

Sharecropping Contracts in Rural India: A Note

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Abstract

In this paper we examine the terms of sharecropping contracts using data from rural India. We examine the effect of - (1) the sharing of input costs between landlord and tenant; (2) the existence of outside employment opportunities for the tenant; and (3) the tenant's capacity to borrow - on the share parameter. We regress the share paid by the household on a set of cultivating household and village level characteristics and find that cost sharing and the existence of outside employment opportunities significantly affect the share parameter.

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1. Introduction

Sharecropping is a commonly observed land tenure contract where a tenant cultivates the land for the landlord and the output that is produced is shared on some pre-determined basis. The output share ranges variously from 25% to 50% for the landlord. Sharecropping has long been the subject of much controversy because it is considered to be an inefficient form of cultivation. The argument is as follows: since the tenant gets only a part of the output he produces he has less of an incentive to provide effort and other material inputs into the production process. Sharecropping in this sense is analogous to a distortionary tax. Sharecropping has often been referred to as a “deplorable method of cultivation, the daughter of necessity and the mother of misery” (Marquis de Mirabeau, as quoted in Basu, 1984). One common conjecture is that sharecropping allows the landlord and the tenant to share the production risk. This is especially true in third world countries where agriculture is still dependent to a large extent on the vagaries of nature. It was believed that over time, with increasing modernization of agriculture and the introduction of new technologies and the simultaneous reduction in the inherent risk through such means as crop insurance and greater availability of credit, sharecropping will become obsolete. However sharecropping continues to thrive as a prominent form of tenancy contract not only in third world countries but in developed nations as well. Sharecropping, for instance, is widely observed in the US mid-west. See Allen and Lueck (1992) for a discussion. There has been a large amount of literature which tries to explain the rationale behind sharecropping contracts. See Eswaran and Kotwal (1985), Newbery (1977) Stiglitz (1974) among others. The explanations range from the risk sharing properties of sharecropping to the existence of moral hazard and/or adverse selection. The fact remains that sharecropping shows no sign of becoming

extinct. It is important then to gain an understanding of the dynamics of sharecropping contracts and the factors which have an impact on the terms of those contracts in the interests of policy formulation.

In this note we focus on the share parameter and factors which impact upon it. Contrary to popular belief that the share is always fifty-fifty, the share parameter, as we have already noted, varies quite widely from 25% to 50% for the landlord. The tenant very seldom gets less than 50% of the output. We examine the effect of the following three factors on the share parameter: (1) sharing of input costs between landlord and tenant; (2) existence of outside employment opportunities for the tenant; and (3) borrowing constraints faced by the cultivating household. Given the preponderance of sharecropping contracts in India as well as the rest of South-East Asia, the answers to these questions have important policy implications.

We regress the actual share paid on a set of cultivating household and village level characteristics and find that cost sharing and the existence of outside employment opportunities significantly affect the same. See Laffont and Matoussi (1995) for a similar but not identical exercise using data from Tunisia.

The empirical work in this paper uses data from the survey conducted by the International Crop Research Institute for the Semi Arid Tropics (ICRISAT) for a set of farm households in the three villages Aurepalle (in the state of Andhra Pradesh) and Kanzara and Shirapur (in the state of Maharashtra) in India. While the survey was conducted over the period 1975-1984, labor market data is available only for the period 1979-1984. Hence, we use data for that period in our empirical analysis. The data is a stratified sample of 40 randomly chosen households in each village; 10 in each of four categories – (1) large farmers, owning more than 13 acres; (2) medium farmers, owning between 5 and 13 acres; (3) small farmers, owning less than 5 acres and finally

(4) landless laborers, owning less than 0.5 acres. The richness of the data from these surveys, both in terms of the breadth of information conveyed and the level of detail pertaining to each aspect of household decision-making, is amply illustrated by the numerous studies that have been conducted by researchers around the world, using this data set. See Shaban (1987), Hanchate (1996), Maitra (1996) among others.

The three villages of Aurapalle, Kanzara and Shirapur are situated in south-central India and are predominantly agricultural with more than 94% of the population (942 households) dependent on agriculture as the main source of income (either as cultivators or farm laborers). Even by Indian standards, the villages are poor with a monthly per capita income of Rs. 700 (averaged over the survey period in 1977 prices) compared to the all-India average per capita income of Rs. 1080 using the same base year.

We have data for 375 plots in Aurapalle, 256 in Shirapur and 604 in Kanzara giving us data for a total of 1235 plots. Table 1 presents the distribution of ownership status across the three villages. As is clear from Table 1 owner cultivation and sharecropping are the two predominant contractual forms. One can refer to Walker & Ryan for a detailed account of the ICRIAT villages, and Singh, Binswanger & Jodha (1985) for more details of the survey.

The rest of the paper is organized as follows. In Section 2 we present some theoretical conjectures. In Section 3 we estimate the model and present the results. Section 4 contains some concluding remarks.

2. Terms of the Share Contract

Let production on a plot of land be denoted by

$$y = f(e, x) + \varepsilon$$

where, y is the output, e the level of effort exerted and x is the amount of other material inputs. ε is a zero mean random variable (to include production shocks and measurement error). We make the standard assumptions about the production function – that it is increasing and concave in both effort and other material inputs. We also assume that the two inputs are complementary. Land is owned by a principal (the landlord) and is leased to the agent (the tenant) to organize production. A general contract is defined by three parameters (β, α, γ) , where β is the share of the output retained by the tenant, α is the fixed payment made by the tenant to the landlord and γ is the share of the cost of material inputs paid by the tenant. We focus on linear contracts. Let $\alpha + (1 - \beta)f(e, x) - (1 - \gamma)x$ denote the income of the landlord such that

- A pure rental contract is characterized by $\beta = 1, \alpha > 0, \gamma = 1$; under a pure rental contract the tenant becomes the residual claimant and bears the entire production risk
- A pure wage contract is associated with $\beta = 0, \alpha < 0, \gamma = 0$; in this case the landlord is the residual claimant
- A sharecropping contract is associated with $\beta \in (0, 1), \alpha \geq 0, \gamma \in (0, 1)$.

All the contracts that we observe are linear and have the above form.

2.1 Cost Sharing

Although no systematic data is available on the extent and nature of cost sharing arrangements, a large number of independent studies from different parts of South Asia have concluded that cost sharing is not uncommon. Further given the increased use of modern, capital intensive production techniques, cost sharing appears to be on the rise. See Singh (1989) for a comprehensive summary of the empirical literature. However, when the tenants' effort is not observable, cost sharing by the landlord leads to an even greater moral hazard problem, since

output is directly proportional to the level of effort exerted. One would therefore expect the landlord's share of the output to be greater in the event that there is sharing of material input costs. The reason for looking at the extent of cost sharing needs some context. In 1977 the Left Front came to power in the state of West Bengal in India and, as part of an omnibus agricultural reform program called *Operation Barga*, legislated that the landlord can at most take 25% of the output if he did not share in costs and could ask for 50% if he shared 50% of the costs. A number of observers believe that Operation Barga accounts for the continued popularity of the Left Front in rural areas of West Bengal. For an excellent discussion of Operation Barga see Banerjee & Ghatak (1996). No such legislation exists in the states of Maharashtra or Andhra Pradesh where our data set comes from. Our findings seem to suggest that the output share does depend on the share of inputs even in the absence of legislation.

2.2 Resource Constraint

Next we turn to the situation where the tenant is resource constrained. By this we mean that because of imperfections in the credit market, the amount of working capital R available to the tenant is limited. Issues of availability of rural credit have received much attention among both academicians and policy makers. Under a tenancy contract the tenant has to bear some or all of the production risk. The tenant has to pay for his share of inputs and the fixed rental payment in the case of a rental contract, and in the event of an adverse harvest the tenant can make these payments through borrowing. So the tenant's ability to incur these out of pocket expenses as well as to make payments to the landlord will obviously be affected by his ability to borrow. In a separate paper (see Chaudhuri and Maitra, 1997) we show that an increasing ability to borrow increases the probability of getting a tenancy contract.

A greater ability to borrow provides the tenant more flexibility in contract negotiations by affording him more choices - for instance a higher borrowing ability may make risk sharing less important. So borrowing ability works to enhance the tenant's bargaining power vis-a-vis the landlord and may lead to improved terms. So we expect to see households with greater borrowing ability to get a higher output share.

2.3 Outside Employment Opportunity

Finally we turn to the question of availability of outside employment. Let us assume that the tenant always has the ability of obtaining outside employment. We can think of such outside employment possibilities as employment guarantee schemes run by federal or state governments, like the Employment Guarantee Scheme in the state of Maharashtra (see Maitra (1996)).

We assume that there is an elastic demand for labor in the government sector, so that whoever wishes to work in that sector can do so. The immediate impact of this possibility is to raise the reservation utility of the tenant i.e. the landlord must now assure the tenant a higher reservation wage, because otherwise the tenant can choose to go and work for the government sector. The presence of an outside employment opportunity offers a bargaining tool for the agents and the tenant's share of the output is greater in the presence of such outside employment opportunities. So we expect that villages in which there exist such outside employment opportunities the tenant should get a higher share of the output.

3. Estimation and Results

The data set for this study comes from the International Crops Research Institute for Semi Arid Tropics (ICRISAT) and was collected as part of ICRISAT's longitudinal Village Level Surveys in the semi arid tropics of India. Even though the survey was conducted over a period of 10 years from 1975 - 1984, we have complete labor market participation data for three villages

Aurepalle, Shirapur and Kanzara between the years of 1979 and 1984. Accordingly this is the data that we use.

We examine what the determinants of the actual share paid by the household are. Define β_{ht} as the share of the household h in year t . Since we do not have data on share paid on output in each plot we cannot test how various plot characteristics affect the share. What we do have is payment in cash or kind made by the household on account of share payments. We aggregate these payments and obtain it as a fraction of total output produced by the household. This is defined as the share of output paid by the household to the landlord.¹ We consider a vector of household (HH) and village (VILL) characteristics and examine how the actual share is affected by these variables. So we have the following regression specification

$$\beta_{ht} = \alpha_0 + \alpha_1 HH_{ht} + \alpha_2 VILL_t + e_{ht}$$

The vector of household characteristics include age, experience² and sex of the household head (AGE, AGE² and SEX, respectively), total number of males (TOTMAL) and females (TOTFEM) in the household, disability status of adult members (DISABIL), outstanding debt at the beginning of the cropping year of the household from all sources (CRED) and dummies as to whether adult males and females participate in the daily wage labor market (MWORKD and FWORKD, respectively), where, MWORKD = 1, if the male members participate in the daily wage labor market; and 0, otherwise; and FWORKD = 1, if the female members participate in the daily wage labor market, and 0, otherwise. Borrowing capacity for a household is an ex-ante figure and cannot be truly measured. Instead, we interpret the actual level of borrowing to be a measure of the capacity to borrow. There is evidence that the outstanding debt of the household

¹ See Singh, Binswanger & Jodha (1985).

is directly proportional to the size of land holdings (see Hanchate (1996) and Morduch (1990) who argue that the actual outstanding debt can be regarded as a proxy for the borrowing constraint of the household). Finally household characteristics also include the percentage of cultivated area under share tenancy (SHAREA) and a dummy as to whether there is cost sharing between the tenant and the landlord. For this purpose we define $SHOWNER = 1$, if the landlord shares in the cost of inputs and is equal to 0, otherwise.

Village level characteristics include a measure of aggregate village level risk and access to outside employment source. Aggregate village level risk is measured by the standard deviations of rainfall in Quarters 2 (SD2) and 3 (SD3) of the calendar year.³ Adverse rainfall in Quarter 2 affects agricultural production in the pre-harvest stage and adverse rainfall in Quarter 3 affects agricultural production during harvest. However, since contracts are determined prior to the planting season, we consider lagged rainfall effects, i.e., we consider standard deviations of rainfall in quarters 2 and 3 of the calendar year lagged by one (LSD2 and LSD3) and two years (L2SD2 and L2SD3). This allows us to test the risk sharing nature of share contracts.

Over the survey period the two villages in Maharashtra (Shirapur and Kanzara) had access to the Maharashtra government's Employment Guarantee Scheme (EGS). Aurepalle (in the state of Andhra Pradesh) had no such program. DVILL is a dummy, such that $DVILL = 1$, if the village is in Maharashtra, 0, otherwise. So $DVILL = 1$, implies that there exists a guaranteed outside employment opportunity. Table 2 provides a description of the dummy variables.

² Since it is difficult to obtain a measure for experience of the household head, we use square of the age of the household head as a proxy. This is a common proxy in both the Development and the Labor literature. See Mincer (1970) for a discussion.

³ Adverse rainfall in Quarter 2 affects agricultural production in the pre-harvest stage and adverse rainfall in Quarter 3 affects production during harvest.

The estimation results are presented in Table 3. Among household characteristics age of the household head (AGE), experience of the household head (AGE²), total number of males in the household (TOTMAL), total number of females in the household (TOTFEM), disability status of the adult members of the household (DISABIL), % of cultivated area under share tenancy (SHAREA) and whether there is cost sharing between the landlord and the tenant (SHOWNER) significantly affect the actual share (β). In particular notice that SHOWNER is negative and significant, indicating that the share of the household goes down if there is cost sharing between the tenant and the landlord. Note, if the landlord shares in the cost, the tenant's share of the cost decreases. So the actual share of the household decreases if there is cost sharing by the landlord which validates the argument in Proposition 1. However the borrowing capacity of the household (CRED) does not affect the share parameter.

When we look at village level characteristics, measures of aggregate risk (LSD2, L2SD2, L3SD3) are significant, and so is the location dummy for the village (DVILL, indicating the presence of outside employment opportunity). Note that DVILL is positive and significant, implying that if the household has access to outside employment opportunity, then its share increases. This validates our conjecture that the tenant's share increases with the availability of outside employment. The presence of the EGS provides the tenant with a powerful bargaining tool which results in his getting a higher share of the output.

4. Conclusion

We wish to conclude by focusing on two of our findings. The first is that the existence of a government sponsored employment guarantee scheme in the village, besides its primary impact on welfare through employment generation, ensures the tenant a higher share of the output. The second is that the landlord takes a higher output share only if he shares in the cost of inputs. We

have provided the context to this finding previously in discussion Operation Barga. The fact that the output share varies with cost share also goes to show that agricultural production is organized more efficiently than is commonly presupposed. Market forces play a greater role in rural transactions than we often believe.

Table 1
Distribution of Ownership Status

Ownership	Aurapalle	Shirapur	Kanzara
Owner-operated	344	165	516
Fixed-rent	13	0	10
Sharecropping	18	91	78
Total under tenancy	31	91	88
Total	375	256	604

Table 2:
Definition of Dummies Used

DISABIL = 1	if any adult member of the family is unable to work
SEX = 1	if household head is a female
MWORKD = 1	if an adult male member of the family worked in the village labor market in the year
FWORKD = 1	if adult female member of the family worked in the village labor market in the year
SHOWNER = 1	if the landlord provided inputs
DVILL = 1	if the village is in Maharashtra

Table 3:
What Determines the Actual Share β

<u>Variable</u>	<u>Coefficient</u>	<u>Standard Error</u>
Constant	1.14*	0.18
<i>Household Characteristics</i>		
AGE	-0.16E-01*	0.49E-02
AGE ²	0.28E-03*	0.85E-04
TOTMAL	-0.86E-01*	0.30E-01
TOTFEM	0.51E-01	0.32E-01
DISABIL	-0.16*	0.78E-01
SEX	0.43E-01	0.10
SHAREA	-0.14	0.90E-01
CRED	0.23E-05	0.50E-05
MWORKD	-0.30*	0.13
FWORKD	0.11	0.12
SHOWNER	-0.31*	0.76E-01
<i>Village Characterisitcs</i>		
DVILL	0.25*	0.98E-01
LSD2	-0.35E-01*	0.71E-02
LSD3	0.59E-02	0.65E-02
L2SD2	0.17E-01*	0.28E-02
L2SD3	0.22E-01*	0.55E-02

Results from OLS Estimation

*: H_0 significant at 95%

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