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TRANSACTION COSTS, RISK AVERSION, AND THE CHOICE OF CONTRACTUAL ARRANGEMENTS*

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Every transaction involves a contract. The transactions conducted in the market place entail outright or partial transfers of property rights among individual contracting parties. The contractual arrangements through which these transfers are negotiated are several and varied.

It is common in land tenure literature to rank the relative efficiency of various lease contracts. For example, share tenancy (or sharecropping) has long been considered inefficient, as have leases with relatively short duration. These views are based on an inquiry into the resource use implied by the existing contractual arrangements. But the inquiry has been made without explicit consideration of the pertinent property right constraint and cannot account for the frequent choice of allegedly inefficient contracts. The wrong question has been asked.

Elsewhere¹ I have derived the theory of share tenancy on the condition that transaction costs, and in particular the costs of contractual negotiation and enforcement, are zero. It shows that economic efficiency is the same under various land tenure arrangements subject to the constraint of private property rights. Although transaction costs exist in the real world, the theory enables us to understand much of the farming behavior.² However, the presence of a variety of contractual arrangements under the *same* constraint of competition poses the question of the choice of these arrangements. In this article, I set out an approach based on non-zero transaction costs and risk

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¹ Steven N. S. Cheung, *Private Property Rights and Sharecropping*, 76 *J. Pol. Econ.* 1107 (1968).

² See Steven N. S. Cheung, *The Theory of Share Tenancy*, chs. 3, 7 and 8.

aversion to explain the observed contractual behavior in agriculture. The observations used are largely drawn from the Chinese experience.

If a firm can increase efficiency in production by employing productive resources of more than one resource owner, a contract to combine the resources will obtain. The formation of the contract involves partial transfers of property rights in one form or another, such as leasing, hiring or mortgaging.³ These transfers, and the associated coordination of inputs of various factors in production, are costly events.⁴ There are costs of negotiating *and* of enforcing the stipulations of the contract.

Given the state of personal wealth distribution and the portfolios of assets held as private property by resource owners, some owners will seek contractual arrangements with others in combining resources for production.⁵ There is a variety of arrangements under which this is done. At least two reasons may be offered for the existence of different types of contractual arrangements. First is the existence of *natural* risk, defined here as the contribution by nature or the state of the world to the variance (or standard deviation) of the product value.⁶ Given a non-zero variance for the expected output yield (the total income for the contracting parties), different contractual arrangements allow different distributions of income variances among the contracting parties. Under the postulate of risk aversion, an individual will seek to avoid risk if the cost of doing so is less than the gain from the risk averted. He may avert risk either by searching for information about the future (which may not be attainable even at infinitely high cost), by choosing less risky options when investing (which options include portfolio diversification), or by choosing among arrangements with which his burden of risk can be dispersed to other individuals—such as insurance and various contractual arrangements. A second reason for the existence of different contractual arrangements lies in the different transaction costs that are associated with them. Transaction costs differ because the physical attributes of input and output differ, because institutional arrangements differ, and be-

³ If only *outright* transfers exist for all resources, "owner" production will exist for all firms. Contracting for outright transfers does not concern us here.

⁴ See R. H. Coase, *The Nature of the Firm*, N.S.4 *Economica* 386 (1937). Reprinted in *Readings in Price Theory* 331 (Kenneth E. Boulding & George J. Stigler, eds. 1952).

⁵ Portfolio selection is a complicated subject. The two major theses that have been advanced center on anticipated changes in the general price level and on the aversion of risk. Transaction costs may imply a third.

⁶ While this concept has the advantage of treating risk as a measurable quantity that can be conveniently applied to observations, it also has some theoretical difficulties. See for example, Jack Hirshleifer, *Investment Decision under Uncertainty: Choice-Theoretic Approaches*, 79 Q. J. Econ. 509 (1965).

cause different sets of stipulations require varying efforts in enforcement and negotiation.⁷

Let me advance the following hypothesis: the choice of contractual arrangement is made so as to maximize the gain from risk dispersion subject to the constraint of transaction costs. In the following three sections, I shall develop this hypothesis and apply it to some observations.

I. THE CHOICE OF CONTRACTS IN AGRICULTURE

Consider the three main forms of contracts in agriculture, namely, a fixed-rent contract (rent per acre stated in cash or in crop), a share contract and a wage contract. Under private property rights, the contracting parties are free to choose among these forms. The observed patterns of contractual choices vary from place to place. For example, share contracts were more frequent than fixed rents in Taiwan and Southeast Asia before the agrarian reforms; in China fixed rents were more frequent than share rents in the 1930's; in Japan, fixed rents predominated; and in general, wage contracts (farm hands) have been infrequent, occurring in about one to five per cent of the farming households in various localities.⁸ Why do the patterns of contractual choices differ? What determines the choice of contracts?

Any contract combining resources from different owners for production involves, in addition to negotiation costs, the enforcement costs of controlling inputs and distributing output, according to the terms of the contract. Contracting on a share basis appears to involve higher transaction costs as a whole (the sum of negotiation and enforcement costs) than a fixed-rent or a wage contract. The terms in a share contract, among other things, include the rental percentage, the ratio of non-land input to land, and the types of crops to be grown.⁹ These are mutually decided by the landowner and the tenant. For fixed-rent and wage contracts, however, given the market prices, one party alone is sufficient to decide how much of the other party's resources he shall employ and what crops shall be grown. And since in a share contract the sharing of output is based on the *actual* yield, efforts must be made by

⁷ Transaction costs may also depend on other factors, such as the number of participants and transactions, which I shall not explore here. Changes in prices and innovations will also affect the costs of transactions. See for example, Theodore W. Schultz, *Transforming Traditional Agriculture* 162-174 (1964).

⁸ For the case in China, see J. L. Buck, *Land Utilization in China* 198 (1938); for Japan, see R. P. Dore, *Land Reform in Japan* (1959); for other parts of Asia, see sources cited in Steven N. S. Cheung, *The Theory of Share Tenancy*, ch. 1 nn.10 & 14.

⁹ These terms are implied by the theory in Cheung, *Private Property Rights and Sharecropping*, *supra* note 1. Samples of share contracts obtained from China (see next section) are consistent with this statement.

the landowner to ascertain the harvest yield. Thus negotiation and enforcement are more complex for a share contract than for a fixed-rent or a wage contract.

The ranking of transaction costs of fixed-rent and wage contracts appears uncertain. The physical attributes of land are such that the cost of enforcing the contracted amount of input is lower than in the case of labor. That is, the "shirking" of labor input, which may exist in a wage contract (also in a share contract) without either enforcing the input or checking the output, is costly to prevent.¹⁰ But while this "shirking" problem does not appear significant for land input in a fixed-rent contract, policing (or enforcing) the maintenance of soil and other assets owned by the landlord is more costly for a fixed-rent or a share contract than for a wage contract.¹¹

If we accept the above reasoning, pending empirical confirmation, and if transaction cost is the only consideration, then the minimization of transaction cost implies that share contracts will never be chosen. Why, then, are share contracts chosen?

Suppose the transaction cost is zero or the same for all forms of contract. Let us employ a behavioral postulate of risk aversion, defined here to mean that an individual, given the same expected average income, prefers a lower to a higher variance. In agriculture, variables exogenous to the production function, such as weather conditions and pests, are risk factors which are difficult to forecast and which may significantly affect the variance of the value of output. Under a fixed-rent contract, the tenant bears most, if not all, of the risk; under a wage contract, the landowner bears most, if not all, of the risk. Share tenancy may then be regarded as a device for risk sharing (or risk dispersion); that is, the variance of the output yield is distributed

¹⁰ For the tenant's incentive to use an amount of input less than that stipulated in a share contract, see Cheung, *supra* note 1. The adoption of different forms of contractual payment for *labor* alone due to "shirking" problems and enforcement costs appears to constitute an important subject which has not been explored. For example, a piece-rate contract will be preferred to a wage contract on an hourly basis if checking output costs less than enforcing input. However, with piece rates the worker is inclined to be "sloppy" and produce products of lower quality. Thus, a piece-rate contract will be less preferable if the physical attributes of the product are such that it is relatively costly to police a specified standard. Similarly, commission payments (as in the case of insurance salesmen) are preferred to other forms when the value of output depends on the intensity of work per sale; "tipping" payments (as in the case of waitresses) are preferred to other forms when the quality of services is significant—in either case, the costs of enforcing "intensity" and "quality" of work appear to be relatively high.

¹¹ In horticulture, for example, the usual contracts other than owner cultivation are wage or piece-rate contracts. This may imply that in horticulture, owner management involves a lower cost of policing the orchard assets than fixed-rent contracts. On the other hand, one expects wage contracts would be infrequent when the land holding is large, for high costs of labor supervision would be incurred.

among the contracting parties. Given the postulate of risk aversion, a share contract will be mutually preferred by the landowner and the tenant.¹² However, in varying degrees, risk exists in any tenancy. Why, then, are fixed-rent and wage contracts chosen at all?

I suggest that the choice of contract should be analyzed by employing both the differences in transaction costs and the postulate of risk aversion. Given the state of risk associated with a particular output, a higher transaction cost will lead to lower returns to the productive assets. On the other hand, given the transaction cost, risk aversion implies that asset values and the variances of income are negatively related.¹³ While in itself the dispersion of risk under a share contract will lead to higher values for the contracted resources, the higher associated transaction cost will lead to lower asset values. Wealth maximization (or utility maximization, depending on the relevant measurement problem) implies that the contractual arrangement chosen will be the one which yields the highest values for the contracted resources.

Given the variance of output value and the rental percentage, a share contract prescribes a specific distribution of income variances for the contracting parties. The associated state of risk dispersion may not conform to the most preferable state according to the parties' preference functions. However, since some dispersion of risk is preferred to no dispersion at all, a share contract will be chosen rather than a fixed rent or a wage contract if the higher transaction cost is at least compensated for by the gain from risk dispersion. There exist, of course, still other arrangements under which the dispersion of risk can be tailored to fit each case. But as we shall discuss in the next section, the transaction cost of an arrangement for risk dispersion more flexible than a share contract may be so high as to make it undesirable.

Evidence is available to support the applicability of this kind of analysis:

(1) Since transaction cost is assertedly higher for share than for fixed rents, there would be room for some third parties to insure the amount of crop yield. That is, if a third party (an insurance company) were to insure the expected mean yield, the contracting parties would choose a fixed-rent contract and would be willing to pay the insuring party an amount no higher

¹² This result is implied in William F. Sharpe, *Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk*, 19 J. Fin. 425 (1964); Jack Hirshleifer, *supra* note 6, and *Investment Decision Under Uncertainty: Applications of the State-Preference Approach*, 80 Q. J. Econ. 252 (1966). "Risk-exchange" models derived from the current state-preference and mean, variability approaches, with the aid of an Edgeworth-Bowley box, suggest that risk sharing is preferred—if we ignore transaction cost.

¹³ For a theoretical treatment of asset prices and risk premiums as determined in the market place, see Sharpe, *supra* note 12.

than the saving from a lower transaction cost plus a premium for the virtually certain income now obtained as compared with the variable income in a share contract. Yet we seldom find the existence of such a crop insurance without government taking an active role. The reason, perhaps, is that the cost of handling insurance transactions may be so high as to be prohibitive: the insuring agent would have to check not only the actual crop yields but also the amount of inputs. For the French *metayage* (sharecropping), however, Constantia Maxwell observed:

The usual procedure for French seigneurs was, while retaining the chateau and its immediate neighborhood for their own use, to let out their lands in *gros* to middlemen or *fermiers* (to be distinguished from *fermiers exploitants*), who paid a fixed sum to the proprietor and gathered the rents from *metayage* or from *censitaires* at their own risk for a personal profit. Some of these middlemen, like the landlords, were absentees and worked the estate through sub-agents.¹⁴

In this case we see the *fermiers*, a third party, interposing between landlords and tenants to provide a more certain income for the former.¹⁵ To my knowledge, no similar arrangement existed in China, though another practice prevailed (see next section). In Japan, share tenancy has been rare; and, at the same time, a compulsory crop insurance system has been enforced.¹⁶

(2) In China, share tenancy is reportedly more frequent in the wheat region than in the rice region. Taking the hectare yield data of wheat and rice crops in Taiwan, we find significantly higher proportional variances for wheat than for rice. This is shown in Table 1. Due to the lack of price data, only the variances of physical output are computed, although value of output would be a more appropriate measure.

¹⁴ Arthur Young, *Travels in France During the Years 1787, 1788 and 1789* at 395 ed. n. (C. Maxwell, ed. 1929).

¹⁵ To interpret the existence of the *fermiers* on grounds of risk aversion alone seems inconclusive. R. H. Coase has pointed out to me that the *fermiers* resembled the "farmers" in England, who served to collect taxes and postal revenues for the Crown. Coase's explanation for the existence of the English "farmers" is as follows: a collecting agent who is allowed to take the difference between what he can collect and what he has to pay the Crown has a greater incentive to maximize receipts than if the same agent is paid a wage rate for his service. This argument, I believe, is correct, and can be expressed alternatively: transaction costs differ, among other things, because different sets of stipulations require varying efforts in enforcement and negotiation; and for collection a "farming" contract involves a lower cost of enforcement than a wage contract. The *fermier* of France may therefore be viewed as a "farming" agent as well as an "insuring" agent.

¹⁶ See *Agricultural Development in Modern Japan*, ch. 13 (Takekazu Ogura ed. 1963). I have been unable to discover the frequency of share contracts in Japan before the introduction of the compulsory crop insurance.

TABLE 1
Mean Yield (μ) and Proportional Variance (σ_p^2) of Wheat and Rice Hectare
Yield (kg.), Taiwan, 1901-1950

Value	Crop	1901-10	1911-20	Period 1921-30	1931-40	1941-50
μ	Wheat	880	710	759	1,058	625
	Rice	1,318	1,379	1,588	1,927	1,648
σ_p^2	Rice	291	118	357	1,180	1,158
		31	32	46	62	180

Source: Computed from data in Sino-American Joint Commission for Rural Reconstruction, Taiwan Agricultural Statistics 1901-1955 at 20, 24 (1956).

In Table 1,

$$\sigma_p^2 = \frac{\sum_{i=1}^n \left(\frac{X_i}{\mu} - 1 \right)^2}{n},$$

where X_i is the hectare yield in kg., and n the number of years. The higher frequency of share contracts among wheat crops appears to be a universal phenomenon.¹⁷

(3) According to three independent surveys conducted in China (1930-1935), share rent is generally slightly higher than fixed (crop) rent,¹⁸ and this premium may be regarded as a return for risk bearing to the landowner.

Let us summarize. The postulate of general risk aversion or the minimization of transaction costs, taken separately, do not explain well the observed coexistence of several forms of contracts. For this reason I use both, and the choice of contracts is determined by weighing the gains from risk dispersions and the costs of contracting associated with different contracts. Two factors appear to be important in explaining different patterns of contractual choices in different localities. First, different physical attributes of crops and types of climate often result in different variances of outputs in different

¹⁷ See for example, J. L. Buck, *supra* note 8, at 198; and James O. Bray, Farm Tenancy and Productivity in Agriculture: The Case of the United States, 4 Food Research Institute Studies 25 (Stanford Univ. 1963).

¹⁸ See Li Fa Yuan, Tung Chi Yueh Pao II, 5 (Legislative Yuan, Statistical Monthly, 1932); Nei Cheng Pu, Nei Cheng Kung Pao II (Dep't of Int. Affairs, Public Rep. of Inst. Affairs 1932); Shih Yeh Pu, Chung Kuo Ching Chi Nien Chien G62-83 (Dep't of Real Estates, China Econ. Yearbook, 1936). Some of these findings are reproduced in Steven N. S. Cheung, The Theory of Share Tenancy, App. B.

agricultural areas. Second, different legal arrangements, such as compulsory or subsidized crop insurance, affect the variances of incomes as well as affecting transaction costs for the contracting parties. An examination of some contractual details in the next section will suggest a third factor: different market arrangements also affect the choice of contractual forms.

II. CHARACTERISTICS OF FIXED AND SHARE CONTRACTS (CHINA, 1925-1940)

In this and the following section we analyze in some detail the observed stipulations of fixed and share contracts. This will serve not only to clarify the hypothesis that contractual arrangements are chosen to disperse risk bearing and minimize transaction cost, but also to illustrate that the contractual stipulations in sharecropping are consistent with efficient resource use.¹⁹ I turn to some information from China, roughly from 1925 to 1940. This choice of data is based not only on the availability of information, but also on the fact that during this period in China, some 93 per cent of the farm land was held under private ownership.²⁰ Let me begin by translating a few sample contracts of fixed rent.

Sample (a)—fixed (crop) rent contract with definite lease duration (Shantung Province):

Tenant A now leases from landowner B [so many acres] of land at location C. We hereby stipulate, with the presence of referee D, that the annual rent per acre includes [so many catties] of millet, soybean and Indian corn. The payment in wheat will be one month after the wheat harvest, and autumn crops two months after the autumn harvest. In a famine year, rental payments shall be adjusted [downward] according to local customs. The duration of the lease is [so many years].²¹

Sample (b)—fixed (crop) rent contract with indefinite lease duration (Kiangsi Province):

¹⁹ The prevailing inefficiency argument against sharecropping can be briefly stated as follows. Since under sharecropping a portion of every output unit is taken as rent, it is similar to an *ad valorem* excise tax—where part of every unit produced is “taxed” by the landowner (government). The distribution of output is not the same as with fixed rent or owner cultivation—where the tiller obtains the *entire* incremental product. Sharecropping, therefore, is said to result in less intensive (and less efficient) farming because the tenant’s incentive to work or invest in land is reduced. This thesis, however, ignores the terms in a share contract which the participating parties must *mutually* agree to abide by when the contract is formed.

²⁰ See J. L. Buck, *Farm Ownership and Tenancy in China* (1927).

²¹ Kuo Min Cheng Fu, Tung Chi Chu, Chung Kuo Tsu Tien Chih Tu Chi Tung Chi Fen Hsi 52-53 (Nat’l Gov’t, Statistics Dep’t, Statistical Analysis of Tenancy System in China, 1942).

. . . we contractually establish an iron-sheet [firmly fixed] rent Regardless of good or bad years, not a fraction of rent can be reduced In the event that the rental payment is reduced or delayed, the landowner is free to take back the land, together with all existing crops, and [the right] to contract a new tenant for cultivation. . . . Furthermore, the landowner shall pay the tenant 20 copper coins for the delivery of every 100 catties of grains.²²

Sample (c)—fixed (crop) rent contract with landowner providing non-land farming inputs (Tsinghai Province):

. . . the landowner will furnish [so many catties] of seed, together with [so many pairs] of water buffalo, [so many head] of donkeys, and all essential farming equipment. The durable assets are for use purposes only, and shall not be damaged or lost [by the tenant], . . . and they must be returned to the landowner without delay at the termination of the lease. The [aforementioned] rental rate is subject to adjustment according to local customs in a famine year.²³

The above samples of fixed (crop) rent contracts are about as representative as I could find. They are identical to cash rent contracts in all aspects except that in the latter rental payments are stated in monetary units.²⁴ According to observations collected by the Department of Real Estates, covering 22 provinces in China, cash rents are generally slightly lower than crop rents.²⁵ This differential can be explained by landowners' sharing in the product selling cost undertaken by tenants. We may also note that with inflation occurring in 1938, due to the Sino-Japanese War beginning in 1937, 13.3 per cent of cash rents were converted into crop rents and 15.3 per cent were converted into share contracts.²⁶ This observation, of course, is consistent with minimizing transaction cost. Under inflation, renegotiation of cash rent contracts becomes more frequent and thus more costly.

The characteristics of fixed-rent contracts are not of special interest except for one feature. The one feature which we single out to elaborate on here is the frequent inclusion of the provision for rental reduction according to "local customs" in a "famine" year [see samples (a) and (c)], a provision which is absent under an "iron-sheet" rent [see sample (b)]. Let us call this provision an *escape clause* for the tenant, the inclusion of which in a fixed-rent contract imposes a risk burden on the landowner.

²² Pe-Yu Chang & Yin-Yuen Wang, *Chung Kuo Nung Tien Wen T'i* 68 (Questions of Farm Tenancy in China, 1943).

²³ Nat'l Gov't, *supra* note 21, at 54-55.

²⁴ See Nat'l Gov't, *supra* note 21, at 53-54 and Chang & Wang, *supra* note 22, at 67-70.

²⁵ Shih Yeh Pu, *Chung Kuo Ching Chi Nien Chien* G62-83 (Dep't of Real Estates, China Econ. Yearbook, 1936).

²⁶ Hsing Cheng Yuan, *Ti Chuan Pien Tung* No. 2 (Executive Yuan, Changes in Land Rights 1942). The data were obtained from sample contracts in 14 provinces in 1938.

We may interpret "local customs" as a set of market prices for "famine" adjustments, even though the exact magnitude of the possible reduction of rent is not stated when the contract is signed. The escape clause comes into play only in a year so "bad" that the market considers it to be a "famine." Given a sufficiently large number of fixed-rent contracts which include the escape clause, competition among landowners to keep their tenants will yield certain market rates of rental reduction which each landowner will follow. Other things being equal, the increased risk burden on the landowner associated with the inclusion of the escape clause implies that a premium will be added to the "fixed" rent over the "iron-sheet."²⁷

Although shifting the risk burden by including the escape clause in a fixed-rent contract is not quite the same as the risk dispersion in a share contract, we may imagine the formation of share contracts via the escape clause. Suppose "famine" is defined as occurring when the actual harvest is reduced to a certain per cent of the expected mean yield due to natural causes. The tenant under fixed rent has the option to choose between agreeing to an "iron-sheet" contract or buying an "escape" right by paying an "insurance" premium to the landowner—such that in the event of "famine," rental payment will be reduced by a certain percentage according to a market rule.

To further the argument: there could exist in the market place not just one escape clause as observed, but a wide range of similar clauses each associated with a different level of "famine," such that the tenant could obtain any or several of them by paying different premiums to the landowner. As such, the risk burden could be dispersed between the contracting parties in an infinite number of ways each with slightly different arrangements. This hypothetical world would perhaps exist if the costs of negotiating and marketing all of the different escape clauses were zero. But with increasing transaction cost associated with additional escape clauses—in particular the cost of defining different levels of "famine" in the market place and the cost of negotiating the rental reduction for each—the incremental gains of having them may be so small that no further "custom" is developed by the market. Instead, an alternative device chosen is a share contract, under which multiple "escape" provisions for the tenant will be implicit, and within which the rental payment is no longer fixed.²⁸

From the above we may deduce two implications with respect to transaction cost and risk aversion. First, we have argued that the transaction cost

²⁷ Unfortunately, I have been unable to find data that would confirm or refute this statement.

²⁸ Note that with a share contract the landowner not only shares in the possible loss in a bad year, but also the gain of a good harvest which will reduce the risk premium by a fraction.

is higher for share rent than for fixed rent, pending empirical confirmation. Observed contractual arrangements in China suggest that the transaction cost for a wide range of escape clauses is higher than for share rent. The reason is that a wide range of escape clauses would allow a greater variety of choice for risk dispersion than a share contract, and yet only one escape clause is observed as available. Thus, the range of contractual choices is constrained by transaction cost. Second, since, as noted earlier, evidence indicates that share rent is slightly higher than fixed rent due to the added risk burden imposed on the landowner, we conjecture that the landowner's income would be higher than with a share contract if an escape clause were adopted to the effect that the tenant's income variance is reduced to zero. Imaginative as it may seem, we find such an escape clause exists in the real world, disguised under the name of a wage contract.

Available data on the frequencies of escape clause adoptions under different contracts support my suggestions. A survey conducted by the University of Nanking, covering four provinces in China in 1935, reveals that the escape clause [as in contract samples (a) and (c)] was adopted in 83 per cent of the crop (fixed) rent contracts, 63 per cent of the cash (fixed) rent contract, and not at all in share contracts.²⁹ The higher frequency of adoption for crop rent than cash rent is what we would expect. In the event of a generally poor harvest, the market price of agricultural yield will rise, and with cash rent the tenant's income will be compensated by the rise in price more than with crop rent; hence, the escape clause will become less preferable to the tenant.

The existence of the escape clause in the market implies, other things being equal, a more frequent choice of fixed-rent contracts than of share contracts. Outside China in Southeast Asia, before the agrarian reforms, the escape clause was unpopular. However, there existed some guaranteed minimum rents or wages associated with share contracts. These guarantees could be similarly analyzed with the suggested choice-theoretic approach if more information were available. The different market practices explain, in part, the higher frequency of share contracts in Southeast Asia than in China. Indeed, the *fermiers* of the French metayage, the escape clause associated with fixed rents in China, and the minimum guarantees associated with share rents elsewhere are market practices that serve as intermediate arrangements between pure fixed rents and pure share rents. Each of them has different risk distributions and transaction costs, thus widening the range of contractual choices. Why these intermediate arrangements differ in different markets is a question which I do not seek to answer.

²⁹ See the University of Nanking, Ssu Hsing Chi Tsu Tien Chi Tu 65-67, Rental Systems in Four Provinces (1936).

Turning to sample contracts of share rents in China, we find that their stipulations are more complex than those of fixed rents, due to the added stipulations on tenant inputs and crops to be grown.

Sample (d)—share contract with uniform sharing percentages for all crops (Shantung Province):

. . . tenant A agrees to cultivate [so many mows] of land for landowner B. We hereby stipulate that tenant A provides [so many head] of water buffalo, [so many bodies] of men; and every year the tenant must cultivate wheat once, Indian corn three times, and soybean twice. Fertilizer expenses are to be shared [in certain proportions]. The yields of all crops are to be shared [in certain proportions]. The lease may terminate only after the autumn harvest³⁰

Sample (e)—share contract with varying sharing percentages (Honan Province):

[Stipulations of land size and nonland inputs] We hereby stipulate that wheat yield will be split 20-80; millet, yellow bean, sesame, green bean—all will be split 30-70; cotton and sweet potatoes split 50-50 . . . ; millet straws, and bean and sesame stalks split 30-70³¹

Sample (f)—share contract with some products unshared (Honan Province):

. . . Tenant A . . . voluntarily agrees to furnish [so many] men, [so many head] of water buffalo and donkeys . . . and all plowing equipment We clearly stipulate that seeds of major crops are to be provided by the landowner, and seeds of minor crops by the tenant. All crop yields will be split equally, in dry and clean form But the straws go to the [tenant's] water buffalo entirely; the droppings go to the [landowner's] soil; . . . and all fertilizer expenses are to be borne equally by both parties. All grinding equipment and living rooms are provided [by the landowner], which the tenant shall repair for his own use. These assets must be returned to the landowner at lease cancellation.³²

In share contracts, several things should be noted. First, the explicit stipulations of tenant inputs and crop plantations are implied by economic theory. These stipulations are unnecessary for fixed rents. Evidence indicates, however, that only the actual yields are inspected, for by comparison with adjacent farms or past experience the landowner will be able to decide whether the contracted terms have been fulfilled:

. . . the absentee landlords send their agents, or go themselves, to the fields and

³⁰ Nat'l Gov't, *supra* note 21 at 54.

³¹ Chang & Wang, *supra* note 22 at 63.

³² Chang & Wang, *supra* note 22 at 63-64.

estimate the yield of the crop and the share given by the tenant is based on this estimate. Such men are very expert in approximating the true yield [The tenant] commonly cheats by skilfully hiding some of the threshed grain before division takes place and also by giving the landlord inferior crops. On the other hand, the landlord or his agent often uses a large measure. When the agent collects rent the tenant has to treat the agent very well and often has to bribe him in order to keep the land for cultivation another year.³³

Exaggerated as this quotation might be, an intramarginal tenant with specific farming knowledge (hence, with higher yields than marginal tenants) can "hide" as much as the rent imputed to his special skill and still retain his tenancy; an agent can collect enforcement cost in "bribes" from both the landowner and the tenant as much as other competing agents allow. Nonetheless, this justifies our claim that transaction cost is higher for a share contract than for fixed rent.

A second characteristic of share contracts is that the precise and at times complex delineation of resource rights between the contracting parties suggests that the sharing of investment inputs can be adjusted together with the rental percentage so as to use resources efficiently. This is consistent with a conclusion I have reached elsewhere:³⁴ the landowner may either require the tenant to invest more in land and charge a lower rental percentage, or the landowner may invest in land himself and charge a higher rental percentage; the investment will be made in one way or the other if it leads to a higher rental annuity.

A third characteristic of share contracts is that the rental percentage may vary among different crops in one contract [see sample (e)]. As implied by the theory of share tenancy, the rental percentage is dependent upon the cost of tenant inputs and the relative fertility of land. Since different crops usually require different intensities of tenant inputs relative to land, the sharing percentages for different crops should be expected to differ within a single contract. However, any set of different rental percentages for different crops can also be expressed in terms of a single (weighted time average) rental percentage, uniform for all crops, to yield the same present value of the rental return. It appears that the latter option of a uniform rental percentage [see contract sample (d)] would be more convenient. However, if tenancy is subject to dismissal at any moment of time in the event of poor performance, the use of one rental percentage uniform for crops harvested at different seasons would be likely to lead to disputes or renegotiation should tenancy dismissal be in effect. We usually find a uniform rental per-

³³ J. L. Buck, *Chinese Farm Economy* 149-150 (1930).

³⁴ Cheung, *supra* note 1.

centage being used in a share lease with specified duration, and that when multiple percentages are found in a lease with indefinite duration, a uniform percentage is usually used for different crops harvested in the same season [see contract sample (e)].

We may summarize the characteristics of share contracts by quoting the observation made by two writers—who were critical of tenant farming in China:

Under the system of share rent, the yields after each harvest are to be shared according to certain mutually stipulated percentages between the landowner and the tenant. With the exception of some land used for farmstead purposes, the tenant is required to cultivate almost all the assigned fields for the production of crops. Sometimes, the tenant is even required to furnish farming equipment . . . and other expenses. The landowner and the tenant mutually decide the area to be used for each crop Besides the above, the only affair of management over which the landowner exercises control is confined to permanent improvements of land assets. This last characteristic is identical with fixed-rent contracts.³⁵

III. THE DURATION OF LEASE CONTRACTS

An investigation conducted in China (1934), covering a total of 93 prefectures in 8 provinces, shows that the distribution of lease durations was as follows: 29 per cent of the tenant contracts were *indefinite* (that is, unspecified and usually terminable after every harvest), 25 per cent *annual* leases, 27 per cent from 3 to 10 years, 8 per cent from 10 to 20 years, and 11 per cent were *perpetual* leases.³⁶ Two things should be noted. First, a stipulated lease duration means only that tenancy may not be terminated as long as the contracted terms are fulfilled by each party. That the duration of the lease is specified does not prohibit mutual renegotiations within the lease duration. Second, as the frequency of short-term leases has been used to illustrate the turnover rate of tenancy, it should be pointed out that lease termination is not the same as tenancy dismissal. Available data reveal that the frequency of tenancy dismissal was not high.³⁷

³⁵ Chang & Wang, *supra* note 22, at 49. For similar observations see Ching-Moh Chen, Chung Kuo Ko Hsing Te Ti Tsu (Land Rents of Various Provinces in China, 1936); Chi-Ming Chiao, Chung Kuo Nang Ch'un She Hui Ching Chi Hsueh ch. 9 (A Social and Economic Study of Farm Villages in China, 1938); and Chung Kuo Ke Hsueh Yan Ching Chi Yen Chiu So, Chung Kuo Ching Tai Nung Yeh Shih Tze Liao 1912-1927, at 89-95 (China Econ. Research Dep't, Source Materials of Recent Chinese Agricultural History, 1957).

³⁶ These percentages are computed from Shih Yeh Pu, Chung Kuo Ching Chi Nien Chien 101-104 (Dep't of Real Estates, China Econ. Yearbook, 1935). A similar investigation conducted in the same localities ten years earlier yielded a virtually identical distribution, *id.*

³⁷ According to a survey conducted by the Executive Yuan, *supra* note 26, covering 14 provinces in China (1937), 7.5% of the lease contracts were dismissed in that year.

In the literature of land tenure, two arguments have been commonly used in attacks upon the efficiency of lease durations of less than 10 years. One of these claims that short durations impose insecurity on the tenant and thus impair his incentive to farm. But insecurity, although undesirable to the tenant, may provide a stimulus to farming activity.³⁸ Another argument is that the short-term lease discourages investment in land. However, this is refuted by the fact that yields per acre on tenant farms are not lower than on owner farms; nor has any evidence been offered to show that, in China, productivity under tenancy varies with the duration of a leasing contract.³⁹

The right to each privately owned resource is, by definition, transferable and exclusively delineated. Rights to resources invested in land and other assets are no exception. In the formation of a lease contract, the participating resource owners are free to accept or reject the contractual terms being negotiated. Again, the choice for the duration of the contract is no exception. Thus the relevant question here is not whether a "short-term" lease is inefficient; the relevant question is why different lease durations are chosen.

In a world uncomplicated by transaction costs and risks, in which the right to the income generated by private investment could be costlessly secured and transferred, and in which changes in contractual stipulations could be costlessly negotiated at any time, the duration of the lease becomes irrelevant and its explicit stipulation superfluous. With transaction costs included, I argue that the lease duration will be chosen so as to minimize these costs. To do so, it is convenient to separate the cost advantages for "long" and "short" lease durations.

1. *The Choice of Relatively Long Lease Duration*

A relatively long lease duration is chosen to reduce the cost of transferring (transacting) tenant assets attached to land. There exist differences in physical attributes of capital assets which involve different moving costs at lease dismissal. For example, a water buffalo owned by a tenant for grain

However, since inflation began in the same year, the cited percentage might be higher than that of preceding years. For the rise in prices due to the Sino-Japanese war, see Chang & Wang, *supra* note 22, at ch. 9.

³⁸ Armen A. Alchian has argued that the desire for security leads to "long-term" contracts. But his analysis is based on a property right system which is *not* private, where the private cost of acquiring security is relatively low. See his *Private Property and the Relative Cost of Tenure*, *The Public Stake in Union Power* 350-71 (Philip Bradley ed., 1959).

³⁹ During the period 1925-1937, surveys conducted by five organizations in China show no notable differences in acre yields or land prices that are attributable to different tenure arrangements. Among these surveys, two volumes are particularly comprehensive: Nat'l Gov't, *supra* note 21 and *Land Utilization in China—Statistics—A Study of 16,786 Farms in 168 Localities and 38,256 Farm Families in Twenty-two Provinces in China, 1929-1933* (J. L. Buck ed., 1937).

grinding is easier to move at lease dismissal than an improvement in water irrigation made by him. Of course, the landowner could have invested in the water irrigation himself, or he could purchase the tenant's committed improvement outright.⁴⁰ But when assets attached to land are owned by the tenant, disputes may arise in the event of tenancy dismissal. A lease with a sufficiently long duration may become the preferred option.

However, the cost of moving the *physical* asset is not necessarily the relevant cost to consider. The tenant's property *right* to his committed investment may be transferred, either to a third party or to the landowner, at a market price. The problem is that such a price may not exist, or cannot be obtained in a short period of time, due to transaction costs. One need only point out that the depreciated value of a used asset is costly to evaluate; the landowner may choose to select his new tenant instead of allowing any party who purchases the asset to take over the lease. Also, other information problems exist in the market place. An appropriately long lease duration will thus reduce disputes and the anticipated cost of transferring the tenant's property right. This choice, however, can be made only at the expense of some cost advantage which a shorter lease duration provides.

The foregoing discussion can be supported by observations on the perpetual lease in China:

Under perpetual leases the landowner holds ownership right to the [bottom of] land, and the tenant owns the right to the soil These two rights are separate. The occurrences of perpetual leases are confined to the following: (1) The tenant exploited [privately owned] wasteland and developed it into farm land, thus gaining a perpetual [ownership] right to the soil from the landowner. (2) Permanent improvements in land made by the tenant such as building up water-conserving devices in otherwise sandy fields (3) . . . where labor is scarce and land plentiful, the landowners attracted tenants from afar by offering the perpetual right to till [the soil] (4) The tenant had paid a lump-sum payment to obtain the perpetual right to till And (5) the peasant, when in need of money, sold the ownership right to the land bottom but retained the right to till the soil. Since ownership rights to the bottom and surface of land are separate, both the landowner and the tenant can sell their rights freely, without the consent from each other⁴¹

⁴⁰ Two independent surveys (China, 1921-1924 and 1935) reveal that, among tenant farms, landowners owned about 60 to 70% of the housing assets; tenants owned about 75% of the draft animals and 95% of the farming equipment. The total values of non-land assets on owner and tenant farms were roughly the same. See Nat'l Gov't, *supra* note 21, at 99-116.

⁴¹ Chiao, *supra* note 35, at 261. For similar observations see Nat'l Gov't, *supra* note 21, at 56-58; and China Econ. Research Dep't, *supra* note 35 at 84-89.

In every case, the tenant's asset attached to land (for example, the right to the soil) is physically "permanent." With the perpetual lease and the contracted terms in effect, the landowner may not arbitrarily raise the "bottom" rent (or use other devices) to drive the tenant away. Yet such a lease duration would not be necessary if transaction costs were zero: If the "bottom" and "surface" rights were clearly delineated and costlessly enforced as private, and if these rights could be costlessly transferred, there would exist market prices for these rights at which transfers could be executed at any time.⁴² Thus there would be no need for long lease durations to protect the "immobile" investments of the tenant. The same can be said for other assets attached to land.

2. *The Choice of Relatively Short Lease Duration*

The adoption of a relatively long lease duration involves forgoing some cost advantage which a shorter duration provides. When assets attached to land owned by the tenant are to be exhausted in a short period of time, or when the landowner provides all the "permanent" assets, a relatively short lease duration reduces the costs of *enforcing* the contracted terms and of *renegotiating* these terms.

When a contract is formed, the contracting parties may lack sufficient information on each other's reliability. Within a specified lease duration, the violation of the contracted terms by either party may call for increasing enforcement efforts, or for revoking the contract before its termination date through court action or other means—all to be done at some cost. The choice of a shorter lease duration, which facilitates tenancy dismissal, will reduce these costs. As noted at the beginning of this section, however, the frequency of tenancy dismissals was far less than that of short-term leases, suggesting that most terminated leases were renewed. Available data show that the frequency of lease dismissals caused by rental disputes was low.⁴³ I conjecture, therefore, that in China short-term leases are chosen more as a device to facilitate contractual renegotiation rather than as a device to reduce the costs of enforcing the contracted terms.

⁴² I apply here the thinking in R. H. Coase, *The Problem of Social Cost*, 3 J. Law & Econ. 1 (1960).

⁴³ Legal records which cover 56 prefectures in 6 provinces (China, 1934-35) reveal a total of 124 tenancy disputes (mostly in rental payments) over a one year period. Even though the number of total tenant contracts is not available, the number of disputes brought to court appears to be so small that one suspects a substantial number of disputes were never brought to court. Over two-thirds of these recorded cases ended in tenancy dismissals, together with payment settlements. See Dep't of Real Estates, *supra* note 36, at G118-120; and *supra* note 25, at G143-144.

It is useful to distinguish two types of contractual renegotiation (revision), though at times one relates to the other. The stipulated terms in any tenure contract in essence specify two things: (a) the state of resource use, or allocation, mutually agreed upon by the contracting parties, and (b) the contracted distribution of income for the parties. To revise (a) through renegotiation for more efficient resource use may benefit *all* parties to a contract, that is, all parties may gain or lose less. However, to revise (b) one party must lose.

Consider the contractual renegotiation which entails mainly a reallocation of resources, for example, changes in relative product prices which call for shifts to different crops, or innovations which call for the adoptions of new seeds or new methods of cultivation. Renegotiations of this type are largely confined to share contracts, since under fixed rents the tenants are left to make their own decisions on resource use except improvements in land and maintenance of the landowner's assets. In principle, since all contracting parties expect to benefit from the revision, renegotiation can take place at any time and lease termination becomes unnecessary. However, different individual knowledge of the market may give rise to difference in opinions as to whether the revision is desirable. A relatively short lease duration is a convenient device which allows resource reallocation in the event of unsuccessful renegotiation.⁴⁴ This, together with the more complicated contractual enforcement required for share contracts, explains why durations for share leases are generally shorter than fixed rents.⁴⁵

Consider further the contractual renegotiation which entails the revision of income distribution, when one party gains at the expense of the other. It applies to fixed and share contracts alike. Resource allocation may also be affected. For example, changes in relative asset prices of the contracted resources, a cash-rent contract with unanticipated inflation, or decision errors made in the initial contract—which call for a revision of the rental rates—are cases in point. Since some party must lose when revising the initial distributional terms, that is, the gainer either cannot or will not fully compensate the loser in making the revision, lease termination (hence, the choice

⁴⁴ With lease termination, for example, a share tenant who alone wants changes in production plan can request a fixed-rent contract, purchase the land outright, or seek tenancy with another landowner. Without lease termination, further negotiation may still take place if one party who wants the revision pays the reluctant party an amount to make the revision "convincing."

⁴⁵ Localities with higher frequencies of share leases (China, 1934) were associated with higher frequencies of short-term leases. See Nat'l Gov't, *supra* note 21, at 43, Tables 20 and 21; and at 59, Table 26.

of an appropriately short duration) is essential.⁴⁶ Again, this would not be necessary if transaction cost were zero (even if unanticipated events occur independently). In the absence of transaction cost, a contract would be designed to allow day to day changes in rental payments; within any lease duration, the distribution of income would not be held fixed throughout.

IV. CONCLUDING REMARKS

For generations economists and land tenure writers have sought to rank the relative efficiency of resource use under different leasing arrangements. But their inquiries were undertaken without explicit reference to the property right constraint involved. And in many cases, the characteristics of various lease contracts had not been carefully examined. Different contractual arrangements do not imply different efficiencies of resource allocation as long as property rights are exclusive and transferable. The characteristics of lease contracts presented above also confirm this statement.

In this article I have asked: Why are different contractual arrangements chosen under the same system of private property rights? To answer this question I have introduced transaction costs and risks. The attempt to formulate a choice-theoretic approach to explain the observed contractual behavior in agriculture has perhaps raised more questions than it has answered.

Among some related problems that I have avoided explicitly, the following are significant. First, with respect to risk aversion, a more general analysis would include all risky choices, and not contractual choice alone. The analysis would be less difficult if transaction costs were not involved. Second, with respect to transaction costs, a more general analysis would derive some specific and well-behaved cost function of transactions. This step is essential to the development of a model of general equilibrium including transaction costs.

Still other problems I have avoided implicitly. In particular, some level of law enforcement by legal authorities is taken for granted. We may well ask: What will happen to the choice of contracts if the government changes its enforcement efforts? To what extent will these efforts be consistent with the Pareto condition? What set of legal institutions is consistent with the operation of the market place? With these questions unanswered, the conditions defining efficiency with transaction costs are not all clear. Let me explain.

⁴⁶ Given an unexpired lease which fixes the rental rate, changing economic conditions may lead to a redistribution of income. However, the efficiency of resource allocation may not thereby be hindered.

In production, cost minimization requires not only the fulfillment of the familiar set of marginal equalities, but also the choice of the lowest-cost production method available. In transactions, one relevant consideration is the cost of alternative *contractual* arrangements, which we have discussed at some length. One might think that, as a cost constraint, efficiency will be attained when, other things equal, the set of arrangements with the lowest transaction cost is chosen. However, transaction costs also depend on alternative *legal* arrangements. For example, the varying effectiveness of law enforcement, or the varying corruptibility of courts, will affect the costs of transactions in the market place. Given the existing legal institutions, I have attempted to explain the observed contractual arrangements. But insofar as I have ignored the choice and development of the legal institutions, the Pareto condition with transaction costs is ambiguous.

I have also not explored the contractual behavior associated with different property right constraints. Various restrictions on the transfer of property rights, or various methods of attenuating the right of a resource owner to obtain income from his resource, will affect the leasing arrangements as well as resource allocation.