Volume Title: Evidences of Long Swings in Aggregate Construction Since the Civil War

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Volume Publisher: NBER

Volume ISBN: 0-87014-404-9

Volume URL: http://www.nber.org/books/abra64-1

Publication Date: 1964

Chapter Title: Appendix B: Note on the Manpower Estimates in Table 18

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Chapter URL: http://www.nber.org/chapters/c1811

Chapter pages in book: (p. 228 - 236)

Appendix B
Note on the Manpower Estimates in Table 18

Detailed descriptions of the quality of the census materials and of the estimating procedures which underlie Table 18 may be found in Carson's "Changes in the Industrial Composition of Manpower" (10) and Barger's *Distribution's Place in the American Economy* (3). Fabricant's "The Changing Industrial Distribution of Gainful Workers" (17) is a valuable critical article, and the reader may also wish to consult Durand, *The Labor Force* (14) and Lebergott, *Manpower in Economic Growth* (32). Here we simply note a number of points regarding the scope of the data and some problems affecting their comparability from one census date to the next.

"Gainful Workers" Versus "Labor Force"

From 1870 to 1930, the figures are derived from the census count of gainful workers.

> The primary purpose of the gainful worker statistics was a count of occupations. Thus, census enumerators were instructed to find and enter the occupation of each person 10 years of age and over. . .
>
> The question as posed by the enumerator made no reference to time. . . . Many persons who were retired or permanently disabled and who had not worked for some time reported their former line of work. . . . On the other hand, many employed persons did not enter themselves as gainful workers, because they considered themselves as students or housewives and their current employment as only temporary.
>
> These and other factors made for incomparabilities among different age and occupational groups from one decennial census to the next. The gainful workers statistics, however, are considered as a generally reliable measure of long-term trends during the time period covered.[1]
>
> [1] *Historical Statistics* (45), p. 68.

Note on Manpower Estimates in Table 18

We consider that the defects of the gainful-worker concept and the manner of enumeration of the data, which cloud their significance as indicators of the current labor-force status of the population at specified points in time, may be advantageous for the purposes of the present study. For we desire information about the occupations and industries to which people normally look for their regular livelihood rather than about the jobs they are filling or seeking during the period of census enumeration. For this purpose, people's attitudes toward their labor-force status may signify more than their current activities or actions, which may reflect transient circumstances.

> The concepts and procedures used since 1940 are based principally upon an individual's actual activity, that is, whether he was working, looking for work, or doing something else during the time reference of the survey. . . . Instead of questions about a person's attitudes with respect to his labor market status . . ., the present concept makes labor market participation depend on the more overt test of working or actively seeking work.[2]

The switch from the gainful-worker to the labor-force concept manifestly qualifies the comparability of the 1930 figures with those for 1940. They are, however, treated as comparable by Carson and Fabricant. The change in concept may, nevertheless, be one of the reasons for the apparent overcount of construction workers in 1940, for which a partial correction, described below, was made.

Contract Construction Versus Total Construction

The construction industry, as defined by Carson, is a combination of two Census industries distinguished in the industrial tables of the Census of 1930: (1) building construction and (2) construction and maintenance of streets and roads. This definition of construction gives it a scope which is less inclusive than that to which this study in general

[2] *Ibid.*, p. 67.

tries to adhere. The most serious restriction involved is the exclusion of construction undertaken on force account in other industries, principally transportation and other public utilities, and also the production of the shipbuilding industry. Strictly speaking, however, before 1930 the restriction applies only to the level of the series and not to its changes. For, as explained below, the movement of the series before 1930 is controlled by the numbers of workers attached to trades characteristic of building regardless of the industry to which they are attached. Insofar, then, as construction activity on force account or in shipbuilding is carried on by workers with occupations characteristic of the construction industry, the effect of variation in such activity upon the numbers gainfully employed in construction will be reflected in Carson's estimates. A very crude indication of the extent to which the construction trades are carried on outside the construction industry as defined by Carson is afforded by the correction he makes to adjust his figures before 1910 to the industry estimate established for 1910. For that year, the sum of the number of workers attached to occupations characteristic of construction plus the number of laborers and others in noncharacteristic ("repeater") occupations who would normally complement the workers in characteristic occupations was found to be 135,000, or 5.5 per cent, higher than the number actually reported in the industries included in Carson's construction industry (Carson, "Changes in the Industrial Composition of Manpower" (10), p. 79).

Comparability of Successive Censuses

General Errors in Census Enumerations

During recent years, the census labor-force returns have been reviewed by a number of analysts. They appear to be in substantial agreement that the size of the labor force was understated in the Censuses of 1870 and 1890 and overstated in 1910. There is some suspicion of an undercount in 1920. In most cases, the chief source of the difficulty is thought to be in agriculture, particularly in the number of unpaid family workers. The effect of these errors, if they are correctly identified, would be on the ratio of construction workers to the total labor force rather than on the changes in the number attached to construction itself. They should cause the figures in Table 18 to overstate slightly the decline in the ratio between 1870 and 1880, to overstate slightly the rise

between 1880 and 1890, and to understate slightly the rise between 1900 and 1910.

INTERPOLATION BETWEEN CENSUS DATES BY CHARACTERISTIC OCCUPATIONS

The Census reported the industry as well as the occupation of workers only in 1910 and from 1930 forward. This made it necessary for Carson to extrapolate the total for construction backward from 1910 and also to interpolate the figure for 1920 on the basis of the total number of workers following trades or occupations characteristic of construction (carpenters, masons, painters, etc.). Only the changes between 1930 and 1940 and between 1940 and 1950, therefore, are based upon industry reports. The movements between other census years are based upon changes in the number of workers following occupations characteristic of construction. The total of these was in the neighborhood of 80 per cent of the total assigned to the construction industry as defined by Carson, although a small fraction of them were also engaged in activities other than building, in some branch of manufacturing or transportation, for example.

Carson's allowance for laborers and others in noncharacteristic occupations permits variability in the ratio of laborers, etc., to workers in occupations characteristic of the industry. This does not, however, appear to have influenced the movement of his series drastically. Stanley Lebergott presents an alternative set of estimates, whose movement in the years 1870-1900 is based more nearly exclusively on the behavior of the numbers in characteristic occupations. His estimates for these years move much like Carson's.

Percentage Change Between Successive Census Dates

	Carson	Lebergott
1870-1880	21.5	15.5
1880-1890	74.5	67.5
1890-1900	15.5	10.2

Carson's use of the number in characteristic occupations, however, may have caused him to overestimate the number attached to construction in 1920 and, therefore, to misstate the change from 1910 to 1920. During this decade, many branches of the construction industry declined or failed to grow. At the same time, however, the employment of carpenters, painters, plumbers, and steamfitters in shipbuilding, auto-

mobile and wagon factories, and in other industries which were stimulated by the war, increased a great deal. In a note to me, Lebergott estimates that an allowance for carpenters and painters in shipbuilding alone would require a reduction of 135,000 in the number attached to construction in 1920. Carson's own estimates show a small decline (about 130,000) in the construction labor force between 1910 and 1920. Adjustment for the increase in the number of workers in construction trades who joined other industries would, therefore, serve to strengthen the support which Carson's figures now give to the view that the decade 1910-20 was one of severe retardation or decline in construction. We have, however, left Carson's figure unchanged; partly because the indicated adjustment would not alter the qualitative significance of the movement and partly because we have been treating shipbuilding as a component of construction from some points of view.

REVISION OF CARSON'S FIGURE FOR 1940

The state of the labor market in 1940 created a special problem in maintaining comparability with the figures for earlier years as well as with the estimated number attached to construction in 1950. At the date of the 1940 Census, there were still very large numbers of unemployed workers as well as a large body of workers employed on public emergency work.[3] Following the work of Alba M. Edwards, Carson obtains the total labor force in construction by adding to the number employed in the construction industry on the census date, the number of unemployed workers, and the number of public emergency workers who reported that construction was their usual industry. This procedure undoubtedly resulted in a large overestimate of the number of persons attached to construction as defined by ordinary standards.

> . . . Whether because many emergency workers had never worked regularly in any other industries, or for other reasons, so many of them apparently reported the industries in which they were working, or to which they were assigned, as their usual industries that, even in the

[3]"The category includes persons who, during the week of March 24-30, 1940, were at work on, or assigned to, public emergency work projects conducted by the Work Projects Administration (WPA), the National Youth Administration (NYA), the Civilian Conservation Corps (CCC), or state or local work relief agencies" (*Census of Population, 1940,* Vol. III, *The Labor Force,* Part I, p. 3).

non-service industries, the industrial distribution of emergency workers by usual occupation, as shown by the census returns, was quite different from the industrial distribution of employed workers.[4]

The public emergency workers reporting construction as their usual occupation (805,800) were almost 32 per cent of all public emergency workers enumerated by the Census (2,529,606) and 23 per cent of the labor force attached to construction (3,508,000), according to Carson's tables. The problem is further aggravated because the number of emergency workers enumerated by the Census is almost 850,000 smaller than the number carried on the rolls of the emergency work agencies; and the Census authorities believe that large numbers of persons, reluctant to report themselves as on emergency work, reported themselves as regularly employed in the industries to which they were assigned to relief work.[5] Finally, among the 646,360 persons seeking work and declaring that construction was their usual industry, many may have had no previous experience in the industry except as emergency workers.[6] There is no basis for a revised estimate which would allow for all these distortions. We have, however, attempted a minimal adjustment to allow for the unduly large number of enumerated public emergency workers assigned to construction. The figures for 1940 shown in parentheses in Table 18 reflect this adjustment and so does the

[4]Edwards, *Comparative Occupational Statistics* (16), p. 32.

[5]*Census of Population, 1940,* Vol. III, Part I, p. 3.

[6]Compare Edwards, *Comparative Occupational Statistics* (16), p. 33: "The construction industry, as organized in 1929, was hard hit by the depression, and it experienced a marked decline between 1930 and 1940 in the number of persons to whom it furnished employment. Notwithstanding this fact, the figures for the industry presented in Table 7 show a considerable increase from 1930 to 1940 in the total number of workers. This increase is explained by the fact that the census figures cover public emergency construction as well as construction by private contractors and builders. If from the 3,508,434 persons in the construction industry in 1940, shown by the census figures (Table 7), be deducted the 805,800 emergency workers (CCC, WPA, NYA, etc.) who reported that construction was their usual industry, the remainder—2,702,634—is 10.8 per cent smaller than the 3,029,458 persons the census figures (Table 7) show in the industry in 1930. The census figures for 1940 include, also, 646,360 persons who reported that they were seeking work and that construction was their usual industry. Many of these, in fact, may formerly have been emergency workers."

parenthetical figure for the change from 1940 to 1950. The method of adjustment is as follows:

1. Carson includes in his construction labor force 805,800 public emergency workers who reported that construction was their usual industry. This is almost 32 per cent of all public emergency workers enumerated by the Census. The Census, as well as Edwards, consider that large numbers of public emergency workers reported themselves as attached to construction because their emergency jobs had the character of construction work.

2. The adjustment made is based on the assumption that the proportion of emergency workers who can reasonably be assigned to the construction industry is equal to the proportion which unemployment in construction bears to total unemployment (including public emergency workers).

3. Unemployment in construction is approximated as follows:

a. Assume that, as a first approximation, the labor force in construction is the same proportion of the total labor force as it was in 1930, i.e., 6.2 per cent.

b. This indicates, as a first approximation, that the labor force in construction in 1940 was 53,299,000 × 6.2 per cent = 3,305,000.

c. The number reported employed in construction in 1940 was 2,056,000. Hence, an approximation to the number unemployed in construction is 3,305,000 − 2,056,000 = 1,249,000.

d. This number was 16.4 per cent of the 7,623,416 persons who were seeking work or were on public emergency work at the 1940 Census date.

On public emergency work	2,529,606
Seeking work	
Experienced workers	4,326,469
New workers	767,341
	7,623,416

SOURCE: *Statistical Abstract, 1944-45* (45), Table 131.

4. Applying this ratio to the 2,529,606 persons who were enumerated by the Census on public emergency work yields an estimate of 415,000 public emergency workers who can reasonably be assigned to construction.

5. Since Carson counts some 806,000 public emergency workers in construction, this indicates an overestimate of 806,000 – 415,000 = 391,000 workers; and Carson's figure is reduced by this amount, viz., 3,508,000 – 391,000 = 3,117,000, to obtain an alternative estimate of the construction labor force in 1940.

As already indicated, this revision takes account of only one source of overestimate in Carson's figure. A complete adjustment would put it still lower.

LACK OF COMPARABILITY DUE TO SEASONAL AND CYCLICAL FACTORS

Other difficulties which may affect the comparability of working force figures arise because successive censuses were taken at different stages of business cycles and at different seasons of the year. It is plausible to suppose that in an industry subject to pronounced business cycle and seasonal unemployment, some unemployed workers will find work in other trades and report themselves as attached to the trade in which they are temporarily employed rather than to that in which they are normally employed. I know of no way to gauge how troublesome these problems may be, but I doubt that their net effect can seriously distort the showing of the figures for my purposes. For, barring the special problems of the 1930's, seasonal and cyclical unemployment are both presumably too transitory to make a great difference in the numbers attached to an industry.

Only two Censuses were taken near the turning points of a business cycle—the Censuses of 1890 and 1920 both fell near a business-cycle peak. All other Censuses fell somewhere between cyclical peaks and troughs. In 1890, the cyclical factor would tend to exaggerate the acceleration in the growth of construction workers between 1880 and 1890. In 1920, it would tend to offset the decline in the number of construction workers between 1910 and 1920.

So far as the seasonal factor is concerned, all the Censuses from 1870 to 1900 were taken on June 1. The Census of 1910 fell on April 15, when the construction industry is less active than it is in the summer. This would tend to offset the acceleration in the growth of construction workers between 1900 and 1910. The Census of 1920 fell on January 1, near the industry's seasonal trough. This would tend to exaggerate the decline in numbers attached, but it would be offset by the cyclical factor referred to above. The 1930 Census came on April 1, which

would tend to exaggerate the observed growth from 1920 to 1930. The seasonal factor is presumably neutral in its effect on the changes from 1930 to 1940 and from 1940 to 1950, since the 1940 Census was taken during the week of March 24-30; and the 1950 Census, on April 1.