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The Economic Experience
Of Blacks: 1964–1974

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TITLE VII of the 1964 Civil Rights Act outlawed discrimination on the basis of race, color, religion, sex or national origin in hiring, compensation, and promotion. The law also created an Equal Employment Opportunity Commission to enforce these provisions.[1] A Federal policy of equal pay for equal work would be expected to have raised the incomes of blacks relative to whites. At the same time, affirmative action programs should have increased the relative employment of minorities over the 1964–1974 period.

Despite these anti-discrimination efforts, the ratio of black to white unemployment has remained remarkably constant at about 2:1 (see Table 1). And although minority family incomes showed some gains relative to whites during the 1960s, much of the improvement appears to have been eroded during the 1970s (see Table 2).

This article first summarizes the employment and income trends of blacks and whites between 1964 and 1974. (The years 1975 and 1976 have been omitted due to the distorting effects of the severe recession.) Three main conclusions

Table 1

Unemployment Rates: 1964 to 1974
(annual averages)

| Year | Unemployment Rate | | Ratio: Black and other races to white |
	Black and other races	White	
1964	9.6	4.6	2.1
1965	8.1	4.1	2.0
1966	7.3	3.3	2.2
1967	7.4	3.4	2.2
1968	6.7	3.2	2.1
1969	6.4	3.1	2.1
1970	8.2	4.5	1.8
1971	9.9	5.4	1.8
1972	10.0	5.0	2.0
1973	8.9	4.3	2.1
1974	9.9	5.0	2.0

Source: U.S., Bureau of the Census, Current Population Reports, Special Studies, Series P-23 No. 54, *The Social and Economic Status of the Black Population in the United States 1974*, Table 38, p. 64.

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[1]The Commission's role was initially limited to information gathering, mediation to encourage voluntary compliance and legal support in anti-discrimination suits brought by others. The 1972 Amendments to the Civil Rights Act significantly strengthened the Commission's role by empowering the EEOC to act as a plaintiff bringing civil cases in Federal court on behalf of victims of discrimination.

Table 2

Median Income of Families: 1964 to 1974
(In current dollars)

Race of head

Year	Black and other races	Black	White	Ratio: Black and other races to white	Ratio: Black to white
1964	$3,839	$3,724	$6,858	0.56	0.54
1965	3,994	3,886	7,251	0.55	0.54
1966	4,674	4,507	7,792	0.60	0.58
1967	5,094	4,875	8,234	0.62	0.59
1968	5,590	5,360	8,937	0.63	0.60
1969	6,191	5,999	9,794	0.63	0.61
1970	6,516	6,279	10,236	0.64	0.61
1971	6,714	6,440	10,672	0.63	0.60
1972	7,106	6,864	11,549	0.62	0.59
1973	7,596	7,269	12,595	0.60	0.58
1974	8,265	7,808	13,356	0.62	0.58

Source: U.S., Bureau of the Census, Current Population Reports, Special Studies, Series P-23 No. 54, *The Social and Economic Status of the Black Population in the United States 1974*, Table 9, p. 25.

emerge from the data: 1) black employment has declined relative to white employment, 2) the earnings of those blacks who were employed rose relative to earnings of working whites, and 3) changes in family composition have contributed to the decline in the ratio of black to white family income.

The second part of the article presents a possible explanation for why outlawing discrimination did not produce both greater employment and higher wages for black workers as would be predicted in a perfectly competitive model. Wage rigidity and seniority systems appear to have been two of the factors which prevented the reduction in white wages and employment required to reach the new equilibrium. The importance of these institutional constraints was masked during the late 1960s by strong aggregate demand which accommodated gains for blacks without any losses for whites. However,

as the economy weakened in the 1970s, the constraints permitted black wage gains only at the expense of significantly less employment.

I. *Employment, Wages and Income: 1964–1974*

Analysis of unemployment and labor force participation rates for the years between 1964 and 1974 reveals that employment as a percent of population dropped more rapidly for black males than whites and employment gains for white women far outstripped those of blacks. Until 1970, blacks who were employed did experience significant job upgrading and wage gains but enjoyed only moderate improvement thereafter. During the 1970s the effect of a decline in black employment and slower wage growth together with a relative decline in the proportion of black two-worker families was responsible for a drop in the ratio of black to white family income.

Black Employment Declined Relative to White

Despite the constancy of the 2:1 ratio of black to white unemployment, significant changes have occurred in the unemployment status of certain age-sex groups. The relative position of black teenagers has deteriorated dramatically so that in 1974 black teenage unemployment averaged 2.4 times that of white teenagers (see Table 3). However, the unemployment position of adult blacks, both male and female, improved from the sixties to the seventies. The unemployment statistics alone suggest that a concerted effort to hire minorities has indeed been successful for black adults and has led to a noticeable improvement·in their labor force position.

However, the unemployment status of blacks and whites must be viewed in the context of the significant changes in their labor force partici-

Table 3

Unemployment Rates, by Sex and Age: 1964, 1970 and 1974
(Annual averages)

Sex, age, and race	1964	1970	1974
Black and Other Races			
Total	9.6	8.2	9.9
Men, 20 years and over	7.7	5.6	6.8
Women, 20 years and over	9.0	6.9	8.4
Both sexes, 16 to 19 years	27.2	29.1	32.9
White			
Total	4.6	4.5	5.0
Men, 20 years and over	3.4	3.2	3.5
Women, 20 years and over	4.6	4.4	5.0
Both sexes, 16 to 19 years	14.8	13.5	14.0
Ratio: Black & Other Races to White			
Total	2.1	1.8	2.0
Men, 20 years and over	2.3	1.8	1.9
Women, 20 years and over	2.0	1.6	1.7
Both sexes, 16 to 19 years	1.8	2.2	2.4

Source: U.S., Bureau of the Census, Current Population Reports, Special Studies, Series P-23 No. 48, *The Social and Economic Status of the Black Population in the United States 1973*, Table 28, p. 45, Series P-23 No. 54; *The Social and Economic Status of the Black Population in the United States 1974*, Table 39, p. 65.

pation rates (see Table 4). The relative increase in the black teenage unemployment rate has been accompanied by a substantial withdrawal of black male youths from the labor force. Between 1964 and 1974, black males dropped from 13.2 to 11.0 percent of the teenage work force during a period when blacks were increasing as a proportion of the U.S. population. The decline in participation rate indicates that the unemployment rate ratio understates the deterioration in the labor market position of black teenagers.

Some of the decline in labor force participation among younger black males, however, must be viewed as a positive factor since it can be attributed to rising school enrollment. Between 1968 and 1974, the percentage of black youths

(aged 16–24) out of the labor force increased from 34.2 to 36.8 percent.[2] Over the same period, the percentage not participating due to school attendance rose from 26.5 to 27.3 percent.[3] Therefore, rising school attendance accounted for approximately 30 percent of the decrease in labor force participation rates.

On the negative side, the rising minimum wage has been cited as a major contributor to the secular decrease in black teen-age labor force participation. The postwar changes in the minimum wage have been associated frequently

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[2]U.S., Bureau of Labor Statistics, *Handbook of Labor Statistics, 1976* (Government Printing Office), Table 3, p. 28, Table 7, p. 38.
[3]*Ibid.*, Table 3, p. 28, Table 7, p. 38, Table 9, p. 47.

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Table 4

Civilian Labor Force Participation Rates, by Age and Sex: 1964, 1970, and 1974
(Annual averages)

Age and Sex	1964 Black and other races	1964 White	1970 Black and other races	1970 White	1974 Black and other races	1974 White
Men						
Total, 16 years and over	80.0	81.1	76.5	80.0	73.3	79.4
16 and 17	80.0	81.1	76.5	80.0	73.3	79.4
18 and 19	67.2	66.6	61.8	67.4	62.4	73.6
20 to 24	89.4	85.7	83.5	83.3	82.1	86.5
25 to 34	95.9	97.5	93.7	96.7	92.3	96.3
35 to 44	94.4	97.6	93.2	97.3	90.9	96.7
45 to 54	91.6	96.1	88.2	94.9	84.7	93.0
55 to 64	80.6	86.1	79.2	83.3	70.2	78.1
65 and over	29.6	27.9	27.4	26.7	21.7	22.5
Women						
Total, 16 years and over	48.5	37.5	49.5	42.6	49.1	45.2
16 and 17	19.5	28.5	24.3	36.6	24.2	43.3
18 and 19	46.5	49.6	44.7	55.0	44.6	60.4
20 to 24	53.6	48.8	57.7	57.7	58.2	63.8
25 to 34	52.8	35.0	57.6	43.2	60.8	51.1
35 to 44	58.4	43.3	59.9	49.9	61.5	53.7
45 to 54	62.3	50.2	60.2	53.7	56.9	54.3
55 to 64	48.4	39.4	47.1	42.6	43.5	40.4
65 and over	12.7	9.9	12.2	9.5	10.0	8.0

Source: U.S., Bureau of Labor Statistics, *Handbook of Labor Statistics, 1974* (Government Printing Office, 1974), Table 4, pp. 36–39 and *Handbook, 1976* (Government Printing Office, 1976), Table 4, pp. 30–33.

with an increase in the ratio of nonwhite teenagers to general unemployment and a decline in the proportion of black teenagers in the labor market. Several studies have found that the effect of increases in the minimum wage is significantly stronger on black teenagers.[4] As shown in Table 4, a dramatic upsurge occurred in white teenage labor force participation between 1964 and 1974.

For adult men and women, the improvement in the relative black-white unemployment rate has been accompanied by a relative decline in black labor force activity. For black males, a large part of the apparent improvement in the

[4]Yale Brozen, "The Effect of Statutory Minimum Wage Increases on Teenage Unemployment," *Journal of Law and Economics* (April 1969), pp. 109–122; Marvin Kosters and Finis Welch, "The Effects of Minimum Wages by Race, Age, and Sex," in *Racial Discrimination in Economic Life,* ed. Anthony H. Pascal (Lexington, Massachusetts: Lexington Books, 1972), pp. 103–118.

relative unemployment rate is a result of the exodus of low-skilled black workers from the labor force, due in part to the availability of more liberal disability benefits. The situation for females is roughly reversed. The labor force participation rate for black women has remained approximately unchanged, while white female participation rates have climbed dramatically. Thus the relative improvement in the labor market position of black females stems in part from the influx of unskilled, inexperienced white females, which can be explained by the significant changes in the role of women over the past decade.

The combined impact of changing participation and unemployment experiences is summarized by the ratios of employment to population presented in Table 5. Not surprisingly, the proportion of black teenagers employed dropped dramatically between 1964 and 1974

Table 5

Ratio of Employment to Population by Age, Race and Sex, 1964, 1970, 1974

Age & Sex	1964		1970		1974	
	Black & Other Races	White	Black & Other Races	White	Black & Other Races	White
Men						
Total	72.9	77.8	70.9	76.8	66.6	76.0
16–17 years	27.6	36.5	25.1	41.2	21.1	44.7
18–19	51.7	57.7	47.5	59.3	45.8	65.1
20–24	78.1	79.4	73.0	76.8	69.5	79.8
25–34	88.5	94.6	88.0	93.7	85.7	92.9
35–44	88.5	95.2	89.6	95.1	87.2	94.4
45–54	86.2	93.3	85.3	92.7	81.3	91.0
55–64	74.1	83.1	76.5	81.1	67.7	76.1
65 & over	27.1	26.9	26.4	25.8	20.5	21.8
Women						
Total	43.4	35.4	44.9	40.3	43.8	42.4
16–17 years	12.4	23.6	15.3	31.0	15.4	36.2
18–19	32.9	43.1	30.0	48.5	29.6	52.5
20–24	43.8	45.3	49.0	53.7	47.7	58.6
25–34	46.9	33.2	53.0	40.9	55.6	48.2
35–44	53.8	41.4	57.0	47.8	57.4	51.4
45–54	58.5	48.4	57.8	51.9	54.5	52.3
55–64	46.6	38.0	45.6	41.5	42.1	39.1
65 & over	12.4	9.6	12.0	9.2	9.9	7.7

Sources: U.S., Bureau of Labor Statistics, *Handbook of Labor Statistics, 1971* (Government Printing Office, 1971) Table 63, pp. 125–127, *Handbook, 1974* (Government Printing Office, 1974) Table 4, pp. 36–39, and *Handbook, 1976* (Government Printing Office, 1976) Table 4, pp. 30–33, and Table 57, pp. 119–121.

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when white teenage employment showed a substantial gain. By 1974, only 21 percent of black males age 16 and 17 were employed compared to 45 percent of white youths. The apparent gains (as measured by the ratio of black-white unemployment rates) for black adult males have been completely offset by declines in black labor force participation. Over the 1964-1974 period, the drop in the employment rate for black males was greater than for white males in all age groups except the 65 and over category. The greatest disparity among adult males was in the 20–24 age group where the employment rate of blacks fell 11 percent as compared to a 1 percent increase for whites. In the case of females, both races have experienced higher levels of employment. The greatest gains, however, have occurred among white women.

In light of the relative decline in labor force participation of blacks between 1964 and 1974, the apparent improvement in unemployment patterns of black and white adults is misleading. Affirmative action programs have not succeeded in promoting the employment of black workers. Affirmative action, however, represents only one prong of the antidiscrimination policies. The other prong has been an attempt to ensure that those workers who are employed are treated equally by their employers in terms of compensation and promotion.

Black Wages Relative to Those of Whites

Blacks who were employed during the 1964–1974 period substantially improved their position. As shown in Table 6, more occupational upgrading occurred among employed nonwhites than among employed whites. The proportion of black men employed in white collar jobs—a broad grouping which includes sales and clerical positions as well as higher level professional and managerial jobs—rose from 16

to 24 percent. However, the bulk of this increase occurred between 1964 and 1970 with only moderate gains thereafter. The improvement for black men was spread equally among professional, managerial, sales and clerical jobs. In contrast, most of the white collar gains for black women were clustered in the clerical category.

This upgrading of jobs has produced a steady improvement in the relative median weekly earnings of black wage and salary workers. Between 1967 and 1974, black male earnings increased from 69 to 77 percent of their white counterparts, while black females have almost gained parity with white females (see Table 7). The result of these gains has been an improvement in the median income ratio, particularly for those with strong attachment to the labor force (see Table 8). Median income figures for year-round full-time workers reveal a clear upward trend: from 1967 to 1974 black males' income ratio rose from 64 to 70 percent and black females' income ratio climbed from 74 to 91 percent.

The improvement in earnings and the upgrading of jobs imply that the second prong of the antidiscrimination efforts aimed at equal treatment of workers on the job has been more successful than efforts to increase the number of minority workers hired. However, in order to interpret the implications of the two offsetting developments—less employment but higher wages for those employed—on the relative well-being of the two races, it is necessary to look at changes in the ratio of black and white family income. If, for example, the wage gains accrued to family heads while employment losses were concentrated among secondary workers, the relative position of black families might have improved. Unfortunately, employment of black family heads fell sharply during the 1970s, contributing to a decline in the ratio of black to

Table 6

Occupation of Employed Men and Women: 1964, 1970, and 1974
(Annual averages)

Occupation	1964 Black & other races	1964 White	1970 Black & other races	1970 White	1974 Black & other races	1974 White
Men						
Total employed . . . thousands	4,359	41,114	4,803	44,157	5,179	47,340
Percent	100	100	100	100	100	100
White-collar workers	16	41	22	43	24	42
Professional & technical	6	13	8	15	9	15
Managers & administrators	3	15	5	15	5	15
Sales workers	2	6	2	6	2	6
Clerical workers	5	7	7	7	7	6
Blue-collar workers	58	46	60	46	57	46
Craft & kindred workers	12	20	14	21	16	21
Operatives, except transport	18	15	21	14	17	12
Transport equip. operatives	8	5	7	5	9	6
Nonfarm laborers	22	6	18	6	15	7
Service workers	16	6	13	6	15	7
Farm workers	10	7	6	5	4	5
Women						
Total employed . . . thousands	3,024	20,808	3,642	26,025	4,136	29,280
Percent	100	100	100	100	100	100
White-collar workers	22	61	36	64	42	64
Professional & technical	8	14	11	15	12	15
Managers & administrators	2	5	2	5	2	5
Sales workers	2	8	3	8	3	7
Clerical workers	11	34	21	36	25	36
Blue-collar workers	15	17	19	16	20	15
Craft & kindred workers	1	1	1	1	1	2
Operatives, except transport	14	15	17	14	17	12
Transport equip. operatives	—	—	—	—	—	1
Nonfarm laborers	1	—	1	—	1	1
Service workers	56	19	43	19	37	19
Farm workers	6	3	2	2	1	2

Source: U.S., Bureau of the Census, Current Population Reports, Special Studies, Series P-23 No. 54, *The Social and Economic Status of the Black Population in the United States 1974,* Table 48, p. 73, and Table 49, p. 74.

Table 7

Median Usual Weekly Earnings of Wage and
Salary Workers, 1967–1974

May of Year	Men		Women		Ratio: Nonwhite to White	
	Black & Other Races	White	Black & Other Races	White	Men	Women
1967	$ 90	$130	$ 63	$ 79	0.69	0.80
1968	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1969	104	146	73	88	0.71	0.83
1970	113	157	81	95	0.72	0.85
1971	123	168	87	102	0.73	0.85
1972	129	172	99	108	0.75	0.92
1973	149	193	107	117	0.77	0.91
1974	160	209	117	125	0.77	0.94

Source: U.S., Bureau of Labor Statistics, Special Labor Force Report No. 195 (Government Printing Office, 1977), Table 1, p. 7.

white family income.[5] In addition, changes in family composition between 1970 and 1974 have exacerbated the effect of the shift in work-experience patterns between black and white families.

Black Family Income Gains Eroded in 1970s

Median income of black families increased from 54 percent of white family income in 1964 to 61 percent in 1969, but much of this gain disappeared in the 1970s as the ratio dropped back to 58 percent. Both the improvement and the decline reflect not only the earning experience of the family members but also the composition of the family.

Black family heads have suffered a dramatic decline in employment. While the percentage of male heads of both races who worked during the previous year declined between 1967 and 1974, black males have suffered a significantly larger loss since 1970 (see Figure 1). Between 1970 and 1974 a substantial decline in the proportion of black heads who were employed resulted in a dramatic reversal as the proportion of white families with an employed female head exceeded that for blacks for the first time.

In 1974, black families with heads who worked the previous year had a median income of $9,813 compared to $3,911 when the head did not work. For whites, the comparable figures are $14,717 and $6,403.[6] In light of the large income difference between families with heads who worked the previous year and those with heads who did not work, the relatively larger decline

[5]The percentage of black male family heads employed the previous year fell from 88 percent in 1967 to 82 percent in 1974. For blark female heads the decline was even more drastic from 62 percent in 1967 to 56 percent in 1974. See Figure 1.

[6]U.S., Bureau of the Census, *Current Population Reports*, Series P-60, No. 107 (January, 1976) Table 42, p. 84.

Table 8

**Median Income for All Persons 14 Years Old and Over
With Income and for Year-Round Full-Time Workers,
by Race and Sex: 1967 to 1974**

Sex & Year	Black & other races		White		Ratio: Black & other races to white	
	All persons	Year-round full-time workers	All persons	Year-round full-time workers	All persons	Year-round full-time workers
Men						
1967	$3,323	$4,831	$5,846	$7,505	0.57	0.64
1968	3,718	5,370	6,267	8,047	0.59	0.67
1969	3,935	5,917	6,765	8,953	0.58	0.66
1970	4,157	6,435	7,011	9,447	0.59	0.68
1971	4,316	6,771	7,237	9,902	0.60	0.68
1972	4,733	7,373	7,814	10,918	0.61	0.68
1973	5,113	7,953	8,453	11,800	0.60	0.67
1974	5,309	8,705	8,795	12,434	0.60	0.70
Women						
1967	1,453	3,248	1,855	4,360	0.78	0.74
1968	1,649	3,561	2,079	4,687	0.79	0.76
1969	1,840	4,126	2,182	5,182	0.84	0.80
1970	2,063	4,536	2,266	5,536	0.91	0.82
1971	2,145	5,092	2,448	5,767	0.88	0.88
1972	2,444	5,280	2,616	6,172	0.93	0.86
1973	2,548	5,595	2,823	6,598	0.90	0.85
1974	2,806	6,371	3,133	7,021	0.90	0.91

Sources: U.S., Bureau of the Census, *Current Population Reports* Series P-60 No. 97 (Government Printing Office, 1975) Table F, p. 12 and No. 101 (Government Printing Office, 1976) Table 60, pp. 125–126.

from 1969 to 1974 in proportion of black families with working heads had a negative influence on the overall ratio of black to white family income.

Family income of blacks and whites has also been affected by changes in family composition and the number of earners per family. Historically, black families have had a greater proportion of multiple earners than white families but this situation was reversed in 1970 (see Figure 2). Since most multiple earner families are those in which both husband and wife work, a decline in the proportion of black families with a wife in the paid labor force has contributed to the shift in the black-white ratio of multiple-earner families (see Figure 3). The decline in the proportion of black families with working wives exerts a disproportionately large influence on the overall ratio of black to white family income because the earnings of wives are a more important source of income for black families than for white families. In 1974, black

Figure 1

FAMILIES WITH HEADS WHO WORKED THE PREVIOUS YEAR AS A PERCENT OF ALL FAMILIES, BY SEX AND RACE OF HEAD: 1967-1974
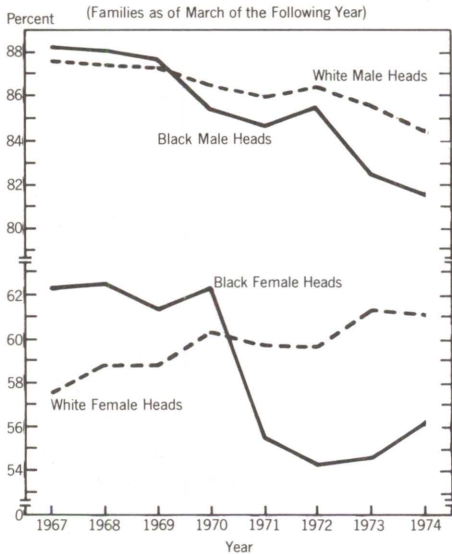
(Families as of March of the Following Year)

Figure 3

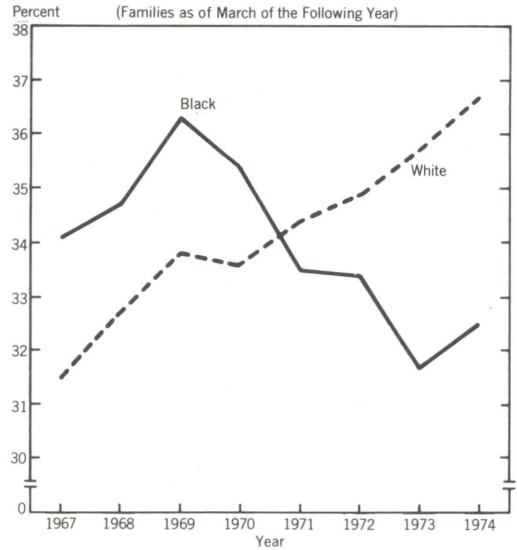## HUSBAND-WIFE FAMILIES WITH WIVES IN THE PAID LABOR FORCE AS A PERCENT OF ALL FAMILIES, BY RACE OF HEAD: 1967-1974

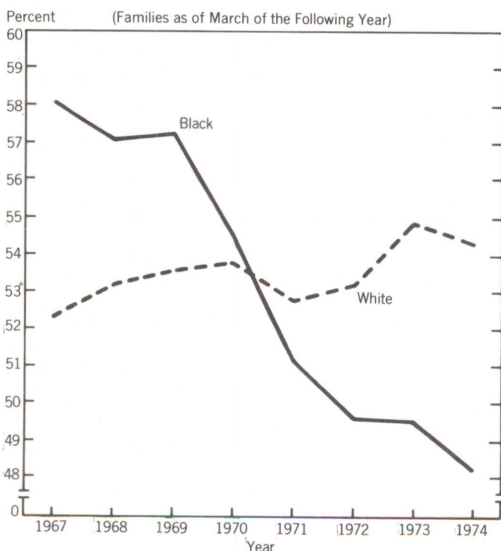(Families as of March of the Following Year)

Figure 2

FAMILIES WITH MULTIPLE EARNERS AS A PERCENT OF ALL FAMILIES, BY RACE OF HEAD: 1967-1974

(Families as of March of the Following Year)

wives contributed 32 percent of family income compared to 25 percent for their white counterparts.[7]

The decrease in the proportion of black husband-wife families has been accompanied by a significant increase in the proportion of black families with a female head. Between 1969 and 1974, the period when black to white family income has declined, the proportion of black families with a female head increased from 28 to 34 percent compared to the corresponding figures of 9 and 10 percent for whites.[8] Most of the increase occurred among black female heads in the 14 to 34 age group. Since female-headed families generally receive less income than families headed by a male, the proportionately greater increase in the number of black families

[7]*Op. cit.,* Table 81, p. 155.
[8]*Op. cit.,* Table 15, p. 26.

headed by a female has also lowered the ratio of overall black to white median family earnings.

The importance of the shifts in family composition and the work experience of family heads is evident by comparing the relative income of black individuals (Table 8) with the relative income of black families (Table 2). While black family income had declined from 61 to 58 percent of that of white families between 1970 and 1974, the relative income of black men and women has remained relatively constant since 1970.[9] Although the actual decline in the relative position of black families can be explained by changes in family composition, the fact that gains made during the 1960s began to level off as soon as the economy slackened in the 1970s raises doubts about the effectiveness of government antidiscrimination policies. Such a reversal in the upward trend for minorities would not be expected if noneconomic government policies were the propelling force.

II. *An Explanation of the Mixed Success of Antidiscrimination Policies*

If labor markets were perfectly competitive (that is, if wages and employment levels were determined purely by the supply and demand for workers), then the elimination of discrimination should lead to both higher wages and greater employment for blacks with a compensating reduction in wages and employment for whites. While black wages have increased, black employment has fallen compared to white. This section will focus on those factors which might have prevented the expected labor market

adjustments, concluding that much of the early success in terms of job upgrading and wage gains for minorities may have been primarily the result of strong aggregate demand during the 1960s.

A simple model will help explain the mixed success of government policies in the 1960s and 1970s. In a perfectly competitive labor market the wage level and the level of employment are determined by the supply of available workers and the demand for labor. Employers' preference for white workers, however, tends to split the labor market into two segments. Demand for nonwhite workers is depressed as nonwhites are prevented from competing with whites for jobs. Unemployment rates and wages may differ dramatically then between the two markets depending on the relative conditions of supply and demand existing in each.[10] Figures 4a and 4b depict separate labor markets for blacks and whites prior to efforts to eliminate discrimination. The wage for blacks (W_B) is significantly lower than the wage for white workers (W_W).

By outlawing discrimination in hiring practices, government policies attempt to merge the black and white markets. Graphically, the merging of the two labor markets is represented by horizontally summing the supply and demand curves for blacks and whites (see Figure 4c). The new wage rate for both black and white workers is determined by the intersection of the combined supply and demand curves. The level of black and white employment is provided by the intersection of the new wage (W_T) with the

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[9]Transfer income, in the form of welfare and public assistance payments, prevented an even greater decline in the ratio of black to white family income during this period. Welfare and assistance income grew from 4.9 to 6.0 percent of black family income from 1970 to 1974. This income source is not as important for white families as it accounted for only 0.6 percent of their income in both 1970 and 1974.

[10]More complicated segmented labor market theories have been developed which explicitly explore supply-side considerations not treated here. Doeringer and Piore, among others, have given attention to the issues of human capital, work attitudes and location in explaining discrimination. If these factors aare important, affirmative action policies alone may not be sufficient to achieve the goals of increased black employment and parity of black and white wages. The interested reader should see Doeringer and Piore, *Internal Labor Markets and Manpower Analysis,* (Lexington, Mass.: Heath, 1971).

Figure 4

THE EFFECT OF OUTLAWING DISCRIMINATION IN A PURELY COMPETITIVE MODEL

DISCRIMINATION CREATES TWO LABOR MARKETS

White
(a)

Black
(b)

ELIMINATING DISCRIMINATION UNIFIES
LABOR MARKET

(c)
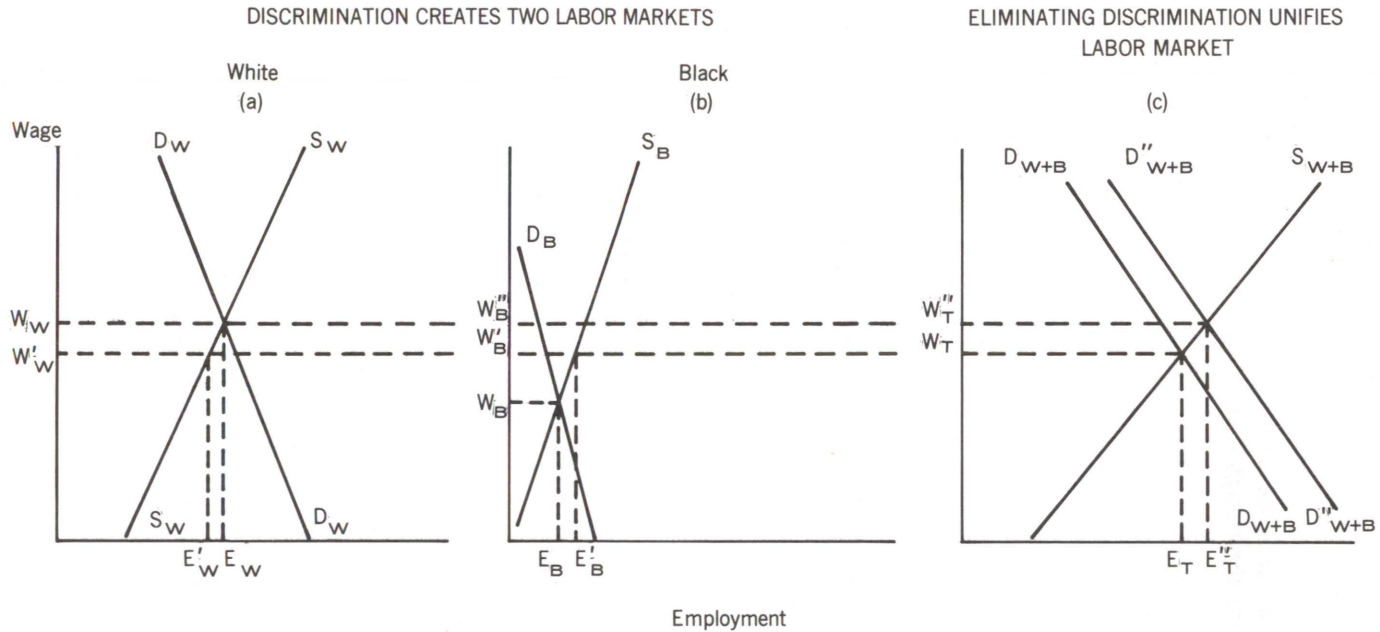
Wage

Employment

supply curve for each race. As shown in Figures 4a and 4b combining the two labor markets should result in higher wages and greater employment for blacks with corresponding reductions for whites.[11]

In reality, institutional constraints such as wage rigidity and seniority may limit the effectiveness of attempts to combine segregated markets by protecting whites from a reduction in wages or employment. Since seniority clauses prevent employers from firing whites to hire blacks, additional jobs must be created for blacks to fill. However, firms will not hire more workers unless the wage can be lowered for all workers, permitting employment to be expanded at no additional cost. Since contract agreements make wages inflexible in the downward direction, improvement for blacks depends on an expansion of the economy to increase aggregate demand.

During the late 1960s the economy grew rapidly creating a very strong demand for labor. This surge in demand, depicted in Figure 4c as a shift to the right in the combined demand curve, allowed whites to maintain their original wage and employment position while permitting gains for black workers. In the tight labor market blacks were hired for jobs in high-wage industries normally dominated by white males, resulting in an increase in relative wages and a temporary increase in employment for adult black workers. When the upswing slowed during the seventies, the number of high-wage positions shrank. Consequently, workers with least seniority were laid off. The result was a slowdown in upgrading for minorities as a whole and a reduction in black employment relative to white.

A recent study of wages and hiring in 12 major industries during 1964–1971 characterized low-wage industries as training grounds for high-wage industries.[12] During periods of rapid expansion high-wage industries recruited experienced workers from the feeder industries resulting in the most significant upgrading for prime age black males. Young black workers did not share in the upgrading enjoyed by adult blacks because they lacked the experience necessary to enter the high-wage occupations of the white sector.

Although upgrading would not be expected for young workers, either black or white, the position of black teenagers deteriorated steadily between 1964 and 1974. One possibility is that the decline in black male teenage employment may be an unintended perverse effect of equal pay guarantees. Just as increases in the minimum wage tend to reduce the number of jobs available to low-skilled workers, the insistence on wage equality may have pushed unskilled and inexperienced young workers out of jobs. Thus, policies aimed at improving the economic standing of minorities may actually have worsened the situation for younger blacks by pricing them out of the market.

Conclusion

Policies to improve the economic status of minorities attempted to unify the racially segmented labor market by outlawing discrimination in wages and hiring. Based on a simple supply-demand analysis, a combination of the two markets should have raised the employment and wages of minorities at the expense of white workers. Although prime age black males enjoyed some immediate gains, black teenagers suffered a steady decline in their labor market

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[11]This analysis assumes that employees recontract regularly with their employers. As this is not the case, affirmative action programs must operate through both the external labor market and the internal labor markets of each individual firm. It is possible that it may take longer than ten years for the anticipated changes to occur.

[12]Wayne Vroman, "Worker Upgrading and the Business Cycle," in *Brookings Papers on Economic Activity,* No. 1, 1977, pp. 229–252.

position. Moreover, the improvement in relative wages for adult black workers has been offset largely by the employment loss experienced by blacks during the seventies.

The recent deterioration of the labor market status of blacks suggests that institutional constraints may have impeded efforts to merge segregated labor markets. Wage rigidity and seniority systems protect whites, who are firmly entrenched in high-wage industries, from reductions in wages and employment. Attempts to upgrade minority workers are thereby stymied by a scarcity of well-paying jobs. This fact was masked during the economic expansion of the late 1960s because strong aggregate demand increased the number of positions in the white sector of the market, thereby providing blacks an entry into high-wage industries. However, when demand slackened during the early seventies accessions ceased and cutbacks affecting workers with the least seniority resulted in heavy employment loss among recently hired minorities.

The dramatic decline in black employment was exacerbated by adverse shifts in the composition of the family during the 1970s. The relative increase in the proportion of black female-headed families has contributed to the erosion of much of the gain in the black-white ratio of median family income. The combined effect of these social and economic changes was a deterioration of the relative wellbeing of blacks to a position only moderately better than in 1964.

In light of the experience of the seventies, efforts to promote the economic advancement of minorities must be judged a mixed success. While policies aimed at insuring equal treatment on the job have raised the relative wages of black workers, attempts to stimulate the employment of minorities have faltered in the face of institutional constraints. It appears that employers have been "creaming" by hiring and promoting experienced and skilled black workers while directing little effort toward increasing overall black employment.

Tax Incentives: Their Impact On Investment Decisions and Their Cost to the Treasury

By Richard W. Kopcke and Richard F. Syron*

THE importance of investment to a healthy economy has stimulated wide interest in providing adequate incentives for capital formation. Traditionally attention has focused on the effect of investment incentives on the economy as a whole. Recently, however, interest has developed in the possibility of using this approach to stimulate particular geographic areas or even individual industries. The efficiency of alternative investment incentives may be quite different for these more narrowly defined purposes than for their traditional uses.

This article examines the relative efficiency of three different investment incentives designed to increase corporate cash flow: an interest rate subsidy, a supplemental investment tax credit, and a change in depreciation allowances.[1] Our purpose is two-fold: first, to explain how investment incentives work; second, to examine the circumstances under which each type of incen-

tive is likely to be most useful. Section I describes the role of investment incentives. Section II examines the determinants of investment spending from the firm's viewpoint and describes how each of the three investments stimulates investment spending. Section III compares the cost to the Treasury of the three incentives for any given benefit to the firm and indicates under which circumstances each would be most cost effective. Section IV concludes that accelerated depreciation is likely to be a superior mechanism for temporarily stimulating investment in depressed areas[2] and for increasing the long-term share of investment in national output although extended investment tax credits may have some advantages for temporary economy-wide stimulus.

Section I: The Role of Investment Incentives

Incentives for capital formation have had two principal goals: first, to increase the share of

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[1] An important question is what the investment response of the firm would be to this increased cash flow. This article does not address that question directly; for a discussion of that issue see Richard W. Kopcke, "The Behavior of Investment Spending during the Recession and Recovery, 1973–76" and "The Outlook for Investment Spending to 1980," both in the *New England Economic Review*, November/December 1977.

[2] Defining depressed areas is a difficult issue. Many government programs use local unemployment rates to define economic distress but the reliability of these figures is questionable. Some proponents of regional incentives advocate a broader eligibility test possibly including such factors as the rate of employment growth. The geographic boundary for determining area eligibility must also be defined. While some programs use individual political jurisdictions, many economists prefer using Standard Metropolitan Statistical Areas.

investment in total national output, thereby encouraging the modernization of plant and equipment; and second, to stimulate short-term economic activity by enhancing aggregate demand for goods and services. In 1954, 1962 and 1971, tax legislation permitted business to accelerate depreciation allowances in an attempt to permanently increase the Nation's capital stock. In addition, legislation in 1962 introduced investment tax credits based on purchases of producers' durable equipment. Unlike accelerated depreciation, the tax credit has had a volatile history because it has been used as a tool of demand management. Not only has it varied in size and coverage, but in 1966 and 1969 the credit was suspended to alleviate inflationary pressures. In both cases, the credit was subsequently reinstated to stimulate economic activity.

While investment incentives have been used almost exclusively as a tool of national economic policy, in recent years this approach has been discussed as a means of stimulating the economies of depressed cities or regions. Such targeted investment incentives would expand employment opportunities in the short run through increased construction activity and more importantly, would enhance an area's competitive position thereby improving longer-term employment opportunities.

In general, two different approaches could be used for investment incentives in depressed areas: a variant of national tax incentives, and subsidized financing.[3] Both tax incentives and financing incentives have the same objective, to reduce the relative cost of investing in depressed areas, although there is a significant difference in how they would accomplish this goal.

One advantage of tax incentives for stimulating investment in depressed areas is that administrative mechanisms for their use are already in place. Supplemental tax benefits for investments in eligible areas could be tied into existing national programs in the interest of simplicity. Firms investing in these areas could be granted an additional investment tax credit or allowed some further acceleration of depreciation schedules.

Financing subsidies could be provided through wider use of industrial revenue bonds, some form of development financing such as an Urban Bank, or a straightforward interest rate subsidy. Industrial revenue bonds lower the issuers' borrowing costs because their interest costs are exempt from Federal income taxation. Thus investors are willing to accept a considerably lower interest rate on these securities than they would on taxable bonds. However, research has indicated that tax exemption is an inefficient subsidy and that the benefit received by the firm issuing industrial revenue bonds is less than the loss in tax revenue to the Treasury.[4]

Numerous proposals have been made for creating development finance institutions. These development banks would either borrow from the Treasury directly or issue federally guaranteed securities in the open market and, in turn, make loans at a lower-than-market interest rate to eligible projects. There are a number of difficult questions about how such a develop-

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[3]Although this article only compares the relative effectiveness of different investment incentives, a variety of other approaches could also be used to improve employment opportunities for residents of depressed areas such as wage subsidies, low state and local taxes on business in these areas, and finally migration allowances to help the disadvantaged move to areas experiencing stronger economic growth.

[4]A 1969 Treasury staff study estimated that interest savings of state and local governments on the outstanding stock of tax-exempt securities was about 67 percent of the lost Treasury revenue. See Joint Economic Committee of the U.S. Congress, *Hearings on the 1969 Economic Report of the President*, Ninety-first Congress, First Session, U.S. Government Printing Office (July 1972), p. 30. See also David J. and Attiat F. Ott, "The Tax Subsidy Through Exemption of State and Local Bond Interest," *The Economics of Federal Subsidy Programs*, Part 3, Joint Economic Committee of Congress, U.S. Government Printing Office, Washington, D.C. (July 1972), p. 305; Peter Fortune, "Tax Exemption of State and Local Interest Payments: An Economic Analysis of the Issues and an Alternative," *New England Economic Review*, May/June 1973, pp. 3–31.

ment bank would decide which projects it should finance. If the Bank were to support all projects where conventional financing was unavailable, the associated risk would almost surely result in high costs due to loan losses. Moreover, the absence of a credit market test makes it difficult to judge which projects are creditworthy. For this reason, a tax rebate based on interest expenses is the simplest way to offer eligible investments lower borrowing costs. Financing decisions would be made according to conventional market tests but debt service costs would be reduced.

Because a direct interest rate subsidy can provide the same financing savings to firms as either industrial revenue bonds or a development bank and is administratively simpler, we have used the rate subsidy approach in making our calculations of the impact of financing incentives. An interest rate subsidy is essentially an investment tax credit which is extended over an asset's lifetime rather than concentrated at the start of the project's life. Unlike an investment tax credit, however, the value of an interest rate subsidy will vary with the proportion of investment which is financed by debt. Rate subsidies will be most substantial for highly levered ventures, and they will be least effective for projects relying heavily on internal funding.

Section II: Investment Incentives and the Firm

In deciding whether or not to undertake particular investments, business managers compare the present value of the project's return over its useful life with the price of acquiring the necessary plant and equipment. The more ample the stream of receipts relative to the price of capital goods, the more attractive is the investment project. If the present value of the project's cash flow exceeds the proposed facility's cost, a firm will ordinarily proceed with the investment.

The prospective cash flow earned by any project depends upon many factors. Foremost is the relatively uncertain flow of net operating revenues which management expects to realize from the proposed facility. However, three other factors also play a crucial role. First, capital expenditures may entitle the firm to receive investment tax credits, rebates against future tax liabilities. Second, tax laws recognize that capital goods are consumed by wear and tear in the production process, so investors are allowed to depreciate plant and equipment. Finally, because projects typically are not financed entirely by stockholders, investments obligate the firm to pay creditors debt service charges during much of the project's useful life. Variations in any of these three elements of cash flow will tend to either stimulate or deter capital formation independently of the outlook for net operating revenues.

Government fiscal policy can directly influence investment spending by offering higher investment tax credits, by accelerating depreciation allowances, or by subsidizing the interest expenses of business enterprises. However, these three options may not be equally efficient. For example, interest rates subsidies designed to spur capital formation might cost the Treasury more than an investment tax credit which provides the same amount of stimulus. Accordingly, selecting the most efficient policy requires two calculations. First, it is necessary to determine the relative magnitudes of the credits, allowances, and subsidies which are required to elicit the desired increase of investment spending. Then, the cost to the government of the different measures must be compared.

Investment tax credits entitle a firm to deduct from its Federal income tax liabilities a certain proportion of its expenses for equipment

purchases. For a profitable enterprise, these credits — currently as high as 10 percent — provide a substantial contribution to the first year's return for many investment projects. Under existing Federal tax law, the credit does not reduce the prospective depreciation allowances on equipment. Thus the investment tax credit (ITC) is effectively a rebate paid by the government on the price of eligible capital goods. Because the ITC is a tax credit and not a deduction, its value is the same to all profitable firms. Accordingly, the ITC is a straightforward and direct device for stimulating capital spending.[5]

While an ITC increases the return on an investment project by giving a firm a Federal tax rebate, accelerated depreciation simply shifts tax deductions from the later stages of an asset's life toward earlier years. Although this acceleration does not increase the total depreciation deductions a firm can claim on an asset, the tax deductions are worth more to the firm because they may be taken earlier. By taking deductions sooner rather than later, investors may use the proceeds to repay loans or to purchase securities and other earning assets sooner. Accordingly, accelerated depreciation provides added income for eligible investment projects. The benefits of accelerated deductions will vary from project to project depending on a number of factors, including asset life, the tax rate, and the rate of return the firm can earn on the proceeds (the firm's after-tax discount rate).[6] For example, Table I compares the value of highly accelerated quadruple-declining balance depreciation

allowances to the less accelerated straight-line allowances. At a 10 percent discount rate, the switch to accelerated depreciation is worth 6.3 cents per dollar of capital expenditure for a 5-year investment project. For a 10-year project, this acceleration of allowances is worth 8.9 cents per dollar of capital expenditure. At a discount rate of 15 percent, accelerated deductions are worth 8.2 cents per dollar of investment spending for a project with a 5-year lifetime. Therefore, faster writeoffs are most valuable for profitable businesses which possess high discount rates and invest in long-lived capital assets.

According to current tax codes, depreciation allowances for producers' durable equipment and nonresidential structures are calculated differently. Equipment can be depreciated in at least three different ways for tax purposes. Under the straight-line method, yearly deductions are constant throughout the asset's life. The two other formulas, sum of the years' digits and double-declining balances, allow a firm to depreciate a higher share of an asset's value earlier in its life. In general, assets which are eligible for the investment tax are also eligible for the most highly accelerated depreciation allowances.

Chart I graphs the profile of allowances for three different depreciation schemes. The horizontal line represents the flat profile of straight-line depreciation: a machine purchased for $10,000 with a statutory life of 10 years is depreciated by a constant amount, $1,000 in each year, assuming that its scrap value is nil. The dotted line represents the schedule of allowances for sum of the years' digits deprecia-

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[5]Currently the investment tax credit can be applied only to certain types of assets, primarily personal property with an economic life of three years or more. Buildings are not generally eligible for the credit. The amount of credit allowable in any year may not exceed $25,000 plus 50 percent of a firm's tax liability in excess of $25,000. However, any unused portion of the credit can be carried back three years and forward five.

[6]The present value of depreciation allowances must reflect not only the rate of return at which a firm may invest funds but also the risks associated with the prospective stream of

receipts. For a profitable enterprise, management may confidently anticipate taking full advantage of potential depreciation deductions. For a less secure firm, management may not be able to claim depreciation allowances according to schedule. Accordingly, the second firm may add a "risk premium" to its discount rate when evaluating prospective depreciation allowances; this adjustment lowers the present value of these deductions.

TABLE I

The Present Value of Depreciation Allowances (After-Tax) Relative to the Purchase Price of Durable Equipment

After-Tax Discount Rate	5-Year Lifetime			10-Year Lifetime			15-Year Lifetime			20-Year Lifetime		
	Straight-Line	Sum of the Years' Digits	Quadruple-Declining Balance	Straight-Line	Sum of the Years' Digits	Quadruple-Declining Balance	Straight-Line	Sum of the Years' Digits	Quadruple-Declining Balance	Straight-Line	Sum of the Years' Digits	Quadruple-Declining Balance
5.0%	41.6%	42.9%	45.2%	37.1%	39.8%	42.7%	33.2%	37.0%	40.5%	29.9%	34.5%	38.5%
7.5	38.8	40.7	43.9	32.9	36.5	40.4	28.2	32.9	37.5	24.5	29.9	35.0
10.0	36.4	38.7	42.7	29.5	33.6	38.4	24.3	29.6	34.9	20.4	26.3	32.0
12.5	34.2	36.8	41.5	26.6	31.2	36.6	21.2	26.8	32.7	17.4	23.3	29.6
15.0	32.2	35.2	40.4	24.1	29.0	34.9	18.7	24.4	30.7	15.0	20.9	27.4
20.0	28.7	32.2	38.4	20.1	25.3	32.0	15.0	20.6	27.4	11.7	17.3	24.0

This table assumes the scrap value is nil and that the corporate tax rate is 48 percent.

SOURCE: Technical Appendix

tion, the most rapid acceleration currently allowed by law. The total deduction for capital consumption after ten years is the same in both cases, but the sum of the years' digits formula reduces allowances in later years while increasing allowances in earlier years so that the profile of deductions is twisted. Quadruple-declining balance (QDB) depreciation, represented by the dashed line on the chart, is one approach for twisting the schedule of allowances even more. In our example of an asset with a ten-year life, QDB permits almost two-thirds of the total capital consumption deductions to be claimed in the first two years, whereas the sum of the years' digits requires more than four years to attain a similar writeoff, and straight-line depreciation requires more than six years.[7]

As the schedule of depreciation allowances is accelerated, the present value of the deductions increases, as shown in Table I. For instance, if a firm's after-tax rate of discount is 10 percent, for equipment costing $10,000 with a ten-year lifetime, the switch from straight-line to the sum of the years' digits increases the present value of after-tax cash flow by $410; the switch from the sum of the years' digits to QDB is worth another $480. Each of these increases represents a 14 percent rise, approximately, in the present value of depreciation allowances. Even though the total amount of deductions is unchanged, accelerated depreciation stimulates capital formation by permitting investors to claim allowances earlier, thereby increasing the present value of cash flow for eligible projects.

The last policy option, an interest subsidy, reduces debt service charges for the life of loans used to finance plant and equipment. Much like an ITC, this policy option boosts investment incentives by making direct contributions to business net receipts. However, unlike the ITC, the contributions are paid out over many years. In effect, then, the interest rate subsidy is similar to a series of investment tax credits extended over the lives of eligible assets.

[7]Of course, QDB is only one among many techniques for accelerating depreciation allowances. Even though we use QDB exclusively in our examples, the use of any other highly accelerated depreciation schedule would not alter our conclusions.

Depreciation Methods Now Allowed

The table below compares the amount of depreciation that can be taken each year under the three different depreciation approaches. The table assumes an asset has a depreciable value of $100 and a useful life of ten years.

Under the straight line basis the total depreciable value of the asset is simply prorated over the equipment's useful life, so 1/10 of the value or $10 is taken as depreciation each year.

In the double declining balance method 200 percent of the straight line rate may be applied to the asset's undepreciated value. This value declines every year because it equals the asset's original value less the accumulated depreciation. For example, $20 or 20 percent of the asset's fixed value is taken as depreciation in year one and $16 or 20 percent of the remaining $80 ($100 − $20) asset value is taken in the second year.

Under the sum of the digits method a varying depreciation percentage is applied each year to the constant original cost of the asset. The rate used in each year is a fraction, the denominator of which is the sum of the digits representing each of the years in the asset's estimated life (10 + 9 + 8 etc. in our example) and the numerator is the current year. In our example the denominator is 55 so in the first year 10/55 or 18 percent of the asset's value is deducted; in the second year, 9/55 or 16 percent of the asset's value is the depreciation allowance.
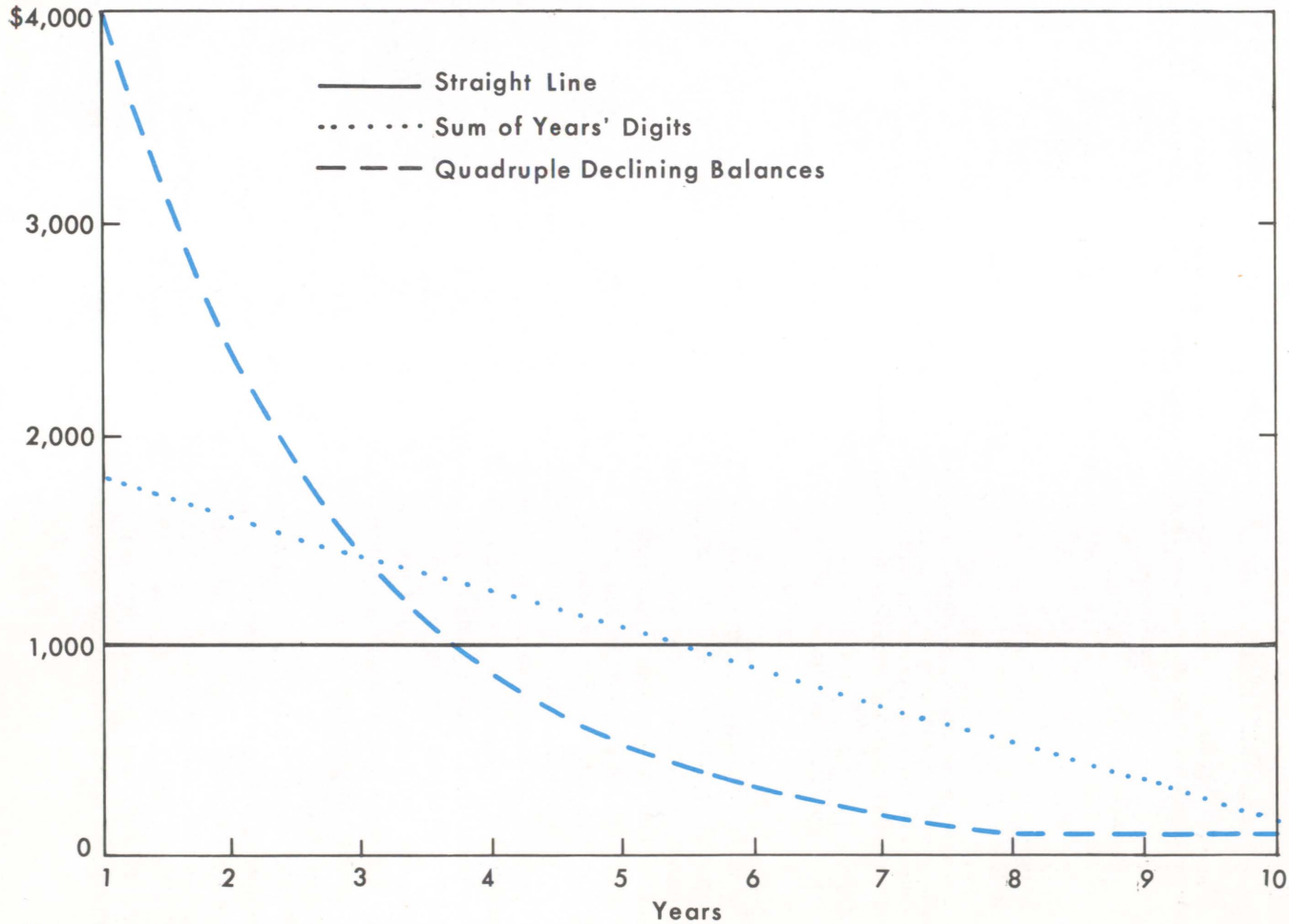
Depreciation allowances for nonresidential structures may be computed by the straight-line method or by the 150 percent declining balance formula. Although 150 percent declining balance schedules accelerate depreciation allowances more than the straight-line approach, this method is not as liberal as sum of the years' digits.

| | Straight-Line | | Declining Balance | | | | Sum of the Years' Digits | |
| | Annual Deduction | Cumulative Cost Recovered | Annual Deduction | | Cumulative Cost Recovered | | Annual Deduction | Cumulative Cost Recovered |
Year			150%	200%	150%	200%		
1	$10	$ 10	$15	$20	$15	$20	$18	$ 18
2	10	20	13	16	28	36	16	34
3	10	30	11	13	39	49	15	49
4	10	40	9	10	48	59	13	62
5	10	50	8	8	56	67	11	73
6	10	60	6	7	62	74	9	82
7	10	70	6	5	68	79	7	89
8	10	80	5	4	73	83	5	94
9	10	90	4	3	77	86	4	98
10	10	100	3	3	80	89	2	100

Source: Clarence F. McCarthy, *The Federal Income Tax — Its Sources and Applications*, (Englewood Cliffs, N.J.: Prentice-Hall, 1974), pp. 253–262.

SELECTED SCHEDULES OF DEPRECIATION ALLOWANCES

($10,000 INVESTMENT WITH A TEN-YEAR LIFETIME)

Legend:
- ——— Straight Line
- · · · · · · Sum of Years' Digits
- – – – Quadruple Declining Balances

Y-axis: $4,000 / 3,000 / 2,000 / 1,000 / 0

X-axis: Years — 1 2 3 4 5 6 7 8 9 10

Source: See box on page.

TABLE II
Changes in Investment Tax Credits and Interest Rate Subsidies
Equivalent to Adopting Quadruple-Declining Balance Depreciation Allowances

After-Tax Discount Rates	5-Year Lifetime		10-Year Lifetime		15-Year Lifetime		20-Year Lifetime	
	Investment Tax Credit	Interest Rate Subsidy	Investment Tax Credit	Interest Rate Subsidy	Investment Tax Credit	Interest Rate Subsidy	Investment Tax Credit	Interest Rate Subsidy
		(basis points)		(basis points)		(basis points)		(basis points)
5.0%	2.3%	108	2.9%	76	3.5%	64	4.0%	58
7.5	3.2	159	3.9	111	4.6	96	5.1	87
10.0	4.0	209	4.8	150	5.3	124	5.7	112
12.5	4.7	259	5.4	182	5.9	154	6.3	141
15.0	5.2	300	5.9	216	6.3	182	6.5	164
20.0	6.2	392	6.7	282	6.8	236	6.7	209

Assuming that the depreciation allowances on equipment are accelerated from sum of the years' digits to quadruple-declining balance, that the scrap value is nil, and that investment is 75 percent financed by amortized loans, this table shows the increase in the investment tax credit or the interest rate subsidy necessary to obtain a change in the present value of net revenues which matches that of the switch to accelerated depreciation.

SOURCE: Technical Appendix

Table II compares the effects of the ITC, accelerated depreciation, and interest subsidies as business investment incentives. This example assumes that a proposed investment project involves only the purchase of equipment with a lifetime of 10 years which is to be funded 75 percent by debt and 25 percent by equity. According to the table, at a discount rate of 10 percent, management would find an increase in the ITC of 4.8 percentage points, an interest rate subsidy of almost 3 percent, yielding an after-tax interest subsidy of 150 basis points, and permission to use QDB depreciation equally attractive — they all increase the present value of net cash flow by equal amounts.

While these particular magnitudes are appropriate only for this specific example, the table does illustrate a general rule: with lower discount rates, smaller increases in the ITC and interest rate subsidies are required to match the effect of switching to faster depreciation, and with higher discount rates, larger increases in the ITC and interest subsidies are necessary to match the value of QDB depreciation. The reason for this finding is simple. At low discount rates, the acceleration of depreciation deductions is worth relatively little, as is evident in Table I: future allowances are not discounted very heavily, so accelerating them adds relatively little to discounted cash flow. Consequently, small credits or subsidies are equally attractive. At high discount rates, accelerated depreciation is worth relatively more, because the firm values highly the increased cash flow available in the immediate future while it discounts heavily the loss of depreciation deductions during the asset's later years. In this case, more substantial increases in the ITC and interest subsidy are necessary to match the impact of accelerated depreciation.

From the viewpoint of business management, investment tax credits, accelerated depreciation allowances, and interest rate subsidies can provide attractive investment incentives. In

addition, it is clear that the after-tax rate of discount of business management is critical in determining how effective each policy option might be. By way of example, Table II shows what combinations of ITC, QDB depreciation, and interest rate subsidy management will find equally acceptable for several different discount rates. Given this information, the Treasury may choose the least expensive policy.

Section III: The Cost of Different Investment Incentives to the Treasury

Depending upon economic conditions, the need for government fiscal policy to enhance capital formation may be temporary or indefinite. Temporary tax incentives might be appropriate for stimulating a depressed region or a distressed industry if the objective is to provide a short-term boost rather than a permanent subsidy. For example, a firm might be granted incentives for investing in a particular area until its unemployment rate dropped below a critical level. Temporary tax incentives for investment might also be used as a device for stimulating the economy as a whole during a general slump. In the event that capital formation is chronically below acceptable levels, the appropriate fiscal stimulus may be maintained indefinitely.

From the government's viewpoint, the relative costs of a supplemental ITC, extended investment subsidies, and a more accelerated schedule of depreciation allowances depends on how they are used. If the stimulus is temporary, the relative costs of the three alternative incentives will depend on the difference, if any, between business and government discount rates. On the other hand, if the incentives are to be used in perpetuity, the relative costs may depend on the relative magnitudes of the long-term rate of growth of investment spending and business discount rates.

The Temporary Stimulus Case

The Treasury analyzes the cost of a policy much like business analyzes its benefit. A fiscal program which boosts a project's cash flow by a certain amount each year must reduce the government's net revenues by an equal amount. Therefore, just as business managers discount the stream of prospective credits or subsidies to assess their potential benefits, the Treasury discounts the net revenue losses to determine the cost of each policy option.

To reach a particular target for investment spending, the three alternative incentives must offer identical increases in discounted cash flow on prospective investment projects. If government and business discount rates are equal, not only would the three programs be equally attractive to investors, but they would be equally expensive for the Treasury as well. In this case, all the incentives are equally efficient. However, as discussed below, in some cases government and business discount rates may diverge. If the government's discount rate is less than that of business, accelerated depreciation is the most efficient investment stimulant.[8] On the other hand, if the government's discount rate is greater than that of business, an interest rate subsidy, or extended ITC, is the most efficient.

Table II illustrates this simple principle. For example, if the firm's discount rate is 10 percent, then, for a machine with a 10-year lifetime, any increase in the ITC less than 4.8 percentage points is less attractive than QDB accelerated depreciation. In other words, the government must offer the firm a supplemental ITC at least as large as 4.8 percent to stimulate investment spending as much as QDB depreciation. If the

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[8]It should be noted that in this context the most "efficient" policy for stimulating investment is simply the one which increases the public debt the least. So defined, an "efficient" policy does not necessarily increase the Nation's productive capacity, real wealth, or living standards more than any other means of stimulating investment spending.

government's discount rate is 5 percent, then any increase in the ITC exceeding 2.9 percentage points yields larger discounted revenue losses than offering investors QDB depreciation. Because a supplemental ITC of 2.9 percent is not sufficient to spur investment spending as much as QDB depreciation, and because any increase in the ITC exceeding 2.9 percentage points is more costly to the Treasury than QDB depreciation, accelerated depreciation is the more efficient tax incentive.

Clearly, the same analysis applies to interest rate subsidies as well, because they too must increase with the discount rate. Therefore, when the government's discount rate is less than that of business, accelerated depreciation is the most efficient investment stimulus.

If the positions are reversed so that the Treasury's discount rate is 10 percent and business discount rates average 5 percent, interest rate subsidies stimulate capital formation most efficiently. For business, a 2.9 percent supplemental ITC, an increase in interest rate subsidies of 76 basis points, and quadruple-declining balance depreciation allowances are equally attractive alternatives. Yet accelerated depreciation is so costly to the Treasury that the government would be willing to offer either a 4.8 percent point increase in the ITC or a 150 basis point interest subsidy instead. In this case, it is less expensive to offer business a 2.9 percent supplemental ITC than it is to offer accelerated depreciation but interest rate subsidies are even more economical.[9] The reason the debt service subsidy is so efficient is that the value of the subsidy, spread out over the 10-year life of the loans, is relatively high at low business discount rates, but the government's high discount rate

shrinks the perceived revenue losses so that the cost of the program is relatively low. The ITC offers no similar opportunity for the Treasury to exploit the difference between its rate of discount and that of business; investment tax credits are paid too soon after investment takes place.

Although these illustrations depend on the specific example provided by Table II, the conclusion is general. The ITC and interest rate subsidy must rise with the discount if they are to remain as attractive as accelerated depreciation, and interest rate subsidies must increase faster than the ITC. Therefore, if the government's discount rate is less than that of business, accelerated depreciation allowances provide the most efficient investment stimulus. If the government's discount rate exceeds that of business, the interest rate subsidy, or extended ITC, is the most attractive policy. Finally, if government and business have equal discount rates, there is no difference in the cost of these programs.

The Long-Run Stimulus Case

If the investment stimulus program is to last indefinitely, for example the accelerated depreciation allowances established in the early 1960s are considered permanent, the Treasury may not be able to select a policy simply by discounting future revenue losses. If the growth rate of nominal investment spending is greater than the Treasury's discount rate, then the present value of revenue losses for any policy is infinite. In this case, the policies' relative costs per dollar of investment spending must be compared. The alternative which requires the lowest revenue drain per dollar of spending in the long run is the most efficient option.

Accelerating depreciation allowances is the most efficient stimulus for investment spending when the growth rate of investment spending is less than the business after-tax discount rate; on

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[9]Whereas the use of a supplemental ITC instead of QDB depreciation would reduce the Treasury's discounted revenue losses by 40 percent in our example, interest subsidies reduce revenue losses by 49 percent. $.40 = (4.8 - 2.9)/4.8$, and $.49 = (150 - 76)/150$. For more detail, refer to the Technical Appendix.

the other hand, if the growth rate exceeds the business discount rate, an interest rate subsidy, or extended ITC, is most efficient. These conclusions are similar to those for the temporary stimulus, except that the growth rate of investment spending has replaced the Treasury's discount rate.

To see why the rate of growth of spending is so important, compare the cost of tax incentives for slow investment growth with their cost for faster investment growth. Because accelerated depreciation does not alter the total depreciation allowances that can be claimed on a particular asset, higher deductions now are ultimately offset by lower deductions later. If the growth in investment spending is slow, the Treasury's revenue losses from higher allowances on new investment are largely offset by the lower allowances which firms are claiming on earlier investments. However, higher investment growth means that the difference between past and present levels of spending are much larger. In this case, the higher deductions allowed on current investment projects are offset less by the lower allowances being claimed on past projects.

Another way of understanding this idea is to consider the Treasury a lending facility; by allowing firms to use accelerated depreciation the Treasury is essentially granting them a loan, they pay less taxes now, more later. In the slow growth case, the revenue the Treasury recaptures from having old loans repaid offsets most of the cost of new commitments. However if investment spending is growing fast enough, the size of new commitments becomes so great that the repayments on old loans are not sufficient to offset it.

As the growth rate increases, the rising expense of accelerated depreciation justifies the government's offering higher investment tax credits and interest rate subsidies as alternatives. However, the cost of an ITC is linked to current levels of investment spending, whereas the cost of interest rate subsidies is linked, in part, to current spending, and, in part, to past levels of spending. As a result, interest subsidies can exploit the difference between past and present levels of investment spending to reduce government losses, but ITCs cannot. Therefore, as the growth rate of investment increases, the Treasury will be willing to increase interest rate subsidies faster than the ITC.

Thus, the growth rate of investment spending becomes the government's "discount rate" weighting the revenue gains and losses entailed by each of the different incentives. Accordingly, a table describing the increases in the ITC and interest rate subsidies which are as costly as quadruple-declining balance depreciation would be identical to Table II except that the growth rate of investment replaces the government's discount rate. In this case the cheapest policy for the Treasury is accelerated depreciation if private firms discount rates exceed the nominal rate of growth of investment. If the converse is true, a rate subsidy is most economical.

What are the Treasury's and Business's Relative Discount Rates?

Because both government and business represent a common constituency, the Nation's citizens and investors, economic theory suggests that the discount rates for both government and business should be equal, implying that all policies would be equally efficient. However, market imperfections or the risks associated with varying economic conditions can cause business discount rates to exceed the social discount rate. If the future is highly uncertain, prudent investors will discount prospective cash flows more severely than they might if they were more confident. Consequently, substantial risks perceived by investors cause business discount rates to exceed those which should guide public policy-makers, thereby depressing investment spending.

This divergence between government and business discount rates can apply to particular geographic regions or industries as well as the whole economy. Because growth does not occur at an even pace throughout the economy, some regions or industries may alternately experience periods of prosperity and periods of deterioration. To some extent, discrepancies in regional development are to be expected, but to the degree these discrepancies are caused by swings in business confidence whose momentum supports speculative over-investment or self-feeding neglect, social and private rates of discount may diverge. Private investors may "write-off" a region for lack of confidence. Consequently, the same conditions which justify enacting regional or industrial investment incentives may cause relevant private discount rates to exceed those of society as a whole.

Accordingly, a temporary program to bring capital formation in disadvantaged geographical regions or industries more in step with the rest of the Nation should rely on accelerated depreciation allowances. At their lowest, business discount rates for investments in these areas could equal the government's, but it is far more likely that the relevant business discount rates are much higher than the rate which should guide public policy. Because the government's discount rate is less than or equal to the private rate in these circumstances, accelerated depreciation is the optimal policy for stimulating capital formation. In this vein, it is interesting to note that temporary investment incentives adopted during World War II and the 1950s permitted essential defense industries to use highly accelerated depreciation allowances.

The same reasoning may not be applicable when there is a need for a temporary, economy-wide investment stimulus during a recession. A general slump in economic activity could increase the government's discount rate as well as that of business. The relatively short planning horizon, often adopted for public policy on these occasions, suggests that the government's effective discount rate may even exceed that of investors. The increasing importance of investment tax credits in post-war stabilization policy may reflect such a high government discount rate. However, in this case, though the ITC is more efficient than accelerated depreciation, the extended investment subsidy is the most appropriate measure, providing maximal investment stimulus while postponing revenue losses to future, more prosperous years.

For the purposes of enhancing long-term capital formation, the choice of policy depends on a comparison of business discount rates with either the government discount rate or the growth rate of investment spending, whichever is greater. Since the second World War, public policy's exclusive reliance on accelerated depreciation allowances to enhance long-term capital formation is consistent with the time preference for business being generally greater than these other two quantities. This is not surprising because a continuing need to stimulate investment spending indicates that business assessments of future economic conditions tend to be relatively insecure, leading to relatively high discount rates. Consequently, a need to enhance long-term capital consumption apparently would warrant an additional acceleration of capital consumption allowances.

Summary and Conclusions

Government fiscal policy can increase capital formation by offering higher investment tax credits, by accelerating depreciation allowances, or by offering subsidies throughout the lifetime of investment projects. In the case of a temporary incentive, if the goal of public policy is to increase capital spending at the least cost to the Treasury, the choice among these three options is determined by the relative magnitudes of the government's after-tax discount rate and the after-tax discount rate of business. Because government's discount rate may be greater than,

equal to, or less than that of business, it is not possible to select an optimal policy without considering the circumstances surrounding its use. For example, while accelerated depreciation is best suited for temporarily enhancing investment spending in disadvantaged regions, the extended investment subsidies may provide the most efficient economy-wide investment stimulus during a severe recession; and accelerated depreciation may be the most attractive long-term policy for increasing the Nation's capital stock.

Although this article used quadruple-declining balance formulas to represent accelerated depreciation allowances, the conclusions would not be altered if some other version had been used instead. In fact, the QDB formula is not the most efficient means of accelerating capital consumption deductions. Rather than simply twist the schedule of allowances, as in Chart I, the most efficient technique would truncate existing depreciation schedules, moving allowances from the tail of the schedule into the first year. Not only is this "first-year bonus depreciation" approach most efficient, it is also relatively flexible. By varying first-year depreciation deductions, the tone of policy may adjust to business conditions: large deductions provide a substantial investment stimulus through highly accelerated allowances, low deductions provide a more moderate incentive.

Just as the QDB formula was only one technique of accelerating depreciation allowances, an interest rate subsidy is only one among many methods providing business with tax credits over several years. Because it may be undesirable to link the stimulus to dependence on debt financing — near business cycle troughs, investment is heavily financed by stockholders, not by borrowing — a more appealing variant would provide an extended investment tax credit spread over the life of eligible capital goods.

This article concludes that in some circumstances, it is likely that government and business discount future cash flows differently, and this divergence is an important factor in determining which incentives will provide the greatest stimulus to investment at the least cost to the Treasury. However, national policy should not be decided on the basis of this definition of efficiency alone. Corporate tax laws should also be designed not to deter capital formation.

Depreciation allowances are currently based on the original acquisition prices of plant and equipment. Thus, capital consumption allowances reflect asset prices which may be significantly out of date after a period of inflation. As a result, profits are overstated and business tax rates are effectively increased. By shortening the time elapsed between acquiring an asset and writing it off for tax purposes, accelerated depreciation helps offset the distortion of inflation on capital consumption allowances. The faster writeoffs enacted in 1954, 1962 and 1971 partially compensated for the effect of price changes; nevertheless, recent increases in inflation have caused corporate depreciation allowances to fall at least $15 billion short of actual capital consumption expenses in 1977. This distortion not only hinders national capital formation, but it further aggravates discrepancies in regional and industrial investment patterns.

Continued tinkering with credits, allowances, and subsidies is one solution to the problem. Another approach would link depreciation allowances to the current prices of capital goods. If investment has been depressed in recent years because prospective depreciation allowances are not sufficient to cover capital consumption expenses, price-level-adjusted depreciation would improve the incentives for long-term capital formation. From a microeconomic viewpoint, this elimination of tax distortions would also increase investment spending in regions or industries heavily dependent on long-lived plant and equipment.

By allowing firms to deduct the replacement

value of capital consumed in production, price-level-adjusted depreciation would be an important first step toward eliminating the existing distortions in business taxation. At the same time, it would stimulate capital spending and provide a sound foundation upon which other investment incentives could build should they be needed.

<div align="center">**Technical Appendix**</div>

The present value of the net cash flow for an investment project is:

$$PV = [\Sigma_{i=1}^n R(i)(1+\delta_1)^{-i} + (\Sigma_{i=1}^n D(i)(1+\delta_2)^{-i}(t)$$

$$-\Sigma_{i=1}^n (1+\delta_2)^{-i} C(1-CAP) + \Sigma_{i=1}^n (1+\delta_2)^{-i}[(1+r/(1-t))^i$$

$$-C\Sigma_{j=0}^{j-1}(1+r/(1-t))^j](r/(1-t))(1-CAP)(t)+k)P].$$

where R is the stream of net revenues the project will earn,
  δ_1 and δ_2 are the firm's relevant after tax discount rates,
  D is the stream of depreciation allowances per dollar of investment,
  C is the constant amortized loan payment per dollar of borrowing,
  t is the corporate income tax rate (equals 48 percent),
  k is the investment tax credit per dollar of investment,
  P is the purchase price,
  CAP is the proportion of the project financed by equity (equals 25 percent), and
  n is the lifetime of the project (useful life equals statutory life).
  r is the after-tax loan interest rate (assumed to equal 5 percent hereafter).

$$C = [\Sigma_{i=1}^n (1+r/(1-t))^{-i}]^{-1}$$

Net revenues are not necessarily discounted at the same rate as depreciation allowances or debt service charges. For a well-diversified firm, the tax benefits of depreciation allowances and the obligations to creditors are fairly secure elements of cash flow regardless of how uncertain the prospective net revenues of any particular project might be. Accordingly, δ_1 may include an extra "risk factor" which does not appear in δ_2. (See also E. Cary Brown, "Tax Incentives for Investment," *American Economic Review,* May 1967, pp. 335–345.)

Assuming the scrap value is zero, for straight-line depreciation the present value of the stream of allowances per dollar of investment equals:

$$PV_{SL} = \Sigma_{i=1}^n (\tfrac{1}{n})(1+\delta_2)^{-i}(t).$$

For sum of the years' digits, the present value of the stream of allowances is:

$$PV_{SYD} = \Sigma_{i=1}^n (i/\Sigma_{j=1}^n j)(1+\delta_2)^{-i}(t).$$

For quadruple-declining balance (QDB) depreciation, the present value is:

$$PV_{QDB} = (\Sigma_{i=1}^m (\tfrac{4}{n})(1-\tfrac{4}{n})^i (1+\delta_2)^{-i} +$$
$$\Sigma_{i=m+1}^n (\tfrac{1}{n-m})(1-\tfrac{4}{n})^m (1+\delta_2)^{-i})(t).$$

With QDB, it is optimal to switch to straight-line depreciation formulas as soon as the age of the project exceeds $3n/4$ years; here, this point is designated m.

A switch from sum of the years' digits depreciation to QDB changes PV by:

(1) $\Delta PV = P (PV_{QDB} - PV_{SYD}),$

a quantity which depends only on δ_2 and n. Since a change in the investment tax credit, Δk, changes PV by:

(2) $\Delta PV = P(\Delta k),$

the investment tax credit columns of Table II show, for given values of δ_2 and n, the value of Δk which causes the value for expression (2) to equal the fixed value for expression (1). An *after-tax* interest subsidy equal to Δr changes PV by:

(3) $\Delta PV = P[\Sigma_{i=1}^n (1+\delta_2)^{-i}$
  $[(1+r/(1-t))^i - C\Sigma_{j=0}^{i-1}(1+r/(1-t))^j](1-CAP)\Delta r.$

The interest subsidy columns of Table II calculate the value of Δr which causes expression (3) to equal expression (1) for given values of δ_2 and n. The expression in the innermost brackets of (3) represents the declining principal of the amortized loan. If the loan were not amortized (or coupled to a sinking fund), the values of Δr would change in Table II, but the policy conclusions would not be altered. Qualitatively, it only matters that a subsidy take place during more than the first year of the project's life.

To explain why the interest rate subsidy is a more efficient policy than the ITC when the Treasury's discount rate exceeded that of business, we noted that the rate subsidy could be cut by a larger proportion than the ITC. The following argument explains why that observation is sufficient. Let Δr_1 and Δk_1 represent the values of Δr and Δk, respectively, which equate expressions (1), (2), and (3), for given values of δ_2 and n. By reducing Δr_1 and Δk_1 to Δr_2 and Δk_2 (the values acceptable to business which has a discount rate lower than the government's), the cost of investment stimulus is reduced by

$$\Delta PV_r = P Z [\Delta r_1 - \Delta r_2] \text{ and}$$

$$\Delta PV_k = P [\Delta k_1 - \Delta k_2], \text{ respectively, where Z represents}$$

the expression in the outermost brackets of (3).
Then

$$\Delta PV_r / \Delta PV_k = [\Delta r_1 - \Delta r_2] Z / [\Delta k_1 - \Delta k_2] =$$

$$([\Delta r_1 - \Delta r_2]/\Delta r_1)/([\Delta k_1 - \Delta k_2]/\Delta k_1)$$

This last equality follows from the fact that unless $\Delta k_1/\Delta r_1$ equals Z, expressions (2) and (3) could not have been equal. Therefore, because the percentage reduction in the rate subsidy exceeds that of the ITC, the use of the interest rate subsidy leads to a greater reduction in Treasury revenue losses.

How Different Are Regional Wages?

By Lynn E. Browne*

NEW England has a reputation as a high wage area. Executives of New England firms relocating or expanding in other areas of the country often cite wage costs as a primary motivation and surveys of business attitudes find wages to be one of the most frequently mentioned sources of dissatisfaction with a New England location.[1] At the same time, however, economists in the region have claimed that earnings are below the national average.

As these conflicting opinions illustrate there is considerable confusion as to the magnitude of regional wage differentials. Published data do not present a simple picture. Regions differ substantially in the composition of their industry, and to the extent that a region specializes in high- or low-wage industries, measures of average earnings do not accurately reflect the region's wage costs for any one industry.

This article attempts to clarify the extent of regional wage differentials in manufacturing by removing the distortions created by regional specialization. Average hourly earnings, standardized for industrial mix are calculated for each of the nine census regions. Because they assume the same industry mix for all regions, these standardized earnings more accurately represent a region's wage cost position relative to other regions and the country as a whole than do unadjusted earnings. At the same time, because standardized wages are averages of hourly earnings in all a region's industries, they avoid the distortions that could occur in a comparison based on only one industry. Wage differentials among industries are not always constant across regions even though a high (or low) wage activity tends to pay high (or low) wages everywhere.

In general, standardizing for industry mix reduces regional wage disparities. However, significant differences remain which show little sign of narrowing. Hourly earnings are highest in the East North Central and Pacific states; lowest in the southern regions and to a lesser extent, New England.

Regional Wage Differentials

Wage rates differ considerably among industries. Table 1 ranks the 21 SIC two-digit industries classified as manufacturing according to their average hourly earnings in 1975. Average earnings in the highest paying industry,

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[1] David J. Ashton and R. D. Robinson, *The New England Region's Exports of Manufacturers*, International Business Center of New England, 1975.

TABLE 1

Earnings in Manufacturing Industries

Industry[1]	U.S. Average Hourly Earnings of Production Workers, 1975
Petroleum & Coal Products	$ 6.42
Primary Metals	6.17
Transportation Equipment	6.02
Chemicals	5.37
Printing	5.36
Machinery exc. Electrical	5.36
Ordnance	5.23
Fabricated Metals	5.04
Paper	4.99
Stone, Clay & Glass	4.89
Average All Manufacturing	4.81
Electrical Equipment	4.58
Food	4.57
Instruments	4.56
Tobacco	4.51
Rubber & Plastics	4.35
Lumber	4.28
Miscellaneous Manufacturing	3.79
Furniture & Fixtures	3.75
Textiles	3.40
Leather & Leather Products	3.23
Apparel	3.19

[1] These are SIC two-digit industries.

Source: U.S. Departments of Labor, and Health, Education and Welfare, *Employment and Training Report of the President 1977,* Tables C-8 and C-9.

region is unusually concentrated in low-wage activities like textiles and apparel, its average hourly earnings will be lower than if it had a more typical industry mix, for the low wages of textiles and apparel will receive a disproportionate weight in the average. Thus, average earnings will tend to understate wage costs in this region compared with those in regions with mixes closer to the norm. Similarly, average earnings in a region specializing in high wage industries will overstate wage costs relative to the rest of the country. By standardizing for industry mix one can eliminate a large measure of this distortion.

Average hourly earnings for manufacturing production workers and average earnings standardized for regional industry mix are shown in Table 2 for the nine census divisions: New England, Mid-Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain and Pacific. The locations of these divisions and their member states appear in Figure 1. The average hourly earnings of Part A of Table 2 are calculated directly from state average manufacturing earnings published by the Bureau of Labor Statistics. The state figures are combined into regional averages by weighting each according to that state's share of manufacturing employment in the region.[2] The state hourly earnings and therefore the regional averages reflect the local industry mix, so that for a particular set of industry wage rates, regional earnings will be higher the more a region specializes in high wage industries.

The earnings figures of Part B, on the other hand, are standardized for industry mix. Thus differences among regions represent differences

petroleum and coal products, were twice those in the lowest paying, apparel. Three industries, petroleum and coal, primary metals, and transportation equipment, had earnings more than 25 percent above the average for all manufacturing; three industries, textiles, leather, and apparel, had earnings more than 25 percent below. If employment in all regions were distributed among these industries in the same proportions or even if high- and low-wage industries were similarly balanced, differences in regional average hourly earnings would reflect differences in regional wage costs. If, however, a

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[2] Although the earnings figures are for production workers, the weights used to combine state figures into regional averages were based on total manufacturing employment. Production worker employment is not available at the state level.

Table 2A

Average Hourly Earnings for Manufacturing Production Workers, Selected Years

| | | Northeast | | North Central | | South | | | West | |
	U.S.	New Eng.	Mid-Atl.	East Nor. Cent.	West Nor. Cent.	So. Atl.	East So. Cent.	West So. Cent.	Mtn.	Pac.
1960	$2.26	$2.08	$2.32	$2.56	$2.28	$1.80	$1.88	$2.07	$2.41	$2.62
1965	2.61	2.44	2.68	2.97	2.66	2.11	2.17	2.39	2.77	3.04
1970	3.36	3.18	3.42	3.81	3.45	2.76	2.83	3.09	3.37	3.83
1975	4.81	4.42	4.93	5.60	4.92	3.95	4.07	4.45	4.70	5.31

Table 2B

Estimated Average Earnings for Manufacturing Production Workers Standardized for Industry Mix
(For each region, hourly earnings by industry are averaged with each industry figure weighted according to that industry's relative importance nationally.)

	New Eng.	Mid-Atl.	East Nor. Cent.	West Nor. Cent.	So. Atl.	East So. Cent.	West So. Cent.	Mtn.	Pac.
1960	$2.08	$2.31	$2.41	$2.16	$1.96	$2.00	$2.00	$2.50	$2.50
1965	2.44	2.68	2.74	2.50	2.28	2.26	2.31	2.93	2.88
1970	3.18	3.40	3.58	3.27	2.95	2.92	2.98	3.54	3.64
1975	4.42	4.86	5.22	4.65	4.20	4.16	4.28	4.86	5.10

Note: Standardized earnings for the Mountain states are based on more limited data than other regions and must be viewed with caution. Both standardized and unadjusted earnings for the South Atlantic do not include the District of Columbia for which no manufacturing earnings data are available. The 1960 figures for the Pacific do not include Alaska and Hawaii.

Source: U.S., Bureau of Labor Statistics, *Handbook of Labor Statistics, 1974 and 1975*. Regional figures calculated from figures in Bureau of Labor Statistics, *Employment and Earnings, States and Areas, 1939–1975*.

in pay rates rather than in industrial composition.[3] The standardized earnings were estimated by calculating regional earnings for

the 21 manufacturing industries of Table 1 from the corresponding state figures. Industry earnings were combined into regional manufacturing averages by weighting each industry figure by that industry's share of manufacturing production workers nationally. Thus for each region, regional industry pay rates were combined according to the industrial mix of the country as a whole. There is one important qualification: although the 21-industry breakdown is the finest available for most states, it is still fairly gross and may hide significant differ-

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[3] The published average hourly earnings include overtime and holiday earnings. Thus regional differences in earnings could be caused by differences in hours worked. This does not appear to be a problem. Average weekly hours were calculated for each region for the four years in Table 2. Regional hours were usually within 1 percent of the national average. The greatest difference was 3 percent and this occurred very infrequently. Such differences as there are do not explain regional differences in earnings; for example, weekly hours tend to be lowest in the Pacific and Mid-Atlantic regions, two relatively high-wage areas.

Figure 1

REGIONS AND DIVISIONS OF THE UNITED STATES
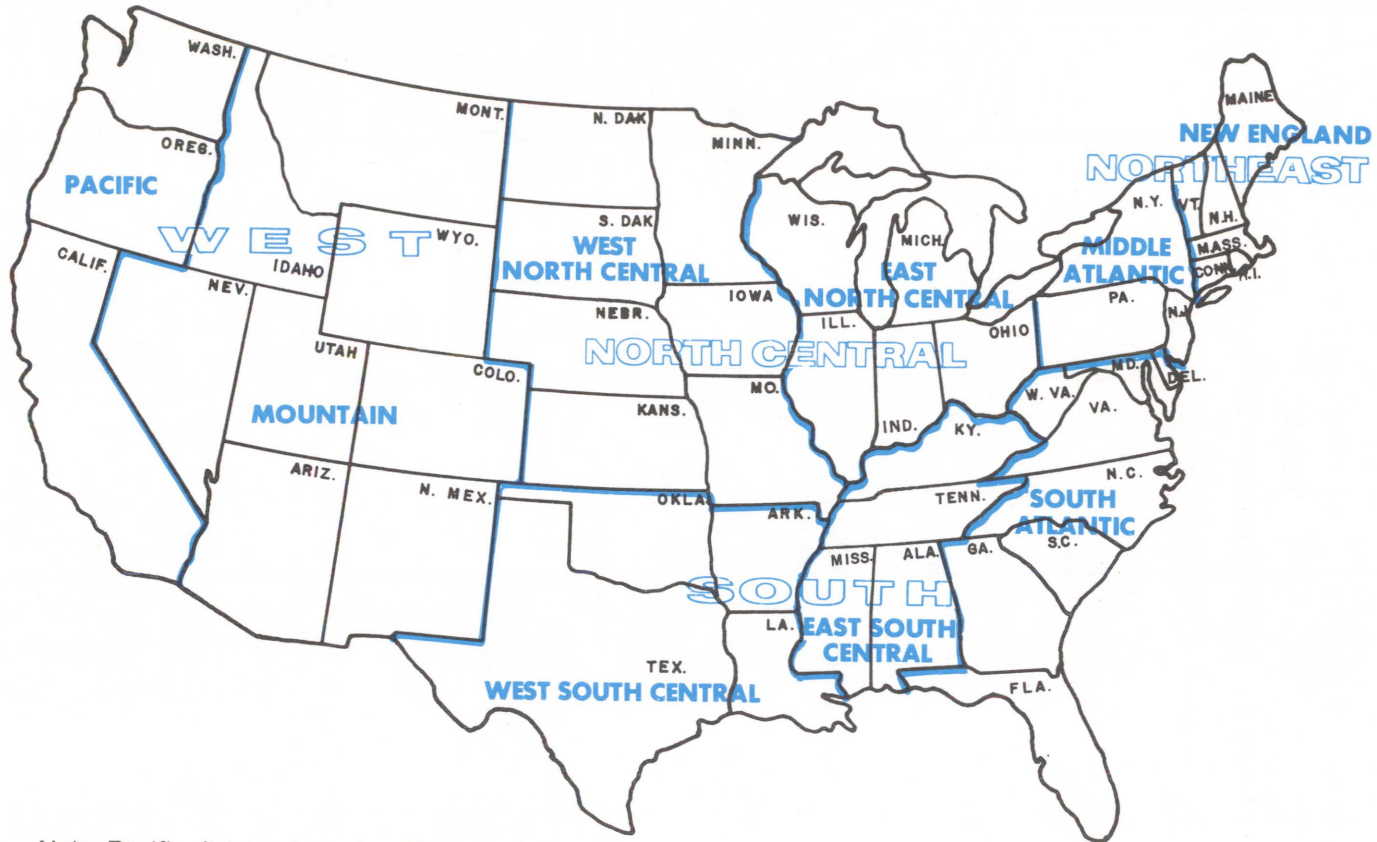
Note: Pacific division includes Alaska and Hawaii.

ences in the regions' industrial structures. In general, however, the average hourly earnings of Part B treat all regions as though they had the same mix of manufacturing industries, so that the differences among regions reflect differences in wage rates.

Effects of Standardizing for Mix

As Figure 2 demonstrates, standardizing for industry mix has a marked effect on the earnings of all regions except those of the Mid-Atlantic and New England. Both these areas are long established manufacturing centers and consequently have diversified industrial structures in which both high- and low-wage industries are well represented. Thus the standardized earnings figures for New England are identical to the unadjusted average and for the Mid-Atlantic almost identical.

The East and West North Central, West South Central and Pacific Divisions all have industry mixes somewhat more oriented to high-wage industries than the United States as a whole. This is particularly true of the East North Central division which is very heavily concentrated in the high-wage durable goods industries, especially transportation equipment and electrical and nonelectrical machinery. The West North Central and Pacific states are also disproportionately active in transportation equipment and like the East North Central have limited employment in low-wage activities. The West South Central division has a fairly high-wage industry mix because of its refining and chemical industries. For each, standardizing for industry mix reduces the earnings figure.

The South Atlantic and East South Central divisions both have industrial structures in which textiles and apparel are much larger employers than in the country as a whole. Consequently, standardizing for industry mix raises average hourly earnings in both regions. The earnings figure for the Mountain states is also increased.[4]

The standardizing process does have an overall downward bias, with earnings being reduced more frequently than increased. This occurs because regions tend to have somewhat higher earnings in those industries in which they specialize. It does not alter the validity of the comparisons among regions.[5]

The standardized figures show the same general pattern of regional earnings as the unadjusted averages. Hourly earnings are highest in the East North Central and Pacific states, lowest in the three divisions of the South. Earnings in the New England, Mid-Atlantic, West North Central and Mountain divisions fall in the middle of the range. The Mid-Atlantic lies toward the high end of the spectrum; New England at the low. Indeed, New England, far from being a high-wage region, has an earnings rate significantly below all but the Southern divisions.

However, although the pattern of regional earnings is similar, taking account of the industrial composition of the various regions reduces the dispersion. Table 3 shows the standard deviation and range of regional earnings on both a standardized and an unadjusted basis. Because those regions which have high wages for

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[4] The Mountain standardized earnings must be viewed with caution. Industry data are very limited for a number of the Mountain states. Such problems are minor in the other divisions and can be offset in the standardizing calculations.

[5] There is no mathematical requirement that the weighted average of standardized regional earnings be identical to the average of the unadjusted figures. In fact, such equality is unlikely. For two regions, A and B, and two industries, 1 and 2, the averages would be identical only if

$$w_1{}^A - w_2{}^A = w_1{}^B - w_2{}^B,$$

where $w_1{}^A$ is the wage in industry 1 in region A. The unadjusted average will exceed the standardized average if the difference between wages in industries 1 and 2 $(w_1 - w_2)$ algebraically is greater in the region specializing in 1. This will occur if regions have relatively higher wages in the industries in which they specialize. This is, in fact, the case. Also, since actual rather than percentage differences are relevant, a downward bias is also likely if regions which pay high wages in any one industry tend to specialize in high-wage industries. Again, this is the case.

Figure 2
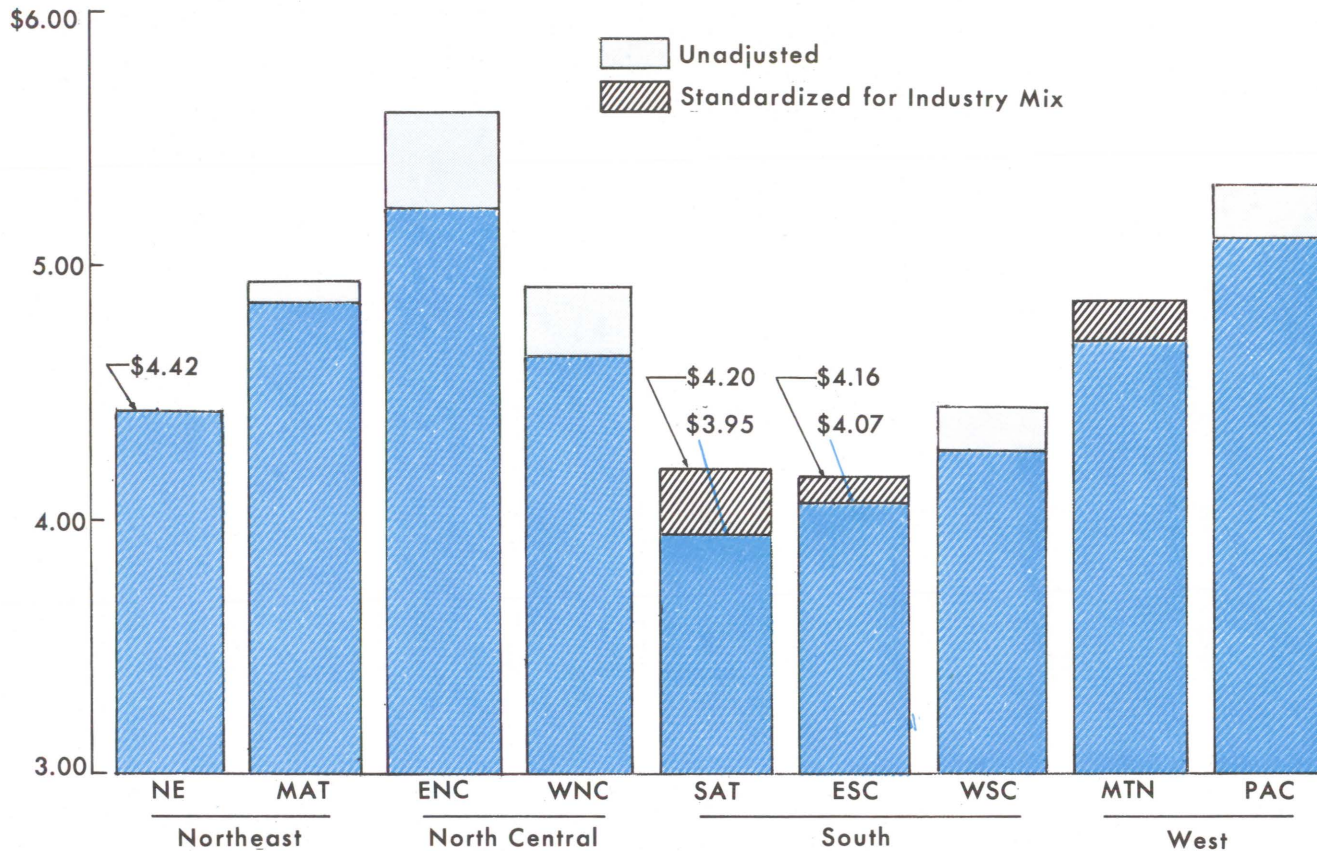
AVERAGE HOURLY EARNINGS FOR MANUFACTURING PRODUCTION WORKERS, 1975

Source: Calculated from Employment & Earnings States & Areas 1939-1975.

Table 3

Dispersion of Unadjusted and Standardized Regional Earnings[1]

	Range			Standard Deviation		
	Unadjusted	Standardized	Standardized as % Unadjusted	Unadjusted	Standardized	Standardized as % Unadjusted
1960	$ .82	$ .54	66%	$ .29	$ .22	76%
1965	.93	.67	72	.33	.26	79
1970	1.07	.72	67	.38	.28	74
1975	1.65	1.06	64	.55	.39	71

[1] Average hourly earnings for manufacturing production workers. Calculations are based on figures in Table 2.

any given industry also specialize in high-wage industries, and low-wage regions specialize in low-wage industries, standardizing for industry mix reduces the range of regional earnings by roughly a third and the standard deviation by 25-30 percent. Standardizing for industry composition results in a more accurate picture of the relative wage costs of the different regions of the country. It is a picture of greater comparability among wage rates than that shown by the unadjusted figures.

Differences in Regional Earnings

Even on a standardized basis, the differences among regions are significant. Thus in 1975 average hourly earnings in New England were 9 percent below those in the neighboring Mid-Atlantic states; 13 percent below the Pacific; and 15 percent below the East North Central division. At the same time, earnings in all three southern regions were about 5 percent below those of New England.

The nature of the South's apparent wage cost advantage over the rest of the country is interesting. The differential is much greater for unskilled workers than for skilled craftsmen. The Bureau of Labor Statistics publishes earn-

ings in selected occupations for four major regions: the South which covers the South Atlantic and East and West South Central divisions; the Northeast, consisting of New England and the Mid-Atlantic; the North Central including the East and West North Central divisions, and the West covering the Mountain and Pacific states. Table 4 shows the regional earnings comparison for manufacturing blue collar occupations in 1962 and 1974, the earliest and most recent years for which the information is published. To highlight the regional differences in each occupation the average earnings in the regions are expressed as percentages of national average earnings in that occupation.

The pattern of regional earnings is consistent with that already shown by the industry data. Blue collar workers in the West and the North Central regions have higher hourly earnings than their counterparts in the Northeast and the South. Earnings in the South are the lowest in the country. However, the differences between the South and the other regions are not uniform. Earnings in low-wage unskilled occupations, like janitor or laborer, are much lower relative to earnings elsewhere, than are earnings in more skilled craft-type jobs. Indeed, skilled maintenance and toolroom personnel in manufactur-

Table 4

Earnings in Selected Blue Collar Manufacturing Occupations as Percentages of U.S. Average, 1962 and 1974[1]

	Maintenance & Toolroom						Custodial & Material Movement				
	Carpenter	Electrician	Machinist	Auto Mechanic	Painter	Tool & Die	Janitors	Laborers	Order Fillers	Truck Drivers	Forklift Operator
1962											
Northeast	96%	96%	96%	102%	94%	93%	96%	100%	98%	107%	99%
North Central	104	103	103	104	103	106	107	107	105	105	104
South	99	98	99	87	100	98	84	81	84	78	87
West	104	104	105	108	104	100	107	107	111	106	105
Standard deviation of regional percentages	3.9	3.9	4.0	9.2	4.5	5.4	11.0	12.3	11.6	14.5	8.3
1974											
Northeast	94	93	96	99	93	91	96	97	101	106	96
North Central	106	106	104	106	106	105	110	110	107	108	107
South	96	93	95	85	98	88	84	83	86	77	84
West	104	103	107	111	100	98	100	105	96[2]	114	104
Standard deviation of regional percentages	5.9	6.8	5.9	11.3	5.4	7.6	10.8	11.8	8.9	16.5	10.3

[1] Earnings are hourly earnings excluding premium pay for overtime, holidays, and lateshifts.
[2] As late as 1972 earnings in the West were above the U.S. average.
Source: U.S., Bureau of Labor Statistics, *Handbook of Labor Statistics 1975*—Reference edition, Table 109.

ing earn approximately the same in the South as in the Northeast.[6]

Regional Earnings Over Time

Even after taking account of the effects of industry mix, substantial differences in regional earnings remain. The question is whether these differences have changed over time. Have the

disparities widened, with earnings in the high-wage regions growing more rapidly than in the country as a whole and the low-wage areas lagging behind, or has the reverse been true, with wages in all regions tending to converge toward the national average?

To show how the variation in regional earnings has changed, Table 5 compares the standard deviations of regional earnings in the years 1960, 1970 and 1975. Each year's figures are divided by the mean earnings for that year to correct for the increase in dispersion that results from the general rise in wages caused by inflation and productivity increases. The figures show some convergence in regional wages during the sixties. The standard deviation of the standardized earn-

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[6] A study by Stephen Baldwin and Robert Daski of the determinants of occupational pay differences found that for the broader category "skilled maintenance," pay rates were actually higher in the South than the Northeast if establishment size and collective bargaining coverage were standardized. "Occupational Pay Differences among Metropolitan Areas," *Monthly Labor Review*, May 1976.

Table 5

Dispersion of Regional Earnings Over Time[1]

Standard deviation ÷ Mean
(Coefficient of Variation)

	Unadjusted Earnings	Standardized Earnings
1960	.131	.100
1970	.115	.086
1975	.117	.084

Note: These figures and the standard deviations of Table 3 treat all regions equally. If one uses the grouped data formula with the frequencies for each region being that region's manufacturing employment, the figures show less convergence for 1960–70 and some divergence for 1970–75. The coefficients of variation for standardized earnings for the three years 1960, 1970 and 1975 are .084, .078 and .084. By weighting regional earnings one attaches more weight to the East North Central region, where earnings have moved away from the mean, relative to the Pacific states, where earnings have moved closer.

[1] Average hourly earnings for manufacturing production workers. Figures from Table 2.

ings declined by 14 percent.[7] Since then, however, no convergence of any consequence has taken place.

The reasons for these findings are apparent in Table 6 which shows the growth in regional earnings in the sixties and seventies on both an unadjusted and a standardized basis. The most striking feature of Table 6 is the relatively slow growth in earnings in the West. Earnings in both the Mountain and Pacific divisions have grown significantly more slowly than in the country as a whole. Moreover, the similarity of the unad-

justed and standardized growth rates shows that this slow growth was not due to changes in the industrial structure of the region, but rather to a more gradual increase in wage rates. It may be significant that for most of the period 1960–75 the West, particularly the Pacific states, had unemployment rates above the national average.

Because the West is a high-wage region, the slow growth in its earnings contributes to a reduction in the dispersion of regional earnings. However, the slow growth in the West does not appear indicative of a general tendency toward convergence. The other high-wage area, the East North Central division, has experienced above average earnings growth. In the seventies its earnings growth was the most rapid of all the regions, offsetting for this period the reduction in dispersion that would have resulted from the slower growth of the West.

In addition, there is no indication that wage rates in the low-wage South are rising relative to those in other parts of the country. Unadjusted earnings in the East South Central and South Atlantic have grown at above average rates, but the smaller increase in standardized earnings indicates that the more rapid earnings growth in the South is due more to a shift to higher-wage industries than to faster growth in wage rates. Although the West is a very important exception, the dominant impression of regional earnings differentials is one of stability rather than change.

Conclusions

Average hourly earnings in manufacturing differ significantly among regions. The extent of these differences is overstated unless one takes account of industry mix, but even after earnings have been standardized for industrial composition the differences are meaningful. The East North Central division and the Pacific states have the highest level of earnings; the three

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[7] Standard deviation here means standard deviation divided by the mean or the coefficient of variation. The fact that 1975 was a recession year is not responsible for the lack of further convergence in the seventies. The coefficient of variation for 1974 is .08 and for 1973, .09.

Table 6A

Growth Rates in Manufacturing Hourly Earnings
(annual percentage rates of change)

| | U.S. | Northeast | | North Central | | South | | | West | |
		New Eng.	Mid-Atl.	East Nor. Cent.	West Nor. Cent.	So. Atl.	East So. Cent.	West So. Cent.	Mtn.	Pac.
1960–70	4.0%	4.3%	4.0%	4.1%	4.2%	4.4%	4.2%	4.1%	3.4%	3.9%
1970–75	7.4	6.8	7.6	8.1	7.4	7.4	7.5	7.6	6.9	6.7
1960–75	5.2	5.2	5.2	5.4	5.3	5.4	5.3	5.2	4.5	4.8

Table 6B

Estimated Rates of Growth in Average Earnings Standardized for Industry Mix
(For each region, hourly earnings by industry are averaged with each industry figure weighted
according to that industry's relative importance nationally.)

		New Eng.	Mid-Atl.	East Nor. Cent.	West Nor. Cent.	So. Atl.	East So. Cent.	West So. Cent.	Mtn.	Pac.
1960–70		4.3%	3.9%	4.0%	4.2%	4.2%	3.9%	4.1%	3.5%	3.8%
1970–75		6.8	7.4	7.8	7.3	7.3	7.3	7.5	6.6	7.0
1960–75		5.2	5.1	5.3	5.2	5.2	5.0	5.2	4.5	4.9

Source: Calculated from figures in Tables 2A and 2B.

southern divisions, closely followed by New England, have the lowest.

Over the time period considered here, 1960–75, some convergence in regional pay rates is apparent. This has been due to the slow growth of earnings in the high-wage West. However, this reduction in dispersion offers no comfort to a Northeast concerned about competition from the Sunbelt areas of the South and West. The West's wage cost position is improving while the South has seen only negligible reductions in its advantage. On the other hand, it is clear that New England's reputation as a high-wage area is undeserved: its average hourly earnings in manufacturing are well below those in most of the country.

Regional Earnings and Cost of Living Differences

This article has looked at regional earnings from the standpoint of a manufacturing firm interested in regional differences in labor costs. However, what is a cost to the employer is income to the employee. As an income concept, unadjusted earnings are probably more appropriate than earnings standardized for industry mix. While it is important to know what an individual earns in the same industry in different areas, it is even more important to take account of the bundle of earning opportunities, implied by industry mix, available to him.

Regional cost of living differences are also

Table 1A

Comparison of Average Hourly Earnings in Manufacturing Unadjusted and Standardized for Cost of Living Differences — 1975

	U.S.	Northeast		North Central		South			West	
		NE	MAT	ENC	WNC	SAT	ESC	WSC	MTN	PAC
Unadjusted Earnings	$4.81	$4.42	$4.93	$5.60	$4.92	$3.95	$4.07	$4.45	$4.70	$5.31
Standardized for Cost of Living	4.81	4.03	4.73	5.54	5.07	4.11	4.47	4.94	4.95	5.09

very relevant when one considers regional differences in earnings as measures of regional differences in income. Table 1A shows for 1975 the effect of standardizing unadjusted hourly earnings in manufacturing for these differences in the cost of living. Each region's hourly earnings figure was divided by an estimate of the region's cost of living relative to that of the country as a whole.[1]

The most striking effect of standardizing for regional cost-of-living differences is the increase in the effective earnings level in the South. Although wages are low in the South the cost of living is also low, particularly in the two South Central regions, so that in terms of purchasing power earnings are much closer to the national average than the unadjusted figures indicate. Because taking account of the cost of living raises earnings in the South and, to a lesser extent, lowers them in the high wage East North Central and Pacific states, the dispersion of regional earnings is slightly less that for unadjusted earnings. The coefficient of variation for unadjusted earnings in 1975 was .117; after one has removed cost-of-living differences it is only .103.

While standardizing for living costs generally raises earnings in the lower-wage areas, this is not true for New England. This region has a very high cost of living and this combined with the relatively low level of its unadjusted earnings figure gives it the lowest effective earnings rate in the country.

[1] The Bureau of Labor Statistics publishes urban family budgets for 39 metropolitan areas and 4 nonmetropolitan regions. The budgets representing an intermediate standard of living were used to calculate the costs of living in the nine census divisions. The estimate for each division was based on the budgets for metropolitan areas in that division and a nonmetropolitan budget estimated from the budget for the larger region including the division.

The Current Business Cycle In Historical Perspective

By Stephen K. McNees*

The most recent business cycle contrasts strikingly with previous cyclical experience. Two of the most distinctive and disturbing features are persistently high unemployment and inflation rates. The unemployment rate has held near or above 7 percent for about three years.[1] The inflation rate has generally exceeded 5 percent for four years. The persistence of each of these problems is troublesome and the combination of the two is unprecedented in the United States in this century. Either fact alone could be attributed to an inappropriate amount of aggregate demand, but the combination cannot be explained so simply without resort to complex arguments based on lags and/or expectations which had not been regarded as necessary to explain previous experience.

This article reviews the history of the current business cycle, comparing and contrasting it with previous post-World War II cyclical experience. It finds that despite periods of abnormal behavior of employment, productivity, and the labor force, the unemployment rate has "tracked" the path of real GNP fairly faithfully. In contrast, the rate of inflation has not been very responsive to cyclical swings. While the path of inflation has been altered drastically by numerous "special factors," the "underlying trend" rate of inflation has held stubbornly near the 5 to 6 percent range for nearly a decade despite large cyclical swings in unemployment.

Business Cycle Chronology

Business cycles are classified into two phases: expansions and contractions (or recessions). The transition point between expansion and contraction is called the cyclical *peak* and the point dividing recessions and expansions is called the *trough* of the cycle.

More recently, with the development of the concept of growth cycles, economic activity has been divided into two phases: high (i.e., above-trend) growth and low (i.e., below-trend) growth.[2] The transition from low to high growth is referred to as the *upturn;* the point dividing high and low growth periods, the *downturn.* The period between the downturn and the cyclical peak is commonly referred to as the *slowdown.*

[2] See Ilse Mintz, "Dating United States Growth Cycles," *Explorations in Economic Research,* Summer, 1974, pp. 1–113.

These concepts are illustrated with reference to the most recent business cycle in Figure I. An economic expansion began in November 1970, the cyclical trough. As in all but one of the previous post-War expansions the trough coincided with an upturn. From mid-1971 through 1972, a period coinciding roughly with Phases I and II of the wage and price controls program, the economy expanded vigorously. The rapid expansion culminated in 1973: I with an unexpectedly large (9.5 percent at an annual rate) increase in real GNP spurred by a surge of consumer purchases, particularly of durable goods.

March 1973 has been selected as the beginning of the downturn.[3] The slowdown lasted eight months — one month less than the slowdown preceding the 1969 peak but twice as long as the median of the five previous post-War slowdowns.

The slowdown ended and the recession began in November 1973 (one month after the outbreak of the Yom Kippur War), the business cycle peak. The recession that followed was the most severe of the post-War period.

The recession lasted 16 months, nearly 50 percent longer than the longest previous post-War recession. From peak to trough, real GNP dropped 5.9 percent, nearly twice as much as the largest previous post-War decline (3.3 percent in 1953–54) and more than four times more than the median post-War decline (see Chart I). The mild initial decline, which was widely interpreted as a "spasm" related to high energy prices, was followed by a "collapse" in demand and heavy inventory liquidations in the final two quarters (Figure I and Chart I). Real GNP fell during this latter interval at an annual rate of 7.7 percent, in contrast to the moderate (2.8 percent

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[3] Much of this article, especially this section, draws heavily on Victor Zarnowitz and Geoffrey H. Moore, "The Recession and Recovery of 1973–76," the definitive source of business cycle dating and measurement, National Bureau of Economic Research, June 1977, mimeo.
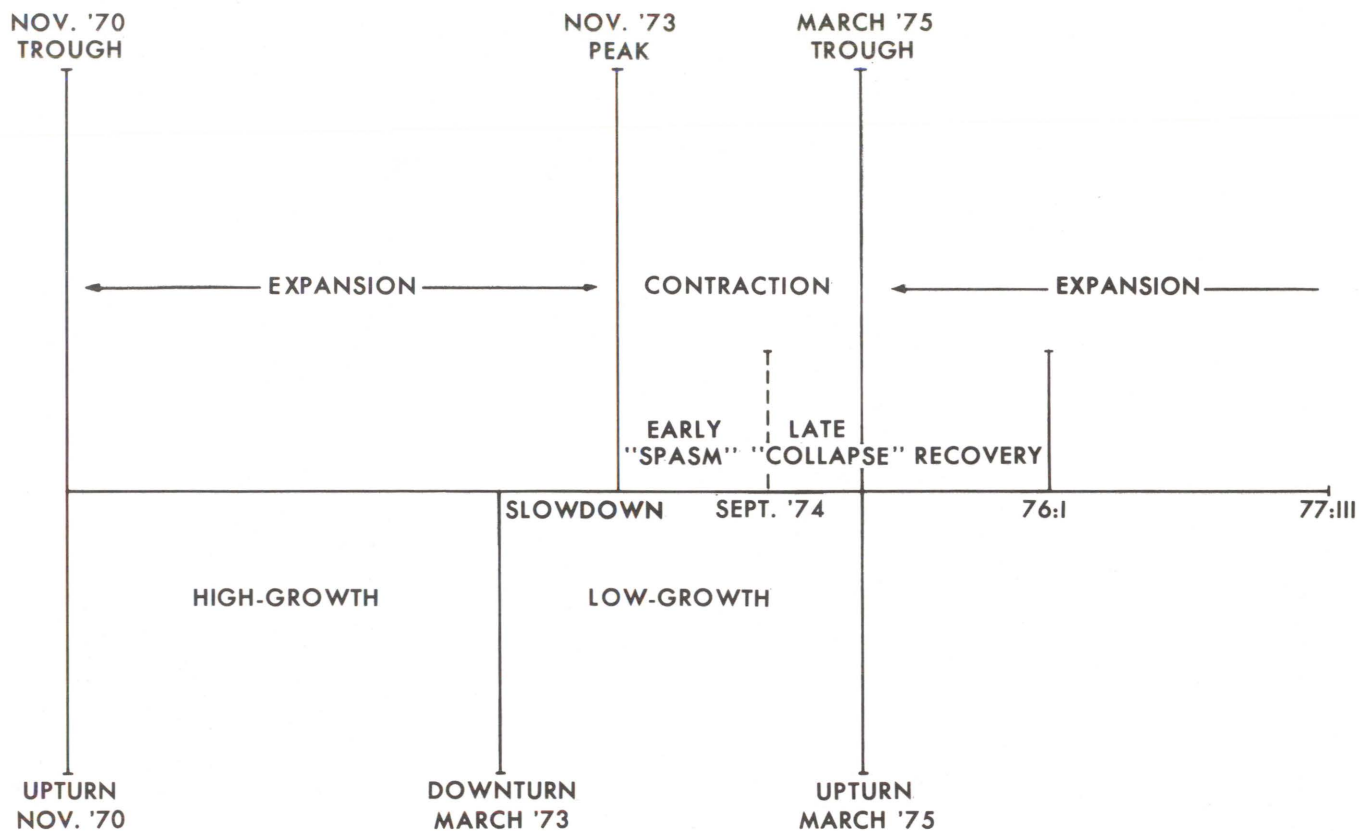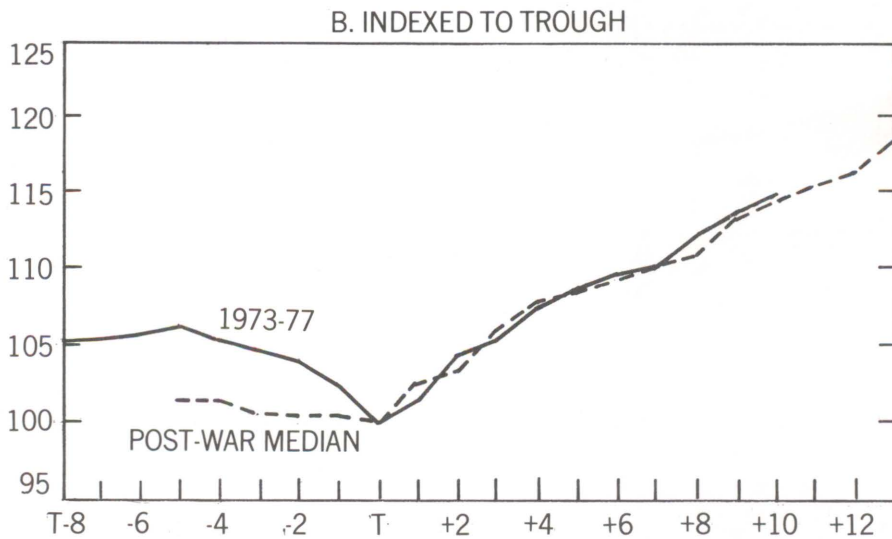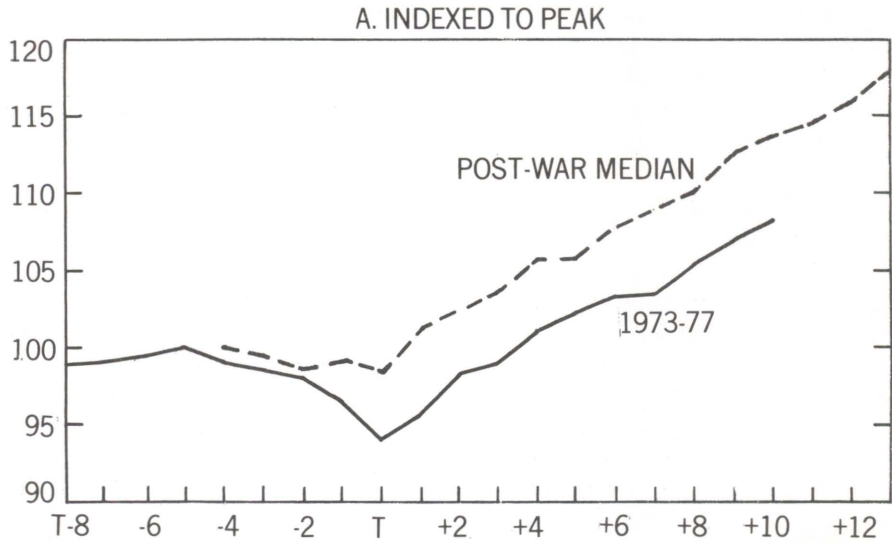
annual rate) decline over the previous three quarters.

The expansion began in March 1975, two years after the downturn. Despite strong growth in the early stages of the expansion, real GNP did not recover to its previous peak for a year. This contrasts sharply with earlier recoveries when the previous peak *level* of real GNP was regained in one (1950, 1961, 1971) or two (1954 and 1958) quarters.

This long recovery period reflects the severity of the preceding downturn rather than a weak early expansion. In fact, the current expansion from the extraordinarily low trough has been very typical of the post-War period. Since the trough, the expansion has progressed at a normal pace, paralleling the median path of previous post-War expansions (Chart I-B).

The Unemployment Rate

In contrast to the previous post-War expansions when the unemployment rate had declined fairly rapidly after the trough, the unemployment rate held at a plateau of about 6 percent for nearly two years after the 1970 trough. Following the vigorous expansion in 1972, the rate finally fell from 5.7 percent in October to 4.9 percent in January 1973. It held steady at just under 5 percent during the 1973 slowdown. During the early, mild phase of the recession, the rate crept up from its pre-recession low of 4.7 percent in October 1973 to only 5.5 percent in August 1974.

This moderate rise, during a period when real GNP had been flat for a year and a half, contributed to the mistaken belief that the economy was experiencing only a temporary "energy spasm." In reality, the economy was entering the later, more severe stage of the recession. In July, data revisions revealed that a substantial build-up of excessive inventories had occurred earlier in the year. It soon became evident that

Figure I

BUSINESS CYCLE CHRONOLOGY

Chart I

CYCLICAL COMPARISON OF GROSS NATIONAL PRODUCT
1972 DOLLARS

A. INDEXED TO PEAK

POST-WAR MEDIAN

1973-77

B. INDEXED TO TROUGH

1973-77

POST-WAR MEDIAN

Source: U.S., Bureau of Economic Analysis, *Business Conditions Digest*, August 1976 and November 1977.
Note: In this and the following charts, the horizontal scale indicates the number of quarters before and after the business cycle trough.

the new model of automobiles would not be well received.

Excessive inventories, along with the collapse in consumer demand, necessitated drastic cuts in production and heavy layoffs. Consequently, the unemployment rate shot from 5.5 percent in August 1974 up to 8.5 percent at the cyclical trough in March 1975, and eventually rose to a 9.0 percent peak in May.

The unemployment rate declined steadily to 7.5 percent in the year following its May peak. Then, during the "pause" in mid-1976, the rate climbed back to 8.0 percent. The rapid expansion in early 1977 brought the rate back down to 7.0 percent by April, where it leveled off through October.

Chart II compares the unemployment rate path in the current business cycle with the median of previous post-War expansions. Starting in 1973 somewhat higher than the 3.8 percent

median at previous peaks, it climbed to well above the 7.0 percent median previous peak. Over the first ten quarters of this expansion, unemployment paralleled the median, holding steadily about 2.5 percent higher.

The *amplitude* of these swings in the unemployment rate over the course of the business cycle broadly mirrored the swings in output. The decline from the 1970 trough to the mid-1973 low, the rise from mid-1973 to the 1975 trough, and the decline from the 1975 trough through 1977: III all can be "explained" by a simple, static version of the unemployment-output relationship known as "Okun's Law," (see Box).

However, the *timing* of these swings in the unemployment rate was not closely tied to the path of output. The major abnormality was the minor, modest rise through mid-1974. This phenomenon will be examined from several perspectives below.

Chart II

CYCLICAL COMPARISON OF THE UNEMPLOYMENT RATE
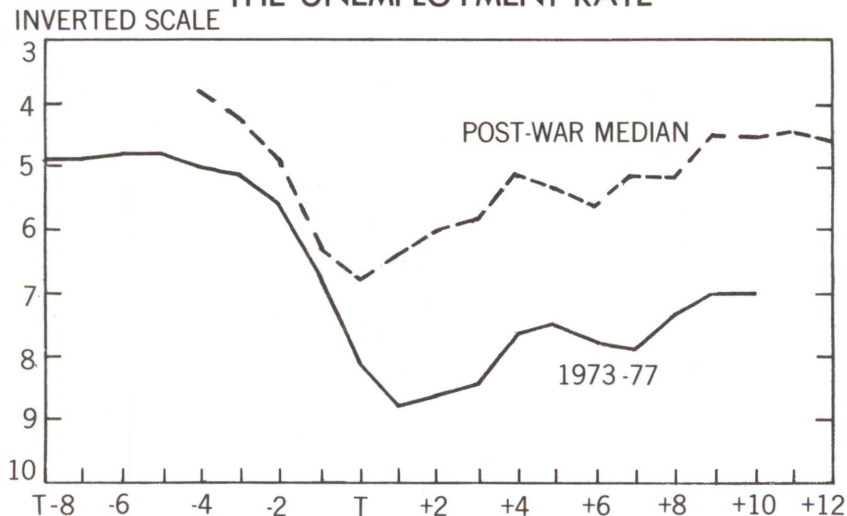
Source: U.S., Bureau of Labor Statistics, *Employment and Earnings*, various issues. Based on quarterly averages of monthly data.

The "Normal" Unemployment-Output Relationship: "Okun's Law"

The unemployment rate is negatively related to the level of output and positively related to productivity, average hours worked, and the labor force. For example, higher output results in lower unemployment if productivity, hours, and the labor force all held constant. In fact, other economic variables do change along with the level of output. In 1962 Arthur Okun examined the historical unemployment-output relationship and summarized it in a simple useful rule of thumb, known as "Okun's Law."[4] More recently, George Perry has reformulated "Okun's Law" to take account of secular changes in the age-sex composition of the labor force.[5] In the Perry version, the difference between actual and "full employment" unemployment rates depends on the gap between potential and actual GNP so that once the "full employment" unemployment rate and potential GNP are estimated, the actual unemployment rate depends on the level of output.

In order to identify the distinctive features of the most recent cyclical experience, Perry's version of "Okun's Law" was modified in three ways:

(1) The relationship was estimated with quarterly, rather than annual, data to highlight the timing of cyclical changes. (As is often necessary with quarterly data, the equation was estimated to take account of first-order serial correlation in the residuals.)

(2) The relationship was estimated using the Council of Economic Advisers' (CEA's) estimates of potential GNP (Q*) and the "full employment" unemployment rate (U*). The CEA estimates were used solely because they are the "official" estimates and are available on a quarterly basis. One should *not* infer that the CEA estimates are more useful than Perry's; in fact, quarterly interpolations of Perry's annual estimates produce a marginally better fit (although the difference is too small to be regarded as significant in the statistical sense).

(3) The relationship was estimated with data available through 1972. To use data available since 1972 is subject to the criticism that the "explanation" of the recent period derives primarily from the power of the estimation technique (which by definition minimizes errors) rather than the underlying relationship.

The estimated unemployment-output relationship was,

$$(U - U^*) = 28.65 \quad (\% \text{ GAP})$$
$$(3.30)$$

Standard error = .26
Rho = .91
Period of fit: 1955: I to 1972: IV
U = unemployment rate
% GAP = percentage deviation of actual GNP(Q) from potential GNP(Q*), (Q* − Q)/Q

A *dynamic* simulation of this equation was conducted to examine how well the unemployment rate in 1973–77 could have been forecasted if the path of real GNP had been known. The equation substantially *over-*

[4] Okun, Arthur, "Potential GNP: Its Measurement and Significance," *Proceedings of the American Statistical Association,* 1962.
[5] Perry, G.L., "Potential Output and Productivity," *Brookings Papers on Economic Activity,* (1977:1), especially pp. 40-41.

estimates unemployment in 1974. Perry regards 1974 as such an unusual year that he chose to ignore it (i.e., dummy it out) in his annual regressions. This judgment is highly arbitrary since the equation produced similar errors in 1958 and in 1975 when the quarterly relationship significantly *under*estimates the unemployment rate. After underestimating unemployment again in 1976, the prediction returns close to the actual figure in 1977 (See Chart III-A). In other words, the dynamic simulation captured the *amplitude* of the swing in the unemployment rate but was imprecise on the *timing* of the swings. This

performance is impressive in that a dynamic simulation allows forecast errors to accumulate so that the predicted unemployment rate could have wandered far off track.

Moreover, a *static* simulation shows that the unemployment-output relationship in 1973–77 was as close as it was in the period of fit (1955–1972) (Chart III-B). The size of the errors — root mean squared error of .32 percent — was about the same as in 1955 through 1972. The average error was small. Thus, recent unemployment-output experience conforms closely to previous historical experience.

Labor Force

The unemployment rate is the percent of the civilian labor force (henceforth labor force) who seek, but cannot find, employment. Variations in the unemployment rate are commonly attributed to or "explained by" changes in the labor force. The growth of the labor force has been much stronger during this business cycle than the median of previous cycles (Chart IV). Relative to the cyclical peak, the path of the labor force has conformed almost identically to the 1969–73 cycle: in both cycles, the labor force was 2.3 percent above the peak at the trough, 6 percent above the peak six quarters after the trough, and 8.6 percent above the peak ten quarters after the trough. These are far greater than the median increases in previous cycles which were 1.2 percent, 2.6 percent, and 4.6 percent, respectively (Chart IV-A).[6] A similar but

somewhat less dramatic disparity appears when the increases are indexed to and centered on the trough (Chart IV-B).[7]
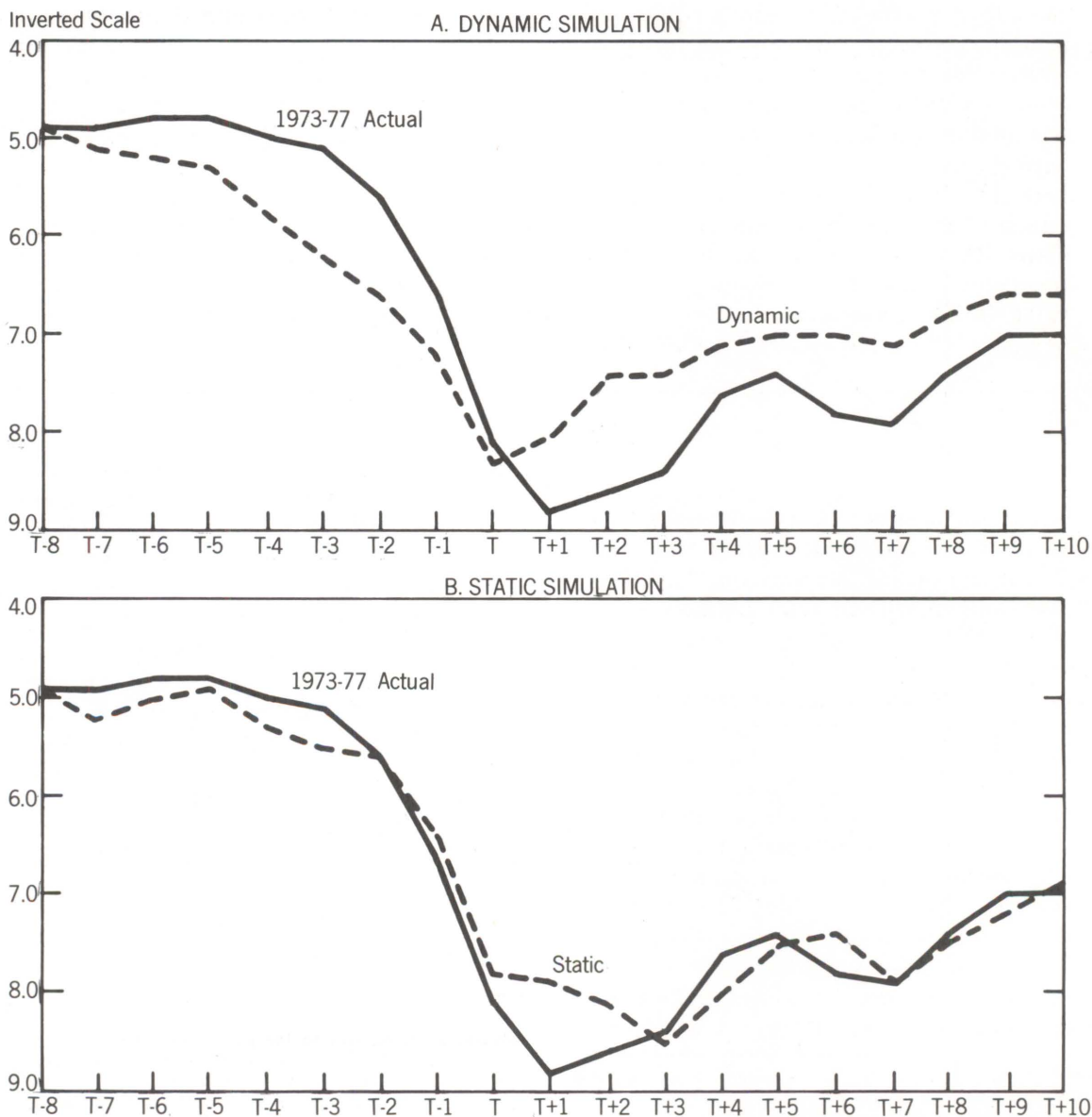
The upward trend of labor force growth illustrated in Chart IV is due mainly to the growth of the working-age population. In addition, since the mid-1960s an increasing proportion of the working-age population has chosen to seek work, i.e., the participation rate has risen. However, it is important to note that, despite the secular increase in the participation rate, changes in the participation rate had *not* been an important factor in labor force growth over the course of business cycles until 1976.[8] More specifically, there was no peak to trough change in the participation rate during the 1973–75 recession; the median of previous peak to trough

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[6] Because the 1958–60 expansion lasted only two years, the median for more than eight quarters after the trough is based on only four previous cycles.

[7] Measurement relative to the peak and centered on the trough makes the increases in previous cycles smaller because the previous recessions were shorter.
[8] This statement applies to the most recent cycle and the *median* of previous business cycles. There have been large changes in the civilian participation rate in some past cycles, especially when the size of the armed forces changed rapidly.

Chart III

ACTUAL AND "NORMAL" UNEMPLOYMENT RATES

Inverted Scale

A. DYNAMIC SIMULATION

1973-77 Actual

Dynamic

| T-8 | T-7 | T-6 | T-5 | T-4 | T-3 | T-2 | T-1 | T | T+1 | T+2 | T+3 | T+4 | T+5 | T+6 | T+7 | T+8 | T+9 | T+10 |

B. STATIC SIMULATION

1973-77 Actual

Static

| T-8 | T-7 | T-6 | T-5 | T-4 | T-3 | T-2 | T-1 | T | T+1 | T+2 | T+3 | T+4 | T+5 | T+6 | T+7 | T+8 | T+9 | T+10 |

Source: U.S., Bureau of Labor Statistics, *Employment and Earnings*, various issues. Based on quarterly averages of monthly data.

Chart IV

CYCLICAL COMPARISON OF CIVILIAN LABOR FORCE
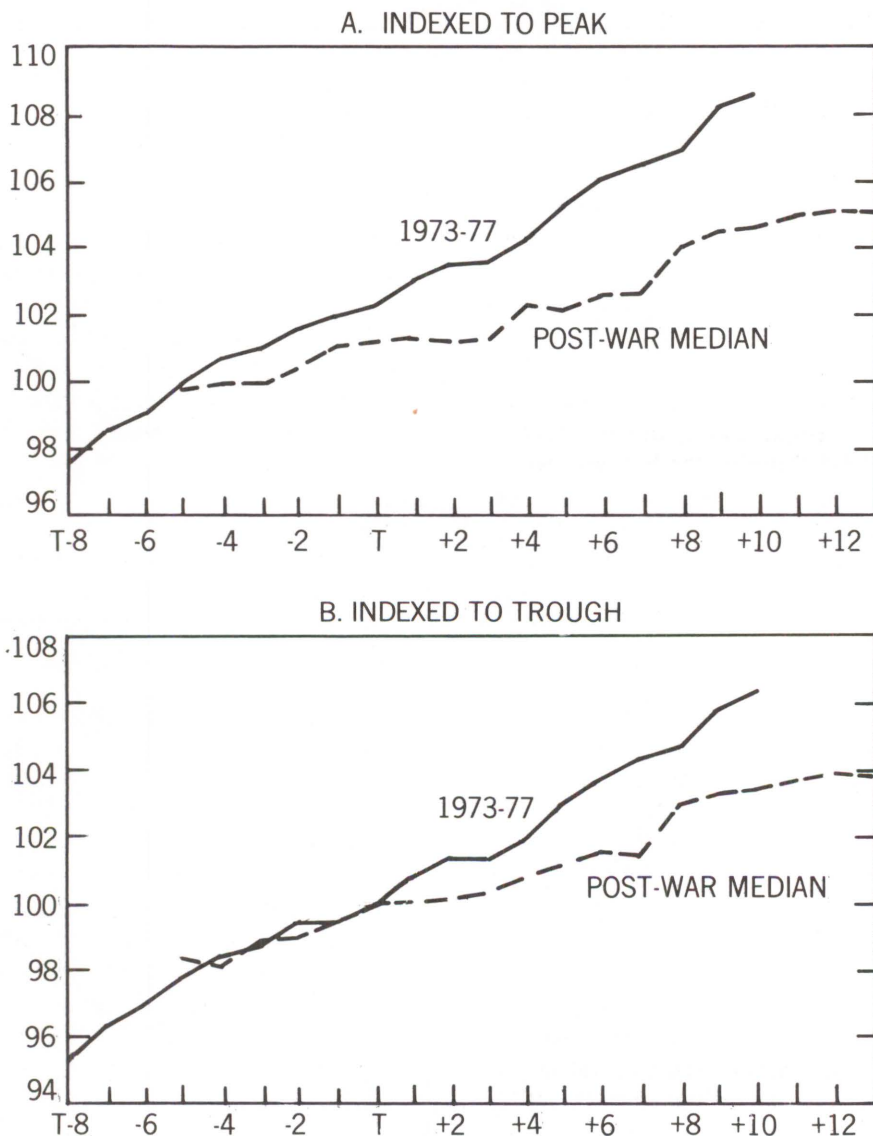
A. INDEXED TO PEAK

B. INDEXED TO TROUGH

Source: U.S., Bureau of Labor Statistics, *Employment and Earnings*, various issues. Based on quarterly averages of monthly data.

changes was only .1 percent. During the first year of the recent expansion, the participation rate rose by only .1 percent; the median change during the first year of previous expansions was −.3 percent. However, from the fourth to the tenth quarter of this expansion, the participation rate rose 1.1 percent; the median change over the comparable stage of previous cycles was only .1 percent (although the range was fairly wide). In short, a large increase in the participation rate in the second and third years of the recent expansion has contributed to a rapid growth in the labor force.

Employment

The path of nonagricultural payroll employment (henceforth employment) did *not* reflect the path of real GNP during the business cycle. Despite the severity of the drop in output, employment declined by only 1.3 percent during the recession. This is smaller than any of the previous cyclical declines except for the .8 percent drop in 1970 (which accompanied a meagre .6 percent decline in output, only about one-tenth of the 1973–75 decline). In contrast, declines in employment during the recessions of the 1950s ranged from 3.1 to 4.2 percent.

In fact, employment continued to *rise* in the first three quarters of the recession. It was not until the trough in the first quarter of 1975 that employment receded below the level achieved at the previous peak.

Due perhaps to "labor hoarding" during the downturn and the recession, the increases in employment in the early stages of this recovery were not especially strong. The full-year increase from the trough was among the weakest in the post-War experience, exceeding only the 1971 experience. In addition, the increase in the two years after the trough was weaker than any except 1961–63. By 77: III, the percent increase

from the trough was still below the median of the five earlier expansions. (Chart V-B.)

The extraordinarily small decreases during the recession followed by below normal increases since the trough *combined* to make the first two years of the expansion almost identical to the median of previous post-War experience (Chart V-A).

Productivity

Before the most recent business cycle, declines in productivity in the nonfarm business sector (henceforth productivity) had been relatively rare. For example, productivity at the trough of all earlier post-War recessions was higher than at the previous peak. Except for the 1949 recession, productivity had never fallen more than one quarter during a recession.[9]

In contrast, in this cycle productivity peaked at the downturn (1973: I) and fell for seven consecutive quarters, throughout the slowdown and the first year of the recession (i.e., until the trough quarter). The cumulative decline was 5 percent, or a 3.0 percent annual rate of decline (Chart VI).

Since the trough, productivity has increased somewhat faster than the median of previous expansions (Chart VI-B), in fact, faster than in any expansion since 1949–52. This performance, however, has not been strong enough to compensate for the sustained deterioration during the slowdown and recession. After two years of recovery, productivity was only 5.1 percent above its level at the cyclical peak; the median increase at this stage of previous expansions was an 8.9 percent rise in the 1969–72 cycle. Two and one half years after the trough, productivity had

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[9] In the 1949 recession, productivity fell in the first quarter after the peak and in the trough quarter. Nevertheless, productivity rose 1.3 percent from the peak to the trough.
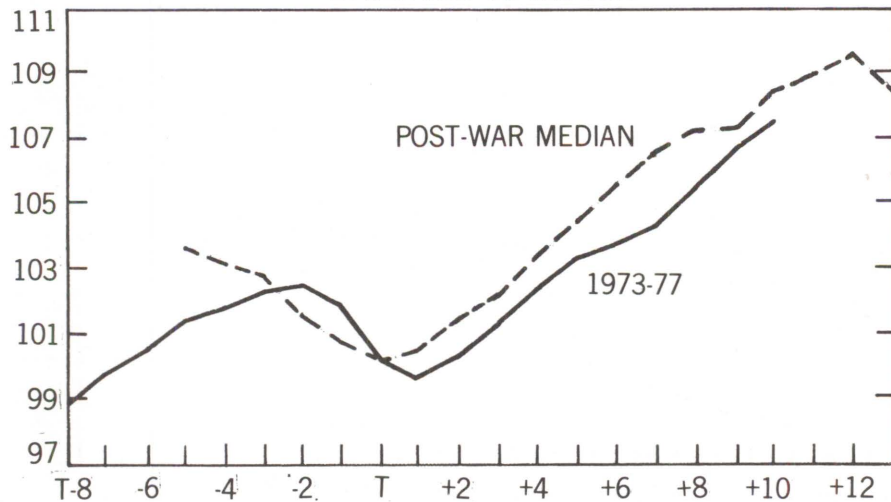
Chart V

CYCLICAL COMPARISON
OF NONAGRICULTURAL PAYROLL EMPLOYMENT
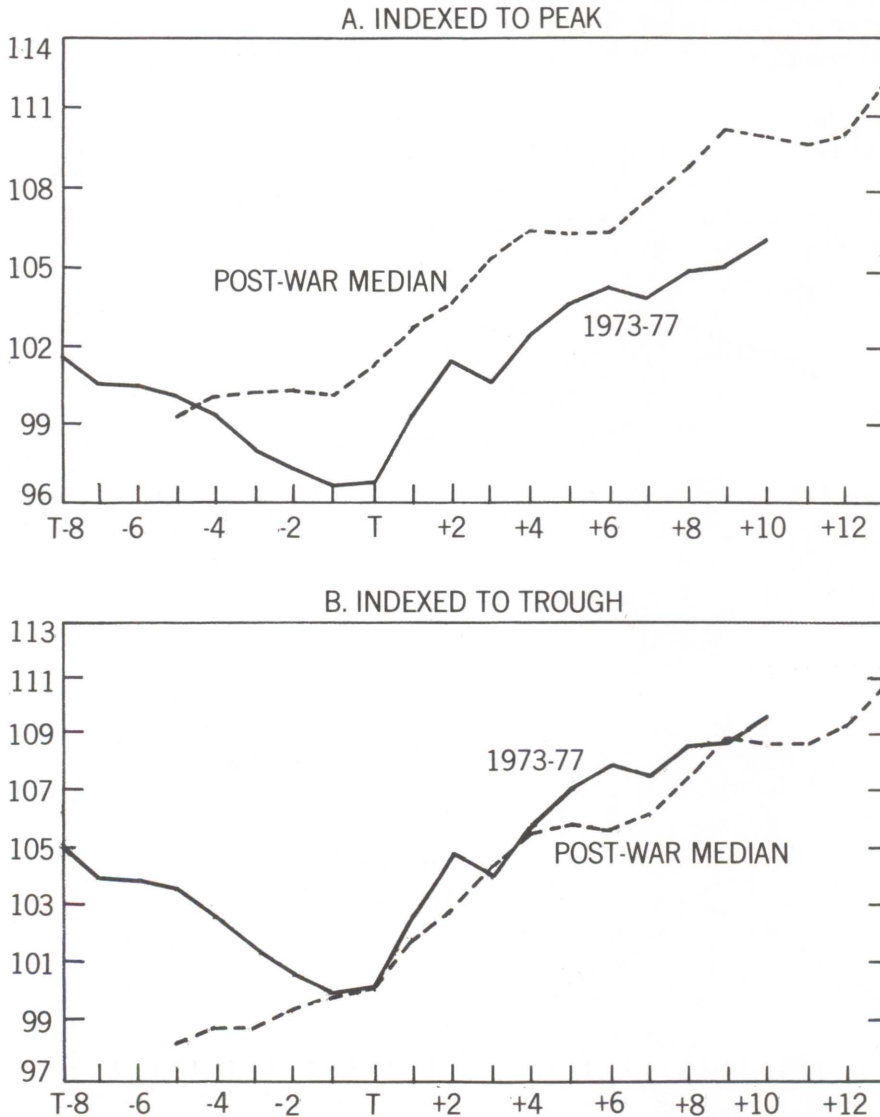
A. INDEXED TO PEAK
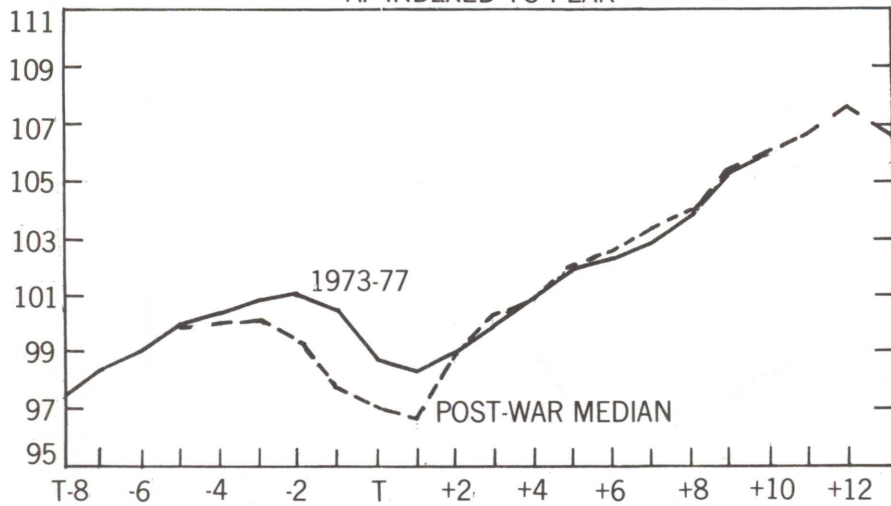
B. INDEXED TO TROUGH

Source: U.S., Bureau of Labor Statistics, *Employment and Earnings,* various issues.

Chart VI

CYCLICAL COMPARISON OF
PRODUCTIVITY-NONFARM BUSINESS SECTOR

A. INDEXED TO PEAK

B. INDEXED TO TROUGH

Source: U.S., Bureau of Economic Analysis, *Business Conditions Digest*, various issues.

risen 6.1 percent above its level at the cyclical peak. In contrast, the median increase of the four earlier expansions over the same period was 10.1 percent. Productivity growth during the current business cycle is even weaker when compared with its own pre-recession "specific peak" in the first quarter of 1973 rather than the cyclical peak, increasing only 4.4 percent over the same interval.

The productivity data are consistent with the hypothesis that there was an extraordinary drop in the *level* of productivity in 1973–74. (It is interesting to note that the drop started in 1973 *before* the "energy crisis" began.) Data since the

1975 trough are consistent with the notion that productivity *growth* returned to normal with the onset of the economic expansion.

Inflation

The inflationary experience in the current business cycle differs significantly from that of previous post-War cycles. Several factors outside the normal path of economic activity account for many of the differences (see Table 1 and Chart VII).

(1) This business cycle "inherited" a high rate of inflation. Throughout the late 1960s, actual

Table 1
Inflation Indicators
(Percent Change — Compound Annual Rates)

|	(1) Apr. '68– Aug. '71	(2) Aug. '71– Oct. '73	(2A) Aug. '71– Jan. '73	(2B) Jan. '73– Oct. '73	(3) Oct. '73– Mar. '75	(4) Mar. '75– Sept. '77
Consumer Price Index						
Total	5.2	5.3	3.4	8.9	10.9	6.2
Total excluding Food	5.3	3.8	2.7	5.9	10.7	6.7
Food	4.6	10.7	5.6	21.0	10.2	5.3
Energy	3.4	5.8	2.9	11.5	21.5	9.4
Total excluding Food & Energy	5.5	3.5	2.7	5.1	10.0	6.3
Wholesale Price Index						
Total	3.6	9.2	5.9	15.7	15.4	5.4
Industrial Commodities	3.7	5.2	3.1	9.4	21.0	6.5
Industrial Commodities excluding Energy	3.5	4.8	3.0	8.2	18.3	5.6
GNP Deflators						
Implicit Price Deflator	5.1	6.2	5.2	8.0	10.8	5.6
Fixed Weight	5.0	6.2	5.2	7.8	11.0	5.9
Nonfarm Business						
Deflator	4.6	4.8	3.5	6.9	12.2	5.5
Unit Labor Cost	5.2	5.8	4.0	9.0	13.9	4.3
Compensation	6.9	7.8	8.1	7.4	9.8	8.3
Productivity	1.2	1.6	3.8	−2.1	−2.6	3.7

Source: Price data — U.S., Bureau of Labor Statistics, statistical releases.
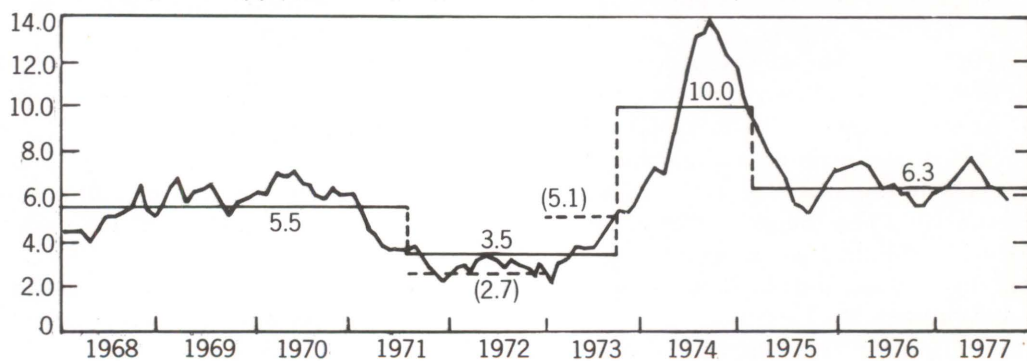GNP deflators — U.S., Bureau of Economic Analysis, *Survey of Current Business*, various issues.
Nonfarm Business Sector — U.S., Bureau of Economic Analysis, *Business Conditions Digest*, various issues.
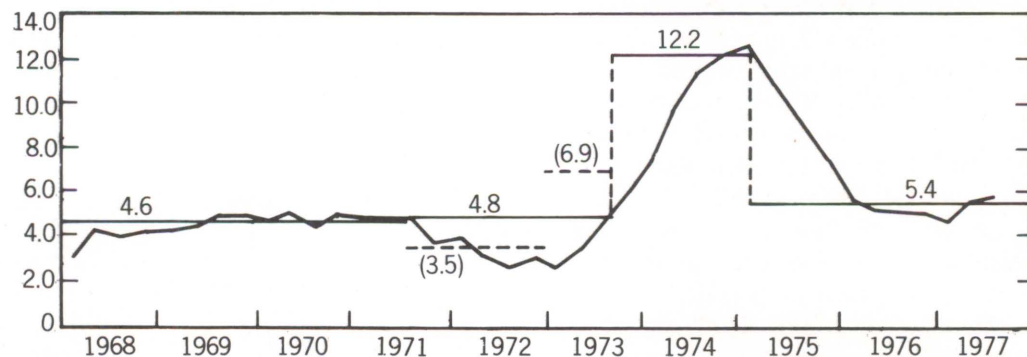
Chart VII

CONSUMER PRICE INDEX - ALL ITEMS
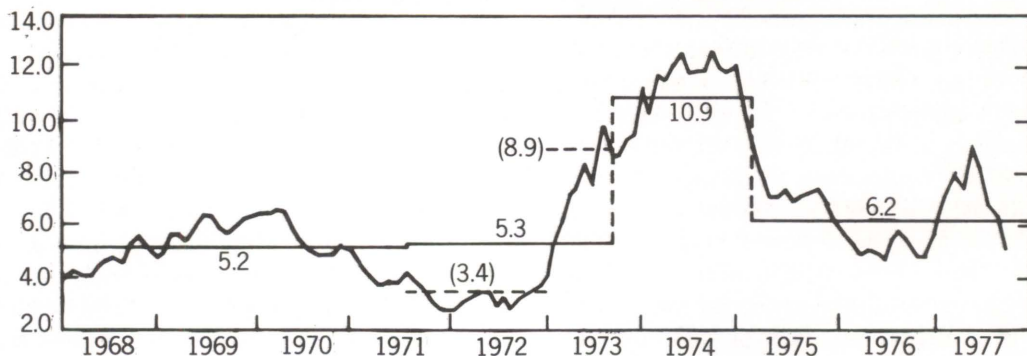
CONSUMER PRICE INDEX - EXCLUDING FOOD AND ENERGY

IMPLICIT PRICE DEFLATOR - NONFARM BUSINESS SECTOR

Note: The top two panels show six-month changes at an annual rate. The bottom panel shows four-quarter changes.

GNP exceeded potential GNP and the unemployment rate averaged below 4 percent. This excess demand situation was accompanied by a gradual but steady acceleration in the inflation rate. Acceleration was halted during the 1970 recession but in mid-1971 the inflation rate was judged high enough (or the risk of reacceleration great enough) that a comprehensive program of wage-price controls was introduced.

(2A) In August 1971, a 90-day wage-price freeze (Phase I), to be followed by a controls program (Phase II), was announced. Phases I and II were in effect for nearly a year and a half. During this period, the rate of inflation, as measured by the CPI, or the nonfarm business deflator was about 3½ percent.

(2B) Controls were relaxed in January 1973 (Phase III), tightened briefly again in June ("Phase III½"), and virtually abandoned in August (Phase IV). Simultaneously, food prices began to accelerate rapidly due to supply-side difficulties and strong world-wide demand. During 1973, retail food prices rose at about a 20 percent annual rate. The "bulge" or "catch-up" associated with decontrol, along with the food price surge, boosted the rate of inflation into the 8 to 9 percent range.

In October 1973 the Yom Kippur War broke out. The outbreak of hostilities was followed by a 70 percent increase in the posted price of crude oil, an Arab oil embargo, and subsequently a quadrupling of the price of imported oil. The oil shock occurred just as the economy was reaching its cyclical peak in November 1973.

(2) During the 26–month period from the advent of controls to the start of the Mid-East War — an interval which combines both the controls and "bulge" or "catch-up" periods, the inflation rate was about 5 percent. This is about the same rate as recorded from mid-1968 until the imposition of controls in 1971. In other words, the price *level* at the time of the oil shock was approximately the same as a simple extrapolation of the pre-controls rate. Much of the acceleration in the rate of inflation in 1973 can be regarded as a "post-controls catch-up." By the time that the "catch-up" was complete, the price level was pushed up even faster by the huge increase in the price of imported oil.[10] Although the controls program clearly altered the *pattern* of inflation during the 1970–73 expansion, this perspective suggests there was little change in its "underlying trend."

(3) Although the cyclical peak was not reached until late 1973, productivity had peaked and a slowdown had begun early in the year. With the continued acceleration in compensation, unit labor costs had been rising at 9 percent annual rate. In short, the economy entered the oil shock and recession period with a high and rising rate of inflation.

During the recession, the inflation problem was exacerbated by rapid increases in energy prices, which not only rose by more than 20 percent but contributed to the increases in other prices. In addition, the decline in productivity continued throughout 1974 until the trough in March 1975 and unit labor costs accelerated to about 14 percent. The most severe recession of the post-War period was accompanied by double-digit rates of inflation.

(4) The economic recovery began in the spring of 1975. The nonfarm business sector experienced a sharp drop in the rate of increase of unit labor costs, falling to 4.3 percent, close to the pre-recession rate. This reflected some slackening in the rate of increase in compensa-

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[10] This statement is not intended to imply that the post-controls "bulge" was exactly, fully incorporated in the price level precisely when the Mid-East War began. For example, if food prices were regarded as "exogenous" and excluded from the calculation, the price level did not return to its pre-controls trend until May 1974. Although this measure would alter the timing of the inflation episodes, it does not alter the central point that much, if not all, of the acceleration of the inflation rate in 1973 was simply a return to the pre-controls trend.

tion and a recovery in the rate of productivity growth.

During the first 30 months of the expansion the inflation rate decelerated to 6.2 percent from the double-digit pace during the recession. Much of the decline was associated with improvement in price behavior in the food and energy sectors — the rate of increase in each of these sectors was only about half of its recession pace. During the expansion slightly below-average increases in food prices offset above-average energy prices so that all consumer prices, as well as those excluding food and energy, have grown at a little more than 6 percent.

Summary and Conclusion

This article has attempted to document, rather than explain, the persistence of high inflation and high unemployment by describing the behavior of several key economic variables. Description of such complex phenomena requires choosing a systematic framework of presentation which, in itself, suggests several conclusions.

It was noted, for example, that the 1970s inherited a high rate of inflation from the boom in the late 1960s. It is an open question whether (or how rapidly) inflation was decelerating in mid-1971 when a comprehensive system of wage and price controls was introduced. There can be little doubt that the controls held down prices in 1972 and that the relaxation of controls contributed to the acceleration of inflation in 1973 and perhaps 1974. Other factors which contributed to the acceleration were supply difficulties for agricultural products, the devaluation of the dollar, the international synchronization of a business cycle upswing, and the quadrupling in the price of imported petroleum.

In addition, a downturn occurred in early 1973. Slow growth was accompanied by unusually strong employment gains and a sustained decline in productivity. Weak productivity and rising compensation put further pressures on unit labor costs.

By 1974, inflation had reached double-digit rates and the economy was in a contraction. Late in the year the contraction accelerated rapidly as consumer demand collapsed at the same time that producers were attempting to cut back on excessive inventory holdings. Layoffs accompanying drastic cuts in production boosted the unemployment rate from 5.5 percent to 9.0 percent in nine months.

The expansion that began in early 1975 was characterized by weak to normal employment growth and normal productivity growth. Inflation and unit labor costs returned to rates near those experienced in the early 1970s. After a period of normal growth during the slowdown, recession, and recovery, labor force growth increased rapidly in the second and early part of the third year of the expansion.

The unusual drop in productivity in 1973–74 held the unemployment rate below its normal path with respect to output. The subsequent rapid rise in labor force participation has brought the unemployment rate back to its normal relationship to real GNP. Lingering high unemployment reflects the persistence of a sizable gap between actual and potential GNP. Although inflation rates have receded from the double-digit pace of 1974, continued slack in product and labor markets has not (yet!?) reduced the inflation rate below the "underlying 5 to 6 percent" which has stubbornly persisted for nearly a decade.

Thus, despite abnormal behavior of employment, productivity, and the labor force, the unemployment rate has mirrored the path of real GNP as closely as in previous years. In contrast, the path of the inflation rate has reflected numerous "special factors" more than the current phase of the business cycle.

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