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A Debate on Tuscans and Their Farms

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Tuscans and Their Farms

I

For over two centuries, the debate on the merits and drawbacks of Tuscan sharecropping (*mezzadria*) has raged from political tribunes and in the pages of scholarly journals. In a recent, trenchant article, Francesco Galassi[1] tries to dispel the fog surrounding the issue by applying recent developments in the economic theory of sharecropping to answer the question, Why was share tenancy adopted in the first place? That is, why was it preferred during the fourteenth and fifteenth centuries over other, available forms of contract such as fixed rent or wage labour?

The answer is important, he suggests, because if we can provide a clear micro-economic rationale for the *origins* of *mezzadria*, we will also be closer to understanding the reasons for its *survival* up to the 1950s; appeals to entrepreneurial failure, "feudal reactions" or "feudal residues" commonly found in the literature are rightly stigmatized for begging all the relevant questions (FG, p. 78). Galassi thus seems to be making a claim common to neo-institutionalist literature, that *mezzadria*'s survival is also proof of its optimality. Although this theme is not pursued any further in the body of the article, it appears again briefly in its conclusions; and we will see that in fact the issue of optimality is critical also to Galassi's main argument.

This note is structured as follows. Section II summarizes Galassi's argument; section III raises some criticisms of the argument as it stands; in section IV I make some tentative and I hope constructive alternative suggestions; and section V draws some brief conclusions. As will become clear from what follows, any doubts I have concern not Galassi's method[2] but his conclusions.

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II

In order to explain sharecropping's diffusion, one must be able to show that it was preferable to available alternatives. Galassi applies this test to current explanations of the rise of Tuscan sharecropping and finds them all lacking. He lists five such explanations, which I summarize briefly together with Galassi's criticisms.

1. Share tenure guaranteed the control of a stable labour force. FG: wage labour would have provided the landlord with greater control; and it is unclear how landlords could control sharecroppers.

2. Share tenure protected capital investments. FG: share tenants had no incentive to maintain invested capital, since none of the gains accrued to them (presumably because of the short duration of the contract).

3. Share tenure created incentives to increase productivity, i.e. to increase labour or capital inputs. FG: this argument fits strangely with the standard criticism of sharecropping, that it provides an incentive to *undersupply* labour or capital because the tenant is rewarded with only a fraction of his marginal product.

4. Share tenancy permitted risk sharing. FG: the risk reducing advantages of share tenure could have been gained more efficiently through an apposite mix of fixed rent and wage contracts. Tuscan landlords, moreover, "were as a rule rich merchants," and hence could insure themselves against crop failure by spreading their portfolio widely.

5. Share tenancy gave tenants access to capital. FG: evidence on ownership of draught oxen from the 1427-30 *Catasto* (land register) suggests that sharecroppers, albeit less well provided than peasant proprietors and leaseholders, were not entirely lacking in working capital of their own.

Having disposed of these arguments, Galassi then proceeds to give his own explanation: sharecropping was a rational response to two problems, monitoring and uncertaint–in short, imperfect information. Although taken by themselves, neither monitoring costs nor output uncertainty would provide a clear rationale for choosing share tenure over available alternatives, Galassi suggests that "these problems on balance favored the diffusion of share contracts" (FG, p. 81).

Urban landlords faced high monitoring costs because they would have had to leave their business and travel to the countryside in order to supervise labour; they were also more likely to be unskilled, hence inefficient farm-supervisors. Wage labour, in which monitoring costs accrued entirely to the landlord, would therefore most probably be avoided if distances to be travelled were high. Alternatively, the landlord could hire a supervisor and pay him out of the marginal product gained from reduced shirking; this only occurred eventually by the seventeenth century (FG, p. 81, n. 21).

Given high travel distances from their residence and the lack of institutions to lower monitoring costs, landlords had to opt for share tenure or for fixed rent. Both contracts provide incentives against shirking, because the tenant's income is directly tied to the amount and quality of input; however, monitoring costs are lower with fixed rent than with sharecropping, because in the former case tenant gains the entire marginal product of his labour rather than just a share of it, and therefore tends to work harder. Hence, high monitoring costs may explain why wage labour was *not* commonly adopted, but they do not explain why sharecropping *was* preferred over fixed rents, since the latter would have been more efficient for both landlord and tenant.

The reason why landlords nonetheless chose share tenancy over fixed rent lies for Galassi in the character of Tuscan (indeed, Mediterranean) agriculture. This is the widespread cultivation of high-value, high-risk crops such as vines and olive trees, whose biological features and "large random element in actual outcomes" make it particularly hard for landlords to link output to input and hence to monitor the tenant's effort (FG, p. 82). Once more, the problem could best be solved by using wage labour, which however raised the monitoring problems detailed above. The next best solution was therefore to provide the tenant with adequate incentives to perform his duties competently, either through fixed rent or share tenure. We might assume that the optimal solution would again be to lease the land for a fixed rent. Not so, argues Galassi: "because the risk of loss was substantial, both in foregone rental payments if tenants defaulted and in damages to grape vines and olive trees on the farm, fixed rent contracts did not effectively diminish the landlords' need to monitor." In addition, "fixed rent contracts ... forced landlords to forego all income from their property above the opportunity cost of land." Hence, landlords preferred sharecropping over fixed rent.

In the balance, therefore, the contrasting pressure of high monitoring costs and high risk made Tuscan landlords opt for

sharecropping over rent and wage labour. What of the peasantry? Here, Galassi takes us from principal-agent analysis to another strand in the economic theory of sharecropping, which emphasizes its risk-reducing features in the presence of inefficient or absent credit markets. Since fixed rent shoulders the tenant with the entire burden of variations in output, there has to be a way of reducing the risk of a bad year. An adequate agricultural futures market would have solved this problem, as tenants could have borrowed in bad years against future harvests: "but credit for small farmers at the time in Tuscany was simply not available" (FG, p. 83). The lack of developed credit markets thus made share tenure attractive to risk-averse peasants.

In conclusion, Galassi's model makes two clear predictions. Firstly, as monitoring costs increased with the landlord's distance from the unit of land, fixed rent would be preferred over share tenancy, and share tenancy over wage contracts. Secondly, as the moral hazard (risk) involved in high-value crops increased, wage labour would be preferred over share tenure, and share tenure over fixed rent. Galassi tests these predictions with a logit analysis of data from the *Catasto* of 1427-30, which registered all the property held by Florentines and individuals of subject cities and territories for tax purposes; the data consists of 12 points, based on an analysis of land tenure in 12 parishes published by Conti in 1965. Galassi's proxies for measuring monitoring costs and problems of moral hazard are respectively the distance between the landlord's residence and his property, and the presence of vineyards and olive trees on the property itself.[7]

The results appear to fit the model's predictions: as distance between the landlord's place of residence and his property (monitoring costs) increased, there was an increasing likelihood that a share tenure or fixed rent contract would be chosen; on the other hand, the higher the proportion of olives and grapes in the total crop, therefore the higher the risk of damage or loss, the greater the likelihood that wage contracts would prevail over sharecropping and rent.

If *mezzadria* emerged in response to moral hazard and high monitoring costs, why did it survive for so long? The answer follows directly from the model itself: had there been a well developed credit market and institutions that lowered monitoring costs efficiently, *mezzadria* would have disappeared. Thus, within existing constraints, sharecropping "provided a reasonably efficient solution to the problems of Tuscan agriculture:

poor credit, poor insurance, high uncertainty, costly monitoring. It was a symptom more than a disease" (FG, p. 89).

III

Although I have tried to represent accurately and, I hope, fairly Galassi's position, the preceding outline suggests a number of objections; and there are also some problems with the evidence adduced. I list these points below more or less at random.

1. The distinction made between "monitoring" and "moral hazard" costs seems nominalist and of little analytical use. Ensuring that one's high-value crops are being competently cultivated is merely a specific instance of the more general monitoring problems Galassi refers to as his first necessary cause of share tenure. Hence, the same criteria apply to the problem of "moral hazard" as to that of "monitoring" in determining the contract that will provide the tenant with the best set of incentives. Thus, once we exclude wage contracts, the most efficient contract to cope with moral hazard is clearly fixed rent, rather than sharecropping as Galassi argues.

2. Galassi argues that sharecropping should be preferred over fixed rent for the cultivation of vines and olive trees because "fixed rent contracts ... forced landlords to forego all income from their property above the opportunity cost of land" (FG, p. 82). Since this is by definition what fixed rent "forces" landlords to do, I interpret Galassi as arguing that fixed rent was less profitable than sharecropping. However, there seem to be no theoretical or empirical reasons for believing this. If sharecropping was always more profitable than fixed rent, we would no longer have to explain its diffusion (or rather, we would have to explain the survival and spread of fixed rent);[8] a number of scattered data suggests in fact (as indeed is usually though not always the case) that in the late Middle Ages the opposite was true, i.e. that fixed rent was more profitable than share tenancy.[9]

3. The problem Tuscan landlords allegedly solved with share tenancy is the high risk involved in growing vines and olive trees (FG, p. 82). However, we are also told that sharecropping was *not* a risk-sharing device for landlords because they could diversify their portfolio sufficiently to hedge against risk (FG, pp. 80-81). If the latter is correct, the "moral hazard" argument seems to fall. Which is right?

4. Share tenure raised a moral hazard problem which Galas-

si does not mention, namely the fair division of the final output. Given the latter's high variability, fair sharing was extremely difficult to monitor. Since fixed rent avoided this problem and at the same time provided the most efficient incentives for labour input, the choice of sharecropping over fixed rent seems even harder to explain in terms of reduced monitoring costs.

5. Galassi's statistical results do not support his model. Rather than demonstrating the superiority of share tenure over fixed rent in relation to the proportion of vines and olive trees (the "cropmix" variable of the logit model), the two coefficients are virtually identical. As Galassi himself notes (FG, p. 94 n. 49), an attempt to estimate the relative probability of sharecropping and fixed rent produces insignificant coefficients. In other words, the model's predictions are entirely *indifferent* as to whether share tenancy or fixed rent would be adopted given a high quota of vines and olive trees. The result suggests either that the 12-point sample is too small (but Galassi defends himself on this issue (FG, p. 87)), or that the model is misspecified.

6. We are told that Tuscan sharecroppers were forced by insufficiently developed credit markets to enter into interlinking contracts with landlords, who thus provided them with the necessary credit for working capital and consumption (FG, p. 83). Yet there is evidence that fully developed and quite sophisticated credit markets existed already from the beginning of the thirteenth century. Indeed, the very data quoted in support of the (somewhat incongruous, as we shall see) view that a large proportion of sharecroppers was provided with working capital, also shows that holding draught animals in leasehold was common practice, particularly among share tenants. On the other hand, the argument that sharecroppers "were not entirely without working capital of their own" (FG, p. 79) seems to be based on a misunderstanding of the data; the figures show that sharecroppers had only a 20.9 per cent chance to own their own working animals compared to leaseholders (40.6 per cent) and peasant proprietors (48.4). These facts suggest that the problem was not that credit was unavailable, but that it was largely unavailable to (poor) *sharecroppers*, who therefore had to resort to credit from their landlord.

7. Galassi's view that *mezzadria* was adopted because it saved on monitoring costs (albeit less efficiently than fixed rent contracts) follows a well-established argument in the theoretical literature. There is, however, at least one well-known example in late medieval Tuscany to which the theory does not apply. During the late fourteenth and fifteenth centuries, the single largest Tuscan landholder, the hospital of Santa Maria della Scala in Siena, established a series of integrated granges (*grance*) each of which included up to 35 farms; the total number of such farms came to over 200. The *grance* were administered by members of the hospital; although supervisors rotated every few years in the smaller granges, at the larger ones supervisors stayed on for many years and sometimes decades. Thus, a specialized core of highly knowledgeable administrators emerged to oversee the hospital's property. The strategy pursued from the start at these granges was to establish compact, self-sufficient units, known as *poderi*, which were then leased on share tenancy contracts. In the friars' minds, the capacity to monitor their labourers seems to have provided an incentive, rather than a hindrance, to allocate their *poderi* to sharecroppers.

IV

Thus, although Galassi seems in the end to come round to some of the explanations he criticizes in terms of risk-sharing and imperfect capital markets, his own explanation does not convince. What alternatives can we offer?

The first point to be made is that Galassi's question seems to be imprecisely posed. For surely, given that share tenancy had existed in Tuscany since the ninth century at least, the issue at the heart of the debate is not, Why were share tenures chosen?, but rather, Why were the large (from 5 to over 30 hectares according to location), self-contained, allegedly highly productive agricultural farms in Tuscany–the so-called *poderi*, first formed during the late fourteenth and fifteenth centuries at the height of the demographic depression–in the vast majority of cases leased out to sharecroppers? (It is, in fact, far from clear from Galassi's article that it is *mezzadria poderale* that makes Tuscan sharecropping distinctive, not share tenure by itself.)

Given Galassi's point that excessive monitoring costs made it infeasible to run distant landholdings (as *poderi* usually were) with wage labour, the preceding discussion has also shown that, *ceteris paribus*, fixed rent contracts provided better incentives for the tenant's self-monitoring than did share tenure, *even with high risk crops like vines and olive trees*. We have also seen that existing credit markets made it feasible for peasants to borrow against future harvests in bad years, thus reducing the uncertainty of output associated with fixed rents. Thus, from *both*

the landlords' and the peasants' side, there was every interest to lease the *poderi* on a fixed rent basis. Why did this not occur?

It is very probable (direct evidence for this is lacking) that access to the credit market was restricted to the better-off peasants, in other words to those provided with collateral. If poorer peasants lacking collateral as surety were simply rationed out of the credit market,[18] it would explain why they were forced to accept interlinked loans from their landlords.[19] However, credit market rationing does *not* explain the well known fact that sharecroppers were drawn overwhelmingly from the poorer sections of the rural population;[20] or to put it slightly differently, it does not explain why landlords leased their *poderi* in share tenure to the poorest peasants, to whom they then proceeded to advance considerable sums of capital often at a net loss.[21]

Initially at any rate, it was not in the landlords' interest to do so.[22] Rather, it was in the landlords' interest to grant fixed rent contracts to wealthy peasants with collateral, whose productivity would almost certainly be higher than that of poorer tenants.[23] So why did this not occur?

Briefly put, I suggest that at least part of the answer lies in the characteristics of the labour supply in this period. There were two sides to this problem. Firstly, the central areas of Tuscany–around Florence and in the Valdarno–and elsewhere where sharecropping spread most successfully coincided with the urban *contado*, the area under direct city jurisdiction; this contrasted with the more distant and more loosely administered areas, which by the time of the *Catasto* had become integrated into what was known as Florence's *distretto* and where peasant property remained quite strong. A variety of evidence, including the acquisition by urban landholders of vast amounts of peasant land, suggests that Florence's *contado* fared particularly badly between the Black Death and the early 1430s as a direct result of the city government's harsh tax policies.[24] By contrast, rural society in the more hilly and mountainous *distretto* was less impoverished, and peasants kept hold of their property. Thus, just as Florentine landlords were busy buying up property in the *contado* from indebted peasants in order to consolidate them into *poderi*, the local supply of risk-neutral (or less risk-averse), wealthier and more productive peasants was drying up.

The second problem with the labour supply was that peasant wealth was, for obvious reasons, tied up in land which the peasant household cultivated itself. Labour supply from better-off peasant households was therefore restricted, and was certainly

insufficient to cultivate the kind of large, self-contained farm that the *podere* was becoming.[25] One might suggest that the landlord could choose *not* to integrate the separate units of land into a single *podere*, but rather lease them each individually at a fixed rent, thereby raising marginal income per unit. In fact, the considerable transactions costs involved in negotiating large numbers of rental contracts with tenants, and the increasing (up to a point) economies of scale involved in consolidating the *podere*, provided compelling reasons for leasing out the landholding as a single unit.[26]

Landlords were as a consequence faced with a dilemma: they had large amounts of land to lease, preferably as a combined unit; yet the most attractive tenants either resided at a great distance or were unable to provide the requisite labour input for a *podere*. There *were* available, however, comparatively large numbers of poor, generally landless peasants. To these risk-averse, un-creditworthy tenants the landlord was forced to offer a lease which reduced their degree of risk and provided interlinked credit.

For landlords, in other words, sharecropping was second-best choice. Yet they did not lose out entirely. On the one hand, interlocking markets provided them with an additional means of sanction against shirking;[27] perhaps more usefully, the tenant could also be made to repay his debt by providing additional labour at less than the going wage rate.[28] On the other hand, landlords now had an incentive to manipulate the labour-land ratio on the *podere* in such a way that the tenant's household would have to provide a maximum labour input in order to break even. The landlords could do this either by varying the size of the holding to suit the size and composition of the tenant's family, or by varying the latter with respect to a fixed size of landholding;[29] and there is evidence to suggest that manipulate it they did. For example, selection by landlords of the size of the tenants' household could well explain why the average size of sharecroppers' households in 1427-30 was larger than that of independent peasants and leaseholders, despite the fact that the relation between wealth and household was generally the opposite one (poorer peasant households were smaller, hence one would expect sharecroppers to have small families).[30] At the same time, the fact that it was against the landlord's interest that the sharecropper have large numbers of non-working dependents[31] may explain why, when population began to recover in Tuscany in the 1450s and '60s, growth rates were lower in the

central areas dominated by sharecropping than in the more peripheral, peasant owner-dominated territories.

These hypotheses also point to a different conclusion from Galassi's about the relative optimality of *mezzadria poderale* and its survival in the long run. It will be clear from what I have suggested above that I believe that share tenure was suboptimal from the start. It screened out the wealthier, more able and less risk-averse peasants while attracting the poorer members of the peasantry; it provided incentives for landlords to maintain control over the labour-land ratio on the farm in such a way that would keep sharecroppers virtually at a level of subsistence. The same set of incentives to increase the intensity of labour on the farm meant that it was in the landlord's interest to make the *podere* as self-sufficient as possible: the goal of self-sufficiency that is so much a part of élite Tuscan discourse on sharecropping in this period was not the initial purpose of *mezzadria poderale*, but it became a common corollary; that goal in turn hindered the process of local and regional specialization that was taking place in different degrees throughout late medieval Europe.

V

Although monitoring costs were an important influence on the choice of contract, I have argued here that they are not sufficient in explaining the emergence or persistence of *mezzadria poderale* itself. In particular, a future model will have to take more account of prevailing conditions on the labour market, the wealth of the tenant, and the size of landholding. The main difference of opinion with Francesco Galassi, however, rests on whether *mezzadria poderale* was in some sense "optimal" within the given set of constraints. While we agree that it was individually rational to pursue the course that was pursued, I have suggested that the outcome was far from socially optimal. Rather however than laying the blaim on "exogenous" factors like the imperfect nature of the credit market, I have suggested that the root cause of the rise of *mezzadria* was the fiscal policy pursued by the Florentine government, which drew its political support from those same landlords who were forced in another guise to put up with inadequate tenants.

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1 F. Galassi, "Tuscans and Their Farms: The Economics of Share Tenancy in Fifteenth Century Florence," *Rivista di storia economica*, n.s., 9 (1992), pp. 77-94 (henceforward FG).

2 About which see M. Cattini, "Questione di sguardo," *Rivista di storia economica*, n.s., 9 (1992), pp. 26-27; and Galassi's reply, "Questioni di sguardo e questioni di pensiero," ibid., 10 (1993), pp. 113-18.

3 Tenant shirking was in fact one of the main themes of the so-called *satira del villano*, a literary genre much in vogue in late medieval and Renaissance Tuscany. See G. Cherubini, "Le campagne italiane dall'XI al XV secolo," in O. Capitani et al., *Comuni e signorie: istituzioni, società e lotte per l'egemonia* (Turin, 1981), pp. 431-39.

4 Besides the references quoted in FG, p. 92, n. 21, see D. M. G. Newbery and J. E. Stiglitz, "Sharecropping, Risk-Sharing, and the Importance of Imperfect Information," in J. A. Roumasset, J. M. Boussard, and I. Singh, eds., *Risk, Uncertainty, and Agricultural Development* (New York, 1979). This argument is conditional on there being no additional inefficiencies with wage or fixed rent contracts alone.

5 In Galassi's sample of 12 parishes (FG, p. 85), only about 30 per cent of urban landlords seem to have been members of the petty bourgeoisie.

6 Although Galassi does not mention this, high-value, labour-intensive crops of the kind he describes expanded after the onset of the Black Death of 1348 (G. Pinto, *La Toscana nel tardo medio evo. Ambiente, economia rurale, società*, Florence, 1982, pp. 152, 178, 186-92), in seeming correlation with the more widespread adoption of sharecropping.

7 The statistical methods and proxies are identical to those used by P. T. Hoffman, "The Economic Theory of Sharecropping in Early Modern France," *Journal of Economic History*, 44 (1984), pp. 309-19.

8 This is also argued by ibid., pp. 314-15.

9 Pinto, *Toscana*, pp. 286 n. 145, 299-300; P. Cammarosano, "Le campagne senesi dalla fine del secolo XII agli inizi del Trecento: dinamica interna e forme del dominio cittadino," in *Contadini e proprietari nella Toscana moderna. Atti del Convegno di studi in onore di Giorgio Giorgetti, 1. Dal Medioevo all'età moderna* (Florence, 1979), pp. 173 n. 35, 180-81; L. A. Kotel'nikova, "L'evoluzione della rendita fondiaria in Toscana sulle terre dei cittadini e della Chiesa (secoli XIV-XV)," *Società e storia*, 7 (1984), pp. 1-43; S. R. Epstein, *Alle origini della fattoria toscana. L'ospedale di S. Maria della Scala di Siena e le sue terre (c. 1250 - c. 1450)* (Florence, 1986), p. 173.

10 This was a common complaint against sharecroppers in the literature of the period (D. Herlihy, "Population, Plague and Social Change in Rural Pistoia, 1201-1430," *Economic History Review*, 2nd ser., 18, 1965, pp. 243-44). A real life example in Epstein, *Alle origini*, p. 173, n. 66.

11 D. Herlihy, "Population," pp. 239-40: Pistoiese peasants in need of capital sold perpetual rents on their lands from at least 1200-10. The question of Tuscan agricultural credit markets has never been studied in depth; most analysis has been concerned with the impact of urban "usury" on the rural landmarket. See A. Sapori, "I mutui dei mercanti fiorentini del Trecento e l'incremento della proprietà fondiaria," in A. Sapori, *Studi di storia economica (secoli XIII-XIV-XV)* (Florence, 1955-67), vol. 1, pp. 191-221; E. Fiumi, "L'attività usuraria dei mercanti sangimignanesi nell'età comunale," *Archivio storico italiano*, 119 (1961), pp. 145-62; G. Pinto, "Aspetti dell'indebitamento e della crisi della proprietà contadina," in Pinto, *Toscana*, pp. 207-23.

12 D. Herlihy and C. Klapisch-Zuber, *Les Toscans et leurs familles. Une étude du Catasto florentin de 1427* (Paris, 1978), p. 276, table 33. The data underestimates the proportion of oxen held in lease, because the *Catasto* seldom lists the reasons for cash loans to tenants (which were often used to buy draught animals).

13 By excluding all cases in which ownership or leasehold was not mentioned, FG, p. 79, n. 13 suggests that share tenants owned their own oxen in 59.0 per cent of known cases. However, Herlihy and Klapisch-Zuber, *Toscans*, pp. 276-77 make it very clear that peasant ownership was *always* mentioned by the *Catasto*; the category "no mention" in their table therefore refers only to cases of undeclared leasehold or in which no oxen were present at all. Hence, the proportion of peasant ownership of draught

animals has to be measured against total numbers of declarations *including* the "no mention" cases, which gives us the quoted 20.9 per cent.

[14] See N. Singh, "Theories of Sharecropping," in P. Bardhan, ed., *The Economic Theory of Agrarian Institutions* (Oxford, 1989), pp. 33-72.

[15] Epstein, *Alle origini*, chs. 4, 9. Rather than being cultivated with wage labour, large-scale vineyards next to the granges were apportioned out among the share tenants so that each had approximately 0.5 hectares, enough to provide for a household's average consumption.

[16] I. Imberciadori, *Mezzadria classica toscana con documentazione inedita dal IX al XIV secolo* (Florence, 1951).

[17] Herlihy and Klapisch-Zuber, *Toscans*, p. 269.

[18] The view that possession of collateral was a critical factor in determining access to the credit market finds support in the correspondence between the approximately one quarter of sharecroppers who owned some land (ibid., p. 274) and the 35.4 per cent of them who either owned or leased their draught animals in 1427-30 (ibid., p. 276).

[19] Interlinking would also reduce the moral hazard faced by peasants who had to buy draught animals on the open market, where there was a severe risk of acquiring a low quality "lemon."

[20] Herlihy and Klapisch-Zuber, *Toscans*, p. 288, fig. 9.

[21] Default rates among sharecroppers in this period were extremely high. See ibid., p. 278: the wealthiest man in Florence at the time of the *Catasto*, Palla di Nofri Strozzi, declares that he has written off c. 3200 florins (the price of 8-9 *poderi*) as bad debt from his sharecroppers. The Florentine tax administration automatically considered loans to sharecroppers as losses, which could therefore not be used to claim a tax rebate (ibid., p. 262).

[22] Debt bondage may have been the outcome of the process, but it was not the initiating cause.

[23] Singh, "Theories," pp. 52, 56: wealthier tenants would tend to choose fixed rent over sharecropping because of the former's greater incentives; more able tenants would do the same. G. Piccinni, *"Seminare, fruttare, raccogliere." Mezzadri e salariati sulle terre di Monte Oliveto Maggiore (1374-1430)* (Milan, 1982), pp. 59-67 shows how poorer tenants faced a higher rate of depreciation of their draught stock; see also Herlihy and Klapisch-Zuber, *Toscans*, p. 263, n. 37 on overuse of draught animals.

[24] S. R. Epstein, "Stato territoriale ed economia regionale nella Toscana del Quattrocento," in R. Fubini, ed., *La Toscana al tempo di Lorenzo il Magnifico. Politica Economia Cultura Arte* (Pisa, 1994).

[25] This can help explain why sharecropping appears to have been inversely related to the presence of peasant property. Sharecropping was weak in the peripheral areas of the Florentine state, and in the present provinces of Pisa and Arezzo, the Valdinievole and the Montagne Pistoiesi (Herlihy and Klapisch-Zuber, *Toscans*, p. 285, map 6).

[26] There may have been further, subsidiary reasons for developing a self-sufficient homestead, detached (as most became) from local village life. A fourteenth-century Tuscan social commentator advised landlords to visit their tenants on a week-day and on their farms, rather than on a weekend at the village, for otherwise the bargaining positions would be all in the tenant's favour; his friends would side with him and obtain far better conditions than if he had been alone (Paolo da Certaldo, *Libro di buoni costumi*, ed. by A. Schiaffini, (Florence, 1945) pp. 91-92).

[27] C. Bell, "A Comparison of Principal-Agent and Bargaining Solutions: The Case of Tenancy Contracts," in Bardhan, ed., *Economic Theory*, p. 88.

[28] Piccinni, *"Seminare,"* ch. 5.

[29] R. Pertev, "A New Model for Sharecropping and Peasant Holdings," *Journal of Peasant Studies*, 14 (1986), pp. 27-49. This is conditional on the peasant household not having alternative means to earn a subsistence income. D. G. Jaynes has also argued (in "Production and Distribution in Agrarian Economies," *Oxford Economic Papers*, 34, 1982, pp. 346-67 and "Economic Theory and Land Tenure," in H. Binswanger and M. R. Rosenzweig, eds., *Contractual Arrangements, Employment, and Wages in Rural Labour Markets in Asia*, New Haven, 1984), that a landlord faced with a given share would always wish to increase the labour-land ratio until the marginal product of labour falls to zero. This is conditional on the share rate being set exogenously rather than by the landlord, which on all accounts in late medieval Tuscany it was. See also

G. Giorgetti, *Contadini e proprietari nell'Italia moderna. Rapporti di produzione e contratti agrari dal secolo XVI a oggi*, 2nd rev. ed. (Turin, 1974), p. 61.

[30] Herlihy and Klapisch-Zuber, *Toscans*, pp. 478-79.

[31] Pertev, "New Model," p. 30.

[32] Herlihy and Klapisch-Zuber, *Toscans*, p. 77; C. Klapisch-Zuber, *Una carta del popolamento toscano negli anni 1427-1430* (Milan, 1983), p. 18.

[33] Self-monitoring through control of labour-land ratios was a far more efficient tool against shirking than the application of external sanctions; neither eviction nor monetary penalties were of much effect at a time of high labour scarcity and faced with propertyless peasants.

[34] Pinto, *Toscana*, pp. 162-63.

[35] Epstein, "Stato territoriale"; S. R. Epstein, "Cities, Regions and the Late Medieval Crisis: Sicily and Tuscany Compared," *Past and Present*, 130 (1991), pp. 3-50.

[36] Note that the greater probability of finding wage contracts closer to Florence can also be explained in terms of a greater elasticity of supply of labour next to the city. See FG, p. 93, n. 35.

FRANCESCO L. GALASSI

Tuscans and Their Farms: A Rejoinder

I

S. R. Epstein's critique[1] of my article on fifteenth-century Tuscan sharecropping is remarkable for the care and thought he has put into following my argument and examining it in detail. Where he disagrees with my analysis he is clear and to-the-point in explaining why he finds my argument or my evidence less than compelling, thus setting the stage for what I hope will be a fruitful exchange.

In this rejoinder I want to focus first on the specific criticisms Epstein lists in his piece, and answer them in the same order in which he has raised them (section II). In section III I will address his alternative suggestions. Section IV will offer a conclusion.

II

In examining Epstein's critique to my work, the underlying issue is not, as he claims, the optimality of sharecontracts. I make no claim as to the optimality of sharecropping in Tuscany, and certainly would not subscribe to the view that an institution's survival is also proof of its optimality. All I claimed is that sharecropping "provided a reasonably efficient solution to the problems of Tuscan agriculture,"[2] reasonably efficient in the sense that there appear to be no clear alternatives that would have solved the same problems. This does not make sharecropping optimal: it simply suggests that until a viable alternative is convincingly argued, we will be justified in thinking that share tenure was the least imperfect solution in a bounded choice set. As will become clear, I do not think Epstein has convincingly presented an alternative to share contracts, and in fact his arguments often end up supporting my position. It appears to me that in fact the underlying issue is a misunderstanding on Epstein's part on the issue of monitoring and moral hazard. But let me proceed with order in answering his criticisms (I will use the same numbers he does).

1. The distinction between monitoring and moral hazard, far from being "nominalist", carries great analytical importance, and is central to my argument. Epstein confuses the costliness of monitoring, which in this case is the opportunity cost of the landlord's time (but may reflect other factors, as I discuss in point 7 below), with what Arrow[3] called *hidden action*, the possibility that an agent may be incompetent or dishonest. While costly monitoring can in some measure be solved by delegation, moral hazard is harder to deal with, and unless one has available a clear signal that faithfully and unambiguously allows him to determine what actions his agent has taken, moral hazard demands strict supervision. In fact, saying that "the same criteria apply to the problem of 'moral hazard' as to that of 'monitoring'" in determining the best contract reveal a profound mis-apprehension of the issue. If it had simply been a matter of more or less expensive monitoring of labour, landlords would, as Epstein points out, simply have resorted to fixed rent contracts. But the problem was more complex than that, because, as I wrote in the original article "fixed rent contracts did not effectively diminish the landlords' need to monitor"[4] because of the presence of delicate and labour-quality sensitive crops on the plot. These crops, we ought to remember, represented the landlord's investment, and a substantial one at that. Because there was no way, *ex post*, for the landlord to judge the quality and quantity of labour being applied by the tenant (and this is the moral hazard problem), fixed rent did not solve the problem of supervising labour, and thus was not preferable to sharecropping. Thus it is absolutely incorrect to say that "the most efficient contract to cope with moral hazard... [was] fixed rent":[5] in the conditions prevailing in Tuscany at the time, with large sums sunk into farms and trees, fixed rent was the worst contract to deal with moral hazard.

2. The same confusion shows up in Epstein's second criticism, where he quotes me as saying that fixed rent "forced landlords to forego all income above the opportunity cost of land," but omits the subsequent lines, which are "and [fixed rent] did not really solve the monitoring problem. Landlords thus had to find a way of resolving the moral hazard issue without incurring prohibitively high monitoring costs."[6] Nothing here suggests that in saying this I was making a general statement about the relative profitability of sharecropping and fixed rent contracts, which will obviously vary depending on circumstances. The rest of this criticism is to say the least puzzling: why should we believe that fixed rent is usually more profitable than sharecropping? There are no theoretical or empirical reasons for believing this, especially as the literature cited by Ep-

stein does not, as far as I can tell, calculate profitability *in relation to capital investments.*

3. Nowhere in my work is there anything that says that *landlords* solved risk problems with sharecropping. I do say that *tenants* found the risk-sharing element attractive.[7] Further, landlords could ensure themselves against risk by means of portfolio adjustments, but this in no way could solve the moral hazard problem, as Epstein appears to believe.

4. The problem of the fair sharing of output is an interesting one, and Epstein is right in pointing out that I failed to mention it. The removal of part of the harvest by sharecroppers before division with the landlord can be solved, as most moral hazard problems can, by stricter monitoring at harvest time. If monitoring was costly, landlords may have accepted some amount of theft as preferable. But fixed rent contracts did not solve this problem at all, or rather solved it only apparently by reducing year-to-year conflict over "small" thefts and then leaving the landlord open to large losses if the harvest failed and the tenant was unable to pay the rent. The point is simply that we do not know whether it was cheaper for a Tuscan landlord to suffer many small thefts over the years or one large default, and that therefore we have insufficient evidence to claim that this type of moral hazard favoured one or the other contractual arrangement.[8]

5. Epstein's point about the statistical results is valid, to a degree, and shows how carefully he has considered my work before criticising it. The problem is that the data on which I performed the logit analysis represent percentage distributions for the 12 parishes from the *Catasto* that Conti published almost 30 years ago.[9] The results are affected by the problems deriving from Conti's less-than-ideal presentation of the data, for instance that instead of reporting tenure system and crop mix farm by farm he simply reported parish-wide averages. Under these conditions, any statistical analysis is bound to give conflicting signals because of the strong "background noise" in the observations themselves. However, my regression analysis, and indeed my model, never claimed to show "the superiority of share tenure over fixed rent in relation to the proportion of vines and olive trees," as Epstein writes. On the contrary, I stated that moral hazard problems, proxied by the crop mix variable, make "share tenure... preferable to fixed rent, and wage labour preferable to share tenure."[10] This is exactly what my results do show: an increase in the share of wine and olive oil increases the probability of wage contracts being observed.[11]

So, while Epstein is right in pointing out that these results are not conclusive, there is no denying that they do accord with the model and they do show the importance of moral hazard issues in tenure choice.

6. On the issue of credit and interlinked transactions Epstein lumps together two quite different problems. In the first place, the case of "fully developed and quite sophisticated credit markets" he cites relates to *land-owning* peasants near Pistoia,[12] which really says nothing about whether in general landless Tuscan peasants had access to credit (and later in section III he recognizes this). Secondly, on the question of oxen, my point, which was not clearly expressed in my article, was that "linking" cannot account for the spreading of sharecropping in Tuscany because tenants did not have access to non-tradeable inputs, such as oxen, required by landlords.[13] For linking to explain sharecropping we must have some nontradeables in the hands of the tenants. If landlords had, as they did in Tuscany, land and oxen and capital, what need was there for them to have sharecroppers? The answer lies in monitoring/moral hazard issue, not in the linking aspect. On the other hand I accept Epstein's point that I misread Herlihy and Klapisch-Zuber's data on oxen, and counted too many share tenants as owning draft cattle. This fortunately strengthens my point that it was not interlinking that motivated share contracts.

7. Finally Epstein cites his own work on the sharecropped lands of the hospital of Santa Maria della Scala in Siena, lands managed by a "specialized core of highly skilled administrators," to show that it was not monitoring costs that explained share tenancy. And yet in the next few words Epstein goes on to give excellent evidence in support of my argument that monitoring mattered. He writes, "the hospital... established a series of integrated granges (*grance*) each of which included up to 35 farms." It is worth reflecting that, however competent and motivated an administrator, 35 farms, or even 20, are a large number to keep an eye on. In effect, each of these supervisors could devote his attention to any given farm for only about ten days each year, that is, less than once a month, assuming travel time was negligible and no religious holidays were observed, which is unlikely given the time period. This is prime evidence for the monitoring argument because it suggests that monitoring labourers was a problem even for these skilled professionals. The source of the difficulty in monitoring was different for them from what it was for my Florentine bankers or shopkeepers, but the end result was that costly monitoring once again gives rise to

share contracts. Epstein then goes further to offer evidence in favour of my argument and adds in footnote 15 "[r]ather than being cultivated with wage labour, large scale vineyards next to the granges were apportioned out among share tenants," which is exactly what my model would predict, that with costly monitoring, share tenancy provided an efficient way of dealing with the moral hazard problems posed by vineyards.

The main thrust of Epstein's criticisms is somewhat misdirected by his fundamental confusion between monitoring costs and moral hazard problems. In the next section I will show that, far from offering an alternative, his own version of the adoption of sharecropping in Tuscany is less than compelling.

III

Stripped to its essentials, I hope without mis-representing it, Epstein's argument is that what has to be explained is not sharecropping *per se* but rather why the self-contained farms known as *poderi* were leased out to sharecroppers. His answer is that the tax policies of the Florentine state brought about the indebtedness and disappearance of the better-off peasantry from the area immediately around Florence. As city-dwellers bought up the land, fiscal pressure was causing "the supply of risk-neutral..., wealthier and more productive peasants" to dry up. Landlords were thus left with "comparatively large numbers of poor, generally landless peasants. To these risk-averse, uncreditworthy tenants the landlord was forced to offer a lease which reduced their degree of risk and provided interlinked credit."[14]

Briefly, there are two points that I want to make about this approach. First, as Epstein himself points out, sharecropping had been in use in Tuscany long before the fifteenth century, and long before the consolidation of farms. Because sharecropping existed *before* landlords started consolidating their holdings into self-contained and more or less self-sufficient *poderi*, what has to be explained is *not* why *poderi* were leased to share tenants, but why sharetenancy set up an incentive to create *poderi*. The answer is simple, once we recall that sharecropping gives the tenant an incentive to undersupply labour. This forced landlords to introduce clauses that prevented tenants from working outside the plot and obliged the tenant to reside on the farm "with wife and children" as the contracts so often say."[15] Once these precautions were taken, the self-contained *podere* had to follow, but the *podere* is the consequence, not the cause, of sharecropping. If we explain sharecropping, we explain the *podere*.

Secondly, Epstein's argument that sharecropping was a second best solution landlords were "forced" to accept because the fiscal policy of Florence had ruined the "wealthier and more productive peasants" is not convincing. If the Florentine landowners had only poor, landless, risk-averse, un-creditworthy labourers to till their lands, what possible reason was there for sharecropping? Why not, instead, a wage contract, given that by Epstein's own account Florentine landowners already owned all complementary inputs? After all "poor, risk-averse, un-creditworthy" peasants surely would have been cheap in the market (and, as if to underscore this, Epstein at the very end of his essay describes them as "inadequate tenants"). But if the situation had been that simple, Tuscany would have become a land of wage earners, not sharecroppers.

As we know, however, wage contracts remained the exception in Tuscany for over 12 centuries, but there is nothing in Epstein's approach to explain why. I argue that the problem was, first, that wage workers have to be supervised, and monitoring is very costly for urban landlords: hence the rarity of wage contracts. Second, given that several important crops demanded large commitments of capital by the landlord, a fixed rent solution was unlikely. Fixed rent works fine when landlords contribute little more than the bare land, and all operating and fixed capital belongs to the tenant. But when the nature of the crop is such that it inevitably comes permanently attached to the soil (as opposed to temporarily growing on it, as in the case of annual grains), as vines and olive trees do, fixed rent does not solve the landlord's monitoring problem because it leaves his investment in the hands of potentially dishonest or just plain incompetent tenants. And yes, fixed rent would have given tenants all the right incentives and avoided sharecropping's inefficiencies, as Epstein points out, but with a shortcoming. Even with fixed rent, landlords still had to check up on their investments.

IV

To sum up, I cannot agree too strongly with Epstein when he writes in his conclusion that "[a]lthough monitoring costs were an important influence on the choice of contract..., they are not sufficient in explaining the emergence and persistence of *mez-*

zadria poderale." Indeed they are not, because if the only problem had been costly monitoring Tuscan landlords could have solved it with fixed rent contracts. What does explain *mezzadria* is that expensive monitoring was coupled with the distinct and quite serious problem of moral hazard.

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[1] S. R. Epstein, "Tuscans and Their Farms," pp. 1-13.

[2] F. L. Galassi, "Tuscans and Their Farms: The Economics of Share Tenancy in Fifteenth Century Florence," *Rivista di storia economica*, n.s., 9 (1992), p. 89.

[3] K. J. Arrow, "The Economics of Agency," in J. W. Pratt and R. Zeckhauser, eds., *Agency: The Structure of Business* (Cambridge, Mass, 1985).

[4] Galassi, "Tuscans," p. 82.

[5] Epstein, "Tuscans," p. 5.

[6] Galassi, "Tuscans," p. 82.

[7] Ibid., p. 83. This is confirmed in P. Cammarosano, "Le campagne senesi dalla fine del secolo XII agli inizi del Trecento: dinamica interna e forme del dominio cittadino," in *Contadini e proprietari nella Toscana moderna. Atti del Convegno di studi in onore di Giorgio Giorgetti. 1. Dal Medioevo all'età moderna* (Florence, 1979), p. 173, n. 35.

[8] The transaction costs characteristics of sharecontracts are well analysed in P. Murrel, "The Economics of Sharing: A Transactions Cost Analysis of Contractual Choice in Farming," *Bell Journal of Economics*, 14 (1983).

[9] E. Conti, *La formazione della struttura agraria moderna nel contado fiorentino* (Rome, 1965), vol. 3, part 2.

[10] Galassi, "Tuscans," p. 83.

[11] Ibid., pp. 87 and 94.

[12] D. Herlihy, "Population, Plague and Social Change in Rural Pistoia, 1201-1430," *Economic History Review*, 2nd ser., 18 (1965), pp. 239-40. Epstein himself is however forced to admit that the sophisticated credit market was really an urban phenomenon (Epstein, "Tuscans," p. 11, n. 11), exactly as I had written in my original article (p. 93, n. 33).

[13] See on this I. Imberciadori's comment in *Contadini e proprietari nella Toscana moderna*, p. 545.

[14] Epstein, "Tuscans,", p. 9.

[15] A large number of share contracts from the 800s to the 1500s have been collected and published. Beside I. Imberciadori's *Mezzadria classica toscana con documentazione inedita dal IX al XIV secolo* (Florence, 1951), recent collections include G. Pinto and P. Pirillo, eds., *Il contratto di mezzadria nella Toscana medievale*. I. *Contado di Siena, sec. XIII-1348* (Florence, 1987), O. Muzzi and M. D. Nenci, eds., *Il contratto di mezzadria nella Toscana medievale*. II. *Contado di Firenze, secolo XIII* (Florence, 1988), and G. Piccinni, ed., *Il contratto di mezzadria nella Toscana medievale*. III. *Contado di Siena, 1349-1518* (Florence, 1992).

S. R. EPSTEIN

Moral Hazard and Risk Sharing in Late Medieval Tuscany

I

Francesco Galassi's rejoinder helps clarify some of our differences in interpretation, but still skirts the main points at issue. On the one hand, he reiterates but does not explain his original statements about the relative efficiency of sharecropping, and fails convincingly to address the inconsistencies in his empirical evidence; on the other, he adduces evidence from me about developed credit markets from the thirteenth century and specialized overseeing of sharecroppers from the fourteenth century as proof of his own arguments, despite the fact that this evidence directly contradicts his original explanation for the long run survival of sharecropping.[1]

At the heart of our disagreement are two clear-cut issues: firstly, the relative efficiency of a fixed rent versus a sharecropping contract in dealing with problems of monitoring and moral hazard; and secondly, the extent to which Galassi's and other empirical evidence conforms to his theoretical predictions. I address these in turn.

II

Galassi's rejoinder reiterates his original argument that Tuscan landlords faced a *combination* of two distinct problems: *a*) the opportunity costs of monitoring labour input, and *b*) moral hazard. They could respond by adopting one (or alternatively, a combination)[2] of three kinds of contract: wage labour (W), fixed rent (R), or sharecropping (S).

With respect to *monitoring*, Galassi ranks the three contracts as follows, putting the most efficient first: 1.R; 2.S; 3.W. With respect to *moral hazard*, on the other hand, he ranks the three contracts so: 1.W; 2.S; 3.R. He contrasts the merits of sharecropping and of fixed rent in solving moral hazard problems as follows: "Fixed rent contracts did not *effectively* diminish the landlords' need to monitor. [...] [They] did not *really* solve the monitoring problem. [...] Landlords thus had to find a way of resolving the moral hazard problem without incurring prohib-

itively high monitoring costs. *This they achieved with share tenure by tying labour income to labour quality while at the same time providing some monitoring to offset the tenants' tendency to undersupply labour*" (FG, p. 82; my emphasis). Galassi therefore suggests that sharecropping, which was *second best* solution to both monitoring and moral hazard, was superior to fixed rent, which was the best solution to monitoring problems but only third best with respect to moral hazard.

However, with respect to moral hazard this argument is quite simply incorrect.[3] The problem of moral hazard arises when landlords are unable to observe or infer the actions of their tenants from the final output, *and at the same time* tenants do not bear the full damages or benefits of their actions. Moral hazard can be solved by providing the tenant with adequate incentives, and the optimal solution is to assign the full consequences of his actions to the tenant in exchange for a fixed fee–that is, a *fixed rent*; since in this case all income above the opportunity cost of land goes to the tenant, the latter will have all the right incentives to supply the adequate *quantity and quality* of labour. To use Galassi's terms, fixed rent "ties labour income to labour quality" in the most efficient possible way. On the other hand, moral hazard is *not* effectively solved with share tenancy, because the sharecropper is partially insulated from the consequences of his actions. In fact, sharecropping actually *creates* a problem of moral hazard, for the same reasons that it creates a monitoring problem: since the sharecropper receives only a fraction of his marginal input of labour, he has an incentive to work less hard and less well than a tenant paying fixed rent.[4]

This of course invalidates Galassi's argument, which hinges critically on the view that sharecropping gave tenants *better* incentives than fixed rent to work competently and honestly on high-value crops like vines and olive trees. Since a tenant on fixed rent stands to gain more from a large and good quality harvest than a sharecropper, the tenant will work more and better than the sharecropper; and this different incentive structure applies *equally* to high-value, capital intensive crops and to lower value, annual crops like cereals.

Let us now return to the ranking of contracts in terms of relative efficiency. In the light of my reasoning, we find: 1.R; 2.S; 3.W, in response to monitoring problems; 1.W; 2.R; 3.S, in response to problems of moral hazard. Combining the two rankings, we observe that fixed rent is always superior to sharecropping, and that wage labour is sometimes superior to sharecropping; in other words, sharecropping is either second or third best option behind fixed rent and wage labour. The conclusion is inescapable: *moral hazard with respect to high-quality crops does not explain why sharecropping was adopted in late medieval Tuscany.*[5]

Why, then, *was* sharecropping adopted? Both in his original article and in his rejoinder, Galassi states that "fixed rent contracts did not effectively diminish the landlords' need to monitor" because "the risk of loss was substantial, both in foregone rental payments *if tenants defaulted* and *in damages* to grape vines and olive trees on the farm" (FG, p. 82; my emphasis). Here Galassi confuses the issue of moral hazard (expressed in damaged crops), which is solved by providing adequate incentives, with the issue of risk (expressed in tenant default), which is solved by providing adequate insurance. Since these needs tend to conflict with one another, contracts are often the result of a compromise between the two.

It is precisely this potential conflict between, on the one hand, the need for adequate incentives for production and, on the other hand, the risk of tenant default, which underlies my alternative explanation for the rise of sharecropping in late medieval Tuscany. Although fixed rent provides the tenant with the best set of incentives for production, it also burdens him with the entire risk of loss due to unforeseeable events like adverse weather and other "acts of God." Fixed rent will therefore be preferred only by risk neutral tenants; by contrast, tenants who for whatever reason are risk averse and want to be insured against unforeseen losses, find one such form of insurance in share tenancy.

As suggested in my original critique, late medieval Tuscan landlords were forced to strike a compromise between their own interests, which lay in leasing their farms on a fixed rent, and the available tenants' unwillingness to take on the entire risks of cultivation.[6] Since, contrary to Galassi's original argument, quite developed credit markets *did* exist in late medieval Tuscany,[7] peasants could have insured against the risks involved in fixed rent by borrowing against future harvests. In order to do so, however, they needed substantial collateral (which in the natural order of things would have been mainly in the form of land). Peasants lacking much collateral would be unable to gain adequate credit; they would therefore be unwilling to take on the potential risks of fixed rent and would choose the lesser risk (and lesser profits) of sharecropping.

After the mid-fourteenth century, the number of land rich,

risk neutral peasants in the environs of Florence collapsed, as a result primarily of the city's fiscal policies, and their land was bought up by city residents and slowly consolidated into largely self-sufficient farms. These farms were leased with share contracts rather than on fixed rents for the reasons just outlined, and because only peasant households owning little or no land could provide the necessary labour to run them. In this context the third alternative, wage labour, was less efficient, both because of the high monitoring costs involved (as argued by Galassi), and because population losses of up to 60 per cent after the Black Death, high rates of rural mobility, and the collapse around Florence of the smallholding peasantry which provided the main source of seasonal labour, impelled landlords to offer relative security of tenure in exchange for adequate supplies of labour input.

Galassi objects to my alternative hypothesis on the grounds that sharecropping had existed in Tuscany since the ninth century; its late medieval manifestation cannot therefore be explained on my terms as the outcome of historical contingency. This however is to imply that there can be only one general explanation for sharecropping. I find this hard to believe: the conditions in which sharecropping has arisen and survives vary enormously across time and between different societies; and we can no more assume identical conditions in ninth and fifteenth century Tuscany than we can confuse sharecropping in twentieth century Tuscany and India.

Galassi's second objection, namely, Why didn't landlords use wage contracts instead of fixed share contracts? I have already answered: on late medieval Tuscan farms, wage labour was more expensive than sharecropping. But this point invites a broader riposte. If, as even he seems to accept (Rejoinder, p. [15]), fixed rent provides better incentives than sharecropping for cereal crops, why didn't Tuscan landlords apply a *combination* of contracts, fixed rent for annual cereal crops and share tenure (?) for high-value, permanent crops, as was in fact done elsewhere in Italy at this time? Since cereal crops took up by far the largest share of farm output, a mixture of contracts would have been considerably more efficient than pure sharecropping could ever be. Why did Tuscan landlords choose a less efficient contract for cereals? The answer, as we just saw, lies not in the realm of monitoring and moral hazard but in the contingent character of the agricultural labour market after 1350 and in the demands of risk averse tenants.

III

Let us now turn to the evidence supporting these alternative views. Whereas Galassi predicts that, holding all things constant, distant landlords would prefer to lease vines and olive trees to sharecroppers, I predict that such landlords would prefer to lease high-value crops for a fixed rent–but I also suggest that all things were *not* constant.

In fact, the evidence quoted by Galassi shows one thing only: that the probability in 1427 of using *wage labour* for high-value crops decreased with greater distance from Florence. While this does "accord with the model," as he states, it also accords with other explanations, such as differences in labour supply between Florence's banlieu and its more distant hinterland; they do not by themselves prove the correctness of the model. Moreover, Galassi's article is concerned with the origins of *sharecropping*, not with the use of wage labour–and his statistical findings for share tenancy manifestly do *not* "accord with the model." Thus, neither the theory nor the empirical evidence accord with Galassi's thesis on the origins of sharecropping.

Galassi goes on to suggest that my own evidence from the administration of the hospital of Santa Maria della Scala supports his thesis. However, if we look at the broader context of the hospital's administration, the evidence runs counter to Galassi's argument and further supports my own. Wherever possible, the hospital leased its vineyards and olive groves for a fixed rent. The relation between distance and contract choice was precisely the opposite of that predicted by Galassi; the more distant a piece of land from the hospital's administrators, the greater the probability of finding it leased for a fixed rent. Moreover, before being apportioned among sharecroppers, large scale vineyards were run with wage labour, contradicting Galassi's view that the hospital administrators were unable to effectively monitor labour and were therefore compelled to introduce share tenure. More generally, this view of the hospital's administration defies all logic: why on earth would vast amounts of capital be invested in building and maintaining an administrative infrastructure which according to Galassi was entirely ineffective? The answer, of course, is that the hospital's granges did assist in monitoring tenants, and thus did help with the problems of moral hazard peculiar to sharecropping discussed above. The granges were a response to sharecropping rather than its cause.

Galassi's reaction to the evidence of developed rural credit markets is especially puzzling. Far from undermining my argument as he suggests, the fact that rural credit markets provided for landowning rather than landless peasants supports precisely the point I wish to make: namely, that we must make an analytical distinction between property owning and landless or near landless peasants, because only the latter could provide the necessary labour to take on a full-time family farm, yet required share tenancy as a form of insurance against risk.

On the lesser matter of linking, I make no claim to "explain" sharecropping with it; it is simply a subsidiary element in the range of constraints that made poor peasants prefer share tenure over fixed rent.[17] I also noted that "linking" the land and credit markets had advantages for landlords: interlinking saves on monitoring costs by making it possible to punish a tenant's dishonesty or shirking on work by assigning damages to the existing debt or calling in the loan, and it allows the landlord to force his tenant to work harder or undertake projects more to his liking.[18]

IV

In sum, late medieval Tuscan sharecropping was the outcome of two conflicting demands: the landlords' need for a contract providing efficient incentives, and the tenants' need for adequate insurance against risk. Had the presence of vines and olive trees been the factor determining the choice of contract, fixed rental would have prevailed. Instead, the fortuitous combination of large, contiguous properties in the hands of urban landlords and of a relatively impoverished and hence risk-averse peasantry at a time of massive demographic collapse produced a nearly unique system of large, self-sufficient, sub-optimal sharecropping farms and helped shape the Tuscan economy for centuries to come.

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[1] This was based on the *lack* of efficient monitoring and credit markets during the late medieval and early modern periods (FG, pp. 88-89); see below, nn. 7, 16.

[2] See below on the theoretical possibility of combining fixed rent and share tenure to run a Tuscan farm.

[3] See J. E. Stiglitz, "Principal and Agent," in J. Eatwell, M. Milgate, and P. Newman, eds., *Allocation, Information and Markets* (London-Basingstoke, 1989), pp. 241-53.

[4] This is of course the source of the endless complaints about sharecroppers' laziness and shirking in late medieval sources.

[5] Hence my original point that Galassi's distinction between monitoring and moral hazard was "nominalist," since the optimal solution to *both* problems is provided by fixed rent.

[6] See e.g. Epstein, *Alle origini*, p. 165, n. 41 for an example of a tenant refusing to renew his fixed rental and opting for share tenancy instead because of the increased risk of losing his high value crops through warfare.

[7] Galassi's original article suggested that the existence and century-long survival of sharecropping were the result of the *lack* of "easily available third-party insurance" (FG, p. 88); had this existed, sharecropping would have withered away (FG, p. 89). I find the reversal of his position in his rejoinder puzzling, all the more so since it implies abandoning his original explanation for the long-term survival of sharecropping.

[8] According to Herlihy and Klapisch, *Toscans*, p. 274, one quarter of recorded sharecroppers in 1427 still owned small parcels of land, albeit not enough to support a household or to secure them secure entry into the ranks of credit-worthy peasants. See also Piccinni, *"Seminare,"* p. 130 and n. 88 for further references.

[9] I accept this point in my original critique; see above, p. 7.

[10] Pinto, *Toscana*, chs. 1, 8, 9.

[11] See e.g. G. W. Grantham, "Divisions of Labour: Agricultural Productivity and Occupational Specialization in Pre-Industrial France," *Economic History Review*, 2nd ser., 46 (1993), pp. 491-92.

[12] Inadequate labour supply explains why landlords where so concerned to ensure that tenants did not work on other landlords' property; see e.g. Piccinni, *"Seminare,"* p. 130.

[13] Giorgetti, *Contadini e proprietari*, pp. 55-56, 65-67.

[14] See above, p. 13, n. 36.

[15] Epstein, *Alle origini*, esp. ch. 5.

[16] This view also conflicts with his original position (FG, p. 91 n. 18). See also above, n. 7.

[17] Galassi consistently downplays the fact that the contract was not chosen by the landlord alone, but was the outcome of bargaining with available tenants in a period of low labour supply. Thus the answer to his question, why landlords who had land oxen and capital should want to lease to sharecroppers (above, p. 17), is that available tenants would not put up with anything else.

[18] P. Bardhan, "A Note on Interlinked Rural Economic Arrangements," in Bardhan, ed., *Economic Theory*, pp. 237-42.