THE SERVICE INDUSTRIES AND U.S. ECONOMIC

GROWTH SINCE WORLD WAR II

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November 1977

ABSTRACT

During the past 15 years employment and current dollar gross
product continued to shift to the Service sector at about the same rate
as in the early post-World War II period, while the Service sector's share
of gross product in constant dollars remained relatively constant.
Productivity (as measured in the National Income Accounts) continued to
grow less rapidly than in Industry or Agriculture. The rate of growth
of output per worker for the total economy was almost one percent per
annum less than in 1948-65, but the shift to the Service sector contri-
buted less than .1 percent per annum to the decrease in productivity
growth. Real GDP grew almost as rapidly as in 1948-65, while employment
growth accelerated due to a sharp increase in the population of working
age. The expansion of service employment contributed substantially to
the growth of female employment throughout the post-World War II period,
but the increase in female labor force participation was not a signifi-
cant factor in either the acceleration of employment or the slowdown of
productivity growth in 1961-76. The growth of the Service sector also
contributed to the growth of government employment. Apart from changes
in industry mix, the expansion of government employment has been quite
modest. Population projections to the end of this century indicate the
likelihood of a marked decrease in the rate of growth of employment (and
output per capita) 1990-2000 because of slow growth of working age
population and the end of the transition to high female labor force
participation.

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"The most important concomitant of economic progress," wrote Colin Clark in 1940, is "the movement of labor from agriculture to manufacture, and from manufacture to commerce and services."[1] Subsequent developments have been fully consistent with Clark's observation, and this close relationship between economic growth and the expansion of Service employment has been discussed by many economists.[2]

Until after World War II, the increase in the Service sector's share of total U.S. employment was largely at the "expense" of Agriculture; employment in Industry was also expanding rapidly. Since then, Service employment continued to expand rapidly with both Industry and Agriculture experiencing large decreases in relative shares. In a series of studies conducted in the 1960's I concluded that the primary reason for the shift of employment from Industry to Service was the more rapid rate of growth of productivity in Industry.[3]

The sector difference in productivity advance has aroused fears that the shift to services will slow down growth for the economy as a whole. Does a "service economy" imply a "stagnant economy"? This paper first examines recent trends (the past 15 years) in employment, output, and productivity to determine whether the sector differentials have persisted. These trends and their impact on the overall growth of the economy are analyzed. The relationship between the Service sector and the growth of female and government employment is considered, and projections

of population, employment, and output through the end of this century are
presented. The paper concludes with a few speculative observations con-
cerning services and growth.

Definitions

The comparison of sector trends necessarily involves some arbitrary
definitions. My definition of the Service sector includes wholesale and
retail trade, finance, insurance and real estate, general government, and
professional, personal, business, and repair services. This sector is com-
pared with "Industry" (including mining, construction, manufacturing, trans-
portation, communications and public utilities, and government enterprise)
and Agriculture. Some comparisons will also be made with agriculture and
government eliminated (i.e., the private non-agricultural economy).

The time period analyzed is from 1961 to 1976. The choice of
initial and terminal years is important because the relative importance of
services tends to rise in slack periods and decline in boom years. It
is desirable to extend the analysis as close to the present as possible
(i.e., 1976) and 1961 is a year of comparable slackness, although it was
the trough of a recession while 1976 was not. The overall unemployment
rates were 6.7 percent in 1961 and 7.7 percent in 1976. Probably more
relevant are the unemployment rates for males 20 years of age and over
which were 5.7 percent in 1961 and 5.9 percent in 1976.

As a check on the sensitivity to choice of years, the trends
between two prosperous years, 1956 and 1973, were also calculated. The
results were very similar. Employment growth between 1956 and 1973 was
somewhat slower than in 1961-76 for each sector, but the Industry-Service
trend differential varied by less than 0.1 percent per annum. In this

paper the 1961-76 period is compared with earlier post-World War II trends, measured from 1948 to 1965, two years with identical unemployment rates for adult males.

It should be noted that significant revisions of the national income accounts were undertaken in recent years.[4] These revisions affected sector levels and also had some effect on rates of change. For this reason the changes from 1948 to 1965 were recalculated, although the results are sufficiently close to those reported in The Service Economy to permit reliance on the analyses presented there.

Employment

Table 1 shows that the differential trends in employment which characterized the first two decades following World War II have continued in recent years. The Industry-Service differential was slightly larger in the earlier period (1.7 percentage points per annum vs. 1.4), but this is entirely attributable to a relative decline in the armed forces between 1961 and 1976. The Industry-Service differential excluding the armed forces was 1.6 per-centage points per annum in both periods. Agriculture continued to lose ground relatively (and even absolutely), but because it has become such a small part of the economy, the expansion of the Service sector has been more at the expense of Industry than was true in earlier periods. Thus, even the Industry-Service comparison omitting government shows a large differential trend.

The decline in Industry's share is manifest in all the major groups, including manufacturing, which grew at only one percent per annum. The increase in the Service sector's share was led by the

Table 1. Levels and rates of change of employment[a] by sector, selected
years 1948-76.

Part A: Sector shares (percent)

	1948	1961	1965	1976
Total economy				
Agriculture	10.8	6.9	5.5	4.2
Industry	43.2	38.6	39.1	35.1
Service	46.0	54.5	55.4	60.7
Private[b] non-agriculture				
Industry	54.0	48.4	48.6	43.0
Service	46.0	51.6	51.4	57.0

Part B: Rates of change (percent per annum)[c]

	1948-65	1961-76
Total economy	1.08	1.76
Agriculture	-2.91	-1.63
Industry	.49	1.14
Service	2.18	2.48
(excluding armed forces)	(2.08)	(2.70)
Private[b] non-agriculture		
Industry	.42	1.09
Service	1.71	2.56

[a]Full-time equivalent persons engaged.

[b]Excludes government.

[c]Continuously compounded.

Sources: The National Income and Product Accounts of the United States,
1947-1974, Statistical Tables (for 1948, 1961 and 1965) (Wash-
ington, D.C.: U.S. Office of Business Economics); and Survey
of Current Business, July 1977 (for 1976).

services proper with a growth of 3.1 percent per annum. Some authors like to stress intra-sector variability (and it exists), but it is instructive to note that the slowest growing part of the Service sector, retail trade, grew more rapidly than construction, the fastest growing major group in Industry.

Gross Domestic Product and Sector Productivity

The continued shift to the Service sector is also evident in gross domestic product measured in current dollars (see Table 2). Indeed, by this criterion the shift from Industry to Service accelerated slightly in 1961-76. When we measure output in constant (1972) dollars (Table 3), however, we observe very little shift from Industry to Service. Apart from the decline of Agriculture there has been very little change in sector shares of gross product in constant dollars for half a century!

The sector trends in productivity, presented in Table 4, are derived in the following way. The actual rate of output per worker is simply the rate for gross domestic product in constant (1972) dollars minus the rate of growth of employment. The rates relative to the total economy for output per unit of labor input (and output per unit of total factor input) are derived by assuming that factor prices change at the same rate in all sectors. If so, the sector change in total labor compensation (or total compensation to all factors) relative to the change for all sectors is approximately equal to the change in labor input (or total factor input) in that sector relative to that for the economy as a whole.[5]

The Industry-Service differential in growth of output per worker was lower in 1961-76 than in 1948-65, but the sector differences

Table 2. Levels and rates of change of gross domestic product in
current dollars by sector, selected years 1948-76.

Part A: Sector shares (percent)

	1948	1961	1965	1976
Total economy				
Agriculture	9.3	4.2	3.5	3.1
Industry	46.8	45.0	45.6	41.2
Service	43.9	50.8	50.9	55.7
Private non-agriculture				
Industry	55.1	51.6	52.0	47.2
Service	44.9	48.4	48.0	52.8

Part B: Rates of change (percent per annum)

	1948-65	1961-76
Total economy	5.70	7.86
Agriculture	-.05	5.98
Industry	5.55	7.26
Service	6.56	8.48
Private non-agriculture		
Industry	5.51	7.19
Service	6.26	8.37

Sources and notes: See Table 1.

Table 3. Levels and rates of change of gross domestic product in
constant (1972) dollars, by sector, selected years 1948-76.

Part A: Sector shares (percent)

	1948	1961	1965	1976
Total economy				
Agriculture	5.8	4.3	3.6	2.9
Industry	43.0	40.7	43.2	40.7
Service	51.3	55.0	53.2	56.3
Private non-agriculture				
Industry	50.8	48.2	50.3	46.7
Service	49.2	51.8	49.7	53.3

Part B: Rates of change (percent per annum)

	1948-65	1961-76
Total economy	3.74	3.51
Agriculture	.97	.87
Industry	3.77	3.52
Service	3.96	3.67
Private non-agriculture		
Industry	3.86	3.56
Service	3.98	3.97

Sources and notes: See Table 1.

Table 4. Rates of change of productivity by sector, 1948-65 and 1961-76 (percent per annum).

	1948-65	1961-76
Actual rates		
Output per worker		
Total economy	2.66	1.75
Agriculture	3.88	2.50
Industry	3.28	2.38
Service	1.78	1.19
Service, excluding government	2.27	1.41
Rates relative to the total economy		
Output per unit of labor input		
Agriculture	+2.05	-.37
Industry	+.41	+.67
Service	-.60	-.49
Service, excluding government	-.04	-.07
Output per unit of total factor input		
Agriculture	+2.98	-.76
Industry	+.18	+.61
Service	-.64	-.46
Service, excluding government	-.32	-.05

Source: Tables 1, 2 and 3.

in the two other productivity measures were somewhat larger in the more recent period. For 1948-65 almost half of the sector differences in growth of output per person was attributable to differential changes in hours of work, quality of labor, and capital per worker.[6] These differences were apparently much less important in recent years.

Overall Productivity

One of the most striking features of Table 4 is the general retardation in the growth of output per worker in 1961-76 compared with 1948-65. It is this slowdown in overall productivity advance which some observers seek to attribute to the growth of services. A few simple calculations, however, show that sector shifts can explain only a very small part of the slowdown.

When output shares remain constant over time an index of aggregate output per worker is simply a weighted average of the indexes of output per worker in each sector where the weights are terminal year employment shares.[7] If one applies the 1965 sector distribution of employment to the 1961-76 sector trends in productivity, or if one applies the 1976 sector distribution to the 1948-65 sector trends, the alteration in the rate of growth of output per worker for the total economy is only .1 percent per annum compared with the rates actually observed. Even these calculations overstate the effect of the shift from Industry to Service because part of the .1 percent per annum sector distribution effect is attributable to the decline of Agriculture, not shifts within the non-Agriculture sector.

This should not come as a surprise. Grossman and I simulated productivity trends for 50 years into the future under a wide variety of assumptions about sector shares of output and employment, and trends in these shares. We found that the shift to services would have only a small effect on national productivity growth.[8] Moreover, Table 4 shows clearly that the slowdown in productivity growth was present in each sector. It was largest in Agriculture and smallest in Service, with a decline in Industry slightly larger than the decline for the total economy.

It is not the purpose of this paper to discuss the deceleration in productivity growth in all its aspects, but a few comments seem warranted. First, it is important to note that real output grew almost as rapidly in 1961-76 as in 1948-65 (see Table 3). Looked at purely in statistical terms, the slowdown in productivity growth was accounted for primarily by the acceleration in the growth of employment from 1.1 percent to 1.8 percent per annum (see Table 1).

Second, it should be noted that output per capita, as distinct from output per worker, grew more rapidly in 1961-76 than in 1948-65 (see Table 5). The acceleration in employment growth was not due to a faster growth of population in general (population growth actually slowed down), but to a sharp increase in the population of working age. It is true that employment grew somewhat more rapidly than did the working age population in 1961-76 (because of the rise in female labor force participation), but this was also true in 1948-65.

Table 5. Rates of change of output, population and employment, 1948-65
and 1961-76 (percent per annum).

	1948-65	1961-76
Output[a]	3.74	3.51
Population[b]	1.66	1.05
Output per capita	2.08	2.46
Population 20-64 years of age[b]	.86	1.45
Population under 20 and 65 or over[b]	2.63	.60
Employment (f-t-e)[c]	1.08	1.76
Employment (civilian full-time and part-time)[b]	1.16	1.90
Male[b]	.62	1.22
Female[b]	2.34	3.09

Sources:

[a]Table 3.

[b]Economic Report of the President, January 1977 (Washington,
D.C.: Council of Economic Advisers, January, 1977).

[c]Table 1.

Female Employment

It might be thought that the rapid increase in female employment
was a significant reason for the acceleration of total employment in
recent years, but Table 5 shows that this was not true. Both male and
female employment accelerated. The fact that female employment grew more
rapidly than male in both periods and that females' share of employment
was larger in the second period contributed only .1 percent per annum to
the change in overall employment growth.

The extremely rapid growth of female employment revealed in
Table 5 explains a significant portion of total employment growth since
1948. Of the 30 million workers added to the U.S. labor force between
1948 and 1976, almost 20 million were women. The growth of female
employment does not, however, explain the acceleration of total employ-
ment in 1961-76 because the sex differential was present in both periods.

Female labor force participation has been studied by many econo-
mists in recent years,[9] but a full explanation of the dramatic rise of
recent decades has not yet been provided. Much of the research emphasizes
the general rise in wage rates (for men and women) or shifts in the
supply curve of female labor. I believe this is part of the story, but
I believe another important and frequently neglected part is the particu-
larly rapid growth in demand for female labor due to the expansion of
the Service sector. Of particular importance is the location of many
Service industries in residential areas and the greater flexibility in
hours of work.

With the aid of Census of Population data on employment by sex
and industry group, we can make a rough estimate of how much the expansion

of the service industries contributed to the growth of female employment.
In Table 6 the growth rates for females and males and the differential
between them are decomposed into the portion attributable to changes in
industry mix and the portion attributable to increases in the female
share of employment within each industry. We see that the change in mix
(at the one-digit level) contributed almost one-half of the total sex
differential in employment growth.

Table 7 shows the relation between the expansion of services and
the growth of female employment in a particularly striking way. The
relative gain in female employment between 1950 and 1970 (the extent to
which female employment in 1970 was larger than what it would have been
if it had grown at the national rate) was 7.7 million jobs. Of this
number, 4.7 million were obtained in professional and related services,
2.3 million in other services industries, and only .7 million in the
rest of the economy. To be sure, the complex relationship between sector
and sex differentials in employment growth is not captured in such a simple
calculation. The growth in demand for services may be partly a result of an
increase in female labor force participation rather than a cause, but
Tables 6 and 7 do, it seems to me, reveal an important part of the total story.

Government Employment

Along with the growth of female employment, another startling
feature of the post-World War II U.S. economy has been the rapid growth
of government employment. By 1976 more than one in six employed persons
was on a government payroll; the ratio was less than 10 percent in 1948.
These data are frequently used to attack "bureaucratic proliferation."

Table 6. Rates of growth of female and male employment, 1950 to 1970 (percent per annum).

		Female	Male	Female minus male
(1)	Actual	3.26	.94	2.32
	Attributable to:			
(2)	Change in industry mix[a]	.69	-.33	1.02
(3)	Change in female's share[b]	.88	-.42	1.30
(4)	Change in total economy[c]	1.69	1.69	0

[a]Assumes constant female share and constant total.

[b]Assumes constant industry mix and constant total.

[c]Assumes constant female share and constant industry mix.

Source: U.S. Bureau of the Census, Censuses of Population, 1950 and 1970, summary volumes.

Table 7. Changes in male and female employment between 1950 and 1970.

| | Employment | | Change in employment, 1950-1970 | | Relative gain or loss in employment[a] |
| | 1950 | 1970 | Absolute | Rate | |
	(000)	(000)	(000)	(% per annum)	(000)
Total	54,275	76,149	21,874	1.69	0
Male	39,364	47,505	8,141	.94	-7,724
Female	14,911	28,644	13,733	3.26	+7,724
Female--prof. & rel. svcs.	2,707	8,527	5,820	5.74	+4,729
Female--other svc. sector	7,501	12,779	5,278	2.66	+2,255
Female, exc. svc. sector	4,703	7,338	2,635	2.22	+740
Male--prof. & rel. svcs.	1,952	4,950	2,998	4.65	+2,210
Male--other svc. sector	12,745	16,980	4,235	1.43	-902
Male, exc. svc. sector	24,666	25,575	909	.18	-9,032

[a]Difference between actual change (column 3) and change if sector had grown at the national rate for all sectors.

Source: U.S. Bureau of the Census, Censuses of Population, 1950 and 1970, summary volumes.

The implication is that government agencies have been multiplying and expanding in accordance with Parkinson's Law. An alternative interpretation is that there has been very little expansion of government employment in the sense of government taking over the production of goods and services that were formerly produced in the private sector. Instead, what has happened is that certain industries in the Service sector (e.g., health, education) have grown particularly rapidly in recent decades and these industries happen to be ones in which government traditionally has played a significant role. According to this view the shift from private to government employment should be seen largely as a consequence of the growth of a service economy.

The data give considerable support to the second interpretation. Table 8 presents the results of a shift and share analysis of employment growth rates between 1950 and 1970 similar to that presented in Table 6. Using Census data on employment cross-classified by industry and class of worker I decompose the growth of government and private employment into the portion attributable to differential industry growth (change in industry mix), the portion attributable to shifts between the private and government sectors within each industry (government share), and the portion attributable to the growth of the total economy. This calculation is done (A) with all industries and (B) excluding postal service and public administration, which always have 100 percent in government. The results are qualitatively similar in both cases. The first row of Table 8 shows a substantial differential in the growth of government and private employment over the two decades amounting to 2.7 or 3.6 percent per annum, depending upon whether postal service and public administration

Table 8. Rates of growth of government and private employment, 1950 to 1970 (percent per annum).

		Government		Private		Government minus private	
		(A)	(B)	(A)	(B)	(A)	(B)
(1)	Actual	4.04	4.98	1.34	1.34	2.70	3.64
	Attributable to:						
(2)	Change in industry mix[a]	1.81	2.45	-.08	-.08	1.89	2.53
(3)	Change in government's share[b]	.54	.89	-.27	-.22	.81	1.11
(4)	Change in total economy[c]	1.69	1.64	1.69	1.64	0	0

(A) includes all industries.

(B) includes all industries except postal service and public administration.

[a] Assumes constant government share and constant total.

[b] Assumes constant industry mix and constant total.

[c] Assumes constant government share and constant industry mix.

Source: U.S. Bureau of the Census, Censuses of Population, 1950 and 1970, summary volumes.

are included or excluded. The next two rows show that most of this differential is attributable to the differential rate of growth of industries (i.e., the change in industry mix) and less than a third is due to an increasing government share holding industry mix constant.

Table 9 examines the same phenomena from a somewhat different point of view. Between 1950 and 1970 total employment in the economy increased by almost 22 million, or a rate of change of 1.69 percent per annum. Private employment grew at 1.34 percent per annum, which meant that the private sector was short 4.6 million jobs compared to what it would have had if it had grown at the rate for the total economy. The government sector showed an equivalent relative gain in employment. The next several rows of Table 9, however, put this shift in a different perspective. The private sector, excluding professional and related services, suffered a relative loss of 8.2 million jobs between 1950 and 1970. Where did they go? The largest relative gains were in private professional and related services, 3.6 million. The next largest was in government professional and related services, 3.3 million. By comparison, the gains in public administration and other government were relatively small. Thus, the so-called expansion of government employment might more accurately be characterized as an expansion of professional and related services, both private and governmental.

These calculations do not, of course, capture all aspects of the expanded role government plays in the economy. There has been a large increase in government serving as a financial intermediary for retirement benefits, medical insurance, and the like. There has also been a huge increase in regulatory intervention, especially with respect to activities

Table 9. Changes in private and government employment between 1950 and 1970.

| | Employment | | Change in employ- ment, 1950-1970 | | Relative gain or loss in employment[a] |
| | 1950 | 1970 | Absolute | Rate | |
	(000)	(000)	(000)	(% per annum)	(000)
Total	54,275	76,149	21,874	1.69	0
Private	48,786	63,829	15,043	1.34	-4,619
Government	5,489	12,321	6,832	4.04	+4,619
Private, exc. professional and related services	46,148	56,505	10,357	1.01	-8,242
Private professional and related services	2,638	7,324	4,686	5.11	+3,623
Government professional and related services	2,021	6,152	4,131	5.57	+3,316
Postal service	454	719	265	2.30	+82
Public administration[b]	2,035	3,483	1,448	2.69	+628
Other government[c]	979	1,967	988	3.49	+593

[a]Difference between actual change (column 3) and change if sector had grown at the national rate for all sectors.

[b]Federal, state and local.

[c]Mostly construction, transportation, communications and public utilities.

and products that might affect health. But the data do not support

frequently voiced simplistic charges about a "government takeover" of

economic production.

Summary of Findings

The principal findings to this point are:

1) During the past 15 years employment and current dollar gross

product continued to shift to the Service sector at about the same rate

as in the early post-World War II period.

2) The Service sector's share of gross product in constant

dollars remained relatively constant; productivity (as measured in the

National Income Accounts) continued to grow less rapidly than in

Industry or Agriculture.

3) The rate of growth of output per worker for the total

economy was almost one percent per annum less than in 1948-65. This

reflected a slight decrease in the rate of growth of output and a sharp

acceleration in the rate of growth of employment.

4) The shift to the Service sector contributed less than .1 per-

cent per annum to the decrease in productivity growth.

5) The acceleration in employment growth is explained almost

entirely by a sharp increase in the population of working age. Total

population growth was much less than in 1948-65, and output per capita

actually rose more rapidly in 1961-76.

6) Female labor force participation rates have risen at a very

rapid rate throughout the post-World War II period, in part because of

the expansion of the Service sector. On the other hand, female employment

was <u>not</u> a significant factor in either the acceleration of employment or the slowdown of productivity growth in 1961-76.

7) Government employment has grown at a very rapid rate in recent decades. The principal reason is the expansion of service industries, such as health and education, in which government has traditionally played a large role. Apart from changes in industry mix, the expansion of government employment has been quite modest.

One huge caveat must be attached to the finding concerning sector differentials in productivity. As is well known, the methods used to measure "real output" in services frequently fall far short of a desirable standard. For instance, until the recent revisions,[4] output in government was simply equated with full-time-equivalent employment. Output per worker never changed, by definition. The revised method is based on employee hours in the various civil service and wage board grades weighted by the 1972 payrolls in these grades. That is, changes in the "quality" of labor measured by changes in the mix of grades are assumed to produce proportional changes in output. Changes in capital stocks or technology continue to be ignored.

Another problem area is banking. Prior to the revisions, output in banking (and other financial intermediaries except life insurance carriers) was indexed by constant dollar deposits. This produced an apparent sharp decline in banking productivity over time as the volume of services provided per constant dollar deposits rose.[10] This approach was discarded in the last revision. Now real output in banking is assumed to be proportional to full-time-equivalent employment!

The rates of growth of output and productivity in government,
banking, and many other service industries are almost surely understated
in the National Income Accounts. I do not, however, believe that these
biases are the principal reason for the observed Industry-Service differ-
ential because there are also biases that work in the opposite direction.
For instance, the growth of output and productivity in retailing is
probably overstated because of a failure to capture a decline in services
provided by retailers per constant dollar of goods sold.[11] Furthermore,
there probably are large downward biases in many indexes of Industry
output, especially when the goods produced are complex and undergoing
rapid technological change (e.g., computers).

I also do not believe that these biases can explain the slowing
down of productivity growth in recent years. This slowing down seems to
be a real phenomenon, the explanation for which should rather be sought
in the slowing down of growth of capital per worker and in a variety
of other social and economic changes.[12]

Predictions to 1990 and 2000

We have seen how demographic trends can have significant effects
on employment, productivity, and output per capita. It may be useful,
therefore, to look ahead to 1990 and 2000 and try to project growth
rates for the variables under discussion. To be sure, such an exercise
should be treated with great caution. The literature is replete with
examples of demographic predictions and projections which proved to be
far off target. For instance, Peter Drucker, usually an acute observer
of economic and social trends, in a 1955 article in Harper's predicted

an increase in population of at least 40 percent by 1975. The actual

increase was only 29 percent. He no doubt failed to anticipate the

tremendous decrease in the birth rate during that period. In the same

article he predicted an increase in the labor force of 20 percent. The

actual increase was 41 percent! The discrepancy was probably attributable

primarily to a failure to anticipate the sharp rise in female labor force

participation. The projections presented in Table 10 should, therefore,

be viewed for the most part as one possible scenario rather than as firm

forecasts.

Probably the most reliable projection is for the population age

20 to 64 in 1990. This figure cannot be affected by subsequent changes

in the birth rate, and death rates for that age group are already

sufficiently low that even further reductions, far greater than those

expected, would not alter the growth rate very much. Therefore, short

of a major catastrophe (not allowed for in any of the projections), we

see that the population of working age will continue to grow at a very

rapid rate until 1990. After that point, however, (actually beginning

in the late 1980's) there will be a noticeable retardation in the growth

of population of working age.

The projections for the population under 20 and 65 and over

over are much more speculative because sharp changes in the birth rate

or in death rates at older ages could significantly alter trends. Using

the Bureau of the Census medium projections for cohort fertility rates

(approximately 2.1 births per woman) and assuming a slight improvement

in life expectancy, the non-working age population will grow at only

.5 percent per annum until 1990, and at a slightly more rapid rate from

Table 10. Projected rates of change of output, population and employment, 1976-1990 and 1990-2000 (percent per annum).

	1976-1990	1990-2000	Actual (1961-1976)
Population, 20-64	1.3	.8	1.45
Population, <20 + 65+	.5	.6	.60
Total population	.9	.7	1.05
Employment (full & parttime)			
Male	1.0	.6	1.22
Female	2.5	1.2	3.09
Total	1.7	.9	1.90
Employment (f-t-e)	1.5	.7	1.76
Gross Domestic Product (1976 dollars)	3.2	2.3	3.51
Output per worker	1.7	1.6	1.75
Output per capita	2.3	1.6	2.46

Note:

Population projections are taken from the Bureau of the Census medium estimates of cohort fertility. Employment projections are based on the author's assumption that female labor force partici- pation rates will continue to rise rapidly until 1990, move slowly thereafter, and that unemployment rates in 1990 and 2000 will be at the 1976 level. Sector growth rates of output per worker are assumed the same as in 1961-76, and sector differentials in employ- ment growth are also expected to continue as before.

Source:

U.S. Bureau of the Census, Current Population Reports, series P-25.

1990 to 2000.[13] These rates are consistent with the low rate recorded in the 1961-76 period.

Given the rapid growth of population 20-64 until 1990, I expect employment to grow almost as rapidly during that period as in 1961-76 (assuming unemployment is approximately the same in 1990 as in 1976). This projection is higher than that of the Bureau of Labor Statistics because I expect female labor force participation to increase at a more rapid rate than does the BLS.[14] For women ages 20-64 the BLS is projecting a labor force participation rate of 61 percent in 1990 compared with a current rate of about 55 percent. My projections assume a rate of 68 percent. (Note: The comparable male rate is now, and is expected to be, about 89 percent.) It is possible that I may be correct about female employment but still be too high for total full-time-equivalent employment because male labor force participation rates may fall more rapidly than in the past, or part-time employment may increase sharply. On the other hand, my employment projection may be too low if there is a reversal of past trends toward earlier retirement.

If I am correct that female labor force participation rates will be quite high by 1990, then employment growth for 1990 to 2000 is likely to decelerate markedly. Not only will the population 20-64 grow slowly during that period, but the potential contribution to employment of further increases in female labor force participation rates will be much weaker.

The final projections concerning output and productivity are the most speculative of all and are presented primarily to provide a basis

for discussion. I assume that the Industry and Service shares of <u>real</u>

<u>output</u> will remain relatively unchanged (as they have in the past. I

further assume that <u>output per worker</u> in each sector will grow at the

same rate as in 1961-76, which in the cases of Industry and Service, are

approximately the same rates as for the half century since 1929.

Under these assumptions the growth rate of <u>total output</u> 1976-1990

would be only .3 percentage points per annum less than in 1961-76 and

the increase in <u>output per capita</u> would be almost equal to that of the

past 15 years. The decade from 1990 to 2000, however, would show a

marked slowdown in the growth of output and output per capita because

of the slow growth in employment. To the extent that sector increases

in productivity are faster or slower than those recorded in 1961-76,

the output and productivity projections would have to be modified

accordingly.

<u>Concluding Comments</u>

The sector rates of productivity growth 1961-76 are low in

comparison with the exceptional rates recorded in 1948-65, but they are

squarely in line with longer-term trends from 1929 to 1965. Thus the

question currently receiving so much attention--"Why has the rate of

productivity advance slowed?"--might more reasonably be formulated

"Why did productivity grow so rapidly after World War II?"

This paper rejects the hypothesis that the shift of employment

to the Service sector was a major cause of changes in the rate of growth

of productivity. The paper calls attention to the importance of demo-

graphic trends for economic growth, both in the past and in the decades

ahead. Substantial decreases in the rates of growth of employment and output per capita during 1990-2000 seem inescapable because of population trends and because the transition of women to high rates of labor force participation will be almost over.

Although output growth will slow, there is no basis for assuming a "stagnant" economy. Productivity does advance in Services, albeit at a slower pace. Greater emphasis is likely to be given to the "qualitative" dimensions of life. Real GNP (as currently measured) will be increasingly unsatisfactory as an index of long-term trends in the well-being of society, and we are likely to see more effort devoted to direct measures of health, educational attainment, and other outputs of a service economy.

NOTES

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2. Allan G. B. Fisher, The Clash of Progress and Security (London: Macmillan, 1935): George Stigler, Trends in Employment in the Service Industries (Princeton: Princeton University Press, for the National Bureau of Economic Research, 1956), p. 47; B. M. Deakin and K. D. George, "Productivity Trends in the Service Industries, 1948-63," London and Cambridge Economic Bulletin, March 1965; and B. D. Haig, "An Analysis of Changes in the Distribution of Employment between the Manufacturing and Service Industries, 1960-1970," Review of Economics and Statistics, February 1975.

3. Victor R. Fuchs, The Service Economy (New York: Columbia University Press, 1968); and Victor R. Fuchs, ed., Production and Productivity in the Service Industries, Conference on Research in Income and Wealth, Vol. 34 (New York: National Bureau of Economic Research, 1969).

4. See "The National Income and Product Accounts of the United States: Revised Estimates, 1929-74," Survey of Current Business, Vol. 56, No. 1, Part I, January 1976.

5. See Fuchs (note 3 above), pp. 48-50 and 204, for the justification for and qualifications of this approach.

6. Ibid., pp. 60-76.

7. See Michael Grossman and Victor Fuchs, "Intersectoral Shifts and Aggregate Productivity Change," Annals of Economic and Social Measurement, 1975, p. 232. This is strictly true when there is only one factor of production.

8. See R. E. Kutscher, J. A. Mark, and J. R. Norsworthy, "The Productivity
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9. Jacob Mincer, "Labor Force Participation of Married Women," in
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11. David Schwartzman, "The Growth of Sales Per Man-Hour in Retail Trade,
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12. National Center for Productivity and Quality of Working Life, Annual
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13. U.S. Bureau of the Census, Current Population Reports, series P-25.

14. H. N. Fullerton, Jr., and P. O. Flaim, "New Labor Force Projections to 1990," Monthly Labor Review, December 1976.