

0.1 Property rights and wages in general equilibrium

Our previous comparison of institutional arrangements posited a partial equilibrium setting, that is, both input and output prices were held constant. Suppose that the resource in question is land and that the main input to land use is labour. Our analysis predicts that a move from open access to exclusive ownership induces owners to shed workers from the land. Now if this is happening economy-wide, one expects labour wages to be affected. This has many implications which we now consider with the help of a *general-equilibrium* framework with endogenous labour wages.

Not surprisingly, we shall see that a move from open access to exclusive ownership leads to a more efficient allocation of workers between sectors of the economy. As wages vary, however, the benefits from a higher national income are unequally distributed. This provides an explanation why efficient outcomes may not obtain in a political-economic equilibrium. We shall further argue that once we introduce transaction costs, exclusive ownership may lose its efficiency appeal. But since the benefits and costs of exclusive ownership are not shared equally, we show why an inefficient exclusive ownership arrangement may still persist in a political-economic equilibrium.

0.1.1 A basic model of rural enclosures

An economy is composed of two sectors: rural and manufacturing.¹ Each sector has its own type of *immobile* factor: land in the rural sector; physical (or man-made) capital in the manufacturing sector. Each sector commonly uses labour as a variable input, which can move freely and costlessly between them. In the present static analysis, the supplies of land and capital are fixed. We can thus represent the total output from each sector as a function of labour only. Let $f_i(L_i)$ denotes the total output in sector i , $i \in (R, M)$, L_i is the total quantity of labour present in sector i . Function f_i is increasing and concave.

¹This section is based on Samuelson (1974), Weitzman (1974) and Cohen and Weitzman (1975).

The open-access general equilibrium

In the rural sector, we assume that property rights over land are absent. It is consequently exploited under open access by rural workers.² Workers are identical in terms of their productivity and each worker can take home the full product of his or her own work.

Let L_R denote the amount of labor in the rural sector. Each rural worker thus earns $pf_R(L_R)/L_R$, where p is the unit price of agricultural output in terms of manufactures.

The wage rate offered in the manufacturing sector is denoted w . Since workers can move freely between sectors, it really represents the opportunity cost of working in the rural sector. Although it is taken as a given by the individual worker, it will be endogenously determined in the general equilibrium by the labor market clearing condition.

Let $\phi_R(L_R)$ denote the average product of a worker in the rural sector, that is, $\phi_R(L_R) \equiv f_R(L_R)/L_R$. We have seen in section ?? that under open access, the equilibrium amount of labor working on the land is given by the following condition:

$$p\phi_R(L_R) = w. \quad (1)$$

In the manufacturing sector, property rights on capital are on the other hand assumed to be perfectly and costlessly respected. Assuming that each employer takes the wage rate as given and maximizes profits, workers are hired up to the point where $f'_M(L_M) = w$. The equilibrium allocation of labor between both sector is thus given by the following two equations:

$$p\phi_R(L_R^{OA}) = w^{OA} = f'_M(L_M^{OA}), \quad (2)$$

$$L_R^{OA} + L_M^{OA} = \bar{L}, \quad (3)$$

where \bar{L} is the total number of workers in the economy and superscript OA denotes equilibrium values when the rural sector is subject to an open-access regime.

This equilibrium can be conveniently illustrated and analysed with the help of figure 1. The length of the abscissa equals the total size of the labor force, that is, $\overline{0_R 0_M} = \bar{L}$, where 0_R is the origin for the labor force

²In the early literature where these models were first developed, a common property regime was often assimilated to an open access situation. In this text, since we make a clear distinction between the two, we shall use the term open access.

in the rural sector and that of the manufacturing sector is at 0_M . Any rightward move along the abscissa denotes an equal movement of workers out of the manufacturing sector and into the rural sector. The three curves denote the marginal and average products of those workers with decreasing returns. Equations (2) and (3) are therefore represented by point a , where $\overline{0_R L^{OA}} = L_R^{OA}$, $\overline{0_M L^{OA}} = L_M^{OA}$.

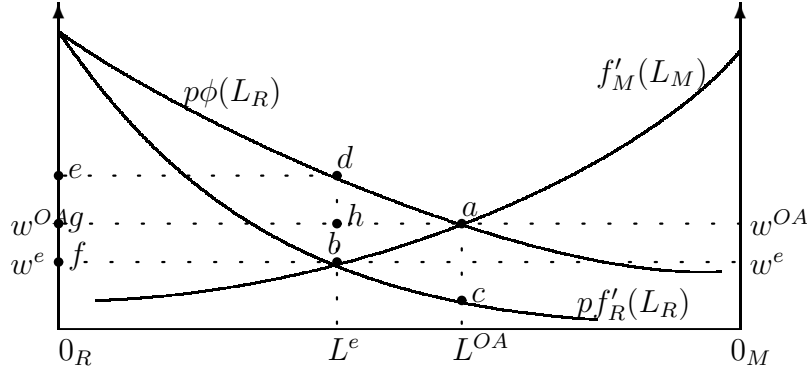


Figure 1: Rural privatization in general equilibrium

The open-access equilibrium is characterized by point a in figure 1. The equilibrium wage rate in the manufacturing sector is given by w^{OA} . As expected for an open access situation, the allocation of workers implied by point a is inefficient from the classical point of view because the marginal product of rural labor is strictly lower than in the manufacturing sector.

The restricted-access general equilibrium

We now wish to analyse the effect of a shift to a classical property regime, that is, one in which land owners can exclude workers perfectly and at no cost. Cohen and Weitzman (1975) associate this shift to the enclosure movement in England. They will therefore choose the number of workers so as to maximize land rents. Assuming that land owners take the wage as given, the equilibrium allocation of workers between sectors is thus given by the following conditions:

$$pf'_R(L_R^e) = w^e = f'_M(L_M^e), \quad (4)$$

$$L_R^e + L_M^e = \bar{L}, \quad (5)$$

In figure 1, the new equilibrium is characterized by point b , where the marginal products in each sectors are equalized.

One first notes that by moving the equilibrium from a to b , the labor force is displaced from the rural sector to the manufacturing sector. The size of the displacement is given by segment $\overline{L^e L^{OA}}$. This result has led some to explain rural outmigration in those terms, that is, as the consequence of a privatization of the commons (Cohen and Weitzman, 1975).

Now because of labor's higher marginal product value in the manufacturing sector between L^e and L^{OA} , the reallocation of labor following the enclosures contributes to a rise in national income. Letting Y denote the national income, the increase is equal to the surface between the two marginal product value curves, that is, $\Delta Y = \diamond abc$. Using the average product curve in the rural sector, one can also verify that $\Delta Y = \diamond gedh - \diamond bha$. (This equality will prove useful below when we discuss the efficiency of exclusive ownership in the presence of transaction costs.)

Another important consequence of rural enclosures is its effect on factor payments. With diminishing marginal product in the manufacturing sector, the larger labor force causes the equilibrium wage to drop. Meanwhile profits on manufacturing capital increase, partly because of a transfer of surplus from the pre-existing workers to the capital owners, partly because more workers are hired at the lower wage. As for land rents, they are absent by definition in the open-access regime and are given by the surface $\diamond fedb$ after enclosure. In the absence of a compensating redistribution mechanism, therefore, the workers are bound to lose from enclosing the land and this, in spite of the fact that it is Pareto efficient.³

Exercise 1 *Suppose that the productivity of agricultural land can be increased through some investment, say an irrigation system. Land irrigation is a non-excludable good in the sense that it raises the productivity of all workers. Discuss why this consideration may turn exclusive ownership as desirable for the workers also.*

Now if enclosing the land requires the support of the state, we then have a situation in which urban capitalists join forces with rural land owners to press

³Another way to make labor gain from enclosing the land would be to make them all equal shareholders of the land. (ANY GOOD REFERENCE TO PRIVATIZATION OF AGRICULTURE IN RUSSIA IN THE 1990S?) This amounts to an equal redistribution of land rents. We assume here that the newly created land titles are given to a very small fraction of the labor force. (See Cohen and Weitzman, 1975, p. 299.)

the government for enclosures, while laborers would oppose it. In the end, the prevailing property regime will come about as the result of a bargaining process between the concerned groups, that is, how the state balances the interests of the individuals.

Finally, one notes that the private gains from enclosing the land exceed the social gains.⁴ Indeed, under fixed output prices, a comparison of the two can be performed simply by comparing the change in national income with the increase in land rents. By inspection of figure 1, one can clearly see that the following inequality holds: $\Delta Y = \diamondgedh - \diamondbha < \diamondfedb$. For the well-trained economist, it should come as second nature that a divergence between social and private gains spells trouble. Adam Smith's invisible hand argument is not at work when it comes to the demand for property arrangements, as will be seen in section 0.1.2.

Exercise 2 *Constant marginal productivity and efficient property rights* (This problem is based on Samuelson (1974)) In the economy of figure 1, assume that the marginal product of labor in the manufacturing sector is constant, say equal to A . Show that in this case, there is no divergence between the private and social gains from resource privatization.

0.1.2 Property rights and transaction costs

By its very definition, a regime of open access involved no transaction cost in its creation or management. Indeed, the absence of any restriction whatsoever imposed on the use of the resource, though it leads to resource overuse, requires neither enforcement, nor negotiation between users.⁵

On the other hand, with enclosure and restricted entry, rents will be created. In anticipation of this, people will claim those rents and may compete for them. This competition may take many forms, including lobbying the state representatives, bribing a judge, or outright violent conflict. In any case, the final allocation of the parcels calls for some costly mechanism for their delineation and distribution. And once this is done, some resources

⁴To quote Samuelson (1974): "Under the conditions postulated, the rent collected by landlords always represents more than the extra output society thereby achieves; so in a certain sense, rent collection subject to no tax represents a subtraction (if not "exploitation") of labor." (p. 7)

⁵MENTION Anderson and Hill (1983)

must be devoted for the enforcement of this allocation. For instance, outsiders may be tempted to use the land without permission for the owner. Others may contest ownership. The land owner must therefore continuously enforce his right to exclude outsiders and contestants, another costly activity linked with the creation of exclusive property.

The upshot of the above discussion is that the creation of property rights introduces all sorts of transaction costs that were absent under open access. In some settings, the competition between rent seekers may be so intense that they end up spending as much as the anticipated rent from the land. Now as discussed at the end of section 0.1.1, the private gains from enclosure are larger than the social gains. This implies that exclusive ownership may actually lead to a reduction in national income, once transaction costs are subtracted. A sufficient condition would be that transaction costs larger than \diamondgedh .