AN EMPIRICAL STUDY OF LABOUR REALLOCATION GAINS IN SWEDEN BETWEEN 1950 AND 1960

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Introduction

The main purpose of this article is to attempt to obtain a quantitative measure of the significance of the structural transfer[1] of labour—mainly between agriculture and other industrial sectors—during the period 1950 to 1960.

Economic growth is customarily specified in terms of changes in the national product. Since the problem of this article can be thought to belong to the problem-complex of economic growth, it appears to be a natural step to attempt to study the significance of structural transfers in relation to the rate of growth of the national product (total or per capita).

In order to study the 1950–1960 period, it was necessary to estimate the contribution of the various sectors to the gross national product for the years 1950 and 1960. Different operational definitions of transfer gains are applied to this empirical material.[2] One purpose is to clarify the relationship between different definitions and discuss some of their underlying assumptions. From this discussion of the different definitions there emerges one definition which is particularly suitable for measuring the effect of labour movement from the agricultural sector.

Section I. The Concept of Transfer Gains

This section starts with a theoretical model of reallocation gains. Later in this section some problems relating to an empirical measure of transfer gains are treated.

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[1] The terms "labour reallocation gains" and "labour transfer gains" are used interchangeably in the article. The word *labour* is sometimes excluded in the text.

[2] See, e.g., Salter, W. E. G., *Productivity and technical change*, Cambridge, 1960, p. 184.

1. Theoretical Approach

Let us begin with a closed, two-sector economy. Sector 1 = agriculture and sector 2 = manufacturing industry. Each sector produces only one good. The total quantity of labour in the economy is L. This is divided between the sectors, at the initial stage, into $L_{1(t-1)}+L_{2(t-1)}$ respectively. (The first index symbol will designate the sector for all quantities.) A comparative static method of analysis will be employed. We begin from an equilibrium situation, to be defined at a later stage.

Sector 1's production function in period t–1:

$$Q_{1(t-1)}=f_{1(t-1)}(L, K)$$

where L and K designate the production factors labour and capital.

By analogy, the production function for Sector 2 is:

$$Q_{2(t-1)}=f_{2(t-1)}(L, K)$$

We assume that labour, viewed as a whole is constant during periods $t-1$ and t, i.e.

$$L_{1(t-1)}+L_{2(t-1)}=L_{1t}+L_{2t}$$

The production functions will offer diminishing returns upon the variation of one factor. Each production function is constructed for a given technique. Since only one factor, labour, will be considered in the analysis, capital can be viewed as a constant in time for each production function. Thus, we examine the sectors' marginal productivity curves for the labour factor with capital stock given for every point in time.

By combining these production functions we can construct a product transformation curve. The following discussion can be facilitated by resort to a figure.

The transformation curve in period $t-1$ is designated TT. P is an equilibrium point in the sense that the marginal rate of substitution in cousumption = the marginal rate of transformation in production. The sectors produce the quantities Q_{11} and Q_{21} respectively in the equilibrium position and sell these quantities at the price relation indicated by pp.

Let us assume that the technical development up to the next period

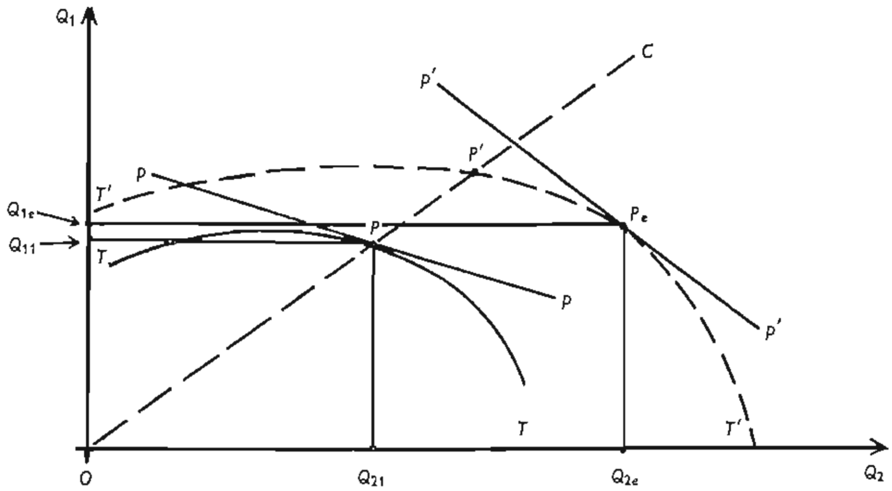

Fig. 1.

varies for each sector. $T'T'$ represents the transformation curve in period t. If the consumers, irrespectively of income, want to consume the products of the sectors in a given proportion, equilibrium in period t will occur at the point of intersection between line OC and the transformation curve $T'T'$, i.e. at point P'. However, if the income elasticities are lower for the agricultural product Q_1 than for the industrial product Q_2, the equilibrium position in period t must fall on any point along $T'T'$, from P' to the Q_2 axis. Let us assume that the point P_e represents the equilibrium position in period t. The price relation in this situation is designated by $p'p'$ and thus Q_{1e} and Q_{2e} are valued accordingly.

We now ask the following question: "Must labour be reallocated from one sector to the other in order to reach the equilibrium position P_e in period t?"

To illustrate the discussion of this point we must resort to a more complicated figure. This is constructed as Figure 2.[1] The production functions are placed in the second (Sector 1) and fourth quadrants (Sector 2). In the third quadrant, there is a restriction line for the

[1] The method for constructing a TT curve is obtained from a paper in welfare theory by Per Wijkman. (Mimeo) Department of economics, University of Stockholm, 1964, p. 8.

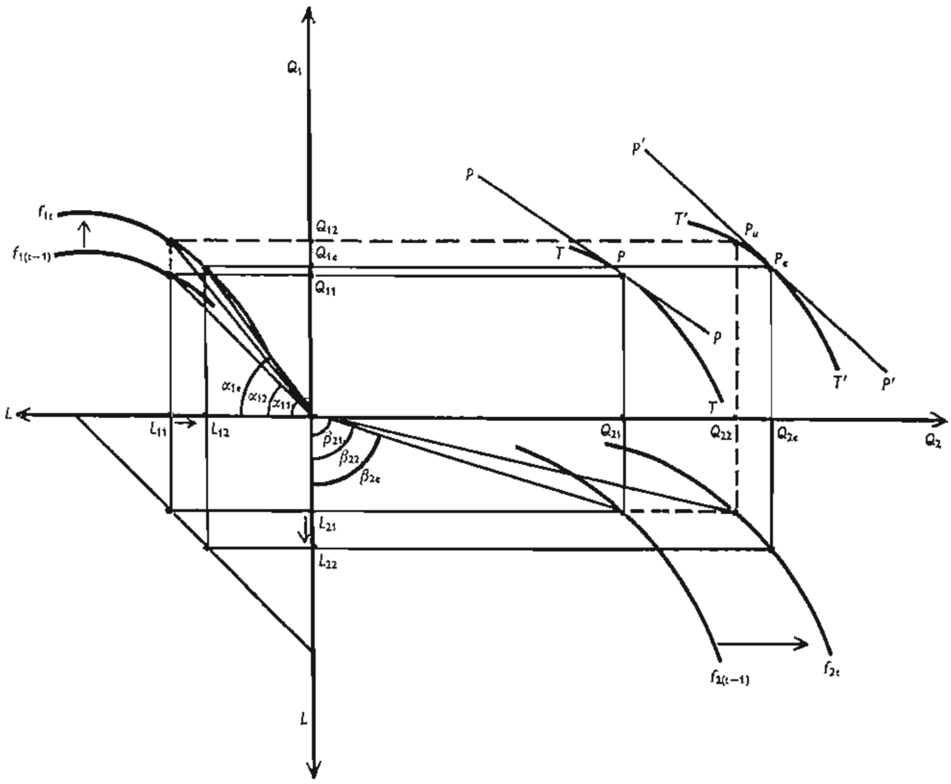

Fig. 2.

quantity of labour. The first quadraut shows the product transformation curve. (The same symbols as before.)

In the initial position, in period $(t-1)$, we find ourselves at the optimal point P on curve TT. The sectors produce Q_{11} and Q_{21} and employ L_{11} and L_{21} respectively. The average productivity of labour in sector $1 = tg\ \alpha_{11}$ and in sector $2 = tg\ \beta_{21}$. The value of the marginal product is the same for both sectors. The price relation $= pp$.

Now we look at the situation in period t, after the sectors have experienced different technical developments during the previous period.

We postulate an optimal equilibrium position in production and consumption at point P_e. We can express this so that this point is assumed to be superior to every other along the transformation curve $T'T'$. (Each poiut on the transformation curve is better than all the points between the origin and the $T'T'$ curve.) If labour is completely immobile we end up at point P_u on $T'T'$. Consequently, we can derive a sort of gain by reducing the labour input in Sector 1 from L_{11} to L_{12} and increasing it in Sector 2 from L_{21} to L_{22}. $(L_{11}-L_{12}=L_{22}-L_{21})$. At point P_e the value of the marginal product is the same for both sectors while the average productivity $= tg\,\alpha_{1e}$ and $tg\,\alpha_{2e}$ respectively.

The volume of production in the sectors $= Q_{1e}$ and Q_{2e} respectively. The price relation is $p'p'$. The point P_u corresponds to the production volumes Q_{12} and Q_{22} and the respective average productivities $tg\,\alpha_{12}$ and $tg\,\beta_{22}$.

By transferring labour from one sector to the other, we will move along $T'T'$ from P_u in the direction of P_e. Were labour completely mobile, we would have immediately reached P_e. Transfer gains will consist of the value of $(Q_{2e}-Q_{22})+(Q_{1e}-Q_{12})$ in which the former parenthetical terms is positive and the latter negative if valued according to the price relation p'p'. Thus, if assume that the price relation prevailing at point P_e is optimal, in the sense that it is preferred above all others, the sum of the parenthetical terms will be positive.[1]

Conclusion

If a change took place between two periods in such a way that without reallocation we failed to reach the point on the transformation curve which corresponds to an optimal position, than through labour transfer we can derive a gain in the sense that we move from a non-optimal to an optimal situation. This gives rise to the following reflection. If we state that the potential transfer gains are equivalent to the difference between the values of the marginal products of one factor in different applications, we have assumed that the production change derived from the redistribution is desirable to some extent.

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[1] Place the origin at point P. The net gain is the value of $(Q_{2e}-Q_{23})$ measured by the quantity Q_2. (To measure the gain in terms of Q_2 implies straight lined indifference curves in the interval.)

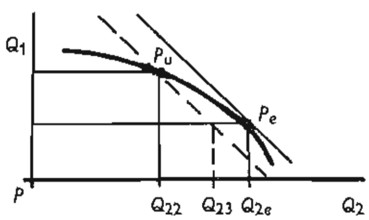

Fig. 3.

2. *How can Transfer Gains Be Approached Empirically*

Let us examine Figure 2 to see what we empirically observe. In period $(t-1)$ we will register a point on every production function. In this way, we also obtain the point P on the TT curve. The price relation at point P is empirically given. During period t we can assume that we observe the points on the production functions which correspond to P_e on the $T'T'$ curve.

An assumption inherent in the empirical concept of transfer gain is that the change in production satisfies the wishes of consumers. However, we do not have to assume that the empirically observed point on the $T'T'$ curve is optimal but only that it moves towards optimality and that it may reach but not pass the optimal position during the observed time periods.

In an empirical study it is not possible to differentiate between the effects of changed technology, improved training, reallocation etc. The discussion can be illustrated by the following sketch. (The figure shows the industrial sector.) Point A corresponds to the observation we make in period $(t-1)$ and point B to that made in period t.

How has the change from A to B occured? Let us measure the technical change by observing how the average productivities change. (We assume that the average productivities remain unaffected by the reallocation.) How much can the sector produce in period t without an increase in its labour input? We see that if its average productivity$=$ $tg\,\beta$, its production will correspond to Q_A'. The difference between Q_A' and Q_A can be attributed to technical change[1] while the difference between Q_B and Q_A' corresponds to the increase in production for the sector, resulting from an increased labour input.

The above thoughts imply production functions with *constant average* productivity within the current interval. If we look back to Figure 2, and the production function for Sector 2 (where $\partial^2 Q_2/\partial L_2^2 < 0$) we discover that the change in average productivity is a good measure of technical change *on the assumption* that one measures it at a *constant* input quantity—$(tg\,\beta_{22} - tg\,\beta_{21})$. An empirical difficulty

[1] Here we disregard the possible change in the quantity of capital. However, our concept "technical ehange" could be thought of as including such a change.

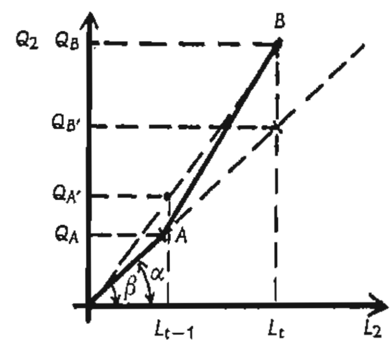

Fig. 4.

arises therefore, in that we observe only two points, and these at different quantities of factor input. In order to obtain a measure of the magnitude of the transfer effect we are compelled to make certain assumptions about the form of the production functions.

How accurate will the estimation of transfer gains be if we postulate constant average productivities?

3. *Average Versus Marginal Productivities*

The aim of the following discussion is to ascertain, by the use of an example how the gain will be affected by the use of average productivities instead of marginal productivities.

The economy consists, as before, of only two sectors, the products of which are Q_1 and Q_2 respectively. The relative prices are assumed to be constant. We observe empirically the following four points in two co-ordinate systems: A_1, B_1 A_2, B_2.

Let us assume that the marginal productivity curve is linear and is designated by $f_{1t}(L\overline{K})$ and $f_{2t}(L\overline{K})$.

Transfer gain[1], with average productivity as the starting point,

$$= dL \cdot \text{tg}\,\beta_{12} - dL \cdot \text{tg}\,\alpha_{12} = dL\,(\text{tg}\,\beta_{12} - \text{tg}\,\alpha_{12}) = V_1$$

Transfer gain, with $f_{1t}(L, \overline{K})$ and $f_{2t}(L, \overline{K})$ as the starting point,

$$= dL\,(\text{tg}\,\beta_{13} - \text{tg}\,\alpha_{13}) = V_2.$$

[1] The average and marginal products are measured at those prices, which are prevailing at points B_1 and B_2.

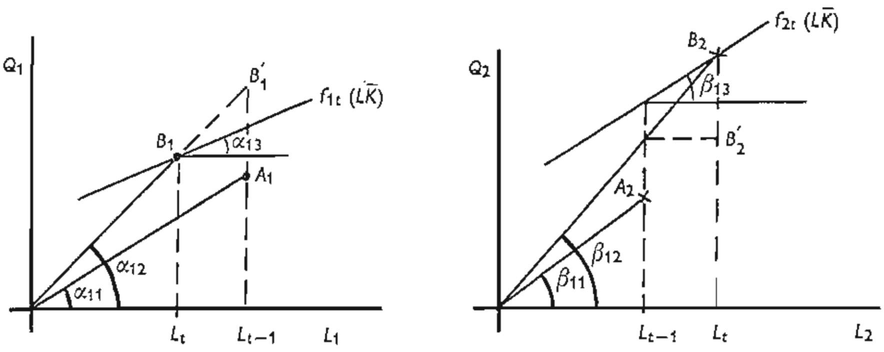

Fig. 5.

Set $\text{tg}\,\alpha_{13} = a \cdot \text{tg}\,\beta_{13}$ and $\text{tg}\,\alpha_{12} = b \cdot \text{tg}\,\beta_{12}$ where a and b are positive constants, and we obtain

$$V_1 = dL\,(\text{tg}\,\beta_{12} - b \cdot \text{tg}\,\beta_{12})$$
$$V_2 = dL\,(\text{tg}\,\beta_{13} - a \cdot \text{tg}\,\beta_{13})$$

or

$$V_1 = dL \cdot \text{tg}\,\beta_{12}(1 - b)$$
$$V_2 = dL \cdot \text{tg}\,\beta_{13}(1 - a)$$

divide V_1 by V_2

$$\frac{V_1}{V_2} = \frac{\text{tg}\,\beta_{12}(1 - b)}{\text{tg}\,\beta_{13}(1 - a)}.$$

Set $b = {}^1/_2$, i.e., average productivity in the agricultural sector (Sector 1) is one-half of that in the industrial sector (Sector 2). Assume that the same relation exists at the margin, i.e., $a = {}^1/_2$. That will give

$$\frac{V_1}{V_2} = \frac{\text{tg}\,\beta_{12}}{\text{tg}\,\beta_{13}}.$$

If $tg\,\beta_{12} > tg\,\beta_{13}$, V_1 will be larger than V_2, that is, by using average productivities a greater gain is obtained.

If we assume that the marginal product in agriculture is only 20 % of that of industry, that is, $a = 0.2$ and that $b = 0.5$ we obtain

$$\frac{V_1}{V_2} = \frac{\text{tg}\,\beta_{12} \cdot 1 \cdot 5}{\text{tg}\,\beta_{13} \cdot 2 \cdot 4} = \frac{5}{8} \cdot \frac{\text{tg}\,\beta_{12}}{\text{tg}\,\beta_{13}}.$$

Assume further that $\text{tg}\,\beta_{13} = 80\%$ of $\text{tg}\,\beta_{12}$.

The results of the constructed example will be

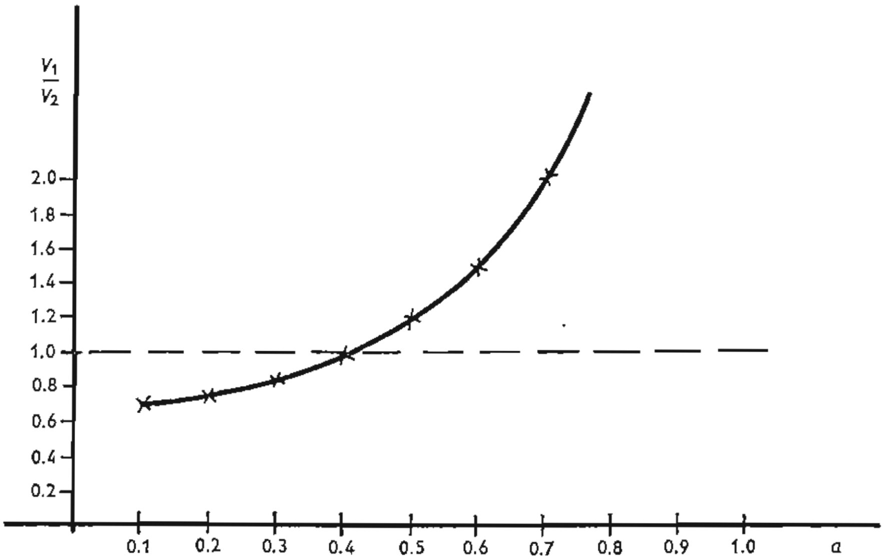

Fig. 6.

$$\frac{V_1}{V_2} = \frac{5}{8} \cdot \frac{5}{4} \cdot \frac{\text{tg}\,\beta_{12}}{\text{tg}\,\beta_{12}} < 1$$

that is, under these special assumptions, the estimation of transfer gains, by using average productivities, results in a lower value than the calculation of reallocation gains by employing the marginal productivities.

Under the assumption that $b = 0.45$ and that $tg\beta_{13} = 0.9 \cdot tg\beta_{12}$ we can draw a curve for the ratio $V_1 : V_2$ for different values of a. (The empirical study shows that $b \sim 0.45$; $tg\ \beta_{13} = 0.9\ tg\ \beta_{12}$ is a looser assumption.)

If any conclusion can be drawn from Figure 6, it would be that if $a < 0.4$, a lower estimation will result from the application of average productivities.[1] We must, however, remind ourselves that, inter alia, there remains the assumption that the average productivities are not influenced by the reallocation. This will be discussed in the following section.

[1] We must keep in mind the assumption of constant prices. However, correcting for changes in relative prices would lead to a shift downwards of the curve in figure 6, that is, a lower V_1/V_2 for every a. (The underlying assumption is that an increase in output is accompanied by a decrease in price.)

Summary

For a determination of a potential transfer gain (or loss) we must know the optimal point. In order to obtain that we are compelled to make certain welfare theory abstractions. The assumptions behind an empirical study is that the empirical observations indicate the direction in which the optimal point is shifted. The changes in the price relations we register statistically can be viewed as adjustments to optimal price relations. These adjustments may be insufficient, entailing that the sought after situations are not reached but rather remain points towards which we move. In both "theory and practice" we can consider the national product as a kind of potential welfare.[1]

As a summary of the discussion of average or marginal productivities, it can be said that lacking empirically determined marginal productivities we were compelled to use average productivities, and that under certain assumptions it is possible to establish which one of the two productivities that gives the highest or lowest value for the transfer gain.

Section II. How Can a Transfer Gain Be Defined Operationally?

The section commences with a rough explanation of how an increase in total production occurs in the economy.

Different ways of operationally defining transfer gains are then introduced. A simple example provides the starting point for a discussion of the relationship of the methods and what they—applied to the example—are basically intended to measure.

Finally, a definition with particular reference to the gains from the transfer from the agricultural to other sectors is offered.

1. An Increase in Total Production

One can measure aggregate production within an economy during two equal time periods and compare one result with the other. Let us assume that production has increased during the periods in question. How has this increase taken place? (We disregard the complications created by methods of measurement.)

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[1] Scitovsky, T., *Welfare and competition*, London, 1963, p. 71.

Assume that the production resources of the economy consist of labour and capital. These resources are distributed in a number of definable sectors. From the supply side, one can roughly divide the causes of production changes into three components which together "explain" the entire change: 1) changes in the quantity of the invested resources 2) changes in the quality of the invested resources 3) redistribution of the resources.

Changes in quantity comprise, in the case of two factors of production, an increase or decrease in the total quantity of invested labour or capital. Examples of changes in the quality of labour would be better training or greater expertise. The comparable change in capital is exemplified by quicker and more productive machinery. The third component, the redistribution of existing resources, will be the subject of further discussion in this article.

We can conceive of an economy divided into a given number of sectors, each one employing a given quantity of labour and using a given quantity of capital in its production apparatus. The following discussion is based on an analysis of the disparities in average labour productivity among the various sectors. The role of capital in the reallocation process is ignored for the present.

2. *Different Operational Definitions*

Symbols:

Q_i = production in sector i (where $i = 1 \ldots n$).

A_i = the size of the labour force in sector i.

The time period is designated by $(t-1)$ and t respectively through a second index.

$q_{1t} = \dfrac{Q_{1t}}{A_{1t}}$ = average productivity in Sector 1 in period t.

$\sum_{i=1}^{n} A_{it}$ = the size of the labour force in the economy in period t.

Definition Ia

We start from ΣA_{it} and distribute this quantity of labour between the sectors according to the employment distribution of the base period.

We form

$$\left[\frac{A_{i(t-1)}}{\Sigma A_{i(t-1)}}\cdot \Sigma A_{it}\right] \tag{1}$$

or verbally stated, if during period t, we retain the employment structure of period $t-1$, how many persons would have been actively employed in each sector?

Let us multiply (1) by the productivities in period t and add together

$$\sum_{i=1}^{n}\left\{q_{it}\left[\frac{A_{i(t-1)}}{\Sigma A_{i(t-1)}}\cdot \Sigma A_{it}\right]\right\} \tag{2}$$

Formula (2) gives us, thus, the quantity, which we would have produced in period t, if we had retained the employment structure of the base period.

(3a) Production during period $t = \sum_{i=1}^{n} q_{it}\cdot A_{it}$

(3b) Production during period $t-1 = \sum_{i=1}^{n} q_{i(t-1)}\cdot A_{i(t-1)}$

(3a) – (3b) gives the increase in production during the periods.

$$\sum_{i=1}^{n} q_{it}\cdot A_{it} - \sum_{i=1}^{n} q_{i(t-1)}\cdot A_{i(t-1)} \tag{3c}$$

The difference between the quantity produced during period t and production calculated according to formula (2) is ((3a) – (2))

$$\sum_{i=1}^{n} q_{it}\cdot A_{it} - \sum_{i=1}^{n} [q_{it}\cdot A_{i(t-1)}]\frac{\sum_{i=1}^{n} A_{it}}{\sum_{i=1}^{n} A_{i(t-1)}} \tag{4a}$$

which is precisely the quantity produced as a result of the structural reallocation of labour between the given sectors.

In order to quantify the share of the increase in production attributable to the inter-sectoral effect, one devides (4a) by (3c)

$$\frac{(4a)}{(3c)} \tag{5a}$$

The expression (5a), thus, becomes our first definition of the transfer gain.

Definition Ib

We pose the problem in a different way: What would be the quantity produced in period $(t-1)$ if the process had been carried out with the employment structure of period t?

The difference between production during period t and period $(t-1)$ as observed corresponds to formula (4a) above but with different weights. We obtain

$$\sum_{i=1}^{n} q_{i(t-1)} \cdot A_{i(t-1)} - \sum_{i=1}^{n} [q_{i(t-1)} \cdot A_{it}] \frac{\Sigma A_{i(t-1)}}{\Sigma A_{it}} \tag{4b}$$

By analogy with the earlier definition we now obtain

$$\frac{(4b)}{(3c)} \tag{5b}$$

which is our second definition of the transfer gain.

Definition IIa

Definition I involves the question of how large a part of the increase in total production between two time periods can be attributed to reallocation of labour. Let us instead consider the effect of transfer on average productivity for the economy as a whole.

We view the transfer gain as that percentage of the total increase in productivity which can be ascribed to the structural reallocation of labour between well-defined sectors.

$$\frac{\sum_{i=1}^{n} Q_{it}}{\sum_{i=1}^{n} A_{it}} = \text{the observed average productivity in period } t. \tag{6}$$

$$\frac{\sum_{i=1}^{n} Q_{i(t-1)}}{\sum_{i=1}^{n} A_{i(t-1)}} = \text{the observed average productivity in period } (t-1). \tag{7}$$

$(6)-(7)$ = the observed change in average productivity between t and $(t-1)$. (8)

$$\left\{(6) - \left[\frac{(2)}{\sum_{i=1}^{n} A_{it}}\right]\right\} \cdot \frac{1}{(6)-(7)} \tag{9a}$$

= the percentage of the total change in production attributable to the reallocation of labour between the given sectors.
The expression (9a) = Definition IIa.

Definition IIb

A construction by analogy to definition Ib gives us

$$\left\{\sum_{i=1}^{n}\left[q_{i(t-1)}\cdot A_{it}\right]\frac{\Sigma A_{i(t-1)}}{\Sigma A_{it}}\right\}\cdot\frac{1}{\Sigma A_{i(t-1)}}-(7)\Bigg\}\cdot\frac{1}{(6)-(7)} \qquad (9b)$$

which will be our fourth definition of transfer gains.

A Verbal Summary of the Definitions

If in period t, we had the same distribution of labour as in period $(t-1)$, what would have been the quantity produced in period t? The difference between the hypothesised and the actual production in period t will be the absolute reallocation gain. If we set this absolute gain in relation to the observed actual *increase in production*, we have definition Ia. Definition Ib takes as a starting point production in period $(t-1)$ and we calculate the production that could have been obtained during this period with the labour distribution of period t. The difference is set in relation to the observed *increase in production.*

Definitions IIa and b attempt to answer the question of how much of the observed *increase in average productivity* for the economy as a whole can be attributed to the reallocation of labour between the defined sectors. The difference between a) and b) is that in a) we estimate the productivity we could have reached in period t with the same employment distribution as that of period $(t-1)$ and in b) we go back in time to period $(t-1)$ and ask what would have been the productivity in period $(t-1)$ if the structural distribution of labour had been the same as in period t. Will the size of the transfer gains be the same whether we applicate definition a) or b)? How could systematical empirical differences between definitions I and II be interpreted? This question will be treated later but it is advantageous to be acquainted with the problem in advance.

3. Discussion of the Definitions

The definitions imply that, in order to give "correct" reallocation gains,[1] the movement of labour taking place between the different sectors has not affected the development of average productivity for each separate sector. Expressed in another way, the sectoral productivities obtained for period t would have been obtained even if no structural reallocation had occurred.

The realism of the assumption that the average productivities of the sectors remain unchanged by the redistribution of labour must be questioned. A movement of labour from one sector to another *can*, at the same time, cause the productivity of the sector from which the factor moved as well as the productivity of the recipient sector to alter. Expressed in another way, a factor movement from Sector 1 to Sector 2, does not necessarily entail that the transfer gain represents the difference between the average productivities of the two sectors.

Let us consider the example of an economy consisting of two sectors, agriculture and industry. We will call the agricultural sector sector I and the industrial sector sector II.

Sector I

Assume that Figure 7 designates the distribution of labour in Sector I at a given point in time.

The average productivities of the different land areas are designated in the figure by $q_1, q_2 \ldots q_5$. The weighted average productivity for the sector as a whole is given the symbol q_1.

Although productivities vary not insignificantly within each land area, we disregard this for the present. Consequently each land area group will be viewed as homogeneous from the point of view of productivity.

Sector II

The industrial sector consists of, let us assume, five different industries. The structure is given in Figure 8, the symbols of which are wholly analogous to those in Figure 7 for sector I.

[1] Observe that we also assume that the average productivities give acceptable results (see page 48).

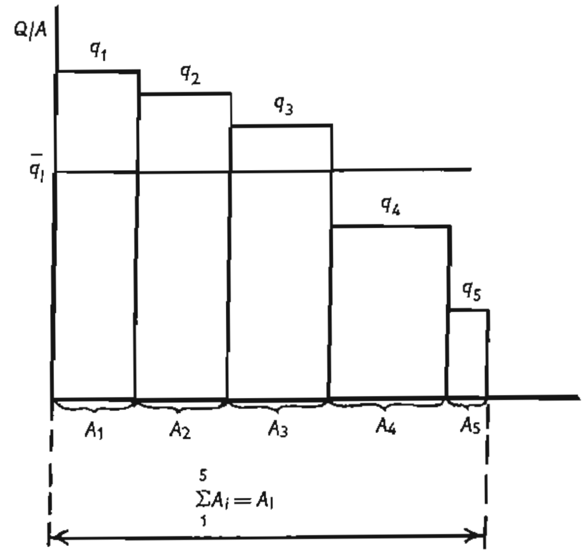

Fig. 7.

A_1 = the number of workers on property between >50 hectares in size
A_2 = the number of workers on property between 30–50 hectares in size
A_3 = the number of workers on property between 20–30 hectares in size
A_4 = the number of workers on property between 10–20 hectares in size
A_5 = the number of workers on property between 5–10 hectares in size

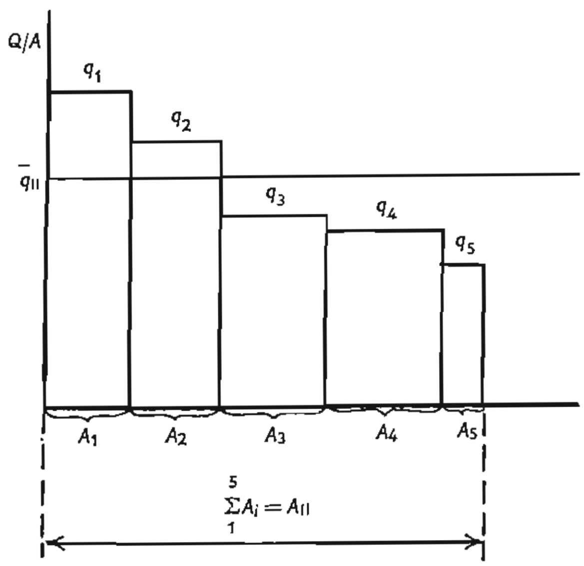

Fig. 8.

A certain quantity of labour is moved from Sector I to Sector II. We assume that the movement takes place from land area groups 4 and 5, that is, from units in the 5 to 20 hectone group.[1] This will result in an increase in the average productivity of the sector without any increase in the productivity of the other area-size groups.—The resource productivity in the sector from which the movement occurred was affected. To which branch of industry does labour move and how does this influence the average resource productivity of the sector?

We hypothesize that the most expansive industrial branch has the greatest capability and desire to attract labour. We also assume that the most swiftly growing branch of industry has the highest average resource productivity during the moment the transfer effect is studied. These hypotheses, being rather rough so far, will be "tested" empirically in another section.[2] For the moment, however, we accept the hypothesis as reasonable; this allows us to suppose that the transfer takes place to one of the industries in Group 1 or 2. The result will be an increase in the average resource productivity for the sector as a whole.

If the transfer gain for the economy is measured as the number of those who moved multiplied by the difference between the average productivities of the sectors before the movement, one will underestimate the actual effect of reallocation between the sectors. In our example nothing happened other than a movement of labour from Sector I to Sector II which means that the entire increase in productivity could be ascribed to reallocation.

(The same symbols as in the example with the addition of an asterisk to designate the same unit after the reallocation.) The actual transfer gain in this case:

$$A_{II}^{*} \cdot \bar{q}_{II}^{*} - A_{II} \cdot \bar{q}_{II} + A_{I}^{*} \cdot \bar{q}_{I}^{*} - A_{I}\bar{q}_{I} \tag{10a}$$

– the production increase as a whole.
After a transfer of the terms we obtain

$$[A_{I}^{*} \cdot \bar{q}_{I}^{*} + A_{II}^{*} \cdot \bar{q}_{II}^{*}] - [A_{I} \cdot \bar{q}_{I} + A_{II} \cdot \bar{q}_{II}] \tag{10b}$$

[1] Compare Agricultural Estimates. (SOS) 1956 and 1961.
[2] Compare p. 67.

We compare (10b) witb the numerator in (5a) and find that they mean the same thing, namely the increase in production between two time periods. The denominator in (5a) is more interesting and we shall concentrate on it (denominator = (4a)).[1]

The first part of (10b) is identical with the first part of (4a) and its significance is therefore already known. The second part of (4a) expresses the quantity we would have produced if we were able to use $\bar{q}_1$ and $\bar{q}_2$ before the transfer (because we allowed only a transfer of labour in the example, $\frac{\Sigma A_{it}}{\Sigma A_{i(t-1)}} = 1$, that is to say, there is no change in the total labour input). Definition Ia reformed to fit in with our example gives us

$$[A_I^* \cdot \bar{q}_I^* + A_{II}^* \cdot \bar{q}_{II}^*] - [A_I \cdot \bar{q}_I^* + A_{II} \cdot \bar{q}_{II}^*] \quad (11a)$$

or rewritten

$$-\bar{q}_I^*(A_I^* - A_I) + \bar{q}_{II}^*(A_{II}^* - A_{II}) \text{ but } -(A_I^* - A_I) - (A_{II}^* - A_{II}) \quad (11b)$$

Verbally, the number of those who moved multiplied by the difference between the mean productivity of the sectors after the reallocation.

In our example, with the stipulated assumptions,[2] such a definition (i.e.,Ia) will tend to underestimate the gains to the economy from the point of view of production.

A graphic illustration is offered in Figure 9.

The Definition Ia of the transfer gains, is represented in the figure by the lined area of the rectangle abcd.

The total transfer gain according to the example = the area of klch + the area of abcd + the area of bfnm.

Let us weight the productivities of the respective periods with the original labour distribution. This gives

$$[A_I \cdot \bar{q}_I^* + A_{II} \cdot \bar{q}_{II}^*] - [A_I \cdot \bar{q}_I + A_{II} \cdot \bar{q}_{II}] \quad (12a)$$

$$A_I(\bar{q}_I^* - \bar{q}_I) + A_{II}(\bar{q}_{II}^* - \bar{q}_{II}) \quad (12b)$$

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[1] See page 51.

[2] See page 54.

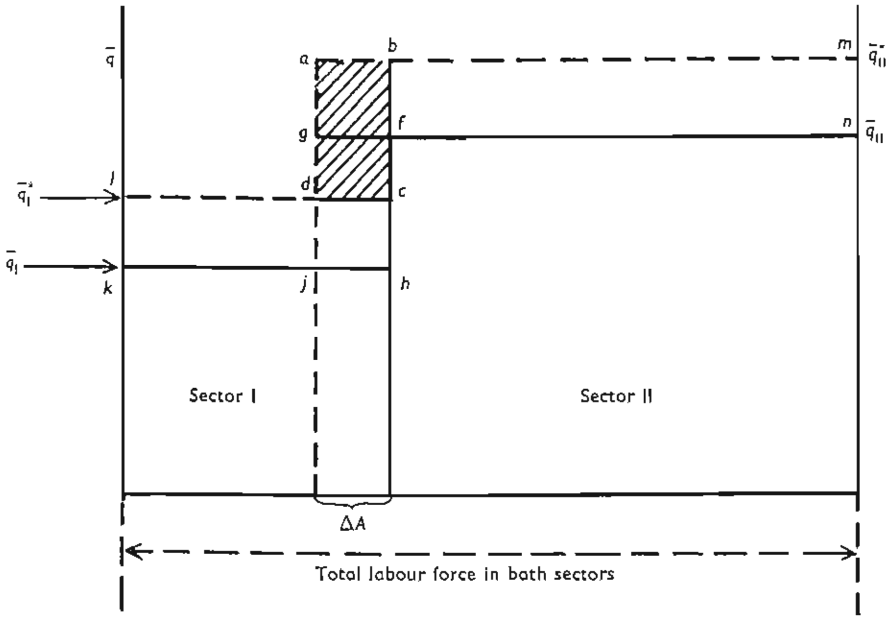

Fig. 9.

that is, area klch and area bfmn. This method of weighting gives us, clearly, an intra-sectoral effect with the productivities weighted according to the weights of the base period.

If we combine (11b) and (12b) we will obtain the entire production effect.

Observe that the intra-sectoral effect is in no way contained within our definition of transfer gain. One can say that the intra-sectoral effect is the difference between the entire production increase and definition I. In our example, the intra-sectoral effect is also dependent on the transfer, and Definition Ia tends to underestimate the actual transfer gain with (12b) as a whole.

Another conceivable way to ensure that the sum of the effects is equal to the total effect is to combine employment, weighted with the productivities of the base period, and productivity with the final period's employment, that is, a combination of (13b) and (14b) below.

$$[A_I^* \cdot \bar{q}_I + A_{II}^* \cdot \bar{q}_{II}] - [A_I \cdot \bar{q}_I + A_{II} \cdot \bar{q}_{II}] \tag{13a}$$

$$-\bar{q}_I(A_I^* - A_I) + \bar{q}_{II}(A_{II}^* - A_{II}) \tag{13b}$$

$$[A_I^* \cdot \bar{q}_I^* + A_{II}^* \cdot \bar{q}_{II}^*] - [A_I^* \cdot \bar{q}_I + A_{II}^* \cdot \bar{q}_{II}] \tag{14a}$$

$$A_I^*(\bar{q}_I^* - \bar{q}_I) + A_{II}^*(\bar{q}_{II}^* - \bar{q}_{II}) \tag{14b}$$

This method gives a transfer gain corresponding to the area of the rectangle fgjh in Figure 9 above and agrees with our definition Ib.

We can now observe that the two methods of weighting give the same transfer gain only if the areas of rectangles abcd and fgjh are equal. If average productivity is increased by more in Sector II than in Sector I, we will obtain greater inter-sectoral effects when we weight employment with the productivities of the final period than when we resort to those of the base period.

However, if average productivity increases by more in Sector I than in Sector II, the weights of the base period will give the greater result.[1]

We will now look at what happens to our definitions when the total number of workers employed within the economy increases during the studied time-periods, that is

$$\sum_{i=1}^{n} A_{it} > \sum_{i=1}^{n} A_{i(t-1)}$$

The foregoing definitions, if applied to data for which the inequality is relevant, result in a distribution of employment changes according to the total employment structure.[2] The relative changes in employment are assumed to have been the same in each individual sector. *If* we thus experience an increment of labour *and* we continue to define transfer gain as the difference between the observed production in one period and the production which we could have obtained with the employment structure of the other period, we will attach a part of the increment to the reallocated labour force. This is not affected by the fact that the increment of labour in reality need not necessarily have been set in sector I in order to move to sector II. In figure 10, these ideas are further specified.

[1] Drawing a comparison with Salter, *op. cit. supra*, we find that the respective intra-sectoral and inter-sectoral components there stand in a multiplicative relation to each other, while we have treated them as additives. Salters multiplicative relation has an index theory background. If one starts with an index and breaks it down into various components their inherent relation must be multiplicative.

[2] Compare, e.g., (4 a) p. 51.

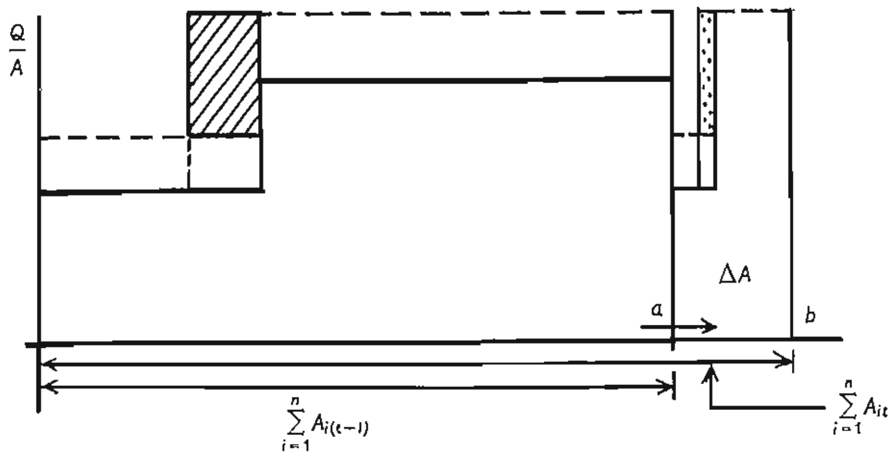

Fig. 10.

As we see the base is shifted from a to b. The increase

$$= \sum_{i=1}^{n} A_{it} - \sum_{i=1}^{n} A_{i(t-1)} = \Delta A$$

As we can easily see from, *e.g.*, formula (2) (page 51) we will multiply all the sectors by the same employment index. This means that ΔA will be divided between the sectors in the same proportion as that existing between the total sectors. The dotted area in Figure 10 thus will be calculated as the transfer gain (according to Definition Ia).[1]

If ΔA is never placed in sector I but rather inserted directly in sector II as a factor of production, we could say that the smaller dotted area within ΔA represents a kind of overestimation. But, this, it is to be observed, tells nothing about the total under- or overestimation. These observations spur us on to a somewhat different method of definition.

4. *A Definition with Particular Reference to the Transfer from Agriculture to Other Sectors*

We now introduce an assumption that the sector with a quantity of labour that has decreased during the periods receive no part of the labour *increment* for the economy as a whole.

[1] The part a to b in figure 10 is a diminished projection of the other part of the figure.

Designations.[1]

$$\Delta A_1 = A_{1t} - A_{1(t-1)}$$
$$\vdots \qquad \vdots$$
$$\Delta A_i = A_{it} - A_{i(t-1)}$$
$$\vdots$$
$$\Delta A_n = A_{nt} - A_{n(t-1)}$$

If we add together all the negative ΔA_1 we obtain the number of those workers who were reallocated between the periods. The difference between Σ (the positive ΔA_1) and Σ (the negative ΔA_1) constitutes the increase in the total labour input.

Let us call Sector 1 the agricultural sector. Assume for the sake of simplicity that Sector 1 is the only one with a decreased number of employed workers. We distribute (ΔA_1) among the other sectors in proportion to their expansion (relating to labour). We express this formally in the following way.

$$\frac{\Delta A_2}{\sum_{i=2}^{n} \Delta A_i} |\Delta A_1|; \ldots \frac{\Delta A_n}{\sum_{i=2}^{n} \Delta A_i} |\Delta A_1| \qquad (15)$$

This need not mean that the transfer for the agricultural sector is distributed exactly in this way but rather that we can interpret it as the expansion within each sector *made possible* by the movement of labour from Sector 1. In itself, it is of slight importance whether, say, the service sector obtains its labour increment directly from agriculture or via an interchange of labour from other sectors (The same assumptions regarding the movement from relatively low to highly productive sectors apply here as before.)

If we multiply the terms in (15) by the difference between the productivity of the sectors in period t and the productivity of Sector 1, we arrive at the increase in production which can be attributed to the movement from the agricultural sector.

Which period's productivity should be chosen for Sector 1?

Two alternatives are available: the productivity of the base period or that of the final period. If we choose that of the base period, we have

[1] The same symbols used as those in connection with the other definitions, see p. 51 et seq.

implicity assumed that the change in productivity in the sector between periods is partly dependent on the movement. If we, on the other hand, select the productivity of the final period, there is the underlying possibility that one might have obtained the productivities of the final period even without a reduction of labour. This would have entailed a substantially increased production level (page 58).

Would sales have been sufficient for an increased production in period t?

A reasonable assumption is that a considerable production increase would be difficult to sell without a strong price reduction.[1]

(Production has rather been held constant and productivity has been increased by the transfer. A reallocation of production between vegetables and animals does not affect our reasoning.)

The conclusion is that we choose the productivities of the base period and consider these more correct for the calculation of the transfer gains—in agriculture as opposed to other industrial sectors.

This verbal discussion can be formally expressed in the following way.

$$\sum_{i=2}^{n}\left\{\left[\frac{\Delta A_i}{\sum_{i=2}^{n}\Delta A_i}|\Delta A_1|\right][q_{it}-q_{1(t-1)}]\right\} \tag{16}$$

which is the increase in production attributable to the movement of labour from agriculture to the other sectors $(2 \ldots n)$.

This expression set in relation to the total increase in production (formula (3c) page 51) gives the transfer gain as a percentage of the entire increase in production between the periods.

$$\frac{(16)}{(3c)} \tag{17}$$

which becomes definition III.

Let us illustrate this definition in a currently familiar type of figure: The transfer gain (16) = the lined area. Observe that the labour increment moves to Sector II without detouring over the agricultural sector. By dividing (16) by the number of employed workers and

[1] One could conceive of, say, exports, at substantially reduced prices if the domestic market hasn't the capacity to absorb more.

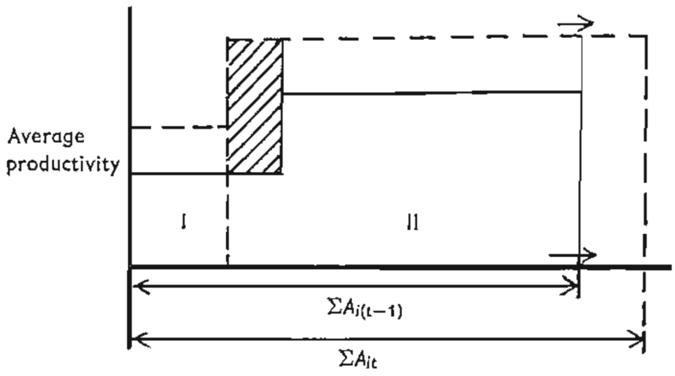

Fig. 11.

relating the ratio to the entire increase in productivity definition IV is formed.

Summary

We can say that the definitions are linked with either one or two different measures of the rate of growth. Definitions I and III relate transfer gains to changes in production while definitions II and IV present these gains as a part of changes in productivities. Different weighting methods differentiate a) from b) in the calculations of definitions I and II. The difference between the first two (I and II) and the latter two (III and IV) is that the former distribute a change in total labour of the economy—according to the sectors' share of the labour force at any[1] of the points in time, while the latter distribute the reallocated between the expanding[2] sectors according to the degree of expansion. Further, definitions III and IV take some consideration to the probable increase in average prodnctivity in the agricultural sector.

As appeared from the definitions, in order to calculate a transfer gain we must know the current average productivities for the sectors as well as the employment distribution. The empirical calculations of these quantities are not described in this article.[3]

[1] Dependent on the weighting method.

[2] = labour-absorbing.

[3] See a mimeographed edition of this article. Nationalekonomiska institutionen, Stockholm 1964.

Section III. An Empirical Calculation of Labour Reallocation Gains

1. *A Summary of the Results of the Productivity Calculations*

In order to facilitate the comparison of productivity within the different sectors at two points in time, the table below and Figures 12 and 13 have been compiled.[1] A difference between the figures arises in that Figure 12 shows the productivities of both sectors for 1950 and 1960 in 1950 prices while Figure 13 presents the same dates in 1960 prices.

Average Productivity Within the Different Sectors (kronor)

Sector	1950		1960	
	Current Prices	1960 Prices	Current Prices	1950 Prices
1. Agriculture, Gardening and Fishing	4.972	6.290	10.418	8.293
2. Forestry	20.453	21.488	28.199	27.407
Manufacturing Industry				
3. Mining & Mineral Extraction	32.923	47.725	58.953	40.657
4. Food, Beverages & Tobacco	10.334	17.364	22.790	13.568
5. Textiles and Clothing	8.010	9.531	14.522	12.204
6. Wood, Furniture & Interiors	7.565	12.860	16.853	9.915
7. Paper	18.546	27.261	33.669	22.899
8. Printing and Publishing	12.396	17.113	21.979	15.930
9. Leather and Rubber	8.002	10.799	19.185	14.231
10. Chemical and Chemical Products	22.408	23.753	42.294	39.907
11. Non-metallic Mining, Quarrying	10.102	15.458	23.843	15.578
12. Metal Engineering and Transport	11.993	17.393	22.735	15.679
13. Miscellaneous and Utilities (Electric, Gas & Waterworks)	18.636	26.110	42.871	30.620
14. Building and Construction	8.670	13.872	19.011	11.882
15. Services	10.430	18.872	21.636	11.585

If we examine productivities in the different sectors we find that considerable difference arises between the relatively low and the high productivity sectors. Let us review the results.

The agricultural sector has by far the lowest labour productivity. After this sector, in reverse order of magnitude comes wood, textiles

[1] Figures 12 and 12 show sectors 3–13 together.

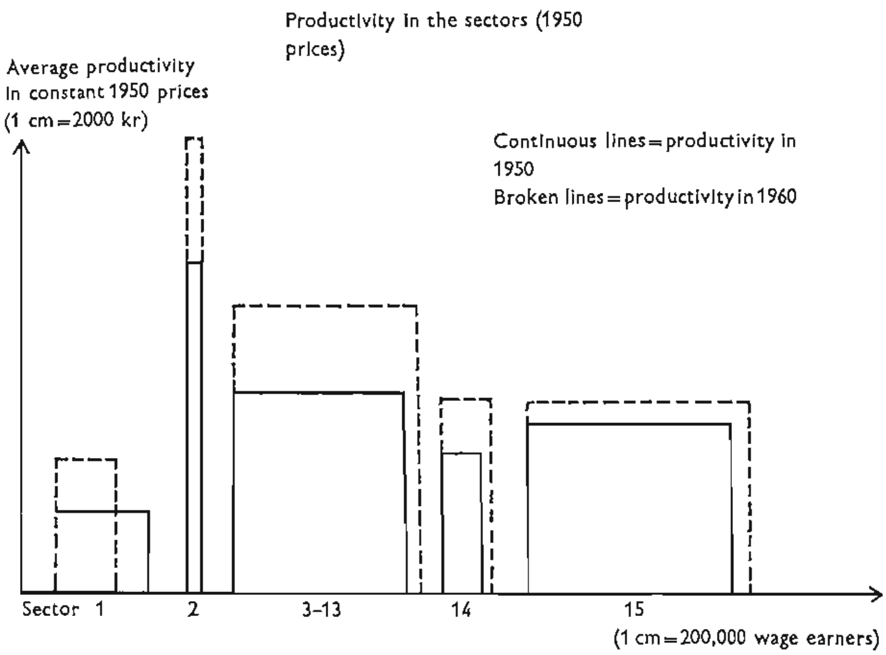
Productivity in the sectors (1950 prices)
Average productivity in constant 1950 prices (1 cm=2000 kr)
Continuous lines=productivity in 1950
Broken lines=productivity in 1960
Sector 1
2
3–13
14
15
(1 cm=200,000 wage earners)

Fig. 12.

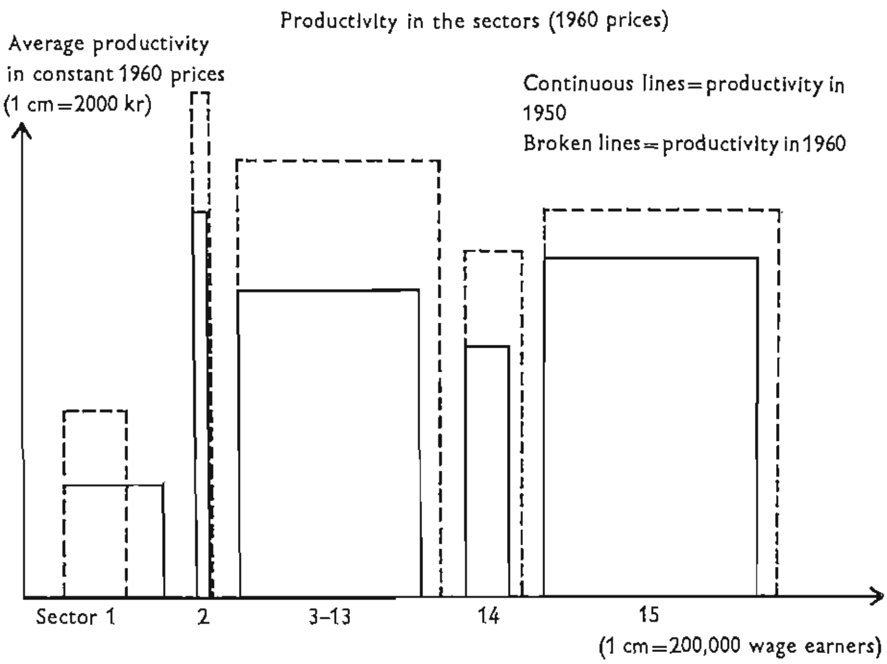
Productivity in the sectors (1960 prices)
Average productivity in constant 1960 prices (1 cm=2000 kr)
Continuous lines=productivity in 1950
Broken lines=productivity in 1960
Sector 1
2
3–13
14
15
(1 cm=200,000 wage earners)

Fig. 13.

and leather and rubber, which, however, reach a productivity almost 160% that of the agricultural sector. The indisputably highest productivity is that shown by the mining industry. How should these results be interpreted?

When attempting to interpret these results one cannot disregard the other factor of production, capital.

Without empirical support for this, we can intuitively conceive of the probability that a large part of the high productivity of the mining industry was due to a high capital intensity.

An assertion that a movement of labour from a sector with low labour productivity to one with a higher productivity resulted in a certain amount of gain can consequently be false if the capital intensity of the two sectors differed. If the transfer took place from a relatively low to a more highly capital-intensive sector, we would obtain a higher estimate of the reallocation gain when one viewed only labour productivity. It is occasionally claimed that one over-estimates the gain if one fails to take into consideration the capital rendered obsolete by the labour transfer.

Disparities in the rate of technical growth affects relative prices to the disadvantage of the least expansive sectors. This can result in a decreasing demand for the products of these sectors. By decreasing demand is meant a lower demand at each price. (If, for example, products from the sectors with a high rate of growth are substitutes, to a certain extent, for products from those with a slower growth rate a shift in the demand curve for the products from the latter sector will occur.)

The profit position becomes less favourable and it becomes impossible to run production at full capacity with unchanged quantities of all factors. In this way, it is decreasing demand resulting in a less favourable, profit position, that creates obsolete capital and not labour moving from the sector. (The problem of obsolescence is given some further treatment in the conclusion.)

Let us accept the idea that capital is a necessary ingredient of analysis of the actual net effect of the transfer. Nevertheless, by studying only labour productivity, we can obtain an appreciation of the value of a mobile labour market.

Has Labour Moved From Lower to More Highly Productive Sectors?

Let us look at the table below in which plus signs are used to indicate an increase in labour in the sector as well as whether the sector's productivity exceeds the average productivity for all sectors.

Sector	Increase (+) or Decrease (−) of Labour Input	Over (+) or under (−) Average Productivity
1. Agriculture, Gardening and Fishing	−	−
2. Forestry	+	+
Manufacturing Industry		
3. Mining & Mineral Extraction	+	+
4. Food, Beverages & Tobacco	+	+
5. Textiles and Clothing	−	−
6. Wood, Furniture & Interiors	±0	−
7. Paper	+	+
8. Printing and Publishing	+	+
9. Leather and Rubber	−	−
10. Chemical and Chemical Prodncts	+	+
11. Non-metallic Mining, Quarrying	−	−
12. Metal Engineering and Transport	+	+
13. Miscellaneous and Utilities (Electric, Gas & Waterworks)	+	+
14. Building and Construction	+	+
15. Services	+	+

From the table, it appears that all cases of labour reductions occurred in sectors in which productivity lay below the average.

Our assumption (see page 56 et seq.) that movement occurs from sectors with relatively low productivity to sectors with high productivity appears, thus, to be reasonable.

2. Transfer Gains According to Definition I and II

Taking as the starting point, the size of the labour force for each sector in 1950 and in 1960, two calculations have been made: how many would have been employed in each sector in 1950 if at that time the structural distribution would have been the same as in 1960; and, how many would have been working within the respective sectors in 1960 according to the structure of 1950.

By multiplying the hypothesised share of the work force by the average productivities of the respective sectors, we obtain the quantity that would have been produced in one period with the other period's employment structure. The difference between the respective period's gross national product and the hypothetical national product calculated by the above method will be the transfer gain in absolute terms. If we divide this by the observed increase in the G. N. P. we obtain the sought after relation.

Since the productivity of each period is evaluated both in changing and in constant prices, we obtain four different values for the transfer gain according to Definition I (see page 51 and four different results according to Definition II (page 52). The size of the transfer gain is a function of the degree of disaggregation and therefore we must sufficiently specify the number of defined sectors in the presentation of results.[1]

Below the size of the transfer gain is given, first according to definition Ia) and b) and IIa) and b) for the economy divided into the 15 above defined sectors and, then, the results for the same definitions are demonstrated but with sectors 3–13 aggregated. In the latter case, the sectors are 5 in number.

Why is the labour transfer gain a larger percentage according to definition II?

Symbols.

GNP_{50} = Gross National Product 1950

GNP_{60} = Gross National Product 1960

L_{50} = The labour Force 1950

L_{60} = The labour Force 1960

An asterisk designates the same quantities, but without the reallocation of labour.

$$\frac{GNP_{60} - GNP^*_{60}}{L_{60}}$$

= the transfer effect on productivity

[1] See, e.g., Lundberg, E., *Produktivitet och räntabilitet*, Stockholm, 1961, p. 41.

The Size of the Transfer Gain

	A) 1960's Productivities and 1950's Structure		b) 1950's Productivities and 1960's Structure	
	1960 Prices	1950 Priees	1950 Prices	1960 Prices
A. The Results for the 15 Defined Sectors				
Definition I				
Transfer Gain as a Percentage of the Total Increase in GNP Between 1950 and 1960	17.6 %	14.9 %	13.2 %	14.8 %
Definition II				
Transfer Gain as a Percentage of the Total Increase in Productivity Between 1950 and 1960	19.8 %	16.7 %	15.5 %	17.4 %
B. The Results for 5 Sectors (Sectors 1, 2, 3–13, 14 and 15)				
Definition I				
Transfer Gain as a Percentage of the Total Inerease in GPN Between 1950 aud 1960	12.9 %	10.6 %	9.3 %	10.7 %
Definition II				
Transfer Gain as a Percentage of the Total Increase in Productivity Between 1950 and 1960	14.5 %	11.8 %	10.9 %	12.5 %

$$\left[\frac{GNP_{60}-GNP^*_{60}}{L_{60}}\right]\cdot\left[\frac{1}{\frac{GNP_{60}}{L_{60}}-\frac{GNP_{50}}{L_{50}}}\right]$$

= the transfer effect as a percentage of the the total increase in productivity.

By rewriting we obtain

$$\frac{(GPN_{60}-GPN^*_{60})L_{50}}{L_{50}\,GPN_{60}-L_{60}\,GPN_{50}}.$$

If $L_{50}=L_{60}$, that is if the labour force has been constant we will obtain the same result as with Definition I.

Set $L_{60}=a\cdot L_{50}$ where $a>1$ and we obtain a higher percentage according to Definition II.

This shows that since the total quantity of labour increased from 1950 to 1960 we will obtain a larger effect, expressed as a percentage, if we set it in relation to productivity than if we set it in relation to production changes. Conclusion: the transfer gain according to Definition I will be more insignificant, than that of Definition II, the greater has been the labour increment.

If we assume that the economy would rather maximize per capita production than total production, Definition II gives a more correct picture of the importance of transfers in relation to the realization of the goal.

How is the Size of the Transfer Gain Affected by the Choice of Time Period in the Re-calculation of Constant Prices?

If the sectors which suffered a relative decrease in production from 1950 to 1960 have prices rising relatively during the same period, our evaluation, based on the prices of the base period, will tend to overestimate the increase in production.[1] If the relatively expanding (labour-absorbing) sectors reduce their prices, an evaluation based on constant 1950 prices will lead to a higher result than an evaluation based on constant 1960 prices. According to the presentation on page 65 we obtained the opposite result. The explanation probably lies in the fact that the service sector—in spite of strong expansion—increased its prices both absolutely and relatively.

If we start from the idea that the relative prices reflect the marginal preferences of the consumer, we should evaluate the transfer gain at the prices which prevail at the time of transfer.

An evaluation of transfer gain according to constant 1950 prices results in an evaluation of the quantitative gain at prices which most closely correspond to the preference of the base period. If we view reallocation as an adjustment process we find that it is more natural to use the prices of the trial period than those of the base period (see the earlier presentation on page 44).

3. *The Gain From the Transfer of Labour From Agriculture to Other Sectors*

Of the total reallocation between the 15 defined sectors during the 1950–60 period, almost 87% had come from the agricultural sector.

[1] Scitovsky, T., *Welfare and competition*, London, 1963, p. 76 et seq.

This demonstrates with desirable clarity that the dominant part of transfer gains must be attributed to the movement from agriculture.

The table below shows the size of the transfer gain according to Definitions III and IV. As with the earlier presentation (page 69), we make a comparison based on the number of sectors.

A. The Result Based on 15 Defined Sectors
   Definition III 16.7% (1960 prices)
   Definition IV 18.8% (1960 prices)

B. The Result Based on 5 Sectors (Sectors 1, 2, 3–13, 14 and 15)
   Definition III 15.3% (1960 prices)
   Definition IV 17.2% (1960 prices)

Under A in the table Definition III shows that 16.7% of the increase in GNP can be attributed to movement between agriculture and other sectors. Definition IV indicates that 18.8% of the total increase in productivity arose from the transfers mentioned.

As we remind ourselves from the presentation on page 62, these definitions are based on the productivities for agriculture in the base year. A more careful calculation—with the help of the productivities of the trial period— will somewhat deflate our percentages. Instead of 16.7% and 18.8%, we obtain 14.8% and 16.6% respectively.

Concluding Reflections

The movement we studied has, in large measure, (approximately 87%) occurred between agriculture and other sectors. It has often been maintained that the income elasticities for agricultural products are low in relation to those for other goods.[1] This relation results in a decreasing ratio of the quantities of agricultural to industrial goods consumed at rising income (i.e. line OC in Figure 2 bends off towards the Q_2 axis). In the long run, thus, one must count on a redistribution of resources from the agricultural sector to other sectors. (If one disregarded foreigu trade, one might under certain assumptions be able to say that a situation of balanced growth implied that production

[1] SOU 1946: 46, particularly the additions by Lundberg and Svennilson (p. 514): "At an increase of income of 10%, expenditure on all types of food is calculated to rise by an average of 3%."

in the different sectors increased in proportion to the income elasticity of the respective products.)

Several investigations in different countries have been made to estimate the influence of the movement of labour on changes in GNP.[1] All of these are based on the increase in value per worker per year for every sector. Most researchers consider that they have confirmed the importance of a mobile labour force.

This paper is based on an analysis of *labour* productivity. As has earlier been suggested, a higher labour productivity need not be a sign of improved efficiency. In order to be able to measure efficiency the factor of production, capital, must be taken into consideration.[2]

An investigation by K. G. Jungenfelt[3] demonstrates that the industrial sectors in 1958 with the lowest average productivities for the capital factor of production were the textiles, wood products and leather, hair and rubber industries.[4] It should be observed that these sectors[5] belonged to the relatively low productive category in our study (see page 64).

Consequently, in these sectors, *both* labour *and* capital productivity are lower.

Will the economy fully utilise its capital resources at any and every price situation?

If labour is allowed to move from sectors of relatively low capital intensity to higher capital intensive sectors, new investments will most likely be undertaken. Even if the increase in GNP will be greater—by comparison with the alternative of inducing labour in some way to remain with the "old" capital—we cannot say how total consumption will be changed. Immediate consumption might *perhaps* increase, if we, for example, subsidised agricultural workers to remain in that

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1 See, e.g., Aukrust, O., Vegst og strukturendering, *Bedriftsøkonomen* No. 10 (1957). Carré, P., *Étude empirique l'evolution des structure d'Économics en État de croissance*, Paris, 1960.

2 See, e.g., Ruist, E., *Industriföretagets produktionseffektivitet*, Uppsala, 1960. Farrell, M. S., The Measurement of Productive Efficiency, *Journal of Statistical Association*, 1957, p. 157.

3 SOU 1962: 11 (p. 187).

4 (Table 5, p. 209.)

5 The sectoral limits were somewhat different for the leather, hair and rubber industries.

sector, but future consumption would probably decrease. New techniques are introduced through new investments and economic growth is dependent *inter alia* on the speed at which innovations are spread. A lower rate of dispersion of innovations reduces the power to compete. A small country such as Sweden with an extensive stake in foreign trade is more dependent on the maintenance of its competitive powers than a larger and more "isolated" country.

What possible conclusions can be drawn from the material presented in the earlier sections'?

We can collate all the results in one statistic and say that at least 12–15 % of the entire increase in productivity from 1950 to 1960 was due to movement from the agricultural sector (dividing the economy into 15 sectors as before). This is probably a lower limit for the "actual" importance of reallocation.[1] The most important reason for this is that we assumed that the average productivities remained unaffected by movement between the sectors. However, as we assumed in an example in Section II and "tested" empirically in Section IV there appears to be every reason to expect that the movement contributes to an increase in the average productivities. This is a change which has not been included in the calculations as a transfer gain.[2]

[1] Compare, SOU 1957: 10, p. 20.

[2] Other than to a limited extent in Definitions III and IV.