Sharecropping in History and Theory

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Sharecropping, in which a tenant applies his labor to another's land in return for a share of the crop, has persisted as a major organizational form in agriculture. But why it has persisted and what its persistence implies for agricultural efficiency is yet undecided. Adam Smith believed that share tenants would work hard, but would slight "improvement of the land . . . because the [land] lord, who laid out nothing, was to get one-half of whatever it produced."[1] Alfred Marshall went beyond Smith and reasoned that the share-tenant would stint his daily labor as well: "For, when the cultivator has to give his landlord half of the returns to each dose of capital and labor that he applies to the land, it will not be to his interest to apply any doses the total return to which is less than twice enough to reward him."[2] Marshall's geometric proof of his conclusion carried the day, and most subsequent writers concurred in his condemnation of sharecropping as wasteful.[3] In particular, historians of the postbellum South concurred: because of its inherent inefficiencies or because of its entwinement with an insidious crop lien system, "the result of this tenant system is poor agriculture, exhausted soils, small crops, poor roads, decaying bridges, unpainted homes, and unkept

1 *The Wealth of Nations* (New York: Modern Library, 1937), 367.

2 *Principles of Economics,* 8th ed. (London: Macmillan, 1964), 535–36.

3 Ibid., 536, note 1. See Dale W. Adams and Norman Rask, "Economics of Cost-Share Leases in Less Developed Countries," *American Journal of Agricultural Economics* 50 (November 1968): 935–42; P. K. Bardhan and T. N. Srinivasan, "Cropsharing Tenancy in Agriculture: A Theoretical and Empirical Analysis," *American Economic Review* 61 (March 1971): 48–64; J. Bhagwati, *The Economics of Underdeveloped Countries* (New York: McGraw-Hill, 1966), 152–57; T. W. Schultz, *Transforming Traditional Agriculture* (New Haven: Yale University Press, 1965), 167–68; and references cited in Steven N. S. Cheung, *The Theory of Share Tenancy* (Chicago and London: University of Chicago Press, 1969), chap. 3.

yards."[4] The facts of sharecropping, however, did not support Marshall's conclusion: landowners' returns from sharecropped land were somewhat higher, not lower, than their returns from rented land; the ratio of labor to land and the average yield were at least as high on sharecropped land; and the ratio of labor to land fell, rather than rose, as the tenants' share rate increased.[5]

Not only are the consequences of sharecropping now clearer, but so are the conditions of sharecropped production. Share contracts from China, for example, reveal that share-tenants and landlords agreed upon the intensity of labor's input and the crops to be grown, as well as the amount of land to be sharecropped and the share rate (or rates on different crops).[6] Share contracts in the postbellum South and in Iowa likewise stipulated: (1) the amount of land to be sharecropped, (2) the share for each crop, (3) the land for allowed crops, including the requirements that the tenant plant all of the land and appropriately cultivate and harvest the crops, (4) tenant and landlord payment shares for and maintenance duties with respect to cooperating inputs (such as implements, work animals, and fertilizers), (5) responsibilities for land improvements (primarily duties relating to the maintenance and improvement of fences, hedges, irrigation ditches, fertility, and barns), and (6) penalties for noncompliance.[7] The specific terms of Southern and Chinese contracts (share rates, landlord and tenant obligations, and so forth) varied with time, location, and tenant. Contracts usually ran for a year, but they were generally renewed.[8]

[4] John L. Coulter, "The Rural Life Problem of the South," *South Atlantic Quarterly* 12 (1913): 63, quoted in C. Vann Woodward, *Origins of the New South: 1877–1913* (Baton Rouge: Louisiana State University Press, 1970), 408.

[5] See Cheung, *Theory of Share Tenancy*, 55–61; D. Gale Johnson, "Resource Allocation Under Share Contracts," *Journal of Political Economy* 58 (April 1950): 111–23; C. H. H. Rao, "Uncertainty, Entrepreneurship, and Sharecropping in India," ibid. 79 (May/June 1971): 578–95; Roger L. Ransom and Richard Sutch, "The Ex-Slave in the Post-Bellum South: A Study of the Economic Impact of Racism in a Market Environment," *Journal of Economic History* 33 (March 1973): 131–48; and Donald L. Winters, "Tenant Farming in Iowa, 1860–1900: A Study of the Terms of Rental Leases," *Agricultural History* 48 (January 1974): 130–50.

[6] Cheung, *Theory of Share Tenancy*, 75–79.

[7] Joseph D. Reid, Jr., "Sharecropping as an Understandable Market Response: The Post-Bellum South," *Journal of Economic History* 33 (March 1973): 106–30; Winters, "Tenant Farming in Iowa," 134–45. See my "Ante-Bellum Southern Rental Leases," *Explorations in Economic History* (forthcoming) for evidence that antebellum share contracts were similarly detailed.

[8] Cheung, *Theory of Share Tenancy*, 77–83; Reid, "Sharecropping as an Understandable Market Response"; Winters, "Tenant Farming in Iowa," 135, says Iowa share terms "did not, however, reveal regional variations or temporal changes." Winters is silent on the renewal rate of Iowa share leases. Although Marshall analyzed sharecropping under fixed, immutable tenure, he recognized that his assumption was

Southern landowners closely monitored their tenants' work over the year and many share contracts provided for binding arbitration so that disputes could be quickly settled.[9] Since some Iowa landowners insisted that they be able " 'to enter upon said lands at all reasonable hours for the purpose of examining the same and the manner in which said farm is being tended,' " it seems likely that they also closely monitored their tenants' work.[10] Chinese landlords monitored their share tenants' work at harvest time, and used the courts and arbitration to secure fulfillment.[11] Everywhere, it seems, sharecropping landlords took active steps to guard their lands' fertility (their future income), as well as to secure the agreed upon intensity of effort from their tenants (their current income).

Such contracts are costly. But wage and rental contracts are also costly to negotiate and enforce. To profitably hire help, a landowner must determine appropriate wages and insure that the promised labor is adequately and appropriately delivered. Typical wage contracts in the postbellum South, for example, required each laborer's attendance to an overseer (often the landowner), as well as specifying in detail daily tasks and a payment schedule tied to each worker's satisfaction of his contractual obligations.[12] To profitably rent, a tenant must determine the quality of the land, while his landlord must guard the land from misuse. Rental contracts in China and America, consequently, resembled their sharecropping counterparts in their close specification of land use and of maintenance duties: contracts often specified the number, type, and location of crops; farming practices; instructions regarding the maintenance or improvement of drainage, fences, and buildings; the amounts and uses of manure and fertilizers; and prohibitions against the grazing of stock in clover or fallow.[13] To insure that renters honored their agreements, as well as paid their rents, landlords often supervised

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too extreme: "But even in the most stationary districts the amount and quality of the stock which custom requires the landlord to provide are being constantly . . . modified to suit the changing relations of demand and supply" (*Principles of Economics*, 536).

[9] Reid, "Sharecropping as an Understandable Market Response."

[10] A Jasper County, Iowa share contract, quoted in Winters, "Tenant Farming in Iowa," 144.

[11] Cheung, *Theory of Share Tenancy*, 77–83. That American landlords monitored their tenants more closely than Chinese landlords did may reflect, in part, their lesser ability to rely on the threat of a bad reputation or on the courts for protection from unsatisfactory tenants: tenants in the unsettled postbellum South and the Iowa frontier probably had fewer attachable assets and greater geographical mobility than did tenants in China.

[12] Reid, "Sharecropping as an Understandable Market Response," esp. 107–9.

[13] Ibid., 114–20; Cheung, *Theory of Share Tenancy*; Winters, "Tenant Farming in Iowa"; Rosser H. Taylor, "Post-Bellum Southern Rental Contracts," *Agricultural History* 17 (April 1943): 121–28.

their work as well. David Harris was a postbellum Southern landlord who, like many others, farmed some of his land with hired help, rented some, and sharecropped some. His diary records him watching and admonishing all of his tenants—guarding his land and past efforts, while sincerely trying to help everyone do better.[14] Indeed, the principal contrast between renting and sharecropping, besides the nature of the landowners' payments, was the closer cooperation expected and evidenced between sharecropping landowners and tenants.[15]

Historically, then, the conditions of sharecropped production were: (1) it coexisted with rental and owner cultivation; (2) landowners and laborers chose among alternative tenures; (3) contracts were common in all tenures; (4) landowners took active steps (monitoring, fines or bonuses, and arbitration) to insure that contracts were fulfilled, so that all contracts were costly to negotiate and enforce; (5) the terms of all contracts varied over time; (6) as did the prevalence of tenures. These conditions, along with the approximate equality of outcomes under all tenures, suggest that sharecropping generally occurred within a competitive market where each landowner and laborer chose among tenures so as to maximize his welfare. These actual conditions significantly differ from those assumed by Marshall. Marshall assumed that the share tenant unilaterally determined the nature and rate of his labor.[16] But, as we have seen, the tenant and landowner jointly agreed to the tenant's duties.

A model of agricultural production that faithfully represents the facts is not hard to construct.[17] Its basic behavioral assumptions are economists' standard assumptions about a competitive market: everyone strives to maximize his welfare; everyone may freely enter agreements with others for joint efforts (such as share, rental, or wage agreements); and all agreements are fulfilled at the same cost. We have shown the accuracy of the first two assumptions above. Only the last assumption, then, is questionable, for the evidence that all agricultural contracts are costly to negotiate and enforce does not imply that all are equally costly. Accept this assumption for the time being, however. In addition, for the moment ignore the uncertainty of agricultural outcomes and also assume

[14] David Golightly Harris Books (M–982) in the Southern Historical Collection at the University of North Carolina Library, Chapel Hill, North Carolina. Summarized in Reid, 'Sharecropping as an Understandable Market Response," 114–15. Not only did landowners often simultaneously rent, sharecrop, and hire help; tenants often progressed through a variety of tenures, and sometimes simultaneously worked under different tenures (Reid, "Sharecropping," 114–18; Winters, "Tenant Farming in Iowa," 138–41).

[15] Reid, "Sharecropping as an Understandable Market Response," 119–20; Winters, "Tenant Farming in Iowa," 141–42.

[16] *Principles of Economics*, 534–36.

[17] The fundamentals of this market equilibrium model of tenancy are presented in the mathematical appendix.

that only land and labor combine for agricultural output. Then each landowner's ability to rent his land, rather than sharecrop it, implies that no landowner will accept a crop share which is less than the market rent. At the same time, a landowner's ability to farm his land with hired help implies that no landowner will rent if he can get a greater return from self-cultivation. On the other hand, each tenant will require a crop share which is at least as great as that he could earn on rented land, and he will not pay a rent which leaves him with less than the wage he could earn as a hired hand. Since each party will demand from each activity at least what he could earn in another, competition among laborers for land and among landowners for labor will insure (when there is no uncertainty) that neither land's nor labor's return will be affected by tenure. Accordingly, labor's intensity of application and output per acre will be unaffected by tenure.

Clearly, the Marshallian analysis, in which the share tenant unilaterally determines his intensity of effort, is inapplicable where landowners are free to rent or to farm with hired help. Landowners would let sharecroppers unilaterally set their level of effort only if the foregone rent on sharecropped land were zero. Such would be the case if share tenants could not be discharged and their landlords' obligations were immutable and inescapable, that is, for the case which Marshall believed represented "many parts of Europe, in which the tenant has practical fixity of tenure."[18] But, in a competitive world, without uncertainty or differences among tenures' organization costs, one tenure would be as good and as productive as another. What, then, determines tenure choice?

Is it uncertainty? Agricultural outcomes are, of course, uncertain. Fluctuations in the weather and local catastrophes (such as floods or onslaughts of pests) affect yields, and deviations in world demands and supplies affect prices, so that agricultural incomes are doubly hazardous. Many observers have noted that alternative tenures distribute the risk from agricultural uncertainty differently between the landowner and the laborer.[19] Owner cultivation with help hired for fixed wages puts

[18] *Principles of Economics,* 536. Bardhan and Srinivasan correctly noted that if share tenants unilaterally set their intensity of effort, then the competitive rental would be zero. Unfortunately, they failed to appreciate that, in such a case, labor's equilibrium share would be the whole of agricultural output, so that they mistakenly reaffirmed that sharecropping was wasteful. See "Cropsharing Tenancy in Agriculture," 51–52, note 8.

[19] See Cheung, *Theory of Share Tenancy,* 62–72; Enoch M. Banks, "The Economics of Land and Tenure in Georgia," *Studies in History, Economics, and Public Law* 23: 1 (1905): 92–100; and responses to "Does the share system give satisfaction?" at the end of each state's "Report on Cotton Production . . ." in Eugene W. Hilgard et al., *Report on Cotton Production in the United States . . .* U.S. Bureau of the Census, *Tenth Census of the United States, 1880,* vols. 5 and 6, *Agriculture* (Washington: GPO, 1884).

all the risk on the landowner, renting puts all the risk on the tenant, sharecropping divides the risk in proportion to the contractual shares. Steven Cheung identified these differences in the allocation of risk, along with differences in the costs of contract negotiation and enforcement, as the determinants of tenure choice.

Analyzing the no-uncertainty case, Cheung proposed a model of tenancy in which each landlord allocates land among tenants and unilaterally sets the sharecroppers' share rate and intensity of labor so as to maximize land's total (share plus fixed) rentals.[20] In contrast to my model, in which laborers and landlords interact in the market to jointly determine the rental rate, the share rate, the intensity of labor, and the wage, Cheung presumed that landlords would set the share rate and the intensity of sharecrop labor so as to return to each share tenant just what he could have earned (in the absence of uncertainty) as a renter or wage laborer. Like my model, Cheung's model implied that yields and the ratios of labor to land would be unaffected by tenure, and that the optimal labor-land ratio would fall when the tenants' share rate increased. But these agreements with the facts did not prevent criticism: Bardhan and Srinivasan argued that Cheung's model—with its optimization "only from the landlord's point of view"—was implausible; they therefore employed Marshall's model (with its equally implausible optimization only from the share tenant's point of view) in their analysis of Indian sharecropping.[21]

More substantial difficulties with Cheung's approach stem from his treatment of uncertainty. Cheung did not formally incorporate uncertainty into his model. Instead, he remembered that a share contract shares risk, as well as income, between landlord and tenant. At the same time, he speculated that negotiation and enforcement costs are highest for share contracts. Thus, he concluded that sharecropping would be preferred only if yields were uncertain and other forms of risk dispersion (such as insurance) were more costly: "the choice of contractual arrangement is made so as to maximize the gain from risk dispersion subject to the constraint of transaction costs."[22] Accordingly, he suggested that the observed excess of share rents over fixed rents represented a risk premium needed to induce landlords to share their tenants' risk.[23] His arguments have not been widely supported, however. Robert Higgs and I found little or no relation between the extent of sharecropping in the postbellum South and Cheung's measure of risk.[24] Rao found that yield

[20] Cheung, Theory of Share Tenancy, chap. 2.
[21] Bardhan and Srinivasan, "Cropsharing Tenancy in India," 52.
[22] Cheung, Theory of Share Tenancy, 64.
[23] Ibid., 69–79.
[24] Robert Higgs, "Race, Tenure, and Resource Allocation in Southern Agriculture,

variance was inversely related to the extent of sharecropping in India
and concluded that, at best, Cheung's hypothesis was too simple. Rao
also found that sharecropped land was more productive than owner-
cultivated land.[25] And, as reported above, owner-cultivation with hired
labor or renting also required costly contract negotiation and enforce-
ment: the hired hand may shirk and the renter may mine the land.

Cheung's intuition erred: in part, because he overestimated the rela-
tive cost of negotiating and enforcing a share contract; but, more im-
portant, because he confused two different types of uncertainty, "point"
uncertainty and "sequential" uncertainty. We shall see that sharecrop-
ping is unnecessary to *distribute* the risk from point uncertainty, but is
useful to *reduce* the risk from sequential uncertainty. Hence, sharecrop-
ping is more likely where uncertainty is sequential. Failure to distinguish
between point and sequential uncertainty is most likely a large part of
the explanation of the low empirical correlation between yield variance
and the incidence of sharecropping.

Point uncertainty occurs when the product of land and labor is ran-
domly and immutably affected by some third input, such as a tornado
or a massive flood (it is hard to think of many other examples of point
uncertainty in agriculture). Here, after labor has been applied to the
land, the third input affects the outcome in such a manner that no
adaptive response is possible (seeds cannot be replanted, harvests cannot
be dried, and so forth). In such cases, agricultural uncertainty can be
reduced only by reducing the amounts of land or labor in agriculture.
But the risk from such uncertainty can be equivalently dispersed among
laborers and landowners in many ways: *there is no unique pattern of
tenures corresponding to a unique level and distribution of risk among
laborers and landowners.*

To see this, consider the properties of a market equilibrium when
there is point uncertainty. In equilibrium, the supplies of labor and land
interact with laborers' and landowners' aversions to risk to uniquely
determine the market wage rate, the rental rate, the share rate, and
society's risk premium (or reward for the bearing of risk). Facing these
market parameters, every landowner and laborer allocates his resource
(land or labor) among tenures so as to maximize his welfare; that is,
each chooses the most desirable combination of expected income and
risk from among those available to him. Because a renting tenant bears
all risk, a sharecrop tenant bears some risk, and a hired hand bears none,
a laborer's expected return from the same amount of effort on rented

1970," *Journal of Economic History* 33 (March 1973): 157; and Reid, "Sharecropping
as an Understandable Market Response," 121. Our inferences are critically discussed
in Gavin Wright, "Discussion," ibid., 171–74.
   [25] Rao, "Uncertainty, Entrepreneurship, and Sharecropping in India."

land will exceed that on sharecropped land, which will exceed that from hire. For the same reasons, a landowner's expected return from owner cultivation will exceed that from sharecropping the same land, which will, in turn, exceed that earned from renting it. These differences in expected return will equal the differences in risk multiplied by the equilibrium unit risk premium. A laborer whose aversion to risk is so great that it is not overcome by the equilibrium risk premium will, therefore, allocate all of his labor for a fixed wage; his landowner counterpart will allocate all of his land for a fixed rent. But consider another tenant whose welfare would be maximized if he allocated all of his labor to sharecropping. This would mean that the incremental risk premium that he would earn would just compensate him for the incremental riskiness of his income. Now, assume that his share rate is b, so that his expected income is b times the land's expected yield, and the standard deviation of his income is b times the standard deviation of the land's yield. Alternatively, we can calculate this sharecropper's expected income as his foregone wages (which he could have earned with certainty) plus his compensation for bearing his share of the total risk (equal to b times the standard deviation of the land's yield times the equilibrium unit risk premium). What if this laborer did not sharecrop, but instead allocated b of his effort to rented land and $(1-b)$ of his effort to working for wages? His expected income would, as before, equal his foregone wages plus his compensation for risk. Since he supplies the same total amount of labor, his foregone wages are unchanged. He now bears all of the risk from his rented land, but that land is but b times the land that he previously sharecropped, for labor-land ratios are unaffected by tenure and he devotes but b of his previous effort to rented land. Hence, his risk and his compensation for risk are unchanged: the standard deviation of his rented land's yield is equal to b times the standard deviation of his previously sharecropped land's yield, and each is multiplied by the equilibrium unit risk premium to determine his alternative risk compensations. Likewise, his sharecropping landlord could achieve the same expected return and risk from farming $(1-b)$ of the land with hired help (bearing all of the uncertainty) and renting the remainder (bearing none of the uncertainty).

Thus, neither a laborer nor a landlord needs sharecropping to distribute the risk from point uncertainty: sharecropping can be used to disperse risk, but it need not be so used. In contradiction of Cheung, then, sharecropping will not be used to distribute the risk from point uncertainty if the costs of negotiating and enforcing a share contract are greater than the like costs of the equivalent pair of rental plus for wages contracts.

The point uncertainty model of agricultural production developed

above assumed that landowners and laborers could make no response to random fluctuations (say, in weather and prices). But agricultural production occurs over the crop year, and effort at one time can, to some extent, substitute for effort at another: a damaged planting can be replanted; a late crop can be more intensively fertilized or cultivated; the harvest can be accelerated. As the initial uncertainty of agricultural production is sequentially eliminated as events occur, therefore, the hurt from bad surprises can often be reduced and the gain from good surprises can often be increased by the appropriate responses of farmers in the time remaining. For example, if unexpectedly favorable weather over the first part of the growing season increased one crop's anticipated yield, profits could be increased by concentrating effort on that crop and neglecting relatively less favored crops and other duties.

Because contractual stipulations are very detailed (to protect land from exploitation), such flexible response would probably require contractual renegotiations between laborers and landlords. Under wage or fixed-rent contracts, renegotiations would entail a new division of the windfall gains or losses among the owners of the cooperating inputs. Contention over the proper division might well prevent mutually profitable renegotiations from occurring. Share tenants and landlords, in contrast, have already solved the division of the spoils, and both have an immediate incentive to note any changes in circumstances and profitably alter their plans. Such alterations could occur informally and cheaply. Because the sharecrop tenant typically agrees to execute all of his stipulated duties to the satisfaction of his landlord, merely by lowering the satisfaction level on relatively nonenhanced duties—which the sharing encourages the landlord to do—advantage can be taken of deviations from initial expectations. By insuring the continued interest of both tenants and landlords in the socially efficient employment of resources and reducing the costs of altering previous plans, then, sharecropping increases the likelihood that profitable responses will be made.

Efficient variation of the allocation of resources among alternative duties in response to surprises will raise the mean of agricultural income. Other things being equal, therefore, the greater flexibility of sharecropping contracts implies that the average productivities of resources employed under sharecropping will exceed those of like resources under alternative tenures, so that sharecropping will be the preferred tenure when uncertainty is sequentially reduced over the crop year and production plans can be altered in response to this reduction.[26] Conse-

[26] As noted above, observers have generally found that the earnings of sharecropped land slightly exceeded those of rented land. The explanation offered here is that this differential reflects the greater efficiency of sharecropping. If other things were equal, of course, this interpretation implies that sharecropping should be the only tenure observed where risk is sequentially reducible (a point made—with some

quently, sharecropping's potentials for income enhancement and risk reduction—derived from the encouragement a share contract gives the owners of cooperating inputs to similarly respond to surprises—rather than its redundant capability for risk dispersion, emerge as major impetuses to sharecropping.

Rao's argument that sharecropping would be most prevalent "in the case of production functions characterized by relatively inflexible input combinations . . . [where] the costs of enforcing [the] tenant's input would be lower" is therefore incorrect.[27] If inputs are used in fixed proportions or uncertainty is not reduced over time, but all at once (as in our point uncertainty model), then easy contract renegotiation would carry no premium. In such cases, as shown above, any equilibrium distribution of mean income and risk between factors could be achieved equally well by a mixture of renting and owner cultivation, and there would be no impetus to sharecropping.

On the other hand, Rao's argument that sharecropping would be more frequent "in situations where the element of uncertainty is smaller and entrepreneurial functions are relatively unimportant" seems to be correct.[28] Although, as we have shown, sharecropping stands on a par with other tenures if there is no uncertainty or no scope for entrepreneurial decisions, too much choice among potential responses may, as Rao suggests, make tenant and landlord expectations and strategies so different that neither is willing to subject himself to the continuing restraint of the other. In our model, this implies that the tenant's risk premium is unequal to the landlord's at equilibrium and leads to either renting or owner cultivation alone, where the more sanguine party minimizes, in advance, the restraint imposed by its less optimistic partner. Such difference in expectations or in planned responses, as well as differences in the potential for risk reduction by flexible responses, may well explain why the less risky crop was more extensively sharecropped in India, the more risky crop was more extensively sharecropped in China, and the more risky crop was sometimes more and sometimes less extensively sharecropped in the South.[29]

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disbelief—privately by Stephen DeCanio and Stefano Fenoaltea, publicly by Gavin Wright, "Discussion," 174). But other things are not equal: expectations differ and information is not free (which encourage other tenures where sharecropping would be more efficient), while the transaction costs of a sharecropping contract may be *less* than those of its renting plus wages replacements (which encourages the use of sharecropping to spread risk even when risk is irreducible). Other reasons to sharecrop when risk is irreducible are discussed below.

[27] Rao, "Uncertainty, Entrepreneurship, and Sharecropping in India," 582.

[28] Ibid., 580–81. Cf. Winters, "Tenant Farming in Iowa," 142.

[29] Rao, "Uncertainty, Entrepreneurship, and Sharecropping in India," 585; Cheung, *Theory of Share Tenancy,* 70–71; Reid, "Sharecropping as an Understandable Market Response," 121.

Two caveats are in order. First, the minimization of risk dispersion's role in promoting sharecropping follows from the assumed equality of transaction costs under all tenures. The evidence advanced earlier suggests that this assumption is not far from the truth with respect to enforcement costs. But negotiation costs are perhaps cheaper for one uniform contract than for two contracts. Thus, effecting a desired risk distribution among contracting parties might be slightly cheaper under one sharecropping contract than under renting and wage contracts jointly combining equal amounts of inputs. Such a small differential in relative contracting costs might lead to sharecropping even when no adjustment to surprises is possible. In such a case, sharecropping would be used to distribute risk because of its *lower* contract costs, not—as alleged by Cheung—in spite of its higher contract costs.

Second, to the extent that changing plans over the crop season can increase average income and reduce the likelihood of downward variations, it would seem that self-cultivation would be the most advantageous form of agricultural production, for alterations of plans could be made at will.[30] This argument seems correct and may explain the drive for farm ownership among tenants, but it is not relevant for the determination of tenures at any one time. Personal holdings of inputs are often not in the proper proportions for efficient one-owner production, and legal and dynamic considerations often make buying an efficiently balanced set of inputs unprofitable. Many laborers, for example, lack the wealth to purchase land and other inputs outright. Although laborers can mortgage future earnings to finance such purchases, they cannot sell themselves. The worth of a labor mortgage, therefore, is uncertain, so laborers' use of mortgaged inputs is protectively restricted. Such restrictions (clearly illustrated by the restrictions on land use in farm rental contracts) are designed to protect the lender's capital rather than to facilitate continuously efficient production. In contrast, a share tenant acquires cooperating inputs from a landlord-mortgagee who always has an incentive to profitably modify such restrictions. Speculative anticipations of future land uses or prices may similarly stop land-rich landowners from immediately balancing their holdings. At the end of the American Civil War, for example, Southern landlords held no slaves and faced abnormally low land prices which discouraged them from selling their land to secure cash for wage payments. After trying and failing to resurrect slavery, landlords increasingly turned to sharecropping to secure a dependable labor force. In the face of criticisms, Southern landlords attested that sharecropping increased laborers' productiv-

[30] This point was made to me by T. W. Schultz in his comments on an earlier version of this paper.

ity by giving them an interest in the crop.[31] By hiring labor on shares, landlords retained ownership of their land and secured a cooperative labor force.

The distinct feature of a sharecropping contract, then, is the continuing incentive for both landlord and tenant to maximize the efficiency of agricultural production. I argued above that this incentive would so quicken response to surprise that sharecropping would be the preferred tenure, other things being equal, when uncertainty is sequentially reduced and production can flexibly respond. This bond between tenant and landlord means that sharecropping will be desirable for some even when uncertainty is irreducible or production is inflexible. If tenants are poorer or less well-known than landlords to lenders, for example, lenders may supplement their credit investigations with the landlords'. That the tenant has entered a sharecropping arrangement shows that his landlord has made a favorable evaluation of the tenant's potential and guarantees that the tenant will have the continuing assistance of his landlord in fulfilling that promise. This documentation of the tenant's credit-worthiness may partly explain the reported preference of country stores for sharecroppers in the Reconstruction South, as well as the negative correlation between the length of settlement and the importance of sharecropping in Iowa.[32] One would, therefore, expect that immigrants and poorer agricultural laborers would immediately prefer sharecropping to renting.

In addition, if the landlord not only supplies land but also (as in the South) managerial expertise, then a sharecropping contract would assure the tenant of increased managerial direction when most profitable, as well as insure the landlord that his exhortations would not fall on deaf ears (in contrast with wage labor), for each has a powerful incentive to cooperate. Such an arrangement would economize on the landlord's time and, from the strong incentive for self-management by the sharecropping tenant, permit greater flexibility in the timing of the delivery of the managerial input. Consequently, when the rewards from landlord supervision are high or a landlord's alternative earnings fluctuate during the year, the guarantee under sharecropping of the other factor's attention may make it the preferred tenure. Less skilled tenants and more skilled landlords would prefer sharecropping, one suspects, for the joint gains from cooperation between the landlord and tenant would likely be higher. Thus, as the managerial complexities of the

[31] See Hilgard et al., "Report on Cotton Production," passim; Banks, "Tenure in Georgia," 79; and Vernon L. Wharton, The Negro in Mississippi, 1865–1890 (New York: Harper and Row, 1965), chap. 3.
[32] Winters, "Tenant Farming in Iowa," 133, 141, note 24.

crop increase we would expect sharecropping to become increasingly preferred. Since farming conditions (soils, cultivation schedules, and so forth) are notoriously variable from place to place, migrants would be especially prone to sharecrop, so as to draw on the landowner's knowledge as well as to secure his favorable credit reference. Winters, for example, found that nonresident Iowa landlords were slightly less prone to sharecrop.[33] Perhaps that was because they had less knowledge of farming conditions to sell to tenants. This, of course, suggests that a portion of the higher rentals from sharecropped lands is a return to the landowners' managerial inputs, and not solely a risk premium.

   This analysis has emphasized the joining of the tenant's and the landlord's interests as the essential cause of sharecropping. A simple market equilibrium model was developed that is consistent with the historical conditions and consequences of sharecropping. In particular, the model's implications agree with the facts: that returns to landowners are, if anything, higher from sharecropped lands than from rented lands; that laborers' efforts and the average yields on sharecropped lands are at least as great; and that the ratio of labor to land on sharecropped lands falls as the share rate rises. In passing, it was shown that Marshall's analysis of sharecropping ignored land's alternative employments in renting and owner cultivation, so that it cannot be generally employed to condemn sharecropping as inefficient. The analysis in the case of uncertainty clearly showed that any distribution of expected income and risk between laborers and landlords could be achieved *without* resort to sharecropping. Consequently, Cheung's hypothesis that a desire by factors to disperse risk—partially restrained by the allegedly higher transaction costs of sharecropping—is the foundation for sharecropping was rejected. The validity of assuming that a sharecropping contract has higher transaction costs was questioned. This discussion led to identifying agricultural risk as a major impetus for sharecropping, but only to the extent that risk is avoidable by modification of production plans in agreed upon ways. Thus our model helps to explain the lack of correlation between yield variances and the incidence of sharecropping. The commonality of interests under a sharecropping contract was interpreted as facilitating contract renegotiation to reduce risk in agricultural production. Although we rejected Rao's argument that certainty and inflexibility of factor proportions are prerequisites for sharecropping, our model was consistent with his hypothesis that too much diversity in agricultural expectations or production possibilities precludes sharecropping.
   While facilitating the reduction of risk through cheapening renego-

[33] Ibid., p. 141, table 5.

tiations of contracts was identified as a major foundation for sharecropping, the joining of landlord's and tenant's interests within the sharecropping contract also implied that sharecropping would be relatively prefered by new immigrants, poorer or less skilled tenants, and by relatively higher skilled landlords or growers of managerially more complex crops, even in the absence of uncertainty. Hence, it is understandable that "Sunday is occasion for the vigilant [share] landlord to visit his farm, walk over his acres, and inspect the crop . . . [on a] tour that often ends with a visit to the tenant's shack and much good advice."[34]

The ultimate conclusion, then, supported by theory and history, is that sharecropping is chosen because of its efficiency, not in spite of its inefficiency.

MATHEMATICAL APPENDIX

To build a simple market equilibrium model of agricultural production under uncertainty, write agricultural output per acre as:

$$Q_i/T_i = f(n_i) \cdot P \tag{1}$$

where i is a tenure index equal to s if the land is sharecropped, r if the land is rented, and c if the land is owner-cultivated, Q_i is total output, T_i and N_i are the amounts of land and labor employed, respectively, n_i is the labor-land ratio, and P is a normally distributed random variable with mean one and a standard deviation v. Assume that all contracts are costless to enforce.

Because output is uncertain, each tenant and landlord strives to minimize his expected utility, $U(I,V)$, which increases as expected income I rises and decreases as income's standard deviation V rises. The arguments of the representative tenant's expected utility are:

$$I_T = N_w \cdot W - T_r \cdot [f(n_r) - R] + T_s \cdot [b \cdot f(n_s)] \tag{2}$$

$$V_T = [T_r \cdot f(n_r) + T_s \cdot b \cdot f(n_s)] \cdot v \tag{3}$$

where the wage rate W, the rental rate R, the share rate b, and the ratio of labor to land under sharecropping n_s are market parameters. Each tenant, then, maximizes his expected utility with respect to those variables he unilaterally controls: the time he works for wages N_w, the land he desires to rent r, the labor-land ratio on rented land n_r, and the amount of land he desires to sharecrop T_s, subject to the constraint that he is fully employed. Each tenant's relevant first order conditions are:

[34] Rupert Vance, *Human Factors in Cotton Culture* (Chapel Hill: University of North Carolina Press, 1929), 163.

$$\text{(w.r.t.} T_r \text{):} \qquad f(n_r) \cdot S_T - R - W \cdot n_r = O \qquad\qquad (4)$$

$$\text{(w.r.t.} n_r \text{):} \qquad f'(n_r) \cdot S_T - W = O \qquad\qquad (5)$$

$$\text{(w.r.t.} T_s \text{):} \qquad b \cdot f(n_s) \cdot S_T - W \cdot n_s = O \qquad\qquad (6)$$

where $(1 - S_T)$ equals the tenant's proportionate risk premium $(S = 1 + U_V/U_T)$.

Similarly taking b, n_s, R, and W as parameters, each landlord maximizes his expected utility $U(I_L, V_L)$ where:

$$I_L = T_r \cdot R + T_c \cdot [f(n_c) - W \cdot n_c] + T_s \cdot [(1-b) \cdot f(n_s)] \qquad (7)$$

$$V_L = [T_c \cdot f(n_c) + T_s \cdot (1-b) \cdot f(n_s)] \cdot v \qquad\qquad (8)$$

with respect to those variables he unilaterally controls: the land supplied for rent T_r, the land supplied for shares T_s, the land retained for self-cultivation T_c, and the labor-land ratio in self-cultivation n_c, subject to the constraint that all land is farmed. Each landlord's first order conditions are:

$$\text{(w.r.t.} T_s \text{):} \qquad (1-b) \cdot f(n_s) \cdot S_L - R = O \qquad\qquad (9)$$

$$\text{(w.r.t.} T_c \text{):} \qquad f(n_c) \cdot S_L - R - W \cdot n_c = O \qquad\qquad (10)$$

$$\text{(w.r.t.} n_c \text{):} \qquad f'(n_c) \cdot S_L - W = O \qquad\qquad (11)$$

The simultaneous solution of these optimality conditions of each tenant or landlord and of the market balance equations determine an interior market equilibrium with unique values for R, W, n_s, b, and $(1 - S)$. This equilibrium is characterized by the properties summarized in the text.