



# A theory of sharecropping: The role of price behavior and imperfect competition<sup>☆</sup>

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## ABSTRACT

This paper proposes a theory of sharecropping on the basis of price behavior in agriculture and imperfectly competitive nature of rural product markets. First we show the superiority of sharecropping over fixed rental contracts in a benchmark landlord–tenant model with seasonal variation of price, where the tenant receives a low price for his output while the landlord can sell his output at a higher price. Then we consider more general interlinked contracts to show that there are multiple optimal contracts. Finally we incorporate imperfect competition in the product market by assuming that a third agent (called the  $\varepsilon$ -agent) may emerge to compete with the landlord as a buyer of the tenant's output. It is shown that (i) the presence of this competing agent generates a Pareto-improving subset of share contracts out of the multiple contracts and (ii) the unique contract that is robust to the emergence of the  $\varepsilon$ -agent results in sharecropping.

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## 1. Introduction

Over the years, sharecropping has remained a widely prevalent, and perhaps the most controversial, tenurial system in agriculture. While writings on this institution can be traced back earlier, modern economic theories of sharecropping are centered around its criticism of Alfred Marshall (1920). The essence of the Marshallian critique is that sharecropping is an inefficient system. Under a share contract, the tenant–cultivator pays the landlord a stipulated proportion of the output. This leads to suboptimal application of inputs: even though there is gain in surplus from employing additional inputs, it does not pay the tenant to do so since he keeps only a fraction of the marginal product. By contrast, the tenant has the incentive to maximize the surplus under a fixed rental contract where he keeps the entire output and pays only a fixed rent to the landlord. The landlord, who usually has the bargaining power, can then extract the entire additional surplus by appropriately

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determining the rent. Thus, apart from being inefficient, sharecropping is also apparently suboptimal for the landlord. The wide prevalence of this institution has therefore remained a puzzle and several theories have been put forward to explain its existence. In particular, it has been argued that sharecropping can be explained by the trade-off between risk sharing and incentive provision (Stiglitz, 1974; Newbery, 1977; Newbery and Stiglitz, 1979), informational asymmetry (Hallagan, 1978; Allen, 1982; Muthoo, 1998), moral hazard (Reid, 1976; Eswaran and Kotwal, 1985; Ghatak and Pandey, 2000) or limited liability (Shetty, 1988; Basu, 1992; Sengupta, 1997; Ray and Singh, 2001).<sup>1</sup> Empirical work on share contracts includes Rao (1971), Bell (1977), Shaban (1987), Allen and Lueck (1992) and Laffont and Matoussi (1995), where the support for the risk sharing theory is inconclusive and factors such as capital constraints and transaction costs are found to play an important role in contract choices. By contrast, in a recent contribution Ackerberg and Botticini (2002) find strong evidence of risk sharing in the historical data of early Renaissance Tuscany. Their empirical test is based on a novel approach of constructing a ‘matching equation’ that takes into consideration endogenous matchings of landlords and tenants as functions of their characteristics.

This paper is motivated by an aspect of agriculture that has not received much attention in the theoretical literature of sharecropping. Given that the core of the contention here is sharing of the produce between the contracting parties, a natural question is: does the price behavior in agriculture influence the resulting tenancy contracts? This question is usually sidestepped in the existing literature as it is always implicitly assumed that price is competitively determined in agriculture and the contracting parties take the same price as given. While price in agriculture is often regarded to be competitive, it is also well-known that it does exhibit variation—seasonal, spatial or both. The seasonal variation has a broad pattern: the price is the lowest right after the harvest, then it rises and finally reaches its peak just before the next harvest. In less-developed agrarian economies, a landlord can take advantage of price variations by ‘hoarding’ (i.e., storing the output for a few months and sell it when the price is high) or transporting the produce to a location that offers a better price (e.g., from the village to the town market). A tenant–farmer, on the other hand, has to sell the output at low price immediately after the harvest due to various reasons such as not having enough buffer wealth to pay for essential commodities for immediate consumption, urgency for clearing his debts or the lack of necessary storage and transportation facilities. Generally speaking, one can say that a landlord has better access to the market and as a result the price that he receives for the produce is higher than the price received by the tenant. We argue that that this innate difference of the two parties can explain sharecropping even in the absence of factors such as risk aversion or informational asymmetry. The underlying intuition is simple. A fixed rental contract leaves the entire output with the tenant. Since the tenant receives a low price for the output, the revenue and consequently the rent to the landlord is low. The landlord may prefer a share contract because it enables him to take advantage of price variation by allowing him to keep a proportion of the output.

We formalize this intuition in a landlord–tenant model with seasonal variation of price, where the tenant receives a low price for his output while the landlord can sell his output at a higher price, and show the superiority of sharecropping over fixed rental contracts. We subsequently consider more general contracts where the landlord specifies the shares for both parties, a rental transfer and a price at which he offers to buy the tenant’s share of output. These are interlinked contracts that enable the landlord to interact with the tenant in two markets: land (through share and rent) and product (through his offer of price).<sup>2</sup> We show that the landlord has multiple optimal interlinked contracts. The intuition behind the multiplicity is simple. The tenant’s incentive is determined by (i) his share and (ii) the price he receives for his share, so the optimal level of incentive can be sustained by multiple combinations of these two variables. To resolve this multiplicity, we appeal to the nature of the rural product markets and propose an equilibrium refinement that takes into consideration the fact that although the landlord has monopoly power over the land he owns, this is not necessarily the case in the product market, where he could face competition from other entities (e.g., traders, intermediaries) who might be interested in trading with the tenant. In fact, a rural product market closely resembles what one might call a situation of *imperfect competition*, along the lines suggested by Stiglitz (1989: 25):

“There is competition; inequality of wealth itself does not imply that landlords can exercise their power unbridled. On the other hand, markets in which there are a large number of participants...need not be highly competitive...transaction costs and, in particular, information costs imply that some markets are far better described by models of imperfect competition than perfect competition.”

The refinement criterion we propose incorporates imperfect competition as follows. Suppose there is a small but positive probability that a third agent emerges in the end of production to compete with the landlord as a potential buyer for the tenant’s share of output. Then the question is, out of the multiple contracts obtained before, which ones will the landlord choose when he anticipates such a possibility? We show that the unique contract that is robust to this refinement criterion is a sharecropping contract. To see the intuition, observe that incentive provision to the tenant demands that a relatively high

<sup>1</sup> See also Johnson (1950), Cheung (1969), Bardhan and Srinivasan (1971), Binswanger and Rosenzweig (1984), Bardhan (1989), Hayami and Otsuka (1993) and recent papers of Ray (1999) and Roy and Serfes (2001). The literature of sharecropping is enormous and we do not attempt to summarize it here. We refer to Singh (1989) for a comprehensive survey.

<sup>2</sup> The theoretical literature on interlinkage has mainly focused on credit contracts, considering (i) land-credit linkage (e.g., Bhaduri, 1973; Braverman and Stiglitz, 1982; Mitra, 1983; Basu, 1983; Bardhan, 1984; Gangopadhyay and Sengupta, 1986; Ray and Sengupta, 1989; Banerji, 1995; Basu et al., 2000) and (ii) product-credit linkage (e.g., Bardhan and Singh, 1987; Gangopadhyay and Sengupta, 1987; Bell and Srinivasan, 1989). See also Chapter 14 of Basu (1998) and Chapter 9 of Bardhan and Udry (1999).

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