LONG SWINGS IN U.S. DEMOGRAPHIC AND ECONOMIC GROWTH: SOME FINDINGS ON THE HISTORICAL PATTERN*

RICHARD A. EASTERLIN
University of Pennsylvania

RESUMEN

El estudio resume algunas conclusiones acerca de la naturaleza de las oscilaciones o ciclos de Kuznets, del crecimiento de la población y de la fuerza de trabajo de los Estados Unidos, y sus relaciones causales aparentes durante el período anterior a la Primera Guerra Mundial, con movimientos similares en la tasa de desarrollo económico. Hasta 1914, la tasa de crecimiento de la población y de la fuerza de trabajo de los Estados Unidos revela la existencia de "ciclos de Kuznets," o sea, largas oscilaciones de 15 a 25 años de duración, aproximadamente. Estas oscilaciones se concentraron en los sectores no agrícolas y en las regiones donde se abrían nuevas explotaciones agrícolas; geográficamente, se difundían ampliamente, a través de todo el país.

El principal componente subyacente del cambio era la migración, tanto externa como interna. Estas oscilaciones en el crecimiento demográfico fueron originandas por oscilaciones previas en la tasa de crecimiento económico, pero, a su vez, provocaron sobre éste, importantes efectos. Así, una oscilación ascendente en la tasa de crecimiento económico fué acompañada por un aumento de la tasa de crecimiento de los salarios por hora y por una baja de la tasa de desempleo. Al ampliarse el mercado del trabajo, la tasa de migración desde los sectores agrícolas y desde el exterior aumentó. A través del gasto de dinero, proporcionado por los nuevos empleos en los centros de actividad, los migrantes crearon a su vez nuevas demandas y oportunidades de inversión: en alimentos, vestuario, vivienda y numerosos servicios urbanos. Este crecimiento inducido del producto y de la inversión—el típico "boom" (don) de desarrollo urbano—alimentó y prolongó la expansión. Durante el período depresivo tendió a prevalecer el mismo movimiento en sentido inverso.

Las oscilaciones en el crecimiento de la población y de la fuerza de trabajo persistieron hasta 1914, mas en parte, han mostrado características diferentes, especialmente una mayor importancia de la tasa de natalidad en las oscilaciones de la población y en el cambio de la tasa de participación en las oscilaciones de la fuerza de trabajo. En un próximo estudio se examinará el mecanismo causal que explica estas oscilaciones recientes.

This paper summarizes findings on the nature of long swings or Kuznets cycles in the growth of United States population and labor force and on their apparent cause-effect relations in the period prior to World War I to similar movements in the rate of economic development. It follows a line of research opened up by Kuznets [30–34], Isard [26, 27], Silberling [45], Abramovitz [1, 2], Brinley Thomas [46, 47], and Dorothy S. Thomas [48–51], among others. While there is some coverage of the period since World War I, the primary concern here is the typical pattern prior to that war. In a summary such as this it is only possible to provide an idea of the evidence by some representative charts and citations, without attempting to discuss underlying sources and methods.[1] Although available annual series are used, stretching back in some cases into the pre–Civil War period, many of the find-

* This is a revised and shortened version of a report presented at the June, 1964 meeting in San Francisco of the Population Association of America. It summarizes part of the tentative results of an on-going National Bureau of Economic Research study, conceived within the framework of a broader inquiry being conducted by Moses Abramovitz, and has not undergone the regular NBER review procedures. Since July, 1963, the project has been supported by funds provided by the Office of Manpower, Automation, and Training, United States Department of Labor. The comments of Omer Galle, Bethel College, at the meeting are gratefully acknowledged, as are those, on an earlier draft, of participants in the Purdue University Seminar on the Use of Theory and Statistics in Economic History. This paper has benefited from the excellent assistance of Chantal de Molliens Dubrin. The charts were drawn by H. Irving Forman.

[1] At least general acknowledgement must be made, however, of the debt owed to a long list of major historical studies of United States population and labor force, without which this study would not have been possible.

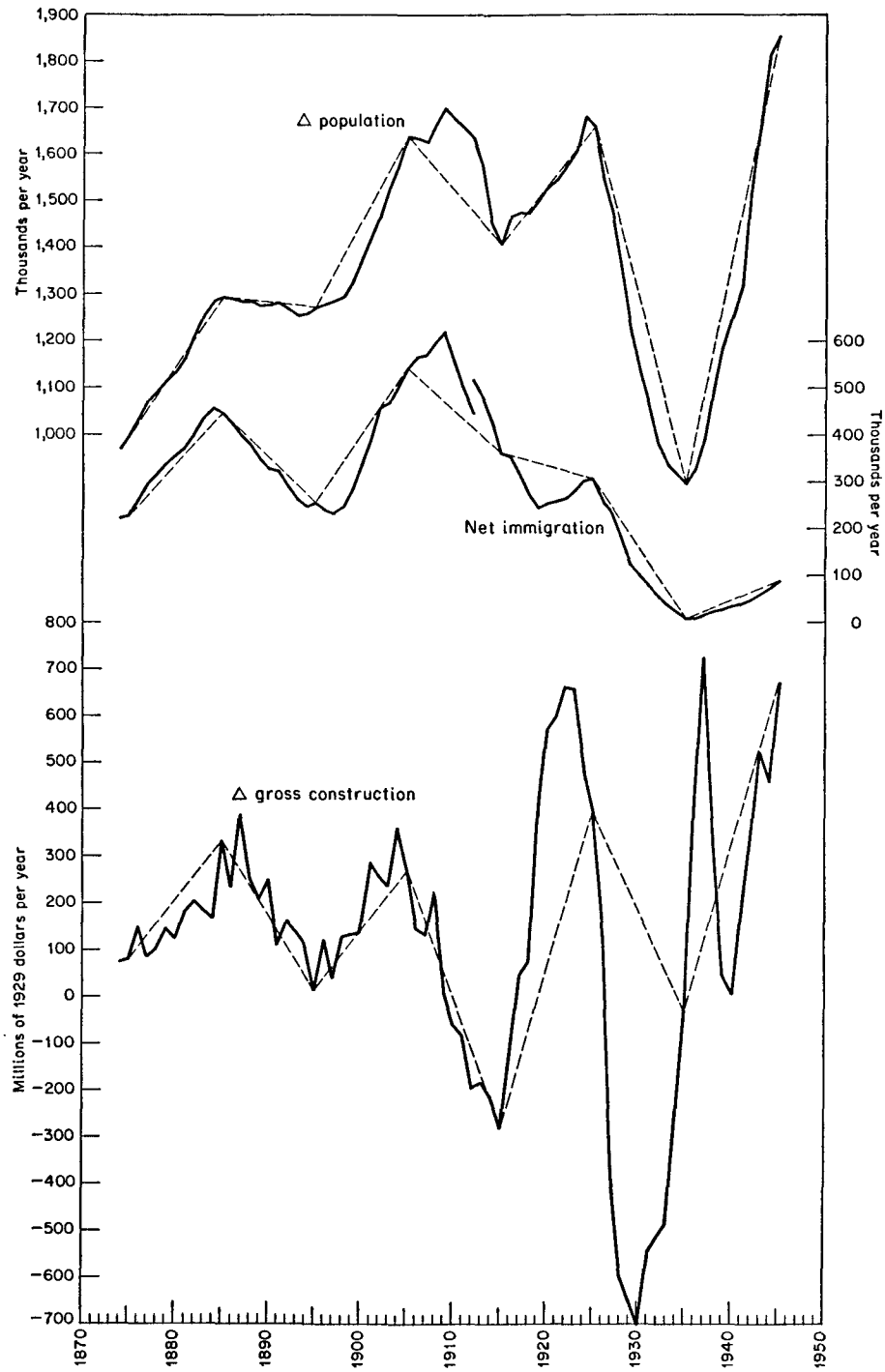

FIG. 1

ings for population and labor force are based on the decennial population censuses of 1870 to 1950. The timing of the censuses during this period occurred sufficiently close to turning points in the demographic swings to permit use of this valuable detailed source. This is illustrated in Figure 1, which shows how observations confined to census dates (*broken line*) reproduce in rough form the pattern of fluctuation revealed in fuller detail by annual data.[2]

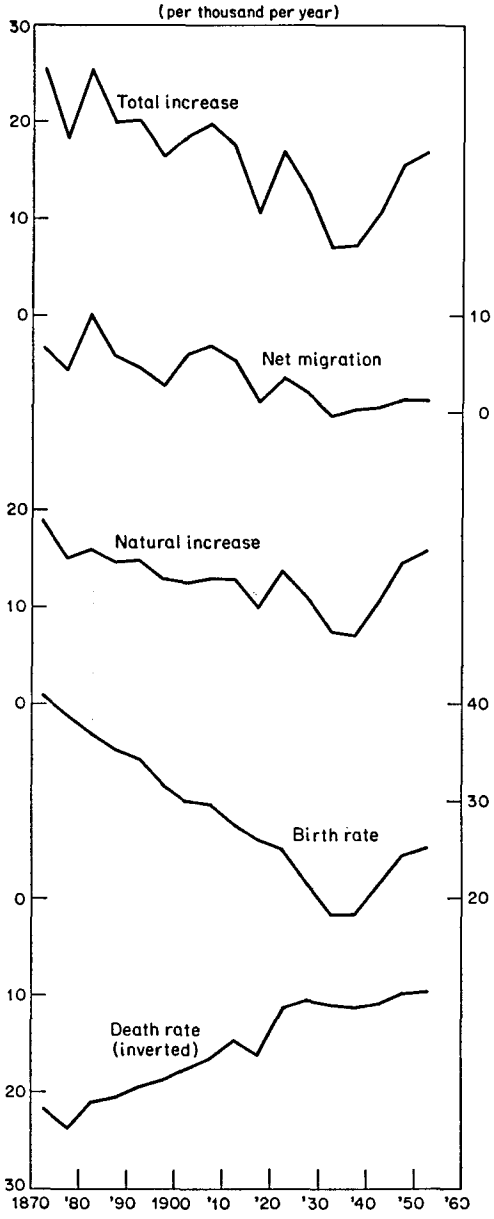

FIG. 2

I. THE NATURE OF LONG SWINGS IN POPULATION AND LABOR FORCE

For the nation as a whole:

I-1. The growth of both population and labor force has been characterized by roughly synchronous long swings since at least 1870 and probably since early in the nineteenth century. The swings were typi-

[2] A ten-year average of annual data is employed because decade changes in the stock of population or labor force, derived from successive censuses, are equivalent to observations at decade intervals on a ten-year moving average of annual changes.

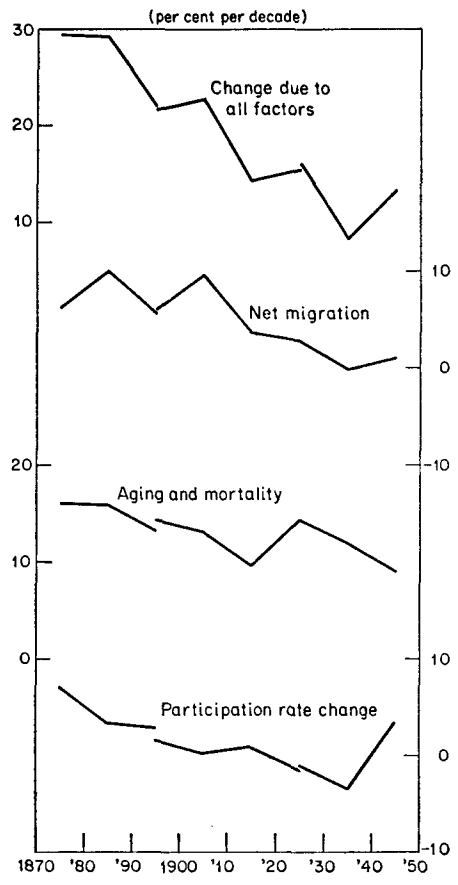

FIG. 3

cally of substantial amplitude and averaged around 15–25 years in duration (Figs. 2 and 3, [31–33], [50], [51]).

I-2. Until 1920 swings in both series arose, largely, from corresponding movements in immigration.[3] Recently, however, fertility has assumed a more important role with regard to population swings and participation rate change with regard to labor force (Figs. 2 and 3).

I-3. The color-nativity components of population and labor force reflect the predominant influence that immigration has typically played in the swings. Histori-

[3] However, evidence of swings is apparent in fertility and mortality (cf. [13], [17], [31]).

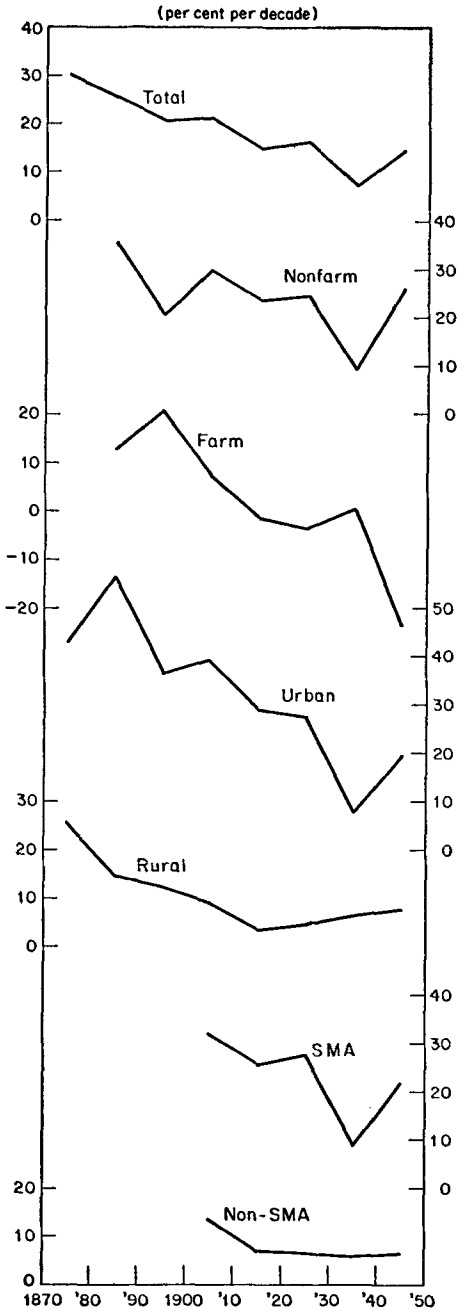

FIG. 4

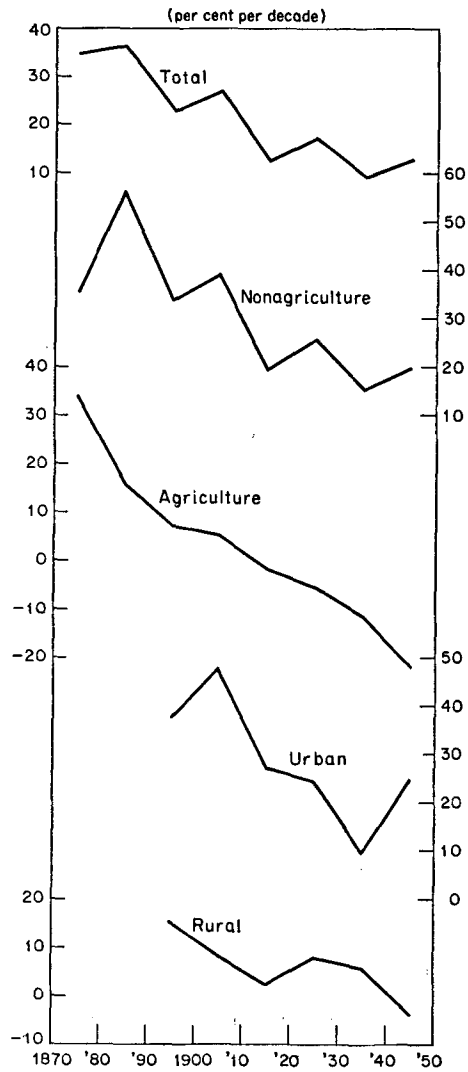

FIG. 5

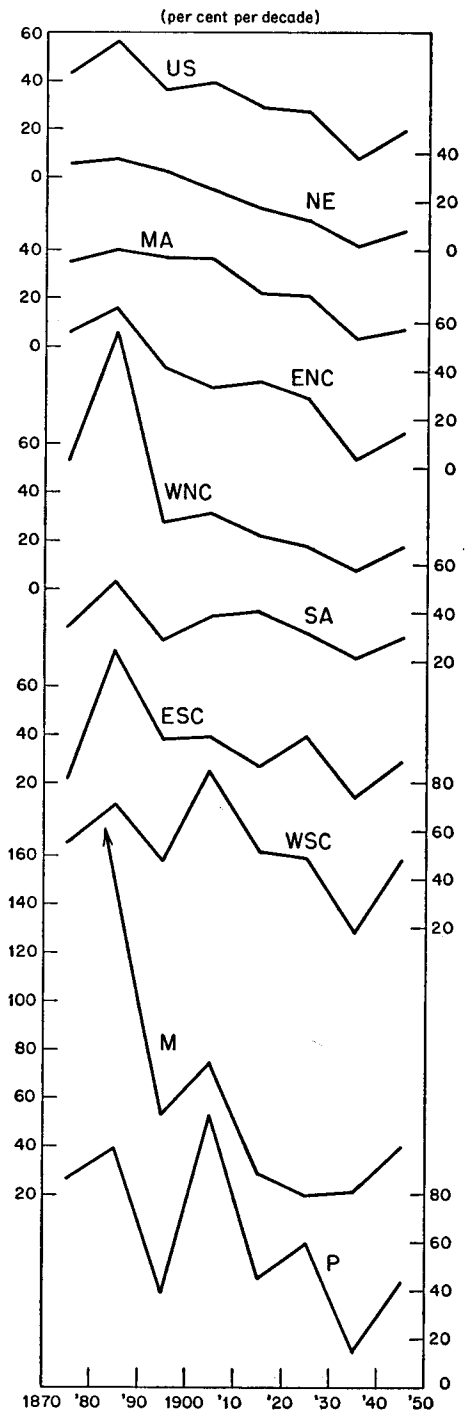

FIG. 6

cally the swings are most apparent in the growth of the foreign born population and labor force. Recently, however, the native born has become important—both the native white and nonwhite components.

Examination of various spatial components of the national aggregate reveals that:

I-4. The swings have typically been a nonfarm, nonagricultural phenomenon. Relatively high positive conformity is apparent in the growth of the total population residing in nonfarm areas, both urban and rural, and in metropolitan areas (SMA's), old and new; in the *number* of urban places and SMA's; and, holding the number of places or SMA's in a given size class constant during each decade, in the growth of the aggregate population in towns and villages and in cities or metropolitan areas of small, medium, and large size. The swings are also evident in the growth of the labor force in nonagricultural industries and in urban areas (Figs. 4 and 5, [19], [35–37]).

I-5. The growth of farm population, of the population in rural areas taken as a whole and in rural territory outside of metropolitan areas, and of the agricultural and rural labor force typically either fails to conform or conforms inversely (Figs. 4 and 5). A possible exception, of greatest quantitative importance in the pre–Civil War period, is population and labor force growth in new agricultural areas. These appear to conform positively while these areas are being settled [40].

I-6. The swings in growth of nonfarm population and nonagricultural labor force are widely diffused geographically, typically occurring at about the same time in the various geographic divisions of the country. When *total* population or labor force in a region fails to conform, this is almost always due to the discordant behavior of the farm or agricultural component of the total[4] (Figs. 6 and 7).

[4] Important contributions at the state and local levels have been made by Gordon [23] and David [16]. See also E. Smolensky and D. Ratajczak, "The Conception of Cities," *Explorations*

I-7. The generalizations above regarding positive conformity relate to broad classes of population and labor force. It is less true that any given city or metropolitan area, or even the urban population of a single state, will consistently show every long swing. Thus stability in the large in the spatial incidence of the swings is accompanied by variability in the small.

I-8. The contrasting behavior of population growth in farm and nonfarm areas suggests the possibility of long swings in *internal* migration, and this, indeed, is the case. Estimates of the overall rate of net interstate migration of the native born population, available by decade since 1870, exhibit high positive conformity to long swings. Much cruder figures for rural and urban areas show that rates of rural net out migration and urban net in migration of the native born population also tended to conform positively. When the four major regions are studied separately, one finds that while the secular levels of the rates differed according to whether the area was a supplier or recipient of migrants, the same pattern of decennial fluctuation in native born net migration rates —interregional, rural, and urban—usually occurred in each region. At the level of individual states, however, net migration rates—available for the total population but not rural and urban separately—conformed less consistently [19], [48–51].

I-9. In both the interstate and rural-urban migration estimates, the white component of the native-born population shows positive conformity to long swings throughout the entire period, and the Negro component shows the same from 1920 on. An interesting feature of the Negro migration before 1910 is that the interstate movement tends to move inversely, but the substantially larger rural-urban flow conforms positively to the swings. On balance, therefore, the evidence at the sub-national level indicates that roughly synchronous fluctuations occurred in in-

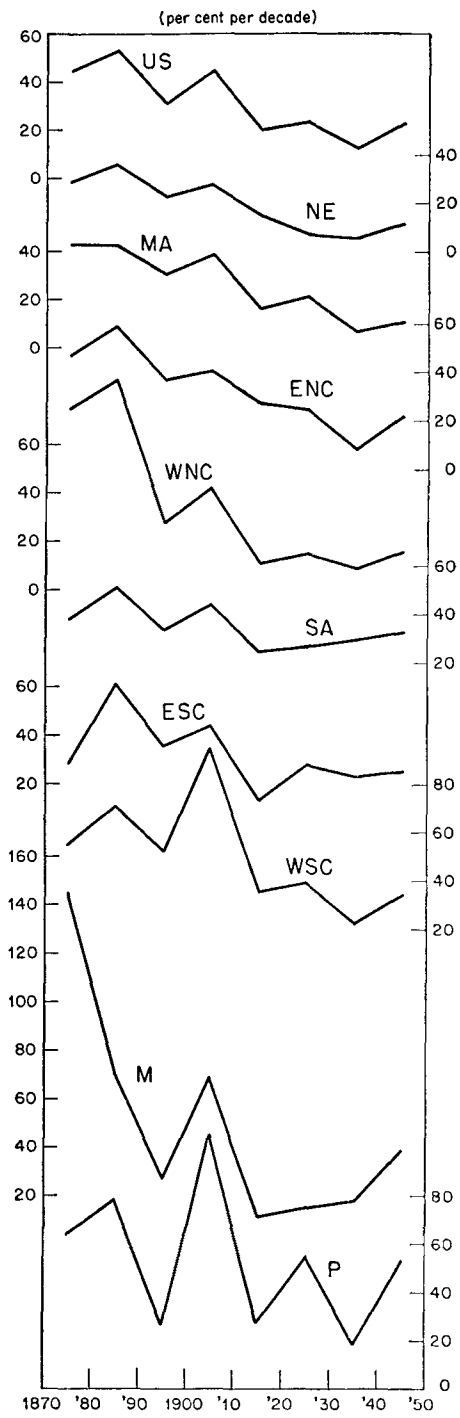

FIG. 7

in Entrepreneurial History (Second Series, forthcoming).

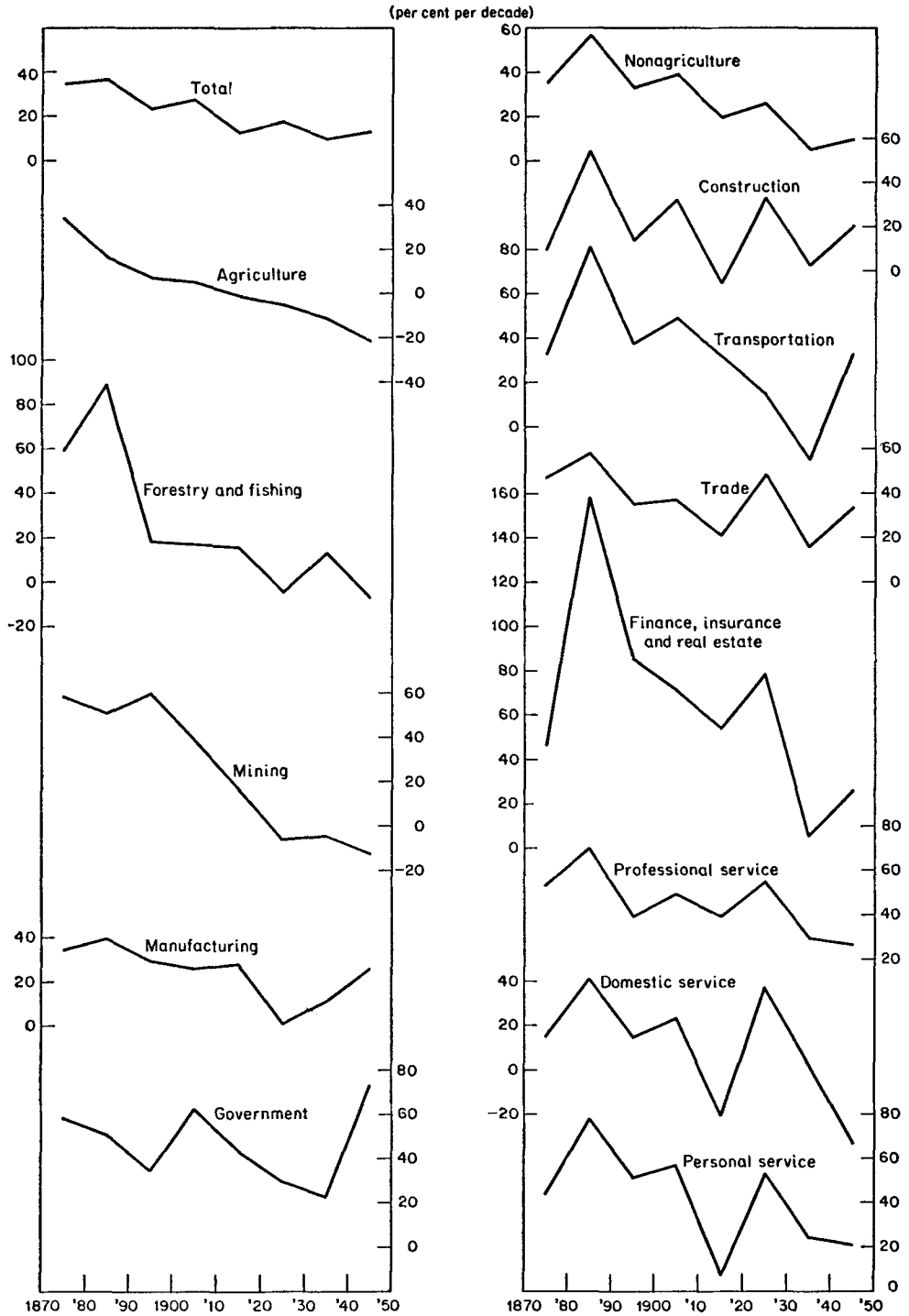

FIG. 8

ternal as well as external migration and that typically all three color-nativity classes—foreign born white, native white, and Negro—participated in migration swings throughout the period since 1870.

Partial light on economic characteristics of the swings is provided by the figures for the main industrial components of the nonagricultural labor force and for the major occupation groups. These data are available only at decennial census intervals for the United States as a whole, and indicate that:

I-10. The swings appear with high regularity in the same industrial sectors, namely, construction, transportation, trade, finance, insurance, and real estate, professional services and amusements, domestic service, and personal services. On the other hand, manufacturing and forestry and fishing show no consistent pattern, while mining tends to move inversely[5] (Fig. 8).

I-11. The occupation data, available only from 1900 on, show quite consistent swings for both the total and components of the white collar group, but only for the total of the manual and service workers. The movements shown by a number of major occupational groups appear to be determined by the industrial pattern, specifically, by the relative weight in each occupational class of the nonconforming manufacturing sector, on the one hand, and the positively conforming construction, trade, and service sectors, on the other.

II. CAUSES OF MIGRATION SWINGS

At the national level prior to World War I, swings in population and labor force growth were due predominantly to swings in immigration. The present section, therefore, focuses on the explanation of the immigration waves.

The flow of migrants between two geographic areas is influenced by a variety of factors, at origin and destination, such as: current and expected economic opportunity, rates of labor force entry, transfer costs, the volume of previous migration, noneconomic conditions such as language and culture, war, and political revolution. All these factors and more determine the level of migration at a given time, but all of them need not fluctuate in order to generate migration swings over time. The question here is whether there is evidence that the observed immigration waves were repeatedly associated with fluctuations in the same factor(s) and particularly whether their source appears to lie in changing conditions in the United States or in the areas of origin. This question is important in clarifying not only the causes of the waves in demographic growth, but also the initiating role, if any, of the latter in the swings in economic growth.

The answer appears to be that typically the swings in immigration were a response to corresponding swings in the demand for labor in the United States.[6] The evidence is as follows:

II-1. In the United States, turning points of long swings in output growth typically preceded those in the rate of immigration, suggesting that immigration was responding to changed conditions in the United States rather than abroad (Fig. 9, [1]).[7] If new circumstances in the areas of origin were the source of the immigration swing, then, other things remaining unchanged, one would expect im-

[5] Fuller time detail for the components as well as the aggregate reveals a more complex pattern for manufacturing (see III-3, III-6, III-7 below).

[6] This conclusion differs from that of Brinley Thomas for the period before 1870 [46]. Albert Fishlow [21] has also questioned Thomas' analysis and criticized the reliability of the underlying railroad building series he used.

[7] Analysis of both the pre- and post-Civil War period has been significantly aided by the newly developed estimates of GNP and components by Robert E. Gallman, who has himself commented on the long swings apparent in the series ("Commodity Output, 1839–1899," in Conference on Research in Income and Wealth, *Studies in Income and Wealth*, XXIV, pp. 13–67, and "Gross National Product in the United States, 1834–1909," *ibid.*, Vol. XXX [forthcoming]). I am grateful to Professor Gallman for making available his preliminary estimates.

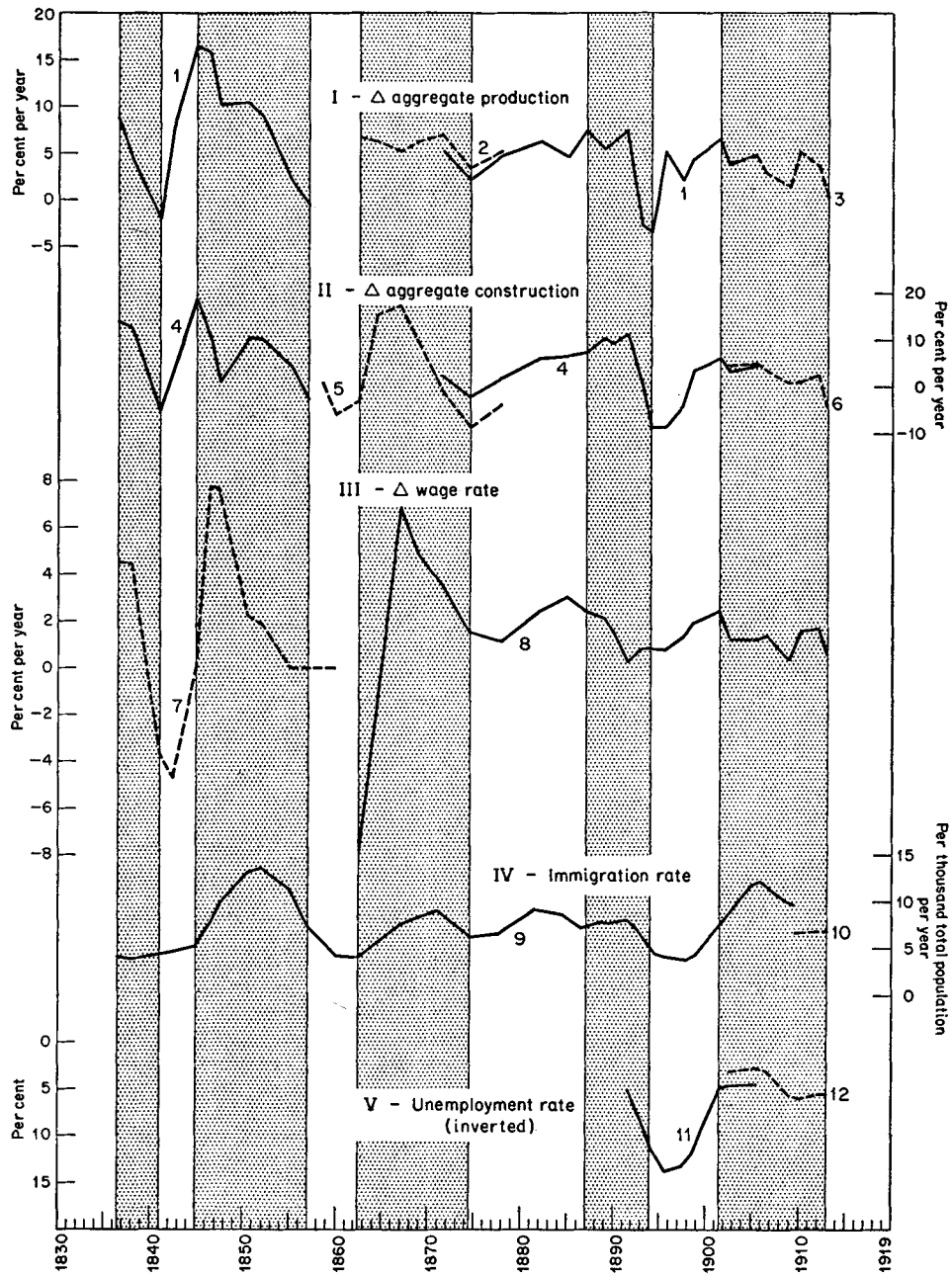

FIG. 9

migration to initiate a corresponding movement in the growth rate of GNP, and thus to move concurrently with, rather than lagging behind, the latter.

II-2. During long swings in the United States, a rising immigration rate was typically preceded by a rising growth rate of hourly wages, and, so far as the limited evidence goes, accompanied by a declining unemployment rate; a falling immigration rate tended to follow a decline in the growth rate of hourly wages and to accompany a rising unemployment rate (Fig. 9). Since the growth of United States labor force from domestic sources, whether from demographic factors or participation rate change, showed but slight evidence of long swings before World War I (Fig. 3), the implication is that immigration waves were one of several symptoms of common origin, namely, alternating tightness and slack in the labor market associated with swings in the growth of labor demand.

II-3. There is a substantial similarity in the timing of out-migration waves from diverse areas of origin—different parts of Europe, Canada, Latin America, Asia, and even the rural sector within the United States [18], [31]. This observation is clearly consistent with the view that these areas were responding to a common external stimulus such as swings in labor demand at destination. It is difficult to explain in terms of conditions in the originating areas, unless these areas were themselves subject to forces generating common swings.

II-4. Investigation of the possibility of common forces generating concurrent swings in areas of origin indicates that:

a) Within Europe, although there is evidence of a cross-section association among countries between the *secular* rate of overseas emigration and the rate of labor market entry from demographic sources (as reflected in the rate of natural increase twenty years prior to emigration), there is no evidence that the emigration *swings* were responding to similar swings in the rate of labor market entry. Rather, while swings in the latter did occur, countries tended to coincide in their peaks and troughs in emigration rates despite differences in those in their rates of labor market entry [18]. Similarly in the United States rural sector, there is no evidence of a systematic fluctuation in rates of labor market entry from demographic sources which could be held responsible for the waves in rural out-migration.

b) Evidence regarding a common movement among European countries in economic opportunity, as measured by agricultural or industrial swings, is mixed [30], [41]. If there were any such movement regularly associated with the United States swing, and it should be emphasized that the evidence is unclear, it was probably a common swing in industrial conditions, conforming *positively* to the United States swing. Also, the United States farm sector does show clearly a positively conforming movement in agricultural opportunity (as measured by per capita real farm income), arising from a corresponding swing in farm product prices.

A case might be made that positively conforming movements in economic opportunity in areas of origin could generate common out-migration waves by providing financing for relocation and thus initiate United States nonfarm swings. However, a substantial proportion of European emigrants, at least at the end of the nineteenth century, appear not to have financed their own migration, but to have relied on funds provided by relatives or friends who preceded them [54, p. 119], [28, p. 77]. As for the United States farm sector, even if the swing in agricultural opportunity did provide financing for migrants, it would seem that this agricultural income swing was itself the result, rather than the cause, of the nonfarm swing. This is because the swing in farm product prices, which is responsible for the positively conforming movement in agricultural opportunity, is evidently a reflection of a swing in the domestic nonfarm demand for food and materials. In other words, the nonfarm economic boom generated a swing in the demand, not only for

labor (and a resultant migration wave), but also for United States farm products (and a corresponding movement in farm prices and income).

II-5. In the United States, the imprint of fluctuations in demand conditions is apparent too in the age data on interstate migration. For every cohort, the migration rate at ages 25–29 exceeded that at ages 35–39. However, a cohort going through the peak migration ages, 25–29, during a long swing depression showed a substantially lower migration rate than one reaching these ages during a long swing boom. Ten years later, at ages 35–39, when the long swing stage encountered by each cohort tended to be reversed, their order with regard to migration rates was likewise reversed. This suggests that the migration propensity at ages 25–29 of a cohort was sometimes significantly deferred until demand conditions became more favorable [19].

II-6. While the evidence above points to United States demand conditions as the *systematic* factor responsible for migration swings, the degree of responsiveness of migration from one long swing to the next could, of course, be influenced by developments outside the destination area. For example, as between two long swings characterized by a similar movement in the demand for labor, the response induced might differ because of secular developments with regard to transport costs, irregular events such as new legislation, revolution, or catastrophic famine, and so on. Among others, the unprecedented amplitude of the immigration response at the time of the Irish Famine seems a good example of this.

III. EFFECTS OF MIGRATION SWINGS

While surges in population and labor force growth associated with immigration appear to have been caused by rather than to have initiated swings in the rate of economic growth, this does not mean that the demographic movement did not play an important functional role in such swings. Rather, the evidence since 1870 suggests that the flow of foreign and internal migrants responding to an upswing in labor demand generated a wave of urban development.[8] The investment induced by the population movement sustained the long upswings and may have been the key factor accounting for its prolonged duration.

Since the data supporting this view relate largely to industrial structure, it is pertinent first to identify those industries most dependent on final urban consumer demand. A clue to their identity is provided by ranking the industries in the 50 sector input-output table for 1947 [20] according to the percentage of gross output flowing directly to households.[9] The highest one-third is as follows:

Food and kindred products
Tobacco manufactures
Apparel
Furniture and fixtures
Leather and leather products
Radios
Miscellaneous manufacturing
Transportation other than rail and ocean
Trade
Communications
Finance and insurance
Rental
Personal and repair services
Medical, educ., and nonprofit organizations
Amusements
Eating and drinking places
Government

To these should be added residential construction, not separately distinguished in the table, and industries in the manufacturing sector closely related thereto, such as lumber products, stone, clay, and glass products, and plumbing and heating supplies. In the absence of special constraints these are the industries that would re-

[8] Isard's work emphasizes this effect of the demographic movement during long swings [26, 27], though his exclusive emphasis on transport innovation as the cause of the movement is open to question. A recent clear analytical statement of the cause-effect role of population movement is given by Tiebout [52].

[9] A preliminary estimate by William G. Whitney of a similar table for 1899 yields virtually the same list of industries at that date.

spond most sensitively to a swing associated with migration in the urban consuming population.

With this background, the evidence indicative of the impact of migration swings on urban development may be summarized by restating and adding to some of the findings of Section I:

III-1. With regard to spatial characteristics, the swings have typically been a nonfarm, urban phenomenon; with regard to industrial characteristics, a nonagricultural one (Figs. 4 and 5).

III-2. Among the major components of the nonagricultural labor force, those characteristically exhibiting the swings are construction; transportation; trade; finance, insurance, and real estate; professional service and amusements; personal service; and domestic service (Fig. 8). The close association of swings in residential construction with those in immigration has been clearly demonstrated ([12]; for other countries, see [10], [24]).

III-3. Classification (according to conformity of movement with the nonagricultural total) of Alba Edwards' more detailed industry-occupation series on labor force for the period 1870–1930 [55] brings to light, as positively conforming, a group of titles much like those listed above from the input-output table. While the manufacturing labor force as a whole does not show positive conformity, the opposite is true of subsectors closely related to construction and urban consumer demand. One activity prominent in Edwards' data, that of printing and publishing, though missing from the input-output list, ranks only slightly below the industries listed there. Industries appearing in the input-output list but not particularly apparent in the labor force data are typically those with special output constraints, such as government or industries relying substantially on extractive activity, for example, manufacture of food products.

III-4. Evidence of association between swings in urban population growth and sensitive industrial sectors is apparent in data not only for the United States but for the individual geographic divisions as well.

These findings accord with expectations regarding the nature of the industrial response if swings in migration to urban areas generated concurrent movements in product demand. In the preceding section, immigration swings were found to lag behind swings in the growth rate of nonagricultural output as a whole. Together, these findings suggest the possibility of a more comprehensive pattern with regard to the industrial structure of long swings, in which, among the positively conforming industries, those more closely dependent on urban household demand either lag or, if turning concurrently, do so sluggishly. The decennial observations on labor force are too infrequent to discern this finer pattern, but evidence of it is apparent in output and capital data, as follows:

III-5. The turning points in Burns's series on building permits coincide almost perfectly with those in Kuznets' series for gross construction and male population of working age. However, they lag those in the "standard trend cycle," a series which reflects the consensus of movement of basic unfinished industrial commodities[10] (Fig. 10, [11]).

III-6. This lag characterizes a number of Burns's individual commodity series other than building permits, series closely related to construction or final urban consumer demand (Figure 11, *right panel*). Even among the industrial commodity series conforming to the standard trend cycle, there are several in which construction demand figures more prominently, and these tend to turn sluggishly, reflecting the imprint of that demand[11] (Fig. 11, *left panel;* see pig iron, nails, cement).

III-7. In Creamer's data on growth of

[10] For an interesting application of Burns's trend-cycle framework [11] to the post–World War II period, see Bernstein [5].

[11] The broken lines in Figure 11, which are confined to observations for the periods between census dates, show how the long swing pattern for series related to construction or final urban consumer demand carries over in such observations, unlike that for series not so related.

real capital stock in manufacturing, long swing turning points in forest products; stone, clay, and glass products; and printing and publishing tend to lag those in the metals industries and in manufacturing as a whole (Fig. 12). The identity of the *leading* manufacturing industries indicated by Creamer's capital data is the same as that suggested by Burns's commodity series, namely, the "capital goods" industries.

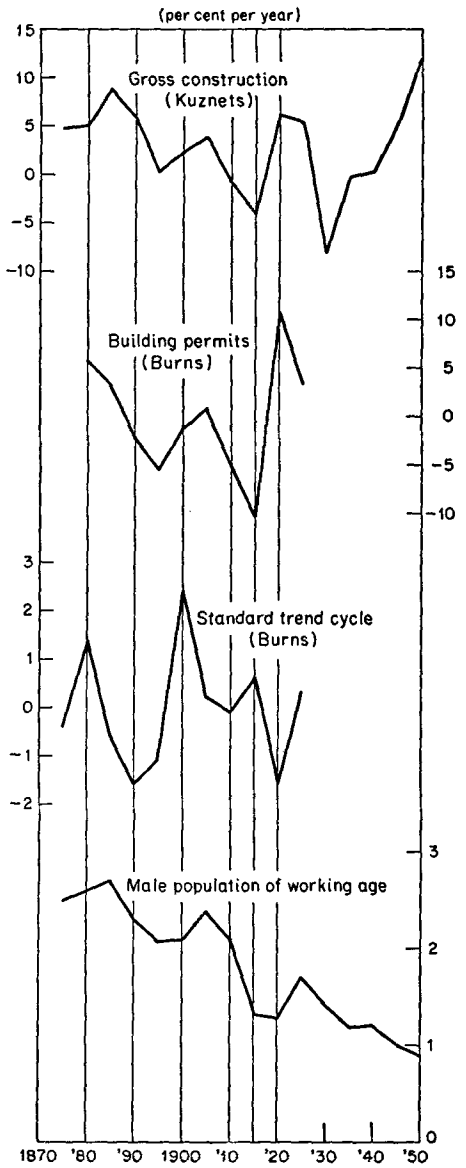

FIG. 10

IV. SUMMARY AND CONCLUDING COMMENTS

To summarize, down to 1914, the growth rate of United States population and labor force exhibited "Kuznets cycles," long swings of around fifteen to twenty-five years duration. These swings were centered in nonfarm areas and places undergoing new agricultural settlement; geographically, they were widely diffused throughout the nation; the dominant underlying component of change was migration, both external and internal. These swings in demographic growth were initiated by prior swings in the rate of economic growth, but, in turn, had important feedback effects. Thus, a long upswing in the rate of economic growth, typically set in motion by a rise in aggregate demand associated with a business investment boom, was accompanied by a rise in the growth rate of hourly wages and a decline in that of unemployment. As the labor market became tighter, the migration rate from older farm areas and from abroad swung up. With spending money provided by new jobs in the centers of opportunity, the migrants, in turn generated new demands and investment opportunities—for food, clothing, shelter, and a variety of urban services. This induced growth in output and investment—typically, an urban development boom—sustained and prolonged the expansion. During the downswing, the same sequence tended to prevail in reverse direction. This interpretation of the swings is, of course, speculative but seems consistent with the evidence available.

As the charts show, long swings in population and labor force growth have persisted since 1914, but have displayed partly different characteristics—notably, much greater importance of the birth rate in population swings and of participation rate change in labor force swings. A task of the current phase of this inquiry is to appraise these new developments in the light

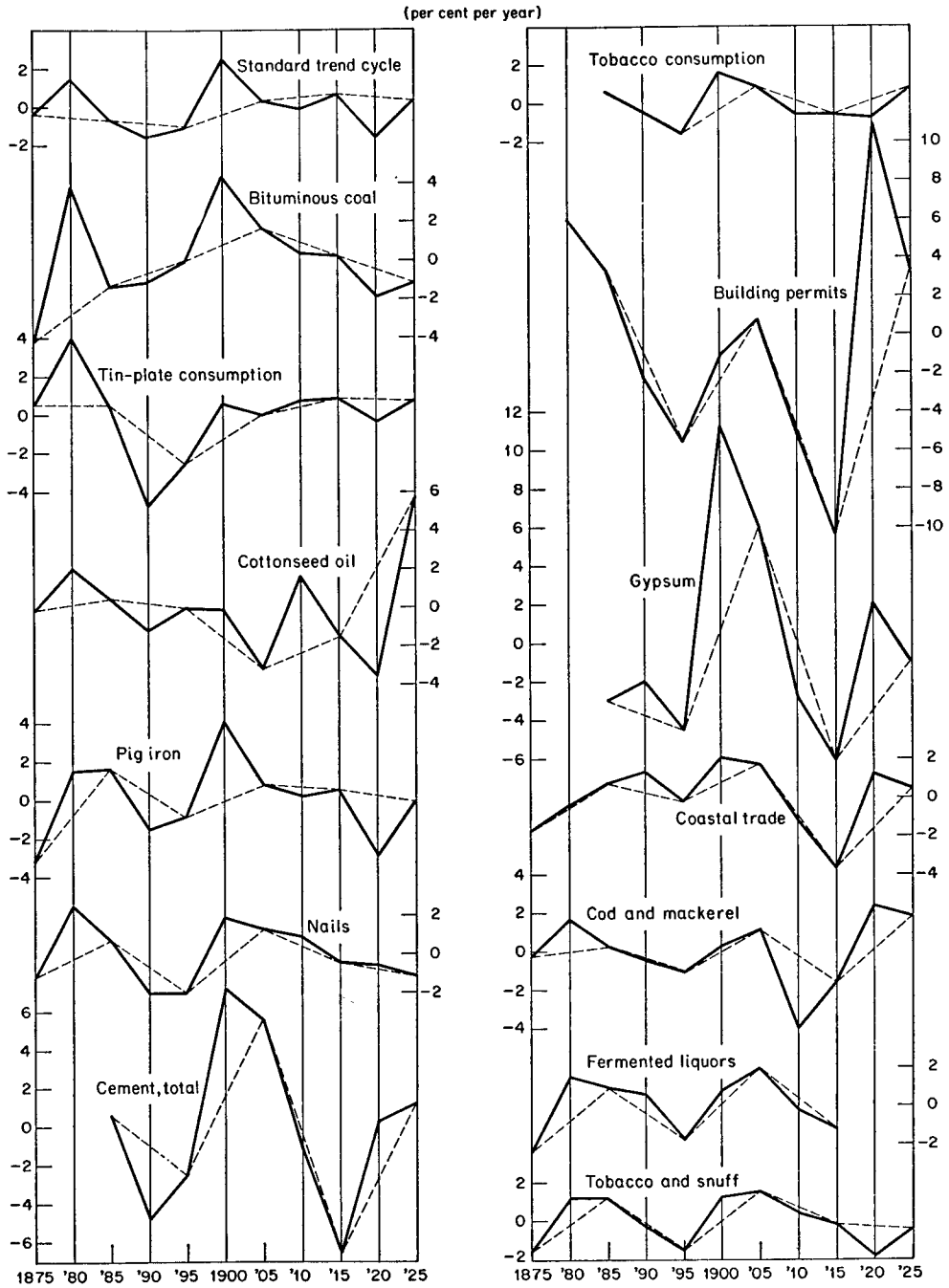

FIG. 11

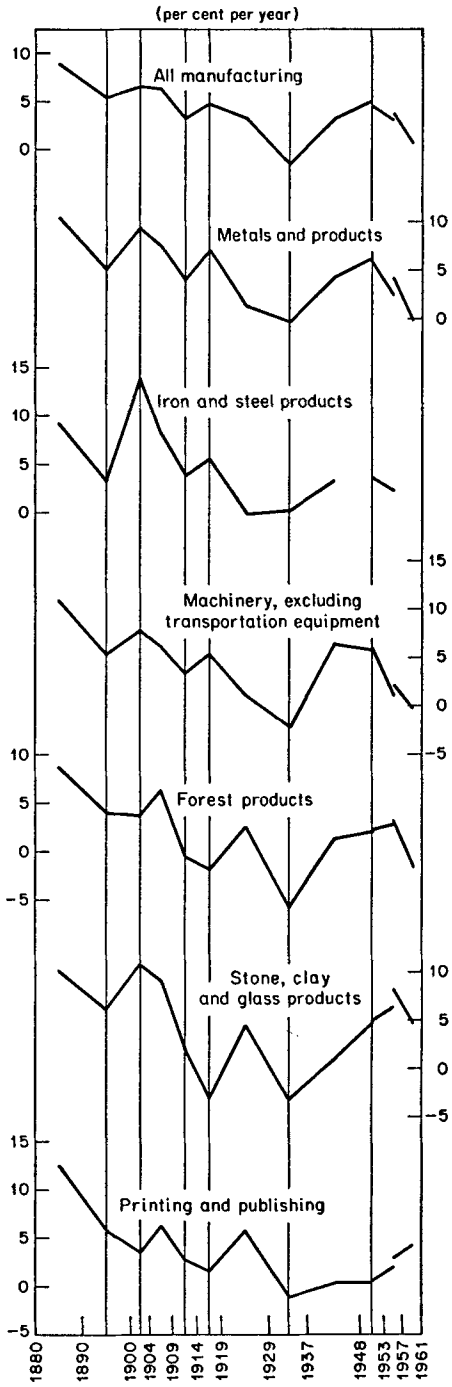

FIG. 12

of the historical record and consider the bearing of the study as a whole on the question of projection.[12]

A few concluding observations may be appropriate. First, while this analysis places emphasis on swings in labor demand as the systematic initiating element in the demographic swings, it should be clear that supply conditions have important bearing on the sources, amplitude, and timing of the response. Indeed, the altered pattern since World War I appears to be directly due to major changes in supply. Second, the present analysis leaves open the question of whether long swings are self-generating. Adequate appraisal of this obviously calls for consideration of a wider range of variables and relationships than are covered here [1], [25]. Finally, it is sometimes suggested that the long swing may be no more than a statistical artifact due to faulty methodology [3, 4] or to data deficiencies. Without attempting a full appraisal, one may note that an important source of reassurance is the mounting number of series from highly diverse data sources and from different countries which exhibit swings.[13] Of obvious relevance too is the consistency of the observations with a meaningful analytical model.

[12] One report has previously appeared [17]. For a general discussion of the relevance of the long swings framework to the recent period, see [2], [25], [12], [58], and accompanying comments.

[13] In addition to the series covered here and the well known literature on the long building cycle, reference may be made to evidence of long swings in patents [43]; land sales and prices [6], [14], [40]; financial series [32]; transportation and other public utilities [22], [53]; and international trade and payments [57]. For evidence for other countries, in addition to the general studies of Kuznets [30, 34], O'Leary and Lewis [41], and Brinley Thomas [46], mention may be made of contributions for Japan by Ohkawa and Rosovsky [42] and Shinohara [44]; for Canada by Buckley [8–10], McDougall [39], and Daly [15]; for Australia by Borrie [7], A. R. Hall [24], and Coale and Zelnik [13]; and of recent or on-going doctoral dissertations by Kelley for Australia [29] Marker for France [38], and Wilkinson for Sweden [56]. See also a paper to be presented by Manuel Gottlieb at the 1965 UN World Population Conference, "Fluctuations in Marriage and Migration Experience in Long Swings in Economic Growth."

REFERENCES

1. ABRAMOVITZ, MOSES. "The Nature and Significance of Kuznets Cycles," *Economic Development and Cultural Change*, IX, 3 (April, 1961), pp. 225–48.
2. ———. Statement in Hearings before the Joint Economic Committee. (86th Cong., 1st sess., Pt. 2.) *Historical and Comparative Rates of Production, Productivity, and Prices*. Washington: Government Printing Office (1959). Pp. 411–66.
3. ADELMAN, IRMA. "Long Cycles—a Simulation Experiment," in F. Balderston and A. C. Hogatt (eds.), *Proceedings of a Conference on Simulation*. South West Publishing Co. 1964.
4. ———. "Long Cycles—Fact or Artifact." Paper read at the Econometric Society meeting, Boston (December, 1963).
5. BERNSTEIN, EDWARD M. "The Postwar Trend Cycle in the United States," *Quarterly Review* (First Quarter, 1963), pp. 1–10.
6. BERRY, THOMAS. *Western Prices before 1861: A Study of the Cincinnati Market*. Cambridge: Harvard University Press, 1943.
7. BORRIE, W. D. "Demographic Cycles and Economic Development: Some Observations Based upon Australian Experience," *Population Index*, XXVI, No. 1 (January, 1960), pp. 3–15.
8. BUCKLEY, KENNETH A. H. *Growth and Housing Requirements: A Report on Economic and Social Aspects of the Housing Problem in Saskatoon*. Saskatoon, Canada: University of Saskatchewan, 1958.
9. ———. "The Role of Staple Industries in Canada's Economic Development," *Journal of Economic History*, XVIII, No. 4 (December, 1958), pp. 439–52.
10. ———. "Urban Building and Real Estate Fluctuations in Canada," *Canadian Journal of Economics and Political Science*, XVIII, No. 1 (February, 1952), pp. 41–62.
11. BURNS, ARTHUR F. *Production Trends in the United States since 1870*. New York: National Bureau of Economic Research, 1934.
12. CAMPBELL, BURNHAM O. "Long Swings in Residential Construction: The Postwar Experience," *American Economic Review*, LIII, No. 2 (May, 1963), pp. 508–18.
13. COALE, ANSLEY J., and ZELNIK, MELVIN. *New Estimates of Fertility and Population in the United States*. Princeton: Princeton University Press, 1963.
14. COLE, ARTHUR H. "Cyclical and Sectional Variations in the Sale of Public Lands, 1816–60," *Review of Economic Statistics*, IX (January, 1927), pp. 41–53.
15. DALY, D. J. "Kuznets Cycles in Canada." Paper presented to the Ottawa Chapter, Canadian Political Science Association (March, 1962).
16. DAVID, PAUL A. "Factories at the Prairies' Edge: A Study of Industrialization in Chicago, 1848–1893." Ph.D. dissertation (in process), Harvard University.
17. EASTERLIN, RICHARD A. *The American Baby Boom in Historical Perspective*. National Bureau of Economic Research Occasional Paper 79. New York: National Bureau of Economic Research, 1962.
18. ———. "Influences in European Overseas Emigration before World War I," *Economic Development and Cultural Change*, IX, No. 3 (April, 1961), pp. 331–51.
19. ELDRIDGE, HOPE T., and THOMAS, DOROTHY SWAINE, *Population Redistribution and Economic Growth, United States, 1870–1950*. Vol. III: *Demographic Analyses and Interrelations*. Memoirs of the American Philosophical Society, Vol. 61. Philadelphia: American Philosophical Society, 1964.
20. EVANS, W. DUANE, and HOFFENBERG, MARVIN. "The Interindustry Relations Study for 1947," *Review of Economics and Statistics*, XXXIV, No. 2 (May, 1952), pp. 97–142.
21. FISHLOW, ALBERT. "Economic Contribution of American Railroads before the Civil War." Unpublished Ph.D. dissertation, Harvard University, 1964.
22. GOODRICH, CARTER, CRANMER, H. JEROME, and SEGAL, HARVEY H. *Canals and American Economic Development*. New York: Columbia University, 1961.
23. GORDON, MARGARET S. *Employment Expansion and Population Growth: The California Experience, 1900–1950*. Berkeley: University of California Press, 1954.
24. HALL, A. R. "Some Long Period Effects of the Kinked Age Distribution of the Population of Australia, 1861–1961," *Economic Record*, XLIX (March, 1963), pp. 43–52.
25. HICKMAN, BERT G. "The Postwar Retardation: Another Long Swing in the Rate of Growth?" *American Economic Review*, LIII, No. 2 (May, 1963), pp. 490–507.
26. ISARD, WALTER. "A Neglected Cycle: The Transport-Building Cycle," *Review of*

Economics and Statistics, XXIV, No. 4 (November, 1942), pp. 149–58.
27. ———. "Transport Development and Building Cycles," *Quarterly Journal of Economics*, LVII (November, 1942), pp. 90–110.
28. JEROME, HARRY. *Migration and Business Cycles*. New York: National Bureau of Economic Research, 1926.
29. KELLEY, ALLEN C. "Long Swings in Australian Output and Investment: 1861–1935." Ph.D. dissertation in economics, Stanford University, 1963.
30. KUZNETS, SIMON. "Quantitative Aspects of Economic Growth of Nations. I. Levels and Variability of Rates of Growth," *Economic Development and Cultural Change*, V, No. 1 (October, 1956), pp. 1–94.
31. ———. "Long Swings in the Growth of Population and in Related Economic Variables," *Proceedings of American Philosophical Society*, CII, No. 1 (February, 1958), pp. 25–52.
32. ———. *Capital in the American Economy: Its Formation and Financing*. Princeton: Princeton University Press, 1961.
33. ——— and RUBIN, E. *Immigration and the Foreign Born*. National Bureau of Economic Research Occasional Paper 46. New York: National Bureau of Economic Research, 1954.
34. ———. *Secular Movements in Production and Prices*. New York: Houghton Mifflin, 1930.
35. MADDEN, CARL H. "On Some Indications of Stability in the Growth of Cities in the United States," *Economic Development and Cultural Change*, IV, No. 3 (April, 1956), pp. 236–52.
36. ———. "Some Spatial Aspects of Urban Growth in the United States," *Economic Development and Cultural Change*, IV, No. 4 (July, 1956), pp. 371–87.
37. ———. "Some Temporal Aspects of the Growth of Cities in the United States," *Economic Development and Cultural Change*, IV, No. 2 (January, 1958), pp. 143–70.
38. MARKER, GORDON. "Internal Migration and Economic Opportunity, France, 1872–1911." Unpublished Ph.D. dissertation, University of Pennsylvania, 1964.
39. MCDOUGALL, DUNCAN M. "Immigration into Canada, 1851–1920," *Canadian Journal of Economics and Political Science*, XXVII, No. 2 (May, 1961), pp. 162–75.
40. NORTH, DOUGLASS C. *The Economic Growth of the United States, 1790–1860*. Englewood Cliffs, N.J.: Prentice-Hall, 1961.
41. O'LEARY, P. J., and LEWIS, W. A. "Secular Swings in Production and Trade, 1870–1913," *Manchester School Econ. and Soc. Studies*, XXIII (May, 1955), 113–52.
42. ROSOVSKY, HENRY, and OHKAWA, KAZUSHI. "Economic Fluctuations in Pre-War Japan: A Preliminary Analysis of Cycles and Long Swings," *Hitotsubashi Journal of Economics*, III, No. 1 (October, 1962), pp. 10–33.
43. SCHMOOKLER, JACOB. "Economic Sources of Inventive Activity," *Journal of Economic History*, XXII, No. 1 (March, 1962), pp. 1–20.
44. SHINOHARA, MIYOHEI. "Growth and the Long Swing in the Japanese Economy," *Hitotsubashi Journal of Economics*, I (October, 1960), pp. 59–83.
45. SILBERLING, NORMAN J. *The Dynamics of Business*. New York: McGraw-Hill, 1943.
46. THOMAS BRINLEY. *Migration and Economic Growth*. Cambridge: Cambridge University Press, 1954.
47. ———. "Wales and the Atlantic Economy," *Scottish Journal of Political Economy*, VI (November, 1959), pp. 169–92.
48. THOMAS, DOROTHY S. "Age and Economic Differentials in Interstate Migration," *Population Index*, XXIV (October, 1958), pp. 313–24.
49. ———. "International Migration," *Population and World Politics*, ed. PHILIP M. HAUSER. Glencoe, Ill.: Free Press, 1958. Pp. 137–61.
50. ———. "Some Aspects of a Study of Population Redistribution in the United States, 1870–1950." United Nations, *Proceedings of the World Population Conference, Rome, 31 August—10 September, 1954. Papers*. New York: United Nations, 1956–1957. Volume II. Pp. 667–713.
51. ——— and ZACHARIAH, K. C. "Some Temporal Variations in Internal Migration and Economic Activity, United States, 1880–1950." (International Union for the Scientific Study of Population, Tome 1: *International Population Conference, New York, 1961.*) London, 1963. Pp. 525–32.
52. TIEBOUT, CHARLES M. *The Community Economic Base Study*. ("Supp. Paper No. 16.) NY: CED, 1962.

53. ULMER, MELVILLE J. *Capital in Transportation, Communication, and Public Utilities: Its Formation and Financing.* Princeton: Princeton University Press, 1960.

54. UNITED NATIONS DEPARTMENT OF SOCIAL AFFAIRS, *The Determinants and Consequences of Population Trends.* (Population Study No. 17.) New York: United Nations, 1953.

55. UNITED STATES BUREAU OF THE CENSUS, *Sixteenth Census of the United States: 1940. Population: Comparative Occupation Statistics for the United States, 1870 to 1940.* By ALBA M. EDWARDS. Washington: Government Printing Office, 1943.

56. WILKINSON, MAURICE. "The Economic Growth of Sweden in Light of the Long Swing Hypothesis." Ph.D. dissertation, Harvard University, 1965.

57. WILLIAMSON, JEFFREY G. *American Growth and the Balance of Payments, 1820–1913.* Chapel Hill: University of North Carolina Press, 1964.

58. ———. "Dollar Scarcity and Surplus in Historical Perspective," *American Economic Review,* LIII, No. 2 (May, 1963), pp. 519–29.