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discussion is the recent baby boom. We first take a fresh look at the historical record in the light of the Kuznets-cycle conception of economic change,[3] taking care to distinguish the experience of three population groups with significantly different patterns—foreign-born, native-born urban, and native-born rural. Then some possible reasons for the patterns observed are explored. The analysis is confined to the white population because of the greater reliability of the data for this group and its predominant influence in determining the pattern for the total.

## I. *Kuznets Cycles in U.S. Population Growth and Fertility*

### A. *The Rate of Total Increase*

We start with the rate of population growth. Since we are interested in focusing on major movements, we employ five-year averages of the basic data,[4] a choice governed partly by preference—to eliminate or at least reduce the shorter-term changes associated with the ordinary business cycle—and partly by necessity—because of the initial mold in which some of the basic data are cast, particularly those relating to fertility.

Figure 1 shows the average rate of increase of the U.S. white population in successive quinquennia from 1870-75 to 1955-59. The familiar downward drift through the 1930's and the recent increase are immediately apparent. Less familiar, but equally obtrusive, are significant fluctuations in the rate of change. The duration of the fluctuations has run from 10 to 35 years and their average magnitude has amounted to about one-quarter of the mean rate of change over the period as a whole. In a recent article [27] these fluctuations were subjected to analysis by Simon Kuznets, who found that while all three components of population change—fertility, mortality, and immigration—showed evidence of these swings, either in level or rate of change, major surges and relapses in immigration typically accounted for the

[3] See the studies by Simon Kuznets [26]-[29], Moses Abramovitz [1] [3] [4], and Arthur F. Burns [7]. Among recent contributions are Brinley Thomas [42], R. C. O. Matthews [35, Ch. 12], and P. J. O'Leary and W. Arthur Lewis [37]. The name "Kuznets cycle" is suggested by O'Leary and Lewis and is adopted here because it is a more distinctive designation of these (typically) 15- to 20-year movements than are terms such as "long swings" or "long waves," which may be confused with the much longer Kondratieff. It is somewhat regrettable that O'Leary and Lewis used the term "cycle," with its inevitable implications of a self-generating process, rather than a more neutral word such as "movement." Use of the designation here is not intended to imply commitment to a self-generating view of these fluctuations.

[4] For the rate of total increase, the average is implicit. The rate, which is actually calculated from observations on the population stock separated by five years, yields a time pattern equivalent to that of a geometric average of the annual rates of change within the successive quinquennia.

greatest part of the change in total. He then linked these waves in immigration to corresponding swings in the rate of development of the U.S. economy, and suggested that the immigration movements were best explained as a response to swings in the demand for labor in the United States. This view has been supported along somewhat different lines by Moses Abramovitz and the present writer [3] [4] [11].

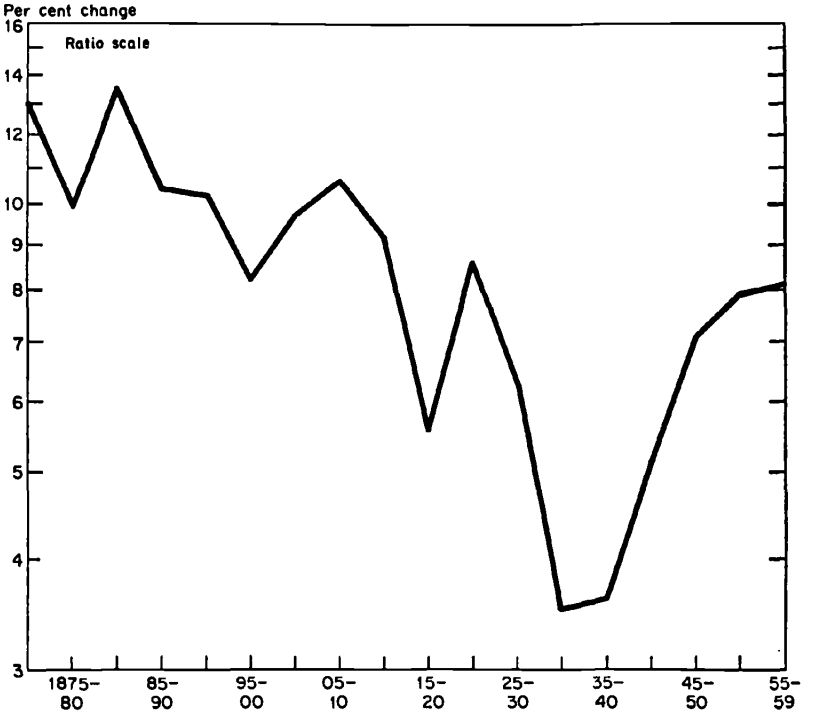


FIGURE 1. RATE OF CHANGE OF TOTAL WHITE POPULATION, 1870-75/1955-59

*Source:* Table A-1.

Since 1870, then (and indeed even before [27, p. 36] [29]) the historical record has consistently been marked by major swings in the rate of population growth. But since the source of the recent upsurge in the rate of population growth has been a rise in the birth rate rather than in immigration, one might maintain that this recent increase bears only a surface resemblance to prior swings and that, given the new immigration restrictions of the 'twenties, recovery in the rate of growth was hardly to be expected. Whether this view is correct or whether the recent movement does bear a logical relation to its forebears is a question to which we shall return toward the end of the paper.

## B. *The Birth Rate of the Total White Population*

Let us turn to the component of population change that constitutes the center of our interest, the birth rate. Recent work has made it possible to reconstruct a full century of fertility experience for the white population of the United States.[5] The annual birth rate estimates have been averaged here for successive quinquennia, in keeping with our interest in discerning Kuznets cycles.

The upper panel of Figure 2 brings out clearly the long-term decline in the level of the birth rate and its recent recovery. It also shows that the movement of the birth rate—even when smoothed by a five-year average—has been far from regular. For the period through the secular trough of the 'thirties, intervals of rapid decline alternated with intervals of slower decline or even absolute increase. These are the long swings in fertility which Kuznets found in a somewhat different set of figures. They are apparent throughout the entire 80-year period of fertility decline covered here.

The lower panel of Figure 2 presents the quinquennial percentage rate of change of the birth rate, computed directly from the data plotted in the upper panel.[6] The average rate of decline per quinquennium through the secular trough in 1935-39 was about 6 per cent. If this rate had prevailed uniformly throughout the entire period, the individual observations would have formed the horizontal line shown in the figure. The movement in the actual observations about the line makes clear that the variations in the rate of change were of substantial magnitude; in fact, the average value of the deviations from the mean amounts to six-tenths of the mean rate of decline itself. The duration of the two swings through the first decade of this century was 15 to 20 years, whether measured peak to peak or trough to trough. The movements since then have been of much longer duration, on the order of 35 to 40 years.

[5] Economists are perhaps not generally aware of the scarcity of historical data on population change. When Kuznets made his study only four years ago, there were no annual data on the crude birth rate before 1909. The new series, extending our perspective to the years before the Civil War, is the product of a doctoral dissertation by Melvin Zelnick, carried on at the Office of Population Research, Princeton University, under the supervision of Ansley Coale [73]. The estimates were derived by applying appropriate mortality rates to the decennial census single-year-of-age distributions adjusted for "age heaping" (excessive reporting of certain ages, primarily those ending in 0 and 5). As the upper panel of Figure 2 shows, the patterns traced by these and the official estimates in the overlap period are virtually the same; for earlier dates, however, the Zelnick figures are somewhat less reliable because of the lesser accuracy or availability of data needed for the estimates.

[6] To avoid confusion, it should be noted that (1) it is the birth rate itself and not the rate of change therein that is the component of the rate of total population change shown in Figure 1, and (2) swings in annual birth or fertility rates do not necessarily imply swings in the completed fertility of successive population cohorts.

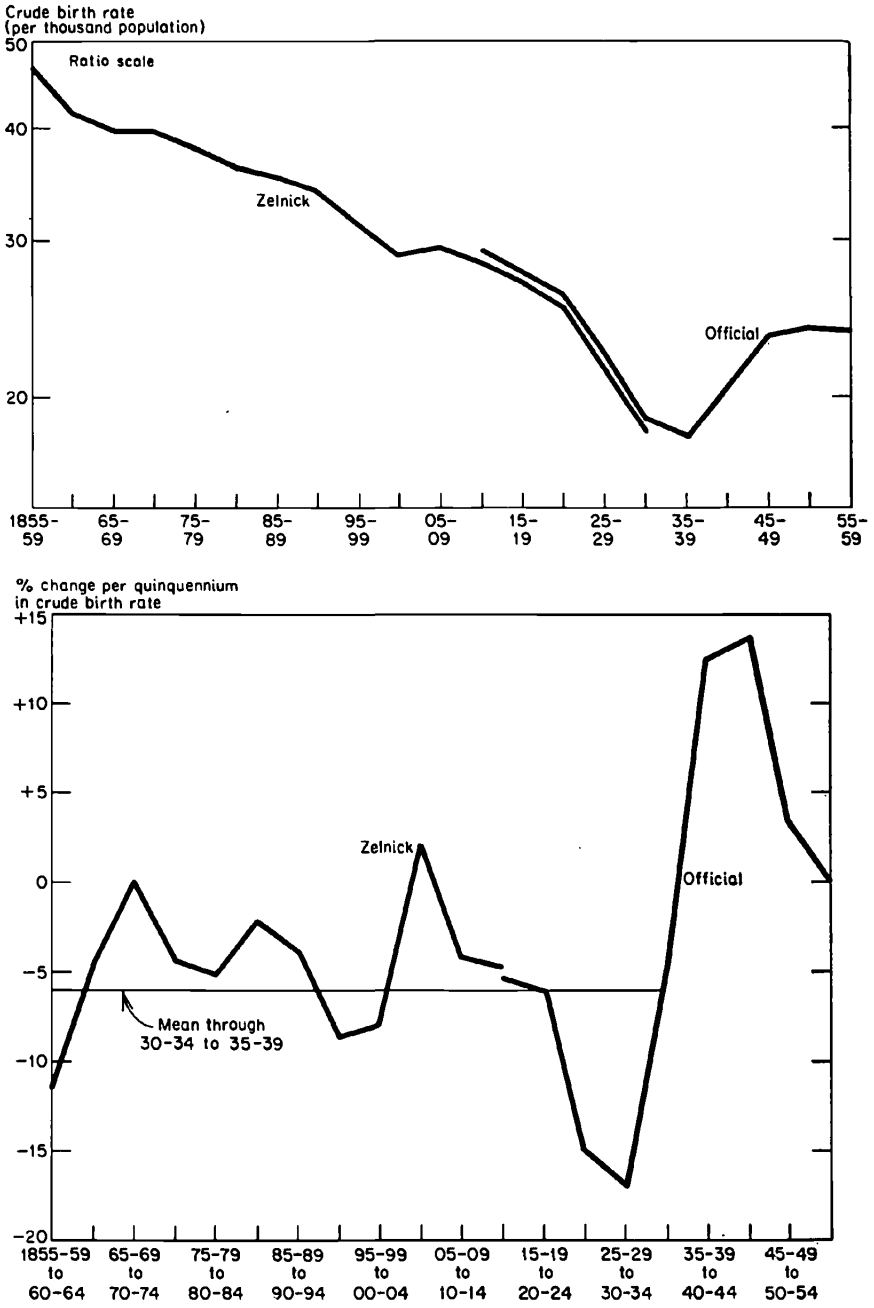


FIGURE 2. LEVEL AND RATE OF CHANGE, CRUDE BIRTH RATE OF TOTAL WHITE POPULATION 1855-59/1955-59

*Source:* Table A-2.

But of what interest, it may be asked, is this exercise in quantitative history for analysis of the baby boom? In reply, one might suggest that it leads to revision of one's conception of the historical record, a revision which has significant implications for the interpretation of recent experience. Typically, the historical movement which has been emphasized is the long-term secular decline.[7] To this we would now add the observation that this decline has been far from regular; that, in fact, it has been repeatedly characterized by fluctuations of noticeable amplitude and subtantial duration. The customary interpretation of the past leads naturally to the view that recent experience constitutes an abrupt break—a reversal in primary trend. In contrast, the conception of historical change employed here suggests that recent experience *might* be conceived as the latest in a succession of major movements around the trend—a Kuznets cycle which, for some reason, is of much greater amplitude and duration than its predecessors. Clearly this view implies less of a break with historical experience and at least raises the possibility of more easily reconciling the present with the past—a *sine qua non* of any attempted explanation of the baby boom. Moreover, it suggests a new research strategy with regard to the baby boom, namely, that one focus on Kuznets cycles, past and present, as the object of explanation in an effort to determine whether the underlying causes of these movements may have operated with exceptional force in recent decades. It is in terms of this conception that the subsequent analysis is organized.

Before proceeding to this analysis, there is one more feature of Figure 2 that deserves attention. This is the precipitous decline in the birth rate during the 1920's. A trend line fitted to the pre-1920 data in the upper panel and extended through the next two decades would lie not only above the observations for the 1930's, but above that for 1925-29 as well. From the lower panel, one finds that the rate of decline between the first and second halves of the 1920's was the second highest in the 100-year record, falling only slightly below that in the next overlapping decade. This drastic decline during a period of high prosperity has been cited by demographers as grounds for discounting efforts to explain the baby boom on the basis of economic factors. For example:

> . . . the interpretation of the baby boom as the natural consequence of prolonged prosperity is hardly more tenable than the earlier interpretation of the reversal in the 1930's as momentary. The next earlier period of notable prosperity in the United States—the 1920's—was a period of

[7] For examples of this see [66] [54] and more recently [16, Ch. 2, 11] [41, Ch. 13] [13].

sharply falling fertility. In fact, as Dudley Kirk points out, the depressed 1930's produced *more* births by far than one would expect on the basis of an extrapolation of the trend of the prosperous 1920's.[8]

Clearly, an attempt to reconcile present with past experience must devote special attention to the record for the 1920's.

### C. *The Fertility of the Native and Foreign-Born White Populations*

The fertility of the total white population is a composite of that of a number of subgroups, each subject in part to distinctive, in part to common, influences. We can gain further perspective on the baby boom if we consider separately the experience of the native and foreign-born white populations, and, within the former, the urban and rural components. Table 1 indicates the proportion of total white females of reproductive age accounted for by each of these groups at various dates. In the present section, we consider fertility patterns for the foreign-born and *total* native white populations.

TABLE 1—PERCENTAGE DISTRIBUTION OF WHITE FEMALES, 20–44, BY NATIVITY, AND OF NATIVE WHITE FEMALES, 20–44, BY RURAL-URBAN RESIDENCE, 1890–1950

| | 1890 | 1910 | 1930 | 1950 |
|---|---|---|---|---|
| Total white | 100.0 | 100.0 | 100.0 | 100.0 |
| Foreign-born white | 20.9 | 19.9 | 14.7 | 4.6 |
| Native white | 79.1 | 80.1 | 85.3 | 95.4 |
| Urban | 30.2 | 39.6 | 51.5 | 64.7[a] |
| Rural | 48.8 | 40.5 | 33.8 | 30.7 |

[a] Based on 1950 census definition of "urban."
*Source:* Census reports.

For our dependent variable, instead of the crude birth rate we now use the fertility ratio, the number of children under 5 years old to the number of women 20 to 44 years old, a choice necessitated by the avail-

[8] Ansley J. Coale, Introduction, in [70, pp. 5-6]. The reference is to Dudley Kirk, "The Influence of Business Cycles on Marriage and Birth Rates" [70, pp. 241-60]. The method followed by Kirk in his analysis is to correlate "trend deviations of economic measures (as independent variables) to measures of nuptiality and natality (as dependent variables)" [70, p. 242], using fertility data for the total population for the period 1920-58. While the results are relevant to analysis of fertility variations within the ordinary business cycle, in our view they cannot be used to draw inferences about the baby boom. The "trend" lines fitted for the period 1920-58 largely reproduce the Kuznets cycle which constitutes the baby boom. By concentrating on explaining deviations from "trend," Kirk in effect eliminates from his analysis the baby boom itself. Moreover, even with regard to business cycle analysis, it would be of interest to distinguish components of the total population whose fertility was subject to substantially different influences, as is done below for Kuznets cycles.

able data.[9] As the following figures suggest, the fertility ratio typically exceeds the crude birth rate by a factor in the neighborhood of 20 to 25: Analytically, this reflects the fact that the fertility ratio is computed from (a) a denominator about one-fifth as large as that for the crude birth rate (females aged 20-44 instead of the total population), and (b) a numerator four to five times as large. (Implicitly, birth experience over a five-year period is totaled rather than averaged, and is multiplied by a survival rate on the order of .85 to .95 to exclude those dying before the end of the period.) Thus the time patterns traced by the

| Total White Population | 1885–89 | 1905–9 | 1925–29 |
|---|---|---|---|
| Crude birth rate, annual average | 35.3 | 29.4 | 22.4 |
| Fertility ratio, next census date | 744 | 632 | 505 |

two measures may differ somewhat because of variations in the ratio of women aged 20-44 to the total population and in the mortality of children under 5 years, particularly in infant mortality.[10]

Figure 3 presents fertility ratios for the foreign-born white population from 1875-79 to 1925-29, and, supplemented by general fertility rates, for the native and total white populations for somewhat longer periods.[11] The observations on fertility ratios are at census and mid-census dates, but since they reflect fertility behavior over the preceding five years, we have dated them according to the quinquennia to which they refer. The lower panel shows the percentage rate of change per quinquennium in each series, computed in the same fashion as for the preceding figure.

Several points deserve mention. First, Kuznets cycles are evident in the series for both the native and foreign-born groups. Through 1925-

[9] A good discussion of the conceptual and statistical problems relating to the fertility ratio is given in [16, p. 13 and App. A].

[10] For the total white population, the only one for which comparison is possible, the directions of change in the rate of change of the crude birth rate and of the fertility ratio are identical from 1885-89 on, the principal period of the analysis, with the exception of the movement from 1905-9/1910-14 to 1910-14/1915-19. This disparity is primarily due to an understatement of the fertility ratio for 1910-14, because no adjustment was made for the exceptional effect of the influenza epidemic of 1918.

[11] The fertility ratio estimates, prepared in connection with the present study, are based in large part on a valuable unpublished memorandum prepared by Everett S. Lee providing age and parentage detail underlying the quinquennial estimates of native white population published by Kuznets [27]. Because of omissions or defects in the recent reporting of parentage and nativity, it was not possible to continue these estimates beyond 1925-29. However, to provide some idea of the pattern after 1925-29, use has been made of the official estimates of the closely comparable general fertility rate (live births per 1,000 females aged 15-44) for the total and native white populations.

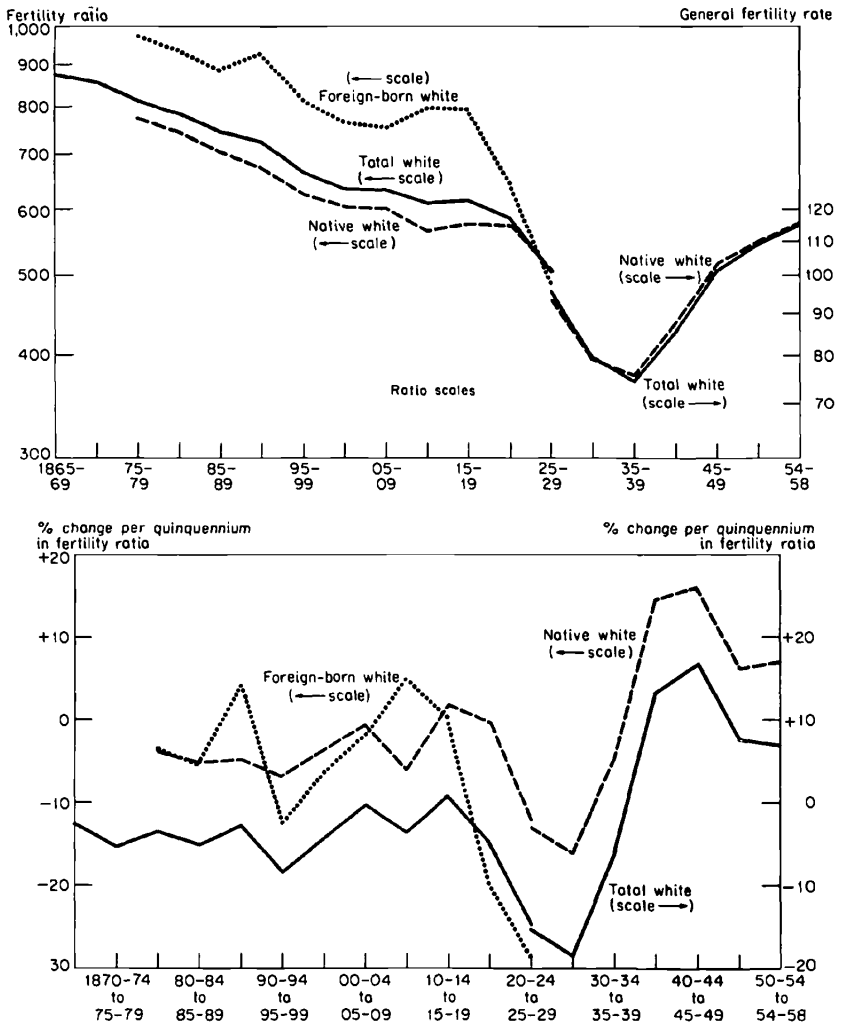


FIGURE 3. LEVEL AND RATE OF CHANGE OF FERTILITY RATIO, 1865-69/1925-29, AND OF GENERAL FERTILITY RATE, 1920-24/1954-58, TOTAL WHITE POPULATION BY NATIVITY

*Source:* Table A-3

29, the timing of the swings appears to be usually the same, but the amplitude is substantially greater for the foreign-born white. There is some suggestion of increasing amplitude, particularly for the native white, and in the most recent period the magnitude of the swing for this group is strikingly greater than previous ones. Arithmetic analysis of the swings in the total white group shows that they are caused in important measure by the fertility movements of both the native and

foreign-born components, and that the contribution of shifts in the relative importance of the two groups has been negligible. The native-born white group, despite the smaller amplitude of its swings, typically accounted for the dominant part of the movement in the total because of its much greater share (Table B-1).

Some light is also cast on the precipitous rate of decline in total white fertility in the 'twenties. For both the foreign- and native-born populations there is a substantial drop in the fertility ratio between the first and second halves of the decade. However, the decline for the foreign-born is more than double that for the native—29 against 12 per cent. Hence, a significant part of the decline in total white fertility in the 'twenties—to be precise, about one-third (Table B-1)—was owing to the drastic reduction in the fertility of the foreign-born white population.[12] Indeed, for this group, if one adds the movement between the two preceding quinquennia, the drop in fertility was nothing short of spectacular. Between 1915-19 and 1925-29 the foreign-born white fertility ratio dropped by about four-tenths, more than double the decline during the preceding 40 years.

### D. *The Fertility of the Urban and Rural Native White Populations*

Our data now become even more limited, relating only to the latter half of each decade from 1885-89 on. Estimates published by the National Resources Committee [64] for 1905-9 through 1925-29 have been carried back two additional decades. A constant 5 per cent adjustment by the NRC for underenumeration of children under five years has been accepted here, in part because no basis for a differential rural-urban adjustment was readily available, and in part because the analysis rests primarily on the figures for the more reliable censuses from 1900 on. Our immediate interest is in the pattern through 1925-29, and estimates for the native white population by rural-urban residence are only available to this point. To fill out the picture since then, however, we have added overlap figures for the total white population for 1925-29 on, an approximation which seems reasonable in view of the much diminished importance of the foreign-born in recent years.

As is clear from the curve for the total native white group in Figure 4, compared with that in Figure 3, the timing of the Kuznets cycles before 1925-29 is such that omission of the observations for the first half of each decade tends to conceal the long swings. Nevertheless, some significant points stand out. As the upper panel shows, the decline from 1885-89 to 1925-29 in fertility of the total native white population was

[12] "The decrease in fertility of foreign-born white women was perhaps the outstanding feature of the decline in the birth rate during the twenties" [65, p. 127].

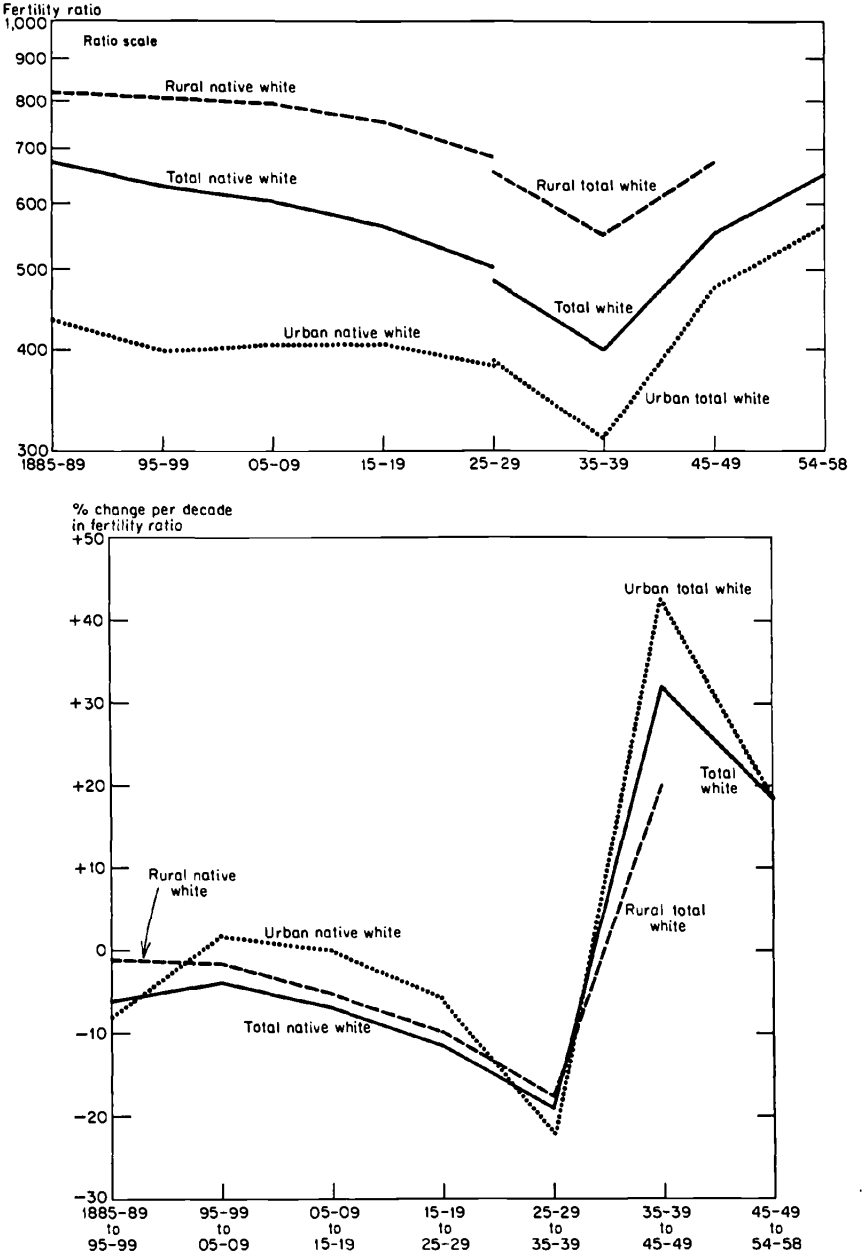


FIGURE 4. LEVEL AND RATE OF CHANGE, FERTILITY RATIO OF NATIVE WHITE POPULATION, 1885-89/1925-29, AND TOTAL WHITE POPULATION, 1925-29/1954-58, BY RURAL-URBAN RESIDENCE

*Source:* Table A-4

significantly greater than that for either of the components. This was caused by the depressing influence on total native white fertility of the continuous redistribution of population from high-fertility rural to low-fertility urban areas. Quantitatively this rural-urban shift accounted for about one-half of the total decline over the 40-year period (Table B-2). The depressing effect on fertility was about the same in each successive decade.

A second point of interest is the greater decline in rural than urban fertility through 1925-29. The rural decline is about half again as great as the urban—18 as opposed to 12 per cent. Indeed, if one considers the estimates for urban fertility from only 1895-99 to 1925-29, there is little evidence at all of a declining trend. The over-all reduction in these three decades is only 4 per cent, and the impression created by the curve is one of general stability.

This observation of substantial stability for a group accounting in this period for a third to a half of white females of reproductive age runs so counter to the common impression of a general and persistent secular decline that it deserves further consideration. This is particularly the case since this group has tended to assume an increasingly dominant role in determining the pattern for the total white population and thus is of central significance for consideration of recent and prospective experience of the white population as a whole.[13] Could the finding be a statistical artifact, resulting from deficiencies in our estimating procedure? The possibility cannot be discounted—we have attempted to make a reasonable estimate for 1895-99, but with more time and larger resources it undoubtedly could be improved. However, even if we take only the more firmly based NRC estimates for 1905-9 through 1925-29—at the expense unfortunately of reducing our span of observation to two decades—there is still little evidence of a significant decline. In presenting these data the NRC does not call into question the figures for urban native white population, though they are accorded hardly any attention [65, p. 127]. With regard to regional fertility patterns of the *total* white population, however, the NRC does note that "these data show clearly a tendency toward the leveling off of birth rates in areas long influenced by the lower birth rate pattern" [65, p. 123].

Some additional historical evidence consistent with the finding of stability is perhaps worth citing. In 1930, Joseph J. Spengler published a study of the fertility of native- and foreign-born women in New Eng-

[13] Readers may be reminded in this connection of the finding in Dorothy S. Thomas' pioneering study of Sweden [44] that during the 19th century *short term* fluctuations in fertility of the total population were initially dominated by fluctuations in agriculture, but subsequently by those in industry.

land, in which he concluded that "during the period between 1860 and and 1915 no definite trend appeared in the native fertility rates" [38, p. 34]. For the period from 1915 through 1925 (the last year of the study), he found an upward tendency in fertility. Here, then, is an area in the forefront of the process of urbanization and industrialization in which native white fertility did not significantly decline over a long period stretching well back into the 19th century.[14] The appearance of a similar pa'tern for the nation as a whole at a later date would clearly be consistent with this earlier New England experience.

One final point should be noted regarding Figure 4. The decline of total native white fertility in the 1920's is now seen to be owing more to a decrease in rural than urban fertility. Between 1915-19 and 1925-29, the reduction in rural fertility was close to 10 per cent, while that for urban fer.ility was under 6 per cent. Thus further understanding of this period calls particularly for an explanation of the rural decline.

### E. *Summary*

While the fertility of the total white population declined substantially from the latter part of the 19th century to the mid-'thirties, there was significant variation in the rate of change over time and among component population groups. Even after averaging data so as to eliminate or substantially reduce variability due to the business cycle, marked fluctuations—Kuznets cycles of 15 or more years duration—stand out in the patterns for the total, native, and foreign-born white populations. Moreover, in the first three decades of this century the over-all decline in total white fertility was owing almost exclusively to declines for the foreign-born white and rural native white populations and to the shift from rural to urban areas; the fertility of the urban native white population, the group of central importance in understanding recent and prospective movements in the aggregate, remained virtually unchanged. Considerations such as these raise the question whether the baby boom, rather than an abrupt reversal in a long-term down-trend, might not be at least in part a Kuznets cycle of much larger magnitude than heretofore. To answer this, it is necessary to look into possible reasons for these movements.

## II. *Reasons for Kuznets Cycles in Fertility of Different Population Groups*

Briefly stated, the analytical viewpoint underlying the subsequent discussion is this: variations in the fertility of a given population group

[14] A recent re-examination by Robert Gutman [17] of the reliability of the Massachusetts birth registration data used by Spengler, while arriving at a somewhat different evaluation from Spengler, does not upset this finding.