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THE MARKET FOR LAND

An Analysis of Interim Transactions

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An 'interim sale' is a sale undertaken with the intention of buying back the same good in the near future. Interim transactions play a prominent role in several markets and they tend to generate multiple equilibria. Such markets can get caught at a low-turnover equilibrium. It is alleged that in many LDCs the market for buying and selling land is extremely inactive. An interim-transactions model is constructed to explain this phenomenon. Wider issues in land markets, including distress sales, are analysed as well. The model is applied also to labour-tying and seasonality in backward agriculture.

1. Introduction

In many less developed countries (LDCs) the market for buying and selling land distinguishes itself by its inactivity.[1] It is true that historically the structure of land rights in LDCs has been extremely complex with different people having different kinds of rights on the same plot of land.[2] But as Bardhan (1984, p. 95) points out: 'Even with full property rights in land, the market for buying and selling of cultivable land is often rather inactive. Unless forced by extremely difficult circumstances, a resident villager does not usually sell his land.' Some micro-level studies – e.g., Rao (1972) and Bliss and Stern (1982) – have also corroborated this.

Several reasons for this alleged low turnover in the market for land have been discussed in the literature [see Chaudhuri (1975), Bhaduri (1976)]. One popular *explanation* is based on the *belief* that the possession of land leads

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[1]It ought to be clarified at the outset that the market for *renting* land is far from inactive in LDCs. All references to the market for land in this paper are to the market for full land rights.

[2]Writing about land rights in East Bengal under the Permanent Settlement of 1793, Raychaudhuri (1969, p. 163) notes, '. . . rights of the various categories of interest in land were enmeshed in an incredible maze of crisscross relationships so that it is impossible to determine with any precision who was who or what was whose. Descriptions in the settlement reports indicate that those who owned land very often did not know what land it was they owned, and those who cultivated land often did not know the title or estate of their landlords'.

to power and prestige. While the belief is probably valid, it does not support the explanation. The fact that possession of land leads to power explains why the demand for land is higher and supply lower than one would expect otherwise. Hence, as is evident from the simple demand–supply diagram, this explains why land price is high but not why turnover is low.

A more satisfactory argument I encountered in a conversation with – not surprisingly – a farmer from Midnapore, in West Bengal. On being asked whether he would sell his land if he got double the 'normal' price, he answered in the negative, arguing that he would not sell because he would not know what to do with so much cash and, unlike land, cash was a risky asset.[3] I persisted: if he got double the normal price, he could buy another larger plot. That, he regretted, is precisely what is not possible. In that region, he explained, land sales were very few – almost non-existent. So there was no guarantee of his being able to buy back land in the immediate future.

If all individuals reason in this way a very interesting possibility arises: individuals hesitate to sell land because land turnover is low; and it is their hesitation which, in turn, reinforces the low turnover. It is this phenomenon which the present paper tries to model, abstracting for the sake of clarity from other features of the market for land.

A sale of the above kind, that is, one where the seller intends to buy back the same commodity (not necessarily the same piece) in the near future, will be referred to as an *interim sale* or *interim transaction.* The concern of this paper is with interim transactions in the market for land. Two qualifications ought to be kept in mind. First, it is possible to construct valid explanations of the inactivity of land markets which lie beyond the ambit of an interim-sales model.[4] Thus there is no attempt to deny that the ensuing theory deals with *one* of the many complex facets of land economics. Some of the broader issues are taken up briefly in a later section. Secondly, our interim-transactions model is, in itself, an abstract theoretical construct and hence

[3]This view has had more scholarly adherents than my Midnapore farmer. Thus Raj (1970, p. 1) observes, '[Land] is the main form in which wealth is desired to be held in these economies . . .. In societies exposed to various kinds of risk, . . . land is an attractive asset to hold even if the pecuniary rate of return on the investment happens to be low'. In a historical context, Chaudhuri (1975) argued that land was the most convenient form of wealth because 'of the very limited existence of "other objects of speculation or investment" and also in view of land possessing "the quality of immovability" – "a very desirable quality when the system of police was defective, and the possession of valuable moveables was sure to tempt the cupidity of the numerous gangs of dacoits, which infested the country"' [the sub-quotes are from Field (1884)]. It would however, be an error to suppose that this was always the case. In India, before the establishment of British rule, land was in fact a very risky asset because of the absence of clear titles and rights. As Cohn (1969, p. 82) observed: 'One needed military force to support a claim to land and had to be willing to fight for it.'

[4]One plausible explanation could be in terms of asymmetric information [Akerlof (1970)]. This, however, has the difficulty that in the personalised atmosphere of backward agriculture people are acquainted with not only one another's scandals but also the quality of their lands. Hence information may not be *adequately* asymmetric to support an explanation on its own.

there is no reason why its application ought to be confined to the market for land. A later section discusses how our model could be applied to different areas, including that of interlinkage and labour-tying in backward agriculture.

The model of interim transactions with reference to land is developed in section 2. Some of the larger issues concerning land are examined in section 3. The welfare consequences of our model are discussed in section 4. This is followed by a sketch of alternative markets where the interim-transactions model may be applicable. Among other things we discuss labour-tying in the rural sector. The model of section 2 is developed under fairly severe restrictions in order to keep its focus sharp. An appendix discusses possible modifications of the basic model.

2. Interim transactions: The basic model

It will be assumed that land is available in indivisible units, with p denoting the price of each unit. At each price the total supply of land, S, is the aggregate of interim supply and 'regular' supply. Interim supply, as just explained, is undertaken with the hope of buying back land in the near future. *Regular supply* is the conventional once-and-for-all supply – for instance, from those who are planning to migrate or have just learnt about the greater advantages of shares and debentures. In order to focus attention on interim transactions, we shall assume that regular supply, $\hat{S}$, is given simply as

$$\hat{S}=\hat{S}(p), \quad \hat{S}'(p)\geqq 0. \tag{1}$$

Aggregate demand, D, also has two components. Since interim sales are undertaken with the hope of buying back land, at any point of time there will be some demand for land which arises from interim sales of the near past. This will be referred to as *interim demand. Regular demand*, on the other hand, is the conventional demand of a fresh buyer. Once again, to keep attention away from the latter, it will be assumed that the regular demand, $\hat{D}$, is given in the following conventional manner:

$$\hat{D}=\hat{D}(p), \quad \hat{D}'(p)\leqq 0, \tag{2}$$

and there exists $\bar{p}$ such that for all $p\geqq\bar{p}$, $\hat{D}(p)=0$. The indivisibility of land, coupled with the fact that individual purchasing power has limits, guarantees the existence of such a price, $\bar{p}$, beyond which demand is zero.

We may now turn to a more detailed analysis of interim supply and demand. Assume there is a set, N, consisting of n individuals each of whom owns one unit of land and who are considering interim sales. Suppose person

$i \in N$ has need for liquid money over the following year and let $a(i)$ ($\geqq 0$) be the benefit he derives from each rupee of *cash*. It may be convenient to imagine that each person, i, has a black box such that if he puts 1 rupee into it now, it emerges at the end of the year as 1 rupee plus $a(i)$ units of benefit. Hence by selling land now he gets a net benefit of $a(i)p$. If i has no need for liquidity, $a(i)=0$; if it is a drought year, and he needs cash for food, $a(i)$ will be very large. At the end of the year he recovers his solvency and, for simplicity, it is assumed that no further need for liquidity arises (i.e., the black box vanishes). From then on, he would like to hold his wealth for use only at retirement. In keeping with our assumption that land is the safest asset, it will be supposed that everybody would ideally like to hold his wealth in the form of land. This may be formalised by assuming that 1 rupee held as land has a value of 1, while 1 rupee held as cash has a value of $c(i)$ (<1), for all $i \in N$.[5]

In order to do away with the complication of time, I will collapse the 'year' in the above description to a 'moment' by assuming that these same benefits [i.e., $a(i)$, for all $i \in N$] accrue by selling land now and putting it in the black box, for just a moment. The trouble is that, once a person encashes (that is, sells) his land, he cannot be certain about being able to immediately buy back land. To keep the algebra simple, I will assume that he is either able to buy back land immediately or not at all. Suppose that an individual considers the probability of being able to buy back land to be ϕ.

Hence, i faces two options: he may sell land, pass money through the black box and then try to buy back land. The net benefit he earns from this option is $a(i)p+\phi p+(1-\phi)c(i)p$. Alternatively, he could play it safe and not sell his land at all. This will ensure that his wealth will be held as land throughout (that is, up to retirement). The net benefit from this option is p. Therefore i will sell land if and only if[6]

$$a(i)p+\phi p+(1-\phi)c(i)p-p \geqq 0, \quad \text{or}$$
$$d(i) \equiv \frac{a(i)}{1-c(i)} \geqq 1-\phi. \tag{3}$$

This implies that if the probability of being able to buy back land, ϕ, is

[5]Suppose i expects to retire and cash his assets after t years, he has no time discount and he expects prices to remain unchanged. While land has no decay, cash has an expected decay rate of $100b$ ($b>0$) percent per annum (perhaps because of expected thefts). In this case the value of holding land is p and the value of holding cash, instead, is $p/(1-b)^t$. Using this interpretation $c(i)=(1-b)^t$. In my model, however, I treat $c(i)$ as a 'primitive'.

[6]This formulation implies risk-neutrality. It is easy to introduce risk-aversion by assuming that i maximises expected utility and his utility function is concave. In such a case a person's decision to sell land would depend not only on $a(i)$, $c(i)$ and ϕ, but also on his degree of risk-aversion.

high or if the preference for holding wealth as land is low [i.e., $1-c(i)$ is low] or if the need for liquidity is high [i.e., $a(i)$ is large], then a person would be more likely to sell his land.

Given ϕ, the interim supply of land (which is equal to the total number of people willing to make interim sales) is

$$\#\{i \in N \mid d(i) \geqq 1-\phi\} \equiv T. \tag{4}$$

Since those who make an interim sale immediately try to buy back land, the interim demand for land equals interim supply and is given by (4). Clearly, therefore, the volume of interim transactions depends on ϕ. Since it is not clear, a priori, how the probability of being able to buy back land, ϕ, is determined, it is possible to consider alternative hypotheses and I do so in the appendix. In this section we shall develop a simple fixed-price model[7] with excess demand, that is, price is fixed at p where $\hat{D}(p) > \hat{S}(p)$. Since interim supply always equals interim demand, $\hat{D}(p) > \hat{S}(p)$ implies aggregate demand exceeds aggregate supply. Since price is fixed, in this section I shall denote $\hat{D}(p)$ and $\hat{S}(p)$ as, simply, $\hat{D}$ and $\hat{S}$.

We shall now assume that people take the probability of being able to buy land as given by the ratio of supply and demand or, more precisely, their expectation of this ratio, which may be denoted as $(S/D)^e$. Hence,

$$\phi = \left(\frac{S}{D}\right)^e. \tag{5}$$

Since aggregate supply, S, is the summation of regular supply, $\hat{S}$, and interim supply, T, and similarly for demand, we have

$$\frac{S}{D} = \frac{\hat{S}+T}{\hat{D}+T}. \tag{6}$$

The essence of our argument is now transparent. Let sellers conjecture an aggregate supply-demand ratio. That, by (4) and (5), immediately determines the interim turnover, i.e., T, and hence, by (6), the aggregate supply-demand

[7]The fixed-price assumption is used here to keep the basic model uncomplicated. The issues which arise from relaxing this and also from using alternative specifications of (5), below, are explored in the appendix. It is worth noting that the strength and weakness of fixed-price modelling have been discussed extensively in the literature on the micro-foundations of macroeconomics. Also, the assumption is not as strong as it appears at first sight. It does not entail that prices do not change but simply that they do not change in response to short-run fluctuations in demand and supply. In Malinvaud's (1977, p. 9) words: '[Q]uantitative adjustments are the first signals of changes in the demand-supply relations'. It should therefore be clear that our fixed-price assumption does not rule out the possibility of an inflation in all sectors. Of course, the model would have to be adjusted to take account of real balance effects.

ratio. If this corroborates the initial conjecture, then we have reached an *equilibrium*. In other words, at equilibrium,

$$\frac{S}{D}=\left(\frac{S}{D}\right)^e.$$

This, coupled with (4) and (5), gives us

$$T=\#\left\{i\in N\,\middle|\,d(i)\geqq 1-\frac{S}{D}\right\}\equiv T\left(\frac{S}{D}\right). \tag{7}$$

Therefore, *equilibrium interim sales* is a value of T which solves (6) and (7).

The interesting feature of this model is that there can be many equilibria. In particular, it is quite possible that both high and low turnovers are equilibrium activity levels. I shall merely present an intuitive argument here, since the example below establishes this formally: suppose S/D is lowered from an initial equilibrium level. Then people have less hope of being able to buy back land and so – as is evident from (7) – T is smaller. This, in turn, implies [from (6)] that S/D is lower and the new S/D may, therefore, well be an equilibrium.

The workings of the model are easier to illustrate if we assume that $d(\cdot)$ is defined on the interval $[0, n]$ (instead of merely on the integers in this interval), and suppose that the people are so arranged that $n_1 > n_0$ implies $d(n_1) < d(n_0)$.[8]

Given any S/D, define $\bar{i}$ such that

$$d(\bar{i})=1-(S/D) \quad \text{or} \quad \bar{i}=d^{-1}(1-(S/D)).$$

Since for all $i<\bar{i}$, $d(i)>d(\bar{i})$, it is clear that given S/D, exactly $\bar{i}$ people would want to sell land, i.e., $T(S/D)=\bar{i}$. There is only one snag in writing it like this. It does not take into account the possibility of corner solutions. Taking these into account, the function $T(S/D)$ in (7) may be rewritten in full as

$$T=T\left(\frac{S}{D}\right)=\begin{cases} 0 & \text{if} \quad d(0)\leqq 1-\dfrac{S}{D}, \\ n & \text{if} \quad d(n)\geqq 1-\dfrac{S}{D}, \\ d^{-1}\left(1-\dfrac{S}{D}\right) & \text{otherwise.} \end{cases} \tag{8}$$

Hence equilibrium interim sales is a value of T which solves (6) and (8).

[8]The possibility of two persons having the same d's is being ruled out. This is convenient and harmless.

In fig. 1, the smooth curve represents (6), where S/D is the dependent variable. In the same space we represent (8) by a broken line, remembering that in this case T is the dependent variable. If $d(\cdot)$ is continuous, the existence of an equilibrium is ensured: note that the continuity of $d(\cdot)$ implies the continuity of $T(\cdot)$. If the broken line lies above curve (6) everywhere on $(0, n)$ then $T=0$ is an equilibrium. If it lies everywhere below, $T=n$ is an equilibrium. If it lies somewhere above and somewhere below (which is the case illustrated in fig. 1), then continuity ensures the existence of $t \in (0, n)$ where the two curves intersect and thereby represent an equilibrium point.

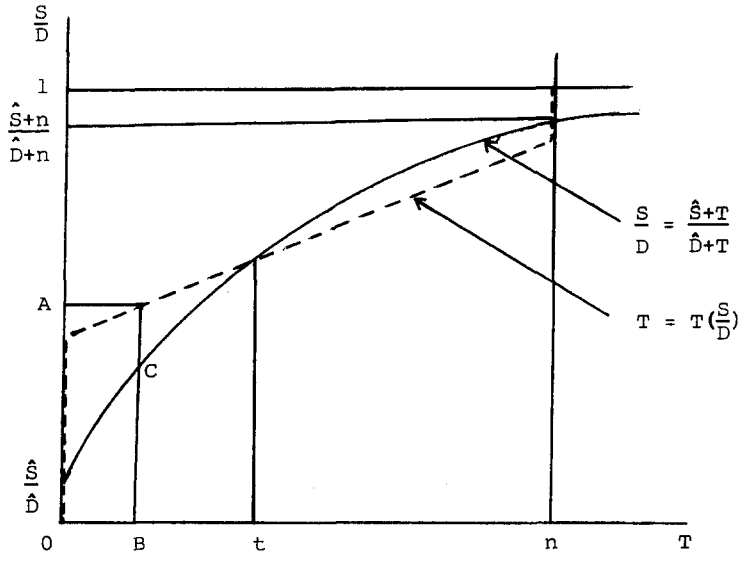

Fig. 1

To be able to talk about the *process* by which equilibrium is brought about I shall suppose (ignoring the deeper problems of 'stability') that if at some T, the dotted line lies above (below) the smooth one, T will tend to fall (rise). This is based on the standard 'phase diagram' argument; to start with, S/D ratio is given by point A. This would result in B interim sales. This would lead the S/D ratio to be lower than A – namely C. This leads to a lower interim sales, and so on. From this discussion it is clear that $T=t$ is an unstable equilibrium. What is interesting and easy to check is that in this model there must exist at least one stable equilibrium.

In the case illustrated in fig. 2 there are three equilibria – at $0, t$ and n. Of these, 0 and n are stable. Hence, ignoring the unstable case, we could assert that the market would be either very inactive, with zero interim sales, or be very active with n interim sales. Which equilibrium actually occurs or whether there are any institutional factors which make one of these equilibria

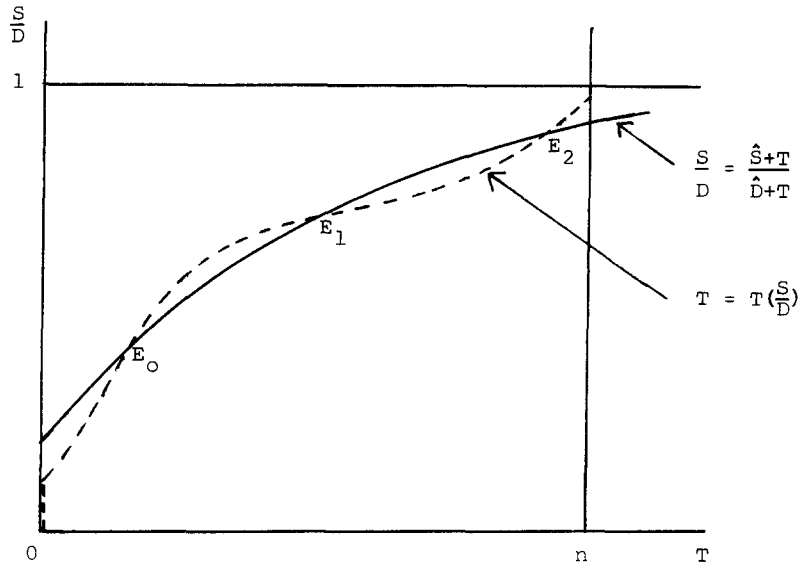

Fig. 2

more likely are issues beyond the ambit of the present investigation, the main aim of which is to demonstrate how hyperactivity and inactivity of land transactions could both be thought of as equilibrium situations.

It ought to be emphasized, since fig. 1 and the example below may create an impression to the contrary, that the low-activity and high-activity equilibria need not coincide with, respectively, zero-activity and full-activity. Since the function $d(\cdot)$ can take different forms depending on the preferences of the individuals, the $T(S/D)$ function in fig. 1 can take different forms as well. It is immediately clear, and is illustrated in fig. 2, that none of the equilibria need coincide with $T=0$ and $T=n$. In fig. 2 the three equilibria are E_0, E_1 and E_2, with E_0 and E_2 being stable. It is obvious that other kinds of equilibrium configurations – with more than three equilibria, with exactly one equilibrium, etc. – are possible depending on the nature of human preferences as embodied in $d(\cdot)$. The taxonomy is easy to work out [see Kaldor (1940) for an analogous taxonomy] and is, therefore, ignored here.

Example. This example illustrates how the situation depicted in fig. 1 may actually occur. Let $n=300$, $\hat{S}=0$, $\hat{D}=100$. Let the function $d(\cdot)$ be as follows:

$$d=\frac{3}{4}-\frac{i}{1200}.$$

From (6), we have

$$\frac{S}{D}=\frac{T}{100+T}. \tag{6'}$$

From (8), we have

$$T=\Omega\left\{0, 1200\left[\frac{S}{D}-\frac{1}{4}\right], 300\right\}, \tag{8'}$$

where $\Omega\{\cdot\}$ is an operator which picks out the middle number, i.e., $\Omega\{a,b,c\}=x$ means x is a, b or c such that $\min\{a,b,c\}\leqq x\leqq\max\{a,b,c\}$.

Note that if $T=0$, then $S/D=0$. And if $S/D=0$, then by (8'), $T=0$. Thus $T=0$ is an equilibrium. It may be checked that there are two other equilibria in this example: $T=300$ and $T\simeq 40$. Of these, $T=0$ and $T=300$ are the only two stable equilibria. Since $\hat{S}$ is assumed to be zero, in this example we would either expect the equilibrium to settle down at level of total inactivity with no land sales, or a large activity level with 300 sales.

3. Broader issues

Interim transactions play an important role in land markets. To maintain this, one does not have to deny that the problem of land markets in general is a vast subject and raises issues which lie beyond the confines of our formal model. In this section I draw attention to some of these issues which play a prominent role in reality but on which we do not, as yet, have any formal analysis to offer.

In the above model all the theorising was focused on interim transactions, all other kinds of buying and selling being tucked away under the residual category labelled 'regular' demand and supply. What this motley collection includes and how its different components behave would be worth investigating.

It was, for instance, mentioned that part of the regular supply of land in the rural sector emanated from villagers migrating to towns. An interesting corroborating evidence is provided by Rao's (1972) excellent study of land transfers in the *Ryotwari* areas of Maharashtra and Gujarat. He found that during 1956 to 1965, in all *talukas* and in almost all villages 'the land purchased by the resident community exceeded the land sold'. This appears paradoxical but, as Rao argues, this may be construed as evidence that some erstwhile villagers who migrated to towns sold off their land. It is therefore true that while some landowners rent out their land when migrating to cities (in fact, this has been an important factor in the subinfeudation of land in

India), some prefer to sell off their land. How they decide between these two options is an open question which deserves attention in the future, given that it could help us understand the incidence of absentee landlordism.

A more momentous kind of land sale is what is popularly known as a 'distress sale'. Contrary to the impression created by popular usage, distress sales comprise an amorphous category. A poor labourer who sells his land to repay his burgeoning debt clearly makes a distress sale.[9] But what about the person who sells his land to marry off his daughter? The answer depends on his income level, on whether he is giving a dowry out of compulsion or choice, etc. Similarly, when a person sells his land for 'consumption or medical expenses' we tend to feel it must be a distress sale. Yet as Cain (1981, pp. 450–452) found out in his study of some regions of India and Bangladesh, most of these sales were made by the large landowners and that too for 'conspicuous or status consumption'. Despite these definitional reservations, it is clear that distress sales do occur in large amounts during periods of famines and other disasters. Mukherji (1971) notes that land sales in the district of his study (Birbhum, in West Bengal) rose sharply in the early forties which is very likely a consequence of the great Bengal famine. Similarly, Bose's (1970) study on Bihar revealed that a very poor rainfall was generally a precursor of high land sales.

Though distress sales are generally (not always) non-interim in nature, they provide an indirect corroboration of the theory developed in section 2. Note first the interesting fact that the term 'distress sale' is almost always attached to *land* sales. The immediate reason is clear enough. It is widely believed that land is the last asset that a person parts with in distress. So a land sale by a poor person is taken to be the last act of desperation [see Cain (1981, p. 436)]. This apparently simple fact, however, hides a deep and puzzling question. If, for reasons of liquidity, a person has to run down a certain amount of his assets (which may include the capitalised value of his future labour), why this fuss if the asset happens to be land? Why would he prefer to sell a thousand rupees worth of jewelry rather than a thousand rupees worth of land? No definitive answer exists, but it seems plausible to argue that while jewelry is easy to buy back, it is not so with land because land sales are so few. And land sales are few precisely because land is the last asset people part with. This brings us back to the theory of interim transactions.

4. Welfare implications

To begin with, let us confine our attention to the basic model. The question which concerns us here is: Between a high-activity equilibrium and

[9]The confiscation of land and other assets when the borrower fails to repay a loan is a problem which has been theoretically investigated: Bhaduri (1977), Basu (1984a).

a low-activity equilibrium, which one is socially more desirable? Given the partial equilibrium nature of our model, no more than some tentative remarks are possible. By using the example in section 2, I try to sketch the kind of considerations that go into evaluating alternative equilibria.

Consider the high-turnover equilibrium ($T=300$) – using E_H to denote it and compare it with the low-turnover equilibrium ($T=0$) which I shall denote E_L. At E_H, 300 people sell their land. Since at equilibrium $\phi=\frac{3}{4}$, of these 300 people, 225 manage to buy back land and 75 do not. These 75 are clearly worse off than they would have been at E_L. But, for these 75 people who have lost land and are forced to hold cash, there must exist 75 people who have got land. So the net benefit of this could be more or less depending on the interpersonal valuation of land. If the variations in such valuation are small, it may not be too wrong to suppose that the net benefit here cancels out with 75 people losing and 75 people gaining. Consider now the 225 people who sell land and manage to buy back. For one such person i, the net benefit of being in E_H compared to E_L is $a(i)$. Let $\bar{a}$ be the average of the $a(i)$'s of those 225 people. Then their net gain in E_H is $225\bar{a}$. Since the loss of the other 75 people could be supposed as approximately offset by the gains of those who acquire their land, we may suppose that the net gain to society of being at E_H is $225\bar{a}$.

Moving away from the specific example, if we consider a case where there are two equilibria – one more active than the other – we may suppose the active equilibrium is more advantageous with its additional benefit equalling the sum of $a(i)$'s of all i who sell and buy back land in the active equilibrium minus the sum of those who sell and buy back land in the inactive equilibrium.

What is interesting to observe is the nature of the benefit that confers with larger interim sales. Recall that $a(i)$ is the advantage that i gets from liquidity, that is, from being able to cash his land asset temporarily. Thus a higher land turnover confers the same benefit which comes with greater liquidity. Thus, in some sense, the benefit of a high turnover is similar to the benefit of having more credit in an economy. In the absence of a high turnover, unless a person's need for cash is very high – i.e., $a(i)$ very large – he does not sell his land. He tries, instead, to manage without this liquidity.

Let us consider a brief digression from the basic model: a preference for the high-turnover equilibrium over the low-turnover appears paradoxical when the sales in question are distress sales. Indeed sales where the sellers are unable to buy back land raise different welfare-theoretic questions from the ones above. These sales, unlike interim transactions, imply a redistribution of land from the poor to the rich; and it appears (and this is the conventional view) that in this case a low-turnover state is welfare-superior. But on reflection the verdict is not so clear. Suppose high land-sales occur every time there is a famine because that is the way the poor stave off

starvation. Now whether the low-turnover state is welfare-superior or not depends on whether (i) the low turnover reflects that there is no famine on, or (ii) there is a famine but people are unable to sell land – perhaps because there is a law prohibiting it (an entirely well-meaning legislation aimed at preventing a redistribution of land away from the poor). A low-turnover of type (ii) is clearly socially undesirable.

5. Applications

The basic model, viewed as an abstract theory, is applicable in many situations. We have so far discussed this in the context of land markets. In this section some other applications are considered.

Interim transactions have a significant role in shaping outcomes in markets with asymmetric information. Suppose used cars on sale can be of varying quality but command a single price, as in Akerlof (1970). Suppose a person buys a used car and discovers that its quality is below the average quality of used cars. Then he would be better off if he sold it and bought another used car. This has the interesting implication that as long as the used cars being sold are of a varying quality, the market for such cars cannot be in equilibrium. In other words, *at equilibrium*, the used-car price will reflect not just average quality but the exact one.

An obvious application is to the decision-making of firms over business cycles. During a cycle, firms often have to take decisions (regarding, for instance, the buying and selling of inputs) which they know they will soon have to reverse, when the cycle turns. The decisions are therefore interim ones and they bring with them some of the considerations discussed in this paper. A related matter and one of considerable interest to development economists is the seasonality of employment in backward agriculture.

The existence of seasonality could induce, as Bardhan (1984) has argued, the emergence of labour-tying contracts and interlinkage.[10] During the lean season landlords would ideally like to lay off workers. But of course they would be aware that once again, within a couple of months, they would have to rehire labourers. And, as with all interim transactions, their decision to lay off will crucially depend on what they reckon the chances are of being able to rehire workers.[11] If these are poor, they may not lay off workers even though there is not enough work for them.[12] A new twist to the standard

[10]The subject of interlinkage has received an enormous amount of attention. Interlinkage could arise for several reasons [see Basu (1984b) for discussion and further references] and seasonal fluctuations in labour requirement is just one of them.

[11]Problems of adjustment cost or the costs of employing new hands in place of old ones – issues which have been discussed in the ample literature on lay-offs and recessions in the context of industrialised economies [see, e.g., Baily (1977)] – are being ignored here.

[12]As Kornai (1983, p. 67) argues; 'If there are shortages, supplies are uncertain. If supplies are uncertain, it is only rational behaviour to hoard inputs . . .. You don't fire workers because maybe you can't find replacements tomorrow . . .. It is all a vicious circle.'

labour-tying argument gets added and the model of section 2 becomes relevant as soon as we make the realistic assumption that the probability of finding workers at the beginning of the peak season is positively related to the amount of unemployment in the lean season preceding it. Note that the amount of unemployment in the lean season depends on the number of workers laid off at the end of the preceding peak season. Hence, if the *aggregate* lay-off at the end of the peak season is high, it is worthwhile for each individual landlord to lay off workers. Conversely if the aggregate lay-off is low, it means rehiring will be that much more difficult and so it may be best for each landlord not to lay off his workers. It is easy to formalise the above sketch of argument along the lines of section 2 and check that there is a possibility of multiple equilibria with varying levels of lean-season unemployment. Thus different levels of labour-tying could be thought of as equilibria in an interim transactions model. A detailed analysis of this could give us further insights into the institution of interlinkage and labour-tying and suggest policies for engineering the agrarian sector into one equilibrium rather than another.

It was argued in this paper that interim transactions play a prominent role in several markets and they tend to generate multiple equilibria. Such markets could get caught at levels of low or even zero activity. A model of interim transactions was developed and its applications to different markets were examined. The structure of land markets which has received so much attention from economic historians and so little from theorists was discussed at length – both in the context of interim transactions and otherwise. Considerable scope for generalising the basic model remains and one particular line is briefly pursued in the appendix.

Appendix

The basic model is one of no friction and perfect foresight. If $S=D$, then everybody is certain [see (5)] about being able to buy back land. Without being able to fully explain why, we know that in reality the *volume* of transactions is usually a good indicator of one's chances of being able to make a transaction. Thus when one asserts – as is often done in India – that it is easy to rent a flat in Delhi but not in Bombay, one is not really saying that there is an excess demand for flats in Bombay but not in Delhi. What one is probably saying is that the turnover in Delhi is larger. One way of capturing this is to assume [in contrast to (5) above] that

$$\phi=\phi(S^e), \quad \phi' \geqq 0, \tag{A.1}$$

where S^e is the expected volume of aggregate supply.

If price is fixed at p, and expected total supply is S^e, then actual total

supply will be

$$S \equiv \hat{S}(p) + \#\{i \in N \mid d(i) \geqq 1 - \phi(S^e)\}. \tag{A.2}$$

Equilibrium is obtained when

$$S = S^e. \tag{A.3}$$

With this alternative specification of the subjective probability function [i.e., (A.1) as opposed to (5)], it is easy to extend the analysis to one with flexible prices. With flexible prices, at equilibrium, aggregate supply [i.e., (A.2)] must be equal to aggregate demand. Since interim supply always equals interim demand, this means that regular supply must be equal to regular demand,

$$\hat{S}(p) = \hat{D}(p). \tag{A.4}$$

Thus a *flexible price equilibrium* is obtained when (A.2), (A.3) *and* (A.4) are true.

It is interesting to note that (A.2)–(A.4) is a recursive system. The equilibrium price, p^*, is determined entirely by the regular market. Once this is determined, the volume of transactions is determined by the interim sales behaviour [i.e., (A.2) and (A.3)]. It is possible to represent the equilibrium diagrammatically, but we shall not go into that here.

While the subjective probability function used in this model, i.e., (A.1) is in some ways more realistic than (5), it has an important analytical lacuna. Given (A.1), it is possible to have (i) $S = D$, and (ii) $\phi(S) < 1$. (i) and (ii) are, however, difficult to reconcile. (i) is usually taken to assert that all those who want to buy land can do so. In that case, it is difficult to see why individuals feel that the probability of being able to buy land, $\phi(S)$, is less than 1. One way of reconciling (i) and (ii) [and thereby making (A.1) acceptable] is to interpret (i) differently. We could assume that it merely says that intended supply equals intended demand, though because of friction, not every buyer (seller) necessarily finds a seller (buyer). A direct use of this approach would run into difficulties as not much is known about markets with this kind of friction, other than their widespread existence. Also, we would have to cope with the problem of uncertainty about being able to sell land, in addition to the uncertainty about being able to buy land.

These are sufficiently serious difficulties not to treat the model of this section as complete in any way. The model is meant to illustrate the kinds of difficulty which one has to face in analysing the flex-price case. If price is flexible and the subjective probability function is the one used in the basic model [as specified by eq. (5)], then – it is easy to verify – the only

equilibrium that would obtain is the high-activity one, which is a fairly uninteresting case. If the probability function is as in (A.1), all the difficulties just discussed crop up. Yet (A.1) has a certain appeal from our everyday experience. The line which needs to be pursued to construct a satisfactory flex-price model is either to formalise the notion of frictional unemployment which underlies the above exercise or to abandon both (5) and (A.1) and search for alternative specifications of the subjective probability function.

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