The Effect of Land Reform on Labor Input Use: Theory and a Case Study of Korean Agriculture

By Young J. Park*

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In most developing countries, economic development has been hampered by the lagging agricultural sector. The traditional agrarian structure has often been considered an important bottleneck. Among the measures suggested for breaking the bottleneck in the agricultural sector, land reform has received much attention since World War II. The importance of land reform as a new socio-economic arrangement was particularly recognized in many Asian countries during the last three decades, where high population density and landlordism were two outstanding characteristics of the agricultural sector.

Although it is generally believed that land reform, when properly under taken, would have a number of beneficial effects on economic development, there have been numerous controversies concerning the specific effects of land reform. One controversy has been the effect of land reform on labor input use. Since the primary purpose of land reform is frequently to increase agricultural production, the question of whether land reform results in increased use of labor input or not has a direct relationship with the effect of land reform on agricultural production.

This paper attempts to synthesize the existing theories of the effect of

*Assistant Professor of Economics, Central State University, Wilberforce, Ohio. I am greatful for helpful comments from Professors Louis T. Harms and Norman Sun. I am especially indebted to Professor Sayre P. Schatz.

land reform on labor input use and, by analyzing the Korean experience, to shed some ligh ton the issue. The term, land reform, is narrowly defined here to mean the transfer of landownership from the landlord to the tenant farmers.

I. Neoclassical Marginal Productivity Theory Approach

Share tenancy, which was prevalent under the traditional landlord-tenant system, has long been criticized by many writers on the ground that it prevented efficient resource allocation in agricultural production. A share-rent contract means that the tenant pays the landlord a specified proportion of the farm produce. Although various criticisms on share tenancy are found in many classical writings of Smith, Young, Jones, J. S. Mill, *et al*, it was Marshall who first brought the analytical framework and insight of the operation and effects of institution to the discussion of share contract.(1) In Marshallian neoclassical tradition, Schickele and Heady also furthered the discussion of share tenancy.(2) The following is the summary of marginal productivity theory approach to share tenancy.

According to the traditional marginal productivity theory, a profit-maximizing enterprenur will employ units of a variable productive service until the value of the marginal product of input is exactly equal to the price of that input. Assuming that farming in an owner farm unit is entirely done by the hired workers and land input per farm unit is fixed, his effort of maximizing income will be subject to both the value of marginal products of labor and capital, and the prices of labor and capital. In diagram 1, if wage is given at w the farmer will hire ON units of labor, produciug $ONLW$ of total value of output. At the equilibrium poiut of L, the total value of production is shared by the hired workers and the owner farmer in such a way that the area, $ONLw$, is paid as a total wage bill and the triangle area, wLW, represents the maximum amount of income of farmer.

(1) For detailed discussion on this topic see, D. Gale Johnson, "Resource Allocation Under Share Contracts," *Journal of Political Economy*, April. 1950, pp. 111-114, and Steven N. S. Cheung, *The Theory of Share Tenancy*, University of Chicago Press, Chicago, 1969, pp. 30-51.

(2) Rainer Schickele, "Effects of Tenure Systems on Agricultural Efficiency," *Journal of Farm Economics*, February 1941, pp. 185-207; and Earl O. Heady, "Economics of Farm Leasing Systems," *Journal of Farm Economics*, August 1947, pp. 599-678.

Suppose that the owner farmer now hires a tenant farmer farmer who is obliged to pay a percent of total crop to the owner farmer for the right of cultivating the land. Forgetting the wage constraint momentarily, the tenant farmer, who pays a percent of total crop, X, as rent, receives $(1\text{-}a)$ of total crop, i.e. $(1\text{-}a)\ X$. By the same token, the value of marginal product of labor accruing to the tenant or marginal tenant receipt is $(1\text{-}a)\ P\frac{\partial X}{\partial l}$ where P is the price of farm output and $\frac{\partial X}{\partial l}$ represents the marginal product of labor. Thus, in figure 2, the marginal tenant receipt curve is represented by $(1\text{-}a)\ VMP_L$ instead of VMP_L. The triangle area, AMW, represents the potential value of total rent which goes to the land owner, while OMA is the potential value of total income to the tenant farmer in the absence of wage constraint.

Reintroducing the given wage, w, and assuming that the tenant farmer uses hired workers for his farming in figure 3, the marginal productivity theorists contend that the tenant farmer will hire only OQ units of labor instead of ON units.

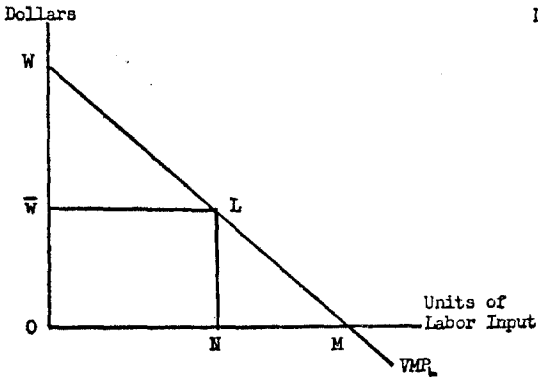


Fig. 1

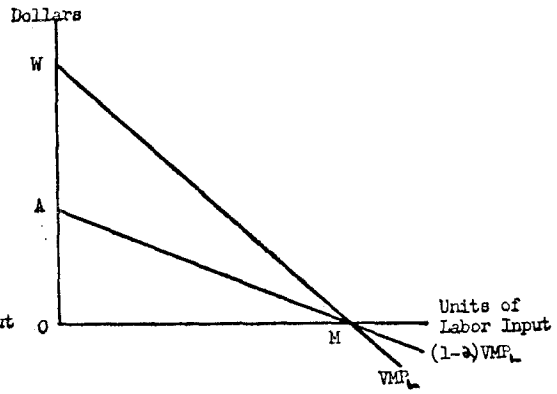


Fig. 2

The comparison of diagram 3 with diagram 1 yields two results: decrease in labor input use by QN and decrease in total production by $QNLT$. This is a theoretical basis of the traditional claim that share tenancy is inefficient in resource allocation and thus production.

The economic reasoning of land reform which involves either transfer of landownership from landlords or tenants or rent reduction is based on such marginal productivity theory approach to share tenancy. While transfer of landownership means the transfer of a source of wealth from the landlord

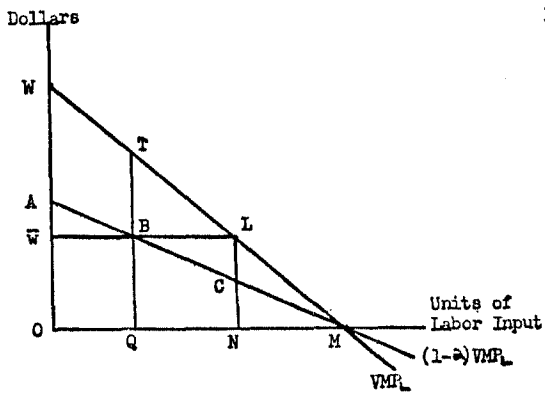


Fig. 3

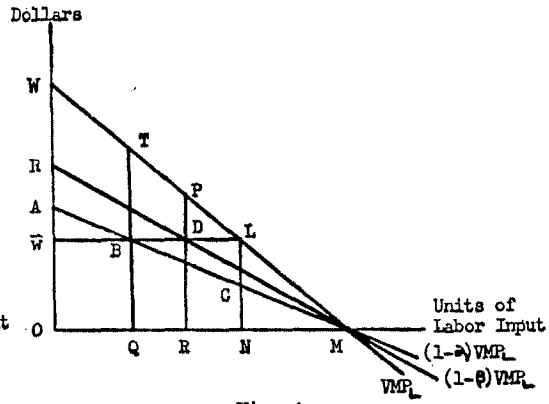


Fig. 4

to the tenant, rent reduction simply means the transfer of income from the landlord to the tenant. Although the effects of transfer of landownership and rent reduction on resource allocation and production are different, the analytical framework of both measures is the same.

On the one hand, a reduction of a certain rate means that the marginal-tenant-receipt curve moves upward. Since the new rent, β is smaller than the original rent, a, the new location of marginal-tenant-receipt curve will be somewhere VMP_L and (1-a) VMP_L, represented by (1-β) VMP_L, in diagram 4. With lower rate of rent, β, the tenant farmer maximizes his income by employing OR units of labor, and producing $ORPW$. The new equilibrium point, D, is superior to the old equilibrium point, B, but still inferior to the equilibrium point, L, in terms of both labor input use and total production.

On the other hand, the transfer of landownership from the landlord to the tenant farmer will have an effect of moving (1-a) VMP_L to VMP_L, because it completely eliminates the rent, with results as shown in diagram 1. In this regard, the transfer of landownership exerts greater effects on both labor input use and total production than the compulsory rent reduction.[3]

(3) This proposition may lead to a contention that the owner farms are more efficient and thus better off than the tenant farms. Such contention has been confirmed in various. Studiesin For example, Sonachalan reports that the peasant farms are superior to the tenant farms in India. K.S. Sonachalan, "Economics of Peasant and Tenant Farming: A Case Study," *Asian Economic Review*, May 1961, pp. 285-301. See also Erich H. Jacoby, *Interrelationship between Agrarian Reform and Agricultural Development: An FAO Land Tenure Study*, FAO of United Nations, September 1953, pp. 6-8.

The same type of analysis can be applied to the capital inputs used in agricultural produciton. At the given level of input prices or interest rate and given value of marginal product curve of capital input, the compulsory rent reduction and transfer of landownership would result in an increase in capital input use and total production attributed to capital inputs. The effect of transfer of landownership on capital input use and total production will also be greater than that of the rent reduction for the same analytical reasons discussed above.

The points made thus far can be stated mathematically. Assume that there are three homogenous factors of production, L, C and l, where L is the size of land per tenant farm, C is the amount of capital inputs used per farm and l is the amount of hired labor used per farm. Let the production function of tenant farm be,

$$X=f(L,C,l).$$

Then, with given wage level, w, given interest rate, i, rate of rent, a, and the price of farm output, P, the tenant farmer's income equation becomes,

$$Y=XP-wl-iC-aXP$$

The problem of tenant farmer is to maximize his income Y, through the choice of l and C subject to X, because the size of land per farm, L, is considered a fixed input. Taking the partial derivatives of Y with respect to l and equating them to zero.

$$\frac{\partial Y}{\partial l}=P\frac{\partial X}{\partial l}-w-aP\frac{\partial X}{\partial l}=0$$

$$\frac{\partial Y}{\partial C}=P\frac{\partial X}{\partial C}-i-aP\frac{\partial X}{\partial C}=0$$

or

$$w=(1-a)P\frac{\partial X}{\partial l}\cdots\cdots(1)\quad i=(1-a)P\frac{\partial X}{\partial C}\cdots\cdots(2)$$

Equations (1) and (2) show that labor and capital will be employed in a tenant farm until $(1-a)$ of the actual values of marginal product of labor and capital inputs are equal to wage rate and interest rate, respectively. Since a reduction in a will result in an increase in the marginal tenant receipt, equations (1) and (2) indicate that with given wage and interest levels rent reduction will result in an increase in labor and capital inputs

used in agricural production in tenant farm.

Since the transfer of landownership means a complete elimination of rent, equations (1) and (2) become $w=P\frac{\partial X}{\partial l}$ and $i=P\frac{\partial X}{\partial C}$ respectively, after the transfer of landownership. This means that the tenant farms become owner farms and maximize their income under the given wage and interest levels, and the given market values of marginal product of labor and capital.

The marginal productivity approach to share tenancy discussed thus far suggests that misuse of agricultural production resources is inevitable under crop-share contracts. Thus, rent reduction or outright rent elimination is suggested for more effective resource allocation in agricultural production.

II. Average Productivity Theory Approach

While the marginal productivity approach to share tenancy can be viewed as the theoretical basis of arguments for land reform which involves rent reduction or rent elimination, some writers such as Johnson and Cheung reject the inefficiency doctrine advocated by the marginal productivity theorists. They reason that the marginal productivity model concerning the resource allocation under share tenancy does not conform with the real world situation as shown by the data on actual rental market or crop share contracts.[4] Since both Johnson and Cheung apply the average product curves of inputs in their analyses, their approach to share tenancy can be called the average productivity model. Although both Johnson and Cheung use similar analytical framework in their discussion, Cheung's analysis of resource allocation under share tenancy is summarized in this paper. This is because Cheung presents his analysis in a more rigorous form and his argument is more in direct contrast with the marginal productivity model.

Cheung's criticism of the marginal productivity model centers on the following two assumptions which were held by the classical and neoclassical writers.

First, the marginal productivity approach to share tenancy assumes that the terms of share contract under the landlord-tenant system are determined

(4) Johnsnon, *op. cit.*, pp. 111-125; and Cheung, *op. cit.*, pp. 16-61.

by custom. Although the meaning of "custom" is not clear in its usage by the marginal productivity model, one interpretation would be, as Cheung points out, that it means "a situation where the postulate of wealth or utility or utility maximization does not apply."(5) Or in the tradition of classical thinking it may be interpreted as something noncompetitive.(6) In the absence of competition the terms of share contract including rental percentage would be taken as given. Since the classical writers as well as the neoclassical writers viewed the share tenancy and custom as a hindrance to improvement or economic efficiency,(7) a custom-determined share contract implies that there exists exploitation by the landlord class, resulting in an unfavorable contract for the tenants.

Cheung rejects the assumption that the share tenancy is regulated by custom. The reason why the terms of share contract were viewed as customary is, he explains, that a share contract yields an impression that market prices do not exist, because "factor prices are not explicitly stated in share contract."(8) But he argues that market prices of non-land inputs such as wage rate exist and affect a share contract, although the pricing mechanism under a share contract operates in such a way that a change in relative market prices of nonland inputs can be flexibly adjusted in a share contract through several dimensions, thus giving an impression of nonexistence or inflexibility.

Moreover, he argues that the classical statement that "the Metayage (or landlord-tenant) system never gives rise to competition is wrong," because various constraints on the contracting parties are restraints imposed by competition itself.(9) He sees competition as a determining factor of the terms of the share contract on the part of both tenants and landowners. Competition among tenants arises from a situation where tenants enter into farming to compete for a share contract which pays a higher aggregate income for each tenant than his alternative earning. Competition among

(5) Cheung, *op. cit.*, p. 48.
(6) J.S. Mill, *Principles of Political Economy*, Fourth Edition: John W. Parker and Son, London, 1857, p. 363.
(7) See, Adam Smith, *Wealth of Nations*, Modern Library Edition, New York, 1937, p. 367., Mill, *op. cit.*, p. 367 and A. Marshall, *Principles of Economics*, Eighth Edition, McMillan and Co., London, 1956, pp. 535-536.
(8) Cheung, *op. cit.*, p. 41.
(9) *Ibid.*, pp. 40-41.

landowners arises when the landowners compete in choosing among tenants who offer the highest rental percentage. In contrast to the classical and neoclassical postulate, Cheung asserts that the income-maximizing behavior applies to both tenants and landlords and so does competition. Thus, he assumes that the terms of share contract are determined by competition.

Secondly the marginal productivity approach implicitly assumes that once the rate of rent is determined, the tenants have freedom to decide how they utilize their inputs in farming. This assumption is traced to Marshall who wrote,

> "When the cultivator has to give to his landlord half of the returns to each dose of capital and labor that he applies to the land, it will not be to his interest to apply any doses the total return to which is less than twice enough to reward him. If then, he is free to cultivate as he chooses, he will cultivate far less intensively than on the English plan (fixed rent); he will apply only so much capital and labor as will give him returns more than twice enough to repay himself." (10)

Although Marshall's statement is not at all explicit about the tenant's freedom of how to cultivate, his supposition, that the tenant "is free to cultivate, as he choose," has been an essential assumption in the marginal productivity model which explains the different behavior between tenant and owner farmers in farming.

The marginal productivity model in which tenants use less input per given unit of land than the owner farmers implies that the behavior of tenants in allocating their resources would not be in accord with the landlord's interest. But it is also suggested that in the absence of competition among tenants and among landlords such tenants' behavior would not create any serious problem as long as their behavior remains in the boundary of custom.

Cheung agrees that once a share contract is determined, a tenant would prefer "to work or invest less in land than if he cultivates his own land." (11) But he argues that,

> "Under private ownership of land, the landlord's incentive to maximize his wealth is not reduced... It does not matter whether the landowner stipulates that the tenant is to

(10) Marshall, *op. cit.*, pp. 535-536.
(11) Cheung, *op. cit.*, p. 31.

invest more in land and charges a lower rental percentage or whether the landowner invests in land himself and charges the tenant a higher rental percentage; the investment will be made if it leads to a higher rental annuity."(12)

Contending that the marginal productivity approach "fails to offer any explicit treatment of the terms in a share contract which the participating parties must mutually agree to abide by," he states that,

> The contracting parties are free only to accept or not to accept a contract, and they can get by with only as much as the restraints of competition allow. These choices are exactly the same as fixed rent and wage contracts, which are implied by the constraints of private property rights.(13)

Thus, he asserts that the amount of input to be used in farming is specified in a contract, and that even if a landowner does not have a direct supervision in farming, competition among tenants will insure that the contracted amount of tenant inputs is committed. Although Cheung is not explicit, it appears that a rental share going to the landowner out of the total output produced by the contracted amount of tenant inputs would be satisfactory to the landowner with profit-maximizing motive. And competition among the landowners would insure that the tenant is satisfied with his aggregate income, a share of total output produced by the contracted amount of his inputs, which is equal to his alternative earning.

With the assumptions that the terms of share contract are determined by competition, and that the tenants are not free to cultivate as they choose but to commit the contracted amount of tenant inputs in farming, Cheung presents the pattern of resource allocation under share tenancy as the following.

According to the marginal productivity model, the equilibrium point is at A, with Ot_1 units of labor input under share tenancy in figure 5. But contending that the marginal-tenant-receipt curve shown by EAF in figure 5 is only illusory for decision making under the unrestrained private property rights, he argues that the real equilibrium is at B rather than at A.

Assume that the land area per farm is fixed and the rate of share rent

(12) *Ibid.*
(13) *Ibid.*, pp. 31 and 50.

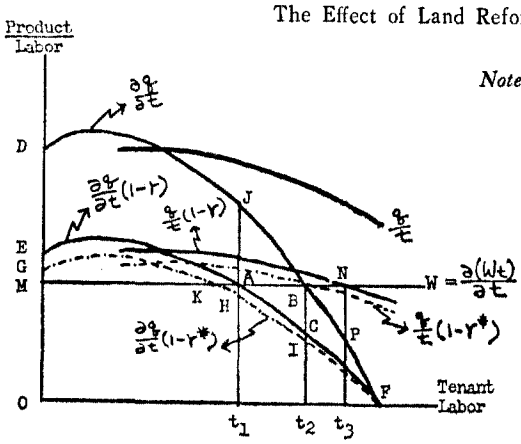


Fig. 5. Comparison of marginal productivity model with average productivity model of share tenancy

Notes to Fig. 5

$\frac{\partial q}{\partial t}$ =marginal product of tentant labo

$\frac{q}{t}$ =average productof tenant labor

$\frac{\partial q}{\partial t}(1-r)$ =marginal tenant receipt net of rent

$\frac{q}{t}(1-r)$ =average tenant receipt

$W=\frac{\partial Wt}{\partial t}$ =prevailing wage rate or marginal tenant cost

r=original rate of rent, 60% of total product

r^*=raised rate of rent

t=amount of tenant labor input per farm

Source: Steven Cheung, *op. cit.*, p.25

is 60 percent of total output and let $\frac{\partial q}{\partial t}(1-r)$ and $q/t\ (1-r)$ represent the marginal-tenant-receipt and the average-tenant-receipt curves, where q, t and r are the total output, the amount of tenant labor per farm and the rate of rent, respectively in figure 5. Suppose that there are many landowners and each landowner does not specify the tenant input per acre. The income-maximizing tenant would not choose to work up to t_1 in figure 5 but to disperse his input over many farms in such a way that his marginal income from different farms is equal. In this case, the tenant's aggregate income from farming will be greater than his alternative earning. This will cause other tenants to enter into farming to compete.

Supposing that each successive tenant entering into farming works on several farms, he goes on to argue that,

> Given $\partial q/\partial t(1-r)$ as drawn, and assuming that the landowners contractually accept any amount of labor, competition among tenants will push labor input on each farm to t_3. The resulted overcrowded tillng implies that rental shares are not at maximums. Competition again prevails. Given homogeneous factors of production, wealth maximization implies that the landower will choose among tenants who offer rental percentages as high as r^*, while competition among landowers implies that it will not be any higher. Given r^* which defines $\partial q/\partial t\ (1-r^*)$, the amount of tenant labor competitively offered and contractually accepted for each farm will be t_2. The market equilibrium reached occurs when the marginal product of tenant labor in each farm equals the marginal tenant cost (point B in figure 5).[44]

(14) *Ibid.*, pp. 54-55.

In other words, the true equilibrum will be found at B instead of A or N in figure 5 though competition among tenants and among landowners. The amount of tenant input t_2 and the rate of rent r^* represent the contracted amount of tenant input and rental percentage which are determined by the mutual forces of tenants and landowners. Since at equilibrium point B the resource allocation under share tenancy is as efficient as under owner farm with the given production function, land reform which reduces or eliminates or fixes rent would not result in the in creased use of input per given unit of land as claimed by the marginal productivity model.

III. Shortcoming of Theories

It has seen that different assumptions on share tenancy resulted in conflicting conclusions in the analysis of resource allocation under share tenancy. The validity of each theory can only be verified by the empirical investigations. However, both the marginal productivity and average productivity models have an important short-coming when they are applied to the underdeveloped-economy agriculture.

By having a common assumption that labor supply in an individual farm is unlimited at the given wage rate which is a valid assumption in a competitive economy, both models fail to offer an explanation for a situation in which farming is done by the family workers instead of hired workers. In subsistence agriculture which is a predominant form in Asian agriculture, farming is mostly done by the family works. An important distinction between the hired workers and the family workers is that, while there is a wage constraint in employing the hired workers, there is no such constraint in using family labor. In overpopulated Asian agriculture the opportunity cost of using family labor is considered zero, because the employment opportunities outside the family farm are extremely limited. Thus, the pattern of labor input supply would be different in the family-worked farms from that in the farms which use the hired workers.

On the one hand, let us assume that the supply curve of labor in the family-worked farms (i.e. farms not using hired labor) is horizontal at zero. Then with the given production function, labor input may be used beyond the point at which the value of marginal product of labor of the value of

average product of labor is equal to the market wage rate (or minium subsistence level). Although this phenomenon can be explained in the analytical framework of marginal productivity model, the assumption of horizontal labor supply curve at zero wage rate necessarily has additional implications.

First, whether in the owner farms or in the tenant farms, the amount of labor input used in a given unit of land in this case would be *OM* in figure 6, if the farmers are assumed to be rational. And the equilibrium point would be at *M*.

Secondly, the value of farmers' leisure would be zero. This means that the farmers would be willing to sacrifice their leisure for low return of even virtually no return at all.

Thirdly, since at *M* the value of marginal product of labor is zero, the last unit of labor input used in farming adds nothing to nothing to the total output. The zero value of marginal product of labor is often cited in the development literature as a typical characteristic of overpopulated underdeveloped-economy agriculture.

On the other hand, the supply curve of labor in the family-worked farms may be assumed to be upward-sloping as shown in figure 6 by *OT*, although the slope and height of the curve may have to be very small. This is because even if the value of farmer's leisure is zero at the initial point, it is not likely to remain zero as his family labor input increases. In other words, a farmer may want to relax rather than to work, if the reward for his work becomes very low. Although there is no general way of determining the exact value of the reward which an average farmer considers unacceptable, it can, at least, be asserted that a rational farmer would not put his labor into farming for nothing unless he is forced to by the external authority.

Since the farmer's leisure is valued greater than zero, the value of marginal product of his labor must be greater than zero at an equilibrium point. In figure 6, the amount of labor input used in farming at an equilibrium point would be *ON* in the family-worked tenant farms and *ON* in the family-worked owner farms, if one applies the marginal productivity theory model.

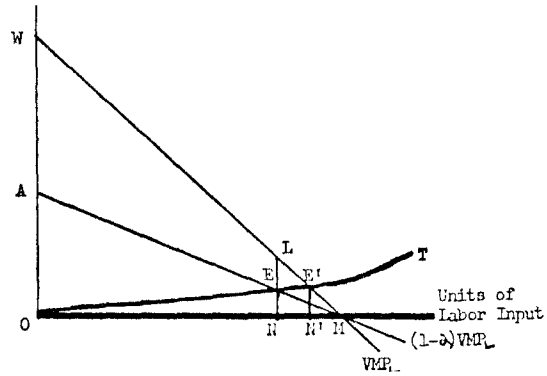


Fig. 6 Labor supply curve in the family-worked farms

However, the analytical framework of both the marginal productivity and the average productivity models can be used to explain a phenomenon in which the value of farmer's leisure is greater than zero by assuming a horizontal labor supply curve at some positive value but lower than the given maket wage rate or minimum subsistence level. But the assumption of upward-sloping labor supply curve in the family-worked farms has an advantage in depicting the real phenomenon. This is because in reality, the value of farmer's leisure is likely to increase as labor input increases and amount of leisure time remaining decreases rather than being fixed at a certain positive level or zero.

Nevertheless, the analysis made above suggests that when the use of labor input is not subject to a wage constraint in the family-worked farms, there are two conceivable ways of explaining the labor input use pattern: either by assuming the horizontal labor supply curve at zero or at certain positive level, or by assuming the upward-sloping labor supply curve. Again, the validity of these assumptions can only be verified by empirical investigations in these countries.

IV. A Korean Case: The Effect of 1950 Land Reform on Labor Input Use

Farming in Korean agriculture has been traditionally done by simple tools and implements, manual labor and domestic animals. Although mechanized farming techniques have been introduced in Korean agriculture since land reform, the mode of farming is still predominantly labor-inten-

sive.[15] Moreover, it should be noted that in Korean agriculture family labor has been a dominant source of labor input supply in farming in most farms. For example, in 1966, 73% of total labor input used in an average farm represented family labor.[16] The proportion of family labor to the total labor used in farming, however, decreases as the size of landholding per farm increases, Table 1 shows that in 1965, more than 80% of total labor input used in farming was supplied by family labor in the small farms, while it was only 46% in the large farms.

One important characteristic of family labor compared with the hired labor is that the money cost of using family labor is zero. In Korean agriculture it is customary that all family members are supported by family farming regardless of whether all able bodies in a farm family participate in farming or not. Cho explains the money-cost-free nature of family labor in Korean farms:

> In general, for the rest of year (except during the peak season in agricultural production), farming is done mostly by family members and attached wage-workers. Non-farm-owning family members are satisfied with such reward as is traditionally regarded as fair for their volunteered services rendered as members of the family not as employees. The strong family ties, the clan, and the village system represent special values for those who live in a rural community.[17]

Table 1. Total work hours per farm by family and hired workers, 1965:

Farms	Family	(%)	Hired*	(%)	Total	(%)
Less than 0.5 chongbo**	1,301.47	84.2	242.56	15.8	1,544.03	100
0.5-1.0 chongbo	1,849.07	80.8	436.80	19.2	2,285.87	100
1.0-1.5 chongbo	2,255.90	75.9	846.25	24.1	3,102.15	100
1.5-2.0 chongbo	2,355.49	61.7	1,456.10	38.3	3,811.59	100
More than 2.0 chongbo	2,180.65	46.0	2,554.76	54.0	4,735.41	100

*Hired workers include those who hired yearly and temporarily.

**1 Chongbo=2.45 Acres

Source: Ministry of Agriculture and Forestry, *Yearbook of Agriculture and Forestry Statistics*, 1971, Seoul, pp. 174-180.

(15) National Agricultural Cooperative Federation (NACF), *Problems in Korean Agriculture*, Seoul, 1969, p. 139.

(16) NACF, *Agricultural Yearbook*, 1970, p. 11.

(17) Yong Sam Cho, *Disguised Unemployment in Underdeveloped Areas with Special Reference to South Korean Agriculture*, University of California Press, Berkeley and Los Angeles, 1963, p. 100. Parenthesis is added.

With the general understanding of nature of the Korean farm labor discussed above, this section aims to analyze the effect of 1950 Korean land reform on labor input use, which transferred landownership from landlords to the tenant farmers.

Contrary to the result to be expected from a simple application of marginal productivity approach to share tenancy discussed in Section I, there was a decreased use of labor input per tanbo (1 tanbo=0.245 acres) in the new-owner (former tenant) farms. In other words, the new-owner farms after land reform used less labor input per tanbe than the pre-reform tenant farms. This is shown in table 2, in which an average pre-reform tenant farm used 80.6 work days of labor input per tanbo in 1939, but the new-owner farms (farms with less than 0.5 chongbo of land and 0.5-1.0 chongbo of land) used much less labor input per tanbo in the post-reform years. Although there are conceivably a number of factors responsible for such a change, it is hypothesized here that this change was, at least partially, due to the Korean land reform.

If it is assumed that farmers are rational so that they use labor input up to the point at which the value of marginal product curve of labor input intersects the labor supply curve, the decreased use of labor input per tanbo in the new-owner farms implies that the family labor supply curve shifted to the left in these farms after land reform. It is then asserted here that the Korean land reform was a cause of such shift of family labor supply curve in the new-owner farms for the following reasons.

First, the new-owner farmers became richer at least by the difference between rent before land reform and various payments after land reform. For example, while the average rate of rent was about 50% of total output in the pre-reform tenant farms, an average new-owner farm paid only about 21% of total output as various payments in 1956.[18] In this comparison, income of an average new-owner farm increased by 29% of total output per farm. The new-owner farmers' increased income after the transfer of landownership from landlords to tenants resulted in the revaluation of their leisure relative to a very low return for their labor used in farming. In other words, the new-owner farmers became more reluctant to

(18) National Agricultural Cooperative Federation, *Agricultural Yearbook*, 1962.

Table 2. Total number of annual work days used per tanbo in selected pre- and post-reform years

Pre-reform tenant farms, 1939*

Total work days per per farm	Size of cultivating land per farm	Total work days per tanbo**
781.6	0.97 chongbo	80.6

Post-reform new-owner farms

Size of landholding per farm	Total work days per tanbo					
	1958	1959	1960	1961	1968	1969
Less than 0.5 chongbo	27.1	27.1	48.1	40.1	29.8	31.1
0.5-1.0 chongbo	24.2	25.2	33.9	35.7	27.5	26.0

*In a sample village, Kyong-sang Province.

**1 tanbo=0.245 acres

Note on Table 2:

The lack of data during the pre-reform years prevents a more extensive comparison of the amount of labor input used per tanbo between the pre-reform tenant and the post-reform new-owner farms in South Korea. However, the 1939 figures in a sample village used in this table as a base point for comparison are considered representative of the pre-reform Korean agriculture for two reasons.

First, the sample village is located in a southern Province which has been one of the two most important agricultural regions in South Korea.

Secondly, there seems little doubt that the mode of farming on the whole was more labor-intensive in the-World War II farms than in the post-World War II farms in South Korean agriculture.

Source: Jung Sik In, *Agricultural Structure in Korea*, Hakyyo-sha, Tokyo, 1940, pp. 339-340 and National Agricultural Cooperative Federation, *Agricultural Yearbook*, 1959-1970, Seoul.

put their labor in farming for a very low reward after land reform.

Secondly, there have been the increased nonfarm employment opportunities in the post-reform agriculture and more importantly, the new-owner farmers unlike the pre-reform tenant farmers enjoyed the freedom to engage in them after land reform. In the pre-reform agriculture the tenant farmers had neither many nonfarm jobs available nor much freedom to engage in them.

Since the landlord class possessed not only economic wealth but also political power and social prestige, they were able to impose various obligations on their tenant farmers. The tenant farmers' various obligations often made it impossible for them to take up nonfarm employment.

The increased nonfarm employment opportunities in the post-reform agriculture were not, however, necessarily caused by the Korean land reform, but the new-owner farmers' freedom and perhaps also their improved knowledge of outside events were a direct consequence of land reform. These

combined with the increased nonfarm employment opportunities brought the increased alternative-income earning opportunities to the new-owner farmers.

The combined effect of new-owner farmers' increased farm income and alternative-income earning opportunities was that the opportunity cost of using family labor increased after landreform. In other words, the supply curve of family labor in the new-owner farms shifted to the left of that in the pre-reform tenant farms, resulting in the decreased use of labor input per tanbo in the new-owner farms. Since Korean land reform was a cause of the increased farm income and freedom in the new-owner farms, despite a number of unidentified factors which may have beenresponsible for the decreased use of labor input per tanbo in the new-owner farms, it can be claimed that the Korean land reform was at leastpartially the cause of the decreased labor input use per tanbo in the new-owner farms.

Moreover, the hypothesis in this section that Korean land reform was a partial cause of the decreased labor input use per tanbo in the new-owner farms is further supported by the following two comparisons.

(1) Even in the past-reform agriculture the owner farms use less amount of labor input per tanbo than the existing tenant farms. This is shown in table 3. Although there is a mixed pattern of labor input used per tanbo between tenant farms with different proportion of rented land to total cultivating land, table 3 shows that the owner farms use less labor input per tanbo than the tenant farms with comparable size of landholding per farm. This suggests that the landownership status created by land reform was to some extent responsible for the decreased labor input use per tanbo in the new-owner farms after land reform.

(2) The large-owner farms (which were mostly formerandlord farms) increased the use of labor input per tanbo after land reform. This is shown on table 4 in which labor used per tanbo in the large-owner farms was much greater than that in the pre-reform owner farms with comparable size of landholding per farm. Although there are no data concerning the amount of labor input used per tanbo in the pre-reform landlord farms, it seems reasonable to assume that the pre-reform owner farms used more labor input per tanbo than the landlord farms in which landlords themselves participated in farming. In this comparison the absentee landlord farms are

Table 3. Number of work house used per tanbo in rice production, 1964*

Ownership status	Size of cultivating land per farm in tanbo		
	Less than 10 tanbo	More than 10 tanbo	Average
Owner farm	154	132	141
Farms with less than 20% of rented land	170	136	148
Farms with 20%—50% of rented land	157	176	168
Farms with more than 50% of rented land	170	141	157

*The number of smaple farms investigated is 680.

Source: Jin Whan Park, "The Comparison of Farm Income and Land Productivity by the Landownership Pattern" in *Agricultural Economy*, Ministryof Agriculture and Forestry, Seoul, December 1965, p. 113.

Table 4. Total number of annual work days used per tanbo in the large-owner farms before and after land reform

Pre-reform large-owner farms, 1939*

Total work days per farm	Size of landholding per farm	Number of work days per tanbo
310.4	3.2 chongbo	9.7

Post-reform large-owner farms

Size of landholding per farm	Number of work days per tanbo					
	1958	1959	1960	1961	1968	1969
More than 2.0 chongbo	20.3	20.7	20.7	22.6	18.2	17.7

*In a sample village, Kyong-sang Province. It is assumed that the landlord farms used less amount of labor input per tanbo than the pre-reform large-owner farms.

Source: Jung Shik In, *op. cit.*, pp. 339-440; NACF, *Agricultural Yearbook*, 1959-1970.

excluded, because they did not participate in farming.

One reason for this phenomenon may be that a reduction in large owner (former landlord) farmers' landholding (i.e. the source of farm income) due to the transfer of landownership resulted in a reduction of income and therefore in the shift of their family labor supply curve to the right. In other words, with given production, the former landlords who became owner-tillers after land reform increased their efforts in farming in order to recover the farm income lost due to land reform.

However, there are likely to be other factors which were responsible for the increased use of labor input per tanbo in the large-owner farms after land reform. They may include a greater incentive for farming due to the improved market condition, increase in the number of family workers available, changes in general attitude toward farming, etc. But it seems

quite reasonable to presume that such factors would have affected the small-owner farmers in the same manner as they affected the large-owner farmers after land reform. But it was shown that labor input used per tanbo decreased in the new small-owner farms after land reform.

Thus the difference between large and small farms in terms of the changes in amount of labor input used per tanbo after land reform appears to support the hypothesis that Korean land reform through changes in income and freedom of new-owner farmers was an important cause of the decreased use of labor input per tanbo in the new-owner farms. while it through a reduction in farm income of large-owner farmers was responsible for the increased use of labor input per tanbo in the large-owner farms after land reform.

V. Conclusion

The analysis of effect of Korean land reform on labor input use has some implications for the theory of share tenancy concerning the use of labor input in farming. The findings in Korean experience conflict with both the marginal productivity theory and average productivity theory approaches to share tenancy. While the static presentation of marginal productivity approach holds that the elimination of rent would result in the increased use of labor input per given unit of land, and the average productivity approach maintains that the amount of labor input used per given unit of land would be same, the Korean experience shows that the tenant farms used more labor input per tanbo than the new-owner farms.

But if the static assumption of horizontal labor input supply curve at the given wage level is dropped and it is assumed that farms with different size of landholding per farm and different landownership status had different shifts in their labor input supply schedules, the Korean experience could be consistent with both the marginal productivity and the average productivity models of share tenancy.

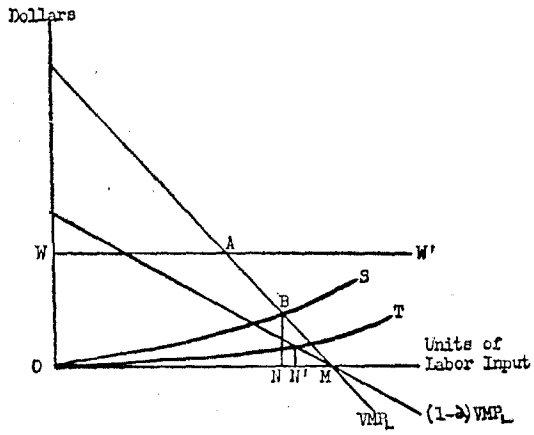
The Korean experience, however, suggests that the assumption of different upward-sloping labor input supply curves in different farms rather than the assumption of horizontal labor input supply curve at the given wage level is valid because the amount of labor input used per tanbo in reality varied

between tenant and new-owner farms and between small and large-owner farms as was shown in Tables 2, 3, and 4. Since the tenant farms used more labor input per tanbo than the new-owner farms, under the ceteris paribus assumption it is reasonable to assert that the labor supply curve in the tenant farms would be lower and further to the right than those in the new-owner farms. By the same token, the labor supply curves in the small farms would be lower and further to the right than those in the large owner farms.

In diagram 7, *OS* represents the labor supply curve of a small-owner farm and *OT*, the labor supply curve of a tenant farm. The labor supply curves of medium and large-owner farms would intersect VMP_L curve at some point between *A* and *B*. Although it might appear that the labor supply curves of large-owner farms would intersect the VMP_L curve at *A* when the market wage rate is given at *WW'*, it should be noted that they would lie to the right of the point *A* on VMP_L curve instead of at *A* because it was claimed that all Korean farms regardless of size of landholding used money-cost-free family labor to some degree.

Incidentally, the Korean case, in which the tenant farms used more labor input per tanbo than the new-owner farms, raises some doubt on the traditional theory of disguised unemployment in the agricultural sector of underdeveloped economies.[19] If it is assumed that the farmers including the tenant farmers are rational so that they do not use labor input beyond the point of zero marginal product of labor input, the previous discussion suggests that at equilibrium point *B* in diagram 7, the marginal product of labor input is greater than zero in the post-reform new small-owner farms. Thus, even if one assumes that the marginal product of labor input is zero in the tenant farms so that there exists disguised unemployment in these tenant farms, the positive value of marginal product of labor in the new small-owner farms suggests htat there is no disguised unemployment in these small-owner farms. Since most farms are owner farms in post-reform

(19) Here the concept of disguised unemployment means zero marginal product of labor input. Disguised unemployment exists, according to Nurkse, when "a number of people are working on farms or small peasant plots, contributing nothing to output, but subsisting on a share of their family's real income." Ragnar Nurkse, *Problems of Capital Formation in Underdeveloped Countries and Patterns of Trade and Development*, Oxford University Press, New York, 1967, p. 33.



WW'=market wage rate
OS=labor supply curve of small-owner farm
OT=labor supply curve of tenant farm

Fig. 7. Labor Supply Curves in the Farms

Korean agriculture,[20] the analysis further suggests that there is no disguised unemployment in most post-reform Korean farms.

References

[1] Cheung, Steven N. S., *The Theory of Share Tenancy*, University of Chicago Press, Chicago, 1969.

[2] Cho, Yong Sam, *Disguised Unemployment in Underdeveloped Areas with Special Reference to South Korean Agriculture*, University of California Press, Berkeley and Los Angeles, 1963.

[3] Dandekar, V. M., "Economic Theory and Agrarian Reform" in *Agriculture in Economic Development*, edited by Carl Eicher and Lawrence Witt. Mcgraw-Hill Company, New York, 1964.

[4] Dorner, Peter, *Land Reform and Economic Development*, Penguin Books, Baltimore, 1972.

[5] Flores, Edmund, "The Economics of Land Reform," *International Labor Review*, July 1965.

[6] Georgescu-Roegen, N., "Economic Theory and Agrarian Reforms," *Oxford Economic Papers*, February 1960.

[7] Heady, Earl, "Economics of Farm Leasing Systems," *Journal of Farm Economics*, August 1947.

(20) For example, in 1963, 83% of total farms were owner farms as opposed to 14.2% in 1947 before land reform.

[8] _____, "Levels and Flexibility of Rent and Agricultural Efficiency," *Land Economics*, Novermber 1951.

[9] In, Jung Shik, *Agricultural Structure in Korea*, Hakuyo-sha, Tokyo, 1940.

[10] Ishikawa, Shigeru, *Economic Development in Asian Perspective*, Kinokuniya Bookstore Co. Tokyo 1967.

[11] Issawi, Charles, "Farm Output under Fixed Rents and Share Tenancy," *Land Economics*, February 1957.

[12] Johnson, Gale D., "Resource Allocation Under Share Contracts." *Journal of Political Economy*, April 1950.

[13] Koo, Anthony Y.C., *The Role of Land Reform in Economic Development: A Case Study of Taiwan*, Frederick A. Praeger, New York, 1968.

[14] Korea, the Bank of Korea, *Annual Economic Review*, 1949-1970.

[15] Korea, Economic Planning Board, *Korean Statistical Yearbook*, 1970.

[16] Korea, Ministry of Agriculture and Forestry, *Yearbook of Agriculture and Forestry Statistics*, 1949-1971.

[17] Lee, Hoon K., *Land Utilization and Rural Economy in Korea*, University of Chicago Press, Chicago, 1936.

[18] Long, Erven J., "The Economic Basis of Land Reform in Underdeveloped Countries," *Land Economics*, May, 1961.

[19] Myint, Hla, *The Economics of the Developing Countries*, Frederick A. Praeger, New York, 1966.

[20] Nurkse, Ragnar, *Problems of Capital Formation in Underdeveloped Countries and Patterns of Trade and Development*, Oxford University Press, New York, 1967.

[21] Park, Jin Whan, "The Comparison of Farm Income and Land Productivity by the Landownership Pattern" in *Agricultural Economy*, Ministry of Agriculture and Forestry, Seoul, December 1965.

[22] Schickele, Rainer, "Effect of Tenure Systems on Agricultural Efficiency," *Journal of Farm Economics*, February 1941.

[23] _____, *Agrarian Revolution and Economic Progress*, Frederick A. Praeger, New York, 1968.

[24] United Nations, *Progress in Land Reform*, United Nations Department of Economic Affairs, First Report, 1954; Second Report, 1956; Third Report, 1962; Fourth Report, 1966.

[25] Warriner, Doreen, *Land Reform in Principle and Practice*, Oxford, Clarendon Press, 1969.

[26] _____, *Land Reform in Development in the Middle East*, Oxford University Press, London, 1962.