Changing Factor Shares by Industry: Factor Prices and Factor Substitutions

ALVIN C. EGBERT
U.S. DEPARTMENT OF AGRICULTURE

According to Scitovsky, writing in 1964, "The theory of income distribution is in a highly unsatisfactory state" [19, p. 15].[1] No evidence of improvement in the theory since that time has been found. Moreover, this paper makes no claim to improve it. Here data are presented that indicate that factor shares have changed since the end of World War II. Relationships are derived which help to throw some light on the so-called mystery of changing or unchanging factor shares. These relationships are used to explain and measure some of the shifts that have taken place. Some suggestions for future investigation of factor shares grow out of this appraisal.

It is relevant to ask why there is such great concern with the distribution of factor shares. One reason is that the need to explain is at the heart of all scientific inquiry. Brown suggests another reason for investigating functional income distribution [3, p. 180].

> Stated simply, the question of relative shares is important because it represents the relative pay-off to various groups that is usually associated with their relative contribution to production. It is the end result of all their productive efforts; for once their productive efforts are established their relative remuneration is determined and only an extraneous force can alter the final distribution. In this sense a factor's relative income share is a variable of last resort. Hence, the question of shares is at the centre of controversy between certain pressure groups, and motivates the appeals to

[1] Numbers in square brackets refer to literature cited in the bibliography at the end of this paper.

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political bodies to effectuate policies that alter the functional (and size) distribution of income. This in itself is sufficient justification for their examination.

The implication of this statement seems to be that all the economist needs to do is determine the factors' relative contribution, presumably on the basis of neoclassical theory, and then confront various groups with this evidence in settling disputes over distributive shares. But this is a gross oversimplification because marginal theory, as a basis for specifying income distribution, has numerous defects. First, in a dynamic economy the marginal conditions will never be satisfied. Second, if they were satisfied the economist could only grossly approximate them. Third, factor ownership is a function of past income distributions which may not have been desirable. Marginal theory may be a good frame of reference for thinking about economic systems and for specifying economic efficiency under certain conditions, but that is about all.

A more realistic reason for investigating income distribution is the relationship between income distribution and economic growth. Income could be distributed according to marginal-productivity criteria and yet the rate of growth may be lower than some feasible and desirable level. (A desirable growth rate as used here is one for which society would express a preference and for which it would also be willing to provide the necessary savings.)

Much empirical research attempting to explain changes in factor shares has been based on neoclassical theory and has dealt primarily with estimation of aggregate production functions. Early investigations assumed that the aggregate production function of an economy was characterized by an elasticity of substitution between factors of one and constant returns to scale. This approach was taken because of the apparent constancy of shares in aggregative data. More recent investigations have been directed toward fitting production functions in which elasticity of substitution is a parameter to be estimated [3, 11, 12, 17, 21]. If the estimated elasticity parameter is not unity, then changing factor shares would be expected over time.

There are at least three possible defects in the aggregate production function approach to changing factor shares. First, there is the well-known aggregation problem. Certainly aggregate production functions for a total economy do not represent homogeneous firms. Consequently, all that these functions can tell us is the average relationships between inputs and outputs for the total firms in the economy, averages

for firms that range all the way from marginal to highly efficient. Thus, they can tell us very little about the basic forces affecting factor shares. Second, even if these aggregate production functions summarize relationships for a set of homogeneous firms, it is not likely, given the dynamic environment of industry, that factor use even approximates the marginal-productivity conditions. Empirical investigations by aggregate production functions support this contention. Furthermore, no studies have been noted demonstrating that entrepreneurs think in the terms of marginal economics as assumed under neoclassical theory. Third, aggregate production function investigations usually assume constant returns to scale. But according to the well-known Eurler theorem, the product is completely allocated by the marginal productivities if, and only if, constant returns to scale exist. If returns to scale are greater than unity, the firm owner or the corporation obtains a residual income. If returns to scale are less than one, the firm gets less than the so-called fair share. Consequently, changing factor shares under neoclassical theory are possible with changing returns to scale over time. But to our knowledge, this possible explanation of changing factor shares has not been investigated. For reasons stated above, however, analysis of this type is not recommended.

Other analyses of the factor shares, theoretical and empirical, have been macroeconomic in nature [8, 9, 13] or deviants from the neoclassical tradition [10]. By their own admission these studies, too, leave much of the relevant factor share theory to be uncovered.

In this paper none of these approaches is followed. However, an attempt is made to relate factor shares to a micro-analytical framework, which then is related to national income accounts.

Factor Shares and the Firm

Consider first a firm's profit or loss equation (1).

$$O_{it}P_{it} \equiv W_{it}L_{it} + G_{it}g_{it} + K_{it} + T_{it}O_{it} + \pi_{it} \tag{1}$$

where O_{it} = output of firm i at time t
P_{it} = price of O_{it} per unit
W_{it} = average wage rate paid by firm
L_{it} = total labor input in hours
G_{it} = total goods and services used to produce current output
g_{it} = average price of goods and services purchased

K_{it} = depreciation of plant and equipment and other fixed costs
T_{it} = indirect business tax per unit of output
π_{it} = residual income or profit before taxes

After some manipulation we have,

$$(2) \qquad \frac{\pi_{it}}{O_{it}P_{it}} \equiv 1 - \frac{L_{it}W_{it}}{O_{it}P_{it}} - \frac{G_{it}g_{it}}{O_{it}P_{it}} - \frac{K_{it}}{O_{it}P_{it}} - \frac{T_{it}O_{it}}{O_{it}P_{it}}$$

This is the old standby profit-sales ratio which is used as a test of efficiency by many firms and also is a standard analysis ratio used in accounting circles.

Multiplying through by

$$\frac{O_{it}P_{it}}{O_{it}P_{it} - G_{it}g_{it}}$$

we have

$$(3) \qquad \frac{\pi_{it}}{O_{it}P_{it} - G_{it}g_{it}} \equiv 1 - \frac{L_{it}W_{it}}{O_{it}P_{it} - G_{it}g_{it}} - \frac{K_{it}}{O_{it}P_{it} - G_{it}g_{it}} - \frac{T_{it}O_{it}}{O_{it}P_{it} - G_{it}g_{it}}$$

The denominator of each of the terms in Equation 3 is, of course, the gross product of the firm as used in national income accounts. Equations 2 and 3 can be converted into the labor and nonlabor share of total value of product (sales) or gross product by appropriate manipulations.

We see from Equations 2 and 3 that any action taken to increase the profit-sales ratio will also increase the profit-GNP ratio. How a firm might go about increasing the profit–sales ratio would depend on its market environment, i.e., monopoly, monopsony, pure competition.[2]

Firms in competitive markets, we usually assume, must take factor and product prices as given. The alternatives open to them for increasing the profit-sales ratio will only involve labor-output, variable capital-output and fixed capital-output ratios. The firm would, presumably, want to make all of these ratios as small as possible for each

[2] It is not assumed that the firm maximizes the ratio, but only that it will take any action which appears to increase the ratio. The knowledge and information required for maximization are too great. If maximization is assumed, we should revert to neoclassical theory.

level of output. However, on considering alternative production techniques and technologies, this will not always be possible. Consequently, a firm presumably would consider alternative techniques as to their net impact on the profit-sales ratio.

Firms having some degree of monopoly power may choose to influence product or factor prices or both. This could be achieved either through advertising or bargaining. It seems reasonable that some firms can, and do, increase their profit-sales ratio by raising product prices and driving down the prices of purchased inputs. However, it may not be possible for a firm to reduce wages, even in a contracting economy. But in an economy of generally rising prices it may be able to hold wages constant or below the growth rate of general prices.

If it can be assumed that fixed and variable nonlabor costs are always proportional to value of output, then the profit-sales ratio is increased by reducing the labor share, as shown in Equation 2. This can be accomplished by one or all of four alternatives—decreasing labor inputs, decreasing wages, increasing output, and increasing product prices under the constraints mentioned above. Wages and prices, as already noted, can be modified independently of the production levels. Labor inputs can be reduced in some cases by changing production techniques, which may or may not require increased capital inputs. Similarly, output can be increased by changing production techniques without necessarily increasing inputs. Many such changes can be effected only over time as equipment wears out or becomes obsolete and employees can be trained or employees with the necessary skills hired. The specific strategy a firm might follow, given the profit-sales ratio as a decision guide, is not at all certain and may vary from firm to firm depending on the technologies available and on the products produced.

The profit-sales ratio is just one of a number of alternatives that may have some role in firm decision making. Another is the profit-capital ratio. However, the profit-sales ratio is cited as being the most prevalent [7, p. 1]. The above derivation is used as a means for developing a hypothesis about changing factor shares. No attempt is made to prove its general applicability.

Before proceeding to the analysis of factor shares, I relate this framework to national income accounts since all analysis is in terms of these accounts.

Factor Shares in Gross National Product Accounts

First, let us assume that the proper aggregations over firms have been performed. Then, omitting time subscripts,

O_j = the physical output of industry j
P_j = average price per unit of output of industry j
W_j = the average wage rate per hour of labor in industry j
L_j = labor input in man-hours in industry j
$\bar{G}_j$ = value of goods and services used in industry j to produce output O_j[3]
$\bar{K}_j$ = depreciation of plant and equipment and other fixed costs
T_j = indirect business taxes
π_j = residual income, or profit before taxes, in industry j

For simplification let us assume that there are just two industries, $j = 1, 2$, and that each product can be used as either a producer or consumer good. We can now form two identity equations

$$O_1P_1 \equiv W_1L_1 + \bar{G}_1 + \bar{K}_1 + T_1 + \pi_1 \tag{4}$$

$$O_2P_2 \equiv W_2L_2 + \bar{G}_2 + \bar{K}_2 + T_2 + \pi_2 \tag{5}$$

Further we define

$$\bar{G}_1 \equiv C_2O_2P_2 \tag{6}$$

$$\bar{G}_2 \equiv C_1O_1P_1 \tag{7}$$

Then substituting Equations 6 and 7 in 4 and 5 we have

$$(O_1P_1 - C_2O_2P_2) \equiv W_1L_1 + K_1 + T_1 + \pi_1 \tag{8}$$

$$(O_2P_2 - C_1O_1P_1) \equiv W_2L_2 + K_2 + T_2 + \pi_2 \tag{9}$$

The left side of Equations 8 and 9 represents industry GNP. Then aggregating Equations 4 and 5,

$$(1 - C_1)\,O_1P_1 + (1 - C_2)\,O_2P_2 \equiv W_1L_1 + W_2L_2 + \bar{K}_1 + \bar{K}_2 + T_1 + T_2 + \pi_1 + \pi_2 \tag{10}$$

The left side of Equation 10 represents the value of final goods and services produced in the economy or total GNP. Dividing each right side of Equations 8, 9 and 10 by the left results in,

[3] $\bar{G}_j$ is used here to represent value, cf. pp. 187–188.

$$1 \equiv \frac{W_1L_1}{(O_1P_1 - C_2O_2P_2)} + \frac{\bar{R}_1 + T_1 + \pi_1}{(O_1P_1 - C_2O_2P_2)} \tag{11}$$

$$1 \equiv \frac{W_2L_2}{(O_2P_2 - C_1O_1P_1)} + \frac{\bar{R}_2 + T_2 + \pi_2}{(O_2P_2 - C_1O_1P_1)} \tag{12}$$

$$1 \equiv \frac{W_1L_1 + W_2L_2}{(1 - C_1)O_1P_1 + (1 - C_2)O_2P_2} + \frac{\bar{R}_1 + \bar{R}_2 + T_1 + T_2 + \pi_1 + \pi_2}{(1 - C_1)O_1P_1 + (1 - C_2)O_2P_2} \tag{13}$$

The first term of Equations 11, 12, and 13 is, of course, the labor share of value added or GNP. The second term on the right is the nonlabor share or capital, rent, and profit share. (The term profit is used here to mean a return greater than total costs.) Equations 11 and 12 show that even though labor, wages, output, and prices change at the same rates, the labor share can increase or decrease if the ratio between nonlabor variable inputs and value of output changes over time. (Such a change has occurred in agriculture, but it has been more than offset by increases in the agricultural wage bill. The hired labor force in agriculture has declined very rapidly in the post-World War II period, but wages have increased relatively more.) Equation 13 indicates that if C_1 and C_2—the proportion of intermediate goods used up in the production process—increase or decrease, the labor share can change over time even though growth in the wage bill and value of output remain the same.

The customary procedure of considering only the labor share and nonlabor share is used in the analysis which follows. Because (1) changes in one of these shares imply offsetting changes in the other and (2) because of lack of data on capital inputs, only changes in the labor share are analyzed.

Labor Share of Gross National Product by Industry Since World War II

Total employee compensation as a percentage of gross national product (labor share) has increased moderately since World War II. It trended upward from about 55 per cent in 1947 to 58 per cent in 1957, but has changed little since then. The labor share by industry, however, does not exhibit this general uptrend. In a number of industries the labor share has declined. But in a statistical sense, not all of these

trends have been significant (Table 1). The downtrend in the labor share has been significant in coal mining, instruments, local and suburban passenger transportation, pipeline transportation and transportation services, telephone and telegraph, radio and television, auto repair and several miscellaneous groups.[4] On the other hand, the labor share has trended significantly upward in food, tobacco, fabricated metal, electrical machinery and miscellaneous manufacturing. But, the most significant uptrend in the labor share runs through the service group.

This simple trend analysis, summarized in Table 1, points up several things related to changing labor and other factor shares: (a) changes in labor's share of GNP have ranged from large declines to large increases, (b) these changes have not been consistent within industry groups, i.e., mining, construction, etc., and (c) the technological nature of the industry—as related to automation—appears to have had some influence on changing labor shares, cf., e.g., telephone and telegraph and services.

We now turn to some probings into explanation of trends in labor shares. First, let us consider the problem somewhat superficially. The labor share is given by the following identity:

$$LS_{jt} \equiv \frac{L_{jt}W_{jt}}{\bar{O}_{jt}P_{jt}} \tag{14}$$

where LS_{jt} = labor share in industry j at time t
L_{jt} = total labor input in hours
W_{jt} = average labor compensation per hour
$\bar{O}_{jt}$ = output[5]
P_{jt} = price per unit of output t[5]

Of course, changes in the labor share are affected by changes in each of the four variables in Equation 14, changing individually or col-

[4] The statistical significance of these trends is, of course, a function of the average change, the b value, and the consistency of the change, R^2. The labor share may have declined dramatically as indicated by the b value, but the decline is erratic, e.g., coal mining.

[5] Because of the nature of the data, output is gross output less intermediate goods used. See Equations 11 and 12. Price is the implicit price deflator which is a weighted average of product and intermediate goods prices. Available data indicate that product and intermediate goods prices are highly correlated for some industries.

TABLE 1

Average Annual Trend in Employee Compensation as Percentage of Gross National Product

Industry	Average Annual Trend[a]	*T* value	R^2
Agriculture, forestry, and fisheries	.095	1.78	.17
Farms	.007	.23	.00
Agricultural services, forestry and fisheries	.077	2.02	.21
Total mining	-.453	-7.05	.77
Metal	.721	2.61	.31
Coal	-.608	-3.15	.40
Crude petroleum and natural gas	.062	1.62	.15
Nonmetallic	.377	2.88	.36
Contract construction	.505	7.78	.80
Total manufacturing	.216	3.35	.43
Total nondurable goods	.130	2.24	.25
Food	.332	4.83	.61
Tobacco	.115	4.05	.52
Textile	.276	1.44	.12
Apparel	.121	1.46	.12
Paper	.558	4.66	.59
Printing	.107	1.98	.21
Chemicals	.240	2.15	.24
Petroleum refining	-.315	-1.13	.08
Rubber	-.075	-.57	.02
Leather	.199	1.12	.08
Total durable goods	.229	2.45	.29
Lumber	.116	1.19	.09
Furniture	.217	2.90	.36
Stone, clay, and glass	-.082	-.72	.03
Primary metals	.311	2.15	.24
Fabricated metals	.350	3.26	.42
Machinery, except electric	.183	1.92	.20
Electrical machinery	.549	5.05	.63
Transportation equipment, except motor vehicles	-.004	-.03	.00
Motor vehicles	-.169	-.75	.04
Instruments	-.595	-6.70	.75
Miscellaneous manufacturing	.332	4.20	.54

(continued)

TABLE 1 (continued)

Industry	Average Annual Trend[a]	*T* value	R^2
Total transportation	.136	2.18	.24
Railroads	.243	2.58	.31
Local and suburban passenger	-.462	-10.33	.88
Motor freight	.510	11.90	.90
Water	.484	1.82	.18
Air	.325	1.91	.20
Pipeline	-.646	-3.83	.49
Services	-.307	-3.84	.50
Total communication	-.998	-12.75	.92
Telephone and telegraph	-1.023	-12.44	.91
Radio and television	-1.112	-10.55	.88
Electric, gas, and sanitary	-.617	-13.93	.93
Total trade	.351	8.90	.84
Wholesale	.141	2.36	.27
Retail	.494	11.58	.90
Total finance, insurance, and real estate	.036	1.96	.20
Banking	.083	1.11	.08
Security brokers	-.403	-1.36	.11
Insurance carriers	.906	3.71	.48
Insurance agents	.182	1.61	.15
Real estate	.123	12.07	.91
Total services	.111	6.25	.72
Hotels	.144	2.95	.37
Personal	-.113	-2.86	.35
Miscellaneous business	.284	4.19	.54
Auto repair	-.747	-6.65	.75
Miscellaneous repairs	.555	4.39	.56
Motion pictures	1.174	5.00	.63
Commencements	.177	4.51	.58
Medical	.548	7.92	.81
Legal	.292	6.86	.76
Educational	.208	4.22	.54
Nonprofit membership organizations	-.163	-9.02	.84
Miscellaneous professional	.407	3.99	.51

(continued)

TABLE 1 (concluded)

Industry	Average Annual Trend[a]	T value	R^2
Total government	-.015	-.44	.01
Federal	.148	1.93	.20
Federal enterprises	1.911	1.19	.09
State and local	.034	2.50	.29
State and local enterprises	-.234	-3.44	.44
Rest of the world	-.054	-7.13	.77

[a]Least squares regression coefficient (b) from equation $Y = a + bT$. The regression log $Y = a + bT$ gave similar results, therefore it is not shown. To reduce the influence of the World War II, only 1948 through 1964 data were used.

lectively. In most instances, all variables change but not in the same direction or at the same rates. It is obvious from Equation 14 that the labor share depends on the relative rates of growth in each of the four factors. Increases in the labor input and the wages have a positive effect on the labor share, *ceteris paribus*. In contrast, increases in output and product prices reduce the labor share, *ceteris paribus*.

Because of a lack of comparable data, relative changes in these factors could only be analyzed for thirty-one industries. The annual growth rates for labor, wages, output and prices for these industries are presented in Table 2.

Growth rates of factors which directly affect the labor share differ significantly among industries, as shown in Table 2. Annual growth in labor use ranges from -4.5 per cent in local and suburban transportation to 3 per cent in motor freight and warehousing.[6] Other industries such as crude petroleum and natural gas, leather and leather products, primary metals and telephone and telegraph show small rates of change in labor use over the 1947–64 period.

Growth and changes in wage rates, as is to be expected, exhibit less variation than labor use, growth is positive throughout, and the

[6] Growth as used here is $r \times 100$ where r is from the formula $A_{t+n} = A_{t+o}(1 + r)^n$.

TABLE 2

Average Annual Growth Rates of Factors Affecting Labor's Share of Gross National Product, Selected Industries, 1948 to 1964[a]

(per cent)

Industry	Labor	Average Compensation Per Hour	Output	Price
Total mining	-2.1	4.1	2.1	0.9
Metal	-1.4	5.8	2.1	0.1
Crude petroleum and natural gas	0.6	4.2	3.0	1.7
Mining and quarrying of nonmetallic minerals, except fuels	1.6	5.2	4.7	1.3
Contract construction	2.0	4.8	2.8	3.2
Total nondurable goods	0.4	4.6	3.3	1.4
Food and kindred products	-0.4	5.3	2.5	1.5
Tobacco manufactures	-1.2	0.7	0.3	1.5
Textile mill products	-2.2	3.0	1.7	1.3
Apparel and other finished products made from fabrics and similar material	0.9	2.5	2.5	0.3
Paper and allied products	1.8	5.1	4.1	2.1
Printing, publishing, and allied industries	1.6	4.5	0.6	2.7
Chemicals and allied products	2.2	5.5	6.8	0.4
Petroleum refining and related industries	-1.1	5.7	3.5	1.6
Rubber and miscellaneous plastic products	2.6	6.9	4.6	2.9
Leather and leather products	-0.7	3.8	0.0	3.0
Total durable goods	1.5	5.3	3.9	2.4
Lumber and wood products, except furniture	-1.9	4.4	1.8	0.6
Furniture and fixtures	1.0	4.2	2.2	2.6
Stone, clay, and glass products	0.9	4.6	3.2	2.6
Primary metal industries	-0.1	5.7	0.8	4.4
Fabricated metal products[a]	1.3	4.6	3.6	1.9

(continued)

TABLE 2 (concluded)

Industry	Labor	Average Compensation Per Hour	Output	Price
	%	%	%	%
Machinery, except electrical	1.6	4.9	3.3	3.0
Electrical machinery, equip. and supplies	3.7	4.8	7.5	0.5
Transportation equipment, except motor vehicles	2.0	9.8	8.8	3.0
Motor vehicles	0.0	6.5	4.6	1.7
Instruments[a]	2.8	5.8	6.3	3.0
Miscellaneous manufacturing industries	-0.3	4.5	2.5	1.1
Railroads	-4.4	4.9	0.0	0.2
Local and surburban transit and interurban passenger transportation	-4.5	6.0	-4.7	6.9
Motor freight and warehousing	3.0	5.5	5.9	1.6
Telephone and telegraph	0.6	5.2	6.8	1.5
Electric, gas, and sanitary	1.0	5.4	7.1	1.2
Wholesale trade	1.6	4.6	4.5	1.2
Retail trade	1.1	4.4	3.0	1.4

[a]See appendix table for definitions.

variance over all industries is 1.5. The lowest rate of increase took place in the apparel industry—2.5 per cent—and the highest in transportation equipment, except motor vehicles—9.8 per cent. However, the extreme rate of increase in the latter is probably explained by the lag in growth of the aircraft industry following World War II and its subsequent resurgence during the Korean conflict. The explanation could also lie in data problems. Transportation equipment aside, wage rates rose most in tobacco manufactures—7.0 per cent.

Differences in output growth by industries were considerable in the post-World War II period, ranging from −4.7 per cent for local and suburban transportation to 8.8 per cent for transportation equipment,

except motor vehicles. As noted above, growth in wage rates in the latter industry, this growth rate may be distorted by the period of measurement and unrepresentative of secular growth. Other industries showing growth rates in GNP of over 6 per cent are chemicals, electrical machinery, instruments, telephone and telegraph, and electric, gas, and sanitary. The variance of the growth rates for all industries listed is 6.5.

Price changes, as measured by the GNP price deflator, showed a little more variation than wage rates—the variance of this set being 1.8. Prices increased only 0.2 per cent per year for railroads, but 6.9 per cent for local and suburban transit. Primary metals and contract construction were two other industries for which prices rose rapidly—4.4 per cent and 3.2 per cent, respectively.

Note that industries in which the labor share has declined are either high growth industries—instruments, telephone and telegraph, radio and television, electric, gas, and sanitary, and pipelines—or declining industries—coal mining, local transportation, and transportation services. This fact seems to imply that with high rates of growth an industry may be able to extract an increasing share of the income pie, at least for an intermediate period of time. On the other hand, a decreasing labor share in a declining industry may indicate a lack of mobility in the labor force. However, this is not a possible explanation for the decreasing share in local transportation. Because the labor input and output in this industry declined at about the same rate, the declining labor share resulted from the fact that net prices increased faster than wages, as shown in Table 2.

As just noted, to explain net changes in the labor share, changes in each of the four factors impinging on the labor share must be considered simultaneously. The net impacts of labor use, wages, output, and prices on the labor share can be specified with a little mathematical manipulation. First, Equation 14 is written in logarithmic form:

$$\log LS_t = \log L_t + \log W_t - \log O_t - \log P_t \tag{15}$$

and

$$\log LS_{t+1} = \log L_{t+1} + \log W_{t+1} - \log O_{t+1} - \log P_{t+1} \tag{16}$$

Taking the difference of Equations 15 and 16 we have,

$$\Delta \log LS = \Delta \log L + \Delta \log W - \Delta \log O - \Delta \log P \tag{17}$$

and dividing through by $\Delta \log LS$, the relative influence of each factor on the change in the labor share can be obtained.

$$1 = \frac{\Delta \log L}{\Delta \log LS} + \frac{\Delta \log W}{\Delta \log LS} - \frac{\Delta \log O}{\Delta \log LS} - \frac{\Delta \log P}{\Delta \log LS} \tag{18}$$

Equation 18 can be used to distribute the percentage change in the labor share by multiplying each term of Equation 14 by the percentage change in the labor share. Let

$$\frac{\Delta LS\ 100}{LS} = y$$

then

$$y = y\frac{\Delta \log L}{\Delta \log LS} + y\frac{\Delta \log W}{\Delta \log LS} - y\frac{\Delta \log O}{\Delta \log LS} - y\frac{\Delta \log P}{\Delta \log LS} \tag{19}$$

Each term of Equation 19 can be interpreted as the contribution of each variable to specified changes in the labor share when the net change in the labor share is allocated approximately on the basis of the relative elasticities.[7]

While the labor share has been changing industry by industry in the post-World War II period, these changes have been by no means smooth or always in the same direction, as shown in Table 3. (Averages for 1948–50, 1955–57, and 1962–64 were used to make comparisons of changes in the labor share over the postwar period and between industries. Three-year averages were used to even out short-term fluctuations, and 1947 was omitted because World War II apparently was still significantly affecting the labor share.)

The apparent declining labor share in all mining is something of a hybrid. Although not shown in Table 3, part of the indicated decline is

[7] As pointed out by the discussant, Dr. Liu, given

$$\log LS = \log W + \log L - \log O - \log P$$

the time derivative is

$$\frac{1}{LS}\frac{dLS}{dt} = \frac{1}{W}\frac{dW}{dt} - \frac{1}{L}\frac{dL}{dt} - \frac{1}{O}\frac{dO}{dt} - \frac{1}{P}\frac{dP}{dt}$$

But this differential equation is approximate and only satisfactory for small changes, and it is equivalent to the analysis of rates of change discussed in the previous section. For the large changes in the labor share that are dealt with in this section, this method leaves a significant part of the change in the labor share unexplained or unallocated.

TABLE 3

Net Influence of Factors Affecting Labor's Share of Gross National Product, Selected Industries, 1948 to 1964 and Selected Subperiods
(per cent)

Industry	Period[a]	Labor	Wage	Output	Price	Change in Labor Share
Total mining	1	-7.4	33.6	-24.1	-12.7	-10.6
	2	-21.3	19.9	-4.6	0.4	-5.6
	3	-27.4	51.6	-27.7	-12.0	-15.6
Metal	1	7.2	58.8	-26.0	-29.3	10.7
	2	-29.1	24.2	-4.4	27.7	18.4
	3	-22.9	89.8	-33.0	-2.8	31.1
Crude petroleum and natural gas	1	24.9	34.0	-35.2	-19.4	4.3
	2	-15.0	24.7	-6.6	-4.2	-1.1
	3	9.3	59.2	-41.8	-23.6	3.1
Mining and quarrying of nonmetallic minerals, except fuels	1	16.8	46.6	-48.1	-10.8	4.5
	2	6.8	25.2	-17.8	-7.7	6.4
	3	24.1	73.3	-67.4	-18.8	11.2
Contract construction	1	34.1	47.4	-46.6	-23.0	11.9
	2	2.1	30.4	-3.6	-26.3	2.7
	3	29.5	70.5	-41.0	-46.6	12.4
Total nondurable goods	1	3.9	36.9	-25.0	-12.1	3.7
	2	0.8	27.2	-22.2	-7.3	-1.5
	3	4.6	63.8	-47.0	-19.3	2.1
Food and kindred products	1	-0.2	42.5	-22.2	-9.8	10.3
	2	-6.1	32.6	-12.9	-13.2	0.4
	3	6.5	76.2	-35.6	-23.4	10.7
Tobacco manufactures	1	-7.2	52.6	-11.8	-20.1	13.5
	2	-10.2	40.1	-29.2	-2.0	-1.3
	3	-18.0	94.5	-42.7	-21.9	11.9
Textile mill products	1	-20.4	20.6	-7.3	19.3	12.3
	2	-11.4	20.3	-17.0	0.0	-8.1
	3	-31.2	40.7	-24.6	18.3	3.2

(continued)

TABLE 3 (continued)

Industry	Period[a]	Labor	Wage	Output	Price	Change in Labor Share
Apparel and other finished products made from fabrics and similar materials	1	3.2	19.5	-15.5	-6.5	0.6
	2	8.8	16.9	-19.6	2.7	8.8
	3	12.2	37.4	-36.0	-4.1	9.5
Paper and allied products	1	18.0	36.0	-32.6	-22.9	-1.5
	2	7.0	35.0	-24.0	-5.4	12.6
	3	26.0	72.9	-58.3	-29.6	10.9
Printing, publishing, and allied industries	1	14.1	38.1	-26.2	-17.1	8.9
	2	8.5	23.7	-15.3	-21.4	-4.5
	3	22.2	61.1	-40.9	-38.3	4.1
Chemicals and allied products	1	22.3	45.3	-54.3	-7.9	5.4
	2	7.5	29.0	-37.2	2.0	1.3
	3	30.4	76.5	-94.4	-5.8	6.8
Petroleum refining and related products	1	6.6	44.7	-28.9	-14.4	8.0
	2	-19.9	31.4	-19.0	-7.5	-14.9
	3	14.5	74.1	-46.5	-21.1	-8.1
Rubber and miscellaneous plastic products	1	22.4	33.4	-26.2	-36.0	-6.3
	2	11.6	25.2	-35.6	-3.5	-2.2
	3	33.5	57.5	-60.4	-39.0	-8.4
Leather and leather products	1	-3.3	26.6	3.7	-26.1	0.9
	2	-6.0	24.8	-3.0	-13.9	1.9
	3	-9.7	52.9	0.6	-40.9	2.9
Total durable goods	1	21.8	43.4	-36.3	-25.5	3.4
	2	-0.4	30.1	-19.1	-9.8	0.8
	3	21.4	73.3	-55.3	-35.2	4.2
Lumber and wood products, except furniture	1	-12.9	41.8	-8.4	-14.4	6.1
	2	-13.9	19.5	-16.3	5.2	-5.4
	3	-26.8	60.6	-24.8	-8.7	0.3

(continued)

TABLE 3 (continued)

Industry	Period[a]	Labor	Wage	Output	Price	Change in Labor Share
Furniture and fixtures	1	7.6	37.0	-23.7	-19.8	1.2
	2	6.4	22.8	-7.9	-17.1	4.2
	3	13.9	59.5	-31.3	-36.7	5.4
Stone, clay, and glass products	1	11.1	34.7	-26.6	-27.9	-8.6
	2	1.2	26.6	-15.9	-9.3	2.7
	3	12.4	60.9	-42.3	-37.2	-6.1
Primary metal industries	1	10.9	46.4	-21.6	-40.4	-4.7
	2	-12.7	31.3	12.1	-20.0	10.8
	3	-0.8	79.1	-11.0	-61.8	5.5
Fabricated metal products[b]	1	18.0	39.4	-32.4	-19.2	5.8
	2	0.1	24.6	-18.4	-8.2	-1.9
	3	17.8	63.8	-50.6	-27.2	3.8
Machinery, except electrical	1	21.8	36.2	-29.6	-27.3	1.1
	2	-0.2	31.8	-17.1	-15.3	-0.8
	3	23.7	71.8	-49.7	-45.4	0.4
Electrical machinery, equipment and supplies	1	33.5	35.6	-57.1	-7.8	4.2
	2	18.5	32.8	-47.5	0.3	4.1
	3	52.6	69.2	-105.8	-7.5	8.4
Transportation equipment, except motor vehicles	1	43.6	84.2	-99.3	-29.3	-0.8
	2	-16.0	45.7	-17.8	-12.4	-0.5
	3	27.4	129.8	-116.8	-41.6	-1.3
Motor vehicles	1	8.3	52.0	-34.5	-21.5	4.3
	2	-9.2	35.4	-29.8	-3.0	-6.5
	3	-1.2	86.4	63.7	-23.9	-2.4
Instruments[c]	1	29.6	48.2	-55.8	-24.2	-2.2
	2	8.2	28.6	-27.8	-16.4	-7.4
	3	36.4	74.2	-80.7	-39.2	-9.4
Miscellaneous manufacturing industries	1	-2.7	42.3	-22.3	-8.4	8.9
	2	-2.1	22.2	-14.0	7.3	-1.2
	3	-4.8	64.6	-36.4	-15.7	7.7

(continued)

TABLE 3 (concluded)

Industry	Period[a]	Labor	Wage	Output	Price	Change in Labor Share
Railroads	1	-22.9	36.9	-2.4	-10.6	1.0
	2	-39.5	31.5	2.4	9.0	3.4
	3	-64.4	71.5	-0.2	-2.4	4.5
Local and surburban transit and interurban passenger transportation	1	-33.4	39.6	43.6	-52.3	-2.5
	2	-30.7	41.2	23.4	-40.5	-6.6
	3	-62.2	78.5	64.7	-89.9	-8.9
Motor freight and warehousing	1	26.6	46.6	-52.0	-15.5	5.6
	2	15.2	28.4	-32.7	-7.0	3.9
	3	42.6	76.5	-86.5	-23.0	9.7
Telephone and telegraph	1	13.6	34.9	-43.0	-14.0	-8.5
	2	-5.0	31.4	-40.3	-5.9	-19.8
	3	7.4	61.5	-77.3	-18.2	-26.6
Electric, gas, and sanitary	1	10.8	36.1	-52.6	-9.3	-15.0
	2	2.3	33.4	-36.8	-6.3	-7.4
	3	12.5	65.6	-84.8	-14.8	-21.4
Wholesale trade	1	12.9	35.3	-31.1	-13.3	3.8
	2	9.3	29.6	-32.2	-4.3	2.4
	3	22.2	64.9	-63.3	-17.6	6.2
Retail trade	1	10.7	32.6	-24.8	-7.4	11.2
	2	5.8	28.9	-18.5	-12.7	3.4
	3	17.2	64.3	-45.2	-21.1	15.1

[a] 1 = 1949-50 to 1955-57 period; 2 = 1955-57 to 1962-64 period; 3 = 1948-50 to 1962-64 period.

[b]Fabricated metal products, excluding ordnance machinery and transportation equipment.

[c]Instruments include professional, scientific, and controlling instruments; photographic and optical goods, watches and clocks.

due to an actual decline in the labor share in coal mining. But part of the measured decline is due to the rapid growth in crude petroleum and natural gas, which [1] now accounts for 71 per cent of total output of the mining sector compared with 65 per cent in 1947 and [2] the relatively small labor share in this industry. The reason for this elaboration is to point out that analysis of aggregates may lead to the wrong conclusions.

In some industries—crude petroleum and natural gas, tobacco manufactures, textiles, printing, fabricated metals, machinery, except electrical, and miscellaneous manufactures—the labor share declined in the last half of the period, even though for the entire period the general trend was up. On the other hand, in paper and allied products and primary metals, the labor share trended downward in the last half of the period even though the over-all trend was up. These examples point out only that the labor share is not stable, and that the trend may change direction within relatively short periods of time and probably reflects the effect of short-term shifts in market forces.

It is not possible at this stage to glean any general conclusions from these data. But several areas loom large as possible explanations for the changes in the labor share among industries. These are differential rates of growth in: (a) the demand for products, (b) the supply and demand for labor of various skills, and (c) technological developments.

Changes in factor share are the product of a very dynamic economy in which demand for many products has been increasing rapidly. An industry facing a rapidly expanding demand for its products may elect to increase output at constant prices or increase both output and prices. For example, output in telephone and telegraph, electric, gas and sanitary, instruments, transportation equipment, electrical machinery, and chemicals grew very rapidly, as shown in Table 2. Prices grew at an above average rate in transportation equipment and instruments, but at a below average rate for the telephone and telegraph, electric, gas and sanitary industries, and at a much below average rate for chemicals. But each of these rates of growth reflects a different degree of control over markets and prices. Decisions with respect to output, advertising, and prices, however, cannot be made without considering their impacts on labor, wage rates, and prices of raw materials and inputs. Increases in output may have various effects on wages, depending on the labor market faced by a particular industry.

In an economy of generally rising wages, an industry may need to increase wages even though it is unable to raise the prices of its products. Moreover, wages may be forced up by strong labor unions. But in planning over time, a firm or industry has the alternative of substituting technology and capital for labor—with or without changes in output. Moreover, an industry may be able to increase output without increasing its demand for labor or even its demand for capital. Data in previous tables point out that many determinative factors such as prices, wages, output, labor, and technology have changed across industries, though at differential rates, and result in various patterns of changing factor shares.

For example, in the telephone and telegraph and electric, gas and sanitary sectors, where the labor share has decreased in the post-World War II period, output has increased very rapidly and the labor-input has risen very slowly, but wage increases have remained near average. In spite of very rapid increases in output, prices were increased as fast as for some other industries which experienced slower growth in output, as shown in Table 2. Moreover, the net-output–labor ratio for these utilities increased much more rapidly than for all other industries analyzed, except transportation equipment, and the net-output–capital ratio declined slowly in spite of large applications of capital, as shown in Table 4.

Relative rates of change in the output-capital and capital-labor ratios are indicators of changes in productivity and technological advance. Available crude measures of productivity increases—as defined by Professor Kendrick [11]—have been greatest in the telephone and telegraph and electric, gas, and sanitary sectors. The replacement of the telephone operator by automatic switching systems has been one of the important factors increasing productivity in the telephone sector.

Summary and Conclusions

Quite a bit of kicking in the bushes has been done in hope that a white rabbit would jump out. If one has appeared it has been a gray one. The mystery of changing factor shares has not been solved, and it is not certain that much light has been shed on it.

A final decision must await considerable probing in depth—probing for the purpose of testing alternative hypotheses which may explain

TABLE 4

Average Annual Percentage Change in Output-Capital, Output-Labor, and Capital-Labor Ratios, 1948–50 to 1962–64

(per cent)

Industries	Output-Capital[a]	Output-Labor	Capital-Labor
Total mining	-2.89	4.35	7.35
Metal	-5.25	3.55	9.70
Crude petroleum and natural gas	-2.20	2.26	4.65
Mining and quarrying of nonmetallic minerals, except fuels	-3.10	2.96	6.23
Contract construction	-2.94	0.74	3.85
Total nondurable goods	-3.14	3.04	6.34
Food and kindred products	-2.15	2.98	5.05
Tobacco manufactures	-5.26	4.20	9.82
Textile mill products	-0.65	4.02	4.68
Apparel and other finished products made from fabrics and similar material	0.25	1.68	1.34
Paper and allied products	-4.35	2.25	6.97
Printing, publishing, and allied industries	-3.85	1.32	5.35
Chemicals and allied products	-2.88	4.55	7.57
Petroleum refining and related industries	-1.74	4.66	6.55
Rubber and miscellaneous plastic products	-4.34	2.04	6.65
Leather and leather products	-2.08	0.64	3.10
Total durable goods	-3.70	2.50	6.44
Lumber and wood products, except furniture	-1.29	3.78	5.00
Furniture and fixtures	-1.55	1.21	2.60
Stone, clay, and glass products	-5.68	2.25	8.81
Primary metal industries	-7.16	1.40	8.61
Fabricated metal products[b]	-3.09	2.35	5.56
Machinery, except electrical	-4.18	1.71	6.02
Electrical machinery, equipment, and supplies	-1.50	3.65	5.38
Transportation equipment, except motor vehicles	-3.36	5.97	9.69
Motor vehicles	-3.34	4.91	8.52
Instruments[b]	-8.50	3.39	13.02
Miscellaneous manufacturing industries	3.06	2.85	0.09

(continued)

TABLE 4 (concluded)

Industries	Output-Capital[a]	Output-Labor	Capital-Labor
Railroads	-4.06	4.55	8.89
Local and surburban transit and interurban passenger transportation	-4.44	-0.25	4.71
Motor freight and warehousing	0.09	3.01	2.95
Telephone and telegraph	-1.19	5.93	7.24
Electric, gas, and sanitary	-1.20	5.97	7.26
Wholesale trade	0.33	2.92	2.60
Retail trade	0.10	1.88	1.81

[a]Capital is the GNP capital consumption allowance deflated by the wholesale price index for producers' finished goods. For definitions of output and labor see appendix tables.

[b]See appendix tables for definitions.

changing factor shares industry by industry and for the economy as a whole. What we have observed in this chapter may be only an aggregative mirage—changing rates of internal growth. However, this is unlikely for the fairly homogeneous communications sector.

Analysis of the functional distribution of income must be built on a dynamic model. The long-run equilibrium concept is a never-never land that is only a beginning point—a point of departure—especially in growing capitalist economies. Such economies are in a continuous state of adjustment where the long-run equilibrium is always at least one step ahead. And so involved is the adjustment process that even if there were no "random shocks" impinging on the system, it might take a lifetime to reach the steady state.

The whole area of the changing quality of inputs, which is a facet of the technological development process, needs to be explored in depth. Both labor and capital inputs need to be measured in this dimension.

Ideally, we would like to specify and measure the relevant behavioral or supply and demand relations for each industry at a satisfactory level of disaggregation. In the first part of this paper, it was suggested that the profit-sales ratio might be a relevant model for initiating a study of

TABLE 5

Labor Use, Wages, Output and Prices, by Selected Industries, 1947 to 1964

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Total Mining				*Metal Mining*			
1947	2,026	1.53	10,183	0.666	224	1.38	975	0.769
1948	2,037	1.77	10,733	0.863	230	1.53	1,006	0.957
1949	1,756	1.82	9,569	0.846	208	1.64	904	0.772
1950	1,775	1.97	10,677	0.860	212	1.75	1,042	0.978
1951	1,855	2.16	11,739	0.865	228	1.99	1,120	1.012
1952	1,803	2.28	11,652	0.865	227	2.22	1,034	0.911
1953	1,747	2.40	12,049	0.876	239	2.36	1,150	0.958
1954	1,588	2.39	11,656	0.929	211	2.42	941	1.146
1955	1,676	2.45	12,842	0.956	223	2.59	1,194	1.247
1956	1,744	2.69	13,570	0.986	238	2.76	1,258	1.296
1957	1,727	2.78	13,556	0.994	236	2.90	1,328	1.034
1958	1,519	2.83	12,359	1.000	187	2.98	1,096	1.000
1959	1,542	2.85	12,848	0.952	175	3.12	1,025	0.914
1960	1,496	2.94	13,141	0.970	204	3.18	1,286	0.988
1961	1,415	3.04	13,265	0.969	188	3.36	1,288	1.000
1962	1,382	3.18	13,579	0.956	178	3.47	1,295	0.893
1963	1,374	3.20	13,951	0.979	173	3.52	1,291	0.912
1964	1,379	3.33	14,378	0.989	183	3.49	1,350	0.967
	Crude Petroleum and Natural Gas				*Mining and Quarrying of Nonmetallic Minerals, Except Fuels*			
1947	556	1.47	5,831	0.549	228	1.15	588	0.794
1948	606	1.66	6,428	0.778	229	1.27	639	0.883
1949	572	1.79	6,087	0.802	213	1.41	618	0.947
1950	581	1.85	6,667	0.785	217	1.56	706	0.953
1951	636	1.98	7,530	0.781	238	1.67	771	1.002
1952	678	2.12	7,777	0.808	242	1.80	806	0.988
1953	691	2.21	8,144	0.823	245	1.92	827	1.002
1954	695	2.30	8,144	0.902	239	2.02	911	0.989
1955	734	2.35	8,699	0.929	250	2.12	991	1.034
1956	753	2.52	9,135	0.942	266	2.25	1,071	1.044
1957	750	2.65	9,126	0.978	260	2.36	1,068	1.020
1958	717	2.64	8,537	1.000	259	2.40	1,051	1.000
1959	730	2.71	8,998	0.957	278	2.41	1,154	0.965
1960	675	2.87	8,981	0.973	280	2.44	1,197	1.012
1961	659	3.01	9,169	0.975	274	2.55	1,193	0.960
1962	651	3.10	9,382	0.970	272	2.68	1,196	1.062
1963	633	3.23	9,596	0.999	272	2.77	1,222	1.129
1964	641	3.28	9,818	1.004	283	2.81	1,294	1.135

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Total Contract Construction				*Total Nondurable Goods*			
1947	3,937	1.54	12,880	0.686	14,965	1.34	39,956	0.833
1948	4,297	1.72	14,097	0.791	14,942	1.46	41,845	0.875
1949	4,244	1.72	14,675	0.762	14,065	1.53	40,612	0.860
1950	4,537	1.85	16,191	0.782	14,754	1.59	44,903	0.847
1951	5,157	2.02	18,245	0.821	15,002	1.73	47,507	0.911
1952	5,328	2.12	18,336	0.883	15,037	1.82	47,322	0.931
1953	5,167	2.28	18,916	0.880	15,316	1.91	49,456	0.935
1954	5,053	2.39	19,321	0.866	14,571	2.01	48,192	0.945
1955	5,406	2.40	20,770	0.866	15,229	2.06	52,902	0.951
1956	5,848	2.48	21,842	0.917	15,257	2.19	54,602	0.974
1957	5,624	2.65	21,130	0.988	14,919	2.32	54,914	0.979
1958	5,314	2.80	20,683	1.000	14,357	2.41	54,039	1.000
1959	5,695	2.84	22,049	1.012	15,076	2.49	58,989	1.016
1960	5,506	3.05	21,736	1.044	14,953	2.60	59,930	1.033
1961	5,403	3.18	21,402	1.093	14,828	2.69	60,697	1.038
1962	5,583	3.28	21,693	1.146	15,183	2.77	64,664	1.034
1963	5,747	3.37	21,850	1.204	15,197	2.86	66,729	1.043
1964	5,912	3.57	22,522	1.263	15,372	2.99	71,060	1.045
	Food and Kindred Products				*Tobacco Manufactures*			
1947	4,041	1.24	11,391	0.828	239	0.87	2,011	0.812
1948	3,971	1.35	11,880	0.859	227	0.95	2,144	0.814
1949	3,874	1.41	11,380	0.897	211	1.08	2,273	0.807
1950	3,900	1.48	12,360	0.858	204	1.18	2,184	0.841
1951	3,991	1.60	12,567	0.886	208	1.33	2,418	0.833
1952	3,982	1.69	13,017	0.935	211	1.40	2,522	0.901
1953	3,968	1.80	13,946	0.912	205	1.53	2,341	1.001
1954	3,905	1.89	13,478	0.948	202	1.61	2,200	1.028
1955	3,938	1.97	14,174	0.972	206	1.64	2,336	0.998
1956	3,956	2.08	14,739	0.952	201	1.80	2,467	0.981
1957	3,830	2.22	15,126	0.944	194	1.93	2,570	0.994
1958	3,761	2.31	14,996	1.000	192	2.00	2,738	1.000
1959	3,815	2.42	15,098	1.056	192	2.11	2,906	0.994
1960	3,798	2.54	15,464	1.057	187	2.35	3,027	0.999
1961	3,776	2.62	15,256	1.102	184	2.38	3,174	0.987
1962	3,757	2.73	15,794	1.099	182	2.55	3,293	0.983
1963	3,708	2.83	16,656	1.077	176	2.69	3,346	1.019
1964	3,568	3.09	17,598	1.092	184	2.75	3,266	1.031

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Textile Mill Products				*Apparel and Other Finished Products Made From Fabrics and Similar Materials*			
1947	2,675	1.16	3,733	1.260	2,160	1.30	3,687	0.968
1948	2,715	1.31	4,100	1.281	2,215	1.38	3,896	0.944
1949	2,321	1.37	3,790	1.109	2,159	1.36	3,847	0.916
1950	2,586	1.40	3,965	1.159	2,250	1.41	4,203	0.861
1951	2,497	1.51	4,082	1.284	2,235	1.48	4,501	0.891
1952	2,365	1.55	4,078	1.143	2,296	1.50	4,488	0.920
1953	2,348	1.57	3,987	1.129	2,343	1.56	4,603	0.928
1954	2,076	1.60	3,793	1.032	2,173	1.62	4,300	0.948
1955	2,190	1.61	4,222	1.044	2,301	1.62	4,613	0.938
1956	2,130	1.69	4,284	1.051	2,290	1.73	4,701	0.982
1957	1,985	1.76	4,190	1.027	2,246	1.79	4,629	0.983
1958	1,844	1.80	4,122	1.000	2,139	1.83	4,559	1.000
1959	1,987	1.87	4,542	1.035	2,314	1.86	4,894	0.997
1960	1,899	1.95	4,400	1.076	2,270	1.94	5,101	1.000
1961	1,854	1.98	4,396	1.025	2,236	1.99	5,068	1.032
1962	1,905	2.05	4,808	1.031	2,379	2.04	5,432	1.046
1963	1,876	2.10	4,971	1.010	2,411	2.08	5,516	1.061
1964	1,818	2.31	5,379	1.036	2,655	2.01	5,891	1.072
	Paper and Allied Products				*Printing, Publishing, and Allied Industries*			
1947	1,042	1.35	3,631	0.689	1,507	1.56	4,627	0.699
1948	1,053	1.49	3,342	0.787	1,516	1.72	4,743	0.740
1949	987	1.56	3,329	0.738	1,493	1.84	4,797	0.769
1950	1,092	1.63	4,328	0.705	1,513	1.93	4,986	0.779
1951	1,146	1.79	4,626	0.831	1,553	2.04	5,091	0.814
1952	1,121	1.91	4,100	0.874	1,578	2.15	5,110	0.865
1953	1,186	2.00	4,551	0.837	1,628	2.26	5,409	0.886
1954	1,168	2.10	4,572	0.858	1,629	2.37	5,688	0.875
1955	1,233	2.17	5,103	0.867	1,688	2.45	6,049	0.900
1956	1,264	2.31	5,296	0.945	1,744	2.55	6,280	0.925
1957	1,255	2.42	4,877	0.995	1,746	2.69	6,364	0.969
1958	1,299	2.38	4,820	1.000	1,724	2.79	6,128	1.000
1959	1,307	2.61	5,480	0.986	1,774	2.91	6,594	1.016
1960	1,316	2.72	5,392	1.026	1,820	3.02	6,764	1.053
1961	1,329	2.84	5,737	1.000	1,822	3.11	6,765	1.070
1962	1,358	2.96	6,121	1.001	1,845	3.20	7,041	1.092
1963	1,377	3.05	6,285	0.985	1,854	3.29	7,069	1.130
1964	1,275	3.46	6,749	0.969	1,940	3.36	7,687	1.127

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Chemicals and Allied Products				*Petroleum Refining and Related Industries*			
1947	1,390	1.56	4,072	0.905	467	2.07	2,070	0.909
1948	1,403	1.68	4,823	0.913	481	2.27	2,261	1.087
1949	1,308	1.82	4,985	0.920	463	2.45	2,269	0.852
1950	1,371	1.92	6,023	0.902	462	2.51	2,595	0.872
1951	1,518	2.11	6,503	1.006	491	2.84	2,624	1.066
1952	1,553	2.24	6,563	0.985	494	3.09	2,658	1.021
1953	1,638	2.37	7,018	0.983	511	3.18	2,824	1.113
1954	1,597	2.52	7,252	0.994	504	3.37	2,746	1.074
1955	1,652	2.60	8,530	0.992	504	3.49	3,100	1.027
1956	1,702	2.80	8,981	0.977	502	3.70	3,179	1.157
1957	1,723	3.00	9,395	0.987	493	4.04	3,144	1.047
1958	1,681	3.12	9,218	1.000	476	4.13	3,124	1.000
1959	1,742	3.25	10,917	0.987	462	4.38	3,310	1.130
1960	1,779	3.37	10,975	0.981	453	4.42	3,498	1.220
1961	1,783	3.50	11,534	0.968	434	4.75	3,530	1.186
1962	1,836	3.60	12,446	0.961	422	4.81	3,826	1.102
1963	1,867	3.72	13,189	0.964	412	5.08	3,835	1.214
1964	1,791	4.11	14,139	0.969	375	5.60	3,912	1.189
	Rubber and Miscellaneous Plastics Products				*Leather and Leather Products*			
1947	670	1.52	2,584	0.574	827	1.19	1,668	0.696
1948	636	1.58	2,403	0.600	797	1.28	1,735	0.743
1949	565	1.67	2,185	0.610	740	1.32	1,576	0.735
1950	663	1.71	2,552	0.622	772	1.36	1,545	0.748
1951	708	1.89	3,210	0.677	729	1.47	1,647	0.838
1952	718	2.01	3,181	0.706	767	1.51	1,535	0.910
1953	758	2.11	3,159	0.748	763	1.57	1,582	0.885
1954	680	2.21	2,773	0.745	716	1.62	1,491	0.932
1955	790	2.26	3,183	0.792	760	1.65	1,555	0.921
1956	776	2.43	3,105	0.906	748	1.75	1,572	0.976
1957	785	2.57	3,067	0.959	725	1.84	1,553	0.998
1958	702	2.75	2,878	1.000	686	1.89	1,456	1.000
1959	800	2.79	3,609	0.914	735	1.94	1,651	0.971
1960	786	2.88	3,768	0.889	697	2.01	1,553	1.072
1961	788	2.91	3,747	0.913	697	2.04	1,484	1.061
1962	871	3.01	4,275	0.912	705	2.10	1,614	1.076
1963	886	3.10	4,341	0.933	684	2.16	1,558	1.141
1964	889	3.34	4,806	0.908	708	2.21	1,655	1.129

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Total Durable Goods				*Lumber and Wood Products, Except Furniture*			
1947	17,659	1.43	53,481	0.628	1,771	1.00	3,285	0.807
1948	17,491	1.57	55,675	0.684	1,701	1.15	3,224	0.925
1949	15,344	1.66	51,083	0.726	1,511	1.15	2,979	0.860
1950	17,298	1.73	61,203	0.747	1,660	1.24	3,239	0.992
1951	19,614	1.92	69,676	0.794	1,717	1.38	3,301	1.097
1952	20,175	2.06	71,896	0.818	1,632	1.46	3,206	1.064
1953	21,660	2.17	79,381	0.829	1,571	1.51	3,108	1.075
1954	19,036	2.29	71,252	0.852	1,439	1.56	3,018	1.060
1955	20,490	2.37	80,797	0.873	1,519	1.66	3,486	1.077
1956	20,966	2.53	79,545	0.925	1,475	1.75	3,475	1.093
1957	20,654	2.68	79,779	0.973	1,305	1.80	3,281	1.026
1958	18,137	2.85	69,634	1.000	1,234	1.86	3,306	1.000
1959	19,837	2.93	79,916	1.016	1,360	1.92	3,619	1.067
1960	19,724	3.07	80,922	1.019	1,271	2.01	3,546	1.036
1961	19,007	3.15	79,733	1.018	1,194	2.04	3,479	0.994
1962	20,162	3.27	90,449	1.016	1,220	2.12	3,788	0.984
1963	20,551	3.38	96,093	1.012	1,223	2.22	4,004	1.007
1964	21,125	3.52	102,548	1.021	1,285	2.30	4,312	1.039
	Furniture and Fixtures				*Stone, Clay, and Glass Products*			
1947	725	1.24	1,425	0.711	1,145	1.31	3,405	0.607
1948	738	1.34	1,657	0.747	1,162	1.46	3,638	0.657
1949	659	1.44	1,575	0.774	1,061	1.54	3,388	0.703
1950	791	1.47	1,901	0.768	1,169	1.61	4,057	0.726
1951	763	1.61	1,807	0.887	1,264	1.77	4,356	0.769
1952	769	1.71	1,950	0.859	1,205	1.85	4,113	0.781
1953	787	1.77	1,946	0.867	1,233	1.98	4,425	0.815
1954	711	1.87	1,872	0.874	1,164	2.08	4,323	0.851
1955	783	1.92	2,171	0.872	1,267	2.15	4,973	0.887
1956	795	2.01	2,186	0.925	1,294	2.28	4,897	0.933
1957	777	2.12	2,091	0.972	1,251	2.42	4,755	0.971
1958	737	2.17	1,911	1.000	1,170	2.57	4,661	1.000
1959	815	2.19	2,178	1.002	1,294	2.64	5,242	1.023
1960	797	2.28	2,147	1.030	1,275	2.77	5,128	1.029
1961	764	2.33	2,066	1.060	1,232	2.83	5,043	1.029
1962	815	2.38	2,218	1.079	1,260	2.94	5,358	1.023
1963	827	2.46	2,284	1.089	1,292	3.02	5,736	1.015
1964	863	2.56	2,462	1.105	1,305	3.20	6,051	1.022

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Primary Metal Industry				*Fabricated Metal Products*[e]			
1947	2,654	1.57	11,796	0.481	2,103	1.49	5,913	0.698
1948	2,697	1.69	11,711	0.536	2,072	1.65	6,026	0.769
1949	2,264	1.80	10,168	0.589	2,025	1.57	5,403	0.782
1950	2,652	1.90	12,430	0.618	2,119	1.80	6,558	0.814
1951	2,951	2.11	14,866	0.662	2,343	1.93	6,908	0.920
1952	2,720	2.30	13,171	0.679	2,308	2.08	7,088	0.889
1953	2,949	2.41	15,235	0.712	2,514	2.18	7,875	0.883
1954	2,460	2.54	11,899	0.774	2,270	2.30	7,601	0.878
1955	2,840	2.66	14,572	0.809	2,434	2.37	8,089	0.912
1956	2,890	2.86	14,308	0.880	2,499	2.47	8,208	0.954
1957	2,791	3.11	13,984	0.951	2,483	2.63	8,409	0.986
1958	2,297	3.28	10,912	1.000	2,234	2.75	7,804	1.000
1959	2,491	3.40	12,181	1.015	2,387	2.86	8,725	0.989
1960	2,497	3.57	12,001	1.049	2,391	2.95	8,741	0.996
1961	2,353	3.64	11,275	1.033	2,284	3.02	8,752	1.005
1962	2,437	3.78	12,043	1.058	2,410	3.09	9,464	1.014
1963	2,498	3.82	12,598	1.056	2,481	3.16	9,856	1.022
1964	2,623	3.99	13,578	1.074	2,529	3.36	10,400	1.059
	Machinery, Except Electrical				*Electrical Machinery, Equipment, and Supplies*			
1947	2,967	1.51	9,509	0.613	2,169	1.47	5,235	0.796
1948	2,946	1.69	10,126	0.660	2,066	1.62	5,079	0.871
1949	2,434	1.79	8,782	0.702	1,770	1.69	4,895	0.847
1950	2,636	1.84	9,572	0.727	2,118	1.69	6,157	0.855
1951	3,295	2.02	12,272	0.791	2,386	1.87	7,062	0.894
1952	3,393	2.19	13,323	0.803	2,539	2.00	8,299	0.875
1953	3,427	2.32	13,212	0.817	2,829	2.10	9,096	0.889
1954	3,000	2.42	11,926	0.834	2,464	2.21	8,123	0.900
1955	3,164	2.46	12,194	0.854	2,626	2.28	8,779	0.885
1956	3,457	2.60	13,470	0.919	2,807	2.40	9,501	0.913
1957	3,389	2.75	12,802	0.983	2,802	2.55	9,767	0.978
1958	2,820	2.92	10,921	1.000	2,572	2.75	9,348	1.000
1959	3,134	3.02	12,687	1.020	2,941	2.86	11,085	1.009
1960	3,153	3.12	12,722	1.030	3,036	3.00	11,660	0.989
1961	3,024	3.22	12,636	1.038	3,080	3.08	12,262	0.982
1962	3,238	3.32	14,135	1.048	3,311	3.18	14,034	0.947
1963	3,328	3.43	14,585	1.057	3,262	3.29	14,790	0.922
1964	3,423	3.70	16,422	1.075	3,284	3.38	15,678	0.898

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Transportation Equipment, Except Motor Vehicles				*Motor Vehicles*			
1947	2,632	0.68	2,655	0.629	1,589	1.52	6,024	0.658
1948	2,602	0.73	3,215	0.671	1,591	1.67	6,595	0.698
1949	2,492	0.75	3,151	0.696	1,551	1.78	6,988	0.807
1950	2,723	0.70	3,324	0.710	1,787	1.96	9,889	0.759
1951	3,246	1.04	4,890	0.803	1,751	2.25	9,427	0.756
1952	3,702	1.39	7,598	0.798	1,674	2.41	8,296	0.904
1953	4,260	1.46	9,139	0.800	2,003	2.50	10,419	0.875
1954	3,731	1.56	8,763	0.811	1,652	2.67	9,071	0.872
1955	4,079	1.45	8,448	0.830	2,020	2.75	13,058	0.900
1956	3,988	1.71	8,495	0.917	1,698	3.06	9,781	0.937
1957	4,050	1.89	9,322	0.976	1,636	3.24	10,254	0.969
1958	3,343	2.23	8,791	1.000	1,252	3.62	7,092	1.000
1959	3,517	2.25	8,749	1.018	1,480	3.52	9,980	1.026
1960	3,358	2.31	8,525	1.030	1,544	3.66	11,000	0.998
1961	3,070	2.60	8,868	1.035	1,319	3.90	9,827	0.993
1962	3,369	2.63	10,136	1.040	1,536	4.15	13,440	0.976
1963	3,523	2.64	10,658	1.043	1,650	4.34	15,388	0.964
1964	3,412	2.77	10,664	1.077	1,684	4.59	16,246	0.953
	Instruments[f]				*Misc. Manufacturing Industries*			
1947	561	1.37	1,363	0.663	887	1.25	1,729	0.879
1948	548	1.52	1,466	0.691	891	1.36	1,927	0.873
1949	493	1.63	1,429	0.713	793	1.43	1,738	0.890
1950	537	1.77	1,675	0.727	849	1.49	1,974	0.899
1951	646	1.88	2,015	0.795	855	1.59	2,067	0.908
1952	682	2.07	2,300	0.796	833	1.69	2,115	0.905
1953	728	2.19	2,476	0.822	886	1.78	2,195	0.926
1954	668	2.36	2,468	0.834	804	1.90	2,105	0.939
1955	687	2.45	2,610	0.846	830	1.95	2,328	0.926
1956	720	2.63	2,759	0.902	838	2.06	2,350	0.967
1957	719	2.83	2,646	0.969	799	2.18	2,310	0.989
1958	670	2.97	2,604	1.000	766	2.25	2,284	1.000
1959	733	3.04	2,980	1.025	804	2.30	2,504	0.987
1960	744	3.14	3,017	1.045	797	2.41	2,448	1.003
1961	735	3.24	3,016	1.067	777	2.48	2,500	1.031
1962	763	3.34	3,251	1.084	804	2.54	2,602	1.027
1963	774	3.48	3,540	1.078	798	2.64	2,621	1.034
1964	779	3.64	3,916	1.061	817	2.76	2,773	1.033

(continued)

TABLE 5 (continued)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Total Railroads				*Local and Suburban Transit and Interurban Passenger Transportation*			
1947	3,757	1.45	10,684	0.687	441	2.89	3,962	0.446
1948	3,644	1.60	10,451	0.793	391	3.19	3,782	0.470
1949	3,106	1.73	8,718	0.862	375	3.28	3,193	0.541
1950	2,951	1.89	9,482	0.873	349	3.47	2,943	0.586
1951	3,089	2.07	10,590	0.868	335	3.80	2,830	0.650
1952	2,956	2.18	10,137	0.935	322	4.08	2,767	0.694
1953	2,907	2.22	9,917	0.950	312	4.26	2,658	0.717
1954	2,578	2.29	8,946	0.922	306	4.19	2,371	0.769
1955	2,626	2.32	9,870	0.906	284	4.51	2,222	0.839
1956	2,580	2.54	10,040	0.935	266	4.88	2,123	0.892
1957	2,431	2.72	9,468	0.984	249	5.41	2,071	0.959
1958	2,070	2.95	8,430	1.000	236	5.59	1,982	1.000
1959	2,015	3.08	8,871	0.947	232	5.83	1,915	1.069
1960	1,919	3.20	8,748	0.929	227	6.15	1,863	1.123
1961	1,797	3.23	8,674	0.909	220	6.46	1,750	1.238
1962	1,763	3.33	9,155	0.889	201	7.10	1,708	1.295
1963	1,722	3.39	9,575	0.857	195	7.48	1,704	1.336
1964	1,710	3.48	9,969	0.842	186	8.02	1,627	1.459
	Motor Freight Transportation And Warehousing				*Total Telephone and Telegraph*			
1947	1,312	1.11	3,120	0.784	1,276	1.41	3,759	0.763
1948	1,359	1.23	3,403	0.832	1,433	1.47	4,375	0.797
1949	1,271	1.37	3,462	0.847	1,388	1.59	4,604	0.824
1950	1,294	1.59	4,335	0.810	1,356	1.70	4,810	0.873
1951	1,420	1.67	4,586	0.836	1,415	1.77	5,248	0.892
1952	1,454	1.82	4,718	0.908	1,449	1.93	5,611	0.921
1953	1,521	1.97	5,176	0.927	1,507	1.99	6,065	0.952
1954	1,502	2.03	5,180	0.942	1,503	2.06	6,151	0.954
1955	1,643	2.11	5,890	0.937	1,548	2.20	6,703	0.950
1956	1,717	2.21	6,217	0.965	1,618	2.29	7,202	0.961
1957	1,719	2.35	6,449	0.992	1,648	2.37	7,706	0.976
1958	1,687	2.43	6,411	1.000	1,547	2.52	7,993	1.000
1959	1,853	2.54	7,047	1.015	1,527	2.69	8,621	1.017
1960	1,847	2.68	7,222	1.020	1,538	2.80	9,109	1.026
1961	1,828	2.76	7,459	1.018	1,502	3.00	9,687	1.029
1962	1,909	2.85	7,974	1.035	1,508	3.12	10,483	1.027
1963	1,973	2.93	8,485	1.031	1,498	3.20	11,222	1.027
1964	2,004	3.10	9,043	1.034	1,548	3.42	12,162	1.027

(continued)

TABLE 5 (concluded)

Year	Labor[a]	Wage[b]	Output[c]	Price[d]	Labor[a]	Wage[b]	Output[c]	Price[d]
	Electric, Gas, and Sanitary				*Wholesale Trade*			
1947	1,005	1.59	4,354	0.867	5,046	1.61	19,591	0.793
1948	1,115	1.61	5,013	0.851	5,306	1.70	20,322	0.853
1949	1,131	1.77	5,510	0.880	5,276	1.68	20,162	0.825
1950	1,163	1.81	5,930	0.890	5,329	1.78	21,957	0.855
1951	1,184	1.94	6,806	0.891	5,529	1.93	23,023	0.926
1952	1,190	2.10	7,284	0.910	5,687	1.98	23,526	0.915
1953	1,217	2.22	7,796	0.926	5,757	2.07	24,021	0.912
1954	1,229	2.36	8,565	0.937	5,768	2.13	24,244	0.915
1955	1,263	2.38	9,095	0.958	5,918	2.22	27,156	0.926
1956	1,281	2.58	9,740	0.967	6,074	2.40	28,497	0.964
1957	1,287	2.72	10,279	0.975	6,063	2.54	28,990	0.993
1958	1,297	2.85	10,710	1.000	5,954	2.66	29,408	1.000
1959	1,305	3.06	11,582	1.010	6,220	2.74	32,218	1.007
1960	1,311	3.20	12,355	1.029	6,326	2.86	33,147	1.007
1961	1,306	3.37	12,919	1.036	6,303	2.96	34,629	1.004
1962	1,301	3.46	13,639	1.038	6,452	3.05	36,824	1.001
1963	1,307	3.60	14,163	1.034	6,585	3.15	38,497	1.002
1964	1,315	3.80	14,878	1.025	6,715	3.30	40,911	1.003
	Retail Trade							
1947	14,060	1.02	33,101	0.842				
1948	14,426	1.09	33,929	0.915				
1949	14,451	1.12	35,066	0.894				
1950	14,678	1.18	38,421	0.846				
1951	15,177	1.23	38,334	0.915				
1952	15,410	1.28	39,414	0.939				
1953	15,563	1.35	40,847	0.926				
1954	15,475	1.39	41,222	0.938				
1955	15,938	1.44	44,480	0.923				
1956	16,213	1.51	45,333	0.947				
1957	16,083	1.60	46,107	0.977				
1958	15,902	1.64	45,713	1.000				
1959	16,466	1.71	48,570	1.020				
1960	16,793	1.79	49,157	1.035				
1961	16,531	1.84	48,910	1.067				
1962	16,774	1.92	52,127	1.071				
1963	17,071	2.00	54,068	1.077				
1964	17,237	2.13	57,321	1.083				

Notes to Table 5

[a]Labor, million man-hours. Estimated from employment – all employees – and average hours worked, production workers. (Source: *Employment and Earnings Statistics for the United States, 1909–64,* Bulletin 1312–2, U. S. Department of Labor, December 1964.)

[b]Wage, average compensation per hour, dollars. Estimated by dividing total employees compensation by estimated total man-hours worked. (Source: Office of Business Economics, Department of Commerce.)

[c]Gross national product, million dollars. (Source: Office of Business Economics, Department of Commerce.)

[d]Price. Implicit industry price deflator, index 1958=100. (Source: Office of Business Economics, Department of Commerce.)

[e]Fabricated metal products, excluding ordnance machinery and transportation equipment.

[f]Instruments include professional, scientific and controlling instruments; photographic and optical goods, watches and clocks.

factor shares. It was pointed out that under certain conditions attainment of larger profit-sales ratios would lead to smaller labor shares. It was noted, too, that important factors affecting the profit-sales ratio and the labor share, such as wages and prices, are outside the influence of many firms but may be controlled to some extent by others. Such things would need to be taken into account in formal behavioral relations.

It is obvious that in order to specify rigorously the relevant behavioral relations within and between industries—and both are needed—reliable data on all factor inputs and their prices, and outputs and their prices are needed but are not presently available. Even if these data were available, the statistical problem involved might defy solution. With the behavioral relations at hand, changing factor shares could be readily explained, at least to the satisfaction of most economists.

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COMMENT

TA-CHUNG LIU, Cornell and Brandeis Universities

An analysis of income shares is important in evaluating the efficiency, the equity, and the growth prospects of an economy. Egbert is not satisfied with the customary approach to the problem through the use of aggregate production functions in a neoclassical model. The well-known complications due to aggregation in estimating production functions, the unlikely fulfillment of the familiar marginal conditions at any moment of time in a dynamic world of change, and the assumption of constant returns to scale involved in much of the literature are valid objections which Egbert has raised. The author has, instead, attempted to analyze factor shares in a micro-analytical framework which is then related to national income accounts in Equations 1–14. His approach is an interesting exercise in rearranging the identity that profits are equal to sales minus various categories of costs.

The empirical work in this paper, however, is carried out on the basis of the following relationship through time for a given industry: [1]

$$\frac{1}{LS}\frac{d(LS)}{dt} = \frac{1}{L}\frac{dL}{dt} + \frac{1}{W}\frac{dW}{dt} - \frac{1}{O}\frac{dO}{dt} - \frac{1}{P}\frac{dP}{dt}$$

This relationship holds approximately for a finite span of time and where LS, L, W, O, P and t denote labor share, labor input, wage rate, output, price of output, and time, respectively.

The main empirical result is presented in Table 3. It decomposes the rate of change of labor share into the four components corresponding to the four terms on the right side of the equation given above. It tells clearly, for instance, that the *decline* of the labor share in the net output of the telephone and telegraph industry and the gas, electric, and sanitary industry from 1948–50 to 1962–64 reflected largely the greater rates of increase in the quantities and prices of outputs (both having negative influence on the labor share) than those of labor inputs and the wage rates. The reverse happened in the case of contract construction, motor freight, and warehousing, and wholesale and retail

[1] This is derived directly from Equation 16.

NOTE: These comments are based on the original version of the paper as presented at the Conference.

trade; the labor share increased because labor inputs and wage rates increased at faster rates than the quantities and prices of output.

The usefulness of the approach formulated in this paper is quite similar to that of the quantity equation of money. The author's approach decomposes the changes in the labor share into the four elements mentioned above, whereas the latter identifies the change in the price level as the algebraic sum of the changes in M, V and T. Similar to the quantity equation of money, the equation given above is an identity and does not provide us with a theory explaining the change in labor share.

As a summary or a classification of the component elements of the change in labor share, the equation presented above suffers a disadvantage in that the four components are not the results of the working of mutually exclusive underlying forces. The basic parameters determining the labor shares are, among others, the elasticity of demand for output, the elasticity of substitution between labor and nonlabor factors, the elasticity of supply of labor, the speed of adjustment toward equilibrium and the extent of the deviation from equilibrium in the labor market, and the rate of technological advance. The elasticity of demand for output acts directly on both O and P. The elasticity of supply of labor and the elasticity of substitution have a direct bearing on both L and W. The rate of technological advance affects directly both O and L. Perhaps only the speed of adjustment toward equilibrium in the labor market is, in the first instance, related to one term alone (L). This compares rather unfavorably with the quantity equation of money because there are perhaps a large number of factors which have a direct effect on P through one component only (M, V or T).

For an explanation of the change in factor shares, a theoretical model must be constructed to include the basic parameters, some of which have been mentioned above. The complications of aggregation cannot be avoided in any approach to the problem, including the one formulated by Egbert. Some of the other difficulties mentioned by Egbert (e.g., deviations from equilibrium and nonconstant returns to scale) can be, and have been, to some extent, overcome in the literature. Nevertheless, the approach formulated by Egbert and the empirical results obtained are a useful contribution. The information given by Egbert on the four components of the change in labor share

for the different industries is quite valuable in formulating realistic industry models. Algebraic solutions for the growth rates of *LS*, *L*, *W*, *O* and *P* can be obtained from the theoretical model constructed for a given industry in terms of the basic parameters. The empirical results concerning the various growth rates given in this paper can then be used to infer the magnitudes of the basic parameters. Complicated problems of identification would be involved in such an attempt, but the Egbert framework would be helpful in resolving these difficulties. Egbert has initiated an approach which may yield interesting analytical results.