NOTES

Risk Sharing in Medieval Agriculture

Metin M. Cosgel *
University of Connecticut, Storrs

What kind of risk-sharing benefits did the organization of medieval agriculture provide to lords and peasants? In answering the question, this paper gives a comprehensive account of the organization by recognizing a symmetry between its two parts: the manorial contractual arrangements between the lord of the manor and the peasants, and the scattering of peasant land holdings on open fields. The focus is on the impact of agricultural risks on the distribution of land and labour. Potentially either the lord, or his peasants, or both could assume the risks. Formulating the simultaneous decision problem of the quantity and the locational choice of land, a risk-aversion hypothesis is proposed to show how the attitudes towards risk affected the overall allocation of land and labour within a manor.

Risk was an important phenomenon in medieval agriculture. Risks were high and the methods of reducing them were limited. The known techniques in ploughing, seeding, drainage and other agricultural operations used in the raising of crops were not developed enough to prevent the effects of adverse natural conditions. The yield was low and its variability was high.

Risk could not be transferred either. There was no formal insurance system or other type of market arrangement readily available to spread risk. Gaining access to outside markets was generally difficult and costly because of the limited means of communication and transportation. Lord and peasant alike had to accept risk as a fact of life, since they had limited means to avoid or shift them. In other words, they could only deal with the risks internally within the manor and share the risks among themselves. The question then becomes: how did the organization of medieval agriculture allocate risks between lords and peasants?

* The author wishes to thank Don McCloskey, S.R.H. Jones, S.Y. Wu, Lars Muus, and participants in seminars at the University of Iowa, Case Western University, University of Connecticut, and University of Dallas for helpful comments and suggestions.

Among the issues involved in understanding the organization, two have particularly interested economic historians: the manorial contractual arrangements between the lord of the manor and the peasants, and the scattering of peasant land holdings on open fields. McCloskey (1976) provides an answer to the above question in his explanation of the second issue, English open fields. As Cosgel (1990) argues, however, McCloskey's answer is partial in that it does not address the first issue, the way lord-peasant relationships were affected by risk considerations. McCloskey and others have typically treated the two issues separately, ignoring their interdependence.[1] The risk-sharing properties of the overall organization of medieval agriculture have not been systematically studied.

This paper aims to give a comprehensive account of the organization by studying the symmetry between the two issues (manorial contracts and scattering) from the perspective of agricultural risks. Potentially either the lord, or his peasants, or both could assume the risks with specific allocations of land and labour. The lord could earn a safe rent and shift the risks onto the peasants, or assume the risks for an uncertain income. Similarly, each peasant could work for the lord for safe wages or lease and cultivate the land, assuming the risks himself. A simultaneous decision problem was the locational choice of land, which was also subject to risk considerations. Each cultivating peasant (or lord) could reduce the risks further by holding scattered rather than consolidated pieces of land. A risk-aversion hypothesis is developed below to show how the attitudes towards risk could affect the overall allocation of land and labour within a manor.

Scattering, Risks and the Organizational Structure

An interesting property of the allocation of resources in medieval agriculture was the locational distribution of land holdings. The holdings of each peasant were typically in many small strips of less than an acre each, which were scattered on the open fields of the village's arable land. A typical peasant held 20 or so plots of land, all in separate locations. To explain this phenomenon McCloskey observes that "[t]he land and weather of England is notoriously variable, even over the two miles square or so of the typical village." In that case a risk-averse peasant would be better off scattering his land

[1] Other economists' explanations of the contractual relationships emphasize transaction costs rather than risks as the essential factor which determined the particular form of contracts observed in medieval agriculture. See, for instance, NORTH and THOMAS (1971) and FENOALTEA (1975, 1988). Note also that the transaction costs explanations typically do not aim to explain the overall organization. Some explanations of scattering such as DAHLMAN (1980) and QUIGGIN (1988) include other aspects of medieval agriculture, such as the decision making process. Scattering and manorial contracts, however, have not been simultaneously considered.

holdings across the village land. That way he could reduce the variability of his income and the risks of poor yield, high prices, and so on if he were to specialize in one crop in a consolidated a piece of land.

McCloskey's explanation views scattering as a risk-allocation and sharing mechanism. The idea of sharing the risks with contracts immediately suggests a view of the members of a manor as "shareholders." Indeed McCloskey views peasants as shareholders diversifying their holdings (portfolio) to insure against disaster.[2]

The analogy, however, neglects the role of the lord (the "major shareholder") in the sharing of risks. The inclusion of the lords in the analysis is essential because the land was not the only item shared within a manor; peasants' labour was also shared. It needs to be answered, for instance, why the peasants could not achieve their desire for a safe income through other arrangements with the lord. That is, if the peasants scattered to achieve safety, why did they not work full-time for the lord for a safer wage income instead? The challenge, therefore, is to check the external consistency of the risk-aversion hypothesis within the totality of the system by incorporating the lord and the wider set of exchange relationships into the model.

McCloskey's formulation of the risk-aversion hypothesis remains incomplete, especially in light of the fact that the manors were often isolated, with limited opportunities to avoid or transfer risks. The only way the lord or a peasant could reduce excess risks was to shift them onto someone else within the same manor. The only means of transferring risk onto others, in turn, was to utilize the internal market for productive resources. The lord or the peasants had no personal control over the variation of the total output of the community, but they could arrange their land holdings or labour allocation so as to adjust the variation in their personal incomes depending on their risk attitudes. The question then becomes how lords and peasants could distribute risks among themselves, in addition to a distribution achieved by the locational choice of land.

Risks and Contractual Arrangements

In a medieval manor the allocation of land and labour for different uses was not determined solely by the lord. The lord of the manor had rights over the land, but the peasants owned their labour.[3] In order for agricultural pro-

[2] The shareholding analogy, in fact, has been employed in the writings of various scholars, from the earliest writers in the field, such as Vinogradoff and Maitland.

[3] Most peasants, however, were dependent on their lord, which restricted their mobility and carried with it certain obligations owed to the lord of the manor, as part of the feudal system — obligations, *regardless* of the quantity of land held by the peasant. Such feudal obligations, however, were determined by different principles altogether. The issue examined here is the economic exchange of peasant labour with land.

duction to take place the lord and the peasants had to negotiate a contract and to agree on how to use their rights to land and labour.

There are three general categories in which the lord and a peasant could exchange their rights to land and labour: wage contracts, rent contracts, and sharecropping. Each contractual form allocates production risks and transaction costs differently between the two parties. In terms of transaction costs, for instance, Fenoaltea's explanation of manorial contracts focuses on supervision costs and North and Thomas' on negotiation costs.[4] The analysis below places the emphasis on the distribution of production risks for the purposes of this paper.

Consider the allocation of property rights between a particular piece of land and the labour of a representative peasant under the three contractual forms. In the first arrangement the lord keeps the land to himself and employs the peasant as a worker in return for a wage. Therefore the lord assumes all the production risks and claims the residual. The second is a system in which the peasant leases the lord's land, assumes the risks and claims the total output in return for a fixed-rent payment. In the third the peasant works the land, but no fixed wage or rent is specified. The lord and the peasant share the total output according to a prespecified rate. In contrast to the first two, in which only one of the parties assume all the risks, sharecropping contracts provide the parties with the opportunity to share the risks between them.

The categorization above emphasizes risks in relation to crop failure only. There were other risks that could be considered. Rents, for instance, could sometimes be paid in grain, which was subject to risks such as the uncertain value of the payments, or the possibility of default by the peasants. Similar issues can be considered regarding labor. Uncertainty regarding employment conditions and payments presented risks to be borne by the laborers. The level of risk associated with rent (wage) contracts, in other words, may not have been zero to the lord (peasants). Such risks, however, are excluded from the present analysis since the change (increase) in the riskiness of income corresponding to residual claimancy is the more relevant consideration.

Medieval Contracts Between Lords and Peasants

The typical contracts observed in medieval England were in fact different in character than each of the three types considered, although they shared some of the underlying principles. The land in a typical manor was divided mainly into two parts. One part was kept by the lord as his *demesne,* and the remaining arable land was let to tenants. The peasants' labour was likewise divided into two parts: the tenants cultivated the lord's *demesne* as well as

[4] See FENOALTEA (1975) for enforcement costs, and NORTH and THOMAS (1971) for negotiation costs in medieval contracts. NORTH and THOMAS's analysis also mentions (but does not elaborate fully) the risk considerations.

their own holdings. Thus the lord and a peasant traded their respective inputs of land and labour in such a way that the peasant, under a system called customary labour dues, typically spent a portion of his available time working for the lord on his *demesne*, in exchange for the right to cultivate his own holdings in the remainder of his time. Note the difference from sharecropping: the total output in this arrangement was not distributed in a fixed proportion. Instead, each party was entitled to output accruing to land cultivated by himself and received payments in return for the exchanged input in units of the other input.

This description is clearly a generalized account of the contractual arrangements. Although typical, the arrangement was not universal by any means. Wage and rent contracts, for instance, existed in pure form in some regions.[5] There were also a few but significant number of exceptions to the typical arrangement, such as freeholders of land and full-time labourers, which nevertheless coexisted within the same system. Moreover, the "medieval" period did not represent a homogenous and static picture with respect to agricultural contracts. The specifics of the contracts, in other words, were highly variable over time and regions. Despite such variations in contracts, however, the typical contractual *form* unique to medieval agriculture was the direct exchange of land and labour, which needs to be explained. An explanation is necessary for why lords and peasants preferred such trading of inputs to pure wage, rent, or sharecropping contracts.

One interpretation of medieval contracts is to see them as a "mixture" of wage and rent contracts. Note, however, the difference between medieval arrangements and the contracts observed in the American South, where a variety of contractual forms coexisted after the Civil War. In the South, the contractual mix often included all forms of contracts — wage, rent, and sharecropping — such that a typical landlord employed different forms of contracts with different workers. Similarly the workers worked for different landlords under different contracts. In Medieval England, however, the contractual form did not change from one peasant to another in their relationship with the lord. The typical contract represented a mixture of wage and rental contracts, without actually mixing the contracts among people. Each peasant exchanged his labour with the lord's land under a single contractual form, which applied to all the peasants in their relationship with the lord.

Considering the two aspects of the organization of medieval agriculture (i.e., scattering and manorial arrangements) simultaneously, we can now address more formally the risk-sharing properties of this overall organization.

[5] Furthermore, the exact specification of the payments took many different forms. Sometimes the contract simply specified how much of the peasant's time was to be used on the *demesne*. At other times the contracts described in detail the specific tasks that each peasant was expected to perform. The peasant's rent payments sometimes included cash, grain and livestock as well as labour dues to the lord.

Medieval Contracts and the Sharing of Risks

A meaningful analysis of the allocation of resources requires a brief and simplified account of the environment in which agricultural production was carried out in a typical manor of medieval England. Considering productive resources first, the peasants' labour was a highly homogenous factor. Farming was the main occupation, and medieval agricultural technology did not require complete specialization of the peasants in specific tasks. The only examples of specialized jobs in a manor were those of the baker, the shepherd and some administrative duties. All the other required agricultural tasks were performed by the peasant. Formally, let L denote homogenous labour.

The land in England, on the other hand, was highly heterogenous as brought to the historians' attention by McCloskey. The soil configuration changed greatly from one part of the village to another. Thus the exposure of land to a particular weather condition would have had varying effects on output depending on the types of soil. Similarly the potential threat of high winds, flooding, theft, insects and other dangerous conditions were likely to be different in different parts of the village. To account for differences in land, let the types of land be denoted by $T^1, T^2 \ldots T^K$.

Suppose for simplicity that the same crop is grown on all types of land and that the difference in land types are represented simply by the variability of output. Suppose for further simplicity that the production technology is given and same for everyone, and that it is characterized by constant returns to scale. These assumptions can be summarized by the production function representing output on type-k land as:

$$y^k = \theta^k F(L,T^k) = \theta^k Lf(\delta^k), \qquad k=1,2,\ldots K,$$

where θ^k is a random shock to production and $\delta^k = T^k/L$ (land-labour ratio on type-k land).

The aim here is simply to understand the way the organizational structure of medieval agriculture allocates property rights and the associated risks. To focus on the choice of a contractual relationship, let us abstract from the problem of the choice of input proportions for production by assuming the input proportions to be fixed by technological constraints.[6] The assumption simplifies the analysis by making the determination of δ^k exogenous to the system.

Given the above simplifications the decision problem confronting the lord and his peasants is to allocate their endowment of resources. Consider, for instance, the lord's land. If the lord lets a strip of land to a peasant, it would

[6] Note that the assumption of a fixed-proportions production function can be thought of as taking the size of a strip to be determined by one day's work, which was in fact the case on open fields.

have a safe return to the lord in the form of rent. But if it is cultivated directly by the lord himself the return is random, because of the yield and price risks. Considering the lord's total endowment of land, therefore, his expected total income is the sum of the rent accruing to him and the expected revenue from the land cultivated by himself (net of the costs of production). Since rent is a sure income, the variation in the lord's income is simply the variance of the land cultivated by himself.

The opposite applies to the peasants: the land which has a safe return in rent for the lord gives a risky return to the peasant who cultivates it. The safe income for the tenant, on the other hand, can be obtained from his labour by working for the lord or for others. The choice he faces is whether to allocate his labour in exchange for a safe income, or to use it in production for a random return, or both.

Denoting by L the total endowment of labour for each peasant, his expected income, consisting of the two potential sources of income (risky production and safe labour) equals:

$$C = \sum \theta^k L^k f(\delta^k) - \sum r^k T^k + w(L - \sum L^k),$$

where w is the wage rate and r^k is the rent of type-k land. L^k and T^k denote the quantities of labour and land employed on type-k land.

Note here that, given the choice of safe and risky incomes, a combination of them would make a risk-averse peasant better-off.[7] Formally, if a peasant is risk-averse than his utility function of income would be concave. Thus, since income is a linear function of safe and risky components, the expected utility function of income would be a concave function of random outputs on each land type (y^k) and fixed payments (wages or rent) for each member. Therefore, convex indifference curves imply that a peasant would prefer farming on scattered land holdings and that a mixture of risky and safe incomes will be preferred to wholly risky or wholly safe. The same argument applies equally to the lord. If he is risk averse he would prefer a mixture of safe and risky returns.

The situation examined here is analogous to a risk-averse investor's problem of the allocation of income between risky and safe assets. As the theory of finance makes clear, faced with such a situation a risk-averse investor would be better off choosing a combination of safe and risky assets, rather than wholly safe or wholly risky. The problem facing the lord and the

[7] The argument made here is analogous to that made by STIGLITZ (1975), where the issue is to achieve the optimal allocation by the mixing of contracts (between different landlords or workers). Also see REID (1976) and NEWBERY (1977) for similar formulations. Although their work is based on a different context the interpretation of their conclusion in our context also implies the optimality of input-trading contracts in terms of the distribution of risks.

peasants is identical in structure. They, too, would be better off choosing a combination of risky and safe sources of income.

The implication is that a peasant needed to rent land and the lord needed to employ workers in order to achieve the desired combination of safe and risky incomes. Moreover, each peasant could reduce risks further by scattering his land holdings among different types of land in addition to exchanging his labour with land. The simultaneous solution to the decision problem, in other words, was the exchange of resources leading to input-trading contracts.[8] Risk distribution advantages of the allocation of land and labour is clear: neither party had to assume all the risks. They could achieve the optimal distribution through the trading of resources.

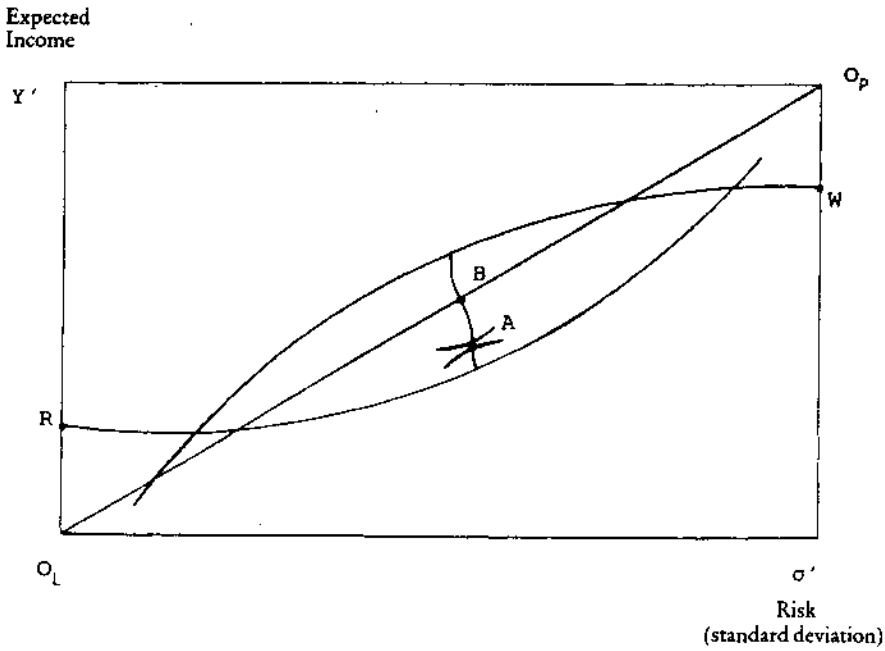
Why Not Sharecropping?

The interpretation provided above to understand the allocation of risks under input-trading contracts may be clearer in terms of a mean-variance framework. Under the conditions of land and labour described above the allocation problem of resources consists of two interrelated parts. The lord and each peasant needed to decide: first, how much of each resource to employ; second, the locational distribution of land holdings. The risk-sharing properties of the scattered land holdings, as shown by McCloskey, is clear and needs no further elaboration. Let us focus, therefore, on the first part, namely the distribution of risks with different allocations of inputs to see the sharing of risks with input trading.

Consider for simplicity the allocation problem of inputs for the case of a specific piece of land and the labour of a particular peasant. The division of land and labour can be shown using the Edgeworth-box diagram below. Within the mean-variance framework the choice problem reduces to the allocation of expected income and its standard deviation.

Given the land-labour ratio for this type of land (δ^k) and other assumptions about the specifications of the production technology (namely, constant returns to scale and multiplicative risk), the total maximum output that can be achieved from the land (Y') and its standard deviation (σ') are given as determined by the endowment of resources.

[8] In this simplified version the model does not explain some of the deviations from the typical arrangement, such as full-time labourers (even in the absence of an active land market). The simplest explanation of such phenomena would be to acknowledge the presence of high-entry costs (e.g., skill, initial capital necessary to purchase working materials, seed, etc.) required to carry out production. In the presence of such costs each peasant faces a first-stage decision problem to determine the feasibility of production first. To keep the analysis simple and to focus on input-trading arrangements, however, such costs are excluded here.



The mean-variance approach is a useful framework to illustrate the difference between input-trading and other types of contracts (fixed wages, fixed rents, and sharecropping). In the figure, O_L is the lord's origin and O_p is the peasants'. Therefore, fixed-rent contracts would correspond to a solution on the segment O_L Y'. Segment σ' O_p represents fixed-wage solutions. Sharecropping would take place along the diagonal from O_L to O_p. Input-trading contracts can be observed at any interior point of the box.

Suppose point W represents the total wage payments that the lord would have to make if he were to farm the land using peasants' labour. If instead peasants farm the land, then they would have to make rent payments to the lord. Let point R be the total rent payments that accrue to the lord in that case.

Notice that with convex indifference curves exhibiting risk aversion, input trading contracts that can be achieved as solutions in the area between the indifference curves of the peasants and the lord would be mutually preferable to R and W. If, for instance, the solution is at point A, then the indifference curves passing through A give higher utility to both the lord and the peasants, reinforcing the argument that when the potential income sources contain risky as well as sure ones, risk aversion would mean that a mixture is more desirable than wholly risky or wholly sure income. Indeed the contractual arrangement between lord and peasant did precisely that.

Trading of inputs is clearly superior to sharecropping. The final distribution of expected income and risk under input trading may or may not coin-

cide with sharecropping solutions. It may be the case that the solution takes place at a point along the diagonal such as point B in the figure. At that point the outcome of input-trading arrangement (in terms of the sharing of risks) would be the same as sharecropping. That would be the case if the lord and the peasants have identical degrees of risk aversion. The two arrangements, however, are based on quite different principles since the lord and each of the peasants claim the output on their own holdings only. Input-trading solutions will generally be different from and preferable to sharecropping. Their main advantage is to allow the differences in risk attitudes between the lord and the peasants to be accommodated.

Changing Risks and the Organizational Structure

The argument so far has been pursued by considering a typical manor and a coincidence of manor and village. There were, of course, variations from this structure. The idea of "one manor-one village", for instance, is now known to be only one of a number of possible relationships between the two, largely confined to parts of the Midlands. A village could comprise a number of manors (as in East Anglia), or the relationship could be reversed for manors comprising groups of settlements (e.g. in parts of east Midlands, the south-west, the far north of England).

The boundary lines of manors were often hard to define. A manor might merge with another in such a way that land which was a freehold on one might be the demesne, or tenant land of the other. Such overlapping manors clearly represented diversification of land holdings across manors. Another interesting case is that sometimes a manor had other sub-manors contained in it. The sub-manor in such cases, however, often operated as a manor with all the essential features. The risk-aversion hypothesis, therefore, remains equally applicable.

More relevant for our purposes is the variations in the internal structure of the individual manor. The essential elements of a typical manor regarding the trading of inputs were the demesne, tenancies, and labour services. These elements were of widely varying importance, and one can find examples of manors where one was missing. The typical manor was to be found mostly in wide plains where the land was suitable for arable cultivation and grain-growing. In other areas the lord – peasant relationship took different forms.

In hilly areas, for instance, rental contracts were more common. The natural conditions of such areas made pasture-farming more suitable, which led to scattered settlements and separate farms. The difference between grain growing and pastoral farming is in the relationship between production risks and the scale of farming. The amount and quality of land was less crucial for pastoral farming. The scale of farming was not a direct function of land, thus risks could not be transferred to others through trading land. Input-trading, furthermore, involved costs that were not observed in grain-growing areas, such as the inconveniences created by dispersed settlements. Each peasant

would be less willing to supply labour to different farms or to the lord because of the full-time labour requirements of most farming operations, and also because of the scale advantage he would have from his labour on his own farm. It was more advantageous for the lord and the peasants, therefore, to engage in other contractual forms in the allocation of land and labour.

Under certain conditions, therefore, the factors which made input trading desirable diminished or disappeared altogether, leading to different organizational structures. When risks did not change with the scale and location of farming, and when they could not be shared through the trading of land and labour, complete specialization with fixed rents or fixed wages was observed.

Scattering and input-trading arrangements were peculiar to medieval agricultural conditions. The arrangements gradually disappeared as the conditions that made them desirable changed. The introduction of new techniques to increase output or to reduce its variability, and increasing market opportunities to spread risks contributed to such changes.

New techniques increased the scale of farming, causing the manorial contracts to change in favour of pure wage or rent contracts. Increased specialization in agricultural operations, furthermore, increased the opportunity cost of the peasants' labour. Improved means of communication and transportation increased the access to markets, which led to the emergence of alternative forms of insurance and opportunities to transfer risks. Indeed the trading of inputs between the lord and the peasants were to disappear first in areas closest to market towns.

The riskiness of crop yields was greatly reduced by new drainage methods, improved and more resistant seeds, and numerous other innovations especially after the fifteenth century. These events increased the uniformity of yields within a village, reducing the benefits of scattering. The widespread consolidations of the seventeenth and the eighteenth centuries, for instance, coincided with the innovations of red-stalked wheat, early ripening barley, floating meadows as well as improved transportation.[9]

There were of course other factors, such as the transaction costs, contributing to differences in organizational structures across time and regions, which have been examined by others.[10] As I have argued at the beginning, however, these explanations have typically not considered the symmetry between the two parts of the organization. In order to explain the risk-sharing properties of this organization of medieval agriculture, it is essential to understand how scattering and manorial relationships worked together. The guiding principle in offering such an explanation here has been to examine the implications of risk aversion by the lords and peasants for the allocation of land and labour under the given conditions of medieval agriculture.

[9] See McCloskey (1976), pp. 128-30.

[10] See, for example, North and Thomas (1971), Dahlman (1980), and Fenoaltea (1975, 1988).

REFERENCES

BAKER, ALAN R.H. and ROBIN A. BUTLIN, eds. (1973) - *Studies of Field Systems in the British Isles.* Cambridge: Cambridge University Press.

COSGEL, METIN M. (1990) - "Scattering and Contracts in Medieval Agriculture: Challenges Ahead", *Journal of Economic History,* 50(3), pp. 663-68.

DAHLMAN, CARL J. (1980) - *The Open Field System and Beyond.* Cambridge: Cambridge University Press.

FENOALTEA, STEFANO (1975) - "Authority, Efficiency, and Agricultural Organization in Medieval England and Beyond: A Hypothesis", *Journal of Economic History,* 35(4), pp. 693-718.

FENOALTEA, STEFANO (1988) - "Transaction Costs, Whig History, and the Common Fields", *Politics and Society,* pp. 171-240.

KOSMINSKY, E.A. (1956) - *Studies in the Agrarian History of England.* Oxford: Basil Blackwell.

MAITLAND, FREDERICK (1897) - *Domesday Book and Beyond.* Cambridge: Cambridge University Press.

MCCLOSKEY, DONALD N. (1976) - "English Open Fields as Behavior toward Risk", in P. Uselding, ed. *Research in Economic History,* vol. 1, pp. 124-170.

MCCLOSKEY, DONALD N. and JOHN NASH (1984) - "Corn at Interest: The Extent and Cost of Grain Storage in Medieval England", *American Economic Review,* 74(1), pp. 174-187.

NEILSEN, NELLIE (1929) - "English Manorial Forms", *American Historical Review,* pp. 725-739.

NEWBERY, DAVID M.G. (1977) - "Risk Sharing, Sharecropping and Uncertain Labor Markets", *Review of Economic Studies.* (44) pp. 585-94.

NORTH, DOUGLASS C. AND THOMAS, ROBERT P. (1971) - "The Rise and Fall of the Manorial System: A Theoretical Model", *Journal of Economic History,* 31(4), pp. 777-803.

ORWIN, C. STEWART and C. ORWIN (1938) - *The Open Fields.* Oxford: Clarendon Press.

POSTAN, MICHAEL M. (1966) - "Medieval Agrarian Society in Its Prime: 7. England", in M. Postan, ed. *The Cambridge Economic History of Europe,* vol. 1, Second ed., pp. 548-632.

QUIGGIN, JOHN (1988) - "Scattered Landholdings in Common Property Systems", *Journal of Economic Behavior and Organization.* (9) pp. 187-201.

REID, JOSEPH (1976) - "Sharecropping and Agricusltural Uncertainty", *Economic Development and Cultural Change.* (24) pp. 549-76.

SEEBOHM, FREDERIC (1883) - *The English Village Community Examined in its Relations to the Manorial and Tribal Systems and to the Common or Open Field System of Husbandry: An Essay in Economic History.* London: Longmans, Green.

STIGLITZ, JOSEPH E. (1974) - "Incentives and Risk Sharing in Sharecropping", *Review of Economic Studies.* (41) pp. 219-56.

VINOGRADOFF, PAUL (1892) - *Villainage in England: Essays in Medieval History,* Oxford: Clarendon Press.