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CHAPTER 11

THE LABOR FORCE UNDER SHORT-RUN CHANGES IN INCOME, EMPLOYMENT, AND ARMED FORCES

> "Labour is a commodity which cannot be increased and diminished at pleasure."
>
> DAVID RICARDO, *Principles of Political Economy and Taxation*

THIS chapter and two occasional papers by the author [1] review the behavior of the labor force since 1939 in the United States, Great Britain, Germany, and Canada. The more recent paper compares the labor force at its wartime peak among these countries and uses annual data to bring out how it was built up in the United States and Britain in large relative amounts and in Canada in a small relative amount, and its failure to rise at all in Germany; how it was demobilized in the United States, Britain, and Canada at the war's end; and (briefly) how it reacted in the United States and Canada to the conflict in Korea. Its course in relation to mobilization in wartime and demobilization is summarized in Chapter 1 of this volume. Here labor force is compared with fluctuations in earnings and income, unemployment, and military strength during the years of war and transition. The comparison—further tested by multiple correlation analysis of quarterly data—yields no evidence that the labor force has responded systematically and dependably to short-run changes in income and in the demand for labor, or to moderate peacetime changes in the armed forces.

As a proportion of the working-age population, labor force is derived from census reports which have provided quarterly averages of monthly estimates in the United States since 1940, quarterly estimates in Canada since late 1945, and annual (June) estimates in Great Britain since 1939. Basic information for census estimates of employment, unemployment, and labor force in the United States during this period rests on data obtained by enumerators in interviews with a random sample of 25,000 households located in 68 broadly representative areas throughout the country.[2] Every individual 14 years of age or over in each house-

[1] *The Labor Force in War and Transition: Four Countries,* Occasional Paper 36, 1952, and *The Labor Force in Wartime America,* Occasional Paper 14, 1944, National Bureau of Economic Research.

[2] The gross number of households in the sample was 25,000 until May 1956. Because of absences, vacancies, and other circumstances, the net number of households actually interviewed was usually between 20,000 and 22,000. Beginning with May 1956, the size of the sample was increased to about 35,000

hold is classified as employed, unemployed, or not in the labor force, in accordance with the answers—given by some "responsible" member of the household—to a standard set of questions. The labor force figure is obtained by adding the estimates based on the number of persons reported to be employed and the number reported to be unemployed but seeking jobs.[3]

Using these data from each household, the Bureau of the Census computes the percentage of persons in each sex-color-age group who are employed, unemployed, or not in the labor force. National estimates are then derived by applying these percentages to independent estimates of the total civilian population by sex-color-age groups.[4]

Since estimates are based on a relatively small sample, there is a possibility of sampling error. The errors, and the steps taken to measure and minimize them, are presented in Supplementary Appendix I.

United States: Effect of Fluctuations in Armed Forces, Unemployment, Earnings, and Income on Labor Force Behavior in the Short Run

ARMED FORCES.

Until the armed forces began to expand, the labor force in this country remained stable in its relation to population (Chapter 12). Since most of the influx into the labor force occurred in the years when recruiting camps were jammed with inductees, it seems safe to infer that it was brought about by the military draft. The immense levies drew young men from schools into the armed forces and thus into the labor force; reduced the number of men at home for whom women had to keep house; deprived many households of their main breadwinners, making it necessary for wives, sisters, and mothers to work; and created a vacuum in the social life of women which millions of them filled by taking defense jobs.

Although the flow of new workers into the labor force during World War II kept close pace with the draft, the outflow began as early as the spring of 1945, several months before the end of the war and a full year before demobilization of the armed forces had neared completion.

interviewed households in 330 areas. (The number of sample areas had been increased to 230 in January 1954.)

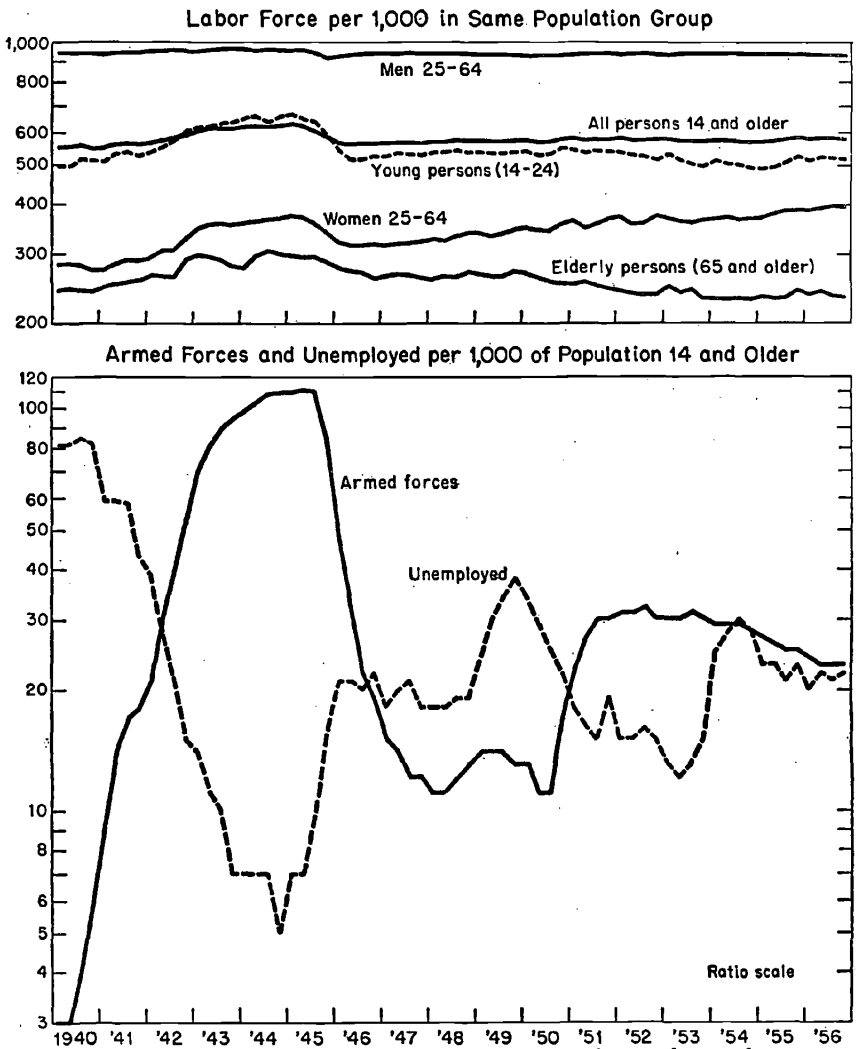
[3] Persons 14 and older who are reported to be neither working nor looking for work are classified as not being in the labor force. Chapter 3 and Appendix E discuss further the census' definitions of employed, unemployed, and labor force. Chapter 3 also describes sampling methods more fully. Some examples of "looking for work," which were provided with questionnaires used by enumerators, appear in Chapter 10 under the heading, "Some Questions Concerning the Findings of This Investigation."

[4] Appendix E of the *Economic Report of the President*, Jan. 28, 1954.

The exodus of men 25–64 from the labor force had been completed in late 1945, that of women and young people in mid-1946, and that of the elderly in the fourth quarter of that year (Chart 20). Armed strength was still two million at the end of 1946, though servicemen were discharged rapidly, and did not reach the post-World War II

CHART 20

Labor Force Compared with Armed Forces and the Unemployed, United States, 1940–1956



All series are quarterly averages of monthly estimates. Labor force and unemployment are seasonally adjusted.

Source and description of adjustments: Appendix Tables B-1 and B-2, and related text.

low of 1.2 million until the winter of 1948. It fluctuated moderately between 1948 and mid-1950, making no apparent impression on the behavior of the labor force (it declined slightly during the first half of 1950 when the labor force also showed a mild general decrease). It nearly reached peak expansion for the Korean operations—almost tripling—in the 12 months after the start of hostilities; during the same time, total labor force participation made most of its Korean expansion. The armed forces then remained rather constant for over three years, from mid-1951 through the third quarter of 1954, while the total labor force first fluctuated slightly and then lost its Korean additions, with its various subgroups moving diversely. In 1955, the services declined about one-fifth while the labor force increased slightly more than it had during the Korean conflict. A small amount of these labor force gains were lost in the last half of 1956, while armed forces remained constant.

THE UNEMPLOYED.

There was a strong association between unemployment and growth of the armed forces during World War II, and a significant but not so strong association during the postwar period. As the Army, Navy, and Air Force expanded in 1941, unemployment declined rapidly—about six months after Pearl Harbor it was less than 4 per cent [5] of the labor force and by mid-1943, less than 1 per cent. It was near this level for 24 months, while the armed services continued to expand to a peak of 12 million in early 1945. Then as millions of persons left both the armed services and civilian jobs during the last half of 1945, unemployment began to rise, reaching almost 4 per cent by early 1946—the end of the labor force contraction. Between early 1946 and late 1948 unemployment fell off a little while the labor force edged from 56.3 to 57.5 per cent of the working-age population. Participation of the age-sex groups was diverse—remaining virtually unchanged for men 25–64 after the second quarter of 1946, dipping slightly for elderly persons but showing no net rise or fall, expanding somewhat for young people, and continuing its steady, long-run increase for females. Between late 1948 and 1949 unemployment doubled, but this did not induce a significant change in the over-all participation rate, which, though dipping slightly in early 1949 was almost the same at the end of the year as it was at the end of 1948: approximately 57.5 per cent of the population 14 and older. Nor was the rise of unemployment accompanied by significant or systematic changes in the participation rates of the broad age groups. The rate for men 25–64 declined somewhat and that for women 25–64 rose even more (though slightly so) than the increase called for by the long-run upward trend in female participa-

[5] The percentage regarded as "normal" in this study.

tion. The rates for young and elderly persons remained approximately unchanged. Between late 1949 and the eve of the Korean action in the second quarter of 1950, unemployment declined substantially. At the same time the labor force as a whole and all major age groups manifested a decline in propensity in accordance with the additional worker hypothesis, but in opposition to the hypothesis that improved employment opportunities bring more persons into the labor force. This was the only instance in the period of systematic behavior of labor force in possible reaction to unemployment change. On the whole the period between early 1946 and the outbreak in Korea gave no real support either to the theory that higher unemployment results in additional workers or to the theory that it squeezes workers out of the labor force by depriving them of job opportunities.

Six months before the Korean action, unemployment began a decline which was to last, almost without interruption, for nearly four years—from the last quarter of 1949 to the second quarter of 1953. At the start of this decline before the Korean outbreak, the participation rates of men 25–64 remained substantially unchanged and those of persons 14–24 and 65 and older, of women 25–64, and of all persons 14 and older moved downward. As unemployment continued to fall from the Korean outbreak to the end of 1951, the total labor force reversed its movement, realizing almost all of its increase of the Korean episode; participation of young people showed a sharp, brief upturn, then began a long, general decline; that of women rose; and that of older people levelled off, then again slipped down. Unemployment still decreased gradually but steadily between the end of 1951 and the summer of 1953, as the participation of females moved generally upward and then declined, that of young and old people moved steeply downward (except for a temporary upturn in the first quarter of 1953), and that of all persons 14 and older first fluctuated, then decreased throughout 1953.

After the trough of this nearly four-year decline, unemployment, seasonally adjusted, rose moderately in the third and fourth quarters of 1953 and sharply in the first quarter of 1954, while the participation of the total labor force and that of young persons and women first declined and then rose, and the participation of elderly persons first rose and then declined. During most of 1954 unemployment rose somewhat further as the participation of young persons and of the total labor force decreased and that of women, men, and elderly persons remained about stable.

The decrease in total labor force participation during 1954 brought it down to about the same level as had prevailed during the two years before the Korean conflict (when, however, unemployment had been, first, appreciably lower, then appreciably higher, than in 1954).

In the first quarter of 1955 unemployment fell and was fairly constant during the rest of that year and throughout 1956; except for men and women, participation rose generally in 1955, failed to rise further during the first half of 1956, and then declined in the last half. The participation of men declined very gently during most of the two years and that of women was generally upward until the last quarter of 1956. Thus, the association of labor force with unemployment during these seven years followed no discernible pattern.

It may, of course, be argued that unemployment as a whole is not a dependable indicator of employment opportunity. Such an argument could proceed on two grounds.

Unemployment may fluctuate, not only from changes in employment, but also from changes in the labor force itself. This possibility can, however, be tested against the behavior of a group which does not enter and leave the labor force in any appreciable numbers, i.e. men 20–44. The test indicates that the unemployment of men 20–44 in this period followed the same course, essentially, as that of total unemployment. Except that it remained constant for the most part during mid-1951–1953 instead of gradually declining, and did not rise quite as much as total unemployment in 1953–1954, its movement was very similar.

But even this test may not be a good indicator of the effect of job opportunity. For example, an abundance of jobs might conceivably induce men 20–44 to alter their employment status if not their labor force status, by leaving one office or factory to seek work in another, thus increasing unemployment at a time when jobs were actually more plentiful. A better indicator might be the total hours worked, or overtime hours paid for at premium rates. An examination of these and other such factors would be most interesting, but they are beyond the scope of this study. The writer does not believe that labor force participation will respond any more sensitively or systematically to these other possible indicators than it has to unemployment, but a rigorous test must wait for some other investigation.

QUARTERLY INCOME.

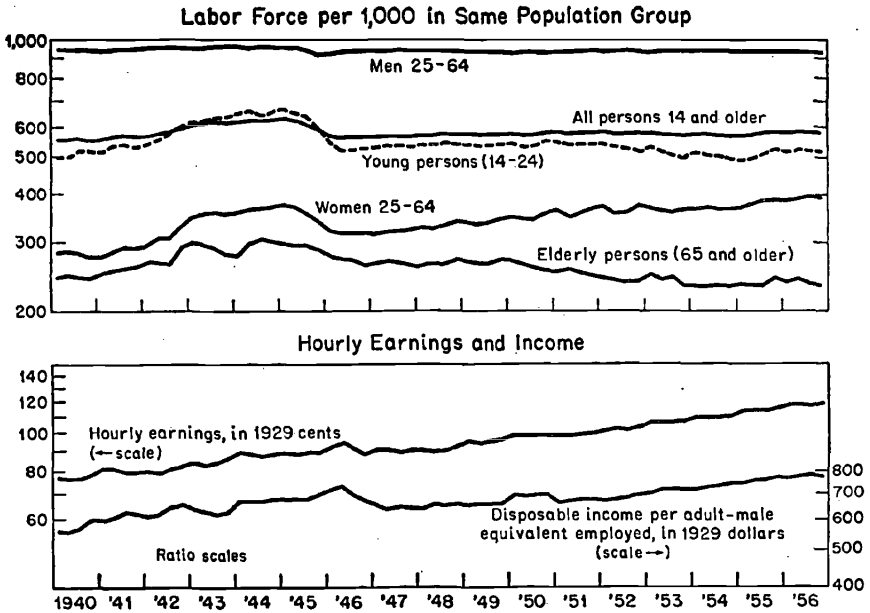
Over the seventeen years from early 1940 through 1956, disposable personal income per adult-male equivalent employed rose 162 per cent —a 35 per cent rise after adjustment for the increase in the cost of living. As estimated by the census from sample surveys, the 1956 labor force was larger than that of 1940 by 3.3 per cent of population 14 and older, and as enumerated by the regular census in 1950, it was about the same as it had been in the censuses of 1890 through 1930 [6] —when the unemployment rate was also about the same (although

[6] Standardized for age-sex and rural-urban composition.

both money income and real income were much lower). The regular census also revealed that participation in 1950 was above 1940. It is possible that participation in 1950 or 1956 was higher than in 1940 because of the increase in armed forces and the decrease in unemployment in 1950 (Chapter 10). Changes in participation were associated neither with trends in income nor with deviations of income from the trends (which seemed to be a straight-line arithmetic movement throughout the entire seventeen years). In constant prices income seemed to move with labor force in only a few years—notably 1940–1942 and late 1943 through early 1945 (Chart 21).

CHART 21

Labor Force Compared with Disposable Income and Hourly Earnings, United States, 1940–1956



All series are quarterly averages of monthly estimates, except disposable income (quarterly totals), and are seasonally adjusted.
Source and description of adjustments: Appendix Tables D-2, D-5, and B-2, and related text.

HOURLY EARNINGS.

Hourly earnings differ from quarterly income in that they exclude dividends, interest, and other non-wage receipts of wage earners, employers, and the self-employed. They cover earnings, approximately, for time worked and are unrelated statistically to employment or unemployment. And they are not adjusted here to an adult-male equiva-

lent. Real hourly earnings rose about a fifth during 1940–1946, and remained rather constant during 1946–1948. They went up nearly 10 per cent by early 1950, changed very little during 1950–1951, and then climbed steadily during 1952–1956, so that by 1956 they were 30 per cent above 1946, and more than 50 per cent above 1940. So far as earnings were concerned, it was impossible to discern any influence on total labor force participation during this period, whether they were expressed in money or in real terms. Participation rates of the individual groups were similarly lacking in systematic association. Participation of females, of course, moved generally upward, as real hourly earnings rose over the seven-year period 1950–1956. The older and younger groups showed some positive agreement with real hourly earnings in certain detailed changes in participation rates during 1950–1956 but not in others, and they both moved in opposite directions from earnings during this period so far as trend was concerned.

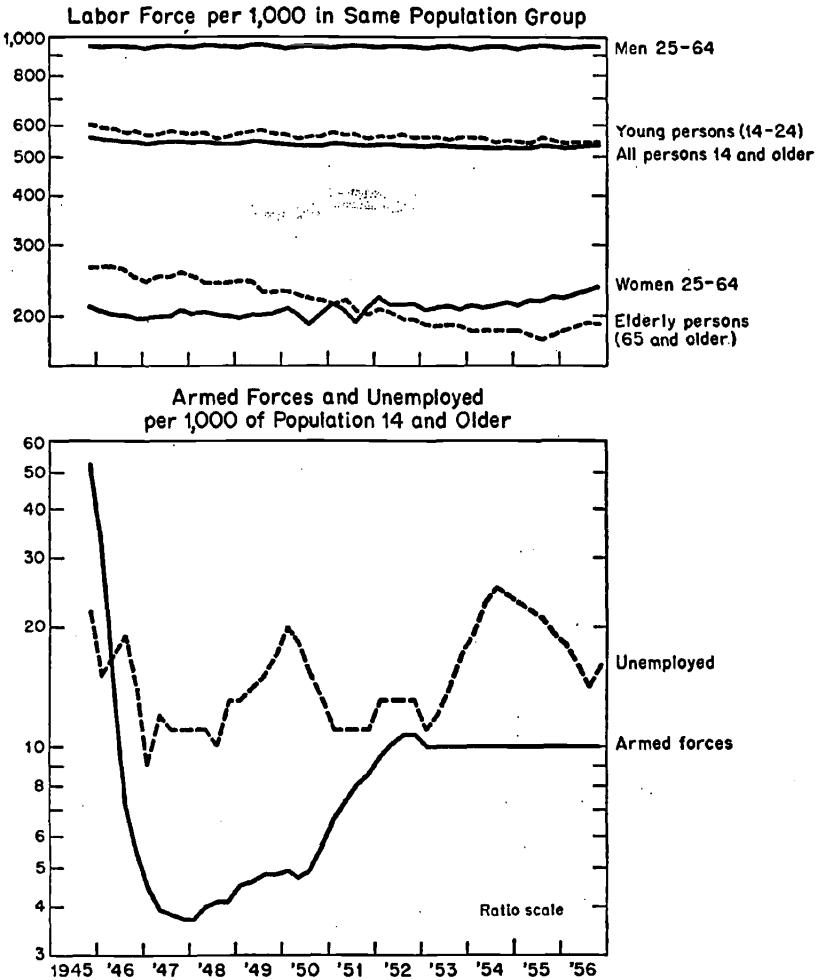
Canada: Effect of Fluctuations in Armed Forces, Unemployment, Earnings, and Income on Labor Force Behavior in the Short Run

ARMED FORCES.

The crude annual data for 1939–1945 have suggested that in Canada the labor force during World War II increased by about the same amount in relation to armed forces as did the labor force in the United States. The Canadian estimates which have been available for every third month from late 1945 to the end of 1952, and thereafter for every month, showed that the labor force had lost its wartime additions by the end of 1946, when demobilization of the armed forces was nearly complete (Chart 22). During the next four years (to mid-1950) the armed forces remained close to 4 or 5, and labor force participation between 534 and 548 per 1,000 population 14 and older. In view of the fact that the sampling error of any figure was as much as 6, i.e. ± 3 per 1,000 population 14 and older, these small variations scarcely uphold the existence of outside influences (Table 43). During the Korean conflict, Canadian armed services did not increase as much as the American armed services but, like the latter, they did remain almost at Korean operation levels after the fighting had ended. Total labor force participation, instead of rising as in the United States, drifted downward and was about 1 per cent less during 1950–1952 than during 1946–1949. It declined further and by a similar amount in 1953 and 1954, then rose in the last half of 1955. Except that it held up slightly better in 1956 and manifested no increase in early 1954, total labor force participation in Canada during 1953–1956 be-

CHART 22

Labor Force Compared with Armed Forces and the Unemployed, Canada, 1945–1956



Quarterly estimates, seasonally adjusted (except armed forces). Source and description of adjustments: Appendix Tables B-6 and B-6A, and related text.

haved rather similarly to that in the United States during these years. But it showed less sign of association with armed forces.

UNEMPLOYMENT.

Unemployment in Canada remained lower [7] than in the United States throughout the decade ending in 1956 (Chart 22). There was some

[7] One of the striking features of United States-Canadian comparisons has been their agreement in movement of unemployment. Unemployment was lower in

TABLE 43

Variation in the Proportion of the Labor Force to Population and the Corresponding Range of Error in the Labor Force Sample Estimates, United States and Canada, 1946–1952

(per 1,000 population of same sex and age)

	Maximum Range of Labor Force Variation		*Range Owing to Sampling Variability* $2(2\sigma)$
	Mid-1946–Mid-1950	*Mid-1946–Mid-1952*	
United States			
Labor force 14 and older	11	20	6
Males 14 and older	14	13	14
Females 14 and older	24	35	10
Young people 14–24	25	37	20
Men 25–64	13	14	20
Women 25–64	33	56	10
Elderly people 65 and older	11	31	20
Canada			
Labor force 14 and older	14	18	6
Males 14 and older	20	30	12
Females 14 and older	13	26	8
Young people 14–24	32	32	20
Men 25–64	21	21	20
Women 25–64	12	32	10
Elderly people 65 and older	37	60	20

Source of estimates of sampling variability: *Current Population Reports;* Series P-57, No. 118, p. 12; *The Labor Force,* November 1945–March 1952, *Reference Paper* No. 35, pp. 5–6. See also the author's comments in "Statistical Standards and the Census," in the *American Statistician,* February 1952, and Supplementary Appendix I.

fluctuation. Seasonally adjusted, it rose from about 2 per cent in 1948 to 3.8 per cent of the labor force in March 1950 and then declined to below 2.5 per cent. But it rose to near United States levels (about 4.5 per cent) only once—in the 1954 recession. There was a similar tendency for the labor force to rise in 1955 when unemployment decreased, as if in response to improved job opportunity, but there was no such association before and during the Korean operations.

The tendency of the total labor force participation to decline somewhat (instead of rising somewhat as in the United States) during the years following World War II is reflected in the behavior of the major age-sex groups. Men 25–64 showed a slight net rise, compared with a

average percentage in Canada, perhaps because of the great importance of agriculture. But the similarity of the detailed movements in the two countries during 1945–1950 was most impressive in view of the small samples on which the unemployment estimates rest.

slight net fall in the United States; but compared with this country the participation of young and elderly persons decreased much more, and that of women rose much less over the decade following 1946. The rise of unemployment in the 1949–1950 recession was not reflected in any significant rise or decline for any of these age-sex groups, and the post-Korean rise of unemployment in 1954 was met by a similar lack of systematic response. For most of this decade the participation of elderly men and young persons continued the downward trend without check or acceleration; that of women 25–64 continued its slow upward trend, also without change of pace. However, the slight increases in participation of all persons 14 and older, of young and old people, and the small acceleration in the increase of participation of women, which occurred in late 1955 and 1956, were associated with a moderate decline of unemployment.

QUARTERLY INCOME AND HOURLY EARNINGS.

Quarterly income and hourly earnings both soared in Canada during 1946–1956. Adjusted for the cost of living, hourly earnings rose about a third and income about a half. A trifling upswing of real income and earnings in early 1947 was accompanied by a very slight drop in labor force participation of all groups; a dip in real income and earnings during late 1947 and early 1948 was associated with a rise in the participation of women and elderly persons, and with a gentle decline in that of the young. On the whole, however, the labor force fluctuations were too restrained and unsystematic to suggest any response to changes in earnings or income of the kind that could be detected by graphical comparison.

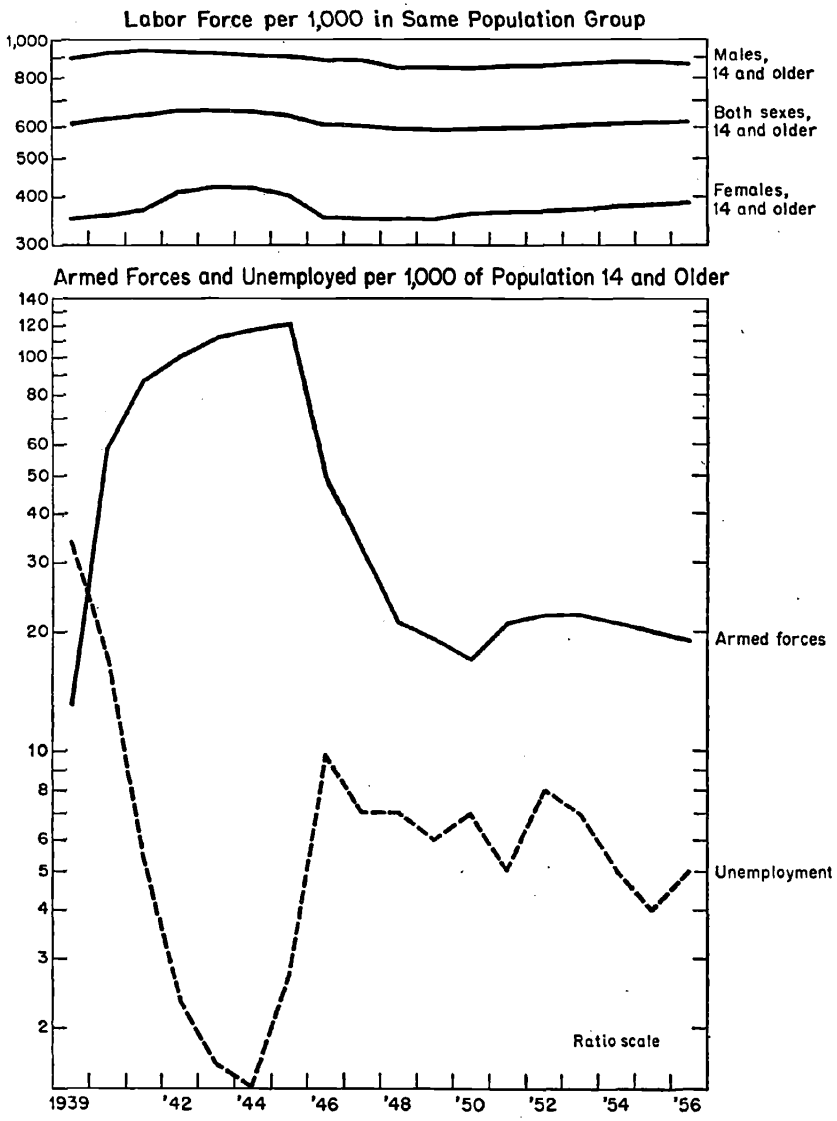
Great Britain

Since Britain's annual estimates of the labor force are derived basically from registrations for social insurance rather than from surveys or censuses of population, they are not likely to reflect ordinary changes in labor force behavior, for a person is scarcely apt to withdraw his registration if he leaves the labor force briefly. They should, however, reflect the more long-lasting changes in his willingness or ability to be gainfully occupied.

British wartime additions to the labor force had entirely disappeared by mid-1946, about the same time as in the United States and about six months earlier than in Canada. Thereafter, participation declined from 60.6 per cent of the population 14 and older in 1946 to 58.8 per cent in mid-1949 (Chart 23), perhaps partly because of the small additional separations from the armed forces, but during 1951–1956 it climbed above the 1946 level and, in fact, to slightly above the level

CHART 23

Labor Force Compared with Armed Forces and the Unemployed, Great Britain, 1939–1956



Annual estimates. For source and description of adjustments, see Appendix Table B-4 and related text, and Table B-5.

of 1939. Through the eleven postwar years, unemployment remained at very low levels—between 0.7 and 1.6 per cent of the labor force; and from 1948 forward the armed forces were at nearly constant strength. All in all, the British labor force participation was fairly stable—it was the same in 1951 as it had been in 1931, and almost the same as in 1921 and 1911.[8]

Recapitulation

In the United States, Great Britain, and Canada wartime additions had left the labor force by the end of 1946 and participation rates were close to those in previous periods of peacetime high employment. During the decade 1947–1956, the over-all participation in these three countries remained rather impressively stable, within a maximum range of 1.8 per cent in Great Britain, 2.3 per cent in the United States and 2.6 per cent in Canada—smaller than the normal range of variation in the United States or Canada between the winter and summer labor force of any given year.

In the United States and Canada males continued to leave the labor force as men above 45 retired earlier in life, and as boys and young men extended their years of schooling. Women above 25, chiefly wives, resumed their long-run labor force inflow in all three countries, though at a very moderate rate in Canada. These offsetting changes did not correspond in any consistent way to variations in armed forces, unemployment, or hourly earnings and disposable income, even when earnings and income were adjusted for changes in the cost of living.

The Joint and Several Effects of Armed Forces, Unemployment, and Income or Earnings

When a number of elements are present in any behavior, the effect of each may be so obscured by that of the others that it can be measured only after all of the elements have been examined in various combinations—by multiple and partial correlation.

Multiple correlations of United States data on labor force, armed services, unemployment, earnings, and income were tested for two

[8] Standardized for age and sex composition.

In a study of the British labor market for 1920–1938 Gerhard Tintner suggests that "it is not at all certain that there is any dependence of the supply of labor on wages and prices." His materials and his use of the term "industrial labor supply," indicate that he deals with shifts both into and out of the labor force and between industrial and nonindustrial occupations within the labor force. His measures therefore pertain to labor supply in relation to a group of important industries, and not to all labor (see Appendix B). However, the stability of the aggregate supply would be even greater than that of any segment of it. "An Econometric Investigation of the British Labor Market," *Econometrica*, July 1950, p. 268.

periods: the World War II period embracing the 26 quarters from 1940 through mid-1946, and the post-World War II period, covering the 24 quarters from mid-1946 to mid-1952 (Table 44). Labor force and unemployment were corrected for seasonal variations. (See text of Appendix B and Tables B-1 and B-2 for the seasonal indexes and a discussion of the method of adjustment and its reliability.) Labor

TABLE 44

Labor Force Correlated with Armed Forces, the Unemployed, Disposable Income, and Hourly Earnings, United States, 1940–1952

		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*	*Persons 14–24*	*Persons 65 & Older*
		SIMPLE CORRELATIONS [a]				
		World War II Period (1940–1946) [b]				
Labor force and:						
Armed forces	r_{12}	+0.956 **	+0.880 **	+0.968 **	+0.973 **	+0.924 **
Unemployed	r_{13}	−0.861 **	−0.783 **	−0.866 **	−0.883	−0.917 **
Income						
Real	r_{14}	+0.413 **	+0.297 *	+0.433 **	+0.485 **	+0.642 **
Money	r_{15}	+0.255 *	+0.273 *	+0.233 *	+0.250 *	+0.364 *
Hourly earnings						
Real	r_{16}	+0.399 **	+0.308	+0.407 **	+0.439 **	+0.466 **
Money	r_{17}	−0.405 **	−0.266 *	−0.443 **	+0.494 **	−0.599 **
		Post-World War II Period (1946–1952) [b]				
Labor force and:						
Armed forces	r_{12}	+0.589 **	+0.328 *	+0.452 **	+0.363 *	−0.745 **
Unemployed	r_{13}	−0.129	−0.442 **	+0.053	−0.010	+0.587 **
Income						
Real	r_{14}	−0.256 *	−0.608 **	−0.054	−0.286 *	+0.151
Money	r_{15}	−0.361	+0.087	−0.360 *	−0.374 *	+0.173
Hourly earnings						
Real	r_{16}	+0.373 *	−0.240 *	+0.424 **	+0.323 *	−0.207
Money	r_{17}	+0.384 *	+0.773 **	+0.137	+0.304 *	−0.381 *
		MULTIPLE CORRELATIONS [a]				
		World War II Period (1940–1946) [b]				
Labor force, armed forces and:						
Unemployed	$R_{1.23}$	0.956 **	0.880 **	0.968 **	0.974 **	0.948 **
Real income	$R_{1.24}$	0.964 **	0.904 **	0.974 **	0.974 **	0.939 **
Money income	$R_{1.25}$	0.961 **	0.889 **	0.971 **	0.977 **	0.948 **
Real hourly earnings	$R_{1.26}$	0.961 **	0.893 **	0.972 **	0.975 **	0.924 **
Money hourly earnings	$R_{1.27}$	0.976 **	0.934 **	0.981 **	0.978 **	0.926 **

(table continues on next pages)

TABLE 44, *continued*

		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*	*Persons 14–24*	*Persons 65 & Older*
MULTIPLE CORRELATIONS [a] (cont.)						
World War II Period (1940–1946) [b]						
Labor force, armed forces, unemployed, and:						
Real income	$R_{1.234}$	0.973 **	0.919 **	0.979 **	0.978 **	0.950 **
Money income	$R_{1.235}$	0.963 **	0.896 **	0.972 **	0.977 **	0.952 **
Real hourly earnings	$R_{1.236}$	0.962 **	0.894 **	0.973 **	0.976 **	0.949 **
Money hourly earnings	$R_{1.237}$	0.980 **	0.937 **	0.982 **	0.981 **	0.948 **
Post-World War II Period (1946–1952) [b]						
Labor force, armed forces and:						
Unemployed	$R_{1.23}$	0.601 **	0.458 †	0.557 **	0.414 †	0.786 **
Real income	$R_{1.24}$	0.639 **	0.687 **	0.454 †	0.459 †	0.760 **
Money income	$R_{1.25}$	0.630 **	0.370 †	0.520 **	0.467 †	0.746 **
Real hourly earnings	$R_{1.26}$	0.613 **	0.505 **	0.531 **	0.417 †	0.751 **
Money hourly earnings	$R_{1.27}$	0.641 **	0.788 **	0.453 †	0.427 †	0.776 **
Labor force, armed forces, unemployed, and:						
Real income	$R_{1.234}$	0.689 **	0.712 **	0.572 †	0.534 †	0.790 **
Money income	$R_{1.235}$	0.633 **	0.462 †	0.559 †	0.467 †	0.814 **
Real hourly earnings	$R_{1.236}$	0.623 **	0.514 †	0.589 **	0.426 †	0.794 **
Money hourly earnings	$R_{1.237}$	0.789 **	0.807 **	0.638 **	0.616 **	0.789 **
PARTIAL CORRELATIONS [a]						
World War II Period (1940–1946) [b]						
Labor force and armed forces holding constant unemployed and:						
Real income	$r_{12.34}$	0.838 **	0.628 **	0.881 **	0.876 **	0.621 **
Money income	$r_{12.35}$	0.830 **	0.691 **	0.858 **	0.872 **	0.629 **
Real hourly earnings	$r_{12.36}$	0.846 **	0.683 **	0.886 **	0.889 **	0.611 **
Money hourly earnings	$r_{12.37}$	0.912 **	0.787 **	0.924 **	0.908 **	0.598 **

TABLE 44, *continued*

		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*	*Persons 14–24*	*Persons 65 & Older*
PARTIAL CORRELATIONS [a] (cont.)						
World War II Period (1940–1946) [b]						
Labor force and unemployed holding constant armed forces and:						
Real income	$r_{13.24}$	−0.477 **	−0.387 *	−0.446 **	−0.406 **	−0.408 **
Money income	$r_{13.25}$	0.193	0.251 *	0.186	0.113	−0.275 *
Real hourly earnings	$r_{13.26}$	−0.171	−0.076	−0.150	−0.253 *	−0.563 **
Money hourly earnings	$r_{13.27}$	−0.362 *	−0.229 *	−0.292 *	−0.339 *	−0.539 **
Post-World War II Period (1946–1952) [b]						
Labor force and armed forces holding constant unemployed and:						
Real income	$r_{12.34}$	0.659 **	0.248 *	0.567 **	0.468 **	−0.653 **
Money income	$r_{12.35}$	0.464 **	0.067	0.444 **	0.219 *	−0.440 **
Real hourly earnings	$r_{12.36}$	0.471 **	0.274 *	0.400 *	0.263 *	−0.461 **
Money hourly earnings	$r_{12.37}$	0.738 **	0.345 *	0.610 **	0.517 **	−0.651 **
Labor force and unemployed holding constant armed forces and:						
Real income	$r_{13.24}$	0.336 *	−0.255 *	0.389 *	0.306 *	0.335 *
Money income	$r_{13.25}$	0.073	−0.298 *	0.240 *	0	0.488 **
Real hourly earnings	$r_{13.26}$	0.138	−0.108	0.224 *	0.096	0.397 *
Money hourly earnings	$r_{13.27}$	0.600 **	0.286 *	0.503 **	0.492 **	0.226 *
World War II Period (1940–1946) [b]						
Holding constant armed forces and unemployed Labor force and:						
Real income	$r_{14.23}$	−0.594 **	−0.562 **	−0.580 **	−0.406 **	0.176
Money income	$r_{15.23}$	0.368 *	0.363 *	0.335 *	0.358 *	0.282 *
Real hourly earnings	$r_{16.23}$	−0.351 *	−0.335 *	−0.389 *	−0.296 *	−0.101
Money hourly earnings	$r_{17.23}$	0.721 **	0.681 **	0.665 **	0.497 **	−0.064

TABLE 44, *continued*

		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*	*Persons 14–24*	*Persons 65 & Older*
PARTIAL CORRELATIONS [a] (cont.)						
Post-World War II Period (1946–1952) [b]						
Holding constant armed forces and unemployed						
Labor force and:						
Real income	$r_{14.23}$	−0.384 *	−0.613 **	−0.154	−0.370 *	0.140
Money income	$r_{15.23}$	−0.160	−0.069	−0.059	−0.237 *	0.345 *
Real hourly earnings	$r_{16.23}$	0.076	−0.262 *	0.107	0.110	−0.191
Money hourly earnings	$r_{17.23}$	0.623 **	0.748 **	0.374 *	0.502 **	−0.117
SIMPLE INTERCORRELATIONS [a] BETWEEN INDEPENDENT VARIABLES						
Unemployed and:						
Armed forces	r_{32}		−0.885 **		−0.503 **	
Real disposable income	r_{34}		−0.707 **		+0.207	
Money disposable income	r_{35}		−0.471 **		−0.447 **	
Real hourly earnings	r_{36}		−0.507 **		+0.339 *	
Money hourly earnings	r_{37}		+0.606 **		−0.652 **	
Armed forces and:						
Real disposable income	r_{24}		+0.539 **		−0.013	
Money disposable income	r_{25}		+0.165		−0.245 *	
Real hourly earnings	r_{26}		+0.504 **		+0.363 *	
Money hourly earnings	r_{27}		−0.590 **		+0.234 *	

Source and explanation: Income and hourly earnings, Appendix D. Labor force, armed forces, and unemployed, Appendix B. The variables are: labor force, X_1; armed forces, X_2; unemployed, X_3; real disposable income, X_4; money disposable income, X_5; real hourly earnings, X_6; money hourly earnings, X_7.

* Significant on the 68 per cent ($\pm\sigma$) level.
** Significant on the 95 per cent ($\pm 2\sigma$) level.
† Significant on the 75 per cent level.

[a] The labor force, armed forces, unemployed, and hourly earnings are quarterly averages of monthly estimates. Disposable income (per adult-male equivalent employed) was computed in three-month aggregates. Income and earnings were adjusted for linear arithmetic trend. All were adjusted where necessary for seasonal variation. Labor force, the armed forces, and the unemployed are expressed per 1,000 population aged 14 and older.

[b] The World War II period is from the first quarter of 1940 through the second quarter of 1946; the post-World War II period is from the third quarter of 1946 through the second quarter of 1952.

force, unemployment, and armed forces were expressed per 1,000 population 14 and older, to eliminate any trend introduced purely by rise in population. Disposable income was computed in three-month aggregates, and hourly earnings in three-month averages. Each was analyzed both with, and without adjustment for changes in the cost

of living and for the straight-line arithmetic upward trend that seems to be observable in income and earnings.[9] There was no apparent over-all trend during 1940–1952 in the participation of either the total population or of males 14 and older. But there was an apparent straight-line *upward* trend in that of females 14 and older, and a straight-line *downward* trend in that of persons 14–24 and 65 and older. The correlations were constructed between the deviations from these trends. In all cases, the trends were derived from the entire 1940–1952 episode.

Table 44 seems to show that during the World War II period labor force participation was very strongly (and positively) correlated with armed forces—only for males 14 and older was this simple correlation below 0.900 (and very little below at that). And for three of the five labor force groups it was above 0.950. All of these correlations were significant well above the 95 per cent level. The correlation of labor force with unemployment was in all cases lower than it was with armed forces, but not much lower. This association was to be expected —as was the fact that it was uniformly negative—in view of another circumstance, to be noted in Table 44 under the heading of "Simple Intercorrelations between Independent Variables," that there was also a high and negative intercorrelation between armed forces and unemployment ($r_{32} = -0.885$). The three-cornered relationship raises a difficult question—to be asked whenever the so-called independent variables are not truly independent of one another. If labor force participation moved with armed forces, and if unemployment moved away from both, which of the three was the prime mover?

We are aided in answering this question by certain theoretical considerations. One is that the size of the armed forces was surely set almost entirely by the needs of the war and was therefore an independent variable, determined little or not at all by the levels of labor force participation and unemployment.[10] Another is that the other variables could not be regarded as independent of armed forces. Large scale mobilization could have the theoretical effects of (1) drawing young students into the armed forces and therefore into the labor force; (2) reducing the size of families, thus enabling adult females to move from unpaid housework into employment; and (3) reducing unemployment, by recruiting idle persons or by increasing the number of civilian jobs.

[9] The adjustment to upward trend was made to allow for the possibility that people become accustomed to a certain rate of rise in income and react only when the rise is specially slow or rapid.

[10] There was some chance that if labor force participation had been lower and unemployment higher, the government might have had to scale down armed force mobilization during World War II; but there is little evidence of such a contingency. It is more likely that the same armed strength could have been levied in any case, with lower labor force participation or higher unemployment resulting in less civilian production.

In support of these theoretical considerations, the multiple correlations of labor force with armed forces and unemployment ($R_{1.23}$) were the same or scarcely larger than the simple correlations with armed forces alone (r_{12}). But all of these multiple correlations were substantially larger than the simple correlations with unemployment alone (r_{13}).[11] And only for persons 65 and older was the multiple correlation of labor force and armed forces with *unemployment* larger than that with *income* or with *earnings*.[12] Although the simple associations of labor force with income or earnings were much weaker than those with unemployment, they were less dependent on the changes in armed forces, as shown by the simple intercorrelations in Table 44.

None of the simple correlations of labor force with income or earnings was very high, but more than half of them were significant on the 95 per cent level, and the remainder of them were significant on the 68 per cent level. Do these simple correlations demonstrate that income or earnings have influenced the short-run changes in labor force participation? Not necessarily, for both could have been influenced by a third factor—especially changes in armed forces.[13] Any such influence might be determined by two methods—multiple, and partial correlation.

Multiple correlation tests the effect on the size of the coefficient by adding a variable. Thus real income was added to the simple correlation between labor force participation and armed forces (with r_{12} becoming $R_{1.24}$) and to the multiple correlation of labor force with armed forces and the unemployed (with $R_{1.23}$ becoming $R_{1.234}$). Then money income, real hourly earnings, and money hourly earnings were substituted alternately for real income. None of the three-variable multiple correlations was substantially greater than the two-variable multiple correlations involving armed forces and unemployment, or than the simple correlation with armed forces. Yet they were very much greater than the simple correlations of labor force with income or earnings alone. This method suggests that income and earnings are not dominant in the explanation of labor force behavior during 1940–1946.

Partial correlation was used to see what the associations of labor force with income and earnings would have been if the other factors had not fluctuated. A first set indicates that the participation of various

[11] For persons 65 and older the difference was least substantial. This was also the only labor force group for which the simple correlation with unemployment was in excess of −0.900.

[12] In spite of the fact that the simple correlations of labor force with unemployment were much larger than the simple correlations with income or earnings.

[13] And the economic developments that occur with changes in the size of the armed forces.

age-sex groups was rather strongly associated with armed forces, holding unemployment and income, and unemployment and earnings constant. The correlations were all positive and significant on the 95 per cent level. A second set indicates that participation had a much weaker association with unemployment, holding armed forces and income or earnings constant. Some of the correlations in the second set were significant on the 95 per cent level, but most of them were significant on the 68 per cent level or not at all. And nearly all were inverse. A third set shows participation to be only moderately correlated with income or earnings, holding armed forces and unemployment constant. The partial correlations of labor force with real income except for persons 65 and older [14] were significant on the 95 per cent level and were inverse. Partial correlations of labor force with money hourly earnings were similarly significant, though positive, for all groups except persons 65 and older.

These uneven and moderate partial associations of the second and third sets may reflect some independent influence of unemployment, real income, and money hourly earnings on labor force participation, but the case is not a strong or a consistent one. All the above correlations —simple, multiple, and partial—make a clear case, however, for a close association between labor force and armed forces during the wartime period.

Nearly all of the correlations were much smaller during the postwar period. The simple correlations with armed forces were significant on the 68 per cent level for the participation of males 14 and older and young persons 14–24. For that of both sexes 14 and older, females 14 and older, and elderly persons, they were significant on the 95 per cent level, but only for the last group was the correlation at all high or negative. That it was negative, instead of positive as it had been during the war period, undermines its significance, since theoretical reasons are lacking for the participation of elderly persons to decline because armed forces rise, or to rise because armed forces decline. This perverse behavior in the postwar period extends also to the relation with unemployment—in this case the participation of the elderly seemed to rise and fall with unemployment [15]—though this behavior may have occurred as the result of incomplete elimination of trend. Of the other groups only for males 14 and older was the simple correlation of participation with unemployment significant in the postwar period.

The simple correlations of labor force with income or earnings were

[14] Thus possibly corroborating the moment-of-time results of this study.
[15] Thus seemingly supporting the additional worker theory.

for the most part substantially weaker than the simple correlations with armed forces.[16] Indeed, the signs of the postwar correlations—significant or insignificant—showed little agreement either from one group to another or within the same group, from wartime to the postwar period. Such evidence does not make it easy to claim a dependable association between labor force participation and income or earnings in either period.

When the various potential influences on postwar participation are added to form multiple correlations of various combinations ($R_{1.23}$ . . . . $R_{1.237}$) the results are all significant on the 95 or 75 per cent level. In the case of both sexes combined and for elderly persons, the multiple correlations were all significant on the 95 per cent level and were all much higher than the simple correlations with employment, income, or earnings. However, they were very little higher than the simple correlations with armed forces—suggesting that for these two groups other factors add little to the explanation, and that armed forces again wield the principal influence on participation. For males, and females taken separately, and young persons, the multiple correlations with armed forces, unemployment, and income or earnings were generally substantially higher than the simple correlations with armed forces alone, or than the simple correlation with any other single factor. For these groups no single factor would seem to offer an explanation of labor force behavior. It is possible that all the factors may combine to offer one—but none of the multiple correlations for these three groups was very high.

The conclusion that only armed forces adds much to the explanation of the postwar labor force behavior of both sexes and elderly persons is also upheld by the partial correlations. Holding unemployment and income or earnings theoretically constant, e.g. $r_{12.34}$ through $r_{12.37}$, labor force participation is correlated with armed forces on the 95 per cent level, though again we have the puzzling inverse association for elderly persons with a positive one for all other groups. Most of the partial correlations with unemployment, holding armed forces and income or earnings constant, e.g. $r_{13.24}$ through $r_{13.27}$, or with income or earnings, holding armed forces and unemployed constant, e.g. $r_{14.23}$ through $r_{17.23}$, are only moderately significant or are not significant at all.

The three groups—males, females, and young persons—showed partial correlations which again reveal no clear dominance of any fac-

[16] Of 20 simple correlations of labor force participation of the five groups with money and real income on the one hand, and with earnings on the other, seven were not significant at all and eleven were on the 68 per cent level, leaving only three significant on the 95 per cent level. Two of the three were for males 14 and older and had signs in reverse of those during the war.

tor. The great majority were significant on only the 68 per cent level, and those with unemployment and income or earnings frequently differed in sign from the war period. Of the few that were significant on the 95 per cent level, about half were with armed forces, holding unemployment and income or earnings constant, and nearly all were modest compared to those during the war. Perhaps the chief exception was the partial correlation with money hourly earnings, holding armed forces and unemployment constant.

How can we explain this general weakness of the postwar association of labor force participation with the various factors that seemed more influential during the war—specially that with the armed forces?

One reason may be that the powerful patriotic and other moral reinforcements that accompany all-out mobilization were missing during peacetime and during the limited military operation in Korea. Perhaps an equally important explanation is that the census estimates of labor force were subject to sampling errors which, though minor in proportion to the great movements in World War II, were large compared with the moderate changes of 1946–1952. A range of 6 persons per 1,000 aged 14 and older resulting from sampling error is appreciable if it is compared with fluctuations of 20, and the sampling variabilities are even more sizable, relatively, among individual groups (Table 43). The estimate of unemployment might vary from the sampling error within a range of 2 per 1,000 population. Still greater variations in the labor force and unemployment data could occur because of differences in the care exercised by census enumerators.

Incidentally, all correlations became much feebler when the labor force was given a lag of one year behind the independent variables.[17]

We might now consider briefly the rather interesting suggestion of Sumner Slichter that the effect of a wage increase on labor supply would depend on the level of earnings previously established.[18] For example, there is the possibility that more labor would be forthcoming at $7 a day if the prevailing wage had been $5 than if it had been $6, presumably because the lower the level from which a given increase starts, the greater is the relative change. This hypothesis was tested for the United States by correlating, separately for 1940–1946 and 1946–1952, the changes in the size of the labor force per 1,000 population 14 and older, with the *percentage* changes in real and money in-

[17] The labor force beginning with the third quarter of 1946, was correlated with armed forces, the unemployed, and real income in the same period of 1945. The multiple correlation dropped from 0.689 to 0.539, and the simple correlation with armed forces both declined and changed sign from +0.589 (Table 43) to −0.530. The associations with unemployed and real income became even more insignificant than before.

[18] *Modern Economic Society*, Holt, 1928, pp. 625–626.

come and earnings, which were computed by dividing the income or earnings of each quarter by those of the preceding quarter. The correlations thus obtained, however, had even less significance than those derived by associating the labor force with income or earnings expressed as percentages of the straight-line upward trend. The effect suggested by Slichter might conceivably be found in the behavior of the labor supply of a locality or of an individual firm, or in the behavior of unions in collective bargaining, but it has no apparent bearing on variations in labor force participation in the aggregate.

The foregoing discussion of factors influencing labor force has been limited to the United States. No correlations were computed for the British data, which covered only one month (June) each year.

For Canada we examine the participation of three groups 14 and older—both sexes combined and males and females separately (Table 45). The simple association with armed forces was found to be signifi-

TABLE 45

Labor Force Correlated with Armed Forces, the Unemployed, Disposable Income, and Hourly Earnings, Canada, Quarterly, February 1946 to August 1952

		1946–1952		
		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*
SIMPLE CORRELATIONS [a]				
Labor force and:				
Armed forces	r_{12}	+0.365 *	+0.084	+0.396 **
Unemployed	r_{13}	+0.169 *	+0.130	+0.092
Real income	r_{14}	−0.199	−0.209 *	−0.097
Money income	r_{15}	−0.061	+0.056	−0.199
Real hourly earnings	r_{16}	+0.023	−0.155	+0.233 *
Money hourly earnings	r_{17}	+0.170	+0.176	+0.045
MULTIPLE CORRELATIONS [a]				
Labor force, armed forces and:				
Unemployed	$R_{1.23}$	0.379 †	0.143	0.396 †
Real income	$R_{1.24}$	0.392 †	0.215	0.398 †
Money income	$R_{1.25}$	0.365 †	0.111	0.418 †
Real hourly earnings	$R_{1.26}$	0.366 †	0.185	0.440 †
Money hourly earnings	$R_{1.27}$	0.396 †	0.191	0.397 †
Labor force, armed forces, unemployed and:				
Real income	$R_{1.234}$	0.402	0.237	0.398
Money income	$R_{1.235}$	0.385	0.218	0.423 †
Real hourly earnings	$R_{1.236}$	0.379	0.223	0.440 †
Money hourly earnings	$R_{1.237}$	0.439 †	0.291	0.398

TABLE 45, *continued*

		1946–1952		
		Both Sexes 14 & Older	*Males 14 & Older*	*Females 14 & Older*
PARTIAL CORRELATIONS [a]				
Labor force and armed forces, holding constant unemployed and:				
Real income	$r_{12.34}$	+0.327 *	+0.033	+0.380 *
Money income	$r_{12.35}$	+0.349 *	+0.074	+0.380 *
Real hourly earnings	$r_{12.36}$	+0.344 *	+0.078	+0.377 *
Money hourly earnings	$r_{12.37}$	+0.316 *	+0.020	+0.379 *
Labor force and unemployed, holding constant armed forces and:				
Real income	$r_{13.24}$	+0.096	+0.103	+0.013
Money income	$r_{13.25}$	+0.131	+0.190	−0.078
Real hourly earnings	$r_{13.26}$	+0.108	+0.126	+0.007
Money hourly earnings	$r_{13.27}$	+0.207	+0.224 *	+0.031
Holding constant armed forces and unemployed				
Labor force and:				
Real income	$r_{14.23}$	−0.146	−0.191	−0.036
Money income	$r_{15.23}$	+0.077	+0.167	−0.162
Real hourly earnings	$r_{16.23}$	−0.024	−0.173	+0.208
Money hourly earnings	$r_{17.23}$	+0.240 *	+0.256 *	+0.037
SIMPLE INTERCORRELATIONS [a] **BETWEEN INDEPENDENT VARIABLES**				
Unemployed and:				
Armed forces	r_{32}	+0.195		
Real disposable income	r_{34}	−0.108		
Money disposable income	r_{35}	−0.573 **		
Real hourly earnings	r_{36}	+0.066		
Money hourly earnings	r_{37}	−0.441 **		
Armed forces and:				
Real disposable income	r_{24}	−0.159		
Money disposable income	r_{25}	−0.177		
Real hourly earnings	r_{26}	+0.109		
Money hourly earnings	r_{27}	+0.053		

Source and explanation: Income and hourly earnings, Appendix D. Labor force, armed forces, and unemployed, Appendix B. The variables are: labor force, X_1; armed forces, X_2; unemployed, X_3; real disposable income, X_4; money disposable income, X_5; real hourly earnings, X_6; money hourly earnings, X_7.

* Significant on the 68 per cent ($\pm\sigma$) level.
** Significant on the 95 per cent ($\pm 2\sigma$) level.
† Significant on the 75 per cent level.

[a] The labor force, armed forces, and unemployed are estimates for quarterly dates. Hourly earnings are quarterly averages of monthly data. Disposable income (per adult-male equivalent employed) is a quarterly total. All are adjusted where necessary for seasonal variations. Income and earnings are adjusted for linear arithmetic trend. Labor force, the armed forces, and the unemployed are expressed per 1,000 population aged 14 and older.

cant on the 95 per cent level for females, and on the 68 per cent level for both sexes; for males it was not significant. It was positive for all three groups. The correlation with real income was inverse for males on the 68 per cent level, and that with real hourly earnings was positive on the 68 per cent level for females. All other simple correlations were insignificant. Again, unemployment and income or earnings seemed to add little or nothing to the explanation of labor force behavior and the same can be said of the multiple and partial correlations. Only a few of the correlations revealed any significance, except where armed forces were involved, and even then they were on the lower levels. There were partial correlations with armed forces, holding unemployment and income or earnings constant, but these were significant only for both sexes and for females on the 68 per cent level. Thus the associations between participation and all the factors—even armed forces—were weaker in Canada than in the United States during the post-World War II years between 1946 and 1952. As in the United States, they were still weaker when the labor force was given a lag of one year to reveal the possible effect of changes in these variables.

Differences in Earnings and Attractiveness of Jobs among Industries

It is possible that average earnings would be raised statistically by the mere transfer of workers from low-paying agriculture and domestic service to high-paying manufacturing and trade, even if no wage rate had changed in any occupation or industry. A comparison of earnings weighted by the industrial distribution of employment prevailing at the time, with earnings weighted by the distribution at a fixed date, reveals that shifts in the composition of employment in industry had little effect on the amount or behavior of earnings in both the United States and Canada (Appendix Tables D-2 and D-3). Of course this does not mean that industrial composition has had no influence on the labor force. Any such influence depends also on the difference in attractiveness or irksomeness between the old and the new jobs. If both jobs were equally attractive to the worker or prospective worker, any transfer from lower to higher paid employments would presumably mean an increase in the effective reward per unit of effort, and would require no distinction from a rise in pay within each occupation. It would therefore require no standardization.

But if the new jobs at higher average pay merely compensated for the greater strain or longer travel involved, they would offer no better rewards, and it would be necessary to standardize the earnings for the changes in industrial composition.

Finally, if the industries whose employments were expanding were relatively more remunerative and more agreeable, standardization would eliminate the effect of a rise in average earnings but not the effect of betterment in average working conditions. Some persons might withdraw from the labor force because of the higher income resulting from the shift in employment composition; others might enter the labor force at the same time because the work was, on the average, more agreeable as a result of the shift. There is no way of dealing with this difficulty, and over the decades it could conceivably involve substantial numbers of workers. Within the years studied in this chapter, however, the changes in the peacetime industrial composition of employment would not suggest any significant net change in the attractiveness of jobs, in view of the minor changes in average earnings that have been found to result from these changes.

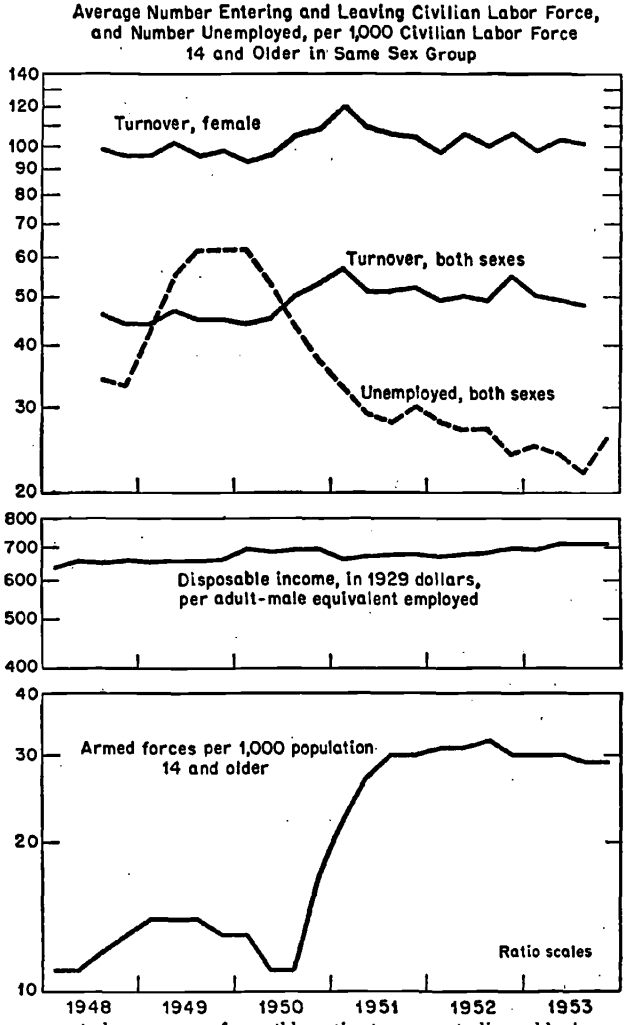
Labor Force Turnover

It would be possible for the net labor force participation to change very little and yet for the gross composition to change a great deal. In every household there occur endless reversals of plans, as girls leave gainful employment to marry, grandfathers enter retirement, husbands become disabled, high school graduates look for their first jobs, or divorced women seek a means of self-support (Chart 24). During 1948–1952 in the United States—the only period during which such data for the whole labor force have been available—the labor force lost and gained, on the average, around 4.5 per cent monthly and 10 per cent yearly. Annual turnover seems to be only double, instead of twelve times the monthly turnover, because many of the same persons enter and leave the labor force several times a year. It is not known how much of this turnover is real and how much is the result of errors in the answers of householders to the census enumerators' questions in different months or years.

Have these gross changes been influenced by the level of unemployment or incomes? The brief experience reveals that turnover has varied seasonally. It quickened in the spring as crops were planted and students left school and went to work or young women resigned their jobs to marry. It sped up in the summer as young people switched from one temporary employer to another and as crops were harvested in different months in different regions. It stayed fairly high in September because the students returned to school. And it finally dropped to a low in late fall and winter (perking up very little during the so-called Christmas rush). The range of the gross change was between 4 per cent in winter and 6 per cent in summer. The average was approximately 10 per cent a month for females and 2.5 per cent for males.

CHART 24

Gross Changes in Civilian Labor Force Compared with the Unemployed, Disposable Income, and Armed Forces: United States, 1948–1953



All series are quarterly averages of monthly estimates, except disposable income (quarterly totals). Source: Appendix Tables B-1 (labor force by employment, and armed forces) and D-5 (income); and *Current Population Reports*, Bureau of the Census, Series P-50, P-59.

Until mid-1950 when the mobilization of armed force brought on additional turnover, the proportion of population 14 and older who entered or left the labor force in any month was not influenced, apparently, by the levels of income and employment. The gross change continued substantially the same while unemployment fluctuated between 3 and

7.5 per cent.[19] During the last half of 1950 and early 1951, a small rise in civilian turnover seemed to be clearly associated with the increase of armed forces, as young men shifted out of jobs into the services and women and girls left school or housework to seek employment; but civilian turnover declined and then remained stable during the rest of 1951, while armed forces were rising and unemployment was still falling.

[19] This is also consistent with the conclusion of Mr. W. Lee Hansen of The Johns Hopkins University. Mr. Hansen has analyzed with some degree of intensity the data on gross additions to, and reductions from unemployment for 1948 through early 1956. He concludes that: "The absolute difference in gross movements during periods of high and low unemployment is due almost wholly to movement from the unemployed to a job or vice versa, rather than to differential movements into and out of the labor force. . . . An examination of gross movements in unemployment [in and out of the labor force] reveals no significant changes in the levels or their composition other than what might be expected because of seasonal variations." *Short-Run Behavior of the Labor Force: An Analysis of "Gross Change" Data,* mimeographed, Feb. 13, 1957, p. 19.