a given contract tend to establish long or semi permanent though unwritten agreements. Very little land is let to strangers. Both of these conditions suggest that the landlord will have the means to determine skill level in advance of contracting and thus by-pass the screening problem altogether.

2.10.6 Agricultural Ladder

Another theory of land tenure posits the existence of an agricultural ladder. The perception is that young beginning farmers would tend to have limited skill and resources. The logical initial step would be to engage in a wage contract, consistent with the predictions of the screening theory discussed above. Successful tenure would lead to the accumulation of skill and assets leading to share and ultimately cash rental agreements with ownership the final goal (Kloppenburg and Geisler 1985). The incentive for the tenant would be to receive compensation for accumulated managerial skill and asset.

The problem with the ladder model was that, although it enjoyed substantial ideological appeal, empirically it was never substantiated. Due to lack of hard evidence the theory fell from academic grace as a viable theory of land tenure around 1950. The contribution to the understanding of tenure in the context of this study is simply to note that this approach has been embraced, scrutinized and discarded.

2.10.6 Linkage

Attempts have been made to incorporate tenant behavior into a model of multiple incentive variables, a practice termed linkage (Bardhan 1984, Bell and Zusman 1976, Braverman and Srinivasan 1981, and Braverman and Guasch 1984). The concept centers around the idea that the landlord plays a role of not only landowner but also as financier of commodities for the tenant much the same as the company store for coal miners. The occurrence of this kind of leasing agreement is limited to developing countries and has little application to leasing in the United States.

2.10.8 Risk

A number of economists have undertaken to show that the sharing of risks provides an incentive for selecting the crop-share lease as opposed to other types (Cheung 1969, Stiglitz 1974, Reiss 1984, Sutinen 1975, Newberry and Stiglitz 1979, Reid 1973, Robison and Barry 1987, and Otsuka and Hayami 1988). Cheung and Sutinen argue that the presence of risk is a necessary condition to the choice of the

share contract.

Reid, however, reached the conclusion that dispersion of risk is not a sufficient incentive to motivate choice of share contract over wage or fixed rental contracts (Reid 1976 & 1983). Moreover, Stiglitz (1974) and Newberry (1977) demonstrated that given constant returns to scale, the risk sharing attributes of share contracts could be achieved through a mixture of wage and fixed rent contracts. The relative significance of risk sharing as an incentive to establishing share crop agreements in the US prompted Newberry (1973) to conjecture:

> ". . . I agree that risk sharing is not the only motive for sharecropping, and, in US agriculture, possibly the least important motive, I think the evidence from developing countries suggests that it has an important role."

In Taiwan, Cheung (1969) found that the risky crop (wheat) was most frequently the target of sharecropping contracts. Less risky crops such as rice tended to attract cash rental agreements. As a result Cheung proposed that the sharing of risk dominated the transactions cost result on crops of high risk. Sutinen raised some important questions about the Cheung data, pointing out that there was no attempt to account for (hold constant) differences in technology or changes in relative crop values over the period of the study.

By contrast, Rao (1971) found that tobacco was more often cultivated under the cash rent agreement while the less risky Indian rice was dominated by share agreements, exactly opposite to what the risk sharing argument would predict. Rao's

conceptual explanation was the individual's entrepreneurial ability that governed the choice of contract. This argument may have been seen as a source of support the Agricultural Ladder theory of tenure that was popular in the early part of the century. However, one is left to ponder whether tenants in India acquire skill in rice production more easily than tenants in Thailand learn to produce wheat?

Allen and Lueck (1990) tested several risk related hypotheses using the Nebraska-South Dakota data. They found no support for the notion that the share agreement was preferred under conditions of more risky crops.

Sutinen (following Cheung's basic argument) showed that risk could be used to argue for a mixture of contract type. Robison and Barry demonstrated that the Sutinen and Hiebert models could be used to establish the crop-share split where the percentage is derived from a ratio of a measurement of the landlord's risk aversion to the combined risk aversion of both landlord and tenant. The usefulness of this result can be challenged on the grounds that empirical measurement of the risk aversion variable λ has yet to be established. Furthermore, the contract choice question remains unanswered.

Robison and Barry (1987) demonstrated that the models proposed by Sutinen and Hiebert, although slightly different in basic construction, yielded a result indicating that the relative risk aversion of the participants provides an explanation for the predominant 50:50 share lease:

$$\alpha = \frac{\lambda_L}{\lambda_T + \lambda_L}$$

where λ_L and λ_T represent the measure of risk aversion for landlord and tenant respectively. Where the landlord and tenant are equivalently risk averse, crop share α will be equal to one half.

Working backward from this result they propose that where the tenant is risk neutral the cash rent agreement will be chosen. Similarly, where the landlord is risk neutral workers will be hired as laborers. Though the argument is plausible, the author is not aware of a study that attempts to sort tenants and landlords into risk averse and non risk averse groups. The intention is to explain the choice of the share contract by agents that are largely of comparable relative risk aversion.

The literature seems particularly inconclusive on the issue of risk and the role of relative risk aversion in contract choice. It would seem appropriate to conclude that, given a prospective leasing situation where the dominate crop is subject to substantial risk, risk averse parties would tend to choose the share contract to help defray the effects of crop or price failure, all else being equal.

2.10.9 Transaction Costs

Typical transaction costs in a lease agreement are the costs of establishing the contract and ensuring the provisions of the contract are carried out. More specifically, the contracting costs will include things like search costs, legal costs, and

time spent in bargaining and negotiation. Enforcing the contract involves such things as exacting payment, supervision, and measurement and division of the output in the case of share contracts. Another cost in this category would be the cost of monitoring the use of the asset, in this case land.

Very little attention is given to the costs of establishing the contract in the literature. Even those addressing the issues of contract choice give only passing acknowledgement of this topic. Furthermore, almost no attention is given to the bargaining aspect of reaching a contract and the associated costs of negotiation. Alston *et al.* (1984) assume that contracting costs are similar for all of the various types of agreements and therefore regard these as an unimportant constant.

Costs associated with enforcing the contract vary greatly with the type of agreement. Where the payment is fixed, the relevant cost may be minimal in the case of the reliable tenant; or, conversely, substantial if the situation requires eviction of a perfidious tenant. [Under the cash rent agreement the tenant bears not only the risk associated with crop failure and price fluctuations, but also the costs associated with the minimization of these potential problems. On the other hand, a pure wage contract may provide some facility and flexibility in reaching, or where necessary, terminating agreements, but, the landlord must bear the risks and accompanying costs. In addition, due to the incentive and potential for the worker to shirk, performance supervision of the worker adds another cost.]

Alston *et al.* (1984) demonstrated that on cotton plantations in Georgia, supervision costs of hired labor provided grounds for the choice of share contracts.

Otsuka and Hayami (1988) regarded the supervision costs of labor and land as being independent and somewhat inverse. They made the assumption that the incentive for gains by the tenant from land and capital abuse increased with the share (percentage) received by the tenant. Under the wage versus share contract set of possibilities, this may be true. But, under the cash lease agreement the tenant has the greatest incentive and potential to maximize extraction of wealth from the fixed asset since he has control of all variable inputs, including labor effort and production inputs. It would stand to reason that the landlord would therefore prefer the contract choice that would minimize this loss or provide adequate compensation. For example, Allen and Lueck (1990) found evidence that the share contract was more often chosen where the potential for exploitation was the greatest, indicating that asset abuse could be diminished under the share contract.

Finally, in the case of the share tenant, the parties face the problem of measurement and division of the output. Again, the literature is virtually silent on this aspect of the subject, with the noted exception of Allen and Lueck (1990). They hypothesized and found support for the notion that where the costs of measurement and valuation were high (with crops such as pasture and hay) the parties would prefer the cash lease. Similarly where these functions could be performed with minimal cost, the choice of share agreements would prevail. For example, where the product such as wheat is marketed in its entirety at the local elevator and is of uniform quality, the problem is minimized. Indeed, it is not uncommon for the elevator to provide the service of dividing the proceeds of the delivered grain and

paying the landlord directly. However, crops such as hay and pasture are much more difficult to measure. Quality may also vary significantly (that is, the crop may not be fully homogeneous). This could have a bearing especially if the crop is delivered "in kind" to the landlord or purchased by the tenant for feed. In some cases there is substantial marketing to be carried out which may or may not be included in the share agreement.

Transaction costs, especially the costs of supervision identified by Cheung, provide defensible grounds for choosing the share contract. The question is, does this issue have sufficient impact in the leasing environment to dominate the opposing forces? Can we point to the transactions costs as the motivation behind the choice of the share contract in spite of the disincentives discussed above?

2.10.10 Service Extraction

Schickele (1941) in discussing efficiency conditions, alluded to the costs associated with the durable assets, as being relevant to the maximizing conditions. His point was that there must be something missing in the traditional model that overlooked the importance of the contribution of the durable assets. Alston, in a discussion of supervision costs, commented on the landlord's incentive to supervise the use of durable assets in order to avoid ". . . careless or excessive use. . . [which would] . . . result in the depreciation of such assets."

Scott (1982) addressed the issue of costs in a slightly different way. Recognizing the problem of equating the marginal costs and returns as in the Adams

and Rask model he states,

> "Also, Adams and Rask do not consider the returns to the landlord and tenant from fixed resources. Although the theory is correct about the decision on the amount of variable resource to use being determined by marginal returns, this is true only within limits determined by fixed resource costs and returns. This is one case where fixed costs and returns are relevant in the decision process, because the range in shares under the ideal lease which either the landlord or the tenant can profitably accept is not only determined by marginal costs and returns but also by returns to fixed costs both before and after the change."

Unfortunately Scott does not take this issue any further and does not elaborate on the perceived problem.

Robison and Barry examined the problem in their discussion of general efficiency of the leasing agreement prior to considering the effects of risk. They proposed a model that incorporated the change of the asset value in the landlord's maximization problem. Their model is included here with notation changes to be consistent with the earlier discussion:

$$q = f(\frac{L}{A}, z)$$

where q is output, A a unit of land, and z fixed inputs other than land.

They then incorporate a term that represents the change in value of the land over the production period. The landlord's income would then be:

$$y_L = (1 - \alpha)[pf(\frac{L}{A}, z) - w\frac{L}{A}] + \frac{\partial V[A(L)]}{\partial L}$$

Here V represents the value of the land. Robison and Barry maintain that the term $\frac{\partial V[A(L)]}{\partial L}$

is negative as production extracts value from the asset unless reinvestment is made. This point deserves some discussion.

Raw land alone has a basic market value. However, for agricultural purposes, the cultivation, fertilization, incorporation of organic matter into the soil, and/or application of minerals (such as lime) can improve the productivity and in turn, value, of the land. In addition, these steps require time for the working of biological and chemical transformations to occur-- sometimes several years. Similarly, neglect of fertility maintenance by failing to perform these functions will result in a diminishing of the productive potential or value of the land. Consequently, the cultivation practices performed have the potential to either improve or diminish the value of the land. There is a great potential for complementarity in some cultivation practices to enhance not only the current crop, but the long term value of the land. On the other hand there is also considerable potential for substitution of long term maintenance for current crop needs or enhancement. Therefore, the sign of the final term in the equation will depend on the practices of the cultivator of the land and can be positive, negative or zero. Obviously, where this term is greater than zero, the landlord stands to gain.

In any event, their first order condition for the landlord:

$$pf'(\frac{L}{A},z) = w - \frac{\partial^2 V[A(L)]}{\partial L^2(1 - \alpha)}$$

reveals that the landlord will have an incentive to choose a share cropping agreement whenever the term $\frac{\partial^2 V[A(L)]}{\partial L^2(1 - \alpha)}$ is negative, causing the marginal product to be greater than under cash rent.

Allen and Lueck (1990) encounter this issue in attempting to develop a model of contract choice between crop share and cash rent leasing agreements. They recognize the potential for the tenant to adjust variable inputs to alter the rate of service extraction from the durable asset, stating that, particularly in the case of cash rent, the tenant will have the potential and incentive to "overutilize any inputs supplied by the landowner". Still they overlook the source of their argument or at least fail to recognize the nature of the services from the durable asset. For, in the following paragraph, they state that "landowners supply just land and no other services".

This author will contend that the land owner will, and does, engage in actions to both maintain and enhance the value of the durable asset, land. Furthermore, the landowner, recognizing the potential for extraction of services (and therefore wealth) from the land, takes this into consideration in reaching the terms of the contract and the particular individual to do business with.

2.10.11 Exploitation of the land

Due to the potential for the short term tenant to extract wealth from the land by either, (1) not replenishing soil nutrients, (2) not practicing erosion control, or (3) excess use of the asset through intense use of variable inputs, it is widely acknowledged and often hypothesized in the literature that the tenant will do so (Schickele 1941, Lee 1980). Of course this assumes that there is no internalized moral standard that prevents the tenant from pursuing myopic self interest.

Shaban (1987) found that input and output intensity varied with contract type. Specifically, tenants who both owned and rented land applied non shared inputs, such as labor, more intensely on owned land. Fertilizer application, however, was less intense (approximately 10%) on owned land, but yields were higher. Assuming the land was of comparable inherent fertility, this suggests a degree of substitutability between inputs and a willingness of the tenant to allow fertilizer (shared on rented land) to substitute for other (unshared) inputs.

More recently Allen and Lueck (1990) proposed that the potential for exploitation of the land (landlord) played a focal role in governing the choice of contract. Using data from the Nebraska-South Dakota 1987 survey they showed that cash rent contracts were more common under conditions where the exploitation potential was low. Furthermore, share contracts prevailed where conditions were more susceptible to exploitation. Somewhat disturbing is that they propose and defend these findings using a model that assumes joint profit maximization which

raises the question, "If the agents are maximizing joint profits, would they not choose a contract to this end rather than exploiting each other's interests?"

2.10.12 Social Distance

The traditional approach to contract enforcement employs the use of supervision with accompanying penalty for shirking. Disciplinary action such as dismissal or contract cancellation provide motivation for satisfactory performance. In several of the works consulted, the authors point out that one of the tools available to the landlord to ensure the performance of the tenant is the short term agreement (Johnson 1950, Cheung 1969, Reid 1976 and Sutinen 1975). The argument is that where the agreement is short-term and competition exists among potential tenants for the same parcel of land, the threat of dismissal or refusal by the landlord to renew the contract will provide an incentive for the tenant to perform.

Again the evidence from the Nebraska-South Dakota study suggest that, at least in US agriculture, more often than not, the tenant encounters little or no competition when negotiating a lease. The question then arises, "Is the tenant's performance really motivated by the short term agreement or is(are) there some other factor(s) involved?" Furthermore, approximately one third of the tenants and landlords reported their agreements as "multi-year" contracts.

An alternate explanation has long been acknowledged but not incorporated into the theory. There is a definite tendency for relatives and close friends to act altruistically. Schickele (1941) observed,

> "... the closer, the more harmonious the personal relation, the more evenly balanced the managerial contributions of landlord and tenant are. If this harmony between the two partners is perfect, the "entrepreneur" under stock share tenancy can theoretically be considered as one person who behaves according to the pattern outlined for the owner-operator."

Baron (1983) cites Reid (1975) and Winters (1974) as evidence that a major motivating factor in the prevalence of the share leasing agreement was the common interest of the parties. Joint profit maximization constituted the grounds for using the talents of tenant and landlord to achieve an altruistic result. While addressing the issue of moral hazard, Arrow (1968) proposed that the most effective way to prevent adverse behavior would be to develop " the relations of trust and confidence between principal and agent . . . so that the agent will not cheat even though it may be 'rational economic behavior' to do so."

Reid (1976) expands on the intricacies of the crop production process, identifying another interesting peculiarity. First, he identifies the three major stages of crop production (planting, cultivating and harvesting) and the fact that there is potential for (at least partial) substitution of productive inputs between stages. For example, intensive weed control efforts during cultivation will diminish or possibly even eliminate some cleaning steps at the time of harvest. He notes that conditions in one stage will motivate input appropriations in later stages. An example of this would be where ideal growing conditions early in the season necessitate employment of special crop drying techniques at harvest time.

As the production of the crop progresses both the landlord and the tenant

have a vested interest in the outcome under a share agreement. Each has an incentive to continuously evaluate the remaining variable inputs in light of past conditions and anticipated future events to optimize the value of the developing crop. Optimal application levels of the remaining inputs will vary depending on the past-- and anticipated future-- conditions.

The share agreement offers the kind of flexibility that allows the tenant to adjust with the changing conditions. The theoretical stipulation of variable (labor) input quantity and intensity proposed and defended by Cheung (169) and Newberry (1974) does not account for this important aspect of the agreement. Indeed the simplicity of the existing theory leaves no room for such adjustments-- assuming that the production process is known, fixed, and optimization is merely a matter of following a recipe. The features of the share agreement allow both the tenant and landlord to benefit from the graces of nature as well as share in the hardships that may occur. This is not merely a matter of variation in quantity. The quality of the crop is subject to numerous management decisions. Furthermore, the level and intensity of labor and other variable inputs required to salvage a failing crop or maximize the value of a bumper yield, may change from day to day. Interestingly, Allen and Lueck (1990) assume joint profit maximization in their model but offer very little in the way of grounds to support this assumption. Johnson *et al.* (1987) found a correlation between the use of the verbal contract and family ties.

Alston (1984) conjectured that supervision costs might be reduced if those supervising were relatives of the landlord, thus diminishing the cost of supervising the

supervisors. His findings supported this notion.

Robison (1987) investigated the implications of social distance on the outcome of contractual agreements. He considered investment in public goods, externalities, and horizontal integration. The synergistic benefits of social closeness were demonstrated using a variety of social investment problems. Optimal investment and outcome results were derived, showing that social closeness is a necessary condition for appropriate investment in goods of this type. Of interest to this study was the derivation of a condition showing that the determination of the crop share depends (in part) on the degree of social closeness of the contracting parties. This concept will be incorporated into the development of a model in Chapter 3.

The importance of social relationships was further examined by Marcelo Siles in a study of lending behavior by small town banks in Michigan (Siles 1992). He clearly demonstrated attitudes by lenders to offer both lower rates and a willingness to lend more money to individuals considered to be socially close. The scope of the social closeness issue has also been addressed by Robison and Schmid (1991) in a paper finding that social relationship and identity of the buyer and seller affects price. It appears that the literature is beginning to document an area of study with potentially important economic implications. Very little empirical work has been done. One aspect of this study will be to examine the role of socially close relationships in establishing contractual agreements in leasing of land.

2.11 Summary

Various works have been examined representing the views of researchers' in explaining the workings of the leasing agreement under a variety of circumstances. The majority of the effort has focused on the paradox of the share agreement and the seeming conflict faced by the tenant. Essentially the problems stem from the complexity of the lease agreement and incompleteness of the contractual agreement. Costs arise as alternative modes of enforcement are considered. The potential for social closeness to alter incentives or otherwise reduce these costs appears to merit further investigation.

In the next chapter the ideas gleaned from the literature will be incorporated into a model of leasing. The merits of the different approaches will be examined and weighed relative to appropriateness for the study at hand.

CHAPTER III

MODELING THE LANDLORD-TENANT RELATIONSHIP

3.1 Introduction

In the previous chapter the land tenure literature was examined. Conflicts were observed relative to established, traditional theory and empirical evidence. Researchers seem to be somewhat perplexed by the prevalence and persistence of share leasing. The authors consulted used a variety of means to point out that the crop share agreement is inefficient and not a logical choice of profit maximizing landlords. Furthermore, tenants would be motivated to more efficient use of labor and other resources with the cash agreement. Numerous attempts were made to offer theoretical alternatives, but no clear line of reasoning with supporting evidence has emerged. Specifically, the question remains, "Why does the crop share leasing agreement persist?"

Most prominent in the argument against the use of the crop share lease is motivation of the tenant to equate marginal use of inputs with the tenant's marginal output. The ensuing result is an inefficient use of assets both durable and expendable. Theoretically, the landlord receives less return than otherwise would be expected and may suffer exploitation of the land through mining of the soil or neglect with respect to maintenance and conservation. In the short run the tenant may do

well as wealth is extracted from the land, but this is not a permanently tenable position. Sharing of variable inputs provides only a partial answer to this problem since there are some variable inputs such as labor or fuel that are virtually never shared.

Much of the literature results from those who have taken up the challenge to provide theoretical alternatives. Of the alternative explanations offered, the sharing of risk seems to provide the most fundamentally sound argument for the choice of the share contract. Unfortunately, the empirical evidence has not been convincing. Conflicting results suggest that some other phenomenon is dominating the choice--at least in some cases. Hence the problem remains unsolved.

The area showing the greatest potential for further research in answering this question is that dealing with social distance of the parties involved in the contract. Anticipation of potential gains from cooperative use of resources, particularly when those resources are seen to be complimentary between the landlord and tenant, may provide sufficient motivation for the choice of the crop share contract.

In the following pages a simple model of leasing is presented. The effects of risk will be incorporated. A case will then be made for the inclusion of social capital as an important motivating factor in modeling the choice of tenure contract. Finally, transaction costs will be considered.

3.2 The model

The choice to lease, or not to lease is ultimately the landlord's, however the alternatives are sometimes not very agreeable. Nevertheless, it will be assumed that the landlord is primarily responsible for offering the contract and therefore decides on the type of contract to offer. However, it is understood that the offer is made in anticipation of the acceptance of the same and subsequent behavior of the tenant. This latter aspect will influence the landlord's decision or choice of contract type. In any event for our purposes, the landlord will choose the contract type and the tenant chooses the levels of production inputs, which crop is to be grown and farming practices to be followed.

Modeling contract choice involves examination of the alternatives faced by the tenant and the landlord and weighing the respective advantages and disadvantages. It is assumed that both parties will be motivated by the desire to satisfy wants and needs, whether directly or indirectly. Specifically, the potential exists for either party to experience satisfaction through enhanced well being of the other is allowed. Representation of satisfaction will be through the greek symbol pi (π) but will have this broader meaning than the traditional "profit" although this latter term will also be used in the discussion.

In Michigan the contract types have precipitated to three main categories: cash rent, share leasing with some production inputs shared (usually 50:50, landlord and tenant respectively), and share leasing with no inputs shared (usually 1/3:2/3, landlord and tenant respectively). Farm managers hired on a salary or wage basis are

sufficiently rare that this kind of contract will not be considered empirically in this study.

The problem will then be to compare contract types and evaluate circumstances that will precipitate the choice of one over the other. The cash rent agreement will be examined first since it will be used as a benchmark to compare alternative results.

3.2.1 The Cash Rent Agreement

Under the cash rent agreement the landlord is faced with a fairly simple problem. First, find a tenant willing to pay the rent. Second, maintain the net value of the asset. The landlord profit function is:

$$\pi_L^c = \beta - \delta_L a - T^c$$

Where π is the landlord's profit (superscript **c** refers to the cash lease and subscript **L** to the fact that this is the landlord's profit). Also, β is the cash rent, δ_L represents the landlords expenditure on a the cost of maintaining the assets, and T^c represents transactions costs associated with the cash agreement which includes such things as contract negotiation, collecting payment, and monitoring the use of the assets. The landlord's profit is constrained, subject to being able to secure a tenant willing and able to pay the rent. (Later the ability of the tenant to pay rent as a function of the landlord behavior will be investigated.)

The tenant's profit function in the cash agreement is:

$$\pi_T^c = pf(L,Z,A,I) - wL - vZ - \delta_I a - T^c - \beta$$

and includes variables:

p = output price

L = inputs in production for which the cost is not shared

Z = inputs in production for which the cost is shared

A = the contribution of the assets to production

I = contributions from the landlord such as information transfers, shared resources, and shared financing of inputs costs.

w = the price of the non shared inputs, and

v = the price of the shared inputs.

β = cash rent

In order to conform to the tenets of mathematical optimization we assume that the function is concave, $f_{LL} < 0$, $f_{ZZ} < 0$, and that $f_{LZ} = f_{ZL} = 0$.

The tenant maximizes profit choosing the variable inputs (which have a secondary effect on the use of the asset(s)).

FOC

$$f_L(L_c^*, Z_c^*, A, I) = \frac{w}{p}$$
$$f_Z(L_c^*, Z_c^*, A, I) = \frac{v}{p}$$

Obviously, if none of the inputs are shared (a common condition under a cash rental agreement) the second equation disappears and the optimal level of inputs chosen by the tenant maximizes profit. If the market for land to rent is competitive, the landlord can adjust the rent up to the point where the tenant is just willing to rent the land.

3.2.2 Summary of the Cash Lease Agreement

In summary if we assume that the market for tenants is competitive such that the profit of the tenant is zero, then by solving the tenant's equation for β and substituting into the landlord's profit equation we get:

$$\pi_L^c = [pf(L_c^*, Z_c^*, A, I) - wL - vZ - \delta_T a - T^c(C_{LT})] - \delta_L a - T^c(C_{TL})$$

Contract choice will then depend on whether profit from other agreements will exceed or fall short of the gains under the cash agreement.

3.2.3 The share agreement

Under the share agreement the landlord's profit depends on the outcome of the crop:

$$\pi_L^s = (1-\alpha)pf(L,Z,A,I) - (1-\alpha)vZ - \delta_L a - T^s$$

where the variables are defined as above with the addition that the landlord now bears a portion of the cost of the shared inputs.

The tenant's profit is similar:

$$\pi_T^s = \alpha pf(L,Z,A,I) - wL - \alpha vZ - \delta_T a - T^s$$

FOC (tenant) are:

$$f_L(L_s^*,Z_s^*,A,I) = \frac{w}{\alpha p}$$
$$f_Z(L_s^*,Z_s^*,A,I) = \frac{v}{p}$$

Since $0<\alpha<1$ then $w/\alpha p > w/p$ which implies that $f_L(L_c^*,Z_c^*,A,I) < f_L(L_s^*,Z_s^*,A,I)$ which in turn implies that the employment of non shared variable inputs will be less under the share agreement than under the cash agreement: $L_c > L_s$, the normal result. With output reduced, the tenant would be unable to pay rent at the same level as under the cash agreement.

Result 1: Under the share agreement the tenant has an incentive to apply variable inputs at a level that is less than that observed under the cash agreement. This results in an inefficient use of the productive assets.

The landlord would refuse to accept a share agreement of this type, opting for the higher rent from the cash contract.

3.3 Incorporating risk into the model

There are a variety of different kinds of risk that could be considered in a model of leasing arrangements. The most common are listed as follows:

*Output-- crop failure or bumper crop. May be the result of farming practices, growing conditions or harvest conditions.

*Price-- unexpected rise or fall in output prices. May be the result of favorable (or unfavorable) growing and or harvest conditions nationally or internationally. May result from changing demand.

*Input-- unexpected change in input costs. One might include the prospect of changes that would require the application of a costly input in order to salvage a crop.

*Income-- inability to tolerate downward fluctuations due to dependence on income for living expenses or debt servicing, including inability to tolerate crop failure on the part of the tenant under a cash rent agreement.

The common element in each of these is the fact that the risk averse individual would be willing to give up something-- a risk premium-- to avoid the cost of the unfortunate event. From our basic model we form the tenant's certainty equivalent:

$$Y_{CE}^{T} = \alpha pf(L,Z,A,I) - wL - \alpha vZ - \beta - \frac{\lambda_T}{2}[\alpha pf(L,Z,A,I)]^2\sigma_p^2 - T_T$$

The term β takes on a broader meaning, representing all transfers other than the sharing of the crop. If α is zero then β is the cash rent, but if α is greater than zero then β can be zero or some other amount. The corresponding certainty equivalent

for the landlord would be:

$$Y_{CE}^{L} = (1-\alpha)pf(L,Z,A,I) - F + \beta - \frac{\lambda_L}{2}[(1-\alpha)pf(L,Z,A,I)]^2\sigma_p^2 - T_L$$

The landlord maximizes certainty equivalent income subject to being able to attract a tenant that will pay the rent. If we solve the tenant's equation for β and substitute into the landlord's equation we get the landlord's constrained maximization problem:

$$Y_{CE}^{L} = (1-\alpha)pf(.) + \alpha pf(.) - wL - \alpha vZ - T_T - T_L - F - \frac{\lambda_T}{2}[\alpha pf(.)]^2\sigma_p^2 - \frac{\lambda_L}{2}[(1-\alpha)pf(.)]^2\sigma_p^2$$

Differentiation with respect to α gives:

$$\frac{\partial Y_{CE}^{L}}{\partial \alpha} = -\lambda_T\alpha[pf(.)]^2\sigma_p^2 + \lambda_L(1-\alpha)[pf(.)]^2\sigma_p^2 = 0$$

Then solving for α we get Hiebert's result:

$$\alpha = \frac{\lambda_L}{\lambda_T + \lambda_L}$$

From this the following is inferred. Where the tenant is risk neutral ($\lambda_T = 0$) and the landlord is risk averse, a cash lease ($\alpha = 1$) is chosen. Where the landlord is risk neutral ($\lambda_L = 0$), α is 0 and a wage contract will result. Evidence of risk aversion on the part of both parties results in the choice of a share contract. This condition is expected to prevail as most individuals are risk averse. The

interpretation is facilitated by the following table:

Table III.1 Summary of Contract Choice Under Risk

Risk Aversion Combinations		
	$\lambda_L = 0$	$\lambda_L > 0$
$\lambda_T = 0$	undetermined	cash
$\lambda_T > 0$	wage	share

λ_L represents the measure of the landlord's risk aversion.
λ_T represents the measure of the tenant's risk aversion.

Where the landlord and tenant are both risk averse, the certainty equivalent profit of each is enhanced by the sharing of risk. Furthermore, where the parties are equally risk averse, the optimal way to share risk is half and half. This result gives the optimal alpha, or division of output under risk.

Result 2: Where both the landlord and tenant are risk averse, sharing the risk reduces the cost. The cost of avoiding risk is minimized if equally risk averse landlord and tenant share this cost equally.

Both of the above results are simply rewritten versions of work that has appeared previously in the literature. And, as noted above, empirically both results have been questioned. Attention will now turn to focus on the attributes of incorporating social capital into the model.

3.4 The effects of social capital

The approach to formulate a model that incorporates the effects of social capital will be patterned somewhat after that used to introduce risk. Some of the features of social capital have effects similar to those observed in the risk model. This is to be expected since reducing risk has the same kind of benefits as building social capital, namely transaction cost reduction through sharing. However, the social capital model must also capture the feature of income enhancement through the sharing of resources, information, and experience. Furthermore we expect a cost savings to occur with a reduction in costs associated with such things as monitoring, bargaining, and exacting payment.

3.4.1 Features of the social closeness factor

Robison and Schmid (1992) identified four potential motivators in addition to the self interest principle endorsed by the economics profession. They argued that satisfaction could be derived from success or happiness of another for whom one cares on a personal basis. The conjecture would then be that augmentation of the other's success and happiness would lead to greater satisfaction or personal utility. Individuals could therefore be expected to invest in things that would enhance the welfare of close friends and family.

They further observed that contribution to community tends to raise the level of satisfaction of the contributor when community services are used. The businessman who contributes to the construction of the downtown park may feel greater satisfaction in enjoying the resulting aesthetic environment than the one not contributing.

Similarly, efforts to invest in establishing improved relationships with those more distant may enhance well being. A case may therefore be made that the one who succeeds in befriending an enemy may enjoy the outcome as much or more than the one who conquers a foe. And finally, they discuss briefly an issue of oneness with a perceived ideal of self-- being true to oneself, that provides a degree of satisfaction. Each of these constitutes a form of social capital.

It is the first item, the issue of deriving satisfaction from the welfare of friends and family, that will be considered here. However, in addition to the vicarious utility drawn from the well being of the other, this author would argue that the static model

does not tell the whole story. There is another dynamic aspect to this condition that was not addressed by Robison and Schmid. It is the prospect of repeated interaction between individuals and a resulting interdependent confidence. Active, mutual exchange of social capital generates a synergistic result. Reciprocity promises an even greater degree of satisfaction. It may be that the propensity to socialize is greater than Adam Smith's propensity to truck and barter.

The economic outcome of the relationship is evidenced in two ways. Cost savings occur as the resources of two individuals are joined to avoid mistakes. Confidence in the motivation and integrity of the other eliminates policing, supervision, or monitoring costs. Other transactions costs may be reduced by avoiding duplication of effort in counting and dividing or verifying the quantity and quality of output.

The second benefit is observed as income enhancement. Exchange of information, resources, and experience increases the productivity of the respective inputs and in turn the potential profitability of the endeavor. The crop share agreement allows for a dual incentive to participate in this kind of exchange. Not only might one party be able to augment the income of the other, but in so doing, helps himself (or visa versa depending on motivation).

Furthermore, the landlord and tenant will likely enjoy some diversification of resources. The benefits of a greater pool of resources for productive skill and adaptability may also enhance production.

In summary, the socially close landlord and tenant would seem to have a

potential to gain from the joint use of assets, skills and other resources. The share agreement would tend to provide the environment for the most productive use of the same.

3.4.2 Conceptualization of the Social Closeness Factor

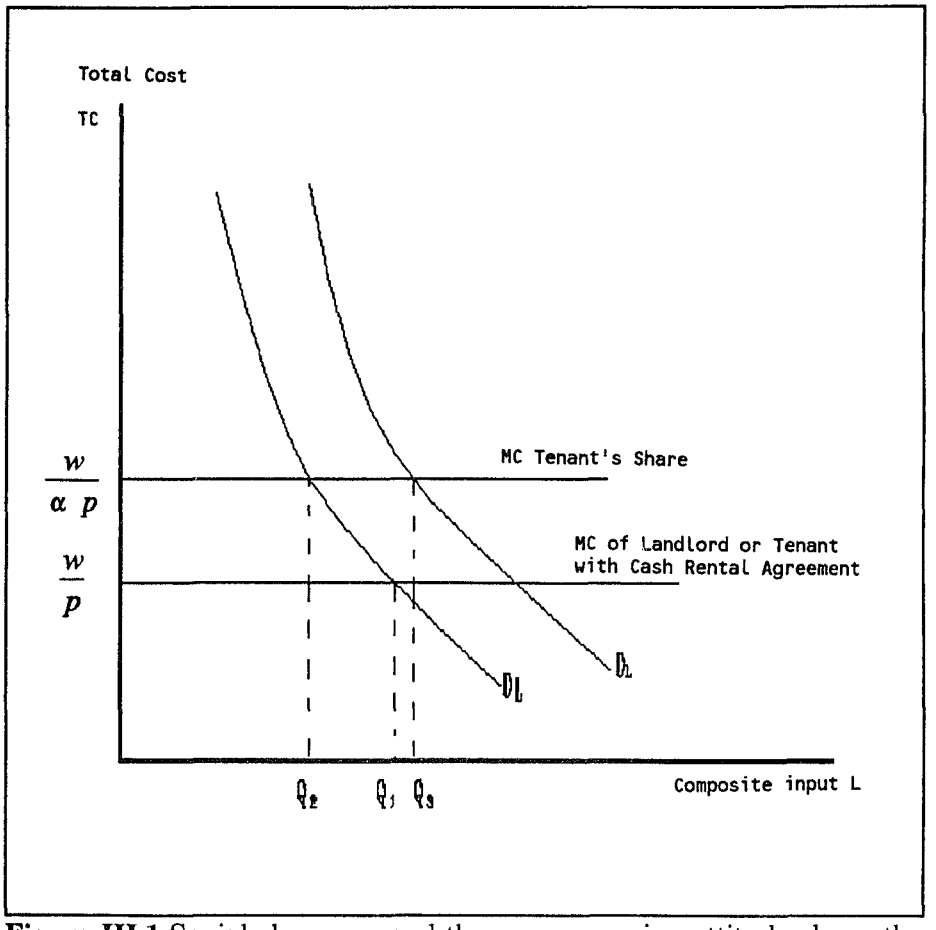

Figure III,1 Social closeness and the accompanying attitudes have the effect of shifting the demand for variable inputs out and upward.

In Figure III,1 the concept is presented geometrically. Two cost structures are conceptualized. Line *A* represents the marginal cost of inputs *w* faced by the share tenant and corresponds to $w/\alpha p$ calculated above. Line *B* represents the marginal cost of inputs *w* faced by the tenant renting for cash and corresponds to w/p

calculated earlier. The reason that A is above B is because $0 < \alpha < 1$. One might otherwise explain the relationship by stating that since the tenant only receives a portion (α) of the output, the marginal return to the unshared inputs is lower. When equated marginally this compares to a higher cost structure faced by the share tenant.

Line D_L represents the demand for inputs. Suppose that in the presence of social closeness the inputs can be used more effectively or efficiently. This would result in a shift of the production function, causing a change in the value of the variable inputs and increasing demand. This, in turn, would be equivalent to an outward shift of the demand curve to D_L'. Essentially what this means is that in the presence of social capital, the value of the inputs in the production function change and are no longer homogenous with the inputs in the function without closeness. Lester Thurow (1983) envisioned this same effect in a discussion of the labor market. Under various circumstances the work effort and corresponding productivity of the laborer may vary with such things as the perception of fairness, making it impossible to assume that all labor hours in the production function are homogenous and independent of the social relationship.

Levels of output by cash and share tenants are represented by Q_1 and Q_2 respectively. Depending on the magnitude of the shift in demand for inputs, or increase in productivity of the inputs, due to the presence of social closeness, it is conceivable that total output under the share agreement (represented by Q_3) could exceed that achieved under the cash agreement. The precise way in which the level of use responds to increased demand is not known, but the graph helps to envision

how even with the higher cost, the level of use could increase. This is precisely the effect that the social capital component is proposed to have on the model. Such an effect would satisfy the landlord's expected return for the use of the assets and the tenant would benefit from increased income.

The term that will be introduced into the model to represent social capital must have components to correspond to attitude, ability, and degree of interest or willingness to devote effort. The following formulation emerged after trying a number of alternatives:

$$\pi_L = (1-\alpha)p[f(L,Z,A,I) + \Theta_T(.)M_T(1-\alpha)\rho_T] - vZ + \beta - T_L$$

where:

$\boldsymbol{\Theta_T}$	=	the social closeness the tenant feels toward the landlord, $0<\Theta<1$
$M_T(.)$	=	the management skill or ability possessed by the tenant, being a function of the productive inputs
$(1-\alpha)$	=	the perception of the tenant relative to his ability to help the landlord
ρ_T	=	the contribution of the tenant to the production activity (this value is viewed as a percentage), ($\rho_T + \rho_L = 1$).

Essentially what is being portrayed is a term that impacts upon the production function. The core component is M_T, the management skill, ability, effort in labor, or information that the tenant can contribute to the production process to augment the income of the landlord. The closeness coefficient (Θ) represents his willingness

or propensity to do so. The extent of effort is further weighted by the tenant's perceived income enhancement to the landlord (**1-α**). This means that the tenant will weight his actions by the perceived (as opposed to actual) benefit they have to the landlord. Finally, the entire contribution is also weighted by the corresponding resources the tenant has committed to the process (**ρ**).

In a similar fashion the landlord can contribute to the income of the tenant:

$$\pi_T = \alpha p[f(L,Z,A,I) + \Theta_L M_L(.)\alpha \rho_L] - wL - vZ - \beta - T_T$$

The nature of the contribution is somewhat different for the landlord. Transfers might include such things as information relative to the land and local environment. Such transfers are normally virtually costless in terms of expense to the landlord but may be useful in enhancing production or avoiding costly errors. The landlord may also have at his disposal capital or physical resources which he may make available to the tenant at little or no additional cost. The landlord's decision to participate or help again depends on the closeness coefficient (Θ_L), his ability to do so, and possession of resources. Furthermore his actions will be weighted by the perceived benefit the contribution will have to the tenant (**α**) and will also depend on the resources the landlord has invested in the production process (ρ_L).

The same pattern (used earlier for risk) of solving the tenant's equation for **β** and then substituting into the landlord's equation yields:

$$\alpha = \frac{\Theta_T M_T \rho_T}{\Theta_T M_T \rho_T + \Theta_L M_L \rho_L}$$

This result has numerous meanings. First, suppose that $M_T = M_L$ and that $\rho_T = \rho_L$.

Then, plugging in various values for Θ gives the following:

Table III.2 Contract Choice Under Consideration of Social Distance

Combinations of Varying Degrees of Social Distance			
Landlord / Tenant	$\Theta_L = 0$	$\Theta_L = 1$	$0 < \Theta_L < 1$
$\Theta_T = 0$	undetermined	wage	wage
$\Theta_T = 1$	cash	share	share
$0 < \Theta_T < 1$	cash	share	share

By examining the results using the extreme values for the closeness factor, it is evident that the share agreement will be preferred by participants that experience some closeness. The benefits ensuing from the closeness factor are maximized when shared equally. Supposing that this factor dominated the contract choice decision, we obtain the following results:

Result 3. The share agreement will be chosen by parties that have some degree of closeness.

Result 4. Cash rent will be chosen under circumstances where the landlord has no closeness toward the tenant.

Result 5. A wage agreement will occur where the tenant has no closeness toward the landlord.

Now, supposing that $\theta_T = \theta_L$ and that $\rho_T = \rho_L$, the result of plugging in values for M will be examined.

Table III.3 Contract Choice Under Consideration of Management Resources.

Combinations of Varying Degrees of Management Resources			
Landlord / Tenant	$M_L = 0$	$M_L = 1$	$0 < M_L < 1$
$M_T = 0$	undetermined	wage	wage
$M_T = 1$	cash	share	share
$0 < M_T < 1$	cash	share	share

Again, the value of the share contract is evident. Furthermore, if skills are similar, the optimal α will be one half. And, assuming dominance of this factor, we obtain:

Result 6. The share agreement will be chosen where both parties have some degree of management resource to offer.

Result 7. Cash rent will be chosen under circumstances where the landlord has no management resource.

Result 8. A wage agreement will occur where the tenant has no management resource.

Finally, an examination of the results where various values for ρ are considered. In this case $\theta_T = \theta_L$ and $M_T = M_L$.

Table III.4 Contract Choice Under Consideration of Investment Resources

Combinations of Varying Levels of Investment Resources			
Landlord / Tenant	$\rho_L = 0$	$\rho_L = 1$	$0 < \rho_L < 1$
$\rho_T = 0$	undetermined	wage	wage
$\rho_T = 1$	no agreement	share	share
$0 < \rho_T < 1$	no agreement	share	share

In this case the interpretation is slightly different. If neither party has resources to invest, no agreement will be reached. For example, if the landlord's investment is zero, $\alpha = 1$ meaning that the tenant receives all the output from no land. Furthermore, the landlord would not be paid any rent, the equivalent to no agreement. On the other hand if the tenant makes no investment of resources, a wage agreement would still be an alternative. Logically, contractual agreements between parties with nothing to invest in the agreement have little meaning. The more interesting part of the outcome is the potential for sharing the output at rates relative to the corresponding level of investment. Consequently, optimal share arrangements could conceivably be something other than the traditional 50:50. This reasoning yields the following results:

Result 9. The share agreement will be chosen where both parties that have some degree of investment resources.

Conversely, where the landlord is without resources (no land) result ten addresses a mute point.

Result 10. No contract will be chosen under circumstances where the landlord has no investment resources.

Result 11. A wage agreement will occur where the tenant has no investment resources.

Result 12. Optimal share arrangements will reflect the comparative level of investment resources attributable to each party.

The next step is to consider combinations of the above results. It is readily evident that total absence of any one of the components on the part of either of the participants will cause the extreme results (cash rent or wage contracts) to be chosen. Without means to measure and calibrate both closeness and management ability, interpretation of levels between zero and one results in mere conjecture.

It is further understood that the landlords and tenants will bring significant variety in combination of resources to any particular agreement. In some cases there will be conflicting combinations. For example, a landlord may have a wealth of knowledge and skill and a willingness to participate with the tenant but be constrained by time, health, or distance. Cumulatively it will not always be readily evident which factor may dominate the choice of contract.

The scientific approach prescribes that means be devised to control for all

variables except the one being studied and then examine the way the one variable behaves under measurably changing conditions. The above model and ensuing results suggest that numerous variables are influencing the choice of contract. The task then is to determine under what conditions certain choices tend to dominate others. In order to do this we will first narrow the range of variables to be studied and then develop testable hypotheses from the predictions of the model.

3.5 Hypotheses

The preceding results obtained from the model will now be examined. Those lending themselves to testing with empirical data in the scope of this study will be transformed into testable hypotheses. In the case of the first result:

Result 1: Under the share agreement the tenant has an incentive to apply variable inputs at a level that is less than that observed under the cash agreement.

it is recognized that this results in an inefficient use of the productive assets;

and will be taken as given.

3.5.1 The effect of risk aversion

In the preliminary version of the model, it was observed that risk was the variable under study. From the initial calculations the following result was derived:

Result 2: Where both the landlord and tenant are risk averse, sharing the risk reduces the cost. The cost of avoiding risk is minimized if equally risk averse landlord and tenant share this cost equally.

The issue of risk aversion must be divided according to landlord and tenant interests respectively. Simply put, the risk averse landlord will prefer that the tenant bear as much risk as possible. Similarly the risk averse tenant will prefer that the landlord bear as much risk as possible.

In this case the reference is to risk associated with stochastic events that affect price and production. As previously discussed, a cash agreement dictates that the tenant bears all the risk, providing the landlord with a cash rent whether the crop succeeds or not. By contrast the share agreement would necessarily involve both parties in the success of the crop since income would be tied to revenues from the production and sale of the same. Hence the risk averse tenant would prefer the share agreement where the landlord shares in production and price risk reducing the tenant's exposure. Conversely, the risk averse landlord would prefer the cash agreement deferring all the risk to the tenant.

From this reasoning we generate two hypotheses:

(1) H_o: **Risk, relative to the tenant's preference for secure income, makes no difference in the choice of contract.**

(2) H_o: **Risk, relative to the landlord's preference for secure income, makes no difference in the choice of contract.**

It is anticipated that both of these hypotheses will be rejected. Testing of these hypotheses will result from survey data gathered. Respondents would be asked to self evaluate their aversion to risk on a scale of 1 to 10, 1 being high risk associated with potentially higher, but insecure, income; 10 being low risk with the potential for

lower more secure income. The data will serve as observations for a variable included in a logistic regression.

3.5.2 The effects of social closeness

In terms of social relationship from the model we obtained the following three results:

Result 3. The share agreement will be chosen by parties that have some degree of closeness.

Result 4. Cash rent will be chosen under circumstances where the landlord has no closeness toward the tenant.

Result 5. A wage agreement will occur where the tenant has no closeness toward the landlord.

Since the scope of the study is to investigate the existence and persistence of the share agreement, implications of Result 5 will not be investigated. Results 3 and 4 will be combined into one hypothesis:

(3) H_o: Social closeness makes no difference in the choice of contract type.

It is expected that this hypothesis will be rejected. Proxies for genuine closeness will include:

1. Family relationships.
2. Stated close friendships.
3. Evidence of social interaction.

A problem lies in the perception of degree of closeness. Since for many, a friend may be closer that a relative, no attempt will be made to scale the responses. It will simply be assumed that friends and family are considered close. Strangers, at the outset of the agreement, will thus be considered distant. Further, it is assumed that individuals with antipathetic relationships will not enter into any agreement. This causes some problem in measuring the full dimension of the variable since we don't have data on those who may have considered the leasing contract but chose not to engage in order to avoid aggravation, irritation or hostility.

The range of the social distance variable may be perceived to have positive, neutral, and negative regions. Due to limitations, only the positive and neutral ground may be examined.

The responses to question 7 will be transformed so that options 1, 2, and 4 will be considered "close" and options 3 and 5 "distant". This variable will then be used with others in a logit regression with 10a as the dependant variable.

3.5.3 The effects of management skills and resources

The farming of land is especially susceptible to appropriate use of management inputs. The complexity of production requires a constant monitoring of the progress of the crop and adjustment of timing and application of variable inputs to coincide with growth and maturity of the crop for optimal results. Production can thus be viewed as an art as well as a science.

The skills associated with the art of farming can be envisioned as valuable

contributing factors that a landlord or tenant brings to a tenure agreement. The ability and propensity to use these skills constitute a resource that enables the individual to enter the non market region of negotiation. The share crop agreement provides the environment for the optimal use of these skills (where they are possessed by both parties).

Earlier we obtained the following results from the model:

Result 6. The share agreement will be chosen where both parties that have some degree of management resource to offer.

Result 7. Cash rent will be chosen under circumstances where the landlord has no management resource.

Result 8. A wage agreement will occur where the tenant has no management resource.

Following the same reasoning expressed above, Result 8 will not be considered in this study. Further, it is assumed that for a tenant to take responsibility of the management of the farm, the tenant will necessarily have management skills and resources. Hence, the variable influencing the choice of contract will be that representing management resources of the landlord. Following this reasoning we hypothesize:

(4) H_o: **The managerial resources of the landlord and the disposition to provide such make no difference in the choice of contract.**

It is expected that this hypothesis will be rejected. Proxies for resources, ability and disposition of the landlord will include:

1. Farming experience of the landlord
2. Stated participation in decision making
3. Willingness of the landlord to participate.

3.5.6 The effects of transaction costs

This topic, though discussed at length in the literature review, does not lend itself well to the behavioral (mathematical) model presented above. Included in the model is a simple additive transaction costs term, however mathematical differentiation of a constant eliminates the term from the result obtained. Nevertheless, transactions cost are real and logically impact the choice of contract. Hence, the following hypothesis will be tested:

(5) H_0: Transactions costs (defined as the costs associated with carrying out the terms of the agreement-- contracting, bargaining, ensuring performance, exacting payment, etc.) make no difference in contract choice.

It is expected that this hypothesis will be rejected.

Sub-hypotheses will be tested in this case.

Since some crops tend to be more difficult to measure and divide (as required under a share agreement), it is expected that share cropping will be more common where field crops are grown. Land more suitable for forage crops such as hay and pasture will tend to be cash rented.

(5.1) H_o: Type of crop makes no difference in the choice of contract.

It is expected that this hypothesis will be rejected.

During the course of the study another indicator of the importance of transaction costs in contract choice was discovered. Numerous individuals commented on the difficulty of keeping records where multiple parcels of land were being leased. Hence it was decided to test the following hypothesis:

(5.2) H_o: Number of parcels makes no difference in the choice of contract.

It is expected that this hypothesis will be rejected.

A primary factor affecting the ability of the landlord to contribute to the agreement as well as monitor the activities of the tenant is the frequency visits by the landlord to the farm. In keeping with a number of other studies where this issue formed the focal point of the transaction costs, the following hypothesis will be tested:

(5.3) H_o: Facility of the landlord to observe and participate in the measurement and division of the crop makes no difference in the choice of contract.

It is expected that this hypothesis will be rejected.

An aspect of the agreement in the share lease has to do with the idea of uncertainty, not the risk associated with stochastic variables but the uncertainty of the

performance of the tenant.

It would stand to reason that where the landlord has doubts about the ability or willingness of the tenant to perform, the landlord would tend to choose the cash rent agreement. Obviously, this would cause the tenant to bear the burden of uncertainty both with respect to his own performance as well as the stochastic events of nature.

On the other hand, where the landlord has confidence in the tenant's performance, empathy could motivate the landlord to share some of the risk associated with production and price. This may well be envisioned as "fair". Furthermore, where the skills, ability and effort of the tenant have proven to be outstanding, the landlord may wish to "share" in the expertise of the tenant and the anticipated gains from his/her labors. Of course this brings us back to the question whether the tenant will exert him- or herself knowing that a portion will ultimately go to the landlord.

3.6 Summary

In this chapter a model of contract choice was developed incorporating the influences of risk, social closeness, management resources and transaction costs. The effects of risk have been examined previously and there is no new outcome either in the model or in the expected data to be collected. Transaction costs effects have been addressed by other authors and in fact form the basis of several major works including that of Steven Cheung. Empirically, however, there is little data either to

support or refute the importance of this variable. The concept of social closeness was also introduced and the anticipated effects set forth.

The primary effects of social closeness were identified to be two fold. First there is an anticipated effect on the production function resulting in increased productivity through more effective use of the production inputs. Second it is expected that social closeness will interact with transaction costs resulting in a reduction of monitoring costs, and costs associated with errors in management, production and marketing.

Hypotheses were developed in order to test the contribution of these issues in the choice of contract. In the next chapter the empirical steps of this study will be set forth, including the results of data collection.

CHAPTER IV

DATA COLLECTION AND ANALYSIS

4.1 Introduction

The process of data collection and analysis is described. The major steps include drawing a sample, preparing the survey instrument, mailing, coding the data, testing for non response, and then compiling and analyzing the data collected, including running tests of the hypotheses developed in the previous chapter. The following pages will detail these steps and provide reasons for decisions in some cases.

4.2 Obtaining a sample

The object of the study is to learn specific points about the characteristics of leasing of farmland in Michigan. Since it is impractical to gather information from all landlords and tenants in the state, a scientific sample will be drawn. The information generated from the data collected can then be used to make generalizations about the population as a whole.

4.2.1 Sample size

Determination of the sample size was done using the formula for estimating a proportion within a certain error tolerance, since the goal of the survey is to study the proportion of farmers choosing the share contract as opposed to a cash rent agreement. Initial investigation indicated that cash rent would be expected to dominate at a rate of approximately three or four to one. Therefore, reliability of statistics on groups within the sample would demand that the sample be large enough to provide for adequate size of these groups, specifically tenants and landlords. However, since the sources consulted for lists had no means of selecting only those tenants or landlords involved in leasing agreements, over sampling of the population would be necessary. Census data estimates suggested that 40 to 50 percent of the farms and/or farmers were involved in leasing.

The formula to calculate the required sample, adopted from Marzillier (1990) is as follows:

$$n = \frac{z^2 LN}{E^2}$$

Where n is the required sample size, z corresponding to the 95% confidence level is approximately 2, and L and N are the proportion of farmers *leasing* and *non-leasing* in the population. E is the error level allowable (.05). The result, using this method, indicates that the required sample be 400. By relaxing the confidence level

to 90% the sample size could be reduced to 176. Assuming a rate of return of at least 25%, it would be necessary to mail out approximately 1000 questionnaires to assemble enough data to fall within the acceptable range. However, since there was no way to preselect those involved in leasing, it was decided that 2000 questionnaires would be sent, anticipating that approximately half of the respondents would not be involved in leasing.

4.2.2 Drawing the sample

Obtaining a representative sample of Michigan landlords and tenants proved to be a fairly difficult task. Initially an attempt was made to follow the procedure of the Nebraska-South Dakota study and seek a sample from the Agricultural Stabilization and Conservation Service (ASCS). However, the ASCS was reluctant to offer any assistance. They cited changes in the federal rulings on the Freedom of Information Act making them liable for the release of personal data in their possession. The request was consequently denied.

A second request was made to the ASCS in such a way that they would be able to preserve the confidentiality of their list. It was proposed that the questionnaire and mailing materials would be delivered to their office leaving their own employees to affix labels and mail the survey. The returned questionnaires would have no means of attaching the responses to an individual. However, the ASCS office did not change their previous position. Again the request was denied.

Failing this approach, help was sought from the Michigan Agricultural Statistics Service (MASS). The MASS proved to be quite helpful and willing to work with us. They required $3,000 for the list of 2,000 names made available for two mailings. The contract also provided for a follow up telephone consultation with a sample of non-respondents to check for non response error.

Some concern remained however in relation the quality of the list maintained by MASS. The list was designed to include producers of agricultural commodities throughout the state. By contrast the ASCS list included landowners with an interest in the farm programs but not necessarily involved in production. It was felt that the MASS list might be deficient in landlord listings since these individuals would no longer be involved in active production. Consequently, a third request was made to ASCS for a listing of corporate or institutional entities in four of the most prominent agricultural counties of the state since these would not be restricted under the Freedom of Information Act. They agreed to provide this list for a cost of $90.

The reasoning was that this smaller but important ASCS list should help compensate for deficiencies in the MASS list particularly with respect to landlords. However it was acknowledged that the data would of necessity remain separate in order to preserve the integrity of the scientific sample drawn by MASS.

4.2.3 Questionnaires sent, received, different mailings, etc.

Approximately 2000 questionnaires were mailed to the MASS sample in July 1992. A second mailing to this same list took place in August 1992. Also in August

a separate mailing was sent to the selected list from ASCS. Finally, in late August a second mailing went out to the ASCS list. In September the MASS office completed the telephone follow up of non respondents. No means was made available to follow up on non respondents from the ASCS list.

Five hundred and eleven of the questionnaires mailed to the MASS list were returned of which 244 claimed they were not involved in any leasing agreements. Of the remaining questionnaires 17 were not filled out properly or were unusable. The remaining 250 constituted the actual data sample. These were coded and the following results were determined using the ensuing data.

4.2.4 Testing for non response bias

The telephone contact of non respondents by MASS gathered an additional 148 questionnaires 77 of which represented individuals not involved in leasing. Of the remaining 71 questionnaires all were sufficiently complete to be used in analysis. These were coded separately from the main data set. Subsequently the two data sets were merged, using a dummy variable to facilitate identification of the parent data set, to test for differences.

The bench mark variables chosen came from the first question-- size of personal holdings-- which should indicate whether there was a difference between individuals; question seven-- number of years leased-- which should indicate any differences in the duration of leases and/or experience of the respondents; and questions eleven and seventeen-- estimated per acre value of parcels leased-- which

should indicate any differences in the kind of operation. Table IV.1 shows the results of testing of these variables for significant differences in the means.

Table IV.1 Testing for non-response bias in the sample.

Variable	Group	Mean	Standard Deviation	Standard Error	t-value
Personal Holdings	Main Response Data	246.7	312.9	20.1	-.24
	Non-Response Data	256.2	279.1	33.84	
Lease term (yrs.)	Main Response Data	9.45	7.1	.466	-.39
	Non Response Data	9.88	8.2	.996	
Estimated Market Value Share Agreement	Main Response Data	875.30	684.8	96.9	-1.2
	Non Response Data	1092.31	558.9	155.0	
Estimated Market Value Cash Agreement	Main Response Data	892.3	468.8	36.7	1.2
	Non Response Data	814.3	362.3	53.4	

Source: 1992 MSU Survey of Landlords and Tenants

In each case the *t*-test shows no significant difference between the value from the main response data and the phone data collected from non responding individuals.

The phone data carried one interesting peculiarity. The telephone operators were more successful in ensuring that all the questions were answered. Question thirty-six in particular had been frequently misinterpreted such that many of the main data set respondents had skipped the question. The author felt that it would be useful to include the data collected over the phone in order to increase the number of responses available for analysis. Dr. Les Mandersheid was consulted on the advisability of this idea. He cautioned that the testing of four bench mark variables (appearing in Table IV.1) was not conclusive evidence that there were no differences in the data sets but merely that there was strong reason to believe that there were no differences. Further, to merge the data would weaken the power of generalization of the findings. However, he explained that as long as what was done was fully disclosed and documented, to merge the two sets of data would not be breaking any cardinal rule. It was consequently decided that since it seemed that there would be more gained than lost by merging, the two data sets would be merged in order to provided a larger set of data for testing and analysis.

The response from the ASCS list was disappointing. Only 89 were returned of which 48 were not involved in leasing and four were unusable. The data collected from the 37 useable questionnaires was very similar to that from the MASS mailing. The proportion of landlords in the ASCS returns was not significantly different from the MASS data set. Furthermore, other variables tested showed no differences

compared to the main data set. It was decided that since this data was not part of the scientifically drawn sample by MASS, that the 37 cases would not be merged with the main data set and hence was not included in any of the following analysis.

For the purposes of the following analysis, the term *respondent* will refer to landlords and tenants whose questionnaires were actually deemed acceptable for evaluation. Similarly, the term *responding landlord* or *responding tenant* will be restricted to the group whose questionnaires were considered satisfactory for analysis.

4.3 General Respondent information

4.3.1 Distribution of respondents

The data sample used in analysis consisted of 97 landlords and 213 tenants and included the responses of three individuals not identified as either landlords or tenants. These three provided sufficiently complete information regarding preferences under the general information sections that the questionnaire was deemed satisfactory to add to the pool. The effective sample for analysis, hence included the compiled responses from 313 individuals. The acreage totals, reported by those responding to the questionnaire, are shown in Table IV.2.

Table IV.2 Acreage Owned and Leased with Estimated Value

Reported Acreage	Acreage	Estimated per acre value
Total Acres Owned by Respondents	72429	$1021
Total Acres Under Leasing Agreements	66272	$ 971

Source: 1992 MSU Survey of Landlords and Tenants

These figures give a sense of orientation with respect to the number of acres represented by the respondents.

To further establish a profile of respondents by income from farming, age, and sex for landlords and tenants, the corresponding data appears in the following Table IV.3.

Table IV.3 Profile of respondents by income from farming, age and sex.

Respondent	Percent income from farming				
	less than 30%	30 to 49%	50 to 80%	more than 80%	totals
Tenant	101	31	32	41	205
Landlord	69	13	9	5	96
Totals	170	44	41	46	301

Respondent	age category in years					
	< 25	25-34	35-44	45-54	55-64	> 64
Tenant	1	22	64	52	54	17
Landlord		3	9	13	29	42

Respondent	sex	
	male	female
Tenant	201	8
Landlord	83	13

Source: 1992 MSU Survey of Landlords and Tenants

In a few cases (no more than four) the respondent was both a landlord and a tenant. However, the questionnaire was designed to gather the data as either one or the other. In one case the information was filled out in such detail that two records were created, one for the individual as a tenant and one as a landlord.

4.3.2 Number, size, and distribution of parcels of land being reported

The majority of respondents reported only one parcel of land involved in leasing. There were substantially more parcels reported by those involved in cash rent agreements. Also, as the number of parcels per individual increased, cash rent dominated as the contract type chosen. Table IV.4 gives a breakdown of parcels and contract type chosen.

Table IV.4 Distribution of parcel holdings by number and type

Number of respondents by Contract type	Number of parcels per respondent				
	1 %	2-3 %	4-5 %	6 & up %	Total
Share crop	59 66%	21 23%	9 10%	1 1%	90
Cash rent	127 51%	68 27%	31 12%	24 10%	250
Totals	186 55%	89 26%	40 12%	25 7%	340

Source: 1992 MSU Survey of Landlords and Tenants

As discussed in Chapter 2 there is a transaction cost factor at issue here. The share agreement requires more time and effort when it comes to counting, weighing, dividing, or otherwise measuring the crop and calculating the rent. Where inputs are shared the effort investment increases. Parties with more than one share agreement face another potential cost of keeping the crops from different parcels separate until the rent can be calculated. This cost may or may not be significant depending on the nature of the crop and the time period over which it is harvested. The data would suggest that this issue is a real concern for those with more parcels of land.

4.3.3 Length of Lease

The average length of lease reported was 9.5 years indicating that there is considerable stability in the leasing of land.

Table IV.5 Lease Length by contract type, respondent and formality

Category	Number	Lease Type		Respondent		Formality	
		Share	Cash	Landlord	Tenant	Oral	Written
less than 5 years	84	23	61	50	34	56	29
5 to 9 years	76	22	54	18	58	49	26
10 to 19 years	97	15	82	16	81	72	25
20 years or more	42	6	36	6	36	34	8
Totals	299	66	233	90	201	211	88

Source: 1992 MSU Survey of Landlords and Tenants

Table IV.5 categorizes the length of the agreement compared to the kind of lease and the role of the respondent. There appears to be some tendency for cash agreements to continue for longer periods of time. Also, proportionately more landlords (than tenants) are reporting leases that have been in existence for short periods of time.

4.3.4 Formality of Agreement

A majority of lease agreements in Michigan are reached rather informally as evidenced by the number of oral contracts reported. Furthermore, those engaging

in crop share leasing are more likely to use the oral agreement. A large number of the leases are renewed annually. Table IV.6 summarizes these details.

Table IV.6 Formality and renewal of agreements

Contract formality	Renewal Frequency		Contract Choice	
	Renewed Annually	Renewed for a Multi Year Period	Crop Share Agreement	Cash Rent
Oral Agreement	171	42	63	155
Written Agreement	43	43	7	81
Totals	214	85	70	236

Source: 1992 MSU Survey of Landlords and Tenants

4.4 Cash Rent Agreements

Each respondent was asked to choose one rental agreement, or parcel of land if more than one, that could be considered typical or most representative of his/her holdings. Those responding to the questionnaire reported on 71 share agreements and 236 cash rent agreements. Clearly the cash rent agreement was more popular among the responding Michigan farmers and landowners.

The average size of the parcel of land under a share rent agreement was 88 acres compared to 126 acres for cash agreements. Those with share agreements

averaged slightly higher estimated value on the land, $920 per acre, with a range of $100 to $5,000, compared to $875 ranging from $27 to $3,000. The highest land values came primarily from land being used for orchards or vineyards. Some rather unique share cropping agreements were reported by those with fruit farms. More discussion of this below.

Cash rent averaged $44.76 per acre, ranging from a low of $2 to a high of $175 per acre. Overall the per acre rent averaged 6% of estimated land value.

4.5 Crops grown share, cash

The distribution of crops grown between the two groups was almost identical. Field crops including corn, soybeans, wheat, sugar beets, as well as other small grains accounted for approximately 75% of the contracts. Hay and pasture dominated the balance with roughly 20%, while specialty crops and fruit filled the remaining 5%. Table IV.7 demonstrates the similarities and differences in crop choice between cash and share crop agreements.

Table IV.7 Distribution of Crops grown by contract type

Crop Group	Share Crop		Cash Rent		Total	
	Number	Percent	Number	Percent	Number	Percent
Field Crops	55	77	172	74	227	75
Hay & Pasture	12	17	49	21	61	20
Fruit	2	3	9	4	11	4
Specialty Crops	2	3	3	1	5	2
Totals	71	100	233	100	304	100

Source: 1992 MSU Survey of Landlords and Tenants

4.6 Adjustments

Respondents reporting cash rent agreements were asked to report conditions where rental adjustments might occur. Specifically if provisions existed in the agreement to adjust the amount of the rent up or down if growing and market conditions turned out to be especially favorable or unfavorable respectively. Very few of the respondents reported any kind of adjustment. Of the 21 total cases acknowledging such adjustments, nearly half (10) cited rent reduction in the case of especially low yields. Seven reported rent increases associated with substantially higher than normal yields. Only two reported adjustments associated with price fluctuations, one each with higher and lower prices respectively. The remaining two cited other unspecified reasons.

4.7 Share Rent Agreements

The number of agreements by tenant's share of output is shown in ?, Table IV.8. The author is suspicious that the one case showing the tenant's share of 15 percent is an error. Most of the respondents fall into the traditional categories of ½ or ⅔ of the crop going to the tenant. Of interest is the lack of a single respondent choosing the 60:40 split commonly reported in the Nebraska-South Dakota study.

The four cases reporting 100 percent of the crop going to the tenant are a bit perplexing. This would not seem to be a share crop agreement. In one of these cases the tenant reported that the landlord had engaged him to husband a vineyard and that all the landlord required was that the tenant upgrade the condition of the fixtures and vines over a period of five years. In other cases there may be some confusion on the part of the respondent. For example, it is not uncommon for the tenant to purchase the landlord's share after the calculation of the split. Consequently a tenant (or landlord) may respond that the tenant is retaining the entire crop, ignoring the fact that the question is asking what percent does the tenant receive for services rendered.

Table IV.8 Tenant's share of output

Tenant's Share of Output	Number of Cases Reported
15%	1
50%	19
67%	28
75%	13
90%	3
100%	4
Total	68

Source: 1992 MSU Survey of Landlords and Tenants

4.7 Landlord participation in inputs

In Chapter II some discussion was presented with respect to the sharing of input costs. It was shown that, in theory, if all inputs were shared in the same proportions as the sharing of the output that the conflict of the share agreement could be resolved. However, no example of complete sharing has been found or demonstrated. Arguably, sharing of some of the inputs may provide some improvement in the agreement.

Surprisingly few of the respondents involved in share lease agreements participated in the sharing of inputs. Specifically, in only twenty-six of the seventy share agreements was there any sharing of input costs. Furthermore, the sharing of inputs in most cases was limited to only one or two items. Most commonly shared inputs were fertilizer, seed, and chemicals (including liming, insecticides and herbicides) as costs of production. Table IV.9 outlines the frequency with which some of these production costs were shared.

The majority of respondents reporting contracts which included the sharing of inputs showed no change in the sharing ratios since the initial establishment of the lease agreement. There is, however, some evidence that the landlord's contribution to inputs in share agreements is diminishing. Nine of the twenty-six respondents reported that the landlord's share of inputs had decreased. Similarly nine (though not necessarily the same nine), respondents reported that the number of inputs in which the landlord participated decreased. In neither of these categories was there a report of increased participation by the landlord.

Table IV.9 Landlord participation in input cost sharing by input

Input	Landlord's share of costs			Totals
	100%	50%	33%	
Seed	7	14	2	23
Fertilizer	6	17	5	26
Lime	12	14	0	26
Herbicide & Insecticide	2	14	1	17
chemical application	3	12	3	18
irrigation	2	0	0	2
harvesting	0	9	1	10
transportation	0	3	0	3
drying	1	7	2	10
other	1	0	0	1

Source: 1992 MSU Survey of Landlords and Tenants

There seems to be some motivation for the choice of traditional, simple ratios for splitting the crop and the input shares such as half and half or one third - two thirds. One may wonder why splits such as 47% - 53% are never observed. One possible explanation is that tradition prevails. It may be that sharing of inputs provides a means of fine tuning a share agreement. For example, where the tenant's share of the crop is less than sufficient to equate invested time, effort and resources, there is a greater tendency for the landlord to participate in the sharing of costs of more inputs.

4.8 Changes from cash to share and visa versa

There was very little evidence of movement between agreement types. The average duration reported for share and cash agreements was 8 and 10 years respectively. Eight respondents reported changing from a cash agreement to share cropping. By contrast twelve respondents reported changing from a share agreement to cash rent.

Respondents were subsequently asked to identify their position with respect to willingness to change and give reasons. Those with share agreements responding to this question were evenly divided; thirty-three said they were willing while thirty-four were not. By contrast, of those with cash rent agreements only sixty-four were willing to change while one hundred and sixty were not.

A variety of reasons were cited, and, since many of the comments were cryptic and incomplete, interpretation is difficult. Of those with share agreements expressing a willingness to change the common answer was that they would accommodate the wishes of the other party. Those unwilling to change cited such things as poor ground and risky yields, lack of capital, and tradition. Interestingly, those with cash agreements unwilling to change often replied to the effect that the agreement would be cash or nothing, implying that if they could not rent on a cash basis they would not be willing to rent the land at all. Others simply noted that share agreements required too much effort in dividing and calculating the rent.

Another common answer that appeared here (and elsewhere where comments were requested) was that the cash agreement ensured that both landlord and tenant

knew in advance the amount of the rent. This implied an unwillingness to incur the cost of disagreeing or haggling over the actual yields or crop division. Further, numerous tenants cited a strong preference for cash and an unwillingness to change, claiming that with a cash rent agreement the landlord would have no right to interfere or have anything to say about how the land was farmed.

Finally, those with cash agreements and willing to change to share again expressed in many cases simply a willingness to accommodate the wishes of the other party. A few indicated that they did feel that the share agreement would be more fair.

4.9 Specifics of landlords and tenants

There is some evidence from landlords that the choice of contract is related to personal farming experience. Landlords with less than 10 years farming experience reported choosing the share agreement about one third as often as cash rent. By contrast, those with more than forty years experience exhibited a somewhat reverse choice. Table IV.10 displays the choices and years of experience of responding landlords.

Table IV.10 Landlord experience and choice of contract

Landlord Experience	Share Crop	Cash Rent
10 years or less	5	14
11 - 39 years	12	22
40 years or more	11	5
Totals	28	41

Source: 1992 MSU Survey of Landlords and Tenants

Further, if the landlord actually farmed the land in question at one time (not simply farmed in the past), he/she was much more likely to choose the share rent agreement (see Table IV.11). Those who inherited the land, or possibly farmed under different circumstances might have less experience to offer in a share lease relationship.

Table IV.11 Landlord prior cultivation of the land to be leased and contract choice

Prior Cultivation	Share	Cash
Landlord once farmed the land	35	44
Landlord did not farm the land	2	12
Totals	37	56

Source: 1992 MSU Survey of Landlords and Tenants

4.9.1 Contracting

Very few of the responding landlords (only 11) reported asking for references when they engaged the current tenant. There was no distinguishing pattern between

share and cash contracts and the checking of references.

When asked about the performance of the tenant in business and management, only rarely did the landlord respond that the tenant was not performing well. (It would seem that for this question a range of choices would have been more useful in gathering the information rather than simply yes and no responses.)

4.9.2 Hypothetical contract choice with parties of varying degrees of closeness and confidence

In this section choice of contract is presented using a comparison of stated initial closeness and actual choice of contract (see Table IV.12). This is followed by data collected using hypothetical situations with corresponding choice of contract.

Table IV.12 Respondent actual contract choice with parties of varying degrees of closeness.

Respondent Relationship	Share Lease	Cash Lease
Very close friend or family	27 (39%)	56 (24%)
Friendly acquaintance	31 (42%)	155 (65%)
Individual unknown	12 (17%)	24 (10%)
Familiar institution		1 (.5%)
Unfamiliar institution	1 (1%)	1 (.5%)

Source: 1992 MSU Survey of Landlords and Tenants

In recognition of the potential for unanticipated distortions in the collection of actual data for testing the hypotheses, several hypothetical questions were asked of the respondents. It was hoped that the preamble to the question would provide the controlled environment for the response. It was understood that there is some margin for error in interpretation since what the respondent claims would be chosen in a given situation, versus what would actually happen should the situation arise, might be different. Nevertheless, by asking the question in this manner, it was hoped that respondents would be able to provide useful information regarding contract preferences.

Table IV.13 Landlord contract preferences (hypothetical) with parties of varying degrees of closeness; assuming no risk in performance.

Prospective Tenant:	Share Lease		Cash Lease		no agreement	
	number	column %	number	column %	number	column %
Very close friend or family	41	51	45	17	6	5
Friendly acquaintance	27	34	67	26	0	
Stranger	8	10	66	25	18	15
Business or institution	3	4	64	24	25	21
Individual or firm with whom you have had a serious disagreement	1	1	20	8	70	59
Totals	80	100	262	100	119	100

Source: 1992 MSU Survey of Landlords and Tenants, question #24.

Landlords were asked to indicate what kind of contract they would prefer given a variety of potential tenants. Table IV.13 shows the distribution of responses. In this first instance, the landlords were told that the performance of the tenant, with respect to farming ability was certain. The variable to be examined was whether the closeness of the individual would make any difference in the choice. The table shows clearly a diagonal relationship. The share lease finds most acceptance with close friends and family. Strangers tend to prefer cash leasing agreements. Not

unexpectedly, individuals with previous disagreements simply prefer not to engage in any contract with such a person.

Responding landlords were then asked to consider the same question but this time they were instructed that the performance of the tenant was not to be considered certain. The wording of the question suggested that there was considerable uncertainty to be taken into account. Accordingly the landlords adjusted their responses as shown in Table IV.14.

Table IV.14 Landlord contract preferences (hypothetical) with tenants of uncertain performance and varying categories of social closeness.

Prospective Tenant:	Share Lease		Cash Lease		no agreement	
	number	column %	number	column %	number	column %
Very close friend or family	15	63	59	23	17	10
Friendly acquaintance	7	29	72	28	13	8
Stranger	2	8	56	21	32	19
Business or institution	0	0	54	20	36	22
Individual or firm with whom you have had a serious disagreement	0	0	20	8	69	41
Totals	24	100	261	100	167	100

Source: 1992 MSU Survey of Landlords and Tenants, question #25.

Tenants were also asked to indicate contract preferences given choices of landlords in various categories of social closeness. Though the tenants were less inclined to choose the share agreement, compared to landlords, the tenants also demonstrated a diagonal trend of responses similar to those of the landlords. One possible explanation for the difference in preferences between landlords and tenants is that the tenants place more value on being the sole decision maker in the agreement. By contrast a retired landlord after having farmed the land for a long period of time may feel that he or she has something to contribute in a share agreement. The landlord may even feel somewhat attached to the land and, as is especially peculiar to farming, may really enjoy being involved though not able to remain fully responsible for all the farming activities. Furthermore, the bonds associated with ownership may influence the landlord's desire to be involved. Table IV.15 provides a breakdown of the tenants' responses.

Table IV.15 Tenants' contract preferences (hypothetical) with landlords of varying categories of social closeness.

Prospective Tenant:	Share Lease		Cash Lease		no agreement	
	number	column %	number	column %	number	column %
Very close friend or family	45	40	157	21	9	5
Friendly acquaintance	33	29	170	23	3	2
Stranger	18	16	182	25	5	3
Business or institution	13	12	168	23	26	14
Individual or firm with whom you have had a serious disagreement	4	3	59	8	143	76
Totals	113	100	736	100	186	100

Source: 1992 MSU Survey of Landlords and Tenants, question #32.

Uncertainty relative to the performance of the landlord does not play the same role in the agreement as with the tenant. In some cases the landlord may provide management skill, resources or assist with production. By contrast, it is not uncommon for the landlord to have no involvement in crop production. Consequently, it was decided that a question suggesting uncertainty in relation to the performance of the landlord would not be applicable.

4.9.3 Landlord qualification and participation in the agreement

The tenant's view of the both the ability and willingness of the landlord to contribute to the agreement was solicited in question thirty-one. Unfortunately the wording of the question caused many of the potential respondents to skip over it rather than respond. A majority of the responses analyzed here come from the questionnaires filled out during the testing for non-response bias as discussed in that section earlier. The MASS operators were instructed with slightly different wording and asked to record the responses to this question if applicable.

Table IV.16 Tenant's view of the contribution of the landlord: Crop-share Agreement

The Landlord has	The Landlord is			
	Well Qualified		Willing to Help	
	yes	no	yes	no
Knowledge of Farming	24	5	22	7
Knowledge of Markets and Marketing	20	9	19	10
Resources (assets and skills)	18	11	16	13

Source: 1992 MSU Survey of Landlords and Tenants

The responding tenants were asked to evaluate the contribution of the landlord, both with respect to skill or knowledge as well as willingness to help or participate in the production process. The responses were sorted by contract type and provide a rather revealing sketch of the perceived attitudes and skills of the landlord and the type of contract chosen. Tenants with share lease agreements and cash rent agreements responses are tabulated in Table IV.16 and Table IV.17 respectively. Comparing the responses it is evident that tenants involved in a share agreement perceive the landlord as willing to help. Furthermore, those with cash rent agreements are much more doubtful about the landlord's qualifications.

Table IV.17 Tenant's view of the contribution of the landlord: Cash Rent Agreement

The Landlord has	The Landlord is			
	Well Qualified		Willing to Help	
	yes	no	yes	no
Knowledge of Farming	47	54	24	76
Knowledge of Markets and Marketing	36	66	18	84
Resources (assets and skills)	31	69	19	81

Source: 1992 MSU Survey of Landlords and Tenants

4.10 General rental market and respondent information

In the final section of the questionnaire respondents were asked to provide further general information that applied to all respondents.

4.10.1 Use, maintenance and care of assets

Rarely did the respondents list assets made available to the tenant by the landlord in addition to the land. Those items that were listed included for the most part the use of a shed or bin for storage. In a few cases cultivation equipment and or tractors were listed. In each of these cases the parties were involved in a family operation and a share lease agreement.

Responsibility for maintenance of land rested primarily with tenants according to respondents. In less than ten percent of the cases this responsibility was shared

and a very few cases remained the responsibility of the landlord. By contrast, maintenance and upkeep of the buildings and other assets rested with the landlord.

In an effort to evaluate the perception of the respondent toward the other party in the lease agreement, with respect to perceived interest of the other party in upkeep of the assets involved, question thirty-six was included in the questionnaire. The vast majority indicated that the other party had a great deal of interest in the upkeep of the assets. Those with share agreements tended to have a higher regard for the interest of the other party but this tendency was not sufficient to show any sharp contrast. The data collected for this question is summarized in Table IV.18 by contract type.

Table IV.18 Perceived interest in, and care for, the assets

Type of agreement	other party's demonstrated care for assets			
	a great deal	somewhat	very little	not at all
Share	41 (61%)	22 (32%)	2 (3%)	4 (6%)
Cash	119 (51%)	83 (36%)	20 (9%)	10 (4%)

Source: 1992 MSU Survey of Landlords and Tenants

4.10.2 Improvements

Eighty-one of the respondents indicated that physical improvements had been made sometime during the duration of their present agreement. The cost of these improvements was divided rather evenly between landlords and tenants. In thirty-four cases the landlord bore the cost of the improvement and likewise in another thirty-four cases the tenant bore all the cost. In thirteen cases the costs were shared between the landlord and tenant. Table IV.19 summarizes the kinds of improvements made. Tiling of the land was the most common improvement.

4.10.3 Self evaluation of risk preferences and contract choice

In an effort to evaluate aversion to risk and the role played by the same in the choice of contract, respondents were asked to evaluate personal risk preferences in question 40 of the questionnaire. Data collected for landlords and tenants were evaluated separately. Tenants responding to the evaluation of risk preference

Table IV.19 Capital improvements reported.

Improvements to:	Number
Buildings	9
Land Clearing	14
Ditching	10
Fencing	11
Tiling	31
Other	6
Total	81

Source: 1992 MSU Survey of Landlords and Tenants

demonstrated the expected distribution though there was not a commanding contrast (see Table IV.20).

Table IV.20 Tenants' risk preferences and contract choice

Tenants responding to the evaluation of risk preferences	contract chosen	
	share	cash
high income, high risk	9	56
medium income, medium risk	10	86
low income, low risk	13	32

Source: 1992 MSU Survey of Landlords and Tenants

Landlords on the other hand were somewhat polarized in their choices. Those preferring less risk were much more apt to be involved in cash rent agreements. Similarly those willing to accept more risk chose share agreements (see Table IV.21).

Table IV.21 Landlords' risk preferences and contract choice

Tenants responding to the evaluation of risk preferences	contract chosen	
	share	cash
high income, high risk	15	4
medium income, medium risk	13	19
low income, low risk	9	30

Source: 1992 MSU Survey of Landlords and Tenants

4.10.4 Interaction and contract choice

In the majority of cases the tenant farmed the land independent of participation on the part of the landlord. However, as Table IV.22 reveals, landlord participation in management decisions was clearly more common among those engaged in share cropping agreements.

Table IV.22 Degree of interaction and choice of contract

Degree of interaction	Share Crop	Cash Rent
Most production and management decisions are made jointly	12	5
Only the most important production and management decisions are made jointly	16	8
Rarely are production and management decisions made jointly	6	7
Decisions are made solely by the tenant with some advice from the landlord	18	48
Production and management decisions are made solely by the tenant with no input from the landlord	19	167
Totals	71	235

Source: 1992 MSU Survey of Landlords and Tenants

4.10.5 Current relationship, changes, and contract choice

When asked to evaluate the current leasing agreement on the basis of fairness, the majority of respondents viewed their leasing arrangement positively. Though those with share crop agreements showed more relative strength in the "excellent" category, overall there did not seem to be a significant difference in the type of contract and the satisfaction of the respondent (see Table IV.23).

Table IV.23 Respondents Evaluation of Fairness

Contract Type	Satisfaction Rating By Respondents					
	Very Bad	Poor	Adequate	Good	Excellent	Totals
Share	1	1	6	32	31	71
Cash	1	3	55	119	57	235

Source: 1992 MSU Survey of Landlords and Tenants

4.10.6 Social Interaction and Contract Choice

It was not uncommon for the parties engaged in a leasing agreement to be acquainted socially. However, our interest in this study was to determine if social closeness had any affect on the kind of contract chosen. Hence respondents were asked to indicate which category or categories of social interaction existed between the leasing parties.

Table IV.24 Contract choice (actual) and social interaction

Categories of social interaction of the contracting parties	contract			
	share	%	cash	%
Member of the same club, church, or other organization	15	22	44	19
Enjoy leisure activities together	19	28	45	19
Work (off farm) at the same location	6	9	3	1
No interaction	27	40	142	60
Totals	67	100	235	100

Source: 1992 MSU Survey of Landlords and Tenants

Though the responses indicate that social interaction is proportionately more common among individuals that choose the share leasing agreement, the evidence here is not overwhelming. The compiled findings are shown in Table IV.24.

4.11 Testing of factors associated with contract choice

Testing of the factors associated with choice of contract will be divided into two sections. Landlords and tenants will be considered separately as the choice of contract is examined using a logit regression model. In the logit model the dependent variable, "CHOICE", is not continuous. The choice is an either-or proposition with

no continuum of partial alternatives in between. The logit model provides a means of analyzing the relative influence of the independent variables on the choice of contract. We will begin by examining the choice of contract by landlords.

4.11.1 Landlord choice of contract

Of the total 313 responses, 97 were from landlords. Of this group, twenty-two were rejected by the program because of missing data in one or more variables being used in the logistic regression. Thus 75 landlord responses were included in the data evaluated in this section.

The dependent variable "CHOICE" (of share lease) was taken from the data collected in response to question ten[2] which asked whether the contract about which the respondent had chosen to reply, referred to a share-crop or cash rent agreement. The independent variables came from questions designed to elicit responses that would test the hypotheses previously stated. Table IV.25 contains the variable list, the question eliciting the variable, and corresponding descriptions.

The anticipated sign of each of the independent variables has been included in parentheses with the name. The interpretation is straight forward. A positive sign would mean that the variable is expected to contribute positively to the choice of a share agreement, and visa versa. An example can be noted in the case of the variable labeled RISK. The negative sign indicates that the risk averse landlord

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[2] Question ten was selected instead of question three since actual choices avoid the discrepancy between *stated* preferences and *real* choices. However, in this case there was only one respondent exhibiting this conflict.

Table IV.25 Variable list for landlord logistic regression.

Variable name and expected sign	Source*	Description
Choice of Share	Q10	This is the dependent variable and contains the choice of contract by the respondent.
Crop (-)	Q11c and Q17c	Type of crops grown on the leased land.
Parcels (-)	Q2	Number of parcels of land under leasing contracts.
Socializing (+)	Q42	Social interaction exclusive of farming activities.
Joint (+)	Q41	Degree of joint decision making in production and management.
Risk (-)	Q40	Self evaluation of risk preferences.
Social Closeness (initial) (+)	Q8	Social closeness at the outset of the agreement.
Oral (+)	Q4	Proportion of oral versus written agreements.
Fair (+)	Q43	Respondent's perception of fairness of the agreement.
Assets (+)	Q36	Landlord's perception of how well the tenant takes care of the assets.
Continue (+)	Q37	Anticipated continuation of the agreement.
Experience (+)	Q26a	Landlord farming experience.
Visit (+)	Q26d	Landlord visits the farm frequently.
Upkeep (-)	Q9	Respondent's appraisal of the general condition of the farm at the time of entering into the leasing agreement.

Source: 1992 MSU Survey of Landlords and Tenants
* Questionnaire numbers. See Appendix I.

would *not* prefer the share agreement since this kind of contract would necessarily increase exposure to risk. In the case of CROP, the negative sign means that the values recorded for the choice of hay, pasture and specialty crops (which would tend to be more difficult to divide) decrease the probability of the choice of the share agreement.

4.11.2 Landlord logit regression results

The results of the logit regression are given in several stages. First, the overall performance or fit of the equation is evaluated. The equation, as a model of contract choice, estimates the log of the odds that a share agreement or a cash rent contract will by chosen by the leasing parties given the reported circumstances and then in turn predicts the anticipated choice. The word *predict* may be a bit misleading in that there is a considerable amount of uncertainty as to causality. For example, the fact that a respondent reports frequent joint collaboration in decision making may be either contributing to or resulting from the kind of agreement chosen. Nevertheless, the equation evaluates the correlation of the dependent variables with the independent variable and *predicts* which contract will be likely.

The equation is presented with the variables described in Table IV.25.

$$\begin{aligned}\text{Choice of Share} = {} & B_0\text{Constant} - B_1\text{CROP} - B_2\text{PARCELS} + B_3\text{SOCIALIZING} + B_4\text{JOINT} \\ & - B_5\text{RISK} + B_6\text{SOCIAL CLOSENESS} + B_7\text{ORAL} + B_8\text{FAIR} \\ & + B_9\text{ASSETS} + B_{10}\text{CONTINUE} + B_{11}\text{EXPERIENCE} + B_{12}\text{VISIT} \\ & + B_{13}\text{UPKEEP}\end{aligned}$$

There are several ways to assess goodness of fit of the model. The first will be to compare the predicted results with the actual data. The accuracy of the model is evaluated in Table IV.26. The first column of numbers shows the number of share and cash agreements expected when each set of respondent characteristics is plugged into the regression equation. Were the model one hundred percent accurate, there would be no difference between predicted and observed. The "observed" column in the table shows the number of contracts that were accurately predicted. This is followed by the percent correct. Obviously the model is more accurate predicting cash rent agreements between individuals than share-crop agreements.

Table IV.26 Classification Table for Landlord Contract Choice

Choice	Predicted	Observed	Percent Correct
Share	24	15	63%
Cash	51	44	86%

Source: 1992 MSU Survey of Landlords and Tenants

The second step in evaluating the outcome of the regression involves analyzing the contribution of each of the variables. As discussed earlier the variables used in the regression are for the most part without scale and hence the size of the meaning of the size of the coefficient if difficult to derive. Some comparison may be made between variables that have common values such as the dummy variables in the

model. A listing of the variables in the regression and statistics pertinent to this analysis are provided in Table IV.27. The full printout of these statistics is located in APPENDIX II.

An alternative method of establishing goodness of fit is to examine the improvement of the log likelihood statistic between the regression model with only a constant and then with the variables added. This statistic is reported in the Appendix (II) together with the significance level. In this case we reject the hypothesis that the coefficients of the independent variables are significantly different from zero.

Examination of these results reveals that the variables all have the anticipated sign, with respect to the model, except for CROP, PARCELS and EXPERIENCE. None of these are significant at the .05 level though CROP would be considered significant at the .1 level. The variables SOCIALIZING, SOCIAL CLOSENESS (initial), and UPKEEP are all significant at the .05 level with CROP, JOINT, RISK, FAIR, and VISIT between the .05 and .1 range. Implications of these findings and corresponding discussion can be found in Chapter V.

Table IV.27 Result of the landlord regression equation on choice of the share agreement- variables and corresponding statistics

Variable	β Value	Statistical Significance
CROP	**-1.44**	**.09**
PARCELS	.48	.63
SOCIALIZING	**2.31**	**.02**
JOINT	**1.55**	**.10**
RISK	**-1.70**	**.06**
SOCIAL CLOSENESS (initial)	**2.84**	**.03**
ORAL	.07	.96
FAIR	**2.22**	**.07**
ASSETS	.21	.78
CONTINUE	1.88	.27
EXPERIENCE	-1.52	.45
VISIT	**4.09**	**.10**
UPKEEP	**-1.71**	**.04**
CONSTANT	-2.00	.52

Source: 1992 MSU Survey of Landlords and Tenants

4.11.3 Tenant Choice of Contract

Although it was assumed that the landlord would be the party primarily responsible for choosing the contract type, reason suggests that landlords will also sensitive to the preferences of prospective tenants. In the survey, tenants were also asked to respond to questions about contract type and preferences for share-crop or cash-rent agreements.

Of the 213 responding tenants, only 121 were sufficiently complete to include in the regression. This was primarily due to the confusion over responses to question 31 regarding the tenant's view of the landlord participation, which many of the respondents skipped. The method of evaluation was very similar to that shown above for landlords. However, a few variable changes are to be noted. The variables VISIT, EXPERIENCE and ASSETS were replaced by KNOWLEDGE and WILLING that refer to the tenants perception of the landlord's potential contribution to the agreement. Also, assuming that tenants would be more sensitive to the current social relationship in the choice of agreement, variable SOCIAL CLOSENESS (current) was substituted for SOCIAL CLOSENESS (initial) in the regression. The list of variables used is contained in Table IV.28.

Table IV.28 Variable list for tenant logistic regression.

Variable name	Source*	Description
Choice of Share Contract	Q10	This is the dependent variable and contains the choice of contract type by the respondent.
Crop (-)	Q11c and Q17c	Type of crops grown on the leased land.
Contracts (-)	Q2	Generated from question 2 indicating the number of parcels of land under leasing contracts.
Socializing (+)	Q42	Social interaction exclusive of farming activities.
Joint (+)	Q41	Degree of joint decision making for production and management.
Risk (+)	Q40	Self evaluation of risk preferences.
Knowledge (+)	Q31a	Tenant's evaluation of the landlord's ability help with management decisions.
Willing (+)	Q31b	Tenant's evaluation of the landlord's willingness to help with management.
Social Closeness (current) (+)	Q38	Current social closeness.
Oral (+)	Q4	Proportion of oral to written agreements.
Fairness (+)	Q43	Respondent's evaluation of the fairness of the agreement.
Continue (+)	Q37	Respondent's expectation of the number of years the agreement will continue.

Source: 1992 MSU Survey of Landlords and Tenants.
* Question number. See Appendix I.

4.11.4 Tenant regression results

As before, the results of the regression are given in several stages. First, the overall performance of the equation is again evaluated by comparing how accurate the model was in predicting the choice of contract. The tenant equation is presented with some differences compared to the landlord equation:

$$\text{Choice of Share} = B_0\text{Constant} - B_1\text{CROP} - B_2\text{PARCELS} + B_3\text{SOCIALIZING} + B_4\text{JOINT} - B_5\text{RISK} + B_6\text{KNOWLEDGE} + B_7\text{WILLING} + B_8\text{SOCIAL CLOSENESS} + B_9\text{ORAL} + B_{10}\text{FAIR} + B_{11}\text{LENGTH}$$

As with the landlord model, the choice of the share agreement is not as accurately determined as the cash rent agreement. Although it may be worth noting that the tenant model is slightly more accurate overall than the landlord model. These results are shown in Table IV.29.

Once again the model appears to be much more successful in predicting the cash rent agreement than the share crop agreement. As with the landlord equation, the results of the improvement of the log

Table IV.29 Classification Table for Tenant Contract Choice

Observed	Predicted		Percent Correct
	Share	Cash	
Share	13	11	54%
Cash	8	86	92%

Source: 1992 MSU Survey of Landlords and Tenants

likelihood statistic fail to reject the hypothesis that the coefficients of the variables are significantly different from zero.

Now we will examine the outcome of the regression with respect to the relative contribution of the variables. As with the landlord model above, most of the variables carried the anticipated sign. Only CROP exhibited a sign different than expected. JOINT, WILLING and LENGTH, were significant at the .05 percent level with KNOWLEDGE and ORAL on the border. PARCELS is on the border of being considered significant at the .1 percent level. Table IV.30 lists the outcome of this regression.

Table IV.30 Variables in the tenant equation and corresponding statistics

Variable	β Value	Significance
CROP	.82	.14
PARCELS	**-.27**	**.10**
SOCIALIZING	.02	.98
JOINT	**1.70**	**.03**
RISK	-.14	.85
KNOWLEDGE	**1.91**	**.06**
WILLING	**2.04**	**.01**
SOCIAL CLOSENESS (current)	1.49	.18
ORAL	**1.92**	**.06**
FAIRNESS	1.06	.22
LENGTH	**3.53**	**.01**
CONSTANT	-11.05	.003

Source: 1992 MSU Survey of Landlords and Tenants

4.12 Summary

In this chapter the procedure of data collection has been set forth in detail. The collected data was analyzed and described in tables and prose. Also as part of the analysis a logistic regression was run using the model described in Chapter 3. The resulting statistical data will provide the basis for the discussion of testing of hypotheses in the following chapter.

CHAPTER V

RESULTS AND HYPOTHESIS TESTING

5.1 Introduction

In the previous chapter the data collected was reported with only limited discussion. In this chapter the previously conceived hypotheses will be discussed in light of the findings of the survey data. Arguments will be presented to support rejection of, or failure to establish rejection of, the various hypotheses as the case may be.

5.2 Basis for hypothesis rejection

As discussed in Chapter III, using the scientific approach we do not *confirm* a belief, notion, or hypothesis, we merely reject or fail to reject as the case may be. The concept is that, given the numerous limits in being able to examine, measure, and test a given phenomenon, there is always the possibility that new information, tools, methods, or techniques may be discovered to more accurately evaluate the proposed relationship. By failing to reject a hypothesis, we are saying that given the information currently available, our methods, tools, and so forth, we are unable to determine that a given relationship does not hold.

There is always the risk that the methods used lead to erroneous conclusions.

Consequently, it is important to analyze the potential of committing what statisticians refer to as Type I and Type II errors. These are to fail to reject a hypothesis when in fact it should have been rejected or to reject a hypothesis when it should not have been rejected. These kinds of errors are normally evaluated with respect to the anticipated corresponding cost of failure. The discussion usually leads to choosing a level of statistical significance that will be considered acceptable in testing. Many fields of science have adopted a tradition of significance levels of .1, .05, or .01 corresponding to 90%, 95%, or 99% levels of confidence, respectively.

There is little doubt that the decision context will impact on the choice of a significance level. A study that examines fatal exposure to radiation will not have the same cost structure relative to hypothesis rejection as one that examines plant growth response to exposure to music. For the purpose of this study, especially given the lack of empirical data and the relatively low cost of error, the .1 level will be considered significant. This means that where we can be confident that at least nine out of ten times that error did not occur, resulting in rejection of (or failure to reject as the case may be) the hypothesis in question. We can thus be reasonably certain that the tested relationships did not occur by chance. This will be considered sufficient to claim a significant finding and, as is common to science, to recommend further research to determine that the condition holds in other populations and possibly under other circumstances.

5.3 Interpretation of the data from the logit regression

Prior to examining the results of the regression it may be useful to note some of the characteristics of the logit model. First, the logit model *approximates* a cumulative normal distribution and is primarily used when examining either/or situations such as the contract type chosen in our model. It examines the probability of an event occurring. The relationship between the dependent variable and the coefficients of the independent variables is not linear as in ordinary least squares regression models. In addition, the unit changes in the data values for the variables in the regression equation lack a corresponding scale to allow interpretation of the magnitude of the actual change. Hence, interpretation of the size of the coefficient will be limited to ordinal comparisons and relative changes.[3] Consequently, the majority of the discussion will focus on the sign of the coefficient and the level of statistical significance.

5.4 Testing of hypotheses

The hypotheses to be tested deal with three main areas of interest. First we will examine the effects of risk on contract choice. This will be followed by the complex transaction costs issues. Finally, we will consider the effects of social closeness and the choice of contract type.

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[3]Strict interpretation of a change in the coefficient translates into a change in the log of the probability of the occurrence of an event. For example, in Table IV.26 the coefficient for RISK is -1.7. This would mean that for every unit change in the landlord's aversion to risk, the log (or logit) of the probability of the choice of the share agreement would decrease by 1.7.

5.4.1 Risk

The concept of risk in leasing situations is complex. The scope of this study allowed only a limited examination, focusing on self evaluation of risk preferences in question forty. The data coded from the responses was tested in the logit regression which examined the influence of the response to the risk question with respect to the choice of contract. The hypotheses were tested separately with seemingly mixed results.

5.4.2 Risk and tenant's choice of contract

The risk averse tenant would be expected to prefer the share agreement since this would minimize exposure to crop failure especially in cases where the cost of inputs were shared. Consequently, the expected result was that the following hypothesis would be rejected:

(1) H_o: **Risk, relative to the tenant's preference for secure income, makes no difference in the choice of contract.**

Not only were we unable to reject this hypothesis, but in addition, the sign of the variable in the outcome of the regression was negative instead of positive, meaning that aversion to risk on the part of the tenant encouraged the choice of the cash rent agreement. However, examination of the significance level (.84) reveals that the variable did not contribute significantly in determining the probability of the choice of a share agreement (see Table IV,29). Further, it was noted by the author that as variables were added to the regression equation, that the sign of this variable changed

frequently. Leamer (1983) would term this a fragile variable. The implication is that for the tenant, the probability of the choice of the share agreement depends much more heavily on variables other than risk.

5.4.3 Risk and the landlord's choice of contract

In contrast to the tenant, the risk averse landlord would be expected to prefer the cash rent agreement since this would provide secure income with the amount known in advance and not dependant on the crop. Hence, it was expected that the following hypothesis would be rejected:

(2) H_o: **Risk, relative to the landlord's preference for secure income, makes no difference in the choice of contract.**

The regression results shown in Table IV,27 reveal that the variable RISK carried the expected negative sign and would be considered significant at the .1 percent level. This is not an overwhelming rejection of the hypothesis. Nevertheless, these findings indicate that for the landlord, risk is an important consideration and merits a consideration. This author would recommend that a more thorough study of all the implications of risk be undertaken.

5.4.4 Discussion of risk

The traditional approach to studying risk is to examine a stochastic event considering the costs or benefits of various outcomes of known or estimated probability. The discussion generally leads to considerations of insurance against the

occurrence of the undesirable event. In the case of leasing of land, the stochastic results of crop failure are certainly a consideration. The aspect of risk tested was evaluated in terms of sharing or not sharing crop failure or success as the case may be. There is certainly room for discussion and examination regarding the approach of self evaluation used.

For one, it was pointed out that self evaluation may be dependent on circumstances such as the relative security of the present position and the cost of failure. For example, if a tenant is facing financial ruin or bankruptcy, there is a greater incentive to risk all. This might be considered similar to "going for it" on forth down in a football game with only minutes to play and another score could make the difference between victory and defeat. Under such circumstances even an historically risk averse person may behave contrary to the aversion. There remains the question of the accuracy of the individual's self evaluation as well. Further examination of this phenomenon is warranted.

The author is somewhat more interested in the less stochastic kinds of risk faced by landlords and in some cases tenants. The performance of the tenant has a significant impact on the health of the soil or well being of the land. Such things as the potential for leaching of nutrients from the soil, failure to replenish the same, failure to perform conservation practices, poisoning of the soil and ground water through inappropriate use of chemicals, and allowing the land to become infested with weeds or other pests lists some of the risks faced by the landlord. The tenant may have to contend with misrepresentation with respect to the fertility of the land,

potential for flooding, or other pre-existing conditions. Risks of this kind are subject to knowledge, trust, and understanding on both sides of the agreement. Furthermore, there is always the potential for a change in disposition. There are events that can lead to changes which may be influenced by attitudes and behavior of both parties. Examination of these kinds of risk provides an arena of diverse potential study.

5.4.5 Transactions Costs

The issue of transactions costs is also very complex, particularly since this term tends to encompass a wide variety of different considerations in leasing agreements. Since the share leasing agreement is expected to necessarily require more interaction with regard to determining and dividing both input costs and output values it was expected that the following hypothesis would be rejected:

(5) H_0: **Transactions costs (defined as the costs associated with carrying out the terms of the agreement-- contracting, bargaining, ensuring performance, exacting payment, etc.) make no difference in contract choice.**

Due to the complexity of the above hypothesis, it is necessary to test sub hypotheses in order to attempt to separate some of the issues involved. The type of crop impacts on the issue of transactions costs. Since some crops lend themselves more readily to measurement, these crops are easier to divide and identify the respective shares and the corresponding values. Where the crops are sold immediately after harvest and/or as a single large lot, identification and splitting of shares is facilitated. Corn grain, wheat, beans, and most of the small grains of lesser

importance fall into the category of easy to divide.

On the other hand, where the crop is of widely varying quality, or where measurement is difficult, the problem of equating shares fairly may become significant. Further, if the crop is retained as feed for livestock, measurement may depend on facilities on the farm at the disposal of the landlord or tenant. On several occasions a comment was entered by a respondent indicating that share rental was not an option since there were no scales available and the tenant retained the crop as feed for livestock. Hence, one null hypothesis proposed for testing was the following:

(5.1) H_o: Type of crop makes no difference in the choice of contract.

The results are moderately in favor of the rejection of this hypothesis. For the landlord, the variable CROP has the anticipated sign and the significance level (.09) is within the bounds set above. However, the tenant results show the significance level (.14) marginally outside the bounds for rejection. It is evident that the choice of crop is important but not overwhelmingly so.

Another issue in transactions costs that was not considered in the creation of the theoretical model is the number of parcels of land or different contracts to be taken into consideration. Multiple share leases result in a compounding of the costs of dividing both output and production inputs and keeping these separate or accounted for mutual until agreement and verification has been accomplished. This

point was raised by respondents in the comments sections as well. Some indicated that during seeding time they did not want to have to measure partial contents of seeding or fertilizer equipment after completing one parcel and moving to the next. Similarly at harvest time, crops from several different locations may be most efficiently stored in one bin. Consequently, the variable PARCEL was added to the regression. The following hypothesis was tested:

(5.2) H_o: Number of parcels makes no difference in the choice of contract.

The response in this case was quite meaningful. In the landlord results we fail to reject this hypothesis. This is understandable since the majority of the landlords rent out only one parcel of land. However, the results of the tenants choices show that the variable is important. The significance level (.10) falls just within the boundaries set earlier and thus for the tenants, this hypothesis will be rejected.

There was also some concern with respect to the potential for the landlord to monitor the behavior of the tenant. It was felt that if the landlord could visit the land frequently that this would make him or her more comfortable with the share leasing agreement. Hence, the following hypothesis was proposed:

(5.3) H_o: Facility of the landlord to observe and participate in the measurement and division of the crop makes no difference in the choice of contract.

The variable VISIT, corresponding to the frequency of landlord visits to the farm, was included in the landlord regression with results indicating that indeed the issue must be taken into consideration. Based on the .09 level of significance the hypothesis is rejected.

To summarize the transactions costs results, the evidence in each case is adequate but less than overwhelming that these considerations are being taken into account in choosing the type of agreement. The three sub-hypotheses tested were rejected based on the statistics from the logit regression and data presented above. Furthermore, there is no evidence that transactions costs as defined and examined here are not being taken into account when choosing the type of agreement. Therefore, based on the cumulative results, the initial transactions costs null hypothesis will be rejected.

5.4.6 Social Closeness

Social closeness between the tenant and landlord was measured in several different ways. Being essentially new ground to investigate, there was little if any precedent to follow. Respondents were asked to evaluate the interpersonal relationship at the outset of the agreement. Later, each was asked to indicate participation in social activities. Closeness was also examined with respect to the degree of shared or joint involvement in production and management decision making. Other indicators such as comments on attitude and satisfaction were examined as proxies for closeness. Only one general hypothesis was formulated from

the model in Chapter III. It was expected that this null hypothesis would be rejected:

(3) H_o: Social closeness makes no difference in the choice of contract type.

As with other variables studied above, the responses of landlords and tenants showed some variation with respect to the importance placed on closeness measures. Nevertheless, the variables representing social closeness provided strong statistical evidence for the rejection of the null hypothesis on the part of both tenants and landlords. The variables and corresponding statistics discussed below can be found in Tables IV,26 and IV,29.

For the landlords, social interaction (SOCIALIZING .02) responses constituted the strongest association with the choice of the share agreement followed closely by social closeness at the outset of the agreement (SOCIAL CLOSENESS initial .03). The probability of the choice of a share agreement by landlords was also associated with the evaluation of fairness of the agreement (FAIRNESS .07). The involvement in joint decision making also contributed to the choice of the share agreement (JOINT .10).

Tenants on the other hand were not motivated by social interaction per se but showed that interaction in decision making (JOINT .03), knowledge of the landlord (KNOWLEDGE .06), and willingness of the landlord to help (WILLING .01) all contributed to the probability of the choice of the share agreement. These responses provided the grounds for rejection of the final hypothesis:

(4) H_o: The managerial resources of the landlord and the disposition to provide such make no difference in the choice of contract.

Data on the physical condition of the farm also appeared to correspond to the probability of the choice of the share agreement and the rejection of the null hypothesis. It appears that the landlord's efforts in maintaining the farm in good condition (UPKEEP .04) may lead the tenants to believe that the landlord may have something to contribute in the choice of the share agreement. Other variables that show evidence of landlord and tenant confidence in each other are the strength of the oral agreement and the anticipation that the lease will continue for some time in the future. For the tenant, the length of existence of the lease (LENGTH .01) is statistically the most significant variable in the equation.

5.4.7 Further study of social closeness

Though the evidence above shows strong support for the inclusion of social closeness variables in a model of contract choice, numerous improvements could be made to construct questions to gather this data. Scaling of choices for respondents would be one area to consider in particular. Question twenty-three provides a good example of this. The choices are strictly "yes" or "no" to a question that probes the landlord's attitude toward the tenant. Rarely was a "no" answer given. It is the opinion of the author that an unhappy landlord would simply find a new tenant with whom a more satisfactory relationship could prevail. However, if given a few more choices such as "excellent", "above average", "average", and "fair" (for example), the

responding landlord may be better able to reveal marginal dissatisfaction with a tenant and correspondingly the effect on contract choice.

By contrast question forty-one provided too many choices. The responses were very polarized. Possibly one middle choice would be sufficient in this case.

Questions twenty-four, twenty-five and thirty-two provided some useful data but did not lend themselves to providing data for the logit regression analysis. Another phenomenon that was anticipated and borne out in the responses to these questions is that there is a tendency for some close family members to turn away from financial involvement, possibly to avoid conflict. This tendency runs contrary to the hypothesis proposed and, depending on its strength, may result in conflicting findings.

Another pool of potentially useful data that was not tapped with the approach used in this study, is the responses of landowners and farmers formerly involved in leasing that have forsaken the practice for whatever reason. It would seem that the continuum of responses would thus be more complete.

5.5 Summary

The results presented in this chapter suggest that the choice of the share agreement may be motivated by a number of different factors. Depending on the importance of the relevant factors to the parties involved, the choice ultimately depends on which of the factors dominates the decision. Risk, transactions costs, and social closeness all appear to play a role. There is strong evidence that interpersonal

relationships (described and evaluated as social closeness) must not be ignored in a study of farmland leasing in Michigan. However, the author would caution that based on the evidence of the success of the two equations, landlord and tenant, in predicting the choice of the share agreement, that accurate prediction of the **cash** agreement was much more successful (see Tables IV,25 and IV,28). It may be that we have found some necessary but not sufficient conditions for the choice of the share agreement.

In this study we examined the choice of contract. The implication is that the landlord and tenant will choose an agreement that best suits their needs either for individual or joint maximization of profits. The traditional research has focused on the idea (predicted from the traditional model) that lower productivity and hence lower profits would result from the choice of the share agreement. Much of the resulting data suggests that this is not the case. It stands to reason that researchers have been looking in the wrong direction. An investigation into the potential for increased profits as a result of share tenancy would be in order.

This study provides evidence that the traditional models of farmland leasing are incomplete. The motivation of both tenant and landlord is impacted by social closeness, a factor not included in traditional modeling of contract choice. Further examination of the contribution of social factors in profitability is recommended.

CHAPTER VI

CONCLUSIONS

6.1 Review

This study has gathered information to address the paradox of the crop share lease. Let us review briefly that paradox and the surrounding issues. It has been demonstrated by numerous authors that, based on the tenets of economic theory, the share lease is inefficient and will not result in appropriate allocation of resources. The argument stems from a conflict faced by the tenant. Under the share agreement the tenant receives only a portion of the output and consequently, when equating marginal costs and returns, will choose a level of production below that which would be chosen by the landlord or a tenant with a cash lease agreement, resulting in an inefficient allocation of resources. This seeming conflict has been the focus of numerous attempts to provided explanations as to why the share agreement would persist if the landowner is attempting to maximize profits. And, though many articles have been written, very little empirical data has been gathered to substantiate the claims and explanations. Hence, the purpose of this study was to formulate a model of leasing behavior, generate testable hypotheses with respect to the motivations for choice of contract, and then gather data and test the hypotheses.

In formulating a model of contract choice in leasing, effort was made to solicit

reasons for choice of contract from landlords and tenants. The issues of risk sharing, ease of handling, tradition, and fairness were most prevalent in the responses. Risk sharing and transactions costs associated with administering the agreement had been addressed in the literature and incorporated into existing models. However, the issues of fairness and tradition prompted further inquiry. In addition, interest had previously been generated with respect to interpersonal relationships and the effects on contracting and economic choices, both formal and informal, by a new literature (Robison 1987). The share lease seemed to offer an appropriate forum for examination of this issue. Thus the concept of social closeness was incorporated as a variable in the model.

Close social relationships were hypothesized to have the effect of reducing some of the costs associated with risk and transactions and of increasing the MVP of the inputs in production including the tenant's labor. Furthermore, if the self interests of the contracting parties could become subordinate to the interests of the unit, the conflict would be resolved. Individuals with strong family ties, friendships, or loyalty might be expected to act in the interest of the whole. Hence, the issue of social closeness took a major part in the study.

6.2 Empirical findings

Collection of data was accomplished by conducting a survey using a mail questionnaire to a sample of farmers and landowners in Michigan prepared by Michigan Agricultural Statistics Service. The resulting data were coded and analyzed

using a logit model and the computer program, The Statistical Package for the Social Sciences.

Caution must be exercised in regional generalization of the implications. The sample taken only from Michigan landlords and tenants, and there appears to be substantial differences in the incidence of share leasing compared to the findings of another recent study in the mid-west. The Michigan ratio of share crop leasing agreements to cash rent agreements was roughly one to three, somewhat less frequent than the Nebraska-South Dakota study which found an almost even split in South Dakota and the reverse or three share leases to one cash rent in Nebraska (Johnson *et al* 1990). Furthermore, parcel size and number of parcels per tenant differed significantly among these states.

It was demonstrated that the three main factors hypothesized as motivators for the choice of the share agreement --risk, transaction costs, and social closeness, --all played a role. There were differences with respect to landlords and tenants on some of the motivating factors.

6.2.1 Findings on risk

The respondent provided information on his or her own attitudes toward risk by the response to the self evaluation question (question 40). The resulting data was then used as a variable in the regression equations for landlords and tenants which examined the correlation of this solicited risk variable with the choice of contract. As discussed previously, the choice of contract carried implications for exposure to

risk which are quite different for landlords and tenants.

The cash agreement provides relative income security to the landlord, leaving the tenant to bear production, price, and ultimate income risk due to stochastic fluctuations. By contrast, the share agreement involves the landlord in bearing risk but only partially relieves the tenant. Hence, it was hypothesized that risk averse landlords and tenants would prefer the cash and share agreements respectively.

The findings revealed that a statistically significant correlation was evident between risk preferences and choice of contract for landlords, but not for tenants. This might suggest that the landlords have greater income dependence on the outcome of the lease than the tenants. One might further speculate that the tenants, having more leases on average, are more diversified and thus control exposure to risk through other means. It may also be that other considerations dominated the tenant's choice sufficiently to overshadow the influence of risk.

Previous studies focused the examination of risk on a slightly different approach. Crops were identified as having inherently greater or lessor risk of successful production and harvest for a give area. It was then hypothesized that the riskier crop would be chosen by tenants with share agreements where the exposure to risk was lower. Conflicting results ensued.

This study suggests that consideration of landlords and tenants separately when examining risk may provide a solution to the above conflicts. Furthermore, the author has earlier provided considerable discussion on the various aspects of risk and how this variable might affect the choice of contract. In particular, the gains from

favorable social interaction and social closeness between the landlord and tenant would have the effect of reducing or eliminating the effects of risk in many cases.

6.2.2 Findings on social closeness

Landlords had a greater likelihood of entering into share agreements with tenants whom they encountered on a social basis. This variable did not play as significant a role in the tenant's choice of share contract. Given that the landlord is placing not only valuable assets but also anticipated income in the care and management skills of the tenant, it makes sense that the landlord would seek an individual in whom confidence could be placed.

Table VI.1 Selected social closeness and interaction variables and corresponding statistics for landlords and tenants.

Variable*	Landlords		Tenants	
	β value	Significance	β value	Significance
Socializing	2.31	.02	.02	.98
Joint	1.55	.10	1.70	.03
Social Closeness (Initial)	2.84	.03		
Social Closeness (Current)			1.49	.18
Fairness	2.22	.07	1.06	.22
Oral	.07	.96	1.92	.06
Willing			2.04	.01

Source: 1992 MSU Survey of Landlords and Tenants
* See Table IV.28 for description of variables.

Comparison of the variables and corresponding statistics in Table VI.1 reveals that tenants and landlords have substantially different needs and views with respect to social aspects of contract choice. For the landlord it appears that the interest tends to focus on factors thay create trust and loyalty such as socializing, social closeness, and perceived fairness that may substitute for the foregone security of the cash agreement. On the other hand, the tenants appear to be more interested in what the landlord has to offer in interactive agreement. For example, tenants were much more likely to engage in a share agreement with landlords demonstrating both

resources and knowledge as well as willingness or disposition to participate in management decisions. By contrast, the socializing relationship was not statistically significant for tenants. This may reflect the nature of discovery of contracting parties. The tenant looks for land, hoping for an amicable relationship and willing to enter into a share agreement if the landlord appears to have the resources and willingness to participate. The landlord looks for the "right" tenant, putting high value on what he knows about the tenant through social channels.

Further, interpretation of the numerous comments sections on the questionnaire leads the author to the conclusion that frequently the share agreement was chosen by the landlord to provide optimal assistance and incentive to a family member leasing the farm. A "we're in this together attitude" often came through indicating a great interest in fairness and a sharing of both hardship and bounty. Other motivations included such things as the landlord's desire to remain involved, retention of identity with the farm and farming, desire to help the tenant "get started", and tradition corresponded with the choice of the share agreement. For the landlord, the share agreement seems to mean more than simply renting out the land for a source of income.

6.2.3 Findings on transaction costs

Theoretical effects of transaction costs on the choice of contract were supported by this study. The share agreement necessarily requires increased interaction, monitoring, record keeping relative to costs shared, and evaluation and

division of the crop. The variables representing the type of crop and the frequency of visits by the landlord to the land, were found to be statistically significant in the landlord regression equation, demonstrating that these concerns influence the landlord's choice of contract.

On the part of the tenant, the variables representing the number of parcels and formality of the agreement (ORAL) indicate that the tenant also takes into consideration the costs associated with carrying out various transactions in choosing the type of agreement. The comments entered by tenants further establish the dimension of this aspect of contract choice. On several occasions individuals took the time to write lengthy explanations about how the share agreement would not be feasible where the tenant is farming numerous parcels of leased land. In such cases the burden of record keeping, time required in joint decision making and even the aspect of storing crops separately until weighing and measuring could be completed was completely impractical. Frequently a tenant would write in response to the question of whether (s)he would be willing to change to a share agreement that scales were not available to measure the crop. This was seen as an insurmountable barrier.

6.2.4 Summary of findings

It may not be possible to completely separate the effects of social closeness and transaction costs and risk. Nevertheless, in each case for the landlord the null hypothesis was rejected, indicating that the findings were sufficient to consider that risk, transaction costs and social closeness must be taken into consideration when

examining the choice of contract. Especially the influence of the social closeness variables on the choice of contract should not be ignored.

6.3 Implications

Probably the most important finding of this study is the support for the social closeness factors in contract choice. Contrary to neoclassical microeconomic assumptions, there is evidence that interpersonal relationships play a role in establishing the characteristics of an economic agreement. A similar conclusion was reached by Marcelo Siles (1993) in a study on lending behavior. The evidence indicates that traditional economic models do not adequately account for the importance of social relationships. This can lead to incorrect conclusions, farm management advice, and policy.

6.3.1 Implications for landlords

The implications of neoclassical theory for the effects of both share leasing and cash rent agreements are somewhat negative for landlords. In the case of the share lease, the theory finds an incentive for the tenant to apply less than optimal variable inputs, resulting in depletion of soil fertility. Under the cash agreement, exploitation may also occur either through mining of the soil, failure to perform conservation and erosion prevention, or neglecting maintenance. However, the presence of social closeness would tend to provide at least partial counter incentives for both of these kinds of problems. As one farmer put it, "We all tend to abuse the

land in poor economic times. The difference is that the good farmer will replenish and restore when times are better." A tenant that experiences social closeness to the landlord would be more likely to try to keep the land and assets in good condition.

The findings here suggest that landlords may be well advised to invest in closeness. Regardless of the type of contract, the tenant that considers the landlord to be a friend and a source of help and advice from time to time, will be much less likely to exploit that landlord. Savings should be expected in transaction costs, especially supervision, which would be greatly reduced where mutual understanding and trust prevails. It is reasonable to hypothesize that the MVP of inputs may be enhanced by investment in social closeness and that enhanced MVP contributes to profitability.

6.3.2 Implications for tenants

It may be that the tenant does not have as much to gain from investing in social closeness in the same way as the landlord. As noted, the coefficients on the SOCIALIZING variable for landlords and tenants were quite different as were the significance levels observed. On the other hand, the WILLING variable (indicating the tenant's perceived willingness of the landlord to contribute to the agreement) played a major role in the tenant's choice of contract. This propensity to provide assistance may be sought by prospective tenants.

Some possible advantages cited earlier include the potential for cost savings through advice, contacts with markets and suppliers, and understanding of

peculiarities of the land. These are consistent with higher factor marginal value products for the inputs supplied by and paid for by the tenant. In addition some (socially close) landlords are willing to contribute a couple of days work, the use of storage areas, and possibly some implements or tools. Depending on the arrangement this could be a valuable resource, contributing to higher income for the tenant.

Willingness of the landlord to accommodate the needs of a tenant suffering from crop failure might also be of considerable value to the tenant. Although the incidence of adjustment was rather rare in the study, further investigation into preconditions for adjustments not formally part of the contract could be warranted.

6.3.3 Implications for farm management and extension personnel

The advantages and disadvantages associated with cash and share tenancy should be fully understood in order to provide accurate information to inquiring landlords and tenants. The importance of maintaining or promoting a positive social relationship between landlords and tenants should be considered. Misunderstanding leads to conflict and possibly lower productivity.

One practice that has been frequently encouraged in the extension literature is the sharing of production inputs. This author has observed that the sharing of inputs does tend to achieve, at least in part, a more equitable allocation of resources. However, another role seems to exist. Given the traditional rigidity of the share splits, (fifty-fifty, one-third-two-thirds, etc.) the choice and number of shared inputs

tends to fine tune the agreement. This was evident in the Nebraska South Dakota study as well as in conversation with farmers and farm managers. Further research in this area might provide links to help bridge the gap between theory and practice.

Land owned by government or institutions is often more vulnerable to exploitation. The importance of establishing a farm manager as acting landlord with genuine interest in the land and the tenant may have beneficial results.

6.3.4 Public policy implications

Traditional aversion to the share agreement, evident in the academic literature, is not warranted. The fact that an increasingly large amount of the nation's landbase is farmed by tenants, many of which are share tenants, cannot be interpreted to mean that there is a deterioration in the efficiency of food production. Public policy to discourage share agreements seems unwarranted.

In a nation reluctant to officially adopt any moral guidelines, it is doubtful that public policy can be formulated to encourage social closeness. It may be possible however to focus on the merits of cooperation, voluntary contributions of all kinds, and community spirit building events, activities, and projects. To the extent that individuals feel a closeness, or a sense of belonging, and a trust of fellow members of community or society, the benefits associated with closeness may emerge (Schmid 1987).

On a broader scale, the author envisions that this line of investigation could have beneficial effects on international relationships. Fewer confrontations might

occur if negotiating parties could find common ground for choosing trade agreements based on established common interests and expectations of improving bonds between nations. There may be reason to believe that individuals with close social bonds demonstrate willingness to make choices in the interest of the unit rather than the individual.

6.3.5 Theoretical implications

The inconsistency of theory and practice is partially resolved by adding social closeness variables to the theory. The persistance of the leasing agreement may not be conclusively resolved in this study. New lines of inquiry are suggested. Much more research must be done to provide support for these findings. Nevertheless, the main areas of potential gain through social closeness appear to be in the cost savings associated with transaction costs and risk. The underlying implication is that socially close individuals with an interest in the welfare of the other can help prevent, avoid, or eliminate altogether some of these costs.

6.4 Recommendations for further research

Replication of this study in another location would provide much in the way of further support for the findings. It is recommended that considerable effort should be expended to secure a more complete sample in another state or region.

The model developed here focused on factors influencing contract choice. Learning from this model, we can now ask about the supply of social closeness. A

more general model linking several steps might better illuminate the complexity of the issues being examined. The following functions might be considered to further develop the mondel:

$$\textbf{social closeness} = f(\textbf{investment})$$

$$\textbf{MVP} = f(\textbf{social closeness})$$

$$\textbf{profit} = f(\textbf{MVP})$$

This model would lend itself to an economic evaluation of the returns to investment in closeness rather than limiting the inquiry to how a given supply of closeness (social capital) influences the contract choice as in the model used in this study.

Closeness could affect MVP in several ways. Closeness affects productivity and ultimately profitability via its interaction with risk and transaction costs. It was noted earlier that only one aspect of risk and contract choice was examined in this study. Of particular interest would be work in the area of examining the substitution of closeness for alternative ways of dealing with risk. It occurs to the author that individuals enjoying social closeness would reduce the probability of an unfortunate event occurring, as well as spread the risk of unavoidable events. Would this make a tenant or landlord less risk averse? How would alternate forms of contracting influence risk attitudes and choice of technology and enterprises?

Similarly there are many areas where there appears to be a relationship between closeness and transaction costs. Further study on this issue, especially that which would promote understanding of actual expected dollar savings due to

closeness, would be very useful.

One implied assumption that could and should receive additional attention and study is the idea that the share agreement is chosen because it enhances profitability. No attempt was made in this study to measure and evaluate profitability specifically. The author anticipates that creation of a means of measuring the gains from socially close relationship would be a rich addition to this area of study.

The author had anticipated analyzing and comparing changes in contract choice in cases where the landlord and tenant were initially strangers and became close friends. This comparison was not made because of lack of sufficient data on individuals that were strangers at the outset of the agreement and changed from one kind of agreement to another. This might be remedied in further research by gathering a larger sample.

APPENDIX I

THE QUESTIONNAIRE

1992

Michigan State University

Farmland Leasing Survey

Farmland leasing is an important part of today's production agriculture. Yet, it is often difficult for tenants and landlords to gain a clear understanding of leasing practices within their locality and the state. By completing this questionnaire, you will be helping to compile lease market information for 1992, which we will be happy to share with you.

This survey is being sent to a random sample of both tenants and landlords. Some questions may not apply to you, but please respond as completely as possible. Your answers will be kept confidential and used in compiling total and average responses.

GENERAL INFORMATION

1. As a land owner or farm operator in Michigan in 1992, how many acres of farmland, if any, do you:

	Total Acres	Estimated Market Value
a. own?	_____	$_____/acre
b. lease to others?	_____	$_____/acre
c. lease from others?	_____	$_____/acre
d. Total that you farm yourself?	_____	$_____/acre

2. Please list and categorize **all** your leases. Each parcel or contract should be considered as a separate lease.

Lease Number	Number of Acres	Major Crops: Percent Field Crops	Percent Hay/Pasture	Share or Cash Rent (Circle One)
1.	_____	_____%	_____%	S C
2.	_____	_____%	_____%	S C
3.	_____	_____%	_____%	S C
4.	_____	_____%	_____%	S C
5.	_____	_____%	_____%	S C
6.	_____	_____%	_____%	S C
7.	_____	_____%	_____%	S C

3. What kind of contract do you prefer-- share or cash rent?_____

Please give the main reason(s) for your choice_____

_____

_____

4. How many of your lease agreements are: a. written?_____ b. oral? _____

*Even though you may have more than one lease, please answer the questions for just **ONE** lease agreement- either your **MOST IMPORTANT OR MOST TYPICAL** lease.*

5. In what county is this leased land located? _____

Please indicate the predominant soil type _____

6. How many years have you leased this land? _____

7. For this agreement, (check one for each question)

a. you are? ..... tenant ___ ..... landlord ___
b. the lease is? ..... oral ___ ..... written ___
c. the lease is renewed? annually___ ..... for a multi-year period ___

8. Please check the one category that best describes your relationship with the other party at the time of entering into this agreement:

_____ Very close friend or family
_____ Friendly acquaintance (e.g. neighbor)
_____ Individual previously unknown to you (stranger)
_____ Familiar institution (a company, government agency, etc. with which you had previously dealt or established a relationship.)
_____ Unfamiliar institution (a company, government agency, etc. with which you had never dealt previously.)

9. Please check the category that best describes the physical condition of the farm at the time you entered into this agreement:

____ Excellent ____ Average ____ Run down

The following pages are divided into two sections, one for crop-share lease agreements and the other for cash lease agreements. **Please answer the questions *ONLY* in the section that best represents the lease you have chosen as most typical or most important.** The questions are designed to be answered by either landlords or tenants.

Following that, there are separate questions for landlords and tenants. Then a few summary questions for all respondents. Please respond to all questions that apply to you.

CROP-SHARE LEASE SECTION

10. Is the lease you will be describing a **CROP SHARE** lease?

___ **Yes.** If "Yes" go to Question 11. ___ **No.** If "No" go to Question 16.

11. Please indicate the nature of the farmland, **your estimate** of value (for farming purposes), major crop(s) and corresponding share. (complete all that apply)

farmland:	Relevant Acreage is	Estimated Market Value of the Land	Major Crop(s)	Tenant's Share of Output
a. dryland	_____acres	$_____ (per acre)	_____	_____%
b. irrigated ...	_____acres	$_____ (per acre)	_____	_____%

12. Is there a cash payment in addition to the share rent?

___**Yes.** If "Yes" go to Question 12a. ___**No.** If "No" go to Question 13.

12a. The added rent amounts to $_____ per/acre or a total of $_____.

13. Of any **CROP PRODUCTION INPUT** costs that are shared, what is the landlord's share? (complete all that apply)

	Landlord's share		Landlord's share
a. seed	_____%	b. fertilizer	_____%
c. lime	_____%	d. herbicide and/or insecticide	_____%
e. cost to apply chemicals	_____%	f. irrigation energy	_____%
g. harvesting	_____%	h. transportation	_____%
i. drying	_____%	j. other (specify)_____	_____%

14. Since you began leasing this land, has:

	Yes	No
a. the lease changed from cash to share	___	___

or has,

	Increased	Decreased	No Change
b. the landlord's percent share of inputs?	___	___	___
c. the number of shared inputs changed?	___	___	___
d. the tenant's crop share changed?	___	___	___

e. Please explain the reason(s) for any change noted._____

_____

15. Suppose the other party in this agreement expressed an interest in changing the lease from crop-share to cash rent.

Would this be acceptable to you? ____ **YES** _____ **NO**

15a. Please explain your reason(s)_____

_____

_____

CASH LEASE SECTION

16. Is the lease you will be describing a **CASH** lease agreement?

___ Yes. If "Yes" go to Question 17.
___ No. If "No" go to Question 21.

17. What were/are the 1991 or 1992 per acre **cash rents**, major crops and **your estimate** of the 1992 per acre market value (for farming purposes), of this **leased land**?

	Relevant Acreage is	Estimated Market Value of the Land	Major Crop(s)	Per Acre Cash Rent
Farmland:				
a. dryland	_____acres	... $_____ (per acre)	.. _____ _____ _____	$_____
b. irrigated ...	_____acres	... $_____ (per acre)	.. _____ _____ _____	$_____

18. Are there lease provisions that vary the amount of cash rent due to changes in yields or prices?

___ **Yes**. If "Yes" go to Question 18a. ___ **No**. If "No" go to Question 19.

18a. Is rent adjusted for changes in: (check all that apply)

___ Higher than normal yields
___ Lower than normal yields
___ Higher than normal crop prices
___ Lower than normal crop prices
___ Other reasons. Please explain_____

18b. If an adjustment of this type has been made any time within the past 5 years, please briefly describe the circumstances and the amount of the adjustment.

_____

19. Since you began leasing this land, has:

	Yes	No
a. land ownership changed?	___	___
b. there been a different tenant?	___	___
c. the lease changed from share to cash rent? .	___	___

d. Please explain the reason(s) for any changes noted._____

_____

20. Suppose the other party in this agreement expressed an interest in changing the lease from cash rent to crop-share.

Would this be acceptable to you? ____ **YES** _____ **NO**

20a. Please explain your reason(s)_____

_____

_____

SPECIFIC LANDLORD INFORMATION

IF YOU LEASE TO OTHERS, please answer Questions 22 through 27. If not, go to Question 28.

21. Securing acceptable tenants is: (circle one)

1	2	3	4
Quite Difficult	Somewhat Difficult	Generally Easy	Very Easy

22. Did you ask for references when you engaged the present tenant? ..... ____ **Yes** ____ **No**

23. Do you regard your tenant as:

	Yes	No
Trustworthy and conscientious	___	___
Timely in performance of the farming operation	___	___
Makes good choices of crops to grow and inputs to use. .	___	___
Up to date and knowledgeable	___	___

24. Suppose you had a parcel of land that you could not farm yourself. You are presented with a variety of potential tenants. You conclude that each is of equal ability, skills and resources. What kind of lease would you prefer with each of the following kinds of tenants? (Please chech one for each kind of tenant.)

Prospective tenant:	Share Lease	Cash Lease	no agreement
a. Very close friend or family	___	___	___
b. Friendly acquaintance	___	___	___
c. Stranger	___	___	___
d. Business or institution	___	___	___
e. Firm or individual with whom you had a serious disagreement	___	___	___

25. Suppose once again you had a parcel of land that you could not farm yourself. You are presented with a variety of potential tenants. This time you are very uncertain about the ability of each one. They may or may not be good farmers but you just don't know and have no way of getting more information. What kind of lease would you prefer with each of the following kinds of tenants? (Please check one for each tenant.)

Prospective tenant:	Share Lease	Cash Lease	no agreement
a. Very close friend or family	___	___	___
b. Freindly acquaintance	___	___	___
c. Stranger	___	___	___
d. Business or institution	___	___	___
e. Firm or individual with whom you had a serious disagreement	___	___	___

26a. Were you, or are you currently actively engaged in farming yourself?

___ **Yes**. If "yes" give number of years_____.
___ **No**

26b. Did you once farm the land about which you are responding in this questionnaire?

___ **Yes** ___ **No**

26c. Do you visit the land frequently? (At least once every couple of months)

___ **Yes** ___ **No**

27. Do you retain any of your share of the production from the farm for your own livestock or other on-farm use?

___ **Yes** ___ **No**

SPECIFIC TENANT INFORMATION

IF YOU LEASE FROM OTHERS, please answer Questions 28 through 33. If not go to Question 34.

28. How did you typically first learn that the land you lease was available to rent? (check one)

___ From landowner directly.
___ From a relative.
___ From a neighbor or other individual
___ From newspaper or other media ad.
___ From other source (explain) _____

29. At the time of your original agreement, were you aware of competition from others? . ___ **Yes** . ___ **No**

30. When you renew your lease, are you usually in competition with others? . . ___ **Yes** . ___ **No**

31. Please evaluate the landlord's ability and contribution to your agreement.

31a. The landlord provides land only.

___ **Yes.** If "yes" go to question 32.
___ **No.** If "no" go to question 31b.

	The land lord is:	
31b. The landlord has:	Well Qualified (circle one)	Willing to help (circle one)
1) Knowledge of farming	Yes No	Yes No
2) Knowledge of markets and marketing	Yes No	Yes No
3) Resources (assets and skills)	Yes No	Yes No

32. Supposing you were interested in farming more land and you were presented with the following possible landlords. What kind of contract would you prefer? (Please check one for each kind of landlord.)

Prospective landlord:	Share Lease	Cash Lease	I would refuse to enter into any agreement
a. Close friend or family	____	____	____
b. Acquaintance	____	____	____
c. Stranger	____	____	____
d. Business or institution	____	____	____
e. Firm or individual with whom you had a serious disagreement	____	____	____

32a. Please give the main reasons for your preference of contract._____

_____

_____

33. Would a change in the type of lease change the way the land is farmed? Please explain.

_____

_____

_____

_____

GENERAL RENTAL MARKET AND

RESPONDENT INFORMATION

Questions 34 through 47 are for **ALL RESPONDENTS.**

34. Please list any assets (other than the land) used in crop production, storage or transportation that are supplied (without additional cost) by the landlord.

_____

_____

35. Who is responsible for care and maintenance costs of:

	Landlord	Tenant
a. Land	____%	____%
b. Buildings	____%	____%
c. Other fixtures & equipment	____%	____%

36. Which category below best describes how much the other party in this agreement cares about the assets, including upkeep and maintenance where applicable.

a.____ a great deal
b.____ somewhat
c.____ very little
d.____ not at all

37. How long do you expect this lease to continue?

___ one year ___ two to five years ___ more than five years

38. How would you classify your current relationship with the other party in this lease?

_____ Very close
_____ Friendly
_____ Strictly business
_____ Distant

39. Over the past 5 years or since this lease agreement began (if less than 5 years), has there been any investment in permanent improvements?

___Yes, if "Yes" please go to questions 39a and 39b.
___No, if "No" please go to question 40.

39a. How was the cost of the improvement shared ____% landlord ____% tenant.

39b. Please indicate the kind of improvement (i.e. tiling, irrigation system etc.)

_____

40. Some investments have high expected return but also high variability from one year to another (sometimes great gain, but sometimes great losses).

Indicate your preference for income-risk trade-off. (Circle a number below):

Higher average income Higher risk									Lower Average Income Lower Risk
1	2	3	4	5	6	7	8	9	10

41. Please check the category that best describes the degree of interaction of landlord and tenant in production and management decisions.

___ Most production and management decisions are made jointly.
___ Only the most important production and management decisions are made jointly.
___ Rarely are production and management decisions made jointly
___ Decisions are made solely by the tenant with some advice from the landlord
___ Production and management decision are made solely by the tenant with no input from the landlord.

42. Do you interact on a social basis outside of the farming agreement? (Please check any that apply)

_____Member of the same club, church, or other organization
_____Enjoy leisure activities together
_____Work (off farm) at the same location

43. From the standpoint of fairness to you, how would you classify your leasing *arrangement(s)? (circle one)*

1	2	3	4	5
Very bad	Poor	Adequate	Good	Excellent

44. On average, **net** income from crop and livestock production or farmland rental contributes what percentage of your total household income? (check one)

___ Less than 30%
___ 30% to 49%
___ 50% to 80%
___ More than 80%

45. Your age is (check one)

___ Less than 25 years
___ 25 to 34 years
___ 35 to 44 years
___ 45 to 54 years
___ 55 to 64 years
___ 65 or more years

39. Your sex is?

___ Male
___ Female

46. Your residence is:

a. _____ County _____State

47. We thank you for completing this questionnaire. If you have any additional comments, please provide them below.

_____
_____
_____
_____
_____
_____

APPENDIX II

STATISTICAL DATA

FROM THE LOGISTIC REGRESSIONS

In this appendix the output of the regression runs is provided with explanation of the statistics.

Landlord regression:

Choice of contract variable Q10 dependent.

LOGISTIC REGRESSION Q10 WITH CROP CONT Q42 DEC Q40 Q8 ORA Q43 Q36 Q37 EXP LAN Q9.

Number of selected cases:	97
Number rejected because of missing data:	22
Number of cases included in the analysis:	75

Dependent Variable.. Q10
Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 94.030419

* Constant is included in the model.

Two goodness of fit tests are performed on the regression model. The first compares the goodness of fit to a model using only a constant in the regression (a perfect model). The second then examines the goodness of fit with all the variables.

Log likelihood (versus perfect model)

To test the null hypothesis that the observed likelihood does not differ from 1 (the value of the likelihood for a model that fits perfectly), we use the value of -2 log likelihood (-2LL). Under the null hypothesis that the model fits perfectly, -2LL has a chi-square distribution with N - p degrees of freedom, where N is the number of cases and p is the number of parameters estimated. Since there are 75 observations and 13 parameters estimated, the degrees of freedom are 62. Consulting the chi-square table the value -2LL of 94.03 and 62 degrees of freedom corresponds to a

significance level off the charts or greater than the .01 level of significance. Since the observed significance level is large, we do not reject the hypothesis that the model fits.

Variable(s) Entered on Step Number

1..	CROP	type of crop grown
	CONT	number of contract or parcels of land
	Q42	degree of interaction socially
	DEC	participation in decision making
	Q40	self risk evaluation
	Q8	relationship to other party in the lease
	ORA	formality of the agreement
	Q43	evaluation of fairness
	Q36	other parties demonstrated care for assets
	Q37	continuation of the lease
	EXP	years of experience
	LAN	years of experience on this land
	Q9	condition of the farm at beginning of lease

Estimation terminated at iteration number 6 because
Log Likelihood decreased by less than .01 percent.

Goodness of fit with all variables

A second test of goodness of fit of the model examines the improvement as variables are added to the regression. The high significance values for lines one and four further substantiate the findings of the first test above. In line two a comparison is made between the model with only the constant (-2LL value 94.03 above) and the complete model (48.72 in line 1). The difference is called the model chi-square (45.31). The degrees of freedom is also the difference between the values for the two models. The low significance value means that we reject the hypothesis that the coefficients for the variables are all equal to 0.

	Chi-Square	df	Significance
-2 Log Likelihood	48.720	61	.8718
Model Chi-Square	45.310	13	.0000
Improvement	45.310	13	.0000
Goodness of Fit	42.588	61	.9649

Classification Table for Q10

		Predicted share s	Predicted cash c	Percent Correct
Observed				
share	s	15	9	62.50%
cash	c	7	44	86.27%
			Overall	78.67%

---------- Variables in the Equation----------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
CROP	-1.4453	.8620	2.8113	1	.0936	-.0929	.2357
CONT	.4879	1.0256	.2263	1	.6343	.0000	1.6289
Q42	2.3125	.9971	5.3786	1	.0204	.1896	10.0992
DEC	1.5514	.9302	2.7814	1	.0954	.0912	4.7180
Q40	-1.7011	.9178	3.4352	1	.0638	-.1235	.1825
Q8	2.8485	1.3744	4.2953	1	.0382	.1562	17.2620
ORA	.0737	1.3982	.0028	1	.9580	.0000	1.0764
Q43	2.2290	1.2179	3.3500	1	.0672	.1198	9.2909
Q36	.2136	.7714	.0767	1	.7819	.0000	1.2381
Q37	1.8838	1.7017	1.2255	1	.2683	.0000	6.5782
EXP	-1.5220	2.0253	.5648	1	.4523	.0000	.2183
LAN	4.0931	2.4676	2.7514	1	.0972	.0894	59.9245
Q9	-1.7160	.8222	4.3554	1	.0369	-.1583	.1798
Constant	-2.0079	3.1300	.4115	1	.5212		

LOGISTIC REGRESSION Q10 WITH CROP CONT Q42 DEC Q40 KNO HEL Q38 ORA Q43 Q37.

Dependent Variable.. Q10 type of lease chosen

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 119.19557

* Constant is included in the model.

Again we fail to reject the hypothesis that the model is significantly different from the perfect model.

Variable(s) Entered on Step Number

1..	CROP	type of crop grown
	CONT	number of contracts or parcels of land
	Q42	degree of interaction socially
	DEC	participation in decision making
	Q40	self risk evaluation
	KNO	tenant perception of landlord's knowledge
	HEL	tenant perception of ll willingness to help
	Q38	current relationship
	ORA	formality of the agreement
	Q43	evaluation of fairness
	Q37	continuation of the lease

Estimation terminated at iteration number 5 because
Log Likelihood decreased by less than .01 percent.

	Chi-Square	df	Significance

-2 Log Likelihood	70.835	106	.9966
Model Chi-Square	48.361	11	.0000
Improvement	48.361	11	.0000
Goodness of Fit	91.993	106	.8319

Testing and outcome are consistent with the landlord equation above.

Classification Table for Q10

		Predicted share s	Predicted cash c	Percent Correct
Observed				
share	s	13	11	54.17%
cash	c	8	86	91.49%
			Overall	83.90%

---------- Variables in the Equation ----------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
CROP	.8238	.5539	2.2123	1	.1369	.0422	2.2792
CONT	-.2712	.1658	2.6767	1	.1018	-.0753	.7624
Q42	.0219	.7680	.0008	1	.9772	.0000	1.0222
DEC	1.7024	.7665	4.9330	1	.0263	.1569	5.4872
Q40	-.1388	.7160	.0376	1	.8462	.0000	.8704
KNO	1.9115	1.0049	3.6185	1	.0571	.1165	6.7635
HEL	2.0443	.7620	7.1976	1	.0073	.2088	7.7235
Q38	1.4897	1.1012	1.8301	1	.1761	.0000	4.4356
ORA	1.9208	1.0159	3.5749	1	.0587	.1149	6.8262
Q43	1.0622	.8606	1.5235	1	.2171	.0000	2.8928
Q37	3.5294	1.2645	7.7904	1	.0053	.2204	34.1050
Constant	-11.0547	3.0799	12.8828	1	.0003		

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