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SUMMARY OF FINDINGS

The United States is now pioneering in a new stage of economic development. During the period following World War II this country became the world's first "service economy"—that is, the first nation in which more than half of the employed population is not involved in the production of food, clothing, houses, automobiles, or other tangible goods.

In 1947 total employment stood at approximately 57 million; by 1967 it was about 74 million. Virtually all of the net increase occurred in institutions that provide services—such as banks, hospitals, retail stores, schools. The number of people employed in the production of goods has been relatively stable; modest increases in manufacturing and construction have been offset by declines in agriculture and mining.

Numerous dramatic examples of the growth of services are readily available. For instance, the *increase* in employment in the field of education between 1950 and 1960 was greater than the total number employed in the steel, copper, and aluminum industries in either year. The *increase* in employment in the field of health between 1950 and 1960 was greater than the total number employed in automobile manufacturing in either year. The *increase* in employment in financial firms between 1950 and 1960 was greater than total employment in mining in 1960.

This book, which reports on the results of more than four years of investigation of the transition from an industrial to a service economy, has the following objectives. First, it delineates in considerable detail the growth of service employment. Second, it attempts to explain this growth, paying special attention to the relatively slow increase in output per man in services. Third, it describes and analyzes differences in productivity change among the service industries, and explores some of the conceptual problems encountered in measuring service output and productivity. The fourth objective is to compare the service industries with the rest of the economy with respect to such critical matters as earnings, behavior over the business cycle, industrial organization, and labor force

characteristics. These comparisons lead to a consideration of the implications of the growth of a service economy. The transition from an agricultural to an industrial economy, which began in England and has been repeated in most of the Western world, has been characterized as a "revolution." The shift from industrial to service employment, which has advanced furthest in the United States but is evident in all developed economies, has proceeded more quietly, but it too has implications for society, and for economic analysis, of "revolutionary" proportions.

Service Employment

The first major finding, plainly in evidence but not sufficiently appreciated,[1] is that the balance of employment in the United States has shifted dramatically (and probably irrevocably) in favor of the service industries. The Service sector's share of total employment has grown from approximately 40 per cent in 1929 to over 55 per cent in 1967.[2] Between 1947 and 1965 alone, there was an increase of 13 million jobs in the Service sector compared with an increase of only 4 million in Industry and a decrease of 3 million in Agriculture.

The increase in service employment was distributed widely through the sector; most service industries had above-average growth rates, and only a few experienced declines. Moreover, if service employment is equated with white-collar and service occupations, the shift away from goods production has been even greater than the industrial classification statistics suggest. This is because there has been a shift of employment within the Industry sector from direct production of goods to activities which, if they were not carried out within the firm, would be classified as services.

Although the relative growth of service employment has been particularly rapid in the past few decades, the trend has been evident for at least the past century in this country, and can also be observed in most

[1] So prominent an observer as J. K. Galbraith seems to have missed this development; c.f. his book, *The New Industrial State,* Boston, 1967.

[2] The Service sector is defined to include wholesale and retail trade; finance, insurance, and real estate; general government; and the services proper, including professional, personal, business, and repair services. The Industry sector is defined to include mining, contract construction, manufacturing, transportation, communications and public utilities, and government enterprise. For a discussion of these and alternative definitions see Chapter 2. Capitalization of the initial letter indicates that the sector as defined is being discussed; when services are being referred to in general terms, the initial letter is not capitalized.

Employment is measured in full-time equivalents, including the self-employed and military personnel, but excluding unpaid family workers.

growing economies. The pervasiveness of the trend to services is also observable within individual states; almost all have shared in the growth of service employment. Until about 1920, the increase in the Service sector's share of total employment was simply part of the general shift in the United States from agricultural to nonagricultural pursuits. Since then, and especially in the past two decades, a sharp divergence in growth rates between Service and Industry has become evident.

Reasons for Growth of Services

When we seek an explanation for this drastic shift of employment, three principal hypotheses are explored: (1) a more rapid growth of final demand for services; (2) a relative increase in intermediate demand for services; and (3) a relatively slow increase in output per man in services.

The first explanation involves the relation between spending patterns and levels of income. As income rises, it has been argued, the demand for goods tends to rise less rapidly than the demand for services; hence, the importance of services in the economy will rise. The relationship between income and demand for various outputs (the income elasticity) is difficult to measure, and precise estimates are beyond our grasp. The available evidence suggests that the growth of the Service *and* Industry sectors relative to Agriculture was related in considerable degree to a low income elasticity of demand for farm products. As Adam Smith noted in the *Wealth of Nations:* "The desire of food is limited in every man by the narrow capacity of the human stomach." Whether there is a similar limitation for goods in general is less clear. The demand for any particular good—such as automobiles or radios—may reach a point where further increases in income do not trigger much additional buying, but new goods—such as pleasure boats or T.V. sets—frequently appear to take up the slack.

Examination of cross-sectional buying patterns, and of trends in output over time, suggests that the growth of income and a consequent shift in demand has not been a major source of the relative growth of service employment. Measured in dollars of constant purchasing power, the Service sector's share of output was the same in 1965 as in 1929. Measured in current dollars, it grew only from 47 to 50 per cent. As a share of nonagricultural output in constant dollars, the Service sector actually declined over the same period, while in current dollars its share rose by less than 1 percentage point. If gross product is classified by type of final output rather than by industrial origin, the share accounted for by

"services" increased only slightly between 1929 and 1965, whether measured in current dollars or after adjustment for changes in price.

The second explanation that has been explored is the growth of intermediate demand for services by goods-producing industries as a result of increased division of labor. As an economy grows, there is some tendency for specialized firms to be organized to provide the business and professional services that were formerly taken care of within manufacturing and other goods-producing firms or were neglected. An analysis of the input-output tables for 1947 and 1958 indicates that there has been some shift in this direction, but the employment change attributable to this source is less than 10 per cent of the total change.

The major explanation for the shift of employment is that output per man grew much more slowly in the Service sector than in the other sectors. In other words, the amount of labor required for a given amount of output fell more rapidly in Agriculture and Industry than in Service. The average annual rates of change, 1929–65, were Agriculture 3.4 per cent, Industry 2.2 per cent, and Service 1.1 per cent. The differential between Industry and Service, slightly over 1 per cent per annum, was similar in several subperiods that were examined. Although there are serious questions concerning the measurement of real output, especially in Service, it does not appear that the differential in output per man is attributable to biases in the measures of output. For one thing, the differential is almost as large if Industry is compared with a Service subsector which excludes government, households and institutions, and real estate—the industries that present the knottiest problems in measuring output.

The lag of output per man in the Service sector is explained by many factors. First, there was a greater decline in hours worked per man in Service than in Industry. Thus, the differential trend in output per man-hour was not as large as that in output per man.

A second, and more important, explanation was the much more rapid increase in the quality of labor in Industry than in Service. This differential is suggested by the much faster growth of wages in Industry (.5 per cent per annum faster in 1929–65). The growth of unions explains part of the differential trend in wages, but the major part probably reflects an upgrading of skill levels in Industry. This inference is supported by changes in the demographic characteristics of the labor force in the two sectors. The level of schooling, the percentage male, and the percentage of prime working age have all been rising more rapidly or falling more slowly in Industry than in Service. The upgrading of labor quality in Industry is also revealed by the faster growth of professional and man-

agerial occupations in that sector. Thus, substantial evidence points to a more rapid rate of growth of human capital per worker in Industry as a major factor explaining the more rapid growth of output per man.

A third explanation, more tentative and based on less reliable data than that for human capital, points to a differential trend in physical capital per worker, also in favor of Industry. This difference in physical capital has probably been quantitatively less important than the difference in human capital in explaining the lag of output per man in the Service sector.

The differential trends in hours, human capital, and physical capital do not account for all of the sector differential in growth of output per man. The residual, which is about .5 per cent per annum, suggests that there was probably more rapid technological change in Industry than in Service, or that Industry benefited more from growing economies of scale.

Although the hypothesis of a sector differential in productivity change is supported by the data, it is not true that output per man was static in services. Except for those service industries where output is assumed to always equal labor input, there was usually some positive growth of productivity.

Productivity, Growth, and Wages

The relationships between productivity, growth, and wages have received considerable attention from economists. Hypotheses derived from previous studies limited to or heavily concentrated on manufacturing were tested in this study in two ways. First, correlations between the variables were examined across the ten major industry groups.[3] Second, similar correlations were run across seventeen detailed retail trade and service industries.

The hypothesis of a strong positive relation between growth and productivity was not supported when tested across the ten major industry groups. There was no correlation between growth of output and productivity, and there was a negative correlation between changes in employment and productivity in the 1929–65 period. The slowest-growing industry group (measured by output or employment), agriculture, had the fastest rate of increase of output per man, and many similar dis-

[3] These groups are: agriculture; mining; construction; manufacturing; transportation; communications and public utilities; government enterprise; wholesale and retail trade; finance, insurance, real estate, and services; and general government.

crepancies are observed. These findings provide some support for the view that disparate rates of change of productivity may involve major structural changes in employment patterns.

The analysis of detailed industries, on the other hand, reveals a significant positive relationship between industry growth rates and changes in productivity. The correlation found among the seventeen service industries is of the same order of magnitude as that found by other investigators in studies of manufacturing industries. The way productivity stimulates growth, and growth stimulates productivity, is illustrated in the case study of the barber and beauty shops (see Chapter 5). Rapid changes in beauty shop techniques have stimulated growth through decreases in price and improvements in quality. An increase in the demand for beauty shop services has raised productivity through the stimulation of technological change, an increase in the average size of transactions, and a decrease in idle time. Barbering, by contrast, has been relatively stable in technology and in demand.

Analysis of the relation between changes in productivity and wages among the seventeen service industries also supports previous findings based on manufacturing; no correlation between changes in output per man and changes in compensation per man is observed. On the other hand, a significant positive relation between these two variables is observed among the ten major industry groups. To the extent that earnings reflect human capital, this finding supports the view that differential trends in output per man among major industry groups have been related to differential trends in labor quality.

Sector Differences in Hourly Earnings

An examination of hourly earnings for a single year (1959) reveals that persons employed in the Service sector earn significantly less than those employed in Industry. The average hourly rates as calculated from the one-in-a-thousand sample of the *1960 Census of Population* were $2.31 and $2.70 per hour, respectively.

The sector differential was examined first in broad terms and then through a systematic analysis of differences in earnings among 138 industries. The richness of the data made possible more comprehensive comparisons than those based on economic censuses or sample surveys. All industries in the Service and Industry sectors were included, and the earnings examined included those of salaried employees and self-employed workers as well as production workers. This is particularly

important in Service because more than half of the persons employed in that sector are either salaried or self-employed.

"Expected" earnings for each industry were calculated, based on the demographic characteristics of the workers in each industry and the national earnings rates for each of 168 color-age-sex-education groups. To the extent that labor quality is associated with these characteristics, differences in average "expected" earnings across industries measure differences in labor quality; differences between actual and "expected" earnings measure differences in wages, holding labor quality constant.

This adjustment for demographic characteristics explains almost three-fourths of all interindustry differences in hourly earnings, but it does not explain any of the intersector differential. The "expected" earnings for each sector (Service and Industry) were both $2.50 per hour, indicating that the labor mix on average was about equal. Average hourly earnings in the Industry sector exceeded those in the Service sector for males and for females, for whites and nonwhites, and at every age and level of education.

The sector differential is also evident among industry groups. Every group in the Industry sector except one had actual earnings higher than "expected." Every group in the Service sector except two had actual earnings below "expected." Hourly earnings in construction, for example, were $2.87, although "expected" earnings were only $2.58. Hourly earnings in durable manufacturing were $2.79 although "expected" earnings were only $2.54. In the Service sector, the lowest standardized earnings were found in retail trade and personal services. Based on the demographic characteristics of the workers in retailing, hourly earnings should have been $2.37, but in fact were only $1.96. For personal services the "expected" earnings were $1.82 and the actual earnings were only $1.36.

The differences in hourly earnings among 138 industries were analyzed in order to explain the sector differential in earnings. The degree of unionization proved to be the most important variable after demographic characteristics in explaining interindustry variations in earnings in 1959. Unionization was found to have a strong and consistent relationship to hourly earnings after allowing for demographic characteristics, location, size of establishment, and other variables. The union effect seems to be strongest between 20 and 60 per cent unionization. Below and above that range, changes in unionization do not show much systematic relation to earnings. Within that range, a change of 10 percentage points in unionization is associated with a change of about 8.5 cents per hour or about 3.7 per cent.

More than half the persons employed in Industry are union members; the Service sector is only about 10 per cent unionized. According to the analysis of interindustry differentials in earnings, the greater unionization in Industry explains about two-thirds of the sector differential in hourly earnings. The larger size of establishments ranks after unionization as an explanation of the higher earnings in the Industry sector.

Other findings from this portion of the study are that, within the Industry sector, average earnings of the individual industries tend to be similar. The weighted (by man-hours) coefficient of variation across 81 industries in that sector is 13.7 per cent. The labor force mix as measured by "expected" earnings also is very homogeneous. The coefficient of variation is only 8.5 per cent. The industries in the Service sector, on the other hand, tend to be much more heterogeneous. The coefficient of variation for 57 service industries is 29.3 per cent for actual earnings, and 16.1 per cent for "expected" earnings.

Sector Differences in Cyclical Fluctuations

Although this report is primarily concerned with long-term trends, several tests of hypotheses concerning cyclical fluctuations were carried out. Monthly data covering the period 1947–65 were analyzed with the aid of the NBER cyclical analysis program. The results were checked and confirmed by analysis of deviations from long-term trends.

The principal findings are that output and employment are more stable over the business cycle in the Service sector than in Industry, but productivity tends to be more unstable in the Service sector. The stability of Service output is attributable to the fact that services cannot be stored. Thus, this sector avoids the swings in output that result from changes in the rate at which business firms and consumers add to or diminish their inventories of goods.

The stability of Service employment over the business cycle is even more striking than the stability of output. For the sector as a whole, the average rate of change of employment during expansions was +2.9 per cent per annum, and during business cycle contractions it was +.7 per cent per annum. Thus, in absolute terms, Service employment continued to increase even during periods when general business activity was declining. By contrast, the average annual rates of change of Industry employment were +3.2 per cent in expansions and −8.3 per cent in contractions.

The stability of employment in services can be explained in part by the stability of output. Even for equal cyclical changes in output, how-

ever, there is evidence that Service employment is more stable. This can be explained by the large numbers of self-employed and salaried employees, and by the substantial number of service industry employees classified as "wage and salary workers" who are actually compensated on a "piecework" basis. The latter group includes real estate, insurance, and security brokers, waiters and waitresses, barbers and beauticians, and most salesmen of durable goods. Their wages, in whole or in part, are determined by their output and take the form of commissions, tips, or a share of "profits." Because their earnings are more sensitive to cyclical fluctuations in spending than are their hours of work, we can think of these workers as having "flexible" wages, and this increases the stability of their employment.

The stability of service employment over the business cycle results in considerable cyclical instability in output per man. Between business cycle peaks and troughs in 1947–65, the average rate of rise and fall (net of trend) was 2.8 per cent per annum for retail employment compared with a rate for manufacturing employment of 13.3 per cent per annum. On the other hand, deflated sales per man-hour in retailing show an average cyclical amplitude of 3.8 per cent per annum, compared with only .5 per cent per annum for deflated sales per man-hour in manufacturing. As the relative importance of the Service sector grows, we can expect more stability in employment, but probably more instability in productivity for a given amount of cyclical fluctuation in aggregate economic activity.

Implications for Industrial Organization and Labor

In addition to its effect on cyclical fluctuations, the growth of service employment has important implications for industrial organization and for labor. To be sure, a shift in the relative importance of different industries is only one of many changes that are occurring simultaneously in the economy, and these other changes may tend to be offsetting in nature. Also, the sum total of these shifts and changes may itself set in motion further developments whose implications are at present indecipherable. Nevertheless, it is useful to note several major differences between the service industries and the rest of the economy, and to speculate about some possible consequences of a "service economy."

In the production of goods, for instance, with some notable exceptions such as agriculture and construction, most of the output is accounted for by large profit-seeking corporations. Ownership is frequently separate from management, and significant market power is often held by a few

firms in each industry. In the Service sector, on the other hand, and again with some exceptions, firms are typically small, are usually owner managed, and are often noncorporate. Furthermore, nonprofit operations, both public and private, account for one-third of the Service sector's employment.

One statistic that epitomizes what has been happening to the American economy is the percentage of the national income originating in business corporations. Ever since the development of the private corporation, its role in the economy has tended to grow, but its relative importance apparently reached a peak about 1956 when corporations accounted for over 57 per cent of total national income. Since then there has been a tendency for this fraction to remain stable, or even to decline, despite changes in the tax laws which encourage the incorporation of small firms.

As these and other facts become better known, we may see an end to the myth of the dominance of the large corporation in our society. Most people do not work and never have worked for large corporations; most production does not take place and never has taken place in large corporations. In the future, the large corporation is likely to be overshadowed by the hospitals, universities, research institutes, government agencies, and professional organizations that are the hallmarks of a service economy.

As stated above, many services are produced by nonprofit institutions. The growing importance of such organizations poses some disturbing questions about efficiency and equity. As the problem of sharply rising costs in nonprofit hospitals illustrates, we may need new instruments of regulation and control to supplement the present system which relies upon competition and a drive for profits as the primary spurs to efficiency in production and distribution.

Some of the most startling comparisons between the Industry and Service sectors concern the characteristics of their respective labor forces. One simple, but profound, difference is that many occupations in the Service sector do not make special demands for physical strength. This means that women can compete on more nearly equal terms with men, perhaps for the first time in history. In the Service sector, we find women holding down almost one-half of all jobs, compared with only one-fifth in Industry.

The ultimate effects of this simple change could be very far reaching. To be sure, man's superior economic position is partly attributable to his more continuous attachment to the labor force and to other factors. To the extent that higher earnings are based on strength, however, the

advent of a service economy should make for greater equality between the sexes.

We also find a disproportionate number of older workers in services, despite the rapid growth which favors new entrants to the labor force. In addition to making more modest demands for physical strength, the Service sector attracts women and older workers because it provides greater opportunities for part-time employment. The use of part-timers contributes significantly to the efficient operation of service firms because demand in many cases comes at particular hours of the day and particular days of the week.

Given the importance of females, part-timers, and the self-employed in the Service sector, it is not surprising to find a large difference in the extent of unionization in the two sectors. Unless there are strenuous new efforts at organization, the continued growth of services may mean a decline in union influence in the United States. On the other hand, if the unions become successful in organizing the Service sector to the same extent as the Industry sector, we may see significant changes in the nature of the union movement and in the reaction of the public to strikes and other forms of union activity.

Still another implication concerning labor which may be of considerable importance (although it is difficult to quantify) is a trend toward "personalization" of work. The transfer from a craft society to one of mass production was said to depersonalize work and alienate the worker. The advent of a service economy implies a reversal of these trends. Employees in many service industries are closely related to their work and often engage in a highly personalized activity that offers ample scope for the development and exercise of personal skill. It should be stressed that the possibility of deriving satisfaction from a job well-done and of taking pride in one's work are only prospects, not certainties. At their best, however, many service occupations are extremely rewarding, and in some the line between "work" and "leisure" activity is often difficult to draw.

This view runs counter to the assertion that automation results in the depersonalization of work. It may be true that the initial impact of automation is the substitution of machinery and controls (highly impersonal) for work that was formerly done by human labor. Given full employment, however, the major impact of automation is to eliminate relatively routine, impersonal work entirely, with the result that if one looks at the kind of work people are now doing—the type of work that is growing most rapidly—it is typically of a much more personal character than before.

Implications for Economic Analysis

Considerable rethinking of economic concepts may be required as a result of the growing relative importance of services. One problem arises because the consumer frequently plays an important role in the production of services, but not in the production of goods. This unmeasured input can have significant effects on productivity in retailing, health, education, and many other service industries. In the supermarket and laundromat the consumer actually works, and in the doctor's office the quality of medical history the patient gives may influence significantly the productivity of the doctor. Productivity in banking is affected by whether the clerk or the customer makes out the deposit slip—and whether it is made out correctly or not. Thus, the knowledge, experience, honesty, and motivation of the consumer affect Service productivity, but the tools and data necessary to incorporate these factors into our analysis do not exist.

A second concept that may require further development is that of labor-embodied technological change. When, as in some services, formal education is important and there is job security, the rate at which advances in knowledge affect productivity will depend in part on how fast labor embodying these new advances can be added to the work force. Moreover, it is not true that physical capital is always a fixed factor and labor always variable, as is usually assumed in models based on manufacturing. In many service firms the reverse assumption is closer to reality.

Another set of concepts requiring re-examination are those concerned with productivity and demand. The flow of production in many service industries is uneven, with sharp peaks at particular hours or on particular days separated by periods of slow activity. Also, the size of the production run (i.e., the individual transaction) is often very small. For these reasons the analysis of the relation between output and productivity in services will probably have to pay more attention to changes in the timing of demand and to changes in transaction size.

A final implication is the likelihood that current estimates of real gross national product are becoming less useful for studies of productivity and economic growth because, at high levels of GNP per capita, a large fraction of productive effort is devoted to services (where real output is often very difficult to measure) and to other activities, such as those of the "do it yourself" type, that are not measured at all. In the future, we shall probably find it necessary to develop auxiliary measures

of "output" and economic welfare to be used in conjunction with the estimates of real gross national product.

Suggestions for Further Research

The preceding section suggested some of the conceptual problems posed by the growth of a service economy. These represent only a portion of the tasks that lie ahead for economic research. Numerous analytical questions require investigation. For instance, what is the relation between growth and productivity across industries? If there is a positive correlation, does the causality run primarily from productivity to growth or from growth to productivity? If the latter, what are the relative contributions of economies of scale, induced innovation, or still other factors to this relationship? Why has labor quality grown more rapidly in Industry than in the Service sector? Have unions been a major cause of this shift? Is it the result of sector differences in elasticities of substitution between capital and labor or between skilled and unskilled labor? Or has technological change proceeded differently in the two sectors? What are the current income elasticities of demand for various goods and services? Are they changing? What is the elasticity of substitution between goods and services with respect to price?

One area of research with much promise concerns greater attention to the diversity that exists within the Service sector. This study is primarily concerned with intersector differences, but throughout the book, and especially in Chapters 4, 5, and 6, significant intrasector differences are noted. These variations among Services with respect to skill levels, wages, productivity trends, capital intensities, and other factors should be explored.

Perhaps the most urgent need of all is for more and better-quality data concerning the service industries. Although the United States is now a service economy, the statistical reporting system largely reflects the interests and conditions of an economy dominated by agriculture and industry. We need more analysis, but we also need the factual basis that will make the analysis more fruitful. One unmistakable finding of this study is that there are significant gaps in our statistical information concerning service output, employment, prices, wages, investment, and profits. These gaps must be filled if we are fully to understand this sector or, indeed, if we are to understand the economy of which it is the major part.