



CAPITAL IMMOBILITY AND THE DISTRIBUTION OF INCOME

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Abstract

This paper analyzes the distributional effects of alterations in the allocation of resources, using a rigorous microeconomic methodology. The author develops models to examine the distribution of losses in overall income resulting from varying degrees of immobility in the capital market, and explores the relation between these losses and the original distribution of factor ownership.

Resumen

En este trabajo se analiza los efectos distribucionales de los cambios en la distribución de recursos, utilizando una rigurosa metodología micro-económica. El autor usa modelos matemáticos para examinar la distribución de las pérdidas en el ingreso total que resultan de varios grados de inmovilidad en el mercado de capitales, además explora la relación entre estas pérdidas y la distribución original de la propiedad de los factores.

The aim of this paper is rather simple; to demonstrate:

- (1) That imperfect mobility in the capital market¹ results in a fall in overall production, but a fall which is not distributed proportionally amongst all factor owners. Indeed I intend to demonstrate that the bulk of the loss, if not all of it, will fall on one single group (generally the poor), at least in a variety of reasonable cases; and
- (2) That the loss in overall income will tend to be distributed equally amongst factor owners, the more equal the original distribution of factor ownership; and conversely, the greater the inequality in the original distribution of factor ownership, the more disproportionate will be the distribution of losses, and regressively disproportionate; that is, the rich will lose little, and indeed may be able to gain absolutely, and not just relatively, as compared to the situation of perfect capital mobility, whereas labor will generally suffer a loss proportional to that of the economy as a whole. And in some cases absolute gains can be made by capital for any and all degrees of immobility.

The basic ideas of this paper were stimulated by the work of Arnold Harberger and Gary Becker.² Harberger attempted to measure the approximate loss in production due to the major inefficiencies of

¹ The employment consequences of much capital market immobility are developed in another paper of mine published in Spanish in Trimestre Economía, April-June, 1984, entitled "Segmentación del Mercado de Capital y Empleo".

² A. Harberger, "Using the Resources at Hand More Efficiently," American Economic Review, May 1959. Gary Becker, The Economics of Discrimination (University of Chicago Press, Chicago, 1957).

the Chilean economy. He concluded that, for a given technology and level of education, the total loss that would result from very strong postulated imperfections and distortions in the factor market was surprisingly small, a maximum of 15% of GNP.

However, Harberger did not consider the distributive effects of such market imperfections. Is the loss in overall output which is due to the allocative inefficiencies distributed proportionately amongst all income earners, as one might suppose at first consideration? If such were the case, we would have to conclude that static factor market imperfections were of little importance, both in terms of their allocative as well as their distributive effects. On the other hand, if the loss were distributed disproportionately (as I will later show to be the case) we could conclude that policies which reduced factor market imperfections were important not so much for their effects on total production, as for their effect on the distribution of income. Moreover, should the distributive effects differ for each income group, we would then have a further basis for analyzing the political conflicts associated with these types of measures.

Becker's work was useful to me in demonstrating that certain factor market imperfections (e. g. racial discrimination) did indeed have differential distributive effects. Moreover, Becker suggested a very novel idea for this analysis. He noted that the economic consequences of discriminating against "others" were identical to those of favoring "one's own"; that is, that the economic effects of discrimination were identical to those of nepotism. While nepotism is no doubt only one of various possible factor market imperfections, it

is a widely prevalent phenomenon in most underdeveloped regions, and certainly in Latin America. Indeed, it is of universal importance if one considers, for example, the barriers to migration set by most countries.

What shall we understand by nepotism in the capital market then? In the pure case, it means that no one lends capital; no one invests in a firm which he himself or his family does not control, not because he distrusts others, but because he wishes to favor his own. Thus the pure case results in the total immobility of capital. Degrees of nepotism would exist to the extent that one was willing to lend to other firms, so long as they were willing to pay a certain differential above that paid internally to capital in one's own firm(s). This differential then would be a measure of the degree of immobility existent in the capital market.

Capital immobility can, of course, be exercised only by those who possess disproportionate amounts of capital (that is, by those who under "normal" circumstances would lend capital). As a result of this limited capital mobility, firms have to engage in self-financing to a far greater extent than they would like. I think that most underdeveloped regions are characterized by a greater degree of self-financing (not only with respect to their domestic capital, but with respect to international capital as well). Indeed, what institutional capital market there is (the banking system, development corporations, semi-autonomous government enterprises) probably concentrates the great part of its resources in a limited number of firms--the large, well-established, safe firms with strong capital resources of their

own. (This would be a nepotism of class, if you will.) In short, the institutional capital market probably does not mitigate, and indeed may exacerbate, the differing access to capital which results from the very unequal distribution of property in most underdeveloped regions.

To be sure, nepotism is not the only cause of capital immobility. As Becker has also pointed out, the market for investment in human capital tends also to be immobile. Education needs be largely self-financed, if it is to be had at all. (I am referring principally to the opportunity costs of education, though in countries where private education is important and costly, tuition costs can also be an impediment.) These two factors plus the inadequate development of credit institutions in most underdeveloped countries would explain why there is considerable capital immobility in these countries, with its resulting losses in production and its regressive distributive effects.

In what follows, I intend to show that while perfect factor mobility maximizes global output, a certain degree of capital immobility can actually improve the absolute, as well as the relative, situation of particular factor owners. In order to prepare for this possibly unexpected conclusion, the reader will do well to recall the traditional example for international trade, where free trade is optimal for global production, but where one of the countries may in fact improve its position via the application of an "optimum" tariff.

THE MODELS

A. The Prototype

Let us assume an economy which produces but one good, with a single production function,³ of Cobb-Douglas form. (This approach is thus analagous to Harberger's.) In the first instance, I will suppose that $Y = K^{1/3} E^{1/3} L^{1/3}$, where Y is the value of production, K is the amount of capital, E is the amount of entrepreneurial services,⁴ and L is the size of the labor force.

As noted earlier, a nepotistic capital market is one where capital is invested preferentially in one's own firm. Therefore, firms tend to be self-financed. If we divide capital holders into two groups--group A, entrepreneurs who own a great deal of capital, and group B, entrepreneurs who own very little capital of their own--complete nepotism would result if all of the capital belonging to A were to remain with the entrepreneurs of A without being lent (outside of that group), and correspondingly where the B entrepreneurs had to work only with the capital they themselves possessed. Thus nepotism is seen to affect directly both capitalists and entrepreneurs, but only

³ I don't know if more complicated models, with differing production functions would radically change the results. In any case I will limit myself to such simple assumptions in this paper.

⁴ I interpret it as entrepreneurial services. Others may prefer to think of it as a third factor, such as land. What is essential is that two of the three factors be imperfectly mobile. For if two are perfectly mobile, the third can be immobile and output will still be maximized.

indirectly the labor force, inasmuch as it has the freedom to work wherever it pleases.

Let us assume then in this first example (which I will later argue adequately represents the distribution of property in agriculture in underdeveloped regions) that the distribution of wealth is highly unequal: one third of the entrepreneurs dispose of almost all of the capital stock (100.5 out of 101 units); moreover, there are 21 labor units with no capital or entrepreneurial capacity of their own. How much will be produced under complete nepotism in the capital market, and how will this production be distributed amongst the different factor owners? That is, 100.5 capital units combine with 1 entrepreneurial unit, and the remaining 0.5 capital unit combines with the 2 remaining entrepreneurial units, with the labor force free to work wherever the pay is the highest. Y_t equals the production in A firms plus the production in B firms, that is, total production.

$$Y_t = \frac{1}{3} (1)^{1/3} L_a^{1/3} + \frac{1}{3} (2)^{1/3} (21 - L_a)^{1/3}$$

The labor force will distribute itself in such a way as to equalize the salary paid in both sectors, which will be the condition for maximizing Y_t . In order to maximize Y_t we need to take the first derivative of Y_t with respect to L_a and set it equal to zero:

$$\frac{dY_t}{dL_a} = 0 = \frac{1}{3} \frac{(100.5)^{1/3}}{(L_a)^{2/3}} - \frac{1}{3} \frac{1}{(21 - L_a)^{2/3}}$$

$$\text{therefore, } \frac{(100.5)^{1/3}}{(L_a)^{2/3}} = \frac{1}{(21 - L_a)^{2/3}}$$

Raising both sides of the equation by the power of $3/2$, we have

$$\frac{(100.5)^{1/2}}{L_a} = \frac{1}{(21 - L_a)}$$

$$\text{or } (21)(100.5)^{1/2} - (100.5)^{1/2} L_a = L_a$$

$$L_a = \frac{(21)(100.5)^{1/2}}{(100.5)^{1/2} + 1}$$

$$\therefore L_a = 19.0913$$

$$L_b = 1.9087$$

Total output under conditions of capital market immobility can now be calculated easily. It is equal to:

$$Y_t = \underbrace{(100.5)^{1/3} (1)^{1/3} (19.0913)^{1/3}}_{Y_a} + \underbrace{(0.5)^{1/3} (2)^{1/3} (1.9087)^{1/3}}_{Y_b} = 13.6665$$

In order to determine how total output is distributed amongst the different groups we must first calculate the marginal product (MP) of each factor, and then multiply it by the units of each factor which belong to each group. In sector A,

$$(MP_L)_A = \frac{1}{3} \frac{(100.5)^{1/3} (1)^{1/3}}{(19.0913)^{2/3}} = 0.21696$$

$$(MP_K)_A = \frac{1}{3} \frac{(19.0913)^{1/3} (1)^{1/3}}{(100.5)^{2/3}} = 0.0412$$

$$(MP_E) A = \frac{1}{3} \frac{(100.5)^{1/3} (19.0913)^{1/3}}{(1)^{2/3}} = 4.142$$

In Sector B,

$$(MP_L) B = \frac{1}{3} \frac{(100.5)^{1/3} (2)^{1/3}}{(1.9087)^{2/3}} = 0.21696$$

$$(MP_K) B = \frac{1}{3} \frac{(1.9087)^{1/3} (2)^{1/3}}{(0.5)^{2/3}} = 0.82698$$

$$(MP_E) B = \frac{1}{3} \frac{(0.5)^{1/3} (1.9087)^{1/3}}{(2)^{2/3}} = 0.2067$$

As one might expect, the free mobility of the labor force assures us that the wage paid (MP) in each sector will be equal. Of course, the marginal products of capital and entrepreneurial services differ between sectors precisely because of the postulated nepotism between K and E.⁵

Under conditions of complete nepotism then, total output will be distributed in the following manner:

(1) The income of the capitalist-entrepreneurs of group A,

$$Y (K,E) A = (MP_K) A (100.5) + (MP_E) A (1) = 8.2826$$

⁵ It should be noted that, in this example, complete nepotism implies that capitalists prefer to invest in firms which they control even when there exists a differential between $(MP_K) B$ and $(MP_K) A$ equal to 0.7858 (0.82698 - .0412)

(2) The income of the capitalist-entrepreneurs of group B,

$$Y_{(K,E)B} = (MP_K) B (0.5) + (MP_E) B (2) = 0.82689$$

(3) The income of the working classes,

$$Y(L) = (MP_L) (21) = 4.557$$

(4) Total income, Y_t , (equal to total output) equals the sum of the incomes of the three groups, that is,

$$Y_t = 8.2826 + 0.82689 + 4.557 = 13.6664^6$$

It would be interesting to compare the levels of total and group income under conditions of complete nepotism and under conditions of perfect factor market mobility.

With perfect factor mobility production would take place in all firms with the same combination of factors; that is, factors would combine in the proportion of 33 1/3 % K to 33 1/3 % E to 33 1/3 % L. Total production would be:

$$Y_t = (101)^{1/3} (3)^{1/3} (21)^{1/3} = 18.5305$$

As is well known, total output is maximized with perfect factor mobility. By comparison, total output is 26.2% less (a fall from 18.53 to 13.66) with complete nepotism in the capital market. Yet such a loss is not all that great if one considers the tremendous distortion complete nepotism signifies (undoubtedly a distortion greater than that given in reality). In this respect our result is not unlike that of Harberger's.

⁶ The difference between Y_t , equal to the sum of factor payments as calculated here (13.6664), and Y_t as calculated on page 7 (13.6665) are due to rounding errors. Obviously they should be the same.

Yet what is of special interest to us is how this 26.2% loss in total output is distributed amongst the differing groups. To determine the income of each group with perfect factor mobility, we need to calculate once more the marginal product of each factor, knowing in this case that it is the same in each sector since factors will combine in the same proportion.

$$(MP_L) = \frac{1}{3} \frac{(10)^{1/3} (3)^{1/3}}{(21)^{2/3}} = 0.2941$$

$$(MP_K) = \frac{1}{3} \frac{(21)^{1/3} (3)^{1/3}}{(101)^{2/3}} = 0.0612$$

$$(MP_E) = \frac{1}{3} \frac{(101)^{1/3} (21)^{1/3}}{(3)^{2/3}} = 2.0589$$

With perfect factor mobility, therefore, total income will be distributed in the following manner:

(1) The income of the capitalist-entrepreneurs of sector A

$$Y(K,E) A = (MP_K) (100.5) + (MP_E) (1) = 8.2095$$

(2) The income of the capitalist-entrepreneurs of sector B

$$Y(K,E) B = (MP_K) (1) + (MP_E) (2) = 4.1484$$

(3) The income of the working class,

$$Y(L) = (MP_L) (21) = 6.1761$$

(4) Total income,

$$Y_t = 8.2095 + 4.1484 + 6.1761 = 18.53$$

Table # 1 summarizes the effects of complete nepotism and of perfect factor mobility on total output and its distribution.

Table # 1

Total Output and Its Distribution with Nepotism
and Perfect Mobility

| | <u>With nepotism</u> | <u>With perfect mobility</u> |
|-------------|----------------------|------------------------------|
| Y_t | 13.6665 | 18.53 |
| $Y (K,E) A$ | 8.2826 | 8.2095 |
| $Y (K,E) B$ | 0.8269 | 4.1484 |
| $Y (L)$ | 4.557 | 6.1761 |

Changes with respect to perfect mobility

| | <u>With nepotism</u> | <u>With perfect mobility</u> |
|------------------------|----------------------|------------------------------|
| $\% \Delta Y_t$ | - 26.2% | - |
| $\% \Delta Y (K, E) A$ | + 0.9% | - |
| $\% \Delta Y (K,E) B$ | - 80.1% | - |
| $\% \Delta Y (L)$ | - 26.2% | - |

The 26.2% fall in total output is shared quite differently amongst the several groups. The group which practices nepotism, the capitalist-entrepreneurs of group A, absorbs none of the loss in

income. Indeed, its income actually rises 0.9%. It has the pleasure of practicing nepotism without suffering any of its generally negative consequences. The capitalist-entrepreneurs of group B absorb a terrible loss (-80%), by virtue of being the group most directly affected by the nepotism (i.e. they can't borrow). Labor's loss is identical to the overall fall in output -26.2%. This is because labor enjoys a perfectly mobile labor market. Nevertheless, nepotism in the capital market has an indirect negative effect on workers, since it limits their possibilities of combining with like proportions of capital and entrepreneurial services in each sector. Hence it loses as compared to perfect mobility, but its share in output is constant.

Inasmuch as it is unrealistic to assume complete capital immobility, we must consider if the above result is not dependent on the extreme assumption of complete capital immobility. Will we observe the same sort of result for less extreme degrees of nepotism? In what follows, we will calculate the level of total output and its distribution in partially mobile capital markets to determine the general validity of these initial results.

Complete nepotism implies that the capitalists of group A will not lend to the firms of group B. Perfect capital mobility in the above example implies that group A will lend $67 \frac{1}{6} K$ to group B (in this manner each E combines with the same amount of K and L). There will

be degrees of capital immobility⁷ to the extent that the A capitalists lend less than 67 1/6 to the B entrepreneurs.⁸

Let us assume, for example, that the A capitalists lend the B entrepreneurs 50 K instead of the 67 1/6 K required for perfect mobility. Total output, Y_t , equals the production of sector A firms plus the production of sector B firms.

$$Y_t = \underbrace{(50.5)^{1/3} (1)^{1/3} (L_a)^{1/3}}_{Y_A} + \underbrace{(50.5)^{1/3} (2)^{1/3} (21-L_a)^{1/3}}_{Y_B}$$

L_a is the number of labor units that will work in sector A firms. Once again we maximize Y_t with respect to L_a . This gives us the amount of labor that will be distributed in each sector to maximize total output (which results as well in the equalizing of wages in both sectors). L_a turns out to be 8.6985, so that $L_b = 21 - L_a = 12.3015$. Therefore, $Y_t = (50.5)^{1/3} (1)^{1/3} (8.6985)^{1/3} + (50.5)^{1/3} (2)^{1/3} (12.3015)^{1/3} = 18.35$

This degree of capital immobility (lend 50 vs. 67 1/6 K) leads to a fall in production of 1% (from 18.53 to 18.35) with respect to its value with perfect factor mobility.

The marginal product of each factor in each sector is as follow:

$$(MP_L)_A = \frac{1}{3} \frac{(50.5)^{1/3} (1)^{1/3}}{(8.6485)^{2/3}} = .02913$$

⁷ Note that this immobility may be due to causes other than nepotism. For instance, as noted earlier, investment in human capital tends to be self-financed because of the very nature of such a debt and the weak institutional structure geared for it.

⁸ Such a situation will make $(MP_K)_B$ greater than $(MP_K)_A$.

$$(MP_L) B = \frac{1}{3} \frac{(50.5)^{1/3} (2)^{1/3}}{(12.3015)^{2/3}} = .02913$$

$$(MP_K) A = \frac{1}{3} \frac{(8.6985)^{1/3} (1)^{1/3}}{(50.5)^{2/3}} = .05176$$

$$(MP_K) B = \frac{1}{3} \frac{(12.3015)^{1/3} (2)^{1/3}}{(50.5)^{2/3}} = .07096$$

$$(MP_E) A = \frac{1}{3} \frac{(50.5)^{1/3} (8.6985)^{1/3}}{(1)^{2/3}} = 2.5339$$

$$(MP_E) B = \frac{1}{3} \frac{(50.5)^{1/3} (12.3015)^{1/3}}{(2)^{2/3}} = 1.7917$$

It is worth noting that:

$$(1) (MP_L) A = (MP_L) B = 0.2913$$

and

$$(2) (MP_K) B - (MP_K) A = 0.07096 - 0.05176 = .0192$$

This latter implies that A capitalists prefer to invest in firms they control so long as the rate of return to capital in their firms is not more than 2 percentage points below the return to capital in B firms. This is the degree of capital immobility implicit in their lending 50 rather than 67 1/6 K to B firms. It is, to be sure, not an extreme degree of immobility; rather it seems quite reasonable and realistic.

Total output is distributed in the following fashion:

(1) The income accruing to the capitalist-entrepreneurs of group A comes from three sources: the capital invested in their own firms; the

capital lent to B firms, and income for entrepreneurial services in A firms.

$$Y(K,E) A = (MP_K) A (50.5) + (MP_K) B (50) + (MP_E) A (1) = 8.6958$$

(2) The income of the capitalist-entrepreneurs of group B.

$$Y(K,E) B = (MP_K) B (1) + (MP_E) B (2) = 3.6189$$

(3) The income of the working classes,

$$Y(L) = (MP_L) (21) = 6.1173$$

In similar fashion, we can determine levels of total output and its distribution for differing degrees of capital immobility. Table #2 summarizes these calculations for (1) perfect factor mobility (67 1/6 K is lent to B). (2) complete factor immobility (0 K is lent to B), and (3) three intermediate degrees of capital immobility (where 10 K, and 30 K, and 50 K are to B).

The data of Table #2 confirm our initial findings:⁹

(1) The fall in production caused by factor immobility is absorbed unequally by the three income groups. All of the loss is absorbed by the less well-off groups, not only for the case of complete capital immobility but also for intermediate degrees of immobility.

(2) Even for degree of capital immobility which only scarcely reduces output (where 50 K is lent and production falls but 1%) the distributive effects are unequal and important: $Y(K,E) A$ rises 5.9% whereas $Y(K,E) B$ falls 12.8% and $Y(L)$ falls 1%. This suggests that

⁹ It is well to point out that these conclusions are general only in the negative sense that we now know that the loss in output--caused by factor immobility--is not generally absorbed proportionately by each income group. But these specific findings are valid only for this example, with the production function and distribution of factor ownership assumed.

Table # 2

Output and Its Distribution for Differing
Degrees of Capital Immobility

A: 100.5 K 1 E $\frac{(K/E) A}{(K/E) B} = 402$
 B: 0.5 K 2 E
 C: 21 L

| Capital lent by A to B | Complete immobility | Imperfect mobility | | | Perfect mobility |
|---|------------------------|--------------------|--------|--------|---------------------|
| | 0 K | 10K | 30 K | 50 K | = 67 1/6 K |
| Y_t | 13.67 | 16.097 | 17.668 | 18.432 | 18.53 |
| $Y (K,E) A$ | 8.283 | 8.903 | 8.894 | 8.696 | 8.21 |
| $Y (K,E) B$ | 0.827 | 1.828 | 2.885 | 3.619 | 4.15 |
| $Y (L)$ | 4.56 | 5.366 | 5.889 | 6.117 | 6.176 |
| Change with respect to perfect mobility | | | | | |
| % Y_t | -26.2% | -13.1% | -4.7% | -1.0% | - |
| % $Y (K,E) A$ | +0.9% | +8.4% | +8.3% | +5.9% | - |
| % $Y (K,E) B$ | -80.1% | -55.9% | -30.5% | -12.8% | - |
| % $Y (L)$ | -26.2% | -13.1% | -4.7% | -1.0% | - |
| $(MP_K) B - (MP_K) A$ | 0.786 | 0.126 | 0.0497 | 0.019 | |

we need concern ourselves far more with the distributive than with the allocative effects of capital immobility.

(3) The wealthiest group (K,E) A, the group that in fact practices nepotism, is rewarded for so doing! Its income is absolutely higher for all degrees of capital immobility. As a result, as a group, it has no incentive for eliminating capital immobility.¹⁰

(4) The MP_L decreases with increasing capital immobility. Thus "too much" labor is forced to work in the excessively capital scarce sector B. So the market wage of labor is less than its shadow force.¹¹

(5) Profit maximizing capital immobility is not necessarily equal to zero capital mobility. As can be seen in Table 2, $Y(K,E)A$ is a maximum, when close to 10 K is lent to A (at least in this case).

(6) Because the income of capital abundant entrepreneurs is higher than with perfect mobility at all degrees of capital immobility, there is no strategy possible whereby capital immobile factors can be persuaded to accept their income level corresponding to that of perfect mobility.¹² For even the threat of prohibiting capital inflows will still

¹⁰ To be sure, analogous to the case of monopolistic collusion, each member of the group has strong individual monetary incentive to lend to sector B. In point of fact, I am predisposed to believe that nepotism is not generally a conscious group or class practice; rather it is an individual and unorganized practice, where the individual is even willing to pay for the pleasure of so acting yet where, as shown above, in many reasonable situations, the practitioner pays little if any part of the cost, and indeed at times actually gains by so doing.

¹¹ Capital immobility thus generates labor misallocation and underemployment. Because of capital immobility, labor, though mobile, has a marginal product, and a wage below that which it would have were capital to be perfectly mobile. For a detailed treatment of the employment implications see the reference cited in page 1.

¹² I am indebted to professor Jim Rakowski of Notre Dame for bringing this point to my attention.

(in this case) leave them better off than with perfect mobility. Thus, unlike the case of an optimum tariff--where the other country can threaten autarchy, and thus induce free trade, with the free trade distribution of income--here capital scarce entrepreneurs can at most induce perfect mobility, but paying at least 0.9% more income to capital abundant entrepreneurs. Moreover, should the latter have a positive "taste" for nepotism, the premium will need to be higher. In short, unlike the case of discrimination, nepotism in the capital market may be indulged in by capital abundant entrepreneurs, not only without paying a price, but indeed, by charging a fee.

With this example, our first thesis is demonstrated; namely, that capital immobility leads to a fall in output which is not generally absorbed proportionately by each group of factor owners in the economy.

B. Variations in the Distribution of Factor Ownership

Let us now consider our second thesis, that the more unequal the original distribution of factor ownership, the more disproportionately distributed is the fall in output and the greater the fall in the income of the poor.

The prototype model used in the previous section was characterized by a highly unequal original distribution of factor ownership: group A disposed of 100.5 K and 1 E, whereas group B disposed of 0.5 K for its 2 E. This means that group A had available 804 times more capital per entrepreneur than group B,

$\frac{100.5/1}{0.5/2} = 402 = \frac{(K/E)A}{(K/E)B}$. In what follows I shall consider far

more equal factor ownership distributions where the relation $\frac{(K/E)A}{(K/E)B}$

is approximately 12 and 8 rather than 402. A 12 to 1 factor ownership distribution will correspond in the examples which follow to a situation where group A has 86.5 K and 1 E, group B has 14.5 K and 4 E, and there are 21 L; an 8 to 1 distribution will be where group A has 80.5 K and 1 E, and group B has 20.5K and 2 E, and there are 21 L.

Once again total nepotism implies that the capital of each group is invested solely in its own firms. There will be mobility to the extent that A capitalists lend money to B entrepreneurs. Capital mobility will be perfect when the marginal productivity of capital is the same in each sector. Workers are free to work where they please, a fact which will equalize wages in the two sectors.

Once again, we must determine the distribution of the labor force which maximizes output for each degree of capital immobility. From there we can go on to calculate the marginal productivity of each factor in the two sectors and the resulting distribution of output. Table # 3 summarizes the resulting level of output and its distribution for differing degrees of capital immobility, for each of the three distributions of factor ownership.

The following observations are worth making concerning Table 3:

- (1) The more unequal the distribution of factor ownership, the greater the loss in output and the more disproportionate a distribution is made possible.

(2) Nevertheless, for comparable degrees of capital immobility (that is, for similar differentials in the rates of return between the two sectors) it is no longer clear that the disparity in distribution and loss in output will always be greater for more unequal distributions of factor ownership. For example, for a differential of 0.0497 between $(MP_K)_B$ and $(MP_K)_A$, the difference between the maximum gain and maximum loss for any 2 groups is 38.8 percentage points (+8.3% - (-30.5%)) for CASE I of extreme inequality whereas it is but 12.4 percentage points (+0.72) - (-11.7%) for CASE III of "minimum" inequality. Therefore, our second thesis is in need of a reformulation: the more unequal the distribution of factor ownership, the greater the degree of nepotism that can be practiced, and so, the greater the possible loss in output and the more disproportionate a distribution possible.

But for similar degrees of immobility (measured by the absolute difference in the marginal productivities of capital in B and A) no general rule prevails.

Table #3

Output and Its Distribution for Different Concentrations of Factor Ownership

| | | | | |
|-------------------------------------|---------------------|-------------------------------------|---------------------------------|----------------------|
| Case I (extreme inequality) | A: 100.5 K | 1 E | $\frac{(K/E)_A}{(K/E)_B} = 402$ | |
| | B: 0.5 K | 2 E | | |
| | C: | | 21 L | |
| <hr/> | | | | |
| With respect to perfect mobility | Total immobility | Degrees of immobility decreasing | | (Perfect mobility |
| | | —————> | | = 67 1/6) |
| <hr/> | | | | |
| % Y total | -26.2% | -13.1% | -4.7% | -1.0% |
| % Y (K,E) A | +0.9% | +8.4% | +8.3% | +5.9% |
| % Y (K,E) B | -80.1% | -55.9% | -30.5% | -12.8% |
| % Y (L) | -26.2% | -13.1% | -4.7% | -1.0% |
| <hr/> | | | | |
| K lent to B by A | 0 | 10 | 30 | 50 |
| <hr/> | | | | |
| $(MP_K)_B - (MP_K)_A =$ | 0.7857 | 0.1261 | 0.0497 | 0.0192 |
| <hr/> <hr/> | | | | |

Table #3 (Cont.)

| | | | | |
|-------------------------------------|---------------------|---|---------------------------------------|-----------------------------------|
| Case II (intermediate) | A: 86.5 K | 1 E | $\frac{(K/E) A}{(K/E) B} = 11.9 = 12$ | |
| | B: 14.5 K | 2 E | | |
| | C: | | 21 L | |
| With respect to perfect mobility | Total immobility | Degrees of immobility decreasing —————> | | (Perfect mobility = 52 5/6) |
| % Y total | -10.7% | -6.5% | -1.8% | -0.0+% |
| % Y (K,E) A | -5.0% | +1.5% | +4.2% | +0.8% |
| % Y (K,E) B | -19.2% | -18.4% | -10.5% | -1.4% |
| % Y (L) | -10.7% | -6.5% | -1.8% | -0.0+% |
| K lent to B by A | 0 | 10 | 30 | 50 |
| $(MP_K) B - (MP_K) B =$ | 0.0990 | 0.0629 | 0.0281 | 0.0036 |

Table #3 (Cont.)

| | | | |
|---|------------------------------|-------------------------------------|------------------------------------|
| Case III "minimum" realistic inequality | A: 80.5 K B: 20.5 K C: | 1 E 2 E 21 L | $\frac{(K/E)A}{(K/E)B} = 7.85 = 8$ |
| With respect to perfect mobility mobility | Total immobility | Degrees of immobility decreasing | (Perfect decreasing = 46 5/6 |
| % Y total | -7.9% | -4.7% | -1.0% -0.2% |
| % Y (K,E) A | -5.0% | +0.7% | +4.2% +1.7% |
| % Y (K,E) B | -11.8% | -11.7% | -6.2% -2.6% |
| % Y (L) | -7.9% | -4.7% | -1.0% -0.2% |
| K lent to B by A | 0 | 10 | 30 40 |
| $(MP_K) B - (MP_K) A$ | 0.0742 | 0.0497 | 0.0191 0.0087 |

(3) The loss in output caused by the immobility of capital is absorbed disproportionately by the various factor-owner groups. Generally speaking, the factor which exercises immobility can gain, not only relatively but absolutely as compared to perfect mobility. The degree of capital immobility which maximizes the income of group A is generally not coincident with perfect capital mobility.

(4) Both the working class as well as the small and medium size capitalist entrepreneurs always suffer increasing absolute losses with greater capital immobility. The relative share of labor is constant throughout, however, as needs be, since it is perfectly mobile. Capital scarce entrepreneurs are the group that suffers most with capital immobility.

We are thus led to conclude:

- (1) That the distributive effects of capital market imperfections are considerably more significant than allocative effects on output.
- (2) That a reduction of capital immobility results in a rise in overall output, a like rise in the income of the mobile factor labor and, in the majority of cases, in a much greater rise in the income of the capital scarce groups in the economy.
- (3) That a policy of property redistribution (towards greater equality) can lead to an increase in total output by reducing the degree of capital immobility possible in the economy, as well as increase the income of the poorer groups of society (both because they now own more factors as well as because now the consequences of capital immobility are less severe) since relative capital endowments are more equal.

C. Four Factor Models

It is interesting to consider more realistic models, where highly qualified labor (Q) is distinguished from the rest of the labor force (L). Moreover, this would allow us to consider a second type of nepotism--in favor of the highly qualified labor of one's own social group.¹³

In what follows, I assume the production function

$$Y_t = (K)^{1/4} (E)^{1/4} (Q)^{1/4} (L)^{1/4}. \text{ There are } 80 \text{ K, } 1 \text{ E, and}$$

3 Q in group A, and 20 K, 2 E, and 12 Q in group B. There are 100 labor units free to move at will. I further assume that A capitalist-entrepreneurs prefer to hire highly qualified Q A persons as long as their salary does not exceed that of Q in B by more than 15% (that is, nepotism is exercised by 15% in favor of Q A).

Table #4 summarizes the resulting levels of output and distribution corresponding to different levels of capital market immobility, and with (15%) and without nepotism in the market of highly qualified labor.

Let us note the following observations:

- (1) The addition of a fourth factor reduces the maximum possible loss in output from 7.9% (Table III, Case III) to 6.5% here. However, it is not unambiguously the case that the loss in output with four factors is less than that for three factors for comparable degrees of nepotism (i.e. for equal differentials in the marginal productivity of capital in each sector).

¹³ This corresponds in reality to the importance of one's family's social standing, or the value of one's "contacts" and "references".

Table # 4

Output and Its Distribution for Differing Degrees of
Capital Immobility, both with (15%) and without
Nepotism in the Market for Highly Qualified Labor

Case A: Perfect mobility of Q

| | <u>K</u> | <u>E</u> | <u>Q</u> | <u>L</u> |
|----|----------|----------|----------|----------|
| A: | 80 | 1 | 3 | 0 |
| B: | 20 | 2 | 12 | 0 |
| C: | 0 | 0 | 0 | 100 |

| | Complete capital immobility | Imperfect capital mobility | | | Perfect capital mobility |
|-----------------------|-----------------------------------|-------------------------------|-------|------|--------------------------------|
| K lent to B | 0 | 10 | 20 | 30 | 46 2/3 |
| $(MP_K)_B - (MP_K)_A$ | 0.08 | 0.055 | 0.035 | 0.02 | 0% |

| With respect to perfect mobility | | | | | |
|-------------------------------------|------|-------|------|------|---|
| % ΔY_t | -6.5 | -3.5 | -3.5 | -0.5 | - |
| % $\Delta Y(K,E) A$ | -3.5 | +1 | 0 | +2.5 | - |
| % ΔQ_A | -6.5 | -3.5 | -3.5 | -0.5 | - |
| % $\Delta Y(K,E,Q)A$ | -4.5 | 0 | -0.5 | +2.0 | - |
| % $\Delta Y(K,E) B$ | -9.5 | -10.5 | -8 | -5.5 | - |
| % ΔQ_B | -6.5 | -3.5 | -3.5 | -0.5 | - |
| % ΔL | -6.5 | -3.5 | -3.5 | -0.5 | - |
| % $\Delta (Q_B, L)$ | -6.5 | -3.5 | -3.5 | -0.5 | - |

| <u>Case B: 15% Nepotism in Q</u> | | <u>K</u> | <u>E</u> | <u>Q</u> | <u>L</u> |
|------------------------------------|------------------------------------|-----------------------------------|----------|----------|---------------------------------|
| i. e. $(MP_Q) A / (MP_Q) B = 85\%$ | | | | | |
| A | | 80 | 1 | 3 | 0 |
| B | | 20 | 2 | 12 | 0 |
| C | | 0 | 0 | 0 | 100 |
| | <u>Complete capital immobility</u> | <u>Imperfect capital mobility</u> | | | <u>Perfect capital mobility</u> |
| K lent to B | 0 | 10 | 20 | 30 | 46 2/3 |
| $(MP_K)B - (MP_K)A$ | 0.09 | 0.06 | 0.04 | 0.025 | 0% |

With respect to perfect mobility

| | | | | | |
|----------------------|------|------|------|-------|---|
| % ΔY_t | -6.5 | -4% | -2% | -0.5% | - |
| % $\Delta (K,E) A$ | -7 | -2.5 | 0 | +0.5 | - |
| % ΔQ_A | 0 | +3 | +6 | +7.5 | - |
| % $\Delta (K,E,Q) A$ | -5.5 | -1 | +1 | +2 | - |
| % $\Delta (K,E) B$ | -5.5 | -2.5 | -5.5 | -2.5 | - |
| % ΔQ_B | -8.5 | -5.5 | -4 | -3 | - |
| % ΔL | -6.5 | -4 | -2 | -0.5 | - |
| % $\Delta (Q_B, L)$ | -6.5 | -4 | -3 | -0.5 | - |

(2) In adding a fourth factor (which reduces the proportion of income which goes to each factor), the total fall in output resulting from the immobility of capital is seemingly absorbed more proportionately by each factor. This is not necessarily true, however, if the added factor itself suffers from nepotism.

(3) In comparing the situation with and without nepotism in Q, we observe that the differential in the sectoral marginal products of capital widens (i. e. effective nepotism in K increases) for the same amount of capital lent, once there is nepotism in Q as well. In short, nepotism in Q exacerbates the nepotism in K implied by the lending of a certain amount of capital to other sectors.

(4) Nepotism in Q favors the highly trained Q of class A as compared to their situation with perfect Q mobility (even with nepotism in K), and hurts Q_B; but (K,E) A loses and (K,E) B gains. The unqualified working class, L, is not particularly affected by nepotism in Q (other than now there is less of an incentive to become highly trained—a point we shall treat in greater detail in the next section).

D. Dynamic Effects

Up until now, we have considered exclusively the static effects on output and its distribution of mobility in the capital market. Let us now consider some of the "dynamic" effects.

(1) As noted earlier, there is no incentive for the capital abundant group to end its practice of nepotism, which means that the loss due to

nepotism is not of a "once and for all" nature, rather it will tend to repeat itself year after year.

(2) In what ways can the least privileged group--the workers--improve their situation? They can train themselves or become small and medium entrepreneurs. Yet it is precisely these two groups Q_B and $(K,E) B$ who suffer the greatest relative loss because of the posited immobility in the capital market. Though at first glance it might appear very lucrative to save, given the much higher marginal product of capital in sector B, this is illusory, for workers' savings most probably are channelled through the established financial system; this surely invests almost exclusively in sector A, given that the firms in this sector are larger and better known, have more pull and contacts, possess greater reserves for guarantees, etc. In short, the high rate of return to capital is for investment in firms of sector B. Yet the financial system does not normally attend this segment. Only if this be his own firm will the investment be possible--and in this case he loses as an entrepreneur far more than what he gains as a capitalist. Only "loan sharks" (that is those dedicated to channelling financial resources to the capital hungry B sector) can make a go of it in this sector. Thus the worker finds most of his avenues of escape blocked (as an individual). It is not strange then that we find a great frustration amongst workers, be they skilled or unskilled. For nepotism impedes social mobility, and perpetuates and even exacerbates existing economic and social inequalities.

(3) The rich, on the other hand, have little incentive to save given the low marginal product of capital in sector A. Indeed, the average

marginal product of the capital of A (the weighted average of the marginal product of A's capital invested in A and B) is less with nepotism than with perfect capital mobility. I am referring here to the incentive to save of the capitalist as capitalist, since there is an incentive to save and invest in his own firms if he is the entrepreneur. In practice this means that it is most convenient for the entrepreneur to push high rates of reinvestment out of undistributed profits (largely the capital of others of his class). Thus while nepotism will increase the tendency to reinvest, it will do so at the expense of limiting capital mobility further. Moreover, should nepotism lower the income of the rich (even if they lose less than proportionately) their overall rate of savings may fall.

(4) In view of the fact that capital immobility lowers the price of capital relative to labor in sector A and raises it in sector B (by comparison to the situation of perfect capital mobility), the firms of sector A will tend to select a product mix and technology more capital intensive than would be socially optimal, while the firms of sector B will select a product mix and technology more labor intensive than socially optimal. In short, capital immobility will result in the creation of and strengthening of a "dual" economy.¹⁴

¹⁴ In the paper referred to on page 1, I developed the employment and underemployment implications of capital inequality with relative immobility. It goes a long way in explaining rural-urban wage differentials, migration, and underemployment.

E. The Relevance of the Models

Is it possible to analyze with these models phenomena more concrete than the general redistributive effects arising from capital market imperfections?

I would argue that the first model (the three factor model, with a highly unequal distribution of factor ownership) could correspond to the situation in agriculture. In Chile, for example, at least up until the mid 1950s, 10% of the farms received 80% of the credit offered by the established financial system,¹⁵ and 7% of the farms contained 81% of the land.¹⁶ Therefore, if 10% of the farms dispose of 80% of agricultural land and capital, 33 1/3% probably dispose of close to 99 1/2% (i.e. 1/3 E disposes of 100.5/ 101 K).

As we saw earlier, any degree of capital immobility in this model results in an absolute gain for the capitalist-entrepreneurs of A (the large landowners), in a very strong fall in the income for (K,E) B (small landowners), and in a significant loss in the wages of agricultural labor. A degree of nepotism of 0.05 (i.e. where $(MP_K) B - (MP_K) A = 0.05$) will lower total output and wages by 4.7% with respect to the situation with perfect capital mobility; $Y(K,E) A$ rises 8.3% $Y(K,E) B$ falls 30.5%. Conversely, a reduction in capital immobility would raise agricultural output somewhat, would raise greatly the income of 2/3 of the farm owners, would increase

¹⁵ See Antonio Garcia, La Dinámica de las Reformas Agrarias en América Latina (ICIRA: Santiago, 1967).

¹⁶ See M. Sternberg "Agrarian Reform and Employment, with Special Reference to Latin America", International Labor Review Jan.-Feb. 1967.

appreciably agricultural wages, and would cut down substantially the income of the large landowners. Similarly, an agrarian reform which made less unequal the distribution of agricultural property (making it more like Model I, Case III) would improve the distribution of income (aside from the increased income of the poor accruing from their new property) because it would put more capital in the hands of people in a position to make better use of it. This would be the case even if the degree of capital immobility remained the same (for example, where the degree of immobility was about 0.05--compare Table 3, Case I with 0.05 nepotism and Table 3, Case III with 0.06 nepotism). $Y(K,E)A$ would fall from 8.3% above that with perfect mobility to 0.7%; $Y(K,E)B$ would now be but 11.7% below what it would be under perfect mobility (vs. 30.5% below); whereas $Y(L)$ and overall output would not be materially affected.

Cases II and III, especially Case III, and the four factor model correspond more closely to the urban situation. For example, there are approximately 5,600 firms in manufacturing in Chile which employ more than 5 workers.¹⁷ It can be estimated that 400 of these firms possess 80% of the capital in manufacturing.¹⁸ One could argue then that $1/14 = (400/5600)$ of the entrepreneurs disposed of 80% of manufacturing capital, or roughly speaking that $1/13$ owned 86% of manufacturing capital. On the other hand, it would be reasonable to argue that the entrepreneur of a large firm is considerably more

¹⁷ I am implicitly considering one unit of "entrepreneurship" per firm. This is, of course, a gross simplification.

¹⁸ See P. Gregory, Sueldos y Salarios en la Industria Manufacturera (INSORA, Universidad de Chile, Santiago, 1966).

capable than that of a smaller firm. How much more? If we suppose that they are 4 times as capable then rather than $1/13$ about $1/3$ (in efficiency units) would dispose of 86% of the capital, which would correspond to Case II. If we suppose, what I consider to be reasonable, that they are 5 times more capable (exclusive of income differences due to nepotism, monopoly, or pull which don't reflect differences in personal capacities, but privileges given them by the social system), then $1/3$ of the entrepreneurs (in efficiency units) would dispose of close to 80% of the capital, and $2/3$ of the entrepreneurs (in efficiency units, though 14 times as many in absolute numbers) dispose of the remaining 20% of the capital. Case III thus corresponds fairly well to the actual distribution of factor ownership in manufacturing, and to the extent that manufacturing is typical, of all urban economic activity.

Finally, a third and highly important application of these models is in the field of regional and international economics. Two adjacent regions may have little capital mobility, despite differentials in factor productivity. The immobility of capital can be partly mitigated by migration from the less developed to the more developed region, or by free trade. Yet these do not completely eliminate capital immobility, a fact which is made manifest by the existence of large differentials in factor prices in the two regions, despite trade and migration.

We can more easily analyze the distributive and allocative effects of such capital immobility between two regions or countries with models of two factors. For labor is often highly immobile between

regions of underdeveloped countries,¹⁹ and almost totally immobile between countries (especially between underdeveloped and developed countries).

Let us consider in detail the case of the imperfect international mobility of capital between the United States and the underdeveloped world.²⁰ With only about 10% of the population of the Third World (including the underdeveloped countries of the socialist world), the U.S.A. disposes of possibly 9 times as much capital. That is, 90 K is controlled by 10 L (U.S.A.), and 10 K is controlled by 90 L (the Third World). Let us assume, in the first instance, that there is a complete immobility of capital and labor between the U.S.A. and the Third World; assume as well that production follows a Cobb-Douglas function, such that $Y = [(K)^{1/2} (L)^{1/2}]$.²¹ We shall relax this assumption shortly and allow some international flows, so that some foreign capital be invested in underdeveloped regions.

¹⁹ I am, of course, aware of the large urban migrations in many underdeveloped countries. Yet large as these are they do not seem to be large enough to close urban-rural differentials in labor productivity in anything less than decades.

²⁰ I am, for simplicity, leaving out the rest of the developed world.

²¹ A two factor model would be inapplicable if only one factor (K) were immobile but where the other factor (L) were perfectly mobile. Such would be the case within the same integrated region. For labor's mobility would fully compensate for capital's immobility. On the other hand, between some regions (for example, the Northeast and South of Brazil, or the Peruvian highlands and the coast) and more so between developed and underdeveloped countries, little labor mobility takes place. Therefore, a two factor model can be used to analyze these situations where, as a first approximation, labor immobility can be assumed.

Table #5 shows the level of "global" output and its distribution between the U.S.A. (or, if you will, the center) and the underdeveloped world (the periphery). Observe the following:

- (1) The fall in "global" output due to the immobility of factors between the center and the periphery is absorbed principally by the countries of the periphery and not by the center. This is true for all cases except for the case of the total immobility of capital.
- (2) The imperfect mobility of capital between the center and the periphery hurts, above all, the workers of the underdeveloped countries, and to a lesser extent, the capitalists of the center. Those who gain the most relatively and absolutely are the workers of the center and, to a lesser extent, the capitalists of the periphery.²² We see then that the workers of the center are a privileged minority who are the principal beneficiaries not only of policies which restrict migration to the center but also of policies which restrict U.S. investment overseas in order to "defend" the U.S. balance of payments.
- (3) There is to be sure, some factor mobility between the center and the periphery, inasmuch as there is, in fact, foreign investment in the periphery (though only a slight proportion of what it is in the center); there is migration to the center (although once again it is an infinitesimal proportion of the periphery's population); and more importantly, there is trade in goods and services (although it generally runs up against innumerable barriers). In any case, such

²² I must insist that these results are true only for this type of production function, with these parameters, and for the distribution of factors posited.

Table 5

"Global" Output and Its Distribution between Countries of the
Center and the Periphery for Differing Degrees of Capital Immobility

| Capital lent to periphery | Total immobility 0 | Decreasing degrees of capital immobility | | Perfect mobility 80 |
|------------------------------|--------------------------|---|-------|---------------------------|
| | | 40 | 55 | |
| Y total | 60 | 69.43 | 95.17 | 100 |
| Y center | 30 | 49.19 | 51.05 | 50 |
| Y (K) c | 15 | 38.01 | 41.7 | 45 |
| Y (L) c | 15 | 11.18 | 9.35 | 5 |
| Y periphery | 30 | 40.24 | 44.12 | 50 |
| Y (K) p | 15 | 6.71 | 5.88 | 5 |
| Y (L) p | 15 | 33.53 | 38.24 | 45 |
| % Y total | -40 | -10.6 | -4.82 | - |
| % Y center | -40 | -1.0 | +2.1 | - |
| % Y (K) c | -67 | -15.5 | -7.3 | - |
| % Y (L) c | +200 | +123.6 | +87.0 | - |
| % Y periphery | -40 | -19.5 | -11.8 | - |
| % Y (K) p | +200 | +34.2 | +17.7 | - |
| % Y (L) p | -67 | -25.5 | -15.0 | - |
| (MP _K) c | 0.17 | 0.2236 | 0.267 | 0.50 |
| (MP _K) p | 1.50 | 0.6708 | 0.588 | 0.50 |
| (MPL) c | 1.50 | 1.118 | 0.935 | 0.50 |
| (MPL) p | 0.17 | 0.3726 | 0.425 | 0.50 |

Note: All of these results would be softened if we took into account differences in human capital between workers of both regions. Yet I believe the results would continue to tend in the same direction. Of course, we would consider human capital to have been included in K. The results for the periphery would be the same. For the center we could only say unskilled labor gained unambiguously. Skilled labor would gain as labor but lose as capital on balance. The center as a whole, would not lose much for reasonable degrees of nepotism, and always loses less than the periphery.

factors reduce the effective degree of factor immobility between countries, but they don't eliminate such immobility completely.²³ The effective immobility which remains manifests itself in the differences in the prices of factors (of the same quality) between countries. I doubt that there be a difference of more than 2 to 1 and certainly not more than 3 to 1 in the return to capital in the periphery relative to the center. With this size differential, expressed as the ratio of (MP_K) periphery to (MP_K) center, "global" production would be between 4.8% (an equivalent of 55 lent) and 11% (40 lent) below what it would be with perfect factor mobility between center and periphery (see Table #5). But the fall in "global" output is absorbed almost exclusively by the periphery, its income falling by 12.6% to 20% with respect to that with perfect, effective international mobility; the center's income would fluctuate between a gain of 2.4% and a loss of 2%. Workers in the periphery would lose between 16% and 26.7% of their income (as compared to the case of perfect mobility).

The same sort of analysis can be applied to the study of regional development within the same country. To be sure no region is victim of factor immobility merely because it has less capital per worker than another. The essential condition indicative of effective factor immobility is that for the same type of investment under similar

²³ A theorem of international trade theory indicates the conditions in which free trade equalizes factor prices in each country. The conditions for such equalization are so many that they could be satisfied only in the most exceptional cases. It suffices that there be some specialization, or that there be differences in the technologies available or that there be tariffs or quotas so that it not be fulfilled. In practice, therefore, we should expect trade to reduce somewhat the factor price differences which arise with factor immobility between countries, but in no case will it eliminate them.

conditions of risk and uncertainty, the return to capital be systematically greater in one region and the wage of labor (of the same skill and under similar conditions) higher in the other.

F. Final Observations

The principal weakness of this study is that the conclusions are negative (i.e. the distributive effects of factor immobility are not observed proportionately by all factor owners). The positive conclusions are not general. For they depend on the type of production function chosen, the distributive parameters selected (i.e. 1/3 for each factor, K, E, L) and the distribution of factor ownership assumed. I am not terribly troubled by my assumptions regarding the distribution of factor ownership, for I believe them to correspond at least as a first approximation to the Latin American situation. Although it is possible to enrich the models introducing more sophisticated production functions (for example, where the proportion of K and Q in production were relatively fixed, whereas Q and L were substitutes), or, indeed various different sectoral production functions, I don't think they would affect very much the conclusions we have come to.

In any case, even though these concrete results are limited to the arithmetic examples used, they have served to demonstrate that the distributive effects of capital immobility can be greater than the allocative effects. Moreover, I think the models suggest novel ways of analyzing diverse macroeconomic phenomena.