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THE LONG-TERM GROWTH OF NATIONAL INCOME IN GERMANY

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1. INTRODUCTORY NOTE ON THE DEVELOPMENT OF GERMAN INCOME STATISTICS

ANNUAL national income statistics have been incorporated in the official German statistical programme since 1928. Before that date no one in the Government had devoted attention to this task. Nor was there any private research institution, university, or professional association engaged in this field. Thus, prior to that time, there existed only some scattered overall estimates, produced by one author or another, frequently without thorough analysis of the subject. The estimate made by Helfferich for the year 1913 is particularly well known and often quoted.[1] It was supposed to be the most reliable estimate for the period before the First World War. Yet his estimate of 43 billion marks for 1913 was 14 per cent lower than the later estimates made by the Statistische Reichsamt on the basis of more thorough study. On the other hand estimates by G. Schmoller for 1895 and by R. E. May for 1895, 1900 and 1907 are in closer agreement with the estimates by the Statistische Reichsamt for these years.[2]

The Statistische Reichsamt remained for some time the only agency concerned with national income research. The Institut für Konjunkturforschung (now Deutsches Institut für Wirtschaftsforschung) in Berlin confined itself mainly to current estimates of labour income (wages of workers and salaries of employees and civil servants). Its estimates differed in part from those of the Reichsamt by showing wider cyclical response, particularly during expansions. The reason is probably that the Statistische Reichsamt computed wages and salaries according to a system based on obligatory social insurance contributions, while the Institut für Konjunkturforschung included sup-

[1] K. Helfferich, *Deutschlands Volkswohlstand 1888–1913*, Berlin, 1913, 4. Auflage, 1917.

[2] See Einzelschrift No. 24 zur Statistik des Deutschen Reichs: *Das Deutsche Volkseinkommen vor und nach dem Kriege*, issued by Statistisches Reichsamt, Berlin, 1932, p. 67.

plementary earnings in periods of boom which probably did not affect the total of contributions, and made small deductions for shorter working hours in depression times, again not reflected in the total of contributions. Since 1945 the Berlin Institut has been preparing also estimates of national income and product for the regions of Western and Eastern Berlin and the U.S.S.R. occupied zone. During 1936–44 the Reichswirtschaftskammer tried to establish some sort of national economic accounting. The results, however, were not printed and are barely known to the public. Its national product totals were frequently 5 to 10 per cent higher than those of the Statistische Reichsamt. The discrepancy was the result of conceptual and procedural differences.

Since mid-1948 gross national product for the Bundesrepublik (Western Germany) is estimated annually and semi-annually by the Statistische Bundesamt. The results are published currently in the review 'Wirtschaft und Statistik'.

II. TOTAL NATIONAL INCOME

National income is understood here as identical with net national product at factor cost. For certain differences regarding the treatment of the government sector, see the comments below on the method of estimation.

Table I offers a brief survey of the changes in money and real income since 1860. However, two large gaps break this ninety-year period, so that it has to be separated into three segments. For the First World War and the immediate post-war years, i.e. 1914–24, national income cannot be estimated since there exist practically no basic statistical data. Moreover, estimates for the immediate post-war years through 1923 would be largely unusable because of the catastrophic depreciation of the currency. Adequate statistical compilations of national income information become possible only for 1925 and subsequent years. The other gap caused by the Second World War is somewhat shorter. It covers the years 1942–48, for which no national income data could be procured because of lack of basic information.

It should be noted, furthermore, that – as can be seen from the three panel headings of the table – the figures given here do not refer to a constant area. For details on this point, see Section 2 (e) below.

1. *General comments on the method of estimation*

For the period before the First World War, only the national income figures for 1913 are based on thorough and detailed study. This study was initiated by the Statistische Reichsamt, in co-operation with the Commission for the Study of German Production and Market Conditions, in 1927. It took several years to complete.[1] Lack of data prevented an equally careful study for other pre-World War I years. In their earlier years, productions and sales statistics in Germany covered such a small part of the economy that it was impossible to use them as bases for national income estimates. It was therefore necessary to rely mainly on income tax figures. At that time, however, income tax was not imposed by the Reich but by the several Länder. The 'splintering' into twenty-six Länder or territories resulted in too many gaps and too many discrepancies in the data to permit estimates of reliable totals for the Reich for any extended period, particularly since in some Länder the income tax statistics began only a few years prior to the First World War. Similar shortcomings affect the scanty financial data and other statistical series of the period.

Estimates for 1925–41 were computed by an approach similar to that adopted for 1913, except that they were based on data of the new uniform Reich income tax. However, in 1931 income tax statistics covered only a small part of agricultural incomes, so that reliable figures on the total income of agriculture and forestry could not be obtained in this way. For this sector it was necessary to shift from income tax to production statistics based on the annual estimates of gross output in agriculture, made by the Institut für Konjunkturforschung.[2] The increasing availability of new statistical series afforded increasing opportunity to check larger parts of national income. From the beginning of the Second World War, however, the reliability of the estimates suffered again, because some data became inaccessible in consequence of security restrictions.

For the period prior to 1913 the Statistische Reichsamt estimated at least total income and per capita income for the years 1891–1912 by linking to total national income in 1913 estimates based on income tax data in Prussia and Saxony. This

[1] See the publication referred to in the footnote on page 79.

[2] For particulars on this matter see P. Jostock, *Die Berechnung des Volkseinkommens und ihr Erkenntniswert*, Stuttgart und Berlin, 1941, p. 54–9.

TABLE I

National Income of Germany, 1860–1952

Period	Income in Current Prices		Income in 1928 Prices		Implicit Price Index (3) : (1) × 100
	Total in Billion Marks	Per Capita in Marks	Total in Billion Marks	Per Capita in Marks	
	(1)	(2)	(3)	(4)	(5)
(a) *Territory of the German Reich before 1913*					
1. 1860–69	10.67	272	17.84	455	59.8
2. 1865–74	11.70	288	20.09	494	58.2
3. 1870–79	13.59	320	24.15	569	56.3
4. 1875–84	15.97	358	29.60	663	54.0
5. 1880–89	18.95	406	36.51	782	51.9
6. 1885–94	22.80	455	45.01	920	50.7
7. 1890–99	26.20	505	51.41	991	51.0
8. 1895–1904	29.80	536	56.43	1,015	52.8
9. 1900–09	35.41	592	62.91	1,051	56.3
10. 1905–14	43.11	662	70.18	1,096	61.4
(b) *Territory of the German Reich of 1925*					
11. 1913	45.70	766	69.30	1,162	66.0
12. 1925–34	60.88	950	67.17	1,049	90.6
13. 1930–39	62.76	945	74.17	1,117	84.6
14. 1925–27	64.34	1,024	68.29	1,112	94.2
15. 1927–29	74.36	1,169	74.39	1,170	100.0
16. 1929–31	67.84	1,079	70.30	1,094	96.5
17. 1931–33	49.44	762	60.13	928	82.2
18. 1933–35	52.55	798	65.84	999	79.8
19. 1935–37	65.96	979	78.94	1,172	73.6
20. 1937–39	81.64	1,191	94.71	1,382	86.2
21. 1939–41	93.31	1,337	104.99	1,504	88.9
(c) *Territory of the Bundesrepublik of 1950*					
22. 1936	37.70	985	45.50	1,182	83.0
23. 1949	63.20	1,303	46.10	951	137.1
24. 1950	71.70	1,479	55.60	1,147	129.0
25. 1951	90.20	1,876	65.00	1,341	138.8
26. 1952	98.40	2,029	69.60	1,436	141.4

Notes to Table I:
For 1860–1914 and 1925–39 annual averages for overlapping decades.
For 1925–41 also three-year averages.
For 1949–52 annual data.
Lines 1–6: Estimates based on geometric inter- and extrapolation (see text).
Lines 7–21: Based on estimates of the Statistische Reichsamt.
Lines 22–25: Based on estimates of the Statistische Bundesamt.
Cols. 1 and 2: Amounts for 1860–1914 in marks; for 1925–41 in reichsmarks, for 1949–52 in Deutsche marks.
Cols. 3 and 4: Income for all years in 1928 prices. Derived for 1860–1914 on the basis of the trend values of the wholesale price index of raw materials; for 1925–52 on the cost-of-living index.
Lines 18–21: From 1935, including the Saar.

series appears to be fairly reliable since 70 to 80 per cent of the estimates for Prussia and Saxony is directly covered by the income tax statistics, and since these two areas accounted for about 70 per cent of the total national income at that time. Furthermore, the series are in broad agreement with the scattered earlier estimates of individual scholars (Schmoller, May, Böhmert).

As a backward extension of the series of global estimates, we have attempted to derive totals of national income for the years 1860, 1870, 1877, 1883, and 1890, using estimates of value added in agriculture and industry – which had become available at a later date – as well as income tax statistics.[1] The resulting estimates are somewhat less reliable than those previously mentioned. No estimates of German national income are known for the time before 1860, except statements – relating to the Prussia of that time – by Leopold Krug for the beginning of the nineteenth century and by C. F. W. Dieterici for the middle of the nineteenth century.[2] Since these studies cover the subject incompletely and refer to parts of Germany alone, the comparability with later figures is grossly impaired. (At that time Prussia was much smaller than after 1866.)

Starting with nominal and real income for the five benchmark years between 1860 and 1890, we determined the value for the intermediate years by geometric inter- and extrapolation. We used the resulting logarithms to compute ten-year averages with five-year overlaps for the period of 1860–1913. Similarly, two ten-year geometric means were computed for the period 1925–39. It seemed advisable, however, to describe this short and extremely heterogeneous period in greater detail. For this reason we computed – with the help of logarithms – three-year averages from 1925–41 with a one-year overlap. For the period since 1949 only annual figures are shown, since it covers only a few years with a steep increase. Comparable data for the same territory are also shown for 1936.

For 1913 and all subsequent years it was possible to derive income in 1928 prices by deflating income in current prices by the cost-of-living index. For the period before 1913, no such index is available. It was therefore necessary to fall back on the

[1] For details on this matter see the Appendix.

[2] L. Krug, *Betrachtungen über den Nationalreichtum des Preussischen Staats und über den Wohlstand seiner Bewohner*, Berlin, 1805, 2 Bände; C. F. W. Dieterici, *Der Volkswohlstand im Preussischen Staate*, Berlin, 1946.

wholesale price index.[1] Since this index shows more marked cyclical fluctuations than a cost-of-living index, it seemed advisable to use not the index numbers themselves but the values of their second-degree trend. The resulting series of real income trends should be fairly representative, as can be shown by comparison with the corresponding trend values of prices for consumers' goods. Such a computation cannot adequately solve the problem and is no more than an expedient which has to be used in the absence of better methods. This has already been stated by Kuznets and we do not have to repeat it here.[2]

Because of the extrapolation method used, and of some confirmation provided by data on sectors of national product for some years, it is possible to regard the national income figures for 1891–1913 as nearly consistent with those for 1924–41. Figures for the period between 1860 and 1890 are approximately consistent with those for the later period. For 1949 and the following years, however, estimates were derived by an entirely different method.

After the Second World War it was impossible to use income tax statistics, since there were no such data available; as far as the Bundesgebiet is concerned they began to be collected in 1950 but have not yet been published. It was accordingly necessary to use the information provided by production statistics, which had expanded in the meantime, and thus to shift from the 'factor payment' to the 'net product' approach. It was still not possible to make direct estimates of current net product. Most estimates are still based on production statistics of 1936 and are carried forward on the basis of current production and price indices. These tentative estimates will be replaced by actual current observations only after the complete results of the 1950 Census become available.

The extent to which the change in method impairs comparability can be determined only when extensive income tax statistics become again available and the factor payment approach can be used as a cross check. It would seem, at first glance, that there may be a considerable difference, particularly

[1] The wholesale price index used is that computed by the Statistische Reichsamt and the Institut für Konjunkturforschung. See *Sonderhefte des Instituts fur Konjunkturforschung, No. 37*, A. Jacobs and H. Richter, *Die Grosshandelspreise in Deutschland von 1792 bis 1934*, Berlin, 1935, pp. 82–3.

[2] S. Kuznets, 'Long-Term Changes in the National Income of the United States of America since 1860', *Income and Wealth Series II*, Bowes & Bowes, pp. 44–7.

as far as the treatment of the Government sector is concerned. The Statistische Reichsamt attempted to classify total Government output into two groups: one group of services that could be regarded as cost of production, essential for the operation of the economy, and hence not part of net national product; and a second group of services that benefit consumers directly and must therefore be included in net national product.[1]

For this method detailed and continuous annual finance statistics are necessary. As these got worse in Germany since 1938 and progressively so as the war went on, the analysis of financial statistical data became more and more inaccurate. The treatment of rearmament expenditures which increased steeply after 1934 was particularly difficult. This problem could only be solved or avoided by considering the total increase of the military expenses as national production costs. The method in Germany has always remained a matter of dispute, and in other countries, except Sweden, it found no following. The German data of national income of the rearmament and wartime (till 1941) are, however, not too much impaired because the special addition on account of public expenditures on final product was held at approximately the same level every year.

After the Second World War this method could not be continued because of the lack of extensive finance statistics for the total Bundesrepublik. After 1948 the Government sector includes only the salaries of government employees, so that a relative downward bias results. However, the difference cannot yet be determined exactly. It is probably at least partially offset by the systematic overestimates of other items, particularly since the Statistische Reichsamt used to be very conservative and, in case of doubt, used the lower figure rather than the

[1] See the discussion in the Statistisches Reichsamt publication *Das deutsche Volkseinkommen vor und nach dem Kriege*, pp. 15 and 55–60; and P. Jostock, *Die Berechnung des Volkseinkommens und ihr Erkenntniswert*, pp. 80–7. Gerhard Colm was probably the first to suggest this method in the 1920s. Later he investigated the possibility of applying it to the data for the United States in his paper 'Public Revenue and Public Expenditure in National Income', *Studies in Income and Wealth, Vol. I*, National Bureau of Economic Research, 1937, pp. 173–227 and 240–8. S. Kuznets also argued that this method of treating public revenue and public expenditure in national income accounts would be the only satisfactory one, assuming of course that available statistics will suffice to segregate public revenue and public expenditure into two groups so as to narrow the range of arbitrary classifications. S. Kuznets, 'Government Product and National Income', *Income and Wealth Series I*, International Association for Research in Income and Wealth, Cambridge, 1951, pp. 178–244, especially 190 et seq.

higher one, so that their total estimates were generally rather too low than too high.

It is also inherent in the method of estimation that there exist no figures for gross national product for the period before 1936. Income tax statistics do not permit an estimate of these figures, and annual capital consumption or total depreciation has never been calculated by another method. If total consumption expenditures were known, as are those for gross capital formation for some years since 1925, it would have been possible to estimate private gross national expenditure (or gross national product) for these years. As it is, however, a comparison between gross national product and net national product is possible only for 1949–52. This comparison shows net national product consistently at about 78–80 per cent of gross national product.

2. *Biases of intertemporal comparisons caused by structural changes*

Certain institutional changes which characterize long periods restrict comparability, since these changes cannot – or can only partially – be measured quantitatively and since the data cannot be adjusted for them. Kuznets' remarks[1] concerning these problems in the United States apply more or less to Germany, too. In particular, the following changes may be pointed out:

(a) *Shifts between urban and rural population*

These shifts were similar to, in some respects even more pronounced than, those in the United States. In Germany in 1871, 37 per cent of the population was living in urban areas (communities with more than 2,000 inhabitants); in 1939, 70 per cent. During the same period the percentage of population in metropolitan areas (cities with more than 100,000 inhabitants) rose from 5 to 32. The share of cities with more than 500,000 inhabitants rose from 2.5 per cent in 1880 to 16 per cent in 1939. These changes imply a large increase in the division of labour and the substitution of market activities for production and services formerly performed within the household. The product of processes carried on in households is

[1] S. Kuznets, 'Long-Term Changes in the National Income of the United States of America since 1870', *Income and Wealth Series II*, pp. 35–47.

largely omitted from national income statistics. Thus, the gradual shift away from the household to the market causes an apparent increase in the national income – expressed in terms of money – with no (or at least a much smaller) corresponding increase in the economic product or in the supply of goods and services to consumers. In the period under consideration the expansion of market activities must have been more rapid in Germany than in the United States. This is suggested by the fact that in Germany commodity traffic increased twentyfold between 1860 and 1913, while in the United States, according to Snyder, a similar increase took one hundred years.[1]

(b) *Changes in the age distribution of the population*

The decrease in the birth rate, which became pronounced in Germany only after 1900, brought about a shift in the relative size of the unproductive part of the population (children and aged people) and the productive age groups. Between 1875 and 1939 the age groups under 20 years decreased from 44.2 to 32 per cent of the total population; age groups between 20 and 59 years of age increased from 48.1 to 55.7 per cent of the total; while old people (60 years and over) increased from 7.7 to 12.3 per cent. The result was a shift in the relation of equivalent consumer units to the total population from .75 in 1875 to .82 in 1939 – an upward shift of almost 10 per cent. The average number of people per household (family) dropped from 4.7 to 3.5 during the same period.

(c) *Expansion of unproductive activities*

Although nowadays nobody considers trade, transportation, and other services to be unproductive – a theory frequently advanced in earlier years – excessive pursuit of those occupations will not lead to a corresponding increase in wealth but must *to that extent* be considered an unproductive burden. It is obvious that these service occupations had to assume increased proportions because of the population shifts from rural to urban areas and because of the increased division of labour. However, a tendency toward exaggerated expansion develops easily in these fields. This is particularly true for an over-

[1] See R. Wagenführ, *Die Industriewirtschaft, Entwicklungstendenzen der deutschen und internationalen Industrieproduktion 1869–1932*, Sonderheft 31, Vierteljahrshefte zur Konjunkturforschung, Berlin, 1933, p. 10.

populated country like Germany: many who would normally have chosen otherwise crowd into service occupations of all kinds, causing an inflation of incomes earned in service industries. Since the percentage of people occupied in trade and transportation in Germany increased from 9.6 per cent in 1882 to 15.8 per cent in 1939, and the portion of those engaged in public and private services (excluding domestics) from 5.1 to 10.1 per cent in the same period, the conjecture that these occupations were over-expanded suggests itself. As a consequence of the two World Wars, people employed by the Government and in the administration of local communities increased rapidly. But even apart from this, organizational, administrative, distributive, and superintending services emerged that had never existed before. The increase of white collar work thus created is shown by the number of civil servants and employees whose share in the total number of gainfully employed increased from 7.4 to 20.4 per cent between 1882 and 1939. It is impossible to express quantitatively the amount of nominal increase in income not backed up by a real increase in wealth (no increment in goods and actually useful and productive services).

(d) *Rearmament and the production of war material*

Since there exist no German income statistics for the periods of the two World Wars and the years immediately following them (except for 1939–41) neither the war-time inflation nor the war production peaks can be observed. On the other hand, it must be pointed out that military rearmament before the Second World War began earlier in Germany than in the Western countries. This is strongly reflected only in figures after 1936, although rearmament dates back to 1934. Thus the increase in income since that time does not represent a gain in welfare as fully as would an increase of similar size without armament. The same considerations hold for income increases due to creation of salaried positions within the National Socialist Party and its subsidiary organizations – down to the compulsory labour service introduced by that régime preliminary to military training. The numerous salaries paid by these organizations increased nominal wage and salary income without increasing income or wealth in the economic sense. They constituted, at least in the majority of cases, pure parasitism.

The genuine economic contribution of the labour service was comparatively negligible.

(e) *Territorial changes*

Long-term income comparisons for Germany are handicapped by territorial changes more than those for any other country. Only the figures for 1860–1914 refer to a constant area.[1] Later data are based on a reduced territory. The First World War brought a loss of territory of a little more than 13 per cent with a loss of population of 8 per cent (cession of Alsace Lorraine, Eupen-Malmedy, North Schleswig, East Upper-Silesia, almost the entire province of Posen and West Prussia, the Memelland, and the independence of the Saar and Danzig). In the 1930s Germany's territory increased again, but the data used here refer to the 'old territory', that is, the area of the German Reich from the time after the First World War to 1937. The series for 1925–41 is thus consistent, except for the fact that the Saar (with more than 800,000 inhabitants) was included from 1935 onwards, without appropriate corrections for earlier years. Data for the years after the Second World War refer to the area of the West German Bundesrepublik (i.e. British, American, and French Occupational Zones). This area is 48 per cent smaller than the previously mentioned 'old Reich territory' and, in 1950, its population was 31 per cent smaller than that of the latter. On the whole the changes in comparability of total national income, relative to the pre-1914 period, can be described as follows. Figures refer to an area which decreased, relative to 1914:

1925–34 by 13.3 per cent
1935–41 by 13.0 per cent
1949–51 by 54.6 per cent

The loss of territory provides only an approximate description and is not an adequate measure of the break in comparability, since the population was less dense and the economic structure less advanced in the ceded territory than in the area of the present German Republic.

It is not feasible to eliminate these incomparabilities, or

[1] Except for the acquisition of the island Heligoland in 1890, but this can be neglected because there were only 2,000 inhabitants in a territory of 6 square kilometres.

circumvent them by estimating the earlier series for the area for the West German Bundesrepublik only. This would require much more accurate statistical information than is actually available for the early period. We therefore have to accept the fact that the estimates of totals for the three periods 1860–1914, 1925–41, and 1949–52 are not comparable and that a continuous comparison for the entire period 1860–1950 has to rely on per capita income figures.

3. *Aggregate national income*

The combination of big territorial changes with the two gaps in the data in 1914–24 and 1942–48 not only handicaps intertemporal comparisons, but also restricts the use of the entire series. If the area had remained the same, it might have been possible to bridge the gaps in some fashion in order to utilize the entire series from 1860 to 1952. As it is, the difficulties are so great that success would remain doubtful in any event and the accuracy of any findings would be indeterminate.

Thus, for the time being, long-term comparisons will have to be restricted to the period 1860–1914. This greatly shortens the period of investigation. And the twentieth century is almost entirely excluded if a series is desired that is smooth enough to permit the basic trend to stand out clearly. In addition, the shorter the graduated series the more difficult and uncertain is the determination of the secular trend. But this, in turn, implies that more weight has to be given to the structural changes described in the previous section. For their effect can be evaluated and isolated – at least conceptually – only if there is no doubt about the basic direction and the extent of the trend.

Table II presents changes in real income. Absolute changes in billions of marks are shown in the first column, percentage changes in the second column, and their geometric mean, over five periods, in the third column. In spite of the smoothing caused by the overlapping of the decades, column 2 still shows clear waves: an increase from 1869 to about the middle of the 1880s, which starts with a spurt and then continues in small steps in such a fashion that it might be assumed to have been caused by a sound economic development. As far as national product is concerned, this soundness undoubtedly existed – although it was not felt by the contemporary generation. The spurt at the beginning of the series was probably caused by the

boom after the victorious outcome of the war of 1870–71 and the establishment of the new empire (Gründerzeit). Towards the end of the 1880s there was a decline of the percentage increases which, shortly after 1900, was followed again by an upward movement. However, the percentage increases never reached more than half of the percentage increases of the earlier decades. Since the series stops in 1914, it is unfortunately impossible to determine how long the acceleration lasted and what the retardation that may have followed would have looked like.

The lower panel (b) of Table II, which shows the changes between three-year averages (with a one-year overlap) from 1925 to 1941 reflects more marked movements of the national product. It shows a drop in the depression years 1930–32 – a

TABLE II

Change in Real National Income at 1928 Prices

Period	In Billion Marks	Percentage Change	
		Per Period	Five-item Geometrical Mean
	(1)	(2)	(3)
(a) *Change per Quinquennium*			
1860–69 to 1865–74 . .	2.3	12.6	—
1865–74 to 1870–79 . .	3.1	20.2	—
1870–79 to 1875–84 . .	4.4	22.6	19.9
1875–84 to 1880–89 . .	6.8	23.4	20.4
1880–89 to 1885–94 . .	8.5	23.3	17.6
1885–94 to 1890–99 . .	6.4	14.2	15.4
1890–99 to 1895–1904 . .	5.0	9.8	13.4
1895–1904 to 1900–09 . .	6.5	11.5	(11.4)
1900–09 to 1905–14 . .	7.3	11.6	—
(1925–34 to 1930–39) . .	(7.0)	(10.4)	—
1860–69 to 1905–14 . .	5.7	16.0	—
(b) *Change per two-year period*			
1925–27 to 1927–29 . .	6.10	8.9	—
1927–29 to 1929–31 . .	−4.09	−5.5	—
1929–31 to 1931–33 . .	−10.17	−14.5	3.7
1931–33 to 1933–35 . .	5.71	9.5	5.9
1933–35 to 1935–37 . .	13.10	19.9	9.2
1935–37 to 1937–39 . .	15.77	20.0	—
1937–39 to 1939–41 . .	10.28	10.9	—

Col. 1: Based on Table 1, column 3.
Col. 3: For 1929–31 to 1935–37 arithmetic average because of the negative figures.

drop unprecedented in the earlier period – and then again a tremendous increase until about 1939. This expansion was largely due to armament activities, but its steepness can primarily be explained by the unusually deep trough of the preceding depression. Were it possible to continue the series of estimates by decades for the entire period 1914–50, the years of the 1930s would probably have presented a rather normal picture. This is indicated by the bracketed figures for the period 1925–39 – panel (a) of the table.

A series further smoothed with the help of a five-item geometric mean (column 3) can be computed only for about half the number of observations which are available for the United States. It therefore does not permit any far-reaching conclusions. Nevertheless, for the period before the First World War the same long-term tendencies are apparent in Germany as in the United States, i.e. a decline in the rate of increase from about 20 per cent to about 12–13 per cent. If the same period of time is considered in both countries, the retardation is more pronounced in Germany. This is not particularly surprising, since Germany did not have the same opportunities for extensive and intensive development of her economy, and thus the long-term growth of her national product had to be slower than in the United States. For this reason, and because of the abnormal situation in which Germany still finds herself due to the after-effects of the Second World War, it is not possible to draw any conclusions regarding the further development of the German national product. Especially the series in column 3 for the period 1925–41 cannot be taken as reflecting the long-term trend.

Since lack of data on consumption – except for the period after 1949 – prevents a discussion of the disposal of national income in Germany, it should be noted in passing that there were two periods, one after each World War in which parts of the German income were diverted abroad without return. After the First World War there were the reparation payments, which reached a peak in 1929 with an annual total of 2,500 million marks or about 3.3 per cent of the national income. (In the years before 1928 the percentage was probably higher, since national income was lower.) After the Second World War, amounts had to be raised for the occupation forces, which have lately been higher than 5 per cent of national income. Other

reparations (e.g. to Israel) should be added. On the other hand, Germany's own military expenditures were reduced or, after the Second World War, completely eliminated. Furthermore, one should note the large contributions in food and clothing with which other countries, primarily the U.S.A., rendered assistance to the German people in the aftermath of both World Wars. The value of these contributions is not exactly known but, of course, it is far lower than the tributes mentioned above.

III. PER CAPITA INCOME

1. *The growth of population and income*

Table III shows the development of the population and per capita income in ten-year averages (overlapping decades) for 1860–1914 and 1925–38, as well as annual data from 1949–51. The percentage changes (columns 2 and 5) cover quinquennial periods. Population figures were derived by geometric interpolation between quinquennial censuses.

The population increased rather steadily till 1914. With a few exceptions the rate of growth per quinquennium increased, so that, by the end of the period, it had almost doubled. Thus the course is entirely different from that of total national product (Table II, column 2) where the rate of growth increases at first, until about the middle of the eighties, but then decreases again to about one-half of the highest peak rate. On the average over the entire period, 1860–1914, the increase in the national product of 16 per cent per quinquennium was three times as high as the increase in population. In particular, it seems that the change in population led and the change in the national product lagged by about one-half to one full decade, as for example after 1880 (retardation) and also after 1890 (acceleration). In general there is a counter movement of the rates of change of the two series, which is also clearly apparent in the individual quinquennia.

Similar considerations hold also for the rates of growth of per capita income. The long waves of about twenty years are even more pronounced here than in total national product. The lag of income changes behind population changes is particularly striking. Another peculiarity becomes even more obvious, namely the complete change in the magnitude of the rate of growth of per capita income after 1890. The difference is so big that one is at first tempted to seek the reason in faulty data or

TABLE III

Population and Real Per Capita Income at 1928 Prices, 1860–1951

(Annual average for overlapping decades, 1949–51 annual data)

Period	Population (per cent)			Per Capita Income (per cent)		
	In Millions	Change per Quinquennium	Five-item Geometric Mean	Amount in Marks, 1928 Prices	Change per Quinquennium	Five-item Geometric Mean
	(1)	(2)	(3)	(4)	(5)	(6)
1860–69	39.2	—	—	455	—	—
1865–74	40.7	3.8	—	494	8.6	—
1870–79	42.4	4.2	—	569	15.2	—
1875–84	44.6	5.2	4.5	663	16.5	14.7
1880–89	46.7	4.7	5.0	782	18.0	14.4
1885–94	49.0	4.9	5.5	920	17.7	9.9
1890–99	51.9	5.9	5.9	991	7.7	7.3
1895–04	55.6	7.1	6.4	1,015	2.4	5.5
1900–09	59.8	7.6	—	1,051	3.6	—
1905–14	64.0	7.0	—	1,096	4.3	—
1860–69 to 1905–14	—	5.6	—	—	9.0	—
1925–34	64.1	—	—	1,049	—	—
1930–38	66.4	3.6	—	1,117	6.5	—
1936 .	39.4	—	—	1,182	—	—
1949 .	46.7	18.5	—	951	−19.5	—
1950 .	47.5	1.7	—	1,147	20.6	—
1951 .	48.1	1.3	—	1,341	16.9	—
1952 .	48.5	0.8	—	1,436	7.1	—

Col. 1: Population figures for all years based on official census and official intercensal estimates, taken from *Statisches Jahrbuch für das Deutsche Reich*, Part I.
Col. 4: Table I, column 3, divided by Table III, column 1.

in the incautious use of statistical methods. However, there are no grounds for this suspicion. Even though the figures for the period before 1890 are somewhat less precise than the later ones, it seems impossible – on the basis of the underlying material – that the essence of the growth pattern could be so misrepresented. But if the series is accepted as roughly correct, the large increase between 1870 and 1890 becomes all the more conspicuous, since these two decades are characterized by a downturn in the long cycle waves of the nineteenth century.

Thus, we would have expected a decline in the rate of growth of income.

In order to explain the course of the series, several circumstances have to be considered. The first of these is the exceptional position of the German economy after 1870. The political consolidation of the Länder to form the new Reich provided an extraordinary stimulus, and German industrial development speedily caught up with that in Western Europe. This is clearly shown, for example, in railway construction. In the decade from 1870 to 1880, its volume was about as high as the sum for the previous and the following decades. Reparation payments of 5,000 million gold francs paid by France constituted at that time an important addition to the supply of capital, which, soon and for many years, was reflected in increased income. On the other hand, prices decreased strongly between 1873 and 1887 (wholesale prices by about 40 per cent), while the following decades registered a strong continuous increase – with a minor interruption around the middle of the 1890s. As a consequence, those kinds of income that are not affected – or only partially affected – by price changes would, when translated into constant prices, rise rapidly during the first period and more slowly during the later years. If it is further noted that – according to Table III (column 2) – population grew faster after 1890 than before that time, the movement of per capita income appears less improbable, particularly since the rate of growth is computed in terms of consistently increasing base figures.

While total real income (in terms of 1928 purchasing power) quadrupled from the decade of 1860–69 to that of 1905–14, per capita real income increased to more than two and one-half times its former level. Its average increase was 9 per cent per quinquennium. It thus reached only two-thirds of the corresponding increase in the United States, which amounted to 13 per cent per quinquennium, for the period 1869–1913.[1] Even if we make a mental adjustment for the previously mentioned factors that distort the comparability and cannot be isolated, a sizable increase in per capita income remains.

The series for population increases, which was smoothed by the geometric mean, shows an almost perfectly uniform slow rise, while per capita income increases show a steep decrease which then becomes slower. Both series are too short, however,

[1] Computed from Kuznets, *op. cit.*, p. 55.

to permit any statement on the long-term trends over the entire period of 1860–1950.

The data available for the two inter-war decades indicate that the population increase decelerated and the increase of per capita income accelerated – at least at times. The rate of increase of 6.5 per cent (column 5) for 1930–38 seems to be well in line with the earlier segment which started to accelerate after 1900. However, one cannot actually relate it to this segment, since the gap between the two series is too big. Besides, this would imply a long upward wave of about forty years which, in the light of earlier experience, is improbable or at least very doubtful.

2. *Effect on purchasing power of income of population shifts to urban areas*

Extended time series on consumption expenditures are not available for Germany. The statistical coverage of the expenditure side of national income has been broadened only recently. It is therefore not possible to use per capita consumption to determine the effect on consumers' purchasing power of the rise in prices associated with shifts of population from the countryside to the cities. However, this can be reflected approximately by using per capita income.

Table IV contains the relevant material for the period 1871–1950. The data are based on a hypothetical computation which, however, comes fairly close to reality, even though size of city and price levels are obviously not highly correlated. It has been assumed that price levels in small towns are about 10 per cent above those in rural areas; in middle-sized towns, 20 per cent; in large cities, 30 per cent; and in cities with more than half a million inhabitants, 40 per cent. The adjustment for size of community (column 9) shows that, compared to 1925, the purchasing power of per capita income in 1871 was 8–9 per cent above its unadjusted value in 1928 prices. This difference shrank with the increase in the proportion of urban population. Moreover the difference between price levels in town and country is probably much smaller today than it was fifty to a hundred years ago. Various adjustments in consumers' habits, the increased use of branded goods, the improved transportation facilities of rural areas, and other factors suggest this trend. In any event, as can be seen in columns 7 and 8 and previous

TABLE IV

The Effect of Rural-Urban Movement of Population on the Purchasing Power of Per Capita Income

(Income in 1928 prices)

Year	Per Cent of Population in					Price Indices Reflecting Shifts (1925=100)	Per Capita Income	
	Rural Areas	Urban Areas, with a Population of					In 1928 (Prices in marks)	Adjusted for Col. 6 (Prices in marks)
		2–20 thousand	20–100 thousand	100–500 thousand	Over 500 thousand			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1871 . . .	63.9	23.6	7.7	2.8	2.0	92.2	494	535.8
1880 . . .	58.6	25.3	8.9	4.7	2.5	93.3	663	710.6
1890 . . .	53.0	25.1	9.8	8.9	3.2	94.8	920	970.5
1900 . . .	45.6	25.6	12.6	11.6	4.6	96.5	1,015	1,051.8
1910 . . .	40.0	25.3	13.4	12.4	8.9	98.3	1,101	1,120.0
1925 . . .	35.4	24.3	13.7	13.4	13.2	100.0	1,043	1,043.0
1939 . . .	30.1	24.6	13.7	15.2	16.4	101.7	1,490	1,465.1
1950 . . .	28.8	29.6	14.2	16.5	10.9	100.7	1,147	1,139.0

Cols. 1–5: Based on official population data. Rural areas include all communities with less than 2,000 inhabitants.
Col. 6: Derived by assuming that average price levels are in the following ratios for community groups: col. 1=1.00; col. 2=1.10; col. 3=1.20; col. 4=1.30; col. 5=1.40.
These five columns are weighted accordingly and reduced to 1925 as 100.
Col. 7: For 1871, 1880, 1890, and 1925 the average of that decade whose midpoint is closest to the respective year has been taken.
Col. 8: Col. 7 adjusted, divided by the index in col. 6.

ones, the temporal changes in income are not significantly affected by these differences in prices or purchasing power. The increase in real income between 1871 and 1950 was about 150 per cent if the urbanization of the population is not considered; if this urbanization is taken into account, the increase is still about 130 per cent.

3. *Value of the increase in leisure*

The efforts of generations brought about the decrease in average weekly working time to about forty-five to forty-eight hours. This, in a fashion, amounts to an increase in the life of the working man. However, a monetary evaluation of this increase in leisure is just as meaningful or meaningless as a computation of the value of a worker – be it by the addition of the costs of his education or by the capitalization of his output – and its inclusion in the sum of a nation's wealth. This has increasingly fallen in disuse. Still, in the demonstration of the increase in well-being over long periods of time, it may be of interest to convert the gains in leisure to monetary terms and to add them to other income in order to shed a light on this side of the productivity increase and to bring its full extent into focus.

It would, of course, be a hopeless task to try to determine the exact average weekly hours worked in all industries for each decade. These figures are not available even for factory workers, since there were no comprehensive inquiries on this subject during the nineteenth century. We therefore have to attempt to derive an over-all estimate mainly on the basis of indications available in sample studies for individual cities. The figures in column 1 of Table V can thus be regarded only as an approximate description of the order of magnitude. They are probably somewhat too low for the early decades, since they are based on larger cities alone and no adjustments were made for handicrafts, retail trade, homework, and agriculture.

To facilitate comparison, Kuznets' assumptions were used as a basis for the following columns (*op. cit.*, pp. 64 ff.), i.e. a maximum working week of seventy-eight hours from which the corresponding working time is subtracted in order to derive the number of leisure hours. These hours are related to the remaining total time per week (168 hours minus leisure hours) in column 4. The value of an hour of leisure is determined

TABLE V

Tentative Estimate of the Value of Leisure in Germany, 1870–1950

(Annual averages for overlapping decades at 1928 prices)

Decade or Year	Approx. Weekly Work Hours	Estimated Weekly Leisure Hours (78—Col. 1)	Per Cent Col. 2 of Col. 1 (per cent)	Col. 2 as Percentage of Committed Hours (of 168—Col. 2) (per cent)	Value of Leisure, National Income times 0.8		Value of Leisure in Per Cent of National Product	
					× Col. 3 (billion marks)	× Col. 4 (billion marks)	Based on Col. 5 (per cent)	Based on Col. 6 (per cent)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1870–79	64	14	22	9	4.5	1.7	18.6	7.0
1875–84	63	15	24	10	5.7	2.4	19.3	7.1
1880–89	61	17	28	11	8.2	3.2	22.5	8.8
1885–94	58	20	34	14	12.2	5.0	27.1	11.1
1890–99	57	21	37	14	15.2	5.8	29.6	11.3
1895–1904	57	21	37	14	16.7	6.3	29.6	11.2
1900–09	56	22	39	15	19.6	7.0	31.2	11.1
1905–14	56	22	39	15	21.9	8.4	31.2	12.0
1925–34	45	33	73	24	39.2	12.9	58.4	19.2
1930–38	44	34	77	25	45.7	14.8	61.6	20.0
1936	46	32	70	24	29.1	8.7	64.1	19.2
1949	47	31	66	23	24.3	8.5	52.7	18.4
1950	48	30	63	22	28.0	9.8	50.4	17.6

Col. 1: For 1870–1914 based primarily on estimates for the large cities of Berlin, Hamburg and Nürnberg as given in R. Kuczynski, *Arbeitslohn und Arbeitszeit in Europa und Amerika, 1870–1909* (Berlin, 1913) and several supplements to 1913. For 1925–32 estimates of Woytinsky, *Die Welt in Zahlen*, Vol. II (Berlin, 1926), pp. 270 ff. were used. For the period after 1932 data of the Statistische Reichsamt were taken from the *Statistische Jahrbuch*. For all other columns see text.

according to the product of an hour of work. It is possible to derive this value from the assumption that .8 of the national product – it might perhaps be possible to use .7 – can be attributed to labour. This amount is then multiplied by the figures in columns 3 or 4, according to whether it is desired to include only the pure labour hours or also the time used for eating, sleeping, etc., which is necessary for the regeneration of the capacity for work. In the first case estimates are about three times as high as in the latter case. Kuznets would prefer the higher estimates and gives reasons for the preference. The question remains, however, whether the addition of such large figures to the total national product will not lead to a meaningless illusion.

It is not possible to add the value of leisure to the value of total consumers' goods and services, since the latter are not available for Germany. In order to provide some kind of measure for its importance, columns 7 and 8 indicate the amounts of columns 5 and 6 in per cent of the national product. This percentage will have to be added if, for certain purposes, it is desired to include the increase in leisure hours quantitatively.

IV. NATIONAL INCOME PER GAINFULLY ENGAGED PERSON

The number of people in the labour force is known only for census years. German censuses were not taken regularly every ten years, but only in 1882, 1895, 1907, 1925, 1933, 1939, and then for the Bundesrepublik in 1950. In order to extend the series back at least by one more decade, estimates were made for the German Reich on the basis of the Prussian Census of Employment of 1871. This is fairly safe, since Prussia was about two-thirds of the Reich and since her economic structure was so similar to that of the Reich. In the present case a purely mechanical adjustment would, however, yield somewhat high estimates for the Reich, since Prussia, the centre of the mining and heavy industry areas, was, at that time, somewhat more industrialized than the Reich as a whole. In generalizing the Prussian data this was taken into consideration by deducting a certain allowance.

It would be tempting to derive a continuous series by geometric interpolation between the few available data. However, there are serious objections. The statistics in the individual

census years are not sufficiently comparable, particularly in the treatment of unpaid family workers who were quite important in agriculture and also in some other industries. In the 1882 census, only 1.7 million unpaid family workers were included, while there were between 5 and 6 million in the censuses from 1925 to 1939. On the basis of these figures, and in view of the fact that work within the family community was relatively more widespread in 1882, one would have expected an estimate of at least 3 million unpaid family workers in that year.

We will have to forgo an estimate of the average income per *employed* person, since no satisfactory estimates of unemployment are available for the census years before the First World War. Even for the later period, particularly for the depression years after 1930, the exact volume of unemployment cannot be given. Apart from the mass of registered unemployed, there was a so-called 'invisible' unemployment, the extent of which is a controversial issue, since it could never be investigated; at times it is supposed to have amounted to between one and two million people.

In general, the increase in the number of people in the labour force was greater than that of the population. The development was probably somewhat more uniform than it appears in Table VI, since the data are not fully adjusted for changes in the method of compilation. Furthermore, the estimate for 1933 suggests that the results of the census are also affected by general business conditions at the time. The preceding great depression apparently caused hundreds of thousands of people to regard themselves as outside of the labour force who would not have done so if the labour market had been more advantageous. Thus the labour force participation ratio declined somewhat in 1933 and increased again at the next census in 1939. The reason for the even larger decline in labour force participation ratio in 1950 is partly the influx of more than nine million refugees, a large part of whom could not yet be absorbed by the business community, so that the labour force did not increase in proportion to population increase. War losses, which principally occurred in the workers' age groups, are also reflected. Finally, there is the relative increase of aged people and persons receiving pensions, due to the naturally increasing age of the population.

The average real income per worker has more than doubled

between 1871 and 1895, but increased only very little from that date to 1907. One might be tempted to assume that this was caused by the reduced national product for the depression year 1907, which is not representative for the first decade of this century. However, the assumption is not correct, since 1906 and 1907 show greater increases in national income than all previous years since 1895. Thus, the fact that the average remains the same must be explained primarily by the absolute and relative increase of the labour force, by the increase in prices which leads to correspondingly lower real figures, and thus, in general, by a slowing down in growth of the economy.

TABLE VI

Labour Force and National Income per Gainfully Engaged Person (1928 Prices) in Germany, 1871–1950

(Data for census years)

Year	Labour Force		National Income per Gainfully Engaged Person (marks)	Index of Standard Hours per Week. 1925=100	National Income per Gainfully Engaged Person at Standard Hours	
	Number in Millions	In Per Cent of Population			Amount in Marks	1871=100
	(1)	(2)	(3)	(4)	(5)	(6)
1871	16.2	39.4	1,235	135.4	912	100
1882	18.8	43.8	1,729	130.4	1,326	145
1895	22.1	42.7	2,339	118.8	1,969	216
1907	28.1	45.5	2,370	116.7	2,031	223
1925	32.0	51.3	2,034	100.0	2,034	223
1933	32.3	49.5	1,851	89.6	2,066	227
1939	34.6	49.4	3,006	100.0	3,006	330
1950	22.1	46.5	2,516	100.0	2,516	276

Col. 1: Census results. Since no data for the German Reich are available for 1871, estimates are based on Prussia and adjusted for the territory of the Reich.

Col. 3: Real national income in 1928 prices for the mentioned years, which is here divided by the number of people in the labour force, amounts to:

Year:	1871	1882	1895	1907	1925	1933	1939	1950
Billion marks:	20.0	32.5	51.7	66.6	65.1	59.8	104.0	58.7

Col. 4: Based on Table V, col. 1.

Col. 5: Col. 3 divided by col. 4 times 100.

Line 1950: Data given only for the territory of the Bundesrepublik (Western Germany).

Income per worker about doubled between 1871 and 1907; it increased about two and one-half times by 1939 (1928 prices), although the after effects of the First World War led to a heavy

relapse. The following considerations show that this relapse affected the further development of national income decisively. In the fifty years before the First World War German industrial production increased at the same rate as world industrial production.[1] The following figures show how the situation changed after the First World War.

TABLE VII

Indices of Industrial Production

(1913=100)

Year	Germany	World
1860	14.1	14.1
1870	17.4	19.0
1880	24.8	25.6
1890	40.5	43.0
1900	64.5	60.3
1910	88.4	87.6
1913	100.0	100.0
1920	55.4	95.9
1925	82.6	119.8
1926	79.3	123.1
1927	100.0	129.8
1928	101.6	135.5
1929	102.5	145.5
1930	90.1	128.1
1931	73.6	111.6
1932	61.2	98.3
1933	69.4	110.7
1934	87.6	121.5

SOURCE: R. Wagenführ, *ibid.*, p. 56, for 1932-34 Konjunkturstatistisches Handbuch 1936, issued by E. Wagemann, p. 46. Base changed to 1913=100.

Thus, while the growth of German industrial production closely paralleled that of world industrial production from 1860 to 1913, it was considerably lower thereafter. The average rate of growth of industrial production for the world from 1913 to the peak years of 1927–29 was 2.1 per cent, that for Germany only .8 per cent according to Wagenführ.[2] The change is also clearly evident in the fact that after 1925 German industrial production no longer increased faster than national income – as it did before the First World War. German exports also suffered greatly and never again reached the volume of 1913.

[1] According to the study of R. Wagenführ, 'Die Industriewirtschaft. Entwicklungstendenzen der deutschen und internationalen Industrieproduktion 1860–1932', Sonderheft 31, *Vierteljahreshefte zur Konjunkturforschung*, Berlin, 1933, p. 18.

[2] *Ibid.*, p. 39.

The Second World War brought a similar setback. Its extent seems smaller, since the economy of the region of the West German Bundesrepublik was more highly developed than that of the former Reich area. Thus, comparability is impaired. If we neglect this fact for the moment, the final results show that in the middle of the twentieth century income per worker in Germany was only 12 per cent higher than at the beginning of the century, while in the United States it increased by about 70 per cent during the same period.[1]

If the change in working time is taken into consideration the development is a *little* more favourable. Average income per worker – computed for a constant work week – increases by 230 per cent between 1871 and 1939. From 1925 to 1939 the increase amounts to about 50 per cent; from the beginning of the century to 1950 it amounts to more than 30 per cent.

The relationship between the national product per worker and capital requirements cannot be established for Germany, since adequate statistics for the size of total capital are not available. This holds not only for total national wealth, but even for parts of it – such as commercial and industrial capital.

V. DISTRIBUTION OF THE NATIONAL PRODUCT BY INDUSTRIAL ORIGIN

Income tax data, which formed the basis for German national income estimates until 1941, do not permit a distribution of national product by industrial origin, since entrepreneurial income is distinguished between agricultural and non-agricultural industries only, and since non-agricultural industries include mining, manufacturing, construction, trade, transportation, banking, etc. Only corporate profits can be distributed in adequate detail. Besides, income tax data for salary and wage income are not broken down by industry at all, so that even a separation into agriculture and non-agricultural industries is impossible. Furthermore, salaries and wages of those employed by government and private institutions are combined. For these reasons a breakdown of national income by industry had to be foregone. It can be estimated only since 1949 for the Bundesrepublik – on the basis of the net product method now being used.

The first census of total industrial production, including

[1] Computed from the data given by Kuznets, *op. cit.*, p. 71.

reliable data on the net and gross product for all industry groups, was undertaken in 1936. Up to that time only selected sectors (mainly heavy industries and products subject to sales tax) were estimated. However, as soon as the results of the 1936 census were available, they were classified as secret material because of the Second World War. The computations of national income continued to be based on personal and corporate income tax (factor payment method). Also in the following years it was not possible to publish estimates based on the production census.

These facts explain why, in Table VIII, only the net products for agriculture and for industrial production are shown and everything else is included in a single total which, moreover, was obtained as a residual by subtracting the other two estimates from national income. Index numbers describing the development of physical volume of German industrial production were developed by the Deutsche Institut für Wirtschaftsforschung in Berlin for the years 1860–1913. The net product of industry and agriculture for the three years, 1860, 1890, and 1913, was also estimated.[1] On this basis, and with the help of the wholesale price index for industrial products, the net product in industry was estimated for all years between 1860 and 1913. The corresponding net product for the years 1925–32 could be taken from the *Konjunkturstatistische Handbuch* (2nd ed., 1936, p. 46) of the same institute. Estimates for the years 1933–38 are given in 'Die deutsche Industrie, Gesamtergebnisse der amtlichen Produktionsstatistik', *Schriften des Reichsamts fur wehrwirtschaftliche Planung*, No. 1 (Berlin, 1939), p. 38. Estimates for the net product of agriculture for the period 1924–38 are taken from the *Vierteljahreshefte zur Wirtschaftsforschung* of the Berlin Institute (13th year, 1938/39, p. 421). For selected years in the earlier period, the net product of agriculture was estimated on the basis of statistics on volume of production and prices. This made it possible to estimate – by geometric interpolation – the entire series for agriculture, too. Since ten-year averages with five-year overlaps were computed for both series, it is likely that errors that may have been caused by the various methods of estimating – particularly by the interpolation between distant years – are reduced to a minimum.

Unfortunately, it was not possible to break down the series

[1] See R. Wagenführ, *op. cit.*, pp. 7 and 58 ff.

TABLE VIII

National Income, by Industry

(in billions of marks, current prices)

Period	Net National Product Originating in						Total National Income
	Agriculture (excluding Forestry)		Industry[1] (excluding Handicrafts)		Other Sources		
	In Billion Marks	Per Cent of National Income	In Billion Marks	Per Cent of National Income	In Billion Marks	Per Cent of National Income	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) *Territory of the German Reich before 1913*							
1860–69 .	3.45	32.3	2.56	24.0	4.66	43.7	10.67
1865–74 .	3.53	30.2	3.64	31.1	4.53	38.7	11.70
1870–79 .	3.69	27.2	4.43	32.6	5.47	40.2	13.59
1875–84 .	3.88	24.3	4.26	26.7	7.83	49.0	15.97
1880–89 .	4.18	22.0	4.70	24.3	10.07	53.7	18.95
1885–94 .	4.46	19.6	5.71	25.0	12.63	55.4	22.80
1890–99 .	4.45	17.0	7.33	28.0	14.42	55.0	26.20
1895–1904	4.72	15.8	10.08	33.8	15.00	51.4	29.80
1900–09 .	6.25	17.6	13.39	37.8	15.77	44.6	35.41
1905–14 .	7.76	18.0	16.74	38.8	16.61	43.2	43.11
(b) *Territory of the German Reich of 1925*							
1925–34 .	8.15	13.4	25.54	42.0	27.19	44.6	60.88
1930–38 .	8.23	13.7	26.50	44.0	25.58	42.3	60.31
(c) *Territory of the Bundesrepublik of 1950*							
1936 .	4.70	12.5	16.00	41.4	17.00	45.1	37.70
1949 .	6.70	10.4	28.20	43.7	28.30	45.9	63.20
1950 .	8.10	11.0	33.70	45.9	29.90	43.1	71.70
1951 .	10.00	11.1	46.30	51.3	33.90	37.6	90.20
1952 .	10.70	10.9	50.00	50.8	37.70	38.3	98.40

SOURCE: See text.

[1] Including construction.

on total industry any further and to estimate some of the major sub-groups. For some parts of the economy, for instance the handicrafts, it was not even possible to make a reliable estimate of the net product for a single year, much less for a series of years.

Table VIII shows that the share of the agricultural net product in total national income decreased from 32 per cent in 1860 to about 10 at the present time. During the same period the share of industry increased from 24 to 50 per cent. This percentage increase seems rather high, particularly if it is

compared to the corresponding increase in the United States. It will therefore be necessary to check it in further studies. In the net product data an upward bias for the seventies is apparent which can be traced back to the business cycle peak after the war of 1870–71. It stands out very clearly in the percentage figures, which subsequently decreased strongly and did not reach their 1870 level again until the end of the century.

In 1860 agriculture (excluding forestry) still accounted for a larger share in total national income than industry (with a ratio of about 3 : 2). By about the middle of the seventies their share became approximately equal. From then on industry assumed a lead which soon became larger and continued to increase, so that, by 1913, its net product of 20 billion marks was more than twice that of agriculture (9 billion marks). The loss of large agricultural areas after the First World War shifted the ratio further in favour of industry. Because of the territorial losses after the Second World War, similar conditions prevail again – and to an even higher degree – in the present Bundesrepublik, where, in 1950, the net product of industry amounted to about four and one-half times that of agriculture.

The third group, net product from other sources, is composed of so many different parts that no specific statements can be made about it. The fact that its share in the total remained large throughout all the decades, and even increased towards the end of the nineteenth century, can be explained by the increase in trade and transportation, as well as by the growth of public services.

VI. DISTRIBUTION OF NATIONAL INCOME BY TYPE AND SIZE OF INCOME

1. *Income of entrepreneurs and income of employees*

A division between the income of entrepreneurs and of employees could be established back to 1895 only (for the period prior to 1913 primarily for a few census years only). In its early studies, the German Institut für Konjunkturforschung in Berlin published data of a similar nature, showing annual series for some of the bigger 'Länder': for Prussia from 1893 to 1913; for Saxony, 1879–1913; for Baden, 1885–1911.[1] But these data do not offer an exact or carefully executed segregation between the

[1] See *Vierteljahreshefte zur Konjunkturforschung*, Ergänzungshefte, 2d Jahrgang, Berlin, 1927; Ergänzungsheft 3, pp. 29–37.

income of entrepreneurs and that of employees but – as far as Saxony and Baden are concerned – merely provide an approximation to these two magnitudes. For Prussia not even that was done. Here the lower bracket income was merely separated from higher bracket income. All incomes between 900 and 3,000 marks were counted as labour income – thus including many independent farmers and unincorporated businessmen; in addition labour income also comprises the income from professional services which exceeded 3,000 marks. At first glance the figures reveal that while in industrialized Saxony labour income in 1913 was only about twice the size of entrepreneurial income, in the somewhat less industrialized Baden it amounted to more than double in 1911; in Prussia, however, where the industrialization was about equal to that of the average over the entire Reich, labour income amounted to abour four times entrepreneurial income. However, the subject of the estimate was differently defined in the three 'Länder' and we are therefore dealing with uncomparable data.

In contrast, the figures shown in our Table IX are derived by a consistent separation of labour and entrepreneurial income (with certain exceptions for the years before 1913). For the period after 1913 the data can be assembled from the national income statistics of the Statistische Reichsamt. It is merely necessary to consolidate a few items, i.e. to add employers' contribution to social insurance to salary and wage income, since these contributions actually form part of the compensation of employees. Similarly, undistributed corporate profits are added to income from industry and commerce, since they are a part of entrepreneurial income and belong predominantly to the industrial and commercial sector. Investment income, rents, interests, income of government enterprises and all other residual items are combined as 'Other Income'. Strictly speaking, pensions of civil servants should have been excluded from this category and added to wage and salary income, but the necessary data were not available for every year.

For the years 1895, 1900, and 1907 the studies of R. E. May[1] are used as a basis. However, his estimates could not be accepted at face value since some of them are obviously too high. This is

[1] R. E. May, 'Die Höhe des deutschen Volkseinkommens 1895, 1900 und 1907 so wie seine Gliederung nach Hauptberufsgruppen und Stellung im Beruf 1895 und 1907', *Schmollers Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft*, 1903, pp. 195 ff. and 889 ff., and 1909, pp. 1459 ff.

TABLE IX

Income of Entrepreneurs and Employers in Germany, 1895–1938

(in current prices)

Year	Income of Entrepreneurs			Salary and Wage Income of Employees	Other Income	Total Nat. Income
	From Agriculture and Forestry	From Industry Handicraft, Trade, Transportation and Professions	Total, Cols. 1 and 2			
	(1)	(2)	(3)	(4)	(5)	(6)
	(a) *In Billion Marks*					
1895	5.0	6.6	11.6	10.0	4.3	25.9
1900	5.3	7.6	12.9	12.4	5.6	30.9
1907	6.0	9.4	15.4	17.3	7.0	39.7
1913	6.5	11.2	17.7	23.3	9.1	50.1
1925	5.7	11.8	17.5	35.0	7.5	60.0
1932	3.9	5.6	9.5	27.4	8.3	45.2
1938	6.4	19.8	26.2	45.7	10.2	82.1
	(b) *In Per Cent of National Income*					
1895	19.3	25.5	44.8	38.6	16.6	100
1900	17.2	24.6	41.8	40.1	18.1	100
1907	15.1	23.7	38.8	43.6	17.6	100
1913	13.0	22.3	35.3	46.5	18.2	100
1925	9.5	19.7	29.2	58.3	12.5	100
1932	8.6	12.4	21.0	60.6	18.4	100
1938	7.8	24.1	31.9	55.7	12.4	100

Col. 2: Including undistributed corporate profits.
Col. 4: Including all contributions to social insurance (also those of employers).
Col. 5: 1895, 1900, and 1907 include income from domestic services; 1895–1938 include pensions of civil servants, since no separate data for these items are available.
For further explanation see text.

not surprising since his method of estimating is quite crude. May's estimates were used as rough bench marks only, which had to be corrected with the help of data on salaries and wages and income tax statistics. Thus, the estimates for those three years are not as reliable as those for later years. Still, they undoubtedly reflect the order of magnitude, and in this respect can be considered fairly comparable to the series from 1913 to 1938.

In interpreting the evidence, we must note that the series do not reflect a period of continuous development from 1895

to 1938. The after effects of the Firat World War produced two sources of discontinuity between 1913 and 1925. First of all, the area decreased by 13 per cent (loss of Alsace Lorraine, East Upper-Silesia, the Polish Corridor through Germany with Danzig, etc.). Then, the destruction of the currency in 1923, together with the change in political system (revolution of 1918) and the financial burdens of the war and of the peace treaty, brought about a sudden shift in the relationship in favour of the employed. This is apparent in their income, which increased from 23.3 billion marks in 1913 to 35 billion marks in 1925, or from 46.5 to 58.3 per cent of total national income. Corresponding decreases appear in the percentage figures for the other groups. The share of the entrepreneurs, which had been steadily decreasing since 1895 – in agriculture as well as in the non-agricultural industries – dropped even more during this period than before. As the share of the residual 'Other Income' decreased strongly, this can be explained primarily by the decrease in income from property caused by the destruction of investment funds by the inflation and by the freezing of residential rents.

Again, the year 1932, the trough of the great depression, constitutes an exception. Although it is of great interest as the lowest extreme, it is completely out of line. Income of entrepreneurs shrank to amounts that had not been experienced since the last century. Because of unemployment and the decrease in wages and salaries, the income of employees decreased by about one-fourth but its share of 60.5 per cent of total national income was higher than ever before. The reason for the increase in 'Other Income' in this depression year – even in absolute amounts – may be the stability of investment income, particularly residential rent, the institutional increase and pensions of civil servants, as well as the structural growth of the government sector. Primarily, however, the increase can be traced to a peculiarity in the method of estimating German national income at that time, that is, to the item 'taxes not included in private income' (reflecting services of government to individuals) which, paradoxically, was even higher in 1932 than in the following years of economic recovery. The high figures for unemployment compensation and benefits, however, do not cause the high level of other income, since these figures are not included in the national income totals but are counted as transfer payments; their inclusion would constitute

(Distribution of income recipients by size of income)

Year	Population (in thousands)	Number of Income Recipients in Income Size Classes							All Income Recipients
		to 900 Marks	900–3,000 Marks	3,000–6,000 Marks	6,000–9,600 Marks	9,600–28,800 Marks	28,800 – 96,000 Marks	96,000 Marks and over	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				(a) *Number of Income Recipients*					
1853	16,870	4,252,000	825,000	32,003	7,239	4,463	640	62	5,122,000
1863	18,504	4,778,000	924,000	45,548	10,800	7,140	1,145	120	5,766,000
1873	24,644	6,470,000	1,370,000	85,603	20,813	13,650	2,815	423	7,963,000
1882	26,820	7,300,000	1,500,000	131,310	27,958	19,580	3,403	434	8,983,000
1892	29,895	8,411,000	2,119,000	204,544	55,561	46,092	9,043	1,658	10,847,000
1902	34,551	8,285,000	3,310,000	291,341	77,636	64,737	13,205	2,762	12,045,000
1912	40,740	8,159,000	6,758,000	547,648	111,747	99,026	20,999	4,456	15,701,000
				(b) *Income Recipients per 1 Million Population*					
1853	—	252,045	48,903	1,897	429	265	38	4	303,616
1863	—	258,214	49,935	2,462	584	386	62	7	311,608
1873	—	262,539	55,592	3,474	845	554	114	17	323,121
1882	—	272,184	55,928	4,896	1,042	730	127	16	334,936
1892	—	281,351	70,881	6,842	1,859	1,542	303	56	362,837
1902	—	239,790	95,800	8,432	2,247	1,874	382	80	348,615
1912	—	200,270	165,881	13,443	2,743	2,431	515	109	385,395
				(c) *Income Recipients per 1 Million Population*, 1853=100					
1853	—	100	100	100	100	100	100	100	100
1863	—	102	102	130	136	146	163	175	103
1873	—	104	114	183	197	209	300	425	106
1882	—	108	114	258	343	276	334	400	110
1892	—	112	145	361	433	582	797	1,400	120
1902	—	95	196	445	524	707	1,005	2,000	115
1912	—	80	339	709	639	917	1,355	2,725	127

Notes to Table X:

Data for this table have been culled from the following sources:

Stenographische Berichte des Abgeordneten-Hauses, Anlagen, 1871–92;

Adolf Wagner, *Statistik des Volks-oder Nationaleinkommens und -vermogens, besonders mit Verwertung der Steuerstatistik*; *Internationales Statisches Institut*, IX, Tagung, Berlin, 1903, pp. 11 ff;

A. Friedemann, *Die Wohlstandsentwicklung in Preussen, Jahrbucher fur Nationaloekonomie und Statistik*, 103 Band, 1914, pp. 1 ff;

A. Soetbeer, *Umfang und Verteilung des Volkseinkommens im Preussischen Staat*, 1872–78, Leipzig, 1879;

K. Helfferich, *Deutschlands Volkswohlstand* 1888–1913, 4, Auflage, Berlin, 1914;

C. Heiss, *Die grossen Einkommen in Deutschland und ihre Zunahme in den letzten Jahrzehnten*, Diss., Berlin, 1893 (based on the study of C. F. W. Dieterici, *Der Volkswohlstand im Preussischen Staate*, Berlin, 1846).

double counting since contributions for social insurance are counted as parts of income.

The trend shown in columns 1–3 for the period before the First World War reflects increasing industrialization and the increase in the number of employed. This trend continued between the two World Wars, although it was less uniform and temporarily interrupted by recessions. The increase in the share of salaries and wages was stimulated also by the formation of large labour unions and their wage policies, particularly since the middle of the nineties. This influence is especially striking after the First World War: although, between 1913 and 1920, the daily working time dropped from about ten to about eight hours, employees' share of total national income increased by more than one-fifth.

2. *Size of income*

The distribution of national income by size can be determined only on the basis of income tax statistics. Thus, it can be shown only for the part of national income that is subject to income tax. The many small incomes which are entirely tax exempt can be estimated by ascribing to all working people an income just below the exemption limit.

Taxable incomes, too, have been covered incompletely because not everyone declared his income fully. Administrative orders, practice in assessments, and controls improved very much in the course of time, so that perhaps only 3 to 5 per cent of total taxable incomes escaped the tax in the German Reich. Evasion amounted to about 15–20 per cent in 1913 in Prussia, according to the statement of the German 'Enquete-Auschuss'[1] and was probably between 20 and 30 per cent in the last decades of the nineteenth century (some experts estimate even more).[2] The extent of evasion probably varied for small, medium and big incomes. On the other hand, since 1920 incomes of wages and salaries are covered much more exactly than before in Germany. To avoid any evasion now, before wages and salaries are paid to dependents, employers have to deduct income taxes and to forward them to the State. A correction cannot be made because

[1] See P. Jostock, 'Uber den Umfang des der Besteuerung entgehenden Einkommens. Ein Beitrag zur Volkseinkommensstatistik', *Weltwirtschaftliches Archiv*, 57 Band, 1943, S.27–80.

[2] See annotations to the table in *Statistisches Jahrbuch für das Deutsche Reich*, 59. Jahrgang, 1951/42, p. 606.

of lack of basic data. For that reason the amounts in Table XI are called uncorrected incomes (unberichtigte Einkommen). Moreover, smaller amounts such as the unassessed capital yields and certain tax exempt deductions for insurance premiums and professional expenditure of wage tax payers are lacking.[1] Nevertheless these figures should reflect the general features of the income pyramid.

Table X shows the development of the income distribution in Prussia from 1853 to 1912 for every tenth year. A similar presentation for the entire German Reich is not possible for the time before the First World War, because at that time there was no Reich income tax. The income tax laws of the various 'Länder' were so different and the resulting statistics and their treatment so heterogeneous that it is impossible to reconstruct the total development in the Reich. The Prussian data, however, can be regarded as nearly representative for the entire Reich, because Prussia (since 1867) included almost two-thirds of the Reich, and its economic and social structure was quite similar to that of the Reich.

As can be seen from the footnotes to the table, the data had to be culled from various sources and sometimes supplemented by estimates of small amounts. The following characteristics of the sources are particularly important. An assessment of individual incomes was not called for by law in Prussia before 1891. Before then the only range was grouping by income. Taxation committees knew the size of firms, their economic situation, etc.; they classified income recipients by income ranges; and they imposed appropriate taxes. In consequence of this method, statistical materials for the period before 1891 are less precise than those made in subsequent years. A statement listing only the number of income recipients, without any amount of incomes, may reveal a sufficiently credible picture of the general trend. Since Prussia increased appreciably in 1867 (after the war against Austria) – population by about 23 per cent, area by about 26 per cent – there are changes in the series associated with an exceptionally large increase in the base. In order to eliminate this incomparability, Part (b) of the table presents the data per million population. Part (c) converts the measures in Part (b) to indices, with 1853 as base.

[1] See annotations to the table in *Statistisches Jahrbuch für das Deutsche Reich*, 59. Jahrgang, 1941/42, p. 606.

A large proportion of the income recipients belong to the lowest bracket 'up to 900 marks'. Although their number decreased somewhat since 1892, as a consequence of shift to higher income size classes, in 1912 it still included more than half of all income recipients. All the same, their share decreased from 83 per cent in 1853 to 52 per cent in 1912, while that of the next highest bracket increased from 16 per cent to 43 per cent. This shift was, of course, partly determined by the movement of wages and prices and is to that extent only nominal.

By comparison with those in the lowest income group the number of recipients in the higher groups was very small. But its increase from decade to decade was much greater, the increase being the steeper the higher the income bracket. In general, the figures reflect an increase in the welfare of the broad classes of the population. Even more pronounced is the increase of the wealth of a small top layer, which is characteristic of prosperous industrial capitalism of the nineteenth century.

It is evident that in most income classes the increase was much smaller in the years between 1873 and 1882 than it was in the previous decade and also in the subsequent ones. This is due in only small part to the fact that the period is only nine instead of ten years. The reason is rather to be found in the extraordinary boom called the 'Gründerzeit' which reached its peak in 1873 following the victorious war of 1870/71 against France and the establishment of the new empire with the Hohenzollern. This prosperous period was followed by the collapse of many industrial enterprises, as a result of which quite a number of income recipients were shifted to lower income ranges. In many cases a recovery was not possible within a few years. So the highest income class, which in general experienced also the biggest increase, shows almost no increase between 1873 and 1882, but in the following decade, 1882–92, it shows an extraordinarily steep rise. In the adjacent income groups there were developments. In other income classes the rise was less retarded by the 1870 crisis. In 1853, 30.4 per cent of the population were income recipients, while in 1912, they accounted for 38.5 per cent. This increase also mirrors the progress of industrialization – i.e. increasing division of labour, shrinking of the household economy, penetration into the economy of the monetary system, shift from rural to urban areas, etc.

For the time being, Table X cannot be continued beyond 1912, because in 1920 the income tax schedules of the 'Länder' were replaced by those for the entire Reich, which were based on different income size classes. Splicing the old and the new income brackets would be possible only if the statistical material were available for both periods and if the income distribution were shown in sufficiently fine classes. Such material has been collected for selected years, but it has never been printed. At present, these data are not available for Germany or for Prussia.

In the inter-war period the Statistische Reichsamt estimated the income size distribution for a few years between 1926 and 1936 and compared it with 1913. These figures are shown in Table XI. The class intervals of the income schedule for 1913 have been set narrower than those for the post-war years, so that – considering the decrease in the value of the mark – the corresponding classes are roughly equivalent. As in Table X (only still more closely) the total number of income recipients corresponds to the number of persons in the labour force, excluding unpaid family workers, but including recipients of property income and rents. Two features of this table should be noted. The first is the shrinkage of the number of persons in the higher income brackets since 1913. This is mainly the result of the destruction of large fortunes by the currency debacle of 1923 and the loss of foreign investments after the First World War. Second, the percentage figures reveal that depressions (1926, 1932) cause a strong shift of the centre of gravity towards the lower levels of the income pyramid. No further conclusions of a general nature can be drawn until statistical information for a larger number of years becomes available.

The question whether and to what extent relative inequality in size of income has been changed cannot be answered by using the data of Tables X and XI. For this purpose it would be necessary to have another classification of income recipients and of the amount of their incomes. It could be done, perhaps, by breaking down all income recipients into three or four or any other number of equally numerous classes arranged from the lower to the higher (or in opposite order) with the amount of income for each class stated. Then we could see whether the corresponding classes account for the same shares of total income, or how their shares shifted in the course of time.

TABLE XI

Income Size Distribution in the German Reich[1]

Income Size Classes[2] in Current Prices		Number of Income Recipients						Amounts of Incomes (Uncorrected incomes)					
1913 (in marks)	Post-war Period (in Reichsmarks)	1913	1926	1928	1932	1934	1936	1913	1926	1928	1932	1934	1936
		In thousands						*In millions of marks resp. Reichsmarks*					
0 to 900	0 to 1,200	11,219	19,317	15,831	16,643	17,961	16,783	8,348	15,422	14,728	12,662	12,776	12,296
Above 900 „ 2,100	Above 1,200 „ 3,000	10,044	8,499	9,941	7,065	8,777	10,918	13,801	14,474	17,549	13,296	16,620	21,234
„ 2,100 „ 3,300	„ 3,000 „ 5,000	1,241	1,485	1,991	1,551	1,728	2,258	3,858	5,640	7,508	5,844	6,499	8,432
„ 3,300 „ 5,500	„ 5,000 „ 8,000	580	530	779	475	544	685	2,597	3,250	4,776	2,877	3,316	4,172
„ 5,500 „ 8,500	„ 8,000 „ 12,000	212	172	251	130	142	197	1,447	1,654	2,409	1,234	1,344	1,873
„ 8,500 „ 10,500	„ 12,000 „ 16,000	64	64	86	42	49	71	631	877	1,184	555	658	972
„ 10,500 „ 16,500	„ 16,000 „ 25,000	87	53	73	33	39	62	1,150	1,037	1,419	628	765	1,223
„ 16,500 „ 30,500	„ 25,000 „ 50,000	59	31	42	18	22	39	1,298	1,050	1,417	580	736	1,306
„ 30,500 „ 70,000	„ 50,000 „ 100,000	30	9	12	5	6	12	1,410	634	832	314	425	858
„ 70,000	„ 100,000	14	4	5	2	2	6	2,560	791	1,034	352	466	1,460
	Total . . .	23,550	30,164	29,011	25,964	29,270	31,031	37,100	44,829	52,856	38,342	43,605	53,826
		In per cent						*In per cent*					
0 to 900	0 to 1,200	47.64	64.04	54.57	64.10	61.36	54.08	22.50	34.40	27.86	33.02	29.30	22.84
Above 900 „ 2,100	Above 1,200 „ 3,000	42.65	28.18	34.27	27.21	29.99	35.19	37.20	32.29	33.20	34.68	38.12	39.45
„ 2,100 „ 3,300	„ 3,000 „ 5,000	5.27	4.92	6.86	5.97	5.90	7.28	10.40	12.58	14.20	15.24	14.90	15.67
„ 3,300 „ 5,500	„ 5,000 „ 8,000	2.46	1.76	2.69	1.83	1.86	2.21	7.00	7.25	9.04	7.50	7.60	7.75
„ 5,500 „ 8,500	„ 8,000 „ 12,000	0.90	0.57	0.86	0.50	0.48	0.63	3.90	3.69	4.56	3.22	3.08	3.48
„ 8,500 „ 10,500	„ 12,000 „ 16,000	0.27	0.21	0.30	0.16	0.17	0.23	1.70	1.96	2.24	1.45	1.51	1.81
„ 10,500 „ 16,500	„ 16,000 „ 25,000	0.37	0.18	0.25	0.13	0.13	0.20	3.10	2.31	2.68	1.64	1.75	2.27
„ 16,500 „ 30,500	„ 25,000 „ 50,000	0.25	0.10	0.14	0.07	0.08	0.12	3.50	2.34	2.69	1.51	1.69	2.43
„ 30,500 „ 70,000	„ 50,000 „ 100,000	0.13	0.03	0.04	0.02	0.02	0.04	3.80	1.41	1.57	0.82	0.98	1.59
„ 70,000	„ 100,000	0.06	0.01	0.02	0.01	0.01	0.02	6.90	1.77	1.96	0.92	1.07	2.71
	Total . . .	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SOURCE: *Statistisches Jahrbuch für das Deutsche Reich*

[1] 1936 including Saar.
[2] Because of the change in the value of the mark, the size groups before and after the war can be regarded as roughly equivalent.

Such a classification is not yet available in the German income tax statistics. If the detailed tables which the Statistische Reichsamt constructed in manuscript only were available for the different years it might be possible to use them for this purpose. The material is inaccessible nowadays. The printed tables, published in the *Statistische Jahrbücher des Deutschen Reiches*, combine too many groups together. Using the figures of Table XI only some vague suggestions can be made. In the lowest bracket about the same share, i.e. 22–23 per cent of the income falls in the year 1913 to 47.6 per cent and in 1936 to 54 per cent of the income recipients. To take another example, in 1928, 54 per cent of the lower income recipients claimed 27.9 per cent of the total income against 22.8 per cent only in 1936. Unfortunately there are no figures available for the subsequent years.

The groups with more than 3,000 Reichmarks (in 1913 more than 2,100 marks) which account for about 10 per cent of the income recipients, derived the following shares:

Year	Number of Income Recipients in Per Cent	Income Share in Per Cent of Total
1913 . .	9.81	40.30
1928 . .	11.16	38.94
1932 . .	8.69	32.30
1936 . .	11.73	38.71

The relative decrease of the share of income from 1913 to 1928 is mainly to be explained by the destruction of funds by the currency debacle of 1923, and perhaps by the effects of the social situation after the First World War. The year 1936 shows approximately the same proportion as 1928. There is no doubt that the share of the higher income classes has increased in subsequent years.

APPENDIX

SOURCES AND METHODS

1. *Estimates for 1860–90*

The averages of national income for overlapping decades for the period 1860–90 are based, with the exception of the values for the industry sector, on estimates for a few years. These estimates for the bench-mark years together with an indication of the more important estimating procedures are presented herein.

Net Value of Product in Billions of Marks

Year	Agriculture (excluding Forestry)	Industry (excluding Handicraft)	Other Sectors	Total National Income
1860 . .	3.4	2.2	4.4	10.1
1870 . .	3.5	3.0	5.0	11.5
1877 . .	3.8	3.8	7.4	15.0
1883 . .	4.0	4.6	8.9	17.5
1890 . .	5.1	6.9	12.0	24.0

(a) *Agriculture*

The values for 1860 and 1890 are estimates by the Institut für Konjunkturforschung in Berlin.[1] The methods underlying these estimates were described by the Institute in a later investigation and published, together with an index of volume of output for agriculture and industry for 1880–1913 and 1924–35.[2] The procedure involved first assembling the records of the output of all important plant and animal products into a volume index which, for the period prior to 1914, accounted for over 80 per cent of agricultural production. The several volume series were then weighted by the corresponding prices, at the farmer's door. The combination of these yielded an index of value of agricultural production which could be described as that of unduplicated gross value (since double counting, such as counting foodstuffs both as a plant product and in the value of cattle, was eliminated). Were one to subtract from this unduplicated gross value the cost of goods received by agriculture from other sectors of the economy (e.g. machinery or artificial fertilizers), the result would measure net value product of agriculture. However, the

[1] Cited by R. Wagenführ, 'Die Industriewirtschaft, Entwicklungstendenzen der deutschen und internationalen Industrieproduktion 1860–1932', *Vierteljahrshefte zur Konjunkturforschung*, Sonderheft 31, Berlin, 1933, p. 7.

[2] Entwicklung und Wandlung der Schguterprodiktion, *Viertehljahrshefte zur Konjunkturforschung*, 11 Jahrgang, Berlin, 1935, pp. 145–63.

measurement of the necessary deductions is extremely difficult, and cannot as yet be accomplished in a thorough fashion. It was possible to secure the result only by dint of a rough estimate of deductions at about 20 per cent of gross value. To the net value product so estimated, 10 per cent adjustment was added, to provide for a shift from prices at farmer's door to wholesale prices. Only thereby could market values set for agriculture be made comparable to those for industry.

Since the volume index covered only about 80 per cent of the commodity output, the estimates yielded by the procedure so far were still short of the total net value of agricultural production. In making the necessary adjustment reliance was placed on the estimate by Wagemann, which set the net value product of agriculture for 1913 at 9 billion marks.[1] With the help of the production index, the values for 1860 and 1890 could be derived from this basic figure for 1913. The net value for 1883 was calculated by the same method. For 1870 and 1877, however, the method could not be followed because no production index was available. Consequently, the values for these two years were secured by interpolation between those for 1860 and 1883; and one could rely here to some extent on partial data relating to crops, livestock, and prices. Since the difference in levels between 1860 and 1883 was relatively small, the error in such interpolation cannot be large; the limit could be set under 10 per cent.

(b) *Industry*

The Institut für Konjunkturforshung in Berlin calculated a volume index of output for German industry for all years from 1860 to 1913.[2] Using it and the indices of wholesale prices for 1860 and 1890, the Institut calculated a corresponding value index. By extrapolating backward the net value product of 1913, set by E. Wagemann[3] at 20 billion marks, we could estimate net value product for 1880 and 1890. In the same connection, I calculated a corresponding index for the whole series back to 1860 and thus derived the net value product of industry for all years between 1860 and 1913. This procedure is based upon the assumption that the ratio of net to gross value product, which was commonly taken to average 40 per cent, remained constant throughout the period. The extent to which the assumption is valid cannot be satisfactorily tested.

Since the net value products of 3.8 billion marks for 1877 and of 4.6 billion for 1883 may seem too low in view of the industrial upswing of the 1870s, the following might be noted. In the boom

[1] Wagemann, *Konjunkturlehre*, Berlin, 1928, p. 31.
[2] See R. Wagenführ, *op. cit.*, p. 58.
[3] *Op. cit.*, p. 31.

years after the war the values were much higher: 5.8 for 1872, 6.0 for 1873, and 5.1 for 1874. Then there was a further decline in net value product. With 3.8 billion in 1877, the lowest point was reached, followed by a slow rise. Only in 1889 was the earlier peak of 1873 (of 6.1 billion) reached again.

(c) *Other sectors*

Particular data for volumes and values were available only for the smaller parts of the area of coverage, and no adequately comprehensive estimates could be built up. Hence, an attempt was made first to estimate the total for 1890, as the difference between the net value product for agriculture and industry and total national income. For 1890, national income could be set at 24 billion marks, on the basis of the estimates of the Statistisches Reichsamt which reach back to 1891 and set the 1891 level at 24.6 billion.[1] Since 1890 was marked by a high level of economic activity followed by some recession, the total of 24 billion may seem a bit too low. But it should be noted that in many branches the rise did not cease until after 1890. This may be seen, e.g., in observing the output of coal,[2] also for railroad construction and railroad revenues,[3] and it is apparently true also for construction, since the value of insurance carried by public fire insurance companies rose more appreciably from 1890 to 1891 than in the preceding years.[4] It is also suggested by changes in the income tax data in Saxony.[5] The net value product of agriculture and industry accounts for one half of the national income for 1890, and the value product for all other sectors is 12 billion marks for the year. For 1883, 1877, 1870 and 1860, the necessary estimates had to be roughly approximated because the statistical data available for this period are exceedingly scanty; and reliance had to be placed on knowledge of general developments. Back to 1877 the estimates of national income totals could be supported by data from the income tax returns of Saxony. Since these data agree fairly well with those of Prussia for 1891–1913, at least in delineating the basic trends, one may consider them useful for the same purpose also for 1877–90, even though the area accounts for a relatively small fraction of the national income of the Reich.

[1] See 'Das Deutsch Einkommen vor und nach dem Kriege', *Einzelschriften zur Statistik des Deutschen Reichs, n.24*, Berlin, 1932.

[2] See R. Regul and K. G. Mahnke, 'Energiequellen der Welt, *Sonderheft 44 der Schriften des Instituts für Konjunkturforschung*, Berlin, 1937.

[3] Konjunkturschwankungen im Reichsbahnverkehr, *Sonderheft 38 des Instituts für Konjunkturforschung*, Berlin, 1936, pp. 7–8.

[4] *Reischstag, 12 Legislaturperiode, 1 Session, 1907–09, no. 1043. Materialien zur Beurteilung der Wohlstandsentwicklung Deutschlands im letzten Menschenalter*, p. 35.

[5] See 'Statisches Reichsamt', *op. cit.*, p. 31, and E. Fuhrman, *Das Volksvermogen and Volkseinkommen des Konigreichs Sachsen*, Leipzig, 1914, p. 50.

The share of the 'other sectors' may appear rather large in comparison with the net value product of agriculture and industry. But it should be noted that here are included the contributions of many important sectors of the economy, such as forestry, handicraft, trade, hotels, transport, banking, insurance, housing, service groups, public and government economy. If the increase from 1860 to 1890 is greater for this residual sector than for total national income – but not greater than in net value product of industry – the explanation may lie in the fact that several sectors, such as trade, transport, banking, housing and the like have undergone a marked secular expansion during the period. During these three decades, population grew from 37.6 to 49.2 million, and at the same time was shifting from the countryside to the cities so that by 1890 only 53 per cent of the population was living on land as compared with close on 70 per cent in 1860. This process, together with technological and economic development, resulted, among other things, in a rise from 1861 to 1895 of numbers engaged in trade and transport by about 166 per cent and in the public and private service pursuits by about 75 per cent, while the numbers in agriculture, industry and handicraft – all combined – rose by about 50 per cent at the outside (calculated on the basis of census of occupations and enterprises in Prussia adjusted to a constant area).

The net value product for the 'other sectors' was estimated for single years by interpolation between the bench-mark years along a straight logarithmic line. We did the same for agriculture, but there was some supporting evidence for 1880–90 in data on the volumes of production and course of wholesale prices. The net value product for industry was estimated for each year from the indices of volumes of output and of wholesale prices.

2. *National income estimates for 1890–1913 and 1925–41*

The calculations of the Statistische Reichsamt are basic here. Figures by years for 1891–1913 are published in *Einzelschrift no. 24* of the Statistische Reichsamt, Das Deutsche Volkseinkommen vor und nach dem Kriege, p. 32, particularly in values of the trend line of a second degree, p. 68. The trend values are to be preferred here, since the nominal values of national income are converted into real values (constant prices) by the use of trend values of the index of wholesale prices. For 1925–41 the national income estimates were taken from the statistical yearbooks of the Reich; and for 1949–52 from that of the Bundesrepublik for 1953. The same figures for 1891–1913 and 1925–41 were recently published by F. Grünig.[1]

[1] See his paper in Beiträge zur Empirischen Konjunkturforschung, *Festschrift zum 25-Jahrigen Bestehen des Deutschen Instituts für Wirtschaftsforschung*, Berlin, 1950, pp. 76–7.

For the period prior to the First World War, only the national income totals for 1913 were estimated in detail. The estimates for earlier years back to 1891 were extrapolated from 1913 on the basis of income tax data for Prussia and Saxony. The methods of estimation for 1913 and for the years beginning with 1925 are described in the *Einzelschrift no. 24* mentioned above. They are also discussed at length by P. Jostock, 'Die Berechnung des Volkseinkommens und ihre Erkenntniswert (*Schriften des Deutschen Wirtschaftswissenschaftlichen Gesellschaft, Band 7*, Stuttgart and Berlin, 1941, pp. 52–87). The same source indicates the changes in method made for the period from 1931 to 1941.

The Statistische Reichsamt used, for both 1913 and 1925–41, the so-called income tax method – in that taxable incomes provide the initial basis for the whole calculation. The items that were not covered in the income tax data had to be pieced out with the help of other data. In the course of time, the relative importance of items not estimated by the tax data grew because larger groups, such as most farmers, were freed from tax, or because the wages and salaries could be more completely estimated from social insurance data. Even of the property incomes (interest, rent) a substantial part was not covered in the tax data and the estimates had to be adjusted with the use of credit and other data. Similarly, undistributed profits of corporations and the net income of public enterprises had to be estimates separately; and so on for many smaller items. The least reliable figures were those for income covered but understated in tax returns; but even so it was possible to secure some reasonable approximation through intensive study. The allowance for this particular gap diminished because both the coverage of the tax and the controls widened with the passage of time.[1]

The methods of estimating wages and salaries from social insurance data are described in *Vierteljahrshefte zur Statistik des Deutschen Reichs*, 42 Jahrgang, 1933, Heft IV, pp. 112–20, and 43 Jahrgang, 1934, Heft III, pp. 69–77. The calculations are carried through separately for every social insurance district. In this fashion, it was possible to set different averages for the upper, open-end classes, in the wage and salary distributions – which yielded more reliable results than the use of a single class mean for the country as a whole. For the government sector precise and detailed data were available in Germany for 1913 and for the years beginning with 1925 – with continuous annual statistics gathered on both state and local finances.

[1] This is explored in P. Jostock, 'Uber dem Umfang des der Besteurung entgehenden Einkommens', *Weltwirtschaftliches Archiv*, 57 Band, 1943, pp. 27–80.