

### Land Tenure Contracts

One of the many criticisms leveled against development economists is that institutions vary from country to country and hence a general, one-size-fits-all theory will not work. If we examine, land tenure arrangements in the third world we do in fact, find similarities:

1. **Much of the land is owned by the wealthy.** In general the Gini coefficient for land holdings in Latin American countries is between 0.8 and 0.9. For example the Gini has been estimated to be 0.82 in Costa Rica (supposedly one of the more democratic countries in Latin America,) 0.84 in Brazil, and 0.91 in Peru. Things are a bit better in Asia: Bangladesh has a Gini of 0.42, Thailand, 0.45 and Indonesia 0.56, but the Gini is 0.62 in India.<sup>1</sup>
2. **There are six basic types of land tenure arrangements**, which will be discussed below: (a) rental contracts, where the tenant pays a fixed rent; (b) ownership, where the tenant owns his (its rarely a her) own land; (3) sharecropping, where the output is split between the landlord and tenant. (4) a wage rate system where workers are paid a wage just as in most modern firms; (5) a variation of the wage rate system is a piece rate, where workers are paid for their output; most migrant workers in the U.S. are paid a piece rate based on the number of crops (e.g., strawberries) harvested; (6) some other countries (notably in sub-Saharan Africa) have a less well defined system of property rights where land is communally. For example, in the Marshall Islands the local and regional chiefs jointly own all land with some landholding rights for traditional tenants.

#### The Economics of Land Tenure Arrangements

A simple way to represent all of the above arrangements is to represent the “rent” that a landlord receives (whether this rent is due to a formal rent contract or sharecropping) as:

$$R = \alpha Y + F$$

Where:

R is the rental paid to the landlord

Y is the output from the farm

$\alpha$  is the share of output that the landlord receives

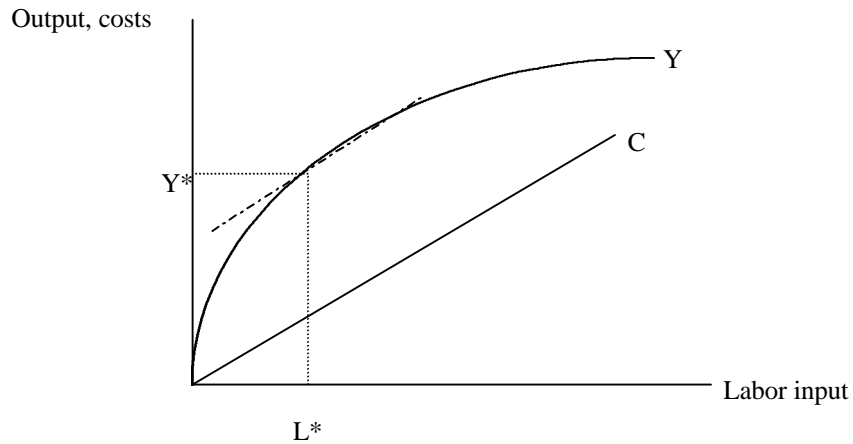
F is the fixed (rental) cost that must be paid by the tenant

1. For a standard rental arrangement,  $\alpha = 0$  and the rent is equal to F.
2. For a standard sharecropping arrangement, the tenant receives  $(1-\alpha)Y$  and the landlord receives  $\alpha Y$ . In a typical sharecropping contract, landlord and tenant split output 50/50 ( $\alpha = 0.5$ .)
3. If the farmer owns the land, he receives the entire output Y.
4. A wage rate contract can be viewed as a wage =  $(-F)$  with  $\alpha = 1$ . (Why?)

**Why does one rarely observe wage contracts except on large plantation farms with cash crops?** A: It is difficult to monitor a workers performance in most subsistence and small scale agriculture. (Why?)

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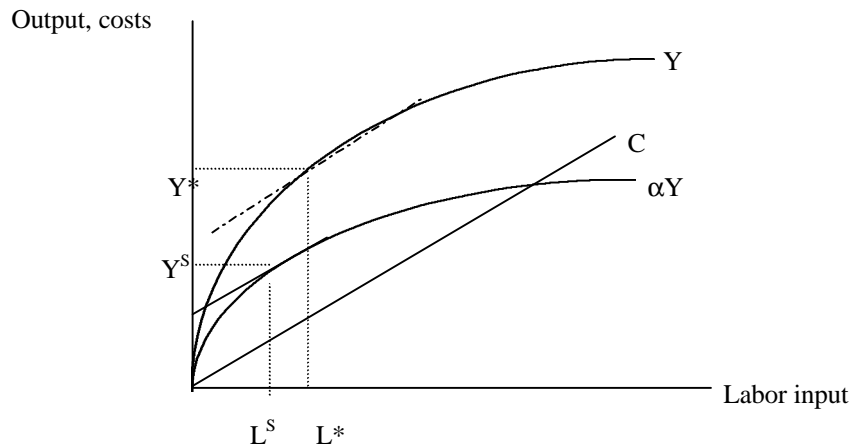
<sup>1</sup> Why such concentration? Apart from the obvious answers the inefficiencies of credit markets have much to do with it.



In the diagram above we have a simple production function very similar to the one seen in handout #1 on the Solow model except that here labor is considered the only input. The peasant must decide how much labor input to use (his own or his families.) Labor is not free since peasants usually have some small landholdings where they can choose to put in more time or they may be able to work for wages elsewhere.

**If the peasant owns his own land, he maximizes his return at point  $L^*$  which represents the greatest difference between output,  $Y$ , and cost**

**Sharecropping and Marshallian Inefficiency:** One paradox for many years to economists was the prevalence of share-cropping when, according to economic theory, it is inefficient. We can see so in the diagram below:



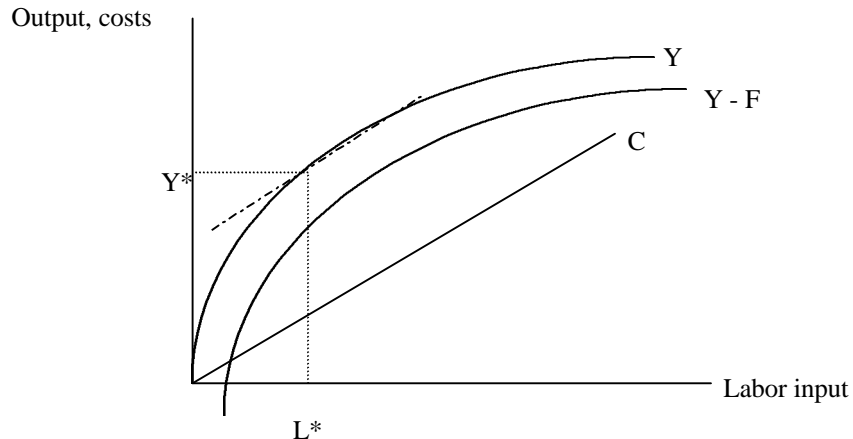
In the above diagram,  $L^S$  represents the labor input and  $Y^S$  represents the output for sharecropping. As one can see, both the labor input and output are significantly lower. Why?<sup>2</sup>

<sup>2</sup> Any economic student should be aware of the reason. As labor input increases its marginal product falls. The marginal benefit of working an extra hour is just the increase in output that the peasant obtains— $\Delta Y$ . For sharecropping, the marginal benefit is lower— $\alpha \Delta Y$ — than under ownership, hence output is lower.

**Is this significant** or just an abstract economic model no one should care about? It is significant. In general, estimates indicate that, correcting for quality, **output on owned land is 50% higher than on sharecropped land**. That is an enormous difference.

### Rental Contracts:

The output for land rental contracts is the same as for land ownership although the tenant must give some of his output to the landlord. This can be easily shown in the diagram below.



In the above diagram, the Y-F line represents the peasant's share of output under rental contracts, Y-F. As one can see, however, the optimum input and output,  $L^*$  and  $Y^*$  are the same as before. Why?<sup>3</sup>

If sharecropping is so lousy, why is it fairly common, especially in Asia, where roughly 85% of tenanted land is sharecropped?

1. **Risk-sharing:** While sharecropping is inefficient it does shift some risk. Under land ownership and pure rental contracts the peasant bears all of the risk.
2. **Input sharing:** Landlords have a greater incentive to provide credit and other inputs under sharecropping since they stand to benefit from any increase in productivity.
3. **Limited Liability:** Sharecropping provides limited liability to peasants since they are not responsible for any rent if the crop fails
4. **Screening:** A more complex theory holds that sharecropping may be a way to screen out less-able peasants and separate them from more productive peasants who pay fixed rent. This allows landlords to extract the maximum from peasants. (A pretty Marxist conclusion from a neoclassical model!)

**Land Reform:** Study after study indicates that the most efficient farms in developing countries are small owner-occupied plots of land. While there may be some **economies of scale** in large farming where large amounts of capital is employed as in the developed countries, economies of scale do not appear to be a significant factor in developing countries where labor is still the primary input. In this case, the incentive effect discussed above appears to dominate. Thus, a land reform that distributed land equally to all peasants would almost certainly increase productivity and equity!

Although hundreds of land reform programs have been implemented over the past hundred years, the vast majority have been dismal failures. Why?

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<sup>3</sup> Rental contracts represent a fixed cost and hence do not change the marginal calculations from land ownership.

1. **Power:** One obvious answer is that landlords have political power and, short of revolution, few landlords will give up this power. Where landlords have seen their land taken, they have often been successful in manipulating the political process after the fact in order to avoid the effects of land reform. Mexico is an excellent example of this type of behavior. In other cases (e.g., El Salvador in the early 80's) land reform is simply a smokescreen and only a few peasants receive small plots of bad land.
2. **Incentives:** Many land reform programs, the most significant being China and the former USSR, are organized around cooperative socialist principles. While these principles are often laudable, the experience of China and the former USSR show that they simply don't work well because peasants have a much lower incentive to produce than under individual land ownership. A simple example will suffice. Suppose there are  $N$  peasants on a collective farm (10,000 was a typical number) and that each peasant receives his or her "fair share" of output  $\alpha Y$ ; in this case  $\alpha = 1/N$ . What incentive does a peasant have to work harder if 99.9% will go to his comrades on the farm. Not much as the Chinese and Soviets soon found out. A good deal of the collapse of the USSR is due to its horrible land-tenure system. The Chinese overhauled this system in 1978 (see below.)
3. **Implementation and Urban bias:** Even where land reform is successfully carried out it may have problems. Tanzania's Ujaama land reform program failed partly due to incompetent management by urban elites who were disdainful of peasants.

**Has land reform worked anywhere?** Yes, in S. Korea, Japan and Taiwan land reform programs were very successful and partly account for the high rates of equality (low Gini coefficients) in these countries.

**China's Household Responsibility System (HRS):** In 1978, these Chinese implemented HRS. The HRS system accomplished the following:

1. Large collective farms were broken up into smaller "collectives" who were almost always extended families. (Why might this be better than collectives of unrelated peoples?)
2. Peasants were given long-term contracts to the land so that they could benefit from potential improvements.
3. Peasants were required to give part of their output to the state either through rental or share-cropping type arrangements.

China's system was a huge success and is estimated to have increased output (correcting for changes in other inputs during the same time) by over 50%. Since 1990, however, output growth has stagnated and a recent report argued that land-tenure contracts needed to be longer term to encourage more improvements on the land (e.g., for irrigation.)

**The "Green Revolution":** This entails using high-yield variety (HYV) strains of crops such as rice and wheat along with increasing use of fertilizer, irrigation and more intensive use of then land (e.g., double and triple cropping.) HYV strains are created in institutes using modern biotechnology.

**HYV and Inequality:** Opponents argue that HYV increases inequality of income since only rich farmers can afford to adopt them.

1. In fact, both economic theory and empirical evidence indicate that this is not so. Hayami has shown that small farmers actually adopt HYV slightly more rapidly than large farmers. (Why?) the same is not true for tractors. (Why?)
2. Hayami and others have shown that HYV are **labor-augmenting**. (Recall from Solow handout that labor augmenting technologies increase the demand for labor.) As output increases due to HYV, more labor is needed on the farm.
3. HYV has increased the amount of food available in Columbia, India, China and many other countries. India and China have largely become self-sufficient in grains over the past 30 years. In India's case,

the self-sufficiency is almost certainly due to HYV; in China the success is due to HYV and HRS.  
(Sorry for all the acronyms, but that is how the literature reads.)

4. Nevertheless, many leading scholars in the field like Lipton, Ruttan, and Binswanger have concluded that the Green revolution has been a mixed blessing.
5. The very poor have been largely left out and many may have seen their land squeezed.
6. HYV has also created regional inequalities since some regions can more readily adopt HYV (availability of water is a key factor here.)
7. Over time, many large landlords do appear to have gained relatively more from the Green Revolution.