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Measuring trends and cycles in industrial production in Norway 1896-1948

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Measuring trends and cycles in industrial production in Norway 1896-1948 *

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Abstract

This paper presents new indices for industrial production in Norway covering the years 1896-1948. Separate annual and monthly indices of gross output and labour productivity are computed for 45 manufacturing and mining industries, using annually updated weights based on value added at factor cost. The new industrial production index shows somewhat stronger growth of output in the years before WWI and, in particular, in the 1930s, than the existing index published by Statistics Norway. The new monthly data set also provides a basis for identifying a business cycle chronology for Norway in the first half of the twentieth century.

Keywords: Industrial production, business cycles, labour productivity

JEL Classification: E32, N64, O47

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1 Introduction

The first part of the twentieth century represents the heydays of manufacturing industries in Norway. At the peak with respect to output share in 1948 the manufacturing and mining industries accounted for 29.2 per cent of gross domestic output.[1] It is a fact that time series on industrial production constitute a firm basis for measuring output trends and business cycles. The construction of indices of industrial production was therefore of prime interest when efforts to measure aggregate economic behaviour in a systematic manner commenced in the 1930s. Statistics Norway presented the first annual index of industrial production in 1931, which was extended back to 1909 a few years later. It was duly acknowledged that index numbers prior to 1927 were quite uncertain because there were few output figures available before the comprehensive annual production statistics was launched in that year.[2]

The problem of the lack of annual production data is still a major concern for all who endeavour to reconstruct historical time series of industrial output in Norway before 1927. The methods which can be employed to circumvent the problems will be extensively discussed below. There is still some uncertainty regarding the actual rate of progress of Norwegian manufacturing in the early years of expansion. This is no doubt in part due to data limitations and measurement problems. But even for later periods there are episodes in which different approaches to measuring industrial production yield somewhat different growth patterns. Among the most uncertain periods are the years until the end of World War I and its immediate aftermath, the mid 1920s and the recovery years after the great depression of the early 1930s. These issues do not only concern statisticians, but they are crucial to the discussion of some long-standing issues in Norwegian economic history, to which we return later.

This paper presents new annual time series on real output in 45 industries within manufacturing and mining from 1896 to 1948. The aim is to measure both trends and cycles in output as accurately as possible. When available, actual production figures for specific commodities have been used for this purpose. This applies both to the years prior to 1927, when no annual manufacturing statistics was published, but also to the following years. The archives of the original production returns handed in by the firms were scrutinized in order to extract more quantitative information on output and prices than was published by Statistics Norway.[3]

In order to increase the statistical basis for identifying the timing and amplitude of business cycles in Norway in this period an attempt is made to derive monthly estimates of output for each of the 45 industries. Using the annual output figures as benchmarks, monthly output data are estimated by using a number of monthly interpolators specific to each industry, largely based on labour market data and various production series. On the basis of these estimates it is feasible to construct a well-defined chronology of business cycles in Norway during this period.

We start out in section 2 by briefly reviewing the previous efforts that have been made by Statistics Norway and other researchers to construct annual indices of industrial production in Norway. In section 3 the principles underlying the new annual indices derived here are explained. In section 4 the performance of the new index is compared with existing indices at the aggregate level as well as for 13 industry groups. Time series of labour productivity are presented in section 5. Using the annual indices of the 45 industries as benchmarks monthly estimates of output have been constructed, which are presented in section 6. This material also forms the basis for

[1] Computed from Statistics Norway (1968, pp. 68-69). Note that all statistical publications from Statistics Norway can be found in digitalized form on the website *http://www.ssb.no/a/histstat/publikasjoner/*.

[2] *Statistiske Meddelelser*, 1931, pp. 184-186 and 1934, pp. 224-237. This source, which is extensively used in this study, was published monthly by Statistics Norway from 1882. The content included statistical time series and applied economic analyses of current problems.

[3] The source material for the two first years, 1927 and 1928, has been destroyed, but for later years it can be found in The National Archives of Norway (Riksarkivet) in Oslo.

the construction of a business cycle chronology for Norway for the first half of the twentieth century. A data appendix contains details about the construction of the new index and various tables showing the new index numbers.

2 Existing index numbers of industrial production 1896-1948

The production index compiled by Statistics Norway in 1934 covered the years 1909-1932.[4] Separate indices for 13 subsectors were calculated, weighted together to form an index for total manufacturing and mining, using nominal value added shares for 1927 as weights. This index was updated yearly with minor technical modifications through 1948, when a new industry classification was introduced. Value added weights were changed to 1935 and subsequently to 1938.[5]

This index is still the one that researchers are most likely to find when they search the publications of Statistics Norway for an industrial production index extending back to the early 1900s.[6] This is somewhat unfortunate because by the early 1950s Statistics Norway had duly acknowledged that this index had some obvious shortcomings. This concerned in particular the infrequent change of the basis year weights and the principle of computing a Laspeyres quantity index on the basis of a fixed set of representative goods only.[7] It also turned out that the assumed correction factors for productivity growth underlying some of the subindices based on hours worked were highly doubtful.

In the early post-WWII years Statistics Norway embarked on a comprehensive program to establish annual national account estimates for the Norwegian economy back to 1900, later extended to 1865. In this connection production figures for manufacturing and mining were thoroughly revised. No aggregate production estimates stemming from this project seems to have been published for the years prior to 1930, but annual index series for eight main industries for the period 1900-1950 can be found in Stoltz (1955, p. 195). These industries covered 84.1 per cent of the value added at factor cost in manufacturing and mining in 1927.

An attempt has been made to reconstruct an aggregate index on this basis by adding index numbers for the missing industries to the revised output estimates in Stoltz (1955). For this purpose index numbers for the five missing industries (clothing, leather and rubber, oils and fats, printing and bookbinding and gas supply) from the original production index published by Statistics Norway were employed.[8] This index will be referred to as SSB2; the original index as SSB1. The index numbers of the thirteen industries were weighted together following the principles underlying SSB1, using weights reflecting nominal value added at factor cost in 1927, 1935 and 1938.[9]

It should be noted, however, that this index is a hybrid measure, as the new series represent estimates of value added (gross domestic product) for the various industries, while the old data refer to production values (gross output), both measured in constant prices. The former measure differs from the latter by the subtraction of the costs of raw materials, fuel, energy and packaging materials from the value of production. The levels of the series are therefore quite different, but growth rates may still be fairly close. In practice Statistics Norway must also have considered

[4] *Statistiske Meddelelser*, 1934, pp. 224-237.

[5] In 1935 arithmetic averages of industry group indices were substituted for geometric averages.

[6] Statistics Norway (1978, p. 218).

[7] See *Norges Industri*, 1951, pp. 12-14 and Brenna (1951, pp. 51-53).

[8] A revised index along the same lines was presented by Venneslan (2008).

[9] Although this was not explicitly stated in the original index it was assumed that value added figures were net of excise taxes, i.e. at factor cost (subventions to industries were negligible before WWII). This essentially concerned the food industry. The same principle was followed by Statistics Norway in the calculation of the new production index after 1948 (see *Norges Industri*, 1951, p. 12).

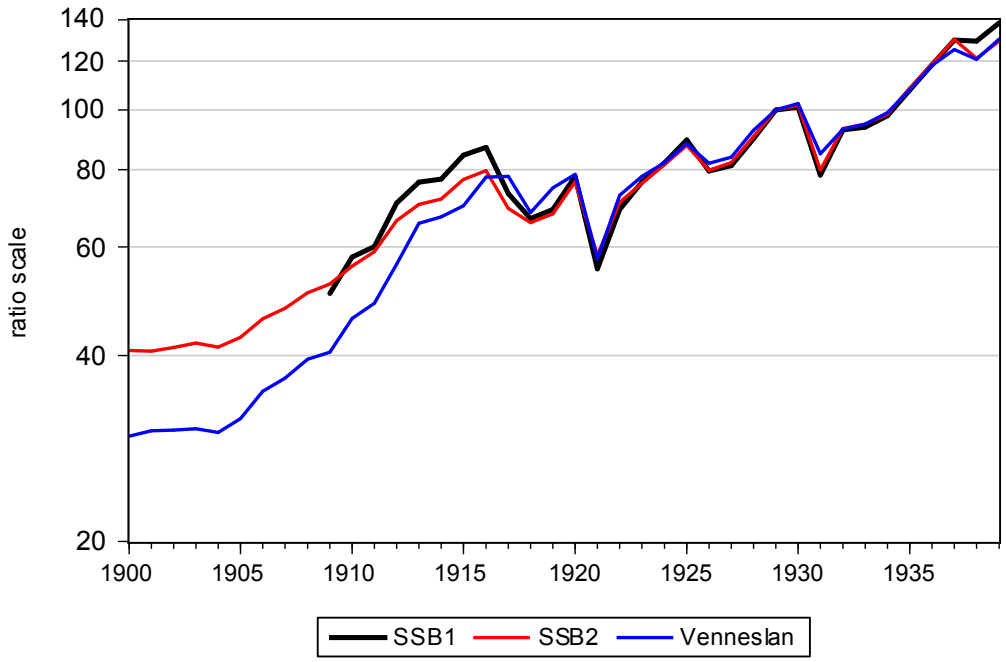

Figure 1: *Industrial production indices 1900 - 1939. 1929=100.*

these two output measures to give approximately the same growth pattern, because it was explicitly stated in Statistics Norway (1952, p. 280) that the figures for net domestic product in manufacturing 1930-1939 were set proportional to the old (SSB1) production index.[10] The production series from SSB1 used as supplements to the gross product estimates represented 15.9 per cent of value added in 1927; hence, SSB2 is basically on a gross product basis. It is nevertheless somewhat surprising to find that the manufacturing industries's contribution to GDP for the 1930s were partly based on the old gross output estimates that were known to have certain defects. The results of the new index calculations presented below may indicate that the growth rates of manufacturing output were biased downward in the 1930s. The two indices, SSB1 and SSB2, are shown in Figure 1. The mean growth rates computed over the 3-year periods are shown in Figure 2.

Also included in Figure 1 is an index based on the annual estimates of gross product recently derived by Venneslan (2007). A brief presentation of this study is given in Venneslan (2008). These estimates represent a major effort to quantify the production and employment growth of Norwegian manufacturing industries in the years 1896 to 1939. The data are presented on a very disaggregated level (51 industries). In order to derive annual production figures for the period before the annual production statistics commenced in 1927 time series on manufacturing production were extended back to 1896 and recalculated, using information from hours worked and energy installation as well as benchmark estimates from the Censuses of Production under-

[10]The data in Venneslan (2007) indicate that movements over time in gross product (value added) and production value follow much the same cycles, with slight deviations in trends. Between 1896 and 1939 the average annual growth rate of gross product according to Venneslan's estimates was 3.5 per cent, for gross output 3.9 per cent.

taken in 1909 and 1916.[11] Trend values were also adjusted in light of censuses of population and handicraft. The time series of aggregate gross product for manufacturing emanating from this work was published by Statistics Norway in 2008, which might suggest that these figures were considered to be an improvement over the existing estimates.[12] Further details of Venneslan's approach will be discussed below.

Turning to Figure 1 it will be seen that the three indices give the same broad picture of the long-run course of industrial production, but there are nevertheless significant differences during some periods, in particular before 1920. Venneslan (2008) claimed that the existing figures had overestimated the level of production in the year 1900, and that the reverse was true for 1910 and later benchmark years. This implied that output growth had been underestimated in the early years of the twentieth century. These discrepancies between the indices stand out more clearly in Figure 2, showing growth rates over three-year periods. There are also differences in the early 1920s, when in fact Venneslan's index is somewhat closer to the original index, SSB1, than to the revised index, SSB2. Finally, we note that Venneslan's index grows somewhat slower than the Statistics Norway indices in the final part of the 1930s, in particular relative to SSB1. Although relatively minor in a broader perspective, all these discrepancies are nevertheless of substantial interest with respect to discussions of the empirical record and the drivers of industrial growth in Norway in this period.[13]

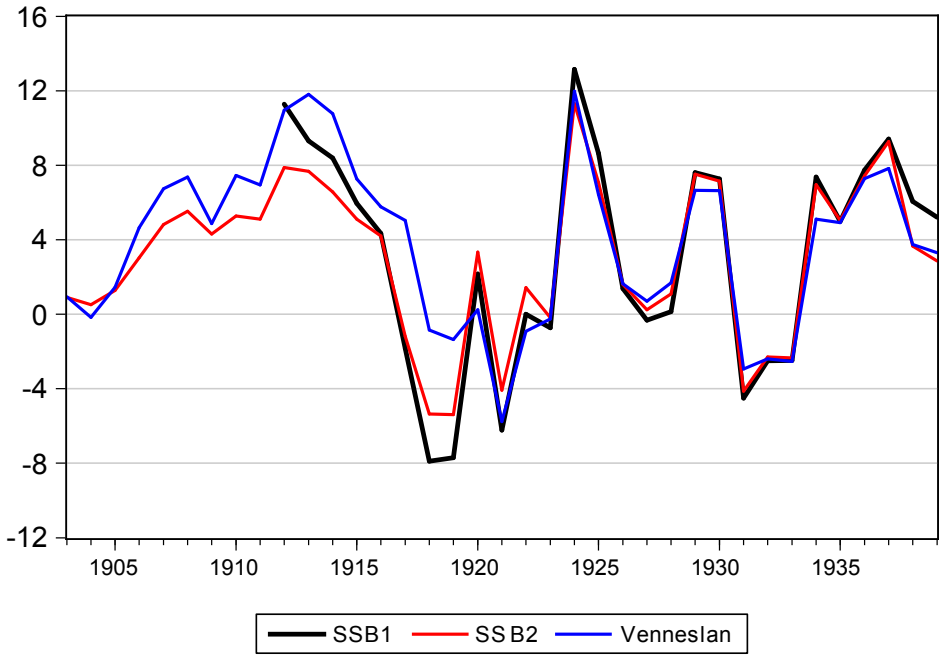

Figure 2: *Industrial production indices 1903 - 1939. 3-year average growth rates.*

[11]Statistics Norway (1915), Statistics Norway (1922).
[12]Statistics Norway (2008, p. 107).
[13]New time series for industrial production covering the interwar years were also published in Klovland (1997b), but these estimates are superseded by the new index calculations presented here.

3 A new gross output index for manufacturing and mining

This section presents the salient features that distinguish the new annual index numbers covering the years from 1896 to 1948 from the existing indices discussed above. The data series and further details on sources and estimation methods for the 45 industry groups can be found in the appendix.

3.1 Gross product vs. gross output

Within a national accounting framework value added is a key measure of production. This was the point of departure for the bulk of the material underlying the SSB2 index constructed by Statistics Norway in the early 1950s. Venneslan (2007) gives estimates of both gross output (production value) and gross product (value added) in constant prices, thus comprising both concepts. The new index presented here is based on estimates of gross output. There are several reasons for choosing this alternative, given that the perspective is confined to measuring trends and cycles in industrial output. Thus, the focus is on growth and cycles in the manufacturing and mining industries alone, rather than the absolute level of industrial production.

There are basically two reasons why gross output in constant prices provides a sharper and more consistent picture of the progress of manufacturing output in this case. In general, value added calculations necessitate the deflation of gross output as well as intermediate inputs, preferably by separate indices. Any errors in the price indices will often imply a relatively greater error in value added, which is the difference between the two items, than in gross output. This is the well-known pitfall inherent in the double deflation procedure.[14]

A second and even greater argument for focusing on gross output is the fact that, prior to 1927, there is virtually no exact information on which annual estimates of raw materials, fuel and energy input can be based. Such estimates must necessarily be founded on guesswork, possibly working from cost shares established on data series beginning 1927, which entails a considerable source of uncertainty. Many previous researchers have been facing this problem in the past and opted for similar ways out. Fabricant (1940, p. 33) noted that, for the United States, data on net physical output (value added) was not available for manufacturing industries, '[t]herefore we have followed what appeared to be the next best procedure: we have combined the indexes of gross physical output for individual industries, with value added as the weight, to measure the output of major groups and total manufacturing output.' This procedure is followed here. It may also be noted that with respect to productivity studies there are some benefits from using gross output rather than value added as the production measure, particularly at a disaggregated level.[15]

Because value added figures are needed as weights to construct the index numbers we do not escape the problem of estimating *nominal* value added for the years before 1927. This is done in a rather crude way as explained below.

3.2 Estimating gross output

There are two main sources for estimating gross output. Beginning 1927 the scope of the *Annual Manufacturing Statistics* (referred to as NI in the following) was greatly increased to include detailed information on quantities and nominal values of output and intermediate inputs in

[14] David (1962) provides a discussion of the sources of the 'potentially nasty index number problem raised by the residual deflation procedure'. Thomas and Feinstein (2004) address this issue with explicit reference to the construction of historical production indices for the UK. See also the discussion in Holmøy and Todsen (2007).

[15] See for example Cobbold (2003) for a general discussion. Statistics Norway has in recent years also employed gross output estimates for productivity assessments of manufacturing industries, cf. *Økonomiske Analyser*, no. 1/2009, p. 39, Statistics Norway, Oslo.

the various industries, thus giving figures for nominal gross output as well as value added.[16] Previously such information had not been collected, except for the two Censuses of Production undertaken in 1909 and 1916.[17] There are numerous problems, however, with the reconciliation of the two latter sources with the NI data from 1927 onwards with respect to coverage, industry classification and other measurement issues.

Before 1927 only man-hours for workers and salaried employees are available on an annual basis.[18] These figures originated from information collected by *Riksforsikringsanstalten (National Insurance Institution)*, starting with the year 1896. From 1921 Statistics Norway was given the task of preparing these data for publication. We refer to this data source as RTV data.

Beginning 1927 the basis for the gross output estimates at constant prices is in most cases the NI data. For metal mining, coal mining and basic metals annual issues of *Mining Statistics* were used. This source extends back to 1896 and beyond.[19] For many - but not all - industries unit price deflators with weights updated yearly can be derived from the published quantity and value information in the NI source. Gross output at constant prices was then computed by deflating nominal gross output by these indices. A similar procedure was followed by Venneslan (2007), but this was in fact not the way the original Statistics Norway index (SSB1) was computed. This index was constructed directly as a Laspeyres quantity index, using a fixed set of representative goods. With relatively infrequent changes in basis years this procedure cannot deal with the problem of new goods in a satisfactory way. As argued by Brenna (1951), this may impart a downward bias to the production index, because the output of new goods is often likely to increase faster than the goods included in the basis year basket. A more natural assumption is that the prices of the goods excluded from the representative basket follow the same course as those included. In their productivity studies undertaken in the 1950s and for the new production index covering the years after 1948 this principle was adopted by Statistics Norway.[20]

For several industries with a small number of firms detailed commodity data were not published due to secrecy requirements. For some of these industries unpublished annual summaries made by Statistics Norway were available in *Riksarkivet (National Archives of Norway)* for the years from 1929 onwards.[21] In several cases, however, these summaries were missing or incomplete. In order to extract the required data it was then necessary to turn to the original returns submitted by the firms.[22] In a few industries where unit prices of goods produced are very difficult to calculate, such as shipbuilding as well as printing and allied industries, nominal gross output was deflated by specific price indices of materials input and wages originating from these sectors.

The estimation of gross output before 1927 is tricky for most industries because of the lack of output data. The standard procedure, which seems to be the only way out in many cases, is to start with nominal output figures (Z_t) for 1909, 1916 and 1927 (the first two from the Censuses of Production 1909 and 1916), applying a deflator (P_t) to these figures to derive an estimate of real gross output $Y_t = (Z/P)_t$. Labour productivity $Q_t = (Y/L)_t$ is then computed by making

[16] *Norges Industri*, annually from 1927.

[17] Statistics Norway (1915), Statistics Norway (1922).

[18] After 1921 only the number (not man-hours) of salaried employees are available.

[19] *Norges Bergverk*, annually from 1866.

[20] *Norges Industri*, 1951, p. 14, Brenna (1951), Statistics Norway (1959).

[21] All source material for 1927 and 1928 appears to have been destroyed.

[22] The industries in question were chiefly: chemicals (matches and explosives, pharmaceuticals, electrochemicals, compressed gases and sundry other chemicals), basic metals (aluminium, ferro alloys), stone, clay and glass products (millstones, glass, china and pottery), leather (rubber products, leather belting), oils (hardened fats and vegetable oils). In an appendix to Venneslan (2007) quantity and value figures for goods produced are listed, but in many cases it seems that quantity figures have been derived by deflating value estimates by general wholesale price indices, not reflecting actual unit prices.

use of the annual data on man-hours (L_t). The mean growth rate of labour productivity g between the benchmark years, say 1916 and 1927, is computed as

$$g = (1/11) \cdot [lnQ_{1927} - lnQ_{1916}]$$

Using the estimated productivity growth rate and the annual industry specific series on man-hours, an annual output series is then derived for the years 1917 through 1927 (J=1 to 11) as

$$Y_{1916+J} = Y_{1916} \cdot [\exp(g)]^J \cdot L_{1916+J}$$

where the initial value, Y_{1916}, has been scaled so that the estimated output volume in 1927 equals the established index number for 1927.

Similar interpolations between 1909 and 1916 (or 1909 and 1927) can be made on the basis of the 1909 Census, but it is quite often the case that the quality of either the 1909 or the 1916 data is so poor that this information must be disregarded. Although the quality of the man-hours data are generally good, this method involves the heroic assumption that labour productivity develops smoothly between the benchmark years, which, of course, is not likely to be strictly true. It is often the case that the non-comparability of the Census data of 1909 and 1916 with the NI-data and the lack of suitable deflators create considerable problems. Although the 1916 Census data conform somewhat better to the NI data base than the 1909 Census, the extreme inflationary environment of the year 1916, when the annual inflation rate was about 40 per cent, creates additional uncertainty regarding the construction of price deflators as well as questioning the accuracy of price information given in the sources of the Census of Production.

Extending the output series backwards beyond 1909 requires an assumption that later productivity trends apply to the early years as well, which is of course even more doubtful. But in the absence of direct output data this is the only way out, and variants of this procedure have been extensively used by Statistics Norway and Venneslan (2007). Venneslan seemed to base his estimates largely on this method, but making an attempt to bring total factor productivity considerations into the interpolation procedure. In view of the incompleteness of the capital stock data - installed horse power is used as a proxy - as well as the limited capital stock of these industries in the early years, it is difficult to assess whether this feature is an improvement upon the use of man-hours as interpolators.

In the new index actual industry output figures, when they exist, have everywhere been substituted for the interpolation method based on man-hours. It turns out that fairly complete data do exist for some industries, mostly back to the early 1900s, and sometimes back to 1896. This applies to such goods as beer, spirits, margarine, cement, pulp and paper and electrochemicals (Norsk Hydro). Other cases, which are based on less complete or indirect data sources, include saw-mills, gas supply, slaughtering, dairying and canning of fish, the latter estimated from the volume of brisling (sprat) and small herring delivered to canning factories. Some of these sources were used by Statistics Norway in the construction of the gross product data for the national accounts project and are thus reflected in the SSB2 index.[23]

As a necessary supplement to unit price deflators all indices have made use of the existing wholesale price indices, which are reasonably good after World War I.[24] In the new index the extensive price data underlying the construction of new monthly price indices for Norway from 1777 to 1920 presented in Klovland (2013) and Klovland (2014) have been used, which is likely to be an improvement, in particular for the years before 1920.

[23] A detailed description of estimation procedures can be found in Statistics Norway (1953).

[24] The indices compiled by Farmand, Økonomisk Revue and Statisitcs Norway are tabulated in Statistics Norway (1949).

3.3 The weighting procedure

There is a long tradition for using nominal value added as weights with respect to aggregating the production series of individual industries to broader aggregates. This principle, which at an early stage was established practice internationally, if followed here and was also applied by Statistics Norway to its first production index in the 1930s.[25] The issue of whether value added should be evaluated at market prices or at factor cost (market values adjusted for excise taxes and subventions) was addressed explicitly by Statistic Norway in the early 1950s. The new production index beginning 1949 reflects the latter principle; presumably this was also the case in preceding years.[26] The discrepancies between market values and factor cost mainly concern the manufacturing industries producing beer, spirits, tobacco and chocolate, in which taxes roughly accounted for 40 to 60 per cent of value added at market prices. Separate estimates of excise taxes for these industries were found in *Norges Industri*, and for years prior to 1927, in various Parliamentary Papers.

The aggregation procedure followed here weighs together the annual output (Y) relatives in each industry, $b_{it} = Y_{it}/Y_{i,t-1}$, by nominal value added shares $V_{i,t-1}$ to calculate an aggregate quantity relative for year t

$$b_t = \sum_{i=1}^{N} b_{it} V_{i,t-1}$$

The index value in period t, X_t, is then chained to the previous period's value by calculating

$$X_t = b_t \cdot X_{t-1}$$

and rebasing the index sequence to equal 100 in a base year. The choice of base year is in a sense arbitrary; here, 1929 is chosen, which is a year of relatively high capacity utilization, without too many distortions caused by labour disputes.

A principle of frequently updated weights is in line with modern theory of index numbers.[27] The new index differs from the existing indices compiled by Statistics Norway covering this period by updating the value added weights each year. The problems caused by using the same weights for a number of years were in fact repeatedly voiced as a concern by Statistics Norway. In *Norges Industri*, 1950, p.15, it is explicitly stated that the use of a Laspeyres quantity index should have been accompanied by frequent changes of weights, but this was not done due to the wartime disruptions.

As explained above, direct estimates of value added cannot be made prior to 1927. Looking at the available value added figures by industry, it turns out that the ratio of nominal value added to nominal gross output varied quite a lot between the individual industries, but this ratio was confined to a relatively narrow range over time within a particular industry. It was therefore decided to use the average ratios of value added to gross output for each of the 45 industries in the years 1927-1930 to derive a crude approximation for the years before 1927. Nominal gross output were calculated by applying specific price indices to the real output series underlying the index numbers, linking these estimates to 1927 figures on nominal gross output from *Norges Industri*. To the extent that the price and quantity estimates of gross output are reasonably correct, the resulting figures for *relative* value added should be acceptable for our purpose.

[25] For the practice followed in the United States, see Fabricant (1940) and Frickey (1947).

[26] This was changed in 1961, when gross product at market prices were substituted for value added at factor cost as weights. This had the slightly unfortunate consequence of producing a negative weight for one particular industry (dairying and milk products). See Statistics Norway (1979) and *Statistiske Meddelelser 1965, no. 6.*

[27] Diewert (1987).

3.4 The definition of manufacturing

The reliability and accuracy of the annual manufacturing statistics starting in 1927 (NI) is judged to be very good. Statistics Norway devoted much resources to the collection of the incoming returns, performing detailed consistency checks on the data supplied by the individual firms. However, the NI data did not cover all firms, generally excluding those with less than five workers (12,000 man-hours per year). The data based on the files of the National Insurance Institution, had a wider coverage, however. This source (RTV) comprised all establishments using mechanical or electrical power, irrespective of the size of the work force.[28] The ratio of man-hours from the two sources was often used as a measure of the coverage of the NI data for a particular industry. In most industry groups this ratio was well above 90 per cent, but for a few groups with a great number of very small firms, such as sawmills, it was lower.[29]

The coverage ratio of man-hours for individual industry groups, as defined above, remained fairly invariant over the years for most groups, but the aggregate ratio showed a slight tendency to decline throughout the 1930s, from 93.0 per cent in 1930 to 91.8 per cent in 1938, and further to 90.2 per cent in 1947. This development indicates that the output shares of small establishments increased over time, which calls for an upward adjustment to NI figures. The fact that the ratio increased slightly in the first three years 1927 - 1929, however, was to some extent considered to be due to a more efficient collection of returns from small establishments.[30] These facts speak in favour of adjusting the NI data to reflect the more consistent coverage of the RTV data. Man-hours of workers and an estimate of hours worked by salaried employees were collected at the most detailed industry level each year and production figures for each industry were multiplied by these RTV/NI ratios.[31] The assumption underlying this procedure is strictly that that output per man-hour is the same in small and large establishments, which is not the case if economies of scale exist. On the other hand, it might be the case that worker effort, adding that of the owner, is greater in the very small firms. This assumption, if not being correct, will only impart a notable bias to the estimates to the extent that the coverage ratios for man-hours vary much over time, which is generally not believed to be the case. It should also be borne in mind that the adjustment ratios for most industries range are small, ranging between 1.0 and 1.1.

Benchmarking the output series to the RTV data thus ensures a more consistent definition of manufacturing over the period considered here. However, making the inclusion of establishments contingent on the use of mechanical or electrical power does not take into account the fact that, particularly in the early years, goods were also being produced outside the manufacturing industry as defined here. This applied in particular to industries such as clothing and footwear, in which the use of machinery might be very limited at the turn of the century. Because the fraction of firms using mechanical power increased over time, conducive to these firms being included in the RTV statistics, growth rates of output will be biased upwards in these industries in the early years of the sample. Information from the decadal Census of Population and a Census of Crafts undertaken in 1910 might have been employed in order to make adjustments for the fraction of output emanating from handicrafts, but such additions must in any case rest on a quite uncertain basis. The information in such sources may be rather vague concerning for example the issue of full-time versus part-time employment. Such corrections must surely be made within a national accounts framework, which comprises production from all sources,

[28] See for example Statistics Norway (1978, pp. 189-191) for a brief discussion of these sources. A more detailed analysis is given in the preface to the annual issues of the NI statistics (*Norges Industri*).

[29] Sawmills had only a coverage ratio of 74.3 per cent in 1929; other groups falling below 90 per cent in 1929 were oils and fats (86.7) and printing and allied industries (87.5).

[30] *Norges Industri*, 1929, p. 3.

[31] Ratios had to be linearly interpolated over the years 1931 - 1933 because the RTV statistics was not published in these years.

handicraft as well as manufacturing. For the index presented here, which is explicitly defined with reference to the basis of output originating from manufacturing establishments, it was decided to make no such adjustments.

3.5 The coverage of industries

The new index comprises some industries that were not included in SSB2 until the 1950s. These are dairying, bakeries, slaughtering and coal mining, which accounted for 5.2 per cent of value added of the new index in 1929. With respect to comparisons with the gross output data in Venneslan (2007) the new index comprises metal mining, coal mining and gasworks, which were not included in Venneslan's work. These industries accounted for 4.6 per cent of value added in 1929. This fact must be born in mind when comparing the new index with the indices compiled by Statistics Norway and Venneslan (2007).

4 A comparison of index numbers

In this section the new index is compared to the two Statistics Norway vintages, SSB1 and SSB2, described above, and the new data series provided by Venneslan (2007). In the latter case the simple sum time series of gross output in constant prices will be used.[32] All indices are set equal to 100 in 1929.

4.1 The aggregate indices

The new index is shown in Figure 3 together with SSB2 and Venneslan's gross output figures. At first glance the impression is largely one of congruence. This is hardly unexpected, given the fact that industrial output increased by a factor of five to six between 1896 and 1939, and a further increase was recorded from 1939 to 1948. The differences during some periods are, however, not inconsiderable, and may give rise to varying interpretations.

To help zooming in on the details of differing trends cyclical movements annual index numbers and growth rates are listed in Table 1.

Table 1: **Industrial production indices 1896 - 1948.**

Year	Index numbers			Growth rates		
	SSB2	Venneslan	New index	SSB2	Venneslan	New index
1896	NA	27.2	25.8	NA	NA	NA
1897	NA	29.6	29.2	NA	8.4	12.3
1898	NA	31.9	32.3	NA	7.6	10.2
1899	NA	33.9	34.8	NA	6.0	7.5
1900	40.8	34.4	35.6	NA	1.4	2.4
1901	40.6	34.8	36.1	-0.3	1.1	1.4
1902	41.2	34.6	36.2	1.4	-0.6	0.0
1903	41.9	34.9	36.5	1.6	1.1	0.8
1904	41.3	34.0	37.4	-1.5	-2.7	2.6
1905	42.8	35.5	38.7	3.7	4.3	3.2

[32] Annual data for the years 1896 - 1939 were extracted from an appendix volume to Venneslan (2007).

Table 1: **Industrial production indices 1896 - 1948.**

Year	Index numbers			Growth rates		
	SSB2	Venneslan	New index	SSB2	Venneslan	New index
1906	45.9	39.3	42.4	6.9	10.1	9.2
1907	47.7	41.6	44.9	3.8	5.8	5.6
1908	50.5	44.3	46.9	5.8	6.2	4.4
1909	52.2	45.9	47.9	3.3	3.7	2.2
1910	55.9	50.2	52.4	6.8	8.8	9.0
1911	58.9	51.7	55.0	5.3	3.0	4.9
1912	66.1	57.7	63.2	11.6	10.9	13.9
1913	70.3	63.9	68.4	6.1	10.2	7.8
1914	71.7	64.3	70.7	2.0	0.6	3.4
1915	77.1	66.9	74.1	7.2	4.1	4.7
1916	79.7	72.5	78.4	3.4	7.9	5.6
1917	69.2	72.8	70.1	-14.2	0.5	-11.2
1918	65.7	63.4	65.0	-5.3	-13.9	-7.5
1919	67.8	69.5	67.0	3.3	9.2	3.0
1920	76.5	72.4	71.7	12.0	4.0	6.7
1921	58.1	53.5	52.5	-27.5	-30.1	-31.0
1922	70.8	69.6	66.1	19.8	26.2	23.0
1923	76.1	75.1	71.6	7.2	7.7	7.9
1924	81.5	81.3	76.7	6.9	7.9	6.9
1925	87.6	87.0	82.3	7.1	6.8	7.1
1926	79.8	81.8	75.2	-9.2	-6.2	-9.0
1927	82.1	84.8	78.1	2.8	3.6	3.7
1928	90.5	91.9	86.6	9.7	8.0	10.3
1929	100.0	100.0	100.0	10.0	8.4	14.4
1930	101.8	103.2	100.3	1.7	3.1	0.3
1931	79.9	84.9	80.0	-24.2	-19.5	-22.5
1932	93.3	97.9	92.6	15.5	14.3	14.6
1933	94.9	98.8	93.4	1.6	0.9	0.9
1934	98.5	102.6	100.1	3.7	3.7	6.9
1935	108.5	111.3	110.3	9.7	8.1	9.7
1936	118.6	120.2	121.5	8.8	7.8	9.6
1937	130.0	127.9	132.8	9.2	6.2	8.9
1938	121.2	123.8	131.2	-7.1	-3.3	-1.2
1939	129.2	134.7	140.4	6.4	8.5	6.8
1940	111.5	NA	120.3	-14.8	NA	-15.5
1941	107.9	NA	114.9	-3.2	NA	-4.6
1942	98.2	NA	103.3	-9.4	NA	-10.6
1943	93.9	NA	98.9	-4.5	NA	-4.4
1944	76.3	NA	92.8	-20.7	NA	-6.4
1945	67.3	NA	81.1	-12.5	NA	-13.4
1946	115.3	NA	130.2	53.8	NA	47.2
1947	136.8	NA	156.6	17.0	NA	18.5
1948	152.9	NA	173.9	11.2	NA	10.5

The new index shows higher growth rates than the Venneslan index before 1900, but there-

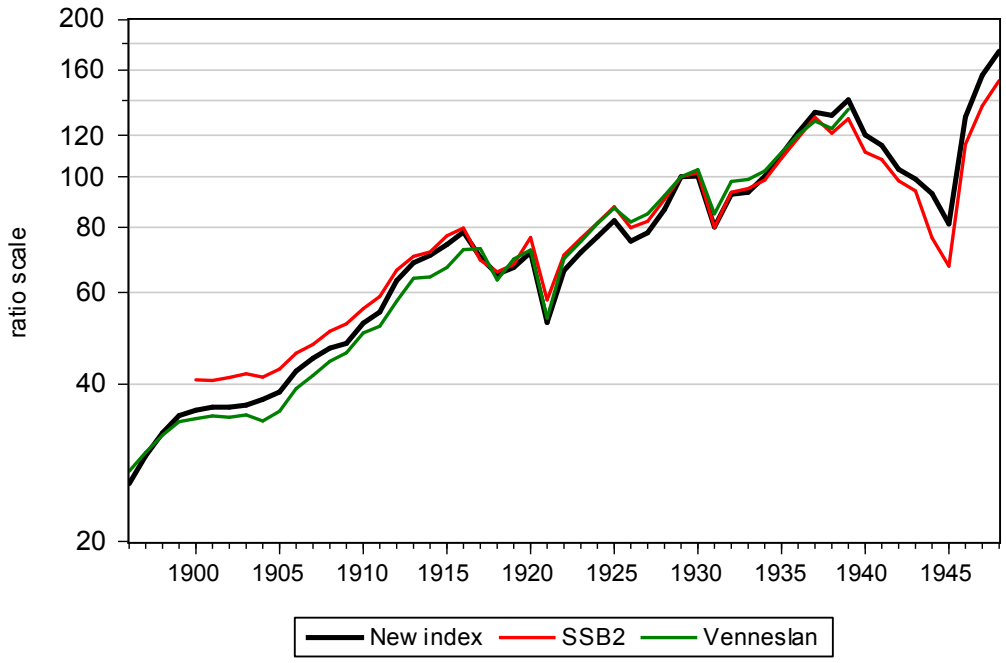

Figure 3: *Industrial production indices 1896 - 1948. 1929=100.*

after the course of the two indices is very similar up to 1910. This supports Venneslan's claim that Statistic Norway's index numbers may have underestimated growth rates in this decade. A comparison with the SSB2 index is evidence of this. All three indices grow fast from 1910 to 1916, which is the peak year according to SSB2 and the new index. Both SSB2 and the new index fall by more than 10 per cent in 1917, but Venneslan's index is 0.5 per cent higher in 1917 than in 1916. This is rather strange in view of the mounting trade disruptions with foreign countries, affecting both supplies of raw materials and sales of final products in the final years of WWI. The year 1917 also saw a ten per cent reduction in standard working hours from 10 to 9 hours per day, reducing the number of man-hours per year from 3000 to 2700.[33] Beginning 1916 the cyclical fluctuations of the new index tend to be somewhat closer to SSB2 than to Venneslan's index. The correlation coefficient of annual growth rates 1917 - 1929 between SSB2 and Venneslan's index is 0.893; between SSB2 and the new index the correlation is 0.982. This fact might perhaps be attributed to more use of direct output figures and less reliance on interpolations based on hours worked in the latter two indices than in Vennslan's data.

The cyclical pattern is much the same in all three indices in the 1920s and the 1930s, but there are some features which warrant a few comments. The new index follows a slightly lower path through the 1920s up to 1928 (1929=100), after being approximately equal to SSB2 in the years 1917 - 1919. This may be of some interest in consideration of the sharply increased unemployment numbers beginning in 1921 which characterized the whole of the 1920s. The business cycle expansion in 1928 - 1929 is stronger in the new index, with a flatter peak in

[33]In the early years, when the primary information in the RTV source is partly in terms of man-years rather than man-hours, all index calculations follow the standard assumption of 3000 man-hours per year through 1916, 2700 man-hours per year in the years 1917-1919, and 2400 thereafter. This convention was first adopted by Statistics Norway, see e.g. *Norges Industri*, 1922, p.

1929 - 1930 than in either of the two other indices. The effects of the great depression on industrial production in Norway is very similar, in particular comparing SSB2 with the new index. A noteworthy feature is a stronger rebound of the new index, with a notably higher growth rate in 1934 and a smaller decline in 1938 than in SSB2. The average annual growth rate (continuously compounded) of SSB2 between 1929 and 1939 is 2.56 per cent, in the new index the corresponding figure is 3.38 per cent. Because index calculations represented in SSB2 were used by Statistics Norway in computing the gross product of manufacturing and mining for the 1930s this implies that the these industries' contribution to the growth in gross domestic product is underestimated by about 0.8 per cent per year in the 1930s.[34] This is noteworthy in view of the debate on the sources and strength of the recovery of the Norwegian manufacturing sector in the 1930s.

The movements of the new index and SSB2 from 1939 through WWII are quite parallel except that the new index records a much smaller decline in output in 1944, which is only marginally compensated for by a stronger reduction in 1945. The recovery in 1946 - 1948 is slightly smaller in the new index, but the overall picture is not much changed.

After WWII Statistics Norway was concerned about the fact that the aggregate production index might be somewhat misleading because it was still calculated on the basis of 1938 value added weights.[35] According to the new estimates presented here this concern was not wholly unwarranted, although essentially most relevant for the years 1944 - 1946. The fact that labour productivity in several manufacturing industries was very slow to regain its prewar level was an issue that was often brought into focus in the early postwar years.[36] The new index alleviates this problem slightly by raising the growth rate of output from 1938 to 1948 from about 26 per cent to 30 per cent. See section 5 below for a more detailed review of the productivity development.

4.2 Comparisons for individual industries

We now turn to a comparison of the results for the major industry groups, for which Statistics Norway has published separate indices. As for the aggregate indices the Venneslan's index numbers are computed from his gross output estimates at constant prices. The new group indices are aggregated from the individual industry indices shown in Appendix Table A1, using annually updated value added weights as explained above. These time series are reproduced in Appendix Table A2. The graphs also show the SSB1 index, but note that in many cases this index is identical to SSB2 beginning 1927 or 1930, so that the curve is no longer visible in the graph.

[34] A numerically similar result was reported by Klovland (1997b,a). The new index differs somewhat from the one presented in that source with respect to technical details relating to the index number construction, weighting and coverage.

[35] *Norges Industri*, 1950, p.5.

[36] *Økonomisk Utstyn*, 1950, p. 143; Brenna (1951).

Foods, beverages and tobacco

Foodstuffs, beverages and tobacco represent the largest group of industries in terms of value added. In 1929 they accounted for 23.4 of value added. The indices shown in Figure 4 present a fairly coherent picture until 1929, but thereafter the level of the three indices diverge. (SSB2 equals SSB1 after 1929.) The new index comprises several food industries that were only included by Statistics Norway in the 1950s (dairies, bakeries, slaughterhouses), which may account for some of the difference. Dairies, in particular, increased their output in the 1930s; in 1939 the index number had increased to 275.4 (1929=100). Other expanding industries were chocolate factories (174.2 in 1939) and grain mills (153.2).

The Venneslan data show the highest growth rates in the 1930s. His gross output figures were based on market prices, not factor cost. In the new index gross output as well as value added weights are calculated at factor cost. For this industry in particular this makes a difference in nominal terms. The increase in excise taxes, which were substantial for such products as sprits, beer and tobacco, will inflate gross output at market prices. If this development is duly reflected in the price deflators, output indices should not be affected, but this is nevertheless a potential source of the diverging behaviour.

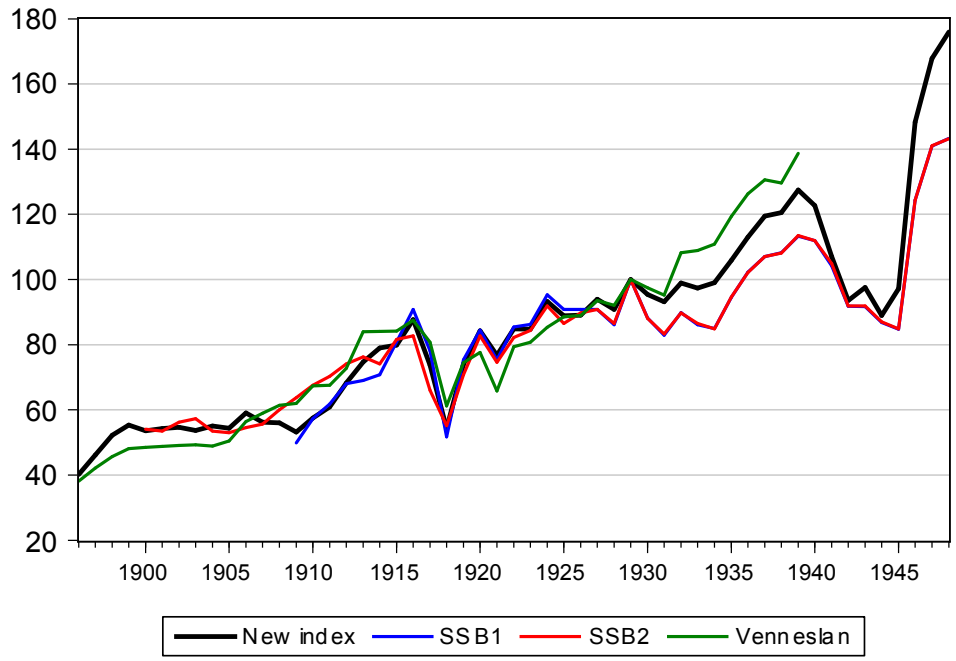

Figure 4: *Industrial production indices for foods, beverages and tobacco 1896 - 1948. 1929=100.*

Textiles

The textile industry accounted for about six to seven per cent of value added in manufacturing and mining throughout the half century studied here. No direct output figures exist before 1927, except for the Census of Production years 1909 and 1916. The difference between the index numbers will therefore be greatly influenced by the price deflators used to derive output estimates at constant prices in the benchmark years. In this case the price and quantity data for 1916 seem to warrant the use of specific unit prices for calculating real output. This procedure has been followed here. Before 1909 the underlying productivity growth estimate is set equal to the actual growth rate over the whole period between 1909 and 1927.

The new index corresponds very well to SSB2 beginning about 1914. Before WWI a faster growth is implied by the new index. It starts at a level slightly higher than Venneslan's index in 1896 but exhibits a stronger growth over the following two decades to reach the level of SSB2 on the eve of WWI.

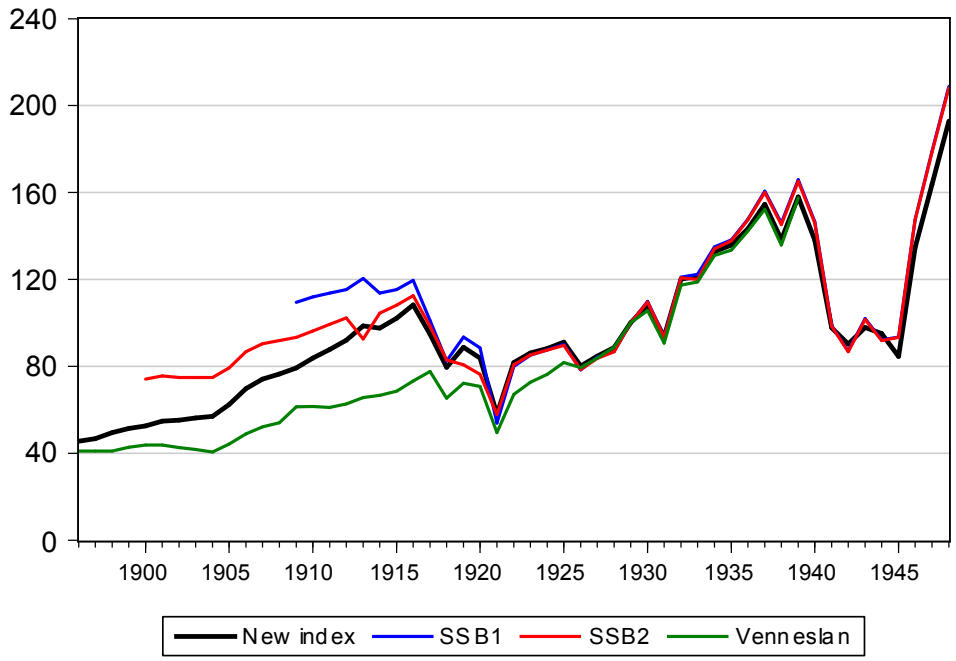

Figure 5: *Industrial production indices for textiles 1896 - 1948. 1929=100.*

Clothing and footwear

As discussed above, index numbers for the earliest decades this industry group are difficult to assess in view of the significant transition of workers from handicraft to industrial firms. Such considerations led Statistics Norway to base its first index calculated for the years 1909-1932 solely on the manufacture of shoes.[37] In later vintages the index numbers back to 1927 were recalculated to include clothing as well, but no revisions were made for the years prior to 1927.[38] No new index number (SSB2) was presented for this industry group in Stoltz (1955).

It is consequently no surprise that the SSB1 index deviates quite much from the two other indices in Figure 6 in the years before 1927. With the exception of the years before 1900, when the statistics on man-hours is particularly problematic, the new index and Venneslan's index are often fairly close until the early 1930s. Thereafter the new index and SSB1 show the same growth pattern in the 1930s. In the 1940s the new index is at a higher level.

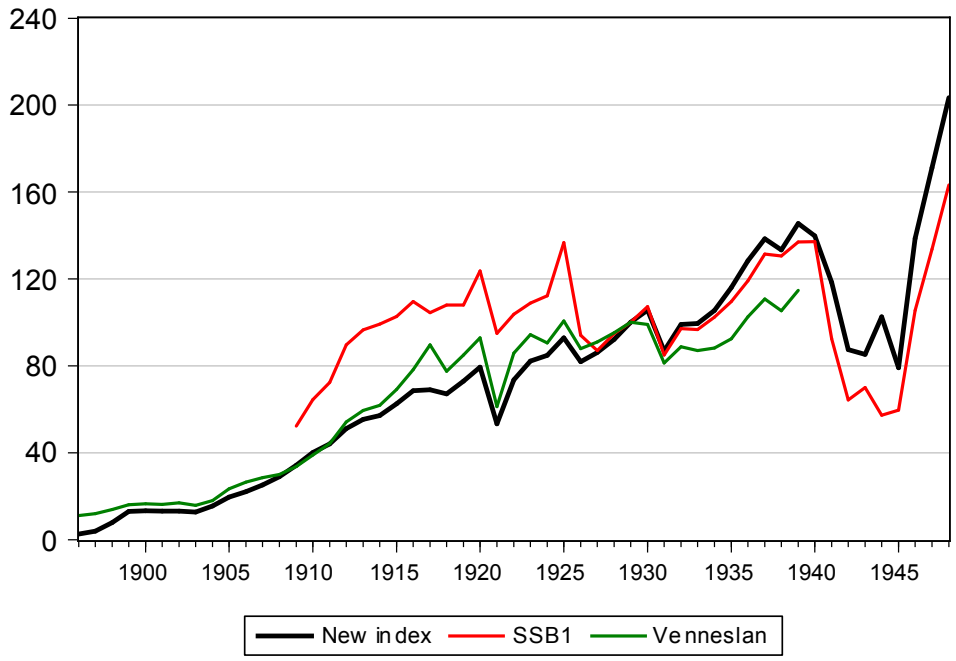

Figure 6: *Industrial production indices for clothing and footwear 1896 - 1948. 1929=100.*

[37] Statistics Norway (1934).

[38] In Statistics Norway (1978, p. 218) the SSB1 index is therefore misleadingly labeled clothing and footwear for the whole period 1909-1948.

Leather and rubber products

The firms within this group produced tanned leather, leather goods and rubber goods, mostly for the domestic market. The structural changes in these industries may be of some importance for the assessment of the course of the output indices. Tanneries and belting factories were most important in the first decades, the latter using initially leather but later primarily balata (a hard rubberlike material) for their products. The demand for transmission belts was great in the early stages of the electrification process but fell off with the coming of the electric motors. From the late 1920s the production of rubber goods for the consumer markets soared, in particular rubber footwear and tyres for bicycles and automobiles.

Output figures for all industries before 1927 are scarce, and even for the period after 1927 it is difficult to measure the output growth of the rubber industry. A detailed examination of the individual returns from the producers of rubber products was undertaken in order to estimate the output index for this industry. The index construction is made difficult in this case because of the rapid technological development, as new products were launched every year. In general, Statistics Norway performed a detailed check on the consistency of the incoming returns. In the case of rubber factories the Bureau was puzzled by the rapid growth of output relative to labour input in the early 1930s, but the correspondence with the management of the firms convinced Statistics Norway that the efficiency of the production process had increased very fast.[39]

The indices of Figure 7 basically show the same pattern of growth until about 1930, but thereafter the new index exhibits more buoyancy than the other indices throughout the 1930s and 1940s. It is likely that the main reason for this stems from measurement problems associated with the technological progress in the rubber industry explained above.

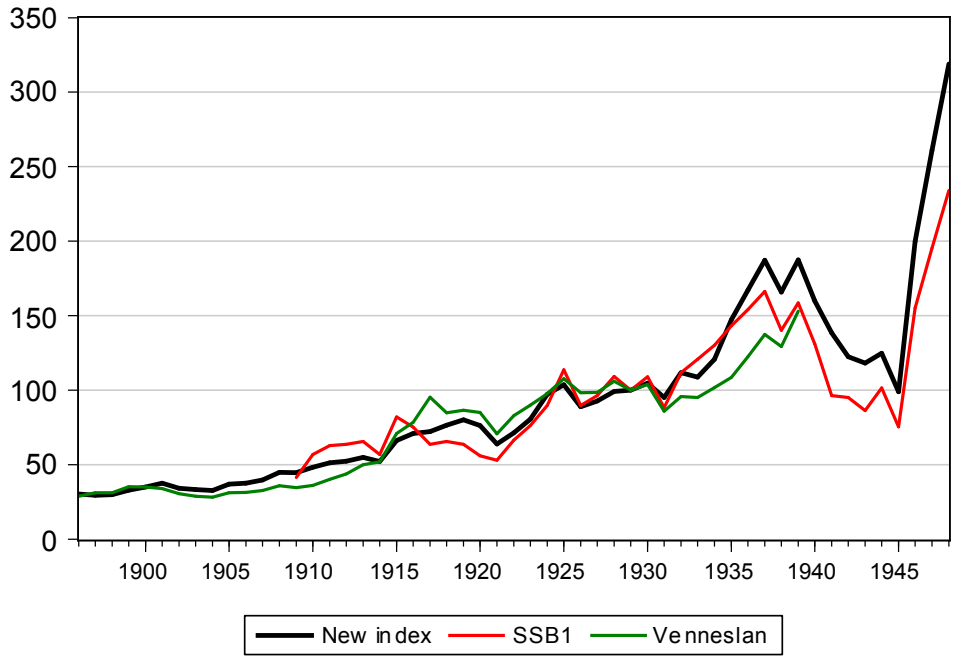

Figure 7: *Industrial production indices for leather and rubber products 1896 - 1948. 1929=100.*

[39] See Klovland (1997a, p. 114) for a specific example.

Wood products and furniture

This group contains two industries, sawmills and other wood products, the latter essentially producing furniture, doors, windows and sundry manufacture of woods. The sawmill industry was a major export industry at the turn of the century, being the largest of the 44 industry groups listed in Table A1 of the appendix until the eve of WWI. During the interwar years it lost much of its competitive edge, ending up producing mostly for the domestic market. In terms of value added it was surpassed by the furniture industry in 1930. Measuring the output of these industries is not easy before 1927 because such calculations have to employ man-hours and benchmark figures of varying coverage in 1909 and 1916, rendering productivity assumptions rather uncertain. The estimates presented here rely on the contemporary study by Aaseth (1936), who had to struggle with the same patchy data base, but whose judgements seem to be well informed. The same source was in fact used in Statistics Norway (1953). A further problem is the large number of very small establishments; in 1929 the man-hours included in the NI data were barely 80 per cent of those of the RTV data, largely due to the existence of many very small sawmills. This implies that the new index reflects a substantial blow-up factor on the NI output figures beginning 1927. Even the RTV statistics did not comprise all sawmills in operation, although this is only a concern here if their share of output varied much over time.[40]

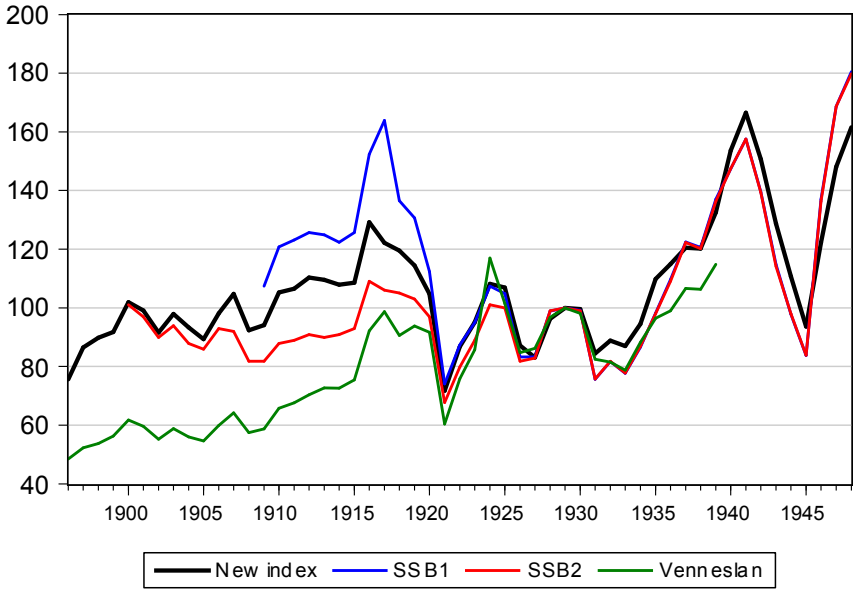

Figure 8: *Industrial production indices for wood products 1896 - 1948. 1929=100.*

Given these measurement problems it is perhaps little surprise that Figure 8 reveals a large dispersion of output estimates. The new index starts out in 1900 at the same level as SSB2, but shows more buoyancy over the next decades, navigating between SSB1 and SSB2. The diverging index number estimates apply mostly to the decades before 1920, however. Thereafter the four index numbers move more closely together, although we note a stronger rebound in the early 1930s in the new index. This result is of some interest in view of the debate on the sources and strength of the recovery of the manufacturing industry in the 1930s. Following Sejersted (1982)

[40]See the analysis of this feature in *Statistiske Meddelelser*, 1936, pp. 283-292.

a strand in this literature places much emphasis on the proliferation of very small industrial firms following the depression of the early 1930s. The wood industry has been viewed as the most typical example of this development. These small firms will in principle be included in the RTV statistics if they used any form of machinery driven by mechanical or electrical power, and thus reflected in the new index through the blow-up factor.

Pulp and paper

Pulp and paper represented a major export industry which had a share of 13.3 per cent of value added in 1929. It is evident from Figure 9 that the Statistics Norway indices and the new index are very close before 1940. They are both based on fairly extensive direct output data on mechanical and chemical pulp as well as paper for most of the period from 1900.[41] The discrepancies between Venneslan's index and the other ones prior to 1920 is probably due to the fact that these output data were presumably not used by him.[42] Beginning 1940 the new index shows a somewhat higher output level than the Statistics Norway index. It may be noted that by 1948 the Statistics Norway index number was still marginally below the prewar peak in 1937. In 1948 the new index had surpassed the 1937 figure by 15.6 per cent.

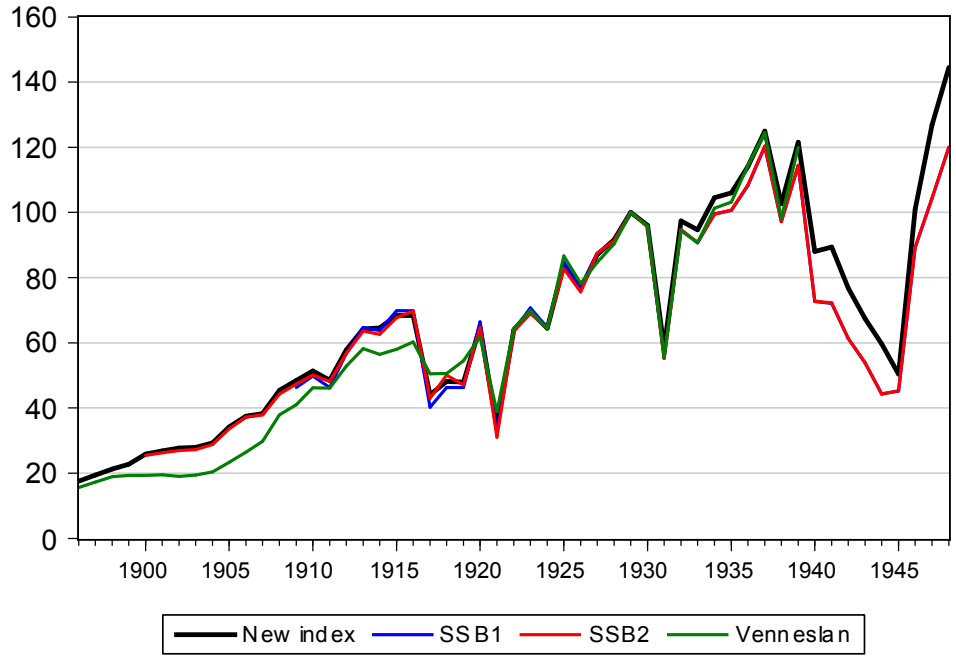

Figure 9: *Industrial production indices for pulp and paper 1896 - 1948. 1929=100.*

[41]The original data series can be found in Norske Papirfabrikanters Forening (1918) and annual issues of *Statistisk-Økonomisk Oversikt* issued by Statistics Norway, beginning 1927. The data series were supplemented and employed as the basis for output estimates for the pulp and paper industries by Aaseth (1936). His estimates are adopted here.

[42]Venneslan (2007) employed in general the Census of Production figures of 1909 and 1916 to arrive at benchmark estimates for these years, interpolating between these years by means of hours worked and capital stock proxies. There is no specific information as to the use of specific industry output series in his study.

Printing and allied industries

This group comprises printing, engraving and plate printing, lithographing and bookbinding. Its share of total value added was about 3 to 4 per cent throughout the period. The estimation of real output for this industry is difficult because the reported production figures are confined to nominal values only; the volume of production is hard to quantify. The measurement problem was approached by constructing indices of industry-specific wage costs and prices of raw material inputs, relying on cost shares in benchmark years to weigh together the index. For 1909 and 1916 and the years beginning 1927, when the nominal values of output are known, real output was calculated by deflating production values by this index. Prior to 1927 the output index was derived from annual time series of man-hours in the usual way. An additional source of uncertainty in the early years stems from the fact that some groups, chiefly bookbinding, were variously classified as belonging to the paper product industry or printing and allied industries.

Given the uncertain data basis for the construction of a production index for this industry it is somewhat reassuring to note from Figure 10 that the new index conforms very well to the SSB1 index up to the early 1930s. The Venneslan index starts at a much lower level. In the 1930s and 1940s the new index is rising much faster than SSB1. The question is which of these indices is closest to the actual development is of course difficult to decide. One indicator that can be used is the course of labour productivity. Hours worked are known with certainty, so that any 'unreasonable' paths of this variable must be due to the output estimates. According to our labour productivity estimates this figure was 19.6 per cent higher in 1939 than in 1929, then showing a further very modest increase to 21.0 per cent above the 1929 level in 1948. The growth rate of labour productivity is relatively high in the 1930s, being 1.8 per cent per year on the average, but it is in no way an outlier in this connection. In the rubber industry, for example, our estimate for the 1930s is 4.9 per cent per year.

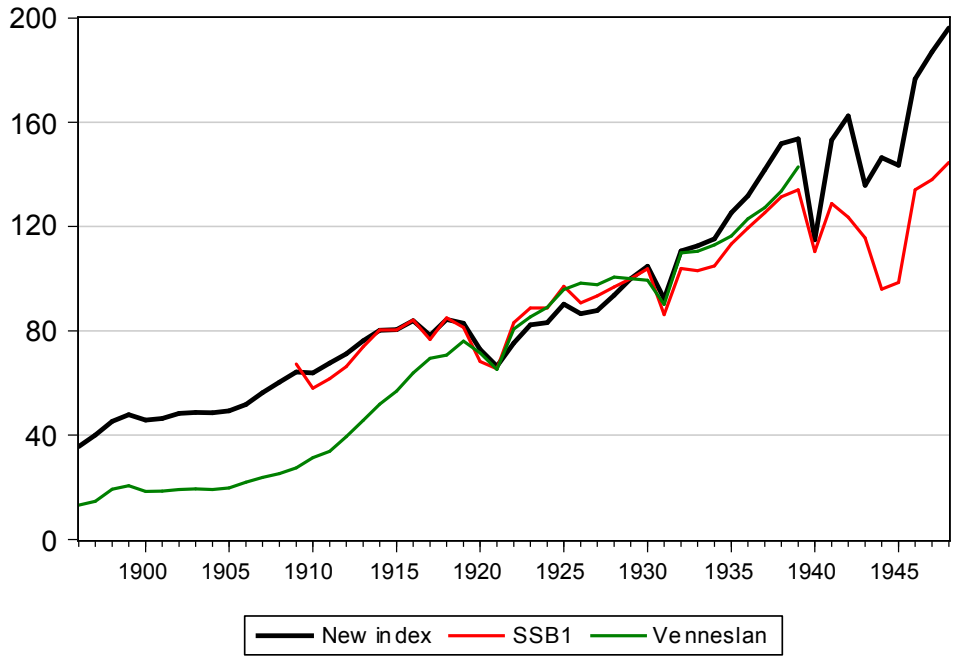

Figure 10: *Industrial production indices for printing and bookbinding 1896 - 1948. 1929=100.*

Chemicals

The manufacture of traditional chemical products, mostly produced in light industries, was dominated in the early years by matches and explosives; later such products as paints, cosmetics, detergents, compressed gases, acids, phosphates and woodtar were added. Another highly energy intensive industry group is electrochemicals, comprising the carbide industry, beginning 1899, and the production of artificial fertilizers, alkalies and other products from the plants of Norsk Hydro, whose output data begin in 1906. The output of the electrochemical industry grew rapidly in the 1900s until 1916, when it accounted for 9.2 per cent of manufacturing value added. In contrast the other chemical industries only accounted for 1.9 per cent.

Beginning 1927 a detailed specification of quantities and prices of the various products of the electrochemical industry was obtained from the files in the National Archives of Norway.[43] Before 1929 a time series of the output of Norsk Hydro, as measured by the nitrogen content of its production from Olsen (1955) was employed. A particular problem with the Norsk Hydro data is the fact that all reported figures after 1910 do not refer to the calendar year, but the year ending in June.[44] These figures were shifted to calendar years by taking the means of two consecutive years. This may seem as an inconsequential transformation, but it does in fact play a role given the size of this company, in particular by placing the vast expansion of Norsk Hydro's output from its new plant completed in the summer of 1929 partly in this year and not entirely in 1930.

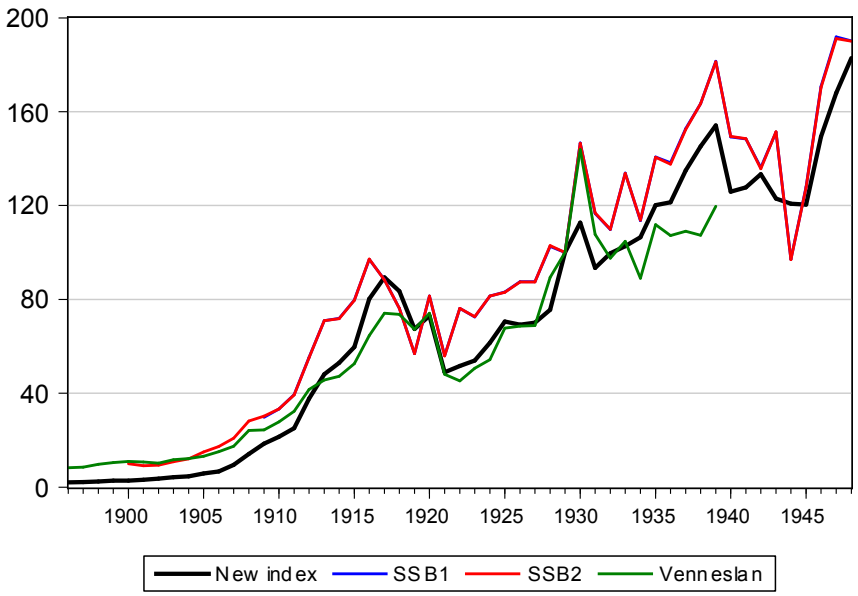

Figure 11: *Industrial production indices for chemicals 1896 - 1948. 1929=100.*

The pattern of the four indices in Figure 11 is one of fairly sustained growth over the whole period.[45] The new index indicates a more marked peak during WWI and its immediate aftermath and a smaller decline during WWII.

[43] Although the product was of no quantitative importance it may be noted that these files even include data on the production of heavy water, a product surrounded by much secrecy.

[44] See the table in Olsen (1955, p. 472).

[45] The SSB1 index is proportional to SSB2 and will therefore not be visible in the graph.

Mining and basic metals

Figure 12 shows the results for mining and basic metals. This group consists of metal mining, basic metal production and coal mining. Pyrites, copper ore, silver ore, nickel ore and zinc ore were the chief products of the metal mining industry. The extraction of other ores, such as molybdenite and wolfram, were of more ephemeral character. In these cases prices and quantities increased enormously during the two wars. The metals produced in the nineteenth century included copper, silver, nickel and pig iron; the iron industry was not particularly important at that time, however. Following the huge investments in electricity supply in the decade preceding WWI the new metallurgical industry expanded rapidly. Aluminium, ferro alloys and zinc then became very important export products. Output data from standard sources are excellent for these industries, except for the metallurgical products before the middle of the 1920s, which had to be pieced together from various sources, having recourse to export figures to bridge some gaps in the series.

The inclusion of coal mining is a novel feature of the new index. This industry was not included in the SSB indices in this period. However, the importance of this industry, which was located at Spitsbergen, was slight. At the peak of its relative share of value added in the 1920s it was still below one tenth of that of metal mining.

These industries experienced long periods of strong growth in the 1910s and in the interwar years but collapsed during the two world wars. The new index is very close to the Statistics Norway indices, which is easily explained by the availability of the underlying output data.[46]

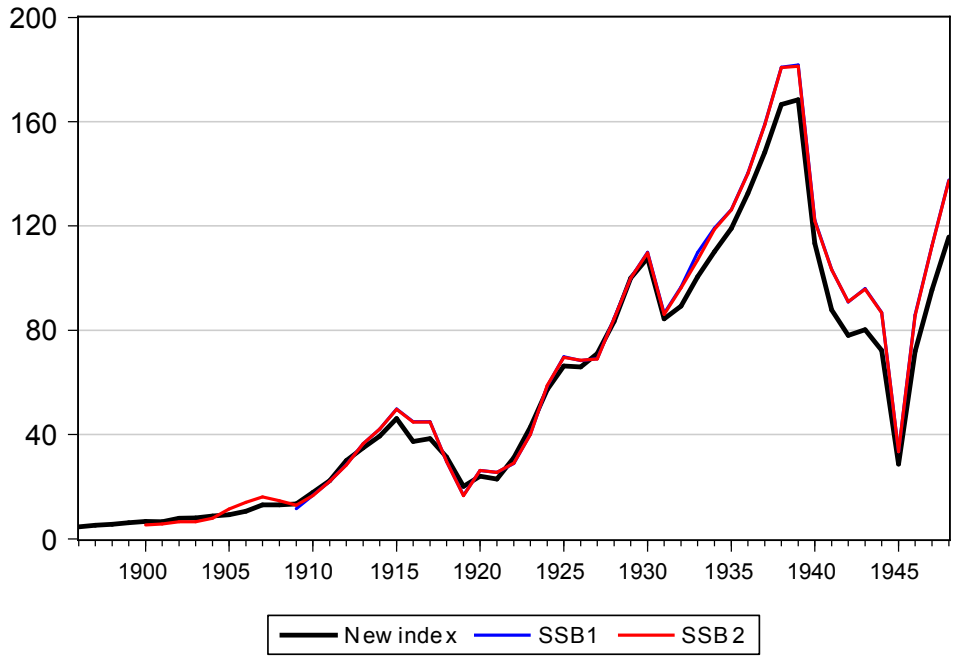

Figure 12: *Industrial production indices for mining and basic metals 1896 - 1948. 1929=100.*

[46] Venneslan (2007) did not present output estimates for metal mining.

Stone, glass and clay products

Stone quarrying, manufactured stone, cement and cement products, bricks, glass products, china and pottery were the products of this group. These industries accounted for 4.2 per cent of value added in 1929. Stone products, in particular paving stone, and cement became relatively important export industries in the 1920s, but these industries found it increasingly difficult to sell their products abroad after the Great Depression of the early 1930s.

Output figures before 1927 were only available for cement.[47] For the other industries benchmark figures from 1909 and 1916 were combined with productivity trends and data on man-hours to construct the output series. The indices in Figure 13 present a rather diverse picture before 1920, which may in large part be due to the weak data base. After 1920 the indices are much more internally consistent, in particular the SSB1 and the new index.

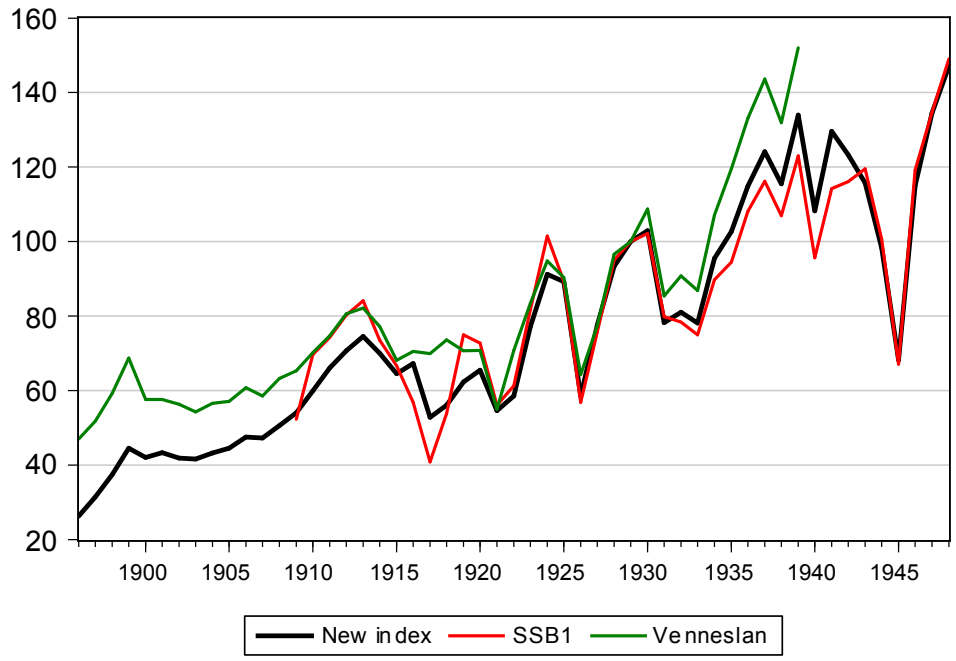

Figure 13: *Industrial production indices for stone, glass and clay products 1896 - 1948. 1929=100.*

[47] Christiania Portland Cementfabrik (1942); Gartmann (1990).

Iron and metal products

The indices for iron and metal products, which represented 19.6 of total value added in 1929, are shown in Figure 14. The most outstanding feature of this graph is the vast difference before the early 1920s between SSB1 and SSB2 and the other indices. When the original SSB1 index was constructed in the early 1930s it was based on hours worked. Clearly, the underlying productivity assumptions must have been rather wide off the mark, indicating a decline in output of about 39 per cent between 1916 and 1923, whereas SSB2 records an increase of 2 per cent. Yet it is the SSB1 index that unwary researchers are most likely to put into their computers because it is the only alternative tabulated in Statistics Norway (1978).

The reestimation of gross output for iron and metal industries for the years 1900 to 1929 in Statistics Norway (1953) was undertaken on a very disaggregate level, using indices of raw material prices and wage costs as deflators of nominal output figures. The new index employs partly the same procedure, but unit prices of semi-manufactured goods were also used to construct the price deflators. It is seen that SSB2 index is fairly close to the new index, although the latter moves at a lower level from the early 1910s through the 1920s. The Venneslan index starts at a lower level in 1896, indicating higher growth in the first decades. After 1929 the SSB2 index, as tabulated in Stoltz (1955, p. 195), was spliced with SSB1. Despite the fact that the latter was computed on the basis of man-hours only, the differences between this index and the new index are fairly small, except during the war years, when output seems to be somewhat overestimated according to SSB2.

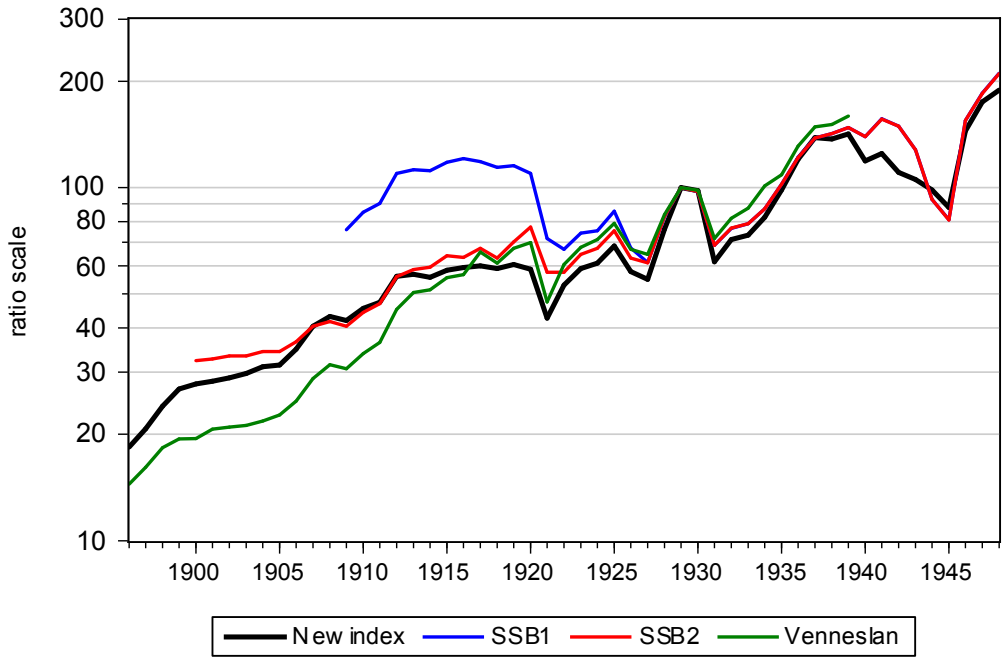

Figure 14: *Industrial production indices for iron and metal products 1896 - 1948. 1929=100.*

Oils and fats

Oils and fats from marine sources are dominating this group, which also comprises vegetable oils and meal as well as various consumer goods produced by soap factories and similar light industries. A particular problem arises from the fact that some of the main products, fish oils and herring meal, were produced in very small factories, many of which were not reporting to either the NI or the RTV statistics. Much higher output figures are to be found in the fishery statistics, which had a far better coverage of these products.[48] Hence we use output data throughout the whole period from this source in the case of cod-liver oil, and foreign trade data as a supplement before 1927 in the case of herring meal and fish meal. This extension of the data base is presumably not incorporated in the SSB1 and Venneslan indices. Output data on hardened fats derived from crude whale oil and vegetable oils and meals were not published in NI but were recovered from the original sources in the National Archives.

Figure 15 discloses large discrepancies between the indices. The differences are very marked in the early years, which may largely be attributed to the extended data base of the new index. In addition, during WWI in particular, there were huge increases in the prices of export goods based on marine oils. By employing annually updated value shares as weights the new index may behave differently from the SSB1 index in this period. Beginning in the mid-1920s the SSB1 and the new index are quite close.

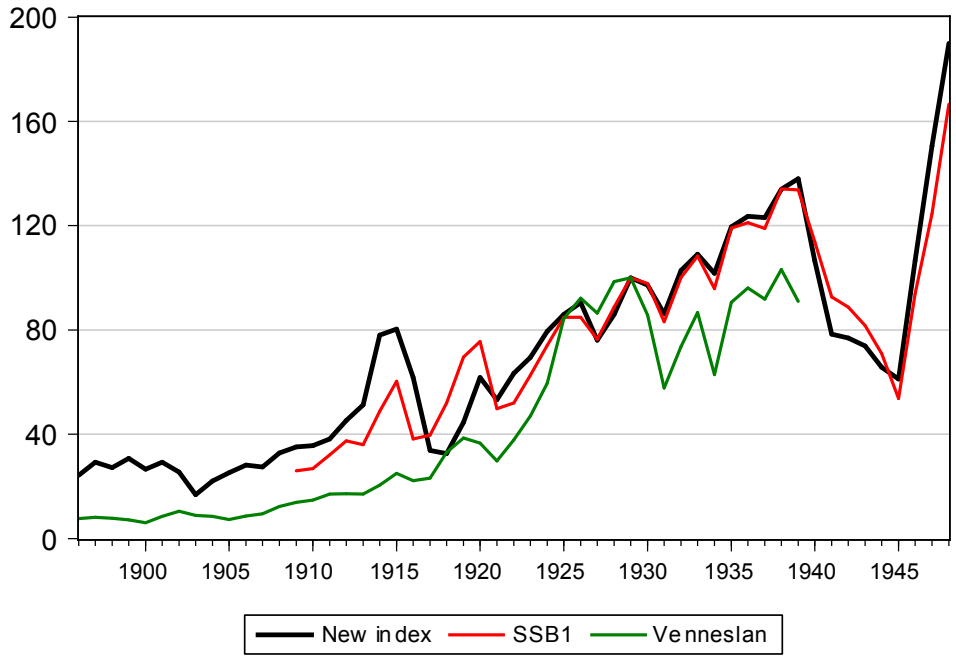

Figure 15: *Industrial production indices for oils and fats 1896 - 1948. 1929=100.*

[48] *NOS Norges Fiskerier.*

Gas supply

Gas works only accounted for about one per cent or less of total value added. The gas companies, the laregest of which were owned by municipalities, produced gas for public consumption, coke and coal tar. The construction of the output index prior to 1927 follows the approach taken in Statistics Norway (1953). In addition to man-hours and Census of Production data for 1909 and 1916 output figures from Oslo and Bergen gas works were used to arrive at estimates for the whole industry.[49] The latter sources are not wholly complete, but do exist for most years.

Figure 16 shows that the new index behaves roughly like SSB1. The largest divergences are to be found before 1927, when the data sources are less complete.

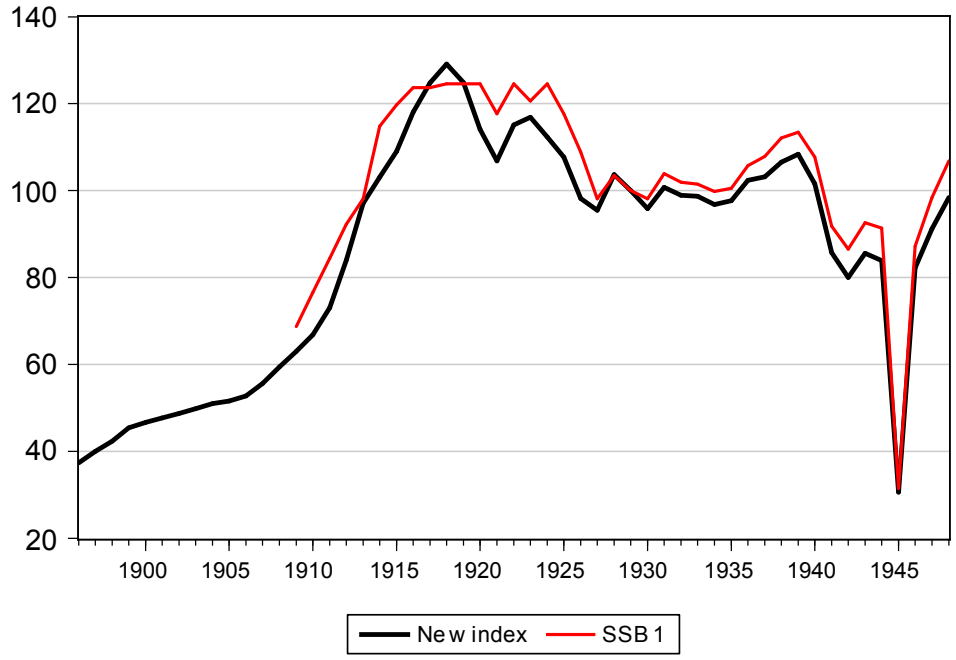

Figure 16: *Industrial production indices for gas supply 1896 - 1948. 1929=100.*

[49] This information can be found in annual issues of *Statistisk Årbok for Kristiania (Oslo)* and *Statistisk Årbok for Bergen.*

5 Labour productivity

Labour productivity LP is calculated as $LP = Y/L$ where Y is real output and L is man-hours. The latter includes both hours worked by operatives (blue collar workers) and an estimate of hours worked by salaried employees, excluding office personnel.[50]

Chain indices of labour productivity for all industries and for home and export industries were weighted together from time series for individual industries by the same procedure as used for output, using nominal value added shares of the previous year as weights. The aggregate series are shown in Figure 17. Similar indices were computed for the 13 industry groups discussed in the previous section. Annual indices of labour productivity for each of the main industry groups and for the aggregates can be found in Table A5 of the appendix.

The trend growth rate of labour productivity by decades are shown in Table 2. These growth rates are derived as the coefficient α from the least squares regression

$$lnLP_t = \alpha_0 + \alpha \cdot TREND_t$$

where $TREND$ is a linear time trend.

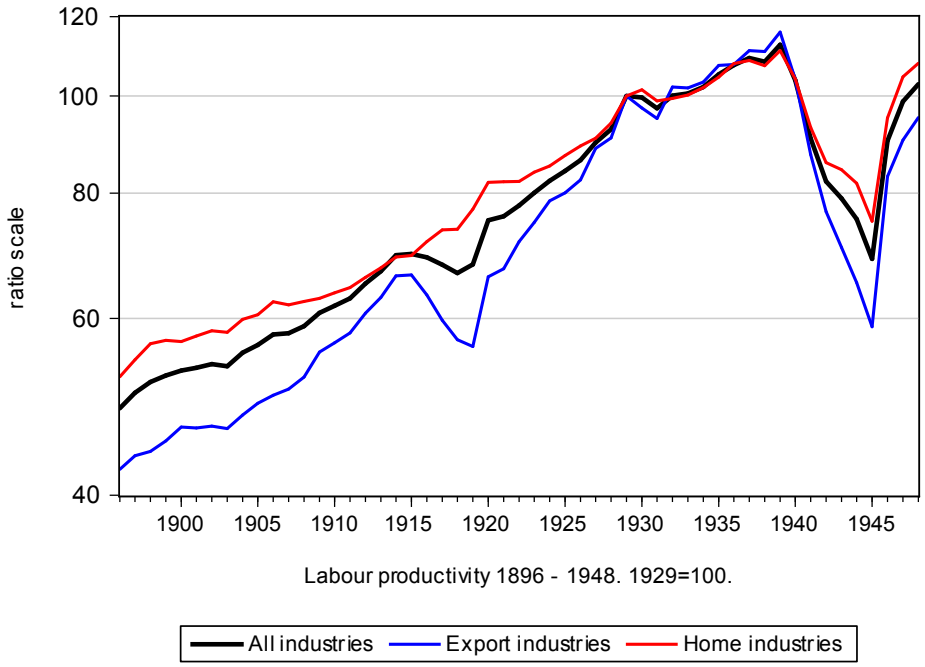

Figure 17: *Labour productivity indices 1896 - 1948. 1929=100.*

The most spectacular feature of Figure 17, which is confirmed in more detail by Table 2, is the decline in labour productivity growth towards the end of the two world wars. The export industries are the ones most severely affected by this phenomenon. We know that due to factors associated with the disruption of trade flows, raw material shortages and collapsing product prices several major export industries, such as mining, basic metals, pulp and paper, and hardened fats, experienced severe setbacks in these years. The negative productivity shocks

[50]Man-hours of salaried personnel were included in the RTV statistics before 1921. Thereafter these figures were calculated as the number of employees times an estimate of hours worked per year, which was set at 2050.

were by far the greatest during WWII, when there was a substantial decline in home industries as well.

A closer look at Table 2 reveals that the highest productivity growth rates were in general achieved in the 1920s. Internationally these years saw the introduction of large-scale substitution of labour for capital in many industries, leading to high rates of productivity growth. In Norway the electrification process may have played an even greater role in such industries as pulp and paper, electrochemicals as well as mining and basic metals. Electricity had been introduced into the factory plants early in the 1900s, but, as argued by David (1990), it takes time before such technological innovations can be efficiently implemented in the production process. A further factor is the significant reduction in general working hours that took place in the final years of the 1910s; from 10 to 9 hours a day in 1917 and further to 8 hours in 1920. The issue of how and, eventually, how much, this affected labour productivity cannot be dealt with here, however.

In the 1930s productivity growth reverted to a level slightly below the average of the whole period. It was only in some of the home industries that trend rates of growth in labour productivity increased from the 1920s to 1930s, notably in foodstuffs and beverages, leather and rubber, printing and gas works. In the typical export industries productivity growth fell off quite significantly.

Table 2: **Mean annual growth rates of labour productivity 1896 - 1948.**

Industry group	1896-1909	1909-1919	1919-1929	1929-1939	1939-1948	1896-1948
Foods and beverages	0.29	1.38	0.69	1.70	1.61	1.05
Textiles	2.34	3.20	1.45	1.33	1.16	1.69
Clothing and footwear	2.46	2.15	1.93	-1.01	1.56	1.16
Leather and rubber products	0.50	2.77	1.41	2.26	-0.50	1.19
Wood manufactures	0.64	1.22	1.73	-1.03	-3.49	0.28
Pulp and paper	3.28	1.40	5.40	2.15	-1.94	2.52
Printing and allied industries	0.86	0.86	1.24	1.79	0.22	1.06
Chemicals	6.27	6.59	6.48	2.81	-1.78	5.06
Mining and basic metals	1.01	-1.23	12.17	2.06	-2.50	3.56
Stone, clay and glass	2.02	1.18	4.45	2.23	-2.48	1.99
Metal products and machinery	1.82	0.57	4.35	0.61	-1.96	1.26
Oils and fats	1.10	-6.74	3.77	1.77	0.08	0.04
Gas work products	1.42	1.42	1.20	1.45	0.90	1.14
Import competing home industries	1.49	2.26	2.59	0.82	-0.83	1.37
Sheltered home industries	0.74	1.29	1.05	1.64	0.95	1.14
Export industries	1.79	0.34	4.99	1.70	-2.35	1.72
Consumer goods industries	1.23	1.84	1.89	1.11	0.13	1.32
Producer goods industries	1.67	0.55	4.81	1.61	-2.50	1.62
Manufacturing industries	1.47	1.27	3.00	1.30	-0.92	1.38
Mining industries	-0.31	-0.77	12.98	2.09	-3.35	4.11
All industries	1.45	1.14	3.22	1.31	-1.09	1.43

The decrease in labour productivity during WWII was massive. For all industries the index values fell from 112.5 in 1939 to 75.3 in 1944 and further to 68.8 in 1945. The productivity level rose to 102.6 in 1948 but was still 8.7 per cent below that of 1939, only slightly surpassing the level experienced in 1934. The new estimates corroborate the rather bleak picture of the postwar productivity level conveyed by the contemporary estimates provided by Statistics Norway.[51] However, a detailed study by Brenna (1951) presented estimates that showed a somewhat better productivity performance of postwar manufacturing industries. Brenna (1951) adjusted the Statistics Norway output indices for several shortcomings, most importantly the treatment of 'new goods' appearing between benchmark years which was a source of error in the published Statistics Norway index (SSB1). This correction brings his estimation method closer to the new index, but, on the other hand, the industry weights were fixed at value added figures for 1938. The important industry groups of metal products, machinery and transport equipment as well as printing and allied industries were excluded from the calculations because output in these industries were estimated on the basis of man-hours only. The ratio of the 1948 to the 1939 figure for output per man-hour is 98.7 per cent for all industries considered in Brenna (1951); for the new index the corresponding figure (including all industries) is 91.3 per cent.

The widespread disruptions to trade and deterioration of the capital stock caused by the war are obviously an important cause of this development. Statistics Norway (1945, p. 256) also attached much significance to a worsening state of nutrition and, above all, to a diminished work effort due to a political protest against the German occupation. This was most certainly a major factor during the war but it is doubtful that such attitudes among workers lingered on several years after the war. If they did, the source of the reduced work efforts must have been different.

Pedersen (1949) drew attention to more fundamental problems of efficiency inherent in the centrally planned economy of postwar Norway. The firms were generally dependent on various licences and permits before most decisions relating to the acquisition of raw materials and investment in new equipment and structures could be implemented. He also maintained that workers may have lacked incentives to increase their work efforts as long as many goods were rationed. Such reasons for the slow rebound of labour productivity were not prominent in the analysis provided by institutions funded by the government, however.

In the study by Brenna (1951) some doubt was raised as to the explanatory power of general arguments because the ratio of postwar to prewar productivity levels varied greatly across industries. A general feature seems to be that export industries lagged behind the home industries in this respect, which is also evident from Figure 17 and Table 2. This feature indicates that a low capacity utilization may have characterized the export industries in the early postwar years. This was, for example, obviously the case for the pulp and paper industry. The capacity utilization of the chemical wood pulp industry in 1948 was only about 60 per cent of the prewar level.[52] Various factors were cited as the reason for this, such as water shortage reducing the availability of electricity supply and import restrictions in foreign countries. Such factors were beyond the control of the domestic authorities, but there were others that were not - in particular the timber shortage, which obviously was connected with the strict price controls.

[51] See, *inter alia*, *Økonomisk Utsyn over Året 1949*.

[52] *Statistisk-Økonomisk Oversikt over Året 1948*, p. 71.

6 Monthly output estimates by industry

6.1 The construction of the new index

On the basis of the annual production indices of the 45 industries monthly indices were constructed for each industry for the whole period 1896 to 1948. This was achieved by applying a procedure suggested by Litterman (1983). This method distributes the annual values over the twelve months of the year, using related series as interpolators; in the case of no monthly related series being available only a constant and a time trend. The only parameter to be specified relates to the choice of the statistical time series properties of the error term arising from discrepancies between the average of preliminary monthly values and the annual figures of the index. In most cases a random walk specification for the error term was chosen, but in some cases more reasonable results were obtained with a first-order serial correlation assumption.[53] In addition to smoothing the intra-year movements, this method ensures that the annual average of the estimated monthly data equals the true annual average. Accordingly, the monthly and annual indices for a particular industry will be growing at similar rates over time.

To illustrate how the method works let us consider Figure 18, which employs data from the production of chemical wood pulp in the period 1920 to 1932. When the annual index numbers of this industry are distributed evenly over the year, this results in the green curve marked by discrete jumps at year-ends. By applying the Litterman (1983) algorithm to the annual data a much smoother time series is obtained, while still keeping the annual mean of the monthly figures equal to the annual benchmark.[54] Even if no true monthly related series are available, leaving only a constant term and a linear time trend as interpolators, this method produces a monthly curve (shown in red in Figure 18) which to some extent reflects the underlying intra-year fluctuations. Although the exact monthly fluctuations of time series that exhibit significant short-term fluctuations cannot by mimicked closely by this crude method, in many cases the general *direction* of intra-year movements are picked up by this simple method. This may be helpful in locating cyclical turning points. In this particular case there exist fairly complete and reliable monthly output figures, which can be employed as related series.[55] Monthly index values obtained by using the related series are shown in Figure 18 in black. This series reflects the intrinsic choppiness which is so characteristic of many monthly output series, but also the very significant decline in output during several months in 1921, 1924, 1926 and 1931. This phenomenon was caused by widespread labour conflicts in this case.

With a view to adding information on intra-year fluctuations in the construction of monthly index numbers of the 45 industries a large number of monthly time series that could be used as related series were collected. In most cases these time series are specific to a particular industry or a group of industries. The following categories of monthly time series were considered:

- physical output series (1896-1948)
- employment figures (1904-1948)
- number of persons seeking employment at labour exchanges (1919-1939)
- trade union unemployment rates (1904-1939)
- workdays lost due to labour conflicts (1904-1939)

[53] The basic idea of this algorithm originates from early work by Friedman (1962) and Chow and Lin (1971) on how short-term information on related time series can be be used to convert annual data into a monthly series.

[54] A slightly modified form of this method included with RATS version 9.0 was used for this purpose.

[55] Monthly data series on the production of mechanical and chemical pulp are available from various issues of *Statistiske Meddelelser* and *Statistisk-Økonomisk Oversikt (later known as Økonomisk Utsyn)*, the latter beginning 1927, published by Statistics Norway.

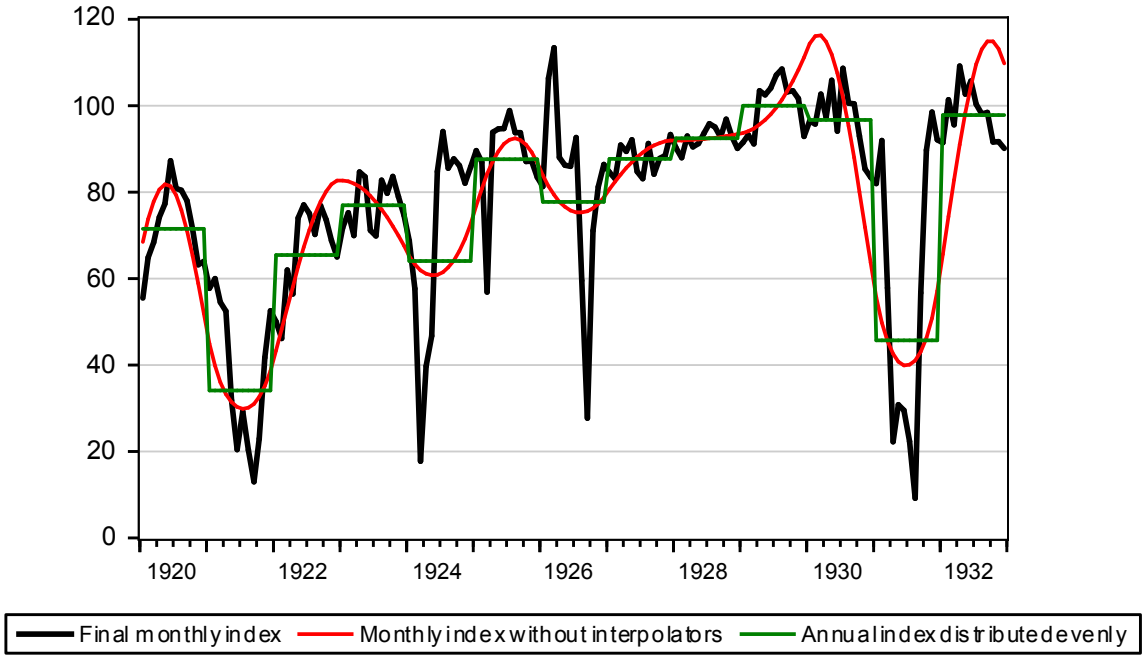

Figure 18: *Monthly estimates of output indices for the chemical wood pulp industry, 1920 - 1932. 1929=100.*

- export volumes (1896-1939)
- raw materials input (1909-1939)
- monthly production indices (Statistics Norway, 1933-1948)

In general, physical output series were used whenever such data existed; otherwise labour market variables turned out to be the most useful ones, basically due to the fact that these data were available at a fairly disaggregated level. Export volumes exist on a monthly basis for many important products, but due to fluctuations in stocks of finished goods such data may reflect monthly fluctuations in output rather poorly. Export volumes were only used in a few cases as a supplementary related series for some periods, chiefly in the case of basic metals and pulp and paper industries in the early years. Raw materials input in the form of quantity of fish delivered to canning factories were aggregated from weekly reports 1909-1939 in *Fiskets Gang* and used for estimating the output index of the canning industry. This is a very good short-term indicator of the often extreme month-to-month fluctuations of output in this industry because of the short time lag between the delivery of sprat (brisling) and small herring to the factories and the canning process.

Beginning 1933 Statistics Norway constructed monthly indices for total industrial production. Separate indices for home and export industries as well as indices for the production of consumers' and producers' goods were also published.[56] At the most disaggregated level monthly time series for 9 of the most important industry groups were regularly published.[57] The coverage of these data in terms of hours worked by the reporting sources varied quite much across

[56] *Statistiske Meddelelser*, 1934, pp. 42-44.

[57] In a personal communication dated 20 January 1995 Svein Longva (at that time director of Statistics Norway),

industries; from 11 per cent in the furniture and wood processing industry to 100 per cent in various industries within the stone and glass, oils and fats and foodstuffs groups.

The labour market variables and the production indices chosen as related series were as far as possible specific to the industry in question. It is important to recognize that as a rule each of the monthly time series only existed for part of the whole sample period, which necessitated a pragmatic selection procedure. Several specifications were often tried out for various subperiods. The criteria used for selecting the final set of related series in each period were basically that coefficients were of the right sign in the auxiliary regressions and that the resulting estimates passed a visual inspection.

Although one would have liked to have a fixed set of monthly interpolators covering the whole period this is not possible except in a few cases. The main implication of this fact is that the estimated volatility of intra-year fluctuations may exhibit some spurious changes over time. In particular, it is to be expected that the resulting monthly series are generally smoother in the first years, especially before 1904 when labour market variables first become available. It is therefore obvious that the new monthly estimates cannot be used to study how short-term (intra-year) output volatility developed over time.

6.2 The new monthly production index

Figure 19 presents the aggregate monthly production index. The aggregation of the 45 monthly indices was performed in a way similar to the annual index, using a Laspeyres quantity index formula with annually updated basis years and weights. For each month the ratio of the index value of each industry relative to previous year's average index number was computed, then using the previous year's shares of nominal value added as weights.[58] As explained above, the Litterman (1983) algorithm ensures that the means of the monthly index numbers are equal to the annual index number for each year.

The dominant feature of the total index shown in Figure 19 is the secular growth trend; the cyclical fluctuations will be more evident when the series is purged of the underlying trend. We return to this in the next subsection.

As a comparison the original Statistics Norway's monthly index is also shown in Figure 20 for the period covered by this index, beginning in 1933. The Statistics Norway index has been seasonally adjusted by the X11 method and the level was shifted to equalize the mean of the new index for 1933. In contrast to the new index, the Statistics Norway monthly index was not regularly benchmarked to the annual index, which resulted in different growth rates over time.[59]

In general, there is a good correspondence between these two monthly indices. The cyclical properties are very similar. Production growth was quite steady from 1933 in both indices, but initially somewhat faster in the new index. Business cycle peaks occurred in 1937 and 1939. The distortions to output following the German occupation in April 1940 and the subsequent persistent fall in output is highly visible in both indices. The same applies to the trough in May 1945. Thereafter the new index grows somewhat faster than the Statistics Norway index. In sum, this comparison gives some support to the feasibility of using the new index through 1948 and splicing it with the Statistics Norway monthly index thereafter, thus obtaining a continuous run of a monthly time series for industrial production for more than a century, beginning in 1896.

kindly provided me with the monthly index numbers for the remaining industry groups that have not been published.

[58] This is in line with the procedure presently used by Statistics Norway, see Finci et al. (2014).

[59] This concerned in particular the index for metal products and machinery, see for example *Statistiske Meddelser*, 1949, p. 304.

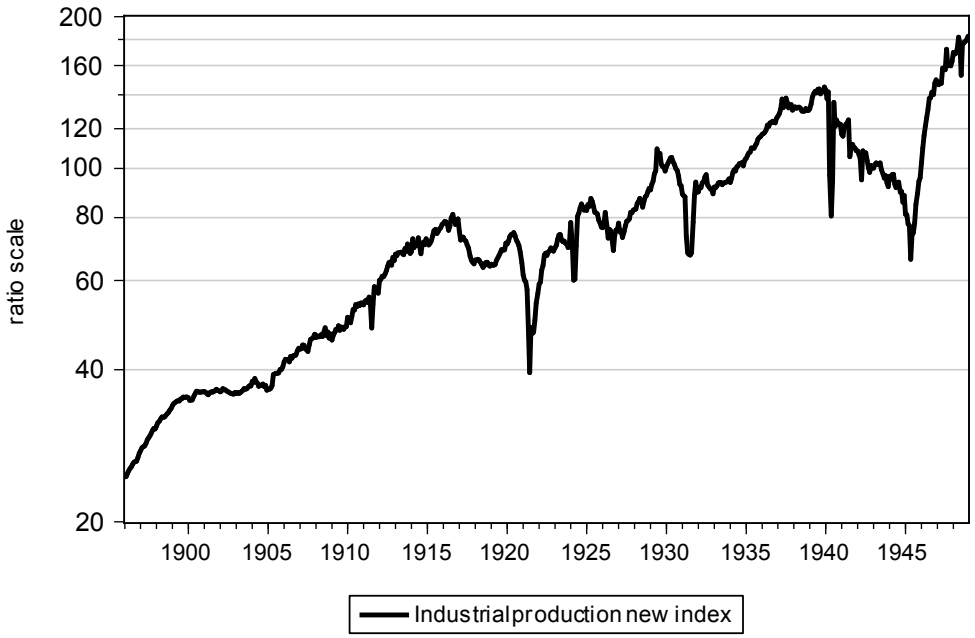

Figure 19: *Total industrial production, monthly 1896 - 1948. 1929=100.*

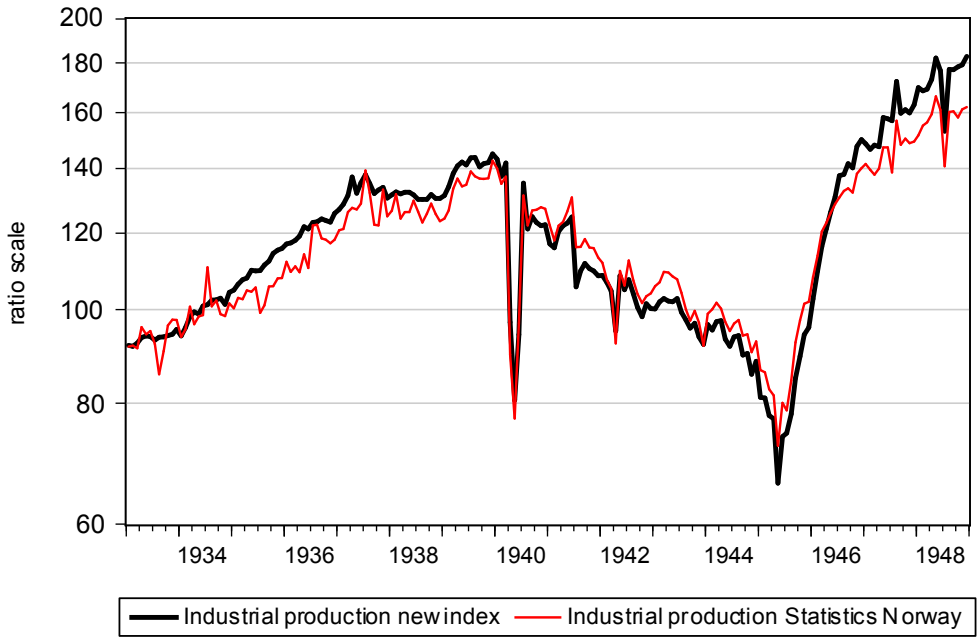

Figure 20: *The new index and Statistics Norway production index, monthly 1933 - 1948. 1929=100.*

6.3 Cycles in industrial production

In order to extract the growth cycles from the new index the trend of the series was estimated by applying a Hodrick-Prescott filter with a smoothing parameter λ set equal to 140 000. The cycle series shown in Figure 21 is the difference between actual time series and the computed trend. The recurrent short periods of widespread labour conflicts, in particular during the interwar years, stand out in this picture. A crude attempt was made to smooth the cyclical series for these distortions by regressing the total index on the number of workdays lost for the period 1904 to 1939. This procedure modifies the cyclical fluctuations slightly in some periods, most evident in the summer of 1911, during 1924 and in the very extensive conflict in 1931. The deep but rather short-lived recession of 1921 is less affected by this adjustment.

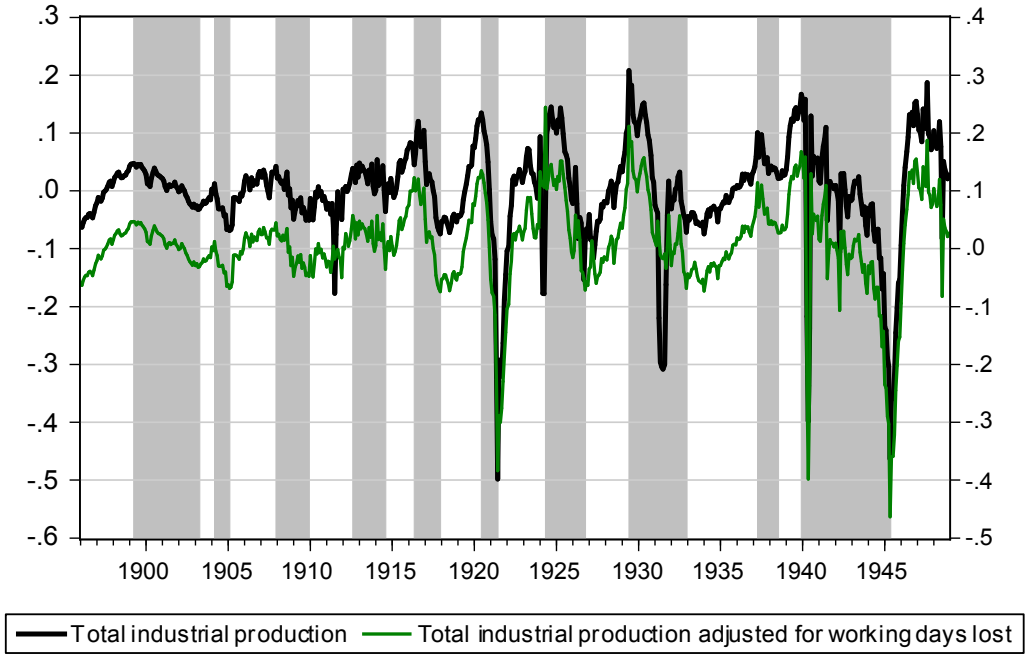

Figure 21: *Cycles in industrial production, monthly 1896 - 1948. Contraction periods are shaded.*

The adjusted cycle series was used as the basis for determining the turning points of the cycles in industrial production. In order to assist in the selection of turning points the monthly cycle data were first run through a computer program which applies the algorithm suggested by Bry and Boschan (1971).[60] This method applies smoothing filters in several steps to locate the peaks and troughs of the time series, starting with a 12-month moving average filter, and ending with the raw data series. The identification rules comprise several constraints, including a minimum duration of the cycle phases and a minimum amplitude of the cyclical fluctuations.

The turning points shown in Table 3 are based on the application of this method except for the cycles in the early 1930s and during WWII.[61] Also shown in this table are the turning

[60] A procedure included with RATS version 9.0 was used for this purpose. Aastveit et al. (2014) applied a version of this algorithm in order to identify business cycles in Norway in recent years, concluding that the Bry-Boschan approach provided the most reasonable definition of business cycles.

[61] The dating of the turning points deviate somewhat from those suggested in Klovland (1989), where a more detailed narrative of the cycles is presented.

points of business cycles of Norway's trading partners. For the interwar years these are detailed measures based on the trade-weighted monthly industrial production indices of 14 of the most important trading partners as constructed in Klovland (1998). Before 1920 the information is less comprehensive as the corresponding turning points of only the most important trading partner, the United Kingdom, are shown in the table.[62]

Table 3: **Turning points of cycles in industrial production 1896 - 1948.**

	Peaks		Troughs	
Cycle no.	Norway	UK/Trading partners	Norway	UK/Trading partners
1	1899:4	1900:6	1903:3	1901:9
2	1904:3	1903:6	1905:2	1904:11
3	1907:12	1907:6	1910:3	1908:11
4	1912:8	1912:12	1914:8	1914:9
5	1916:5	1918:10	1917:12	1919:4
6	1920:6	1920:2	1921:6	1921:5
7	1925:4	1925:1	1926:10	1926:7
8	1929:6	1929:6	1932:12	1932:7
9	1937:4	1937:5	1938:7	1938:7
10	1939:12	NA	1945:5	NA

NOTE: Turning points of cycles abroad are those determined by the National Bureau of Economic Research for the UK prior to 1920 as published in Moore and Zarnowitz (1986); beginning 1919 the turning points are derived from monthly time series of industrial production in 14 of the most important of trading partners, weighted by trade flows of manufactured goods with Norway in 1929 as derived in Klovland (1998).

Prior to WWI the results shown in Table 3 indicate a fair degree of congruence regarding the timing of turning points in Norway and the UK. There are four whole cycles in this period. Three of the peaks in Norway fall within a year of the corresponding peak in the UK; in the first cycle the peak in Norway occurs 14 months prior to the UK peak. Two of troughs (1905 and 1914) are within 3 months of the UK turning points, but the other two (1903 and 1910) are substantially later in Norway. The dating of the trough in March 1910 is somewhat uncertain as there are additional local minima in January as well as December 1909. In the cycle around the turn of the century there are important events peculiar to each country which impinged on the timing of the cycles. In Norway the housing boom in Christiania had for several years caused an overheated economy, at least locally, during the final part of the 1890s, and it is no surprise that it finally matured in the spring of 1899. In the UK the Boer War may have created expansive impulses that prolonged the boom period.

The business cycle pattern during WWI was to a considerable extent shaped by the wartime distortions to established trade patterns. In Norway the first two years of the war were a definite boom period, but later comprehensive trade barriers and the concomitant lack of imported raw materials caused a widespread retardation in economic activity.

[62]These are the dates determined by the National Bureau of Economic Research, reproduced in Moore and Zarnowitz (1986).

In the interwar period the turning points of the Norwegian economy, as represented by the new industrial production index, coincide well with those of her trading partners. All peaks and troughs are within 5 months of those abroad. In the four cycles of the interwar period peaks of economic activity in Norway lagged the peaks abroad by 1.5 months; for troughs the average lag is 2 months. Although the timing is well synchronized, the ranking of the severity of the various cycles differ substantially from that experienced abroad. The evidence discussed in Klovland (1998) points to the 'gold standard depression' in 1925 - 1927 being relatively deeper in Norway than in the sample of 14 trading partners, while the Great Depression of the early 1930s was relatively milder.[63]

No other cycle in the twentieth century has attracted more attention than the Great Depression starting in the autumn of 1929. The peak in Norway selected by the Bry and Boschan (1971) algorithm is June 1929, which coincides exactly with the peak of the trading partners. A special feature of the Norwegian cycle is that output did not fall much once the peak was reached; after a weaker period in the final quarter of 1929 industrial production activity continued to show considerable buoyancy in the first half of 1930. The course of the cycle is nearly characterized by twin peaks, one in the summer of 1929 and one in May 1930, but the former peak is somewhat higher. This feature was duly recognized by Gjermoe (1951), who attributed the relative late impact of depressive impulses in Norway to favourable conditions in several export industries in this period. The significant increase in the production capacity of the electrochemical industry, the existence of long-term sales contracts in the pulp and paper industry as well as a greater decline in raw materials prices than in prices of manufactured goods in general may have contributed to this.

The location of the trough of the Great Depression is somewhat more ambiguous. The Bry and Boschan (1971) algorithm identifies troughs in September 1931 and January 1934, with a peak in between in July 1932. Manufacturing output was severely affected by the six-month labour dispute lasting from the spring to the autumn of 1931. The temporary rebound of production in the autumn of 1931 is presumably caused by a belated effectuation of old orders, not representing a genuine turning point of the cycle. The weak cycle lasting from a peak in July 1932 to a trough in January 1934 suggested by the Bry-Boschan method was discarded because it most probably reflects various distortions to manufacturing output in this period caused by water shortage leading to problems with the supply of electricity and production cutbacks in several export industries as well as the influence of labour conflicts. This decision is fully supported by the contemporary assessment of business cycle situation and the detailed and incisive analysis in Gjermoe (1951). The depression in Norway is thus judged to have ended in December 1932, in line with Gjermoe (1951), 5 months later than abroad.

The 1937-1938 recession is not deep, but nevertheless quite marked in the data series for Norway. The turning points are nearly identical to those of the trading partners. The output level did not change much between October 1939 and March 1940, but there is a slightly higher output figure for December 1939, which is associated with the peak. The very significant decline in output following the German occupation in April 1940 is disregarded here, just as the minor cycle with a peak in June 1943 suggested by he Bry-Boschan algorithm. The whole of WWII is consequently viewed as years of recession. The definite trough is located at May 1945, the month of the liberation. No further cycles are evident in our sample ending in December 1948.

[63]The phrase 'gold standard depression' was used by Lester (1937) in his discussion of the output effects of the contractive monetary policy pursued by Denmark and Norway from about 1924, which led to the restoration of the gold standard in 1927 and 1928 in these two countries, respectively.

7 Some concluding remarks

The new time series for industrial production in Norway which have been presented here hardly alter the established view of the secular growth of manufacturing and mining industries in any fundamental way. But, hopefully, these data will contribute to a wider coverage and sharper measurement of trends and cycles in industrial production in the first half of the twentieth century. Beginning with the new industry classification launched in 1949 index numbers of industrial output are available from Statistics Norway on a more disaggregated level than for previous years and the methods of construction underlying these series were much improved.

Venneslan (2008) claimed that the existing industrial production index compiled by Statistics Norway was biased towards showing too low growth rates in the decades prior to WWI. The new index presented here basically corroborates this tendency at the aggregate level. But looking at the individual manufacturing groups there is often quite large divergences between the time pattern of the indices for the early years. This no doubt reflects the rather weak basis for quantifying output in many industries before the annual production statistics began in 1927. The new index reflects as far as possible the specific output series that do exist for individual industries. In accordance with most other studies value added at factor cost is used to weigh the individual industry indices together, and in line with modern index theory weights are updated annually. The retention of the 1938 weights for the whole wartime period and through 1948, which was a concern voiced by Statistics Norway in the first prewar years, is thus a feature that is dispensed with here. Another extension that may help identifying the most likely trend rate of growth of output is the use of newly constructed price indices in Klovland (2013), which may help convert the nominal output figures in Statistics Norway (1915) and Statistics Norway (1922) into real output, on which the estimated mean rates of productivity growth and output indices are based.

In the interwar years both cycles and trends in the new index are in general closer to the Statistics Norway indices than to those recently estimated by Venneslan (2007). However, there are some interesting discrepancies between the new index and the partly reconstructed index based on the data in Stoltz (1955), which is labeled SSB2 here. The new index points to a weaker output growth from the end of WWI to the middle of the 1920s, thereafter a stronger growth to the peak, which according to the new monthly index was located at June 1929. The other annual indices, including Venneslan (2007), produce a relatively higher output level in 1930 than in 1929, which may be somewhat misleading with respect to the determination of the business cycle peak.

Another noteworthy feature is a higher growth rate in the new index in the 1930s, in particular the second half of the decade. Because the Statistics Norway index was constructed as a quantity index with a fixed basket of representative goods there is an underlying downward bias in the calculated index because of the proliferation of 'new goods' not included in the basket. This was duly recognized by Statistics Norway in the early 1950s.[64] This bias was never corrected in the aggregate Statistics Norway index, although revised index numbers for individual industries were published in Stoltz (1955) and Statistics Norway (1959). The unrevised index calculations for the 1930s were also fed into the national accounts constructed in the early 1950s, assuming that net domestic product in manufacturing grew in strict proportion to the index number of gross output.[65] According to the new index tabulated here the average annual growth rate of industrial output in the 1930s was 0.8 per cent higher than the Statistics Norway index shows. This discrepancy is not very large, but perhaps, large enough, for some to view

[64] Brenna (1951), Statistics Norway (1959, p. 29).

[65] Statistics Norway (1952, p. 280). Note also the equivalence of the indices referred to as SSB1 and SSB2 in the graphs for individual industry groups in the 1930s presented here.

the performance of the manufacturing industry in the 1930s in a slightly different light.

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Data appendix

In this appendix the industry classification is specified with reference to the two main sources used: (1) the annual production statistics beginning in 1927, *Norges Industri*, referred to as **NI** and (2) the data on man-hours by industry collected by *Riksforsikringsanstalten (National Insurance Institution)*, referred to as **RTV**. The latter source was published annually by Statistics Norway as *(Rigsforsikringsanstaltens) Industristatistikk* 1896-1918 and 1921-1922, thereafter as *Norges Industri*. For the years 1919 and 1920 a slightly less comprehensive tabulation of these data can be found in *Ulykkesforsikringen for Industriarbeidere*.

For each of the 45 industries the underlying sector numbers are given for the 1929 volume of NI as well as the 1916 and 1929 volumes of RTV. In the latter source there were frequent changes in classifications and sector numbers. The changes in the years 1900, 1910 and, in particular, 1922 were extensive. An accurate tracking of a particular industry backwards is not always feasible; the most important cases are noted below.

Unpublished data for the years 1929-1948 in the National Archives of Norway have been extracted for several industries. In general these sources were supplemented by data series published in *Statistiske Meddelelser*, Statistics Norway (1949), Statistics Norway (1969) and *Statistisk Årbok for Norge*. Other important sources used for a particular industry are noted specifically below.

For each industry it is indicated in square brackets whether it belongs to export [EXPR] or home [HOME] industries as well as consumers' goods [CONS] or producers' goods [PROD] industries. The home industries are further divided into import competing [HOME-I] and sheltered [HOME-S] industries. The criterion for classifying an industry as an export industry is that at least 25 per cent of its output value was exported in 1929; import competing industries are those where the value of imported goods represent at least 25 per cent of domestic output. See also the classification listed in *Statistiske Meddelelser* 1937, p. 458.

Table A1 gives the annual index number of real gross output for 44 industries. These are aggregated to 13 groups of industries by annually updated weights representing previous year's value added at factor cost, shown in Table A2. Table A3 contains output indices at the most aggregated level. In Table A4 the value added shares of each of the 45 industries are shown. Table A5 contains labour productivity indices for industry groups and main aggregates. Monthly indices of gross output for the main aggregates can be found in Table A6. Monthly indices have been constructed for each of the 45 industries but are not printed here.

1-12 FOODSTUFFS, BEVERAGES AND TOBACCO

1 HER Canning [EXPR, CONS]

NI 1929 XII-e
RTV 1929 XII-10
RTV 1916 XII-172,173
Note: Data on deliveries of sprat and herring (brisling, småsild, mussa, storsild, fetsild) to canning factories were combined with Statistics Norway (1915) and Statistics Norway (1922) to estimate annual index numbers 1909 - 1927. The source is the weekly journal *Fiskets Gang*. Weekly data 1909-1939 from the main fishing waters from the same source were aggregated to monthly totals and used as related series to estimate monthly index numbers.

2 HER Slaughtering [HOME-S, CONS]

NI 1929 Not included in NI until 1951
RTV 1929 XII-9

RTV 1916 XII-174
Note: Annual data on the number of animals registered as controlled slaughtering were combined with estimates of carcass weights (horses, cattle, pigs, sheep, goats, suckling calves and fattened calves). Beginning 1932 monthly data on controlled slaughtering exist. Information on carcass weights was found in the Veterinary Statistics (*NOS Veterinærvesenet*). An output index computed from these sources were linked to benchmark output figures in 1909 and 1951.

3 MAR Manufacture of margarine [HOME-S, CONS]

NI 1929 XII-d
RTV 1929 XII-8
RTV 1916 XII-178,179
Note: Annual output data on margarine, which is virtually the only product of this industry, can be found from 1903 onwards in Bugge (1985).

4 MEI Dairies [HOME-S, CONS]

NI 1929 Not included in NI until 1958
RTV 1929 XII-6
RTV 1916 XII-177
Note: Monthly output series for cheese and butter can be found in *Statistiske Meddelelser* beginning 1925; annual figures in *NOS Meieribruket*. Before this decadal and quinquennial output data for broad categories of cheese and butter are available from the Agricultural Statistics *(Jordbruk og Fedrift 1896-1920, Jordbruksstatistikk 1924)*.

5 MOL Grain mills [HOME-I, CONS]

NI 1929 XII-a
RTV 1929 XII-1,2
RTV 1916 XII-166,167

6 BAK Bakeries [HOME-S, CONS]

NI 1929 Not included in NI until 1950
RTV 1929 XII-4
RTV 1916 XII-168
Note: No useful output data exist for this industry. The output index was crudely estimated from man-hours adjusted for productivity growth, which was set equal to the average of productivity series for grain mills, chocolate factories, manufacture of tobacco and other food industries.

7 KJK Manufacture of biscuits [HOME-S, CONS]

NI 1929 XII-c
RTV 1929 XII-5
RTV 1916 XII-171

8 SJO Manufacture of chocolate and candy [HOME-S, CONS]

NI 1929 XII-j
RTV 1929 XII-16,17
RTV 1916 XII-169,170

9 AFD Manufacture of other foodstuffs [EXPR, CONS]

NI 1929 XII-b,i,l
RTV 1929 XII-3,7,12,15,19
RTV 1916 XII-175,176,182,185,186,187,188
Note: This sector comprises the manufacture of condensed milk, potato flour, fruit juice, jam, vinegar and yeast and. Condensed milk was to a large extent sold abroad before WWI, but on a somewhat smaller scale in interwar years.

10 BRV Manufacture of spirits [HOME-I, CONS]

NI 1929 XII-f
RTV 1929 XII-11
RTV 1916 XII-180

11 BRV Breweries and manufacture of mineral water [HOME-S, CONS]

NI 1929 XII-g,h
RTV 1929 XII-13,14
RTV 1916 XII-181,183,184

12 TOB Manufacture of tobacco [HOME-S, CONS]

NI 1929 XII-k
RTV 1929 XII-18
RTV 1916 XII-189

13 TEXTILES

13 TEK Manufacture of textiles [HOME-I, CONS]

NI 1929 X-a to X-f
RTV 1929 X-1 to 13
RTV 1916 IX-105 to 120
Note: Manufactures of artificial silk, which were transferred from NI sector IV-f (chemicals) to X (textiles) in 1944, is retained in industry 29 KJT (corresponding to IV-f) throughout 1948.

14-15 CLOTHING AND FOOTWEAR

14 KON Manufacture of clothing and wearing apparel [HOME-I, CONS]

NI 1929 XI-b,c,d,e
RTV 1929 XI-2 to 8
RTV 1916 XIII-190 to 195; XIII-197

15 SKO Manufacture of footwear [HOME-I, CONS]

NI 1929 XI-a
RTV 1929 XI-1
RTV 1916 XIII-196

16-18 LEATHER AND RUBBER PRODUCTS

16 GAR Tanneries [HOME-I, PROD]

NI 1929 IX-a
RTV 1929 IX-2
RTV 1916 X-129

17 LRV Manufacture of leather goods and machine belting [HOME-I, CONS]

NI 1929 IX-b
RTV 1929 IX-3,4
RTV 1916 X-131,132,133

18 GUM Manufacture of rubber goods [HOME-I, CONS]

NI 1929 IX-c
RTV 1929 IX-5
RTV 1916 X-134,135,136

19-20 WOOD PRODUCTS AND FURNITURE

19 SAG Saw mills [EXPR, PROD]

NI 1929 VII-a
RTV 1929 VII-1 to 4
RTV 1916 XI-137 to 145

20 MOB Manufacture furniture and other wooden goods [HOME-I, CONS]

NI 1929 VII-b to h
RTV 1929 VII-5 to 16
RTV 1916 XI-146 to 165

21-24 PULP AND PAPER

21 TRM Manufacture of mechanical wood pulp [EXPR, PROD]

NI 1929 VIII-a
RTV 1929 VIII-1
RTV 1916 X-122

22 CEL Manufacture of chemical wood pulp [EXPR, PROD]

NI 1929 VIII-b
RTV 1929 VIII-2
RTV 1916 X-121

23 PPP Manufacture of paper [EXPR, CONS]

NI 1929 VIII-c
RTV 1929 VIII-3
RTV 1916 X-123

24 PPV Manufacture of paper products [HOME-I, CONS]

NI 1929 VIII-d
RTV 1929 VIII-4 to 6
RTV 1916 X-124 to 128
Note: The distribution of bookbinding between 24 PAP and 25 GRA is uncertain before 1927. Changes in industry classification in 1900 and 1910 may affect the index numbers.

25 PRINTING

25 GRA Printing and allied industries [HOME-S, CONS]

NI 1929 XIII-a,b,c
RTV 1929 XIII-1 to 3
RTV 1916 V-61; XV-239
Note: The distribution of bookbinding between 24 PAP and 25 GRA is uncertain before 1927. Changes in industry classification in 1900 and 1910 may affect the index numbers.

26-30 CHEMICALS

26 FEX Manufacture of matches and explosives [EXPR, CONS]

NI 1929 IV-a
RTV 1929 IV-1,2
RTV 1916 VII-89,90

27 FRT Manufacture of paints, varnishes and tar products [HOME-I, CONS]

NI 1929 IV-b,c
RTV 1929 IV-3,4
RTV 1916 VII-85,86,88

28 KJL Manufacture of light chemicals [HOME-I, CONS]

NI 1929 IV-d,e
RTV 1929 IV-5,6
RTV 1916 VII-80,84,87,92; VIII-99
Note: The products include pharmaceuticals, glue, polishes, detergents and sundry consumers' goods.

29 KJT Manufacture of heavy chemicals [HOME-I, PROD]

NI 1929 IV-f
RTV 1929 IV-7
RTV 1916 VII-79
Note: The products include compressed gases, sulphuric acid, phosphates, iodine, potash and other heavy chemicals. See also notes to 13 TEK.

30 ELK Manufacture of electrochemicals [EXPR, PROD]

NI 1929 IV-g
RTV 1929 IV-8,9
RTV 1916 VII-81,82,83

31-33 ORES AND BASIC METALS

31 ORE Metal mining [EXPR, PROD]

NI 1929 I-a
RTV 1929 I-1
RTV 1916 IV-47 to 50

32 BME Basic metal industries [EXPR, PROD]

NI 1929 I-b
RTV 1929 I-2
RTV 1916 IV-51

33 KUL Coal mining [HOME-I, CONS]

Note: Coal mining was not included in NI until 1950. All data are taken from *NOS Norges Bergverk*.

34-37 STONE, CEMENT AND GLASS

34 STB Stone and mineral quarrying, manufactures of stone [EXPR, PROD]

NI 1929 II-a,b,c,d
RTV 1929 II-3,4,5,7,8,10,11
RTV 1916 III-22,23,25 to 28,33,34,43; IV-45,46

35 CEM Cement factories [EXPR, PROD]

NI 1929 II-e
RTV 1929 II-12
RTV 1916 III-31

36 MUR Manufacture of cement products and bricks [HOME-S, PROD]

NI 1929 II-f,g
RTV 1929 II-13,14,15
RTV 1916 III-32,35 to 38, 40

37 GLA Manufacture of glass products and earthenware [HOME-I, CONS]

NI 1929 II-h,i
RTV 1929 II-16,17
RTV 1916 III-39,44

38-41 METAL PRODUCTS, MACHINERY AND TRANSPORT EQUIPMENT

38 MMA Manufacture of metal products and machinery [HOME-I, PROD]

NI 1929 III-a,b,c,f,g,h,i
RTV 1929 III-1 to 7, 10,11,12, 15 to 18
RTV 1916 V-53 to 60,62,63,64; VI-65 to 68, 71 to 75

39 SKB Building and repairing of ships [EXPR, PROD]

NI 1929 III-d
RTV 1929 III-8,9
RTV 1916 VI-69,70

40 EMA Manufacture of electrical machinery and equipment [HOME-I, CONS]

NI 1929 III-e
RTV 1929 III-13
RTV 1916 VI-76,77

41 GSM Manufacture of gold and silver products, music instruments [HOME-I, CONS]

NI 1929 III-j,k
RTV 1929 III-14,20
RTV 1916 V-52; VI-78

42-44 OILS AND FATS

42 TRA Manufacture of fish-oil, herring meal and guano [EXPR, PROD]

NI 1929 V-a,b
RTV 1929 V-1,2,3,6
RTV 1916 VII-91,93,94; VIII-98,100
Note: Annual output data on fish-oil were taken from *NOS Norges Fiskerier*. Export figures were used as a supplement throughout the sample period. Employment figures were adjusted accordingly, but must be considered as uncertain.

43 FAT Manufacture of hardened whale fats, vegetable oils and petroleum products [EXPR, PROD]

NI 1929 V-c
RTV 1929 V-4
RTV 1916 VII-97,101

44 SOP Manufacture of soap [HOME-S, CONS]

NI 1929 V-d
RTV 1929 V-5
RTV 1916 VII-95,102,103

45 GAS

45 GAS Manufacture of gas, coke and coal tar [HOME-S, CONS]

NI 1929 VI
RTV 1929 VI-3
RTV 1916 VII-96
Note: The RTV-data before 1922 only comprise the privately owned gas companies. Estimates of man-hours and labour productivity are uncertain before 1922.

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	1 **HER**	2 **SLA**	3 **MAR**	4 **MEI**	5 **MOL**	6 **BAK**	7 **KJK**	8 **SJO**	9 **AFD**	10 **BRV**	11 **OEL**	12 **TOB**
1896	3.7	46.4	23.6	40.9	77.9	19.0	28.2	6.8	26.5	118.9	80.5	29.5
1897	6.3	50.1	26.0	47.5	76.2	20.6	29.6	10.0	34.3	150.5	89.6	31.2
1898	6.7	50.9	29.2	54.0	77.6	23.3	33.3	13.2	38.2	173.4	105.7	35.1
1899	7.8	56.2	34.4	59.0	79.8	25.5	35.6	16.3	42.4	165.6	116.5	37.4
1900	10.9	56.3	38.3	62.8	76.2	27.7	37.5	13.3	39.4	138.8	113.9	37.2
1901	9.4	50.7	39.3	63.9	80.2	28.2	44.4	16.0	41.9	154.9	106.5	37.4
1902	9.4	54.9	41.1	66.4	78.5	30.9	50.0	17.7	48.9	157.8	99.6	36.7
1903	10.2	53.0	40.9	65.0	86.6	31.0	50.1	20.4	54.6	153.8	84.0	37.7
1904	12.1	56.4	42.4	64.8	82.5	31.1	50.2	22.3	55.0	166.4	80.4	37.3
1905	16.1	53.9	42.6	66.3	81.6	33.6	47.6	22.3	60.6	146.1	81.9	40.0
1906	19.0	56.7	45.4	65.9	86.3	33.8	51.9	26.6	61.5	174.0	81.4	43.2
1907	24.2	57.7	46.4	69.0	86.8	38.1	52.0	28.8	63.4	119.3	82.8	46.8
1908	29.1	60.4	47.8	70.0	91.8	40.7	51.7	33.1	71.1	88.4	84.1	50.2
1909	32.2	64.2	46.4	74.4	92.1	43.4	58.8	37.6	71.7	41.5	89.3	52.0
1910	38.3	68.4	50.1	77.1	89.0	47.9	71.0	43.6	77.4	53.8	90.0	53.4
1911	48.3	75.3	51.0	79.3	90.9	51.8	76.3	52.0	87.1	43.9	96.4	56.7
1912	58.0	72.8	55.5	75.6	86.7	56.1	79.3	69.3	90.6	76.6	100.8	59.3
1913	58.7	68.6	57.6	75.1	87.7	61.8	82.8	65.8	92.3	132.2	98.1	64.0
1914	71.2	75.6	58.6	74.9	90.9	61.3	94.7	68.0	94.5	138.4	104.2	62.2
1915	88.6	79.5	68.1	69.1	89.3	65.8	110.5	77.4	99.4	86.0	98.5	76.9
1916	90.4	60.8	74.0	71.5	94.6	71.8	118.8	95.2	99.0	128.7	117.1	86.6
1917	71.4	75.3	66.8	58.5	71.8	59.1	114.0	77.5	103.7	60.8	104.8	84.3
1918	39.7	67.0	50.9	47.8	66.6	44.8	92.5	47.7	82.5	21.1	79.8	76.6
1919	36.8	63.3	67.2	57.2	80.8	58.6	100.8	68.9	84.3	100.9	110.2	97.6
1920	40.1	78.6	68.9	60.8	80.4	58.2	120.2	99.4	92.4	116.8	158.0	87.5
1921	32.8	79.0	70.4	54.1	74.7	61.0	103.7	110.0	83.2	64.0	151.7	69.2
1922	44.1	86.2	75.4	64.8	88.8	72.9	137.1	114.7	99.5	59.0	153.6	80.0
1923	37.4	96.4	82.7	66.9	93.3	82.5	145.3	106.3	105.6	43.9	147.6	82.8
1924	105.5	93.1	90.4	71.7	95.8	85.3	150.0	98.0	109.6	40.9	133.8	81.3
1925	54.6	80.7	93.4	83.0	98.4	96.8	128.2	102.4	115.8	41.0	137.1	91.2
1926	60.7	89.5	90.3	84.9	104.0	93.4	116.6	96.5	106.3	49.8	123.2	92.9
1927	81.8	97.9	91.2	93.8	105.2	95.0	84.8	95.5	96.4	79.9	108.3	94.1
1928	63.0	100.6	98.3	93.2	102.7	98.0	85.8	95.4	101.8	71.0	100.0	95.5
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	38.6	103.7	99.9	105.9	113.7	109.9	104.9	99.6	98.8	105.1	101.8	106.3
1931	51.0	112.5	100.3	131.9	129.5	120.2	111.7	103.4	86.5	74.6	83.0	97.2
1932	80.8	114.9	102.0	149.1	128.0	118.8	111.8	108.6	85.6	76.0	84.4	98.7
1933	68.8	123.6	102.8	162.0	134.5	115.9	128.4	99.3	82.7	78.3	78.9	98.0
1934	51.1	120.7	106.3	172.5	139.8	124.7	164.5	112.4	79.4	81.8	80.0	102.2
1935	70.7	117.1	110.1	176.3	148.9	134.4	173.3	122.7	94.9	83.3	83.4	105.8
1936	77.0	119.8	116.8	209.5	149.6	131.6	193.1	137.4	98.0	93.5	93.3	112.9
1937	80.8	118.3	115.0	217.9	145.5	137.2	206.5	140.8	114.6	109.2	103.0	122.8
1938	73.5	117.4	119.9	246.5	146.5	141.3	213.9	159.5	110.6	98.9	104.2	124.8
1939	74.6	123.4	126.0	275.4	153.2	150.9	236.1	174.2	117.7	97.2	112.0	134.0

HER = canning, SLA = slaughtering, MAR = manufacture of margarine,
MEI = dairies, MOL = grain mills, BAK = bakeries,
KJK = manufacture of biscuits, SJO = manufacture of chocolate, AFD = other food industries,
BRV = production of spirits, OEL = breweries, TOB = manufacture of tobacco,

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	1 **HER**	2 **SLA**	3 **MAR**	4 **MEI**	5 **MOL**	6 **BAK**	7 **KJK**	8 **SJO**	9 **AFD**	10 **BRV**	11 **OEL**	12 **TOB**
1940	77.4	114.1	109.9	212.6	119.1	146.3	269.6	150.5	120.1	86.7	129.0	144.3
1941	66.2	31.9	88.8	146.2	87.3	132.1	326.9	125.3	130.9	97.2	148.9	106.9
1942	51.9	31.1	52.5	150.7	73.0	110.7	357.0	75.3	121.0	114.6	139.1	87.6
1943	47.5	26.0	57.6	115.3	93.5	114.8	380.2	40.7	134.3	183.8	142.1	74.2
1944	43.8	22.6	50.8	84.9	90.7	105.4	354.1	33.0	118.1	167.2	139.8	67.4
1945	48.5	30.0	56.3	59.0	98.7	126.4	247.6	45.1	113.7	192.6	122.0	98.5
1946	62.8	59.8	116.3	117.0	130.1	211.3	384.2	124.1	216.8	177.1	153.7	177.3
1947	88.9	78.2	136.4	144.6	136.7	229.9	457.6	147.7	236.3	181.8	157.4	202.7
1948	99.7	53.1	169.1	168.0	147.6	252.8	595.0	155.9	283.7	171.1	148.1	203.2

HER = canning, SLA = slaughtering, MAR = manufacture of margarine,
MEI = dairies, MOL = grain mills, BAK = bakeries,
KJK = manufacture of biscuits, SJO = manufacture of chocolate, AFD = other food industries,
BRV = production of spirits, OEL = breweries, TOB = manufacture of tobacco,

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	13 **TEK**	14 **KON**	15 **SKO**	16 **GAR**	17 **LRV**	18 **GUM**	19 **SAG**	20 **MOB**	21 **TRM**	22 **CEL**	23 **PPP**	24 **PPV**
1896	45.5	1.7	4.1	71.3	0.6	2.3	126.0	9.8	35.2	14.6	11.0	17.2
1897	46.6	2.3	6.2	68.8	0.9	2.4	144.2	11.1	36.1	17.4	12.5	18.9
1898	49.4	3.1	14.5	67.3	0.9	6.7	146.6	15.6	41.4	18.3	12.9	24.8
1899	51.4	4.2	25.4	71.2	1.3	10.8	146.6	19.9	45.0	19.1	13.9	25.9
1900	52.6	6.8	22.8	77.7	1.1	8.8	163.9	20.8	44.8	27.1	15.0	25.8
1901	54.8	6.8	22.4	81.5	0.9	12.5	159.7	19.8	49.1	26.6	15.2	25.8
1902	55.1	8.2	20.6	73.1	2.2	11.7	146.5	19.8	53.7	25.4	15.4	26.7
1903	56.2	7.1	21.0	71.8	6.4	7.7	157.2	20.5	51.8	25.5	16.4	29.8
1904	57.0	9.0	24.9	66.2	7.5	11.6	149.0	20.6	50.2	27.9	18.5	31.1
1905	62.4	11.7	31.3	72.0	8.4	16.2	140.8	22.0	53.7	32.7	24.2	36.8
1906	69.7	14.8	33.1	72.0	10.8	16.5	155.0	23.7	54.3	37.9	27.3	44.4
1907	74.2	16.6	37.9	76.7	14.4	14.7	164.6	26.4	56.3	37.5	27.8	49.8
1908	76.5	17.4	46.2	81.7	17.8	21.2	140.6	29.3	64.0	49.0	31.8	55.9
1909	79.3	19.4	55.9	84.3	20.7	15.8	141.0	32.9	69.4	49.3	35.6	57.7
1910	83.8	24.9	62.4	85.6	27.0	20.6	156.8	37.9	68.3	53.6	40.2	61.0
1911	87.7	28.9	66.7	82.7	35.4	26.6	156.2	41.6	63.3	49.3	38.5	65.6
1912	91.9	34.2	76.2	81.4	40.1	28.1	161.6	43.5	69.1	66.2	44.9	70.0
1913	98.6	38.8	80.3	79.0	47.4	33.5	157.5	46.9	73.7	71.6	53.5	75.0
1914	97.6	40.8	82.0	76.6	49.9	26.7	152.5	49.7	69.1	75.3	53.5	76.7
1915	102.2	49.0	84.1	89.9	67.0	41.9	144.9	61.3	71.2	76.9	60.8	78.0
1916	108.3	57.3	88.3	92.9	83.1	41.1	164.5	83.3	75.2	73.5	61.1	83.2
1917	94.7	60.7	85.1	92.2	96.1	28.5	152.2	83.1	54.4	50.3	28.8	79.0
1918	79.5	55.0	87.4	108.9	87.0	23.1	149.4	80.6	56.0	51.5	38.3	76.7
1919	88.7	66.0	87.7	112.0	96.3	20.6	138.7	82.9	64.6	48.2	36.6	78.8
1920	83.7	70.0	97.9	104.6	91.4	24.6	129.3	72.8	68.4	71.5	58.9	79.5
1921	57.9	37.0	82.5	88.2	62.4	37.6	86.2	52.9	44.3	34.1	25.2	61.4
1922	81.8	63.6	91.6	96.4	71.2	43.9	105.2	62.7	65.4	65.4	60.8	71.3
1923	86.1	75.1	95.2	108.3	79.5	51.0	108.4	77.9	70.9	76.9	63.2	69.4
1924	88.1	77.7	97.9	125.8	87.0	75.8	124.9	86.4	70.7	64.0	59.9	75.4
1925	91.1	79.8	117.2	127.6	78.7	99.2	121.4	88.1	87.5	87.6	79.8	74.0
1926	80.2	80.2	84.8	94.3	91.9	80.1	95.3	76.7	85.4	77.7	72.0	68.9
1927	84.7	85.4	87.4	97.8	101.3	80.7	84.0	82.1	87.3	87.6	88.4	71.5
1928	88.6	88.4	98.3	106.9	100.6	89.3	101.7	89.2	93.4	92.4	91.1	85.1
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	108.1	98.0	118.9	116.0	94.5	101.5	91.9	109.1	99.8	96.7	92.8	106.0
1931	93.6	86.8	86.1	100.3	70.6	110.6	73.6	97.1	69.0	45.7	56.7	107.8
1932	120.2	92.4	109.9	119.5	81.3	130.0	70.3	109.0	94.4	97.8	93.7	126.9
1933	121.3	92.3	111.5	118.2	84.6	119.9	66.8	109.1	90.4	94.2	90.7	137.6
1934	132.7	97.4	119.1	124.3	92.1	142.7	77.4	112.5	105.3	107.2	95.5	143.5
1935	135.8	108.2	128.9	126.3	104.6	203.2	83.3	139.4	77.9	110.6	106.6	160.1
1936	143.3	124.7	132.5	130.0	123.7	239.3	83.2	151.0	95.3	121.3	108.3	177.4
1937	154.7	135.1	141.9	146.0	161.6	247.6	93.5	150.2	106.3	136.6	118.4	163.6
1938	138.3	128.9	139.3	129.2	153.1	212.8	93.3	150.0	86.9	114.2	90.9	169.7
1939	158.0	141.7	149.3	137.4	163.3	253.6	99.2	169.0	91.8	123.3	119.4	222.4

TEK = manufacture of textiles, KON = clothing, SKO = manufacture of footwear,
GAR = tanneries, LRV = manufacture of leather goods,
GUM = manufacture of rubber goods, SAG = saw mills,
MOB = manufacture of furniture and wooden goods,
TRM = manufacture of mechanical wood pulp, CEL = manufacture of chemical pulp,
PPP = manufacture of paper, PPV = manufacture of paper goods

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	13 **TEK**	14 **KON**	15 **SKO**	16 **GAR**	17 **LRV**	18 **GUM**	19 **SAG**	20 **MOB**	21 **TRM**	22 **CEL**	23 **PPP**	24 **PPV**
1940	138.0	129.6	158.0	146.6	144.7	191.8	116.6	193.9	34.9	101.0	89.6	172.2
1941	97.8	122.0	110.0	122.4	129.1	166.7	123.1	214.5	39.1	95.5	80.2	286.9
1942	90.2	93.8	73.8	90.6	104.6	175.8	100.1	211.3	32.9	79.5	61.4	339.0
1943	97.8	85.6	84.1	98.9	88.3	168.8	75.0	194.6	25.1	71.1	53.2	315.2
1944	95.0	103.1	100.7	85.1	80.0	207.2	64.2	167.6	14.8	58.1	51.0	294.8
1945	84.5	74.1	88.8	90.6	77.4	134.6	50.2	146.8	20.6	39.0	43.1	253.9
1946	134.7	131.5	151.5	169.6	141.8	290.8	78.8	176.1	54.8	60.6	101.3	291.2
1947	163.6	170.2	169.1	215.7	193.0	377.9	92.9	216.0	60.8	82.8	122.8	432.3
1948	192.9	200.7	204.9	260.2	221.4	476.1	101.4	235.7	85.3	99.9	128.9	462.5

TEK = manufacture of textiles, KON = clothing, SKO = manufacture of footwear,
GAR = tanneries, LRV = manufacture of leather goods,
GUM = manufacture of rubber goods, SAG = saw mills,
MOB = manufacture of furniture and wooden goods,
TRM = manufacture of mechanical wood pulp, CEL = manufacture of chemical pulp,
PPP = manufacture of paper, PPV = manufacture of paper goods

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	25 **GRA**	26 **FEX**	27 **FRT**	28 **KJL**	29 **KJT**	30 **ELK**	31 **ORE**	32 **BME**	33 **KUL**	34 **STB**	35 **CEM**	36 **MUR**
1896	35.6	16.9	12.6	8.7	6.8	0.0	8.6	1.6	0.0	46.1	3.9	40.3
1897	40.0	16.0	14.4	9.3	7.4	0.0	10.2	1.6	0.0	56.4	4.7	47.5
1898	45.2	18.3	14.4	10.3	9.4	0.0	11.0	1.4	0.0	64.7	5.8	65.0
1899	47.8	19.1	17.6	14.1	12.0	0.4	12.1	1.8	0.0	78.4	6.2	76.5
1900	45.8	19.5	16.2	11.4	13.1	0.4	13.2	1.8	0.0	78.4	7.2	46.1
1901	46.3	20.9	17.2	12.2	15.1	0.6	13.1	1.7	0.0	89.6	4.9	36.9
1902	48.4	23.2	16.6	12.8	14.9	0.9	15.5	2.2	0.0	81.7	5.4	45.4
1903	48.7	27.4	17.9	14.8	16.2	1.3	15.7	2.4	0.0	79.8	7.9	45.7
1904	48.6	29.5	17.9	17.3	19.7	1.3	16.2	3.2	0.0	84.2	7.6	46.2
1905	49.3	33.7	24.1	18.1	19.3	2.1	18.4	2.6	0.0	87.6	8.4	45.9
1906	51.8	35.3	22.1	21.7	23.2	2.9	20.7	3.1	0.0	94.8	10.1	46.1
1907	56.3	38.4	23.7	23.8	23.4	5.7	25.2	4.1	0.6	88.3	11.1	48.3
1908	60.3	45.3	24.4	28.7	28.1	10.1	26.5	3.1	2.4	99.3	4.0	50.2
1909	64.2	48.5	25.0	32.3	30.0	14.8	26.0	4.3	1.6	103.5	7.8	55.4
1910	63.8	54.3	35.5	37.4	22.4	17.7	31.6	7.7	1.8	109.0	23.4	59.2
1911	67.7	57.0	25.8	43.1	22.3	22.2	37.2	11.6	8.8	117.9	28.8	69.6
1912	71.2	58.0	28.9	50.0	22.4	37.6	53.1	13.3	9.4	119.8	32.1	82.3
1913	76.2	60.1	40.7	52.4	22.1	49.9	58.1	18.5	13.1	127.8	38.4	88.0
1914	80.1	57.2	40.2	60.8	21.9	55.9	60.2	25.3	15.3	120.2	38.4	74.5
1915	80.5	55.5	46.1	69.0	27.5	63.6	68.6	31.0	7.1	91.0	40.7	73.0
1916	83.8	73.9	51.4	80.4	33.9	86.7	42.4	36.2	7.7	80.4	41.8	97.8
1917	78.2	80.0	52.2	82.6	43.6	97.0	43.0	37.6	9.9	76.0	36.1	83.6
1918	84.3	79.7	78.8	94.7	60.1	83.8	36.8	28.0	22.1	79.1	37.9	86.6
1919	83.0	76.2	95.0	97.4	79.9	59.7	32.4	10.8	27.2	66.5	54.9	83.5
1920	72.9	92.0	68.8	79.7	133.9	64.4	29.9	23.6	30.6	56.5	63.6	83.6
1921	66.4	65.2	79.5	74.5	74.6	39.1	21.2	25.9	43.5	50.5	57.6	67.4
1922	75.3	70.6	105.7	84.7	49.8	40.9	40.4	22.7	83.0	47.1	51.9	81.8
1923	82.3	80.2	106.8	78.2	48.8	42.8	52.7	34.7	91.4	57.9	78.7	113.1
1924	83.1	104.0	116.6	90.1	42.9	47.7	57.4	56.7	106.0	74.0	104.7	107.3
1925	90.3	97.1	118.6	95.4	46.8	60.5	66.1	66.4	113.9	77.7	99.1	89.3
1926	86.5	89.6	121.5	99.5	67.1	58.3	56.9	71.9	110.5	59.9	30.9	70.3
1927	87.8	79.0	118.3	94.7	76.6	61.8	68.2	72.0	127.2	75.9	83.8	74.8
1928	93.6	86.5	125.9	100.6	83.9	66.6	84.0	82.3	109.5	95.5	99.0	99.6
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	104.8	92.1	103.2	117.4	102.3	120.2	102.4	112.6	75.0	105.2	100.1	97.7
1931	92.3	67.3	105.3	125.6	65.0	98.0	65.4	98.8	96.8	82.9	68.6	71.6
1932	110.6	61.7	106.5	132.0	97.6	105.5	77.9	98.4	101.7	74.1	73.0	93.0
1933	112.6	71.4	118.8	152.0	105.0	103.9	94.4	105.7	117.2	82.9	69.0	76.0
1934	115.2	71.8	135.4	159.2	110.9	106.6	102.3	116.7	124.9	110.2	77.4	87.2
1935	125.3	88.0	152.4	190.2	116.0	117.4	115.4	123.8	123.0	107.6	82.1	109.9
1936	131.8	86.0	176.8	189.6	116.5	116.7	129.1	137.6	122.9	122.2	93.3	126.1
1937	141.7	105.7	199.5	217.2	131.7	126.0	139.2	158.7	118.1	126.4	99.4	125.9
1938	151.8	97.1	193.7	236.8	173.1	139.4	161.2	175.4	118.9	120.0	102.8	115.3
1939	153.6	107.8	234.4	273.4	196.9	140.6	155.5	183.3	124.0	129.5	121.2	145.3

GRA = printing and allied industries, FEX = manufacture of matches and explosives,
FRT = manufacture of paints, varnishes and tar products,
KJL = manufacture of pharmaceuticals and other light chemicals
KJT = manufacture of compressed gases and other heavy chemicals
ELK = manufacture of electrochemicals, ORE = metal mining,
BME = basic metal industries, KUL = coal mining, STB = stone and mineral quarrying,
CEM = manufacture of cement, MUR = manufacture of cement products and bricks,

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	25 **GRA**	26 **FEX**	27 **FRT**	28 **KJL**	29 **KJT**	30 **ELK**	31 **ORE**	32 **BME**	33 **KUL**	34 **STB**	35 **CEM**	36 **MUR**
1940	114.9	101.7	145.2	238.4	175.7	115.1	96.1	129.0	106.9	90.7	104.8	111.5
1941	153.1	128.5	136.8	263.2	175.6	111.0	101.8	85.1	58.2	126.7	97.0	161.5
1942	162.4	137.2	147.2	278.4	161.5	115.6	81.3	83.7	0.0	139.5	115.9	124.2
1943	135.8	104.8	171.6	257.6	193.2	102.8	73.2	95.2	0.0	129.3	96.5	118.0
1944	146.5	96.6	182.0	278.6	206.3	97.3	72.8	80.2	0.0	91.4	99.3	109.2
1945	143.5	72.3	151.0	231.1	155.4	121.1	26.8	33.7	2.4	59.6	44.0	95.7
1946	176.6	86.0	286.8	293.1	226.7	131.9	42.8	103.5	38.4	85.4	135.3	173.1
1947	187.0	108.6	369.2	375.8	257.8	136.5	58.7	129.6	134.0	100.4	146.6	221.7
1948	196.2	110.7	386.7	433.0	326.9	147.6	64.2	164.2	173.6	108.0	163.2	240.9

GRA = printing and allied industries, FEX = manufacture of matches and explosives,
FRT = manufacture of paints, varnishes and tar products,
KJL = manufacture of pharmaceuticals and other light chemicals
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ELK = manufacture of electrochemicals, ORE = metal mining,
BME = basic metal industries, KUL = coal mining, STB = stone and mineral quarrying,
CEM = manufacture of cement, MUR = manufacture of cement products and bricks,

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	37 **GLA**	38 **MMA**	39 **SKB**	40 **EMA**	41 **GSM**	42 **TRA**	43 **FAT**	44 **SOP**	45 **GAS**
1896	39.2	16.5	29.0	8.1	14.0	41.4	7.5	12.9	37.3
1897	44.3	18.6	32.3	10.0	16.1	52.6	6.5	16.5	40.0
1898	51.1	21.0	37.2	17.7	18.6	44.8	6.8	23.8	42.4
1899	61.9	23.1	42.1	21.6	20.9	46.1	10.5	27.5	45.4
1900	64.2	24.4	42.1	21.4	22.6	35.3	10.2	29.5	46.7
1901	68.2	23.4	47.6	19.8	22.1	42.1	10.3	29.4	47.7
1902	65.7	23.5	50.4	18.5	22.7	32.6	10.0	30.8	48.7
1903	60.9	24.2	51.9	18.2	23.8	14.0	10.2	35.2	49.8
1904	64.0	25.2	53.9	20.9	25.3	21.2	10.5	38.3	51.0
1905	65.6	25.9	53.7	19.9	26.6	26.4	10.0	40.2	51.6
1906	69.8	29.6	57.1	21.9	31.1	29.5	11.0	45.3	52.7
1907	72.4	34.5	63.5	31.2	37.1	27.7	11.1	46.4	55.6
1908	83.2	38.3	63.2	33.5	42.0	34.6	12.5	53.2	59.4
1909	85.5	40.1	52.3	35.3	45.0	38.1	13.1	54.3	63.0
1910	85.6	43.2	55.9	40.8	51.3	38.6	13.6	53.0	66.8
1911	89.5	45.9	55.8	40.3	57.5	42.9	13.6	55.4	73.0
1912	94.8	53.7	64.9	54.5	71.1	50.9	17.2	58.6	84.0
1913	92.1	55.3	63.5	52.6	77.3	45.4	28.7	59.4	97.0
1914	91.1	54.4	61.4	51.4	80.3	67.9	49.3	58.5	103.1
1915	98.4	56.9	62.4	58.0	88.8	60.6	57.8	60.1	109.0
1916	98.2	58.9	59.6	59.2	97.2	44.7	43.5	69.6	118.1
1917	55.6	56.5	63.7	72.4	93.6	9.3	49.5	64.8	124.8
1918	63.2	52.7	64.0	95.0	87.5	15.4	41.1	58.7	129.1
1919	70.5	54.4	69.4	82.7	90.7	37.1	48.0	62.8	124.9
1920	75.7	53.0	67.4	76.4	88.7	64.8	61.7	61.6	114.1
1921	52.4	38.3	49.7	55.2	64.3	55.8	48.7	65.3	106.8
1922	71.5	54.8	44.3	59.7	92.4	52.0	71.1	68.9	115.1
1923	79.7	60.5	52.3	60.6	102.3	52.1	79.9	80.0	116.9
1924	94.1	62.8	52.1	69.5	106.5	56.2	103.0	75.4	112.4
1925	100.7	67.2	64.5	82.9	114.6	50.0	119.1	88.4	107.7
1926	82.0	58.7	51.2	66.6	100.3	84.7	98.3	85.8	98.2
1927	76.6	56.9	43.4	70.9	97.6	68.0	76.4	90.4	95.5
1928	76.8	80.8	62.6	89.2	95.3	76.9	91.5	93.6	103.7
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	106.5	98.4	94.8	103.2	106.6	88.2	104.0	101.0	95.9
1931	85.1	65.6	44.4	76.6	109.8	68.4	89.9	105.7	100.8
1932	91.9	75.9	45.6	114.8	108.6	99.1	105.4	105.9	98.9
1933	80.7	77.6	50.3	110.0	108.8	111.4	111.7	104.7	98.7
1934	94.3	86.3	55.5	143.8	92.9	88.6	109.1	108.4	96.8
1935	109.3	101.2	72.7	170.4	92.1	113.9	126.7	121.9	97.6
1936	113.3	123.0	90.3	211.9	101.4	119.4	137.3	115.7	102.4
1937	148.6	139.3	108.5	239.8	131.6	95.7	147.3	124.3	103.2
1938	121.5	133.9	112.3	255.3	133.7	119.2	149.7	134.2	106.5
1939	146.3	140.5	108.9	274.1	145.5	117.4	139.9	159.2	108.3

GLA = manufacture of glass, clay products and cement,
MMA = manufacture of metal products and machinery, SKB = building and repearing of ships
EMA = manufacture of electrical machinery and equipment,
GSM = manufacture of gold and silver products, music instruments,
TRA = manufacture of fish-oil and meal, FAT = manufacture of whale fats and vegetable oils,
SOP = manufacture of soap, GAS = manufacture of gas, coke and coal tar

Table A1. Annual volume indices of gross output 1896 - 1948 by industry.
1929=100.

Year	37 **GLA**	38 **MMA**	39 **SKB**	40 **EMA**	41 **GSM**	42 **TRA**	43 **FAT**	44 **SOP**	45 **GAS**
1940	144.2	114.5	92.6	253.6	121.6	95.1	75.3	162.4	101.5
1941	144.3	123.3	96.4	242.8	113.0	55.3	43.2	170.6	85.7
1942	102.3	111.6	82.7	205.0	84.9	47.5	34.1	183.2	80.0
1943	111.6	109.5	77.3	164.7	107.0	30.8	38.1	180.8	85.6
1944	122.1	102.8	74.6	136.7	104.4	32.5	31.4	155.7	83.9
1945	99.9	89.4	73.9	111.2	83.0	50.4	29.3	116.2	30.6
1946	141.5	143.0	122.8	212.8	129.4	79.7	95.0	157.1	82.2
1947	152.1	167.3	142.4	321.1	190.2	118.7	141.1	197.7	91.2
1948	170.0	184.1	143.2	372.1	196.2	152.5	188.5	224.0	98.4

GLA = manufacture of glass, clay products and cement,
MMA = manufacture of metal products and machinery, SKB = building and repearing of ships
EMA = manufacture of electrical machinery and equipment,
GSM = manufacture of gold and silver products, music instruments,
TRA = manufacture of fish-oil and meal, FAT = manufacture of whale fats and vegetable oils,
SOP = manufacture of soap, GAS = manufacture of gas, coke and coal tar

Table A2. Annual volume indices of gross output 1896 - 1948 by industry groups.
1929=100.

Year	1 **NAR**	2 **TEK**	3 **BEK**	4 **LAR**	5 **TRE**	6 **PAP**	7 **GRA**	8 **KJM**	9 **MAM**	10 **STN**	11 **MET**	12 **OLJ**
1896	40.2	45.5	2.6	30.3	75.6	17.5	35.6	2.1	4.5	26.3	18.4	24.3
1897	46.2	46.6	3.9	29.5	86.5	19.4	40.0	2.1	5.2	31.4	20.7	29.2
1898	52.2	49.4	7.8	29.9	89.8	21.3	45.2	2.4	5.5	37.4	24.0	27.2
1899	55.3	51.4	13.0	32.8	91.7	22.7	47.8	2.8	6.2	44.5	26.9	30.7
1900	53.6	52.6	13.3	34.9	101.9	25.8	45.8	2.7	6.6	42.0	27.8	26.5
1901	54.2	54.8	13.2	37.5	99.1	26.9	46.3	3.1	6.6	43.3	28.3	29.3
1902	54.7	55.1	13.1	34.2	91.6	27.7	48.4	3.6	7.8	41.9	28.9	25.4
1903	53.7	56.2	12.7	33.3	97.9	27.9	48.7	4.3	8.0	41.6	29.7	16.8
1904	55.1	57.0	15.4	32.7	93.4	29.3	48.6	4.6	8.7	43.2	31.1	22.1
1905	54.4	62.4	19.6	36.8	89.3	34.2	49.3	5.8	9.3	44.5	31.4	25.2
1906	59.0	69.7	22.1	37.5	98.1	37.5	51.8	6.7	10.6	47.5	34.9	28.1
1907	56.3	74.2	25.1	39.7	104.7	38.2	56.3	9.4	13.0	47.3	40.5	27.4
1908	56.0	76.5	29.0	44.7	92.4	45.4	60.3	14.1	13.0	50.6	43.2	32.9
1909	53.1	79.3	34.2	44.5	94.1	48.4	64.2	18.5	13.4	54.0	42.0	35.2
1910	57.4	83.8	40.0	48.3	105.2	51.3	63.8	21.5	17.7	59.9	45.5	35.6
1911	60.9	87.7	44.1	51.3	106.5	48.5	67.7	25.1	22.3	66.0	47.3	38.1
1912	68.2	91.9	51.0	52.3	110.4	57.8	71.2	37.7	30.0	70.7	56.0	45.3
1913	74.7	98.6	55.4	54.8	109.5	64.3	76.2	48.1	34.9	74.5	56.8	51.3
1914	79.0	97.6	57.1	52.0	107.9	64.6	80.1	53.0	39.4	70.0	55.7	78.0
1915	79.8	102.2	62.5	66.3	108.6	68.4	80.5	59.6	46.1	64.5	58.4	80.4
1916	87.7	108.3	68.5	70.8	129.2	68.4	83.8	80.2	37.3	67.2	59.4	61.8
1917	73.7	94.7	68.9	72.1	122.2	44.0	78.2	89.4	38.4	52.8	59.9	33.7
1918	54.3	79.5	67.0	76.4	119.5	48.2	84.3	83.5	31.3	56.1	59.0	32.6
1919	74.0	88.7	72.9	80.0	114.4	47.9	83.0	67.4	20.0	62.3	60.6	44.5
1920	84.3	83.7	79.3	76.2	104.7	64.8	72.9	73.0	24.0	65.5	58.7	61.7
1921	76.8	57.9	53.3	63.8	71.7	34.0	66.4	49.0	22.9	54.6	42.7	53.2
1922	84.8	81.8	73.6	71.4	86.7	63.9	75.3	51.7	31.1	58.5	52.9	63.3
1923	84.7	86.1	82.2	80.4	95.1	69.7	82.3	54.0	42.8	77.2	58.9	69.5
1924	93.2	88.1	84.8	97.1	108.2	64.4	83.1	61.5	57.3	91.2	61.1	79.5
1925	88.8	91.1	92.8	103.6	106.9	83.8	90.3	70.6	66.3	89.2	68.3	85.9
1926	89.0	80.2	81.8	88.7	87.2	76.7	86.5	69.2	66.0	58.5	57.8	90.4
1927	93.9	84.7	86.2	92.7	83.1	87.1	87.8	70.0	71.1	77.5	54.9	76.0
1928	90.8	88.6	92.1	99.0	96.2	91.6	93.6	75.6	83.4	93.4	76.3	86.0
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	95.4	108.1	105.7	104.6	99.6	96.0	104.8	112.7	107.7	102.9	98.1	97.2
1931	93.2	93.6	86.8	95.0	84.4	58.4	92.3	93.3	84.4	78.2	61.6	86.2
1932	98.9	120.2	99.0	111.7	88.8	97.4	110.6	99.7	89.3	81.0	71.3	102.8
1933	97.4	121.3	99.5	108.8	87.0	94.7	112.6	102.7	100.4	78.1	73.4	109.0
1934	99.0	132.7	105.5	120.7	94.5	104.5	115.2	106.5	110.1	95.4	82.4	101.8
1935	105.9	135.8	116.1	147.3	109.8	105.9	125.3	120.1	119.1	102.6	98.5	119.6
1936	113.0	143.3	128.3	167.2	114.9	114.1	131.8	121.4	132.5	114.9	120.2	123.6
1937	119.4	154.7	138.4	187.1	120.4	125.0	141.7	134.9	148.3	124.1	138.4	123.1
1938	120.6	138.3	133.4	165.9	120.2	102.7	151.8	145.2	166.6	115.5	137.2	133.9
1939	127.5	158.0	145.5	187.5	132.6	121.5	153.6	154.1	168.4	134.0	141.8	138.0

NAR = food, beverages and tobacco, TEK = textiles, BEK = clothing and footwear,
LAR = leather and rubber products, TRE = wood products and furniture, PAP = pulp and paper,
GRA = printing, KJM = chemicals, MAM = ores and basic metals,
STN = stone, cement and glass, MET = metal products, machinery and transport equipment,
OLJ = oils and fats. For gas supply see Table A1.

Table A2. Annual volume indices of gross output 1896 - 1948 by industry groups.
1929=100.

Year	1 **NAR**	2 **TEK**	3 **BEK**	4 **LAR**	5 **TRE**	6 **PAP**	7 **GRA**	8 **KJM**	9 **MAM**	10 **STN**	11 **MET**	12 **OLJ**
1940	122.7	138.0	139.8	159.9	153.7	88.0	114.9	126.0	113.3	108.3	118.9	106.5
1941	107.1	97.8	118.4	138.4	166.5	89.4	153.1	127.8	87.7	129.6	124.8	78.3
1942	93.5	90.2	87.5	122.5	150.7	76.8	162.4	133.4	78.0	123.3	110.3	76.9
1943	97.6	97.8	85.3	118.2	128.7	67.4	135.8	123.0	80.3	115.7	105.3	73.9
1944	88.9	95.0	102.5	124.8	110.7	59.6	146.5	120.8	72.3	98.3	98.4	65.7
1945	97.2	84.5	79.1	98.8	93.6	50.3	143.5	120.3	28.7	68.2	87.9	61.1
1946	148.3	134.7	138.6	199.9	122.2	100.9	176.6	149.4	71.8	115.0	144.5	106.6
1947	167.8	163.6	171.2	261.0	148.0	126.8	187.0	168.0	95.5	134.5	174.6	150.5
1948	176.0	192.9	203.5	318.8	161.6	144.5	196.2	182.9	115.8	147.0	189.0	189.9

NAR = food, beverages and tobacco, TEK = textiles, BEK = clothing and footwear,
LAR = leather and rubber products, TRE = wood products and furniture, PAP = pulp and paper,
GRA = printing, KJM = chemicals, MAM = ores and basic metals,
STN = stone, cement and glass, MET = metal products, machinery and transport equipment,
OLJ = oils and fats. For gas supply see Table A1.

Table A3. Annual volume indices of gross output 1896 - 1948 for industry aggregates.
1929=100.

Year	1 **ALL**	2 **EXP**	3 **HOM**	4 **H-I**	5 **H-S**	6 **CON**	7 **PRO**	8 **MAN**	9 **MIN**	10 **SSB1**	11 **SSB2**	12 **VEN**
1896	25.8	21.5	29.0	25.3	35.6	27.9	22.6	26.5	7.0	NA	NA	27.2
1897	29.2	24.6	32.5	28.4	39.6	31.5	25.6	30.0	8.2	NA	NA	29.6
1898	32.3	26.1	37.2	32.4	45.5	35.9	27.5	33.2	8.9	NA	NA	31.9
1899	34.8	27.8	40.4	34.7	50.4	38.8	29.5	35.8	9.8	NA	NA	33.9
1900	35.6	30.1	39.8	34.1	49.8	38.3	31.4	36.6	10.7	NA	40.8	34.4
1901	36.1	31.0	39.9	34.8	48.4	38.8	31.9	37.1	10.7	NA	40.6	34.8
1902	36.2	30.8	40.1	34.8	49.2	39.2	31.6	37.0	12.6	NA	41.2	34.6
1903	36.5	31.5	39.9	35.4	47.5	39.2	32.2	37.3	12.8	NA	41.9	34.9
1904	37.4	32.2	41.1	36.9	47.9	40.7	32.7	38.2	13.2	NA	41.3	34.0
1905	38.7	33.8	41.9	37.7	48.7	42.4	33.4	39.4	14.9	NA	42.8	35.5
1906	42.4	37.2	46.0	42.5	50.7	46.3	36.8	43.2	16.8	NA	45.9	39.3
1907	44.9	40.3	47.6	43.8	53.2	47.1	40.5	45.4	20.5	NA	47.7	41.6
1908	46.9	42.1	49.8	45.6	56.0	49.2	42.3	47.5	21.5	NA	50.5	44.3
1909	47.9	43.6	50.4	45.3	58.6	49.9	43.6	48.6	21.1	50.4	52.2	45.9
1910	52.4	48.7	54.1	49.2	61.6	54.2	48.0	52.9	25.7	57.8	55.9	50.2
1911	55.0	50.9	57.0	51.4	66.0	57.2	50.2	55.3	30.3	60.1	58.9	51.7
1912	63.2	60.4	63.6	58.5	71.0	63.5	59.6	63.0	43.3	70.7	66.1	57.7
1913	68.4	65.7	68.4	64.0	73.4	69.2	63.8	68.0	47.4	76.4	70.3	63.9
1914	70.7	69.5	69.3	64.5	75.2	71.5	66.1	70.4	49.2	77.3	71.7	64.3
1915	74.1	73.5	71.9	66.3	79.7	75.4	68.9	73.4	55.8	84.5	77.1	66.9
1916	78.4	74.8	79.2	73.4	86.7	82.7	70.5	79.9	34.5	87.0	79.7	72.5
1917	70.1	65.2	72.9	67.1	81.1	71.6	64.7	71.1	35.2	73.1	69.2	72.8
1918	65.0	60.2	67.9	64.1	69.9	65.2	60.8	66.0	31.6	66.7	65.7	63.4
1919	67.0	55.3	76.1	71.6	79.2	74.1	58.0	68.3	28.6	69.0	67.8	69.5
1920	71.7	63.0	77.7	70.6	86.9	79.3	61.9	73.2	26.8	78.0	76.5	72.4
1921	52.5	41.1	62.4	51.2	83.6	62.6	42.3	53.6	22.0	55.3	58.1	53.5
1922	66.1	55.0	75.4	66.5	91.8	78.0	54.0	66.9	42.0	69.0	70.8	69.6
1923	71.6	61.6	80.0	71.0	96.8	81.2	61.7	72.2	54.0	76.4	76.1	75.1
1924	76.7	70.3	82.0	74.7	95.3	86.9	66.3	77.3	59.3	82.0	81.5	81.3
1925	82.3	77.7	86.1	79.1	98.4	89.6	74.6	82.8	67.7	89.4	87.6	87.0
1926	75.2	69.7	79.8	71.6	94.7	84.4	65.6	75.8	58.9	79.6	79.8	81.8
1927	78.1	73.5	81.9	75.0	94.2	89.5	66.2	78.3	70.3	81.3	82.1	84.8
1928	86.6	81.8	90.5	86.8	97.1	91.3	81.7	86.6	84.9	89.8	90.5	91.9
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	100.3	95.7	103.8	104.1	103.4	99.6	101.1	100.2	101.4	101.0	101.8	103.2
1931	80.0	67.5	89.5	83.6	99.5	89.1	69.6	80.5	66.7	78.4	79.9	84.9
1932	92.6	82.5	100.4	97.0	105.3	102.8	80.8	93.0	78.8	92.8	93.3	97.9
1933	93.4	83.8	100.9	98.4	104.1	102.4	83.0	93.4	95.3	93.8	94.9	98.8
1934	100.1	89.5	108.3	107.5	108.7	107.3	91.5	100.1	103.2	97.8	98.5	102.6
1935	110.3	98.6	119.5	121.1	115.2	117.8	101.4	110.3	115.6	107.8	108.5	111.3
1936	121.5	107.1	132.5	137.2	122.5	126.4	115.0	121.3	128.8	118.3	118.6	120.2
1937	132.8	118.8	143.5	150.8	128.6	135.9	128.3	132.7	138.4	129.7	130.0	127.9
1938	131.2	117.5	141.7	145.2	133.9	132.0	129.0	130.3	159.6	129.2	121.2	123.8
1939	140.4	123.0	153.7	158.4	143.7	145.7	133.4	140.0	154.4	138.4	129.2	134.7

ALL = all industries, EXP = export industries, HOM = home industries,
H-I = import competing home industries, H-S = sheltered home industries,
CON = consumer goods industries, PRO = producer goods industries,
MAN = manufacturing industries, MIN = mining ,
SSB1 and SSB2 - Statistics Norway indices of industrial production, see text,
VEN = Venneslan real gross output

Table A3. Annual volume indices of gross output 1896 - 1948 for industry aggregates.
1929=100.

Year	1 **ALL**	2 **EXP**	3 **HOM**	4 **H-I**	5 **H-S**	6 **CON**	7 **PRO**	8 **MAN**	9 **MIN**	10 **SSB1**	11 **SSB2**	12 **VEN**
1940	120.3	97.4	138.0	140.1	133.1	133.5	105.4	121.3	96.6	119.8	111.5	NA
1941	114.9	90.6	133.8	136.8	127.0	124.4	103.5	115.7	98.0	116.4	107.9	NA
1942	103.3	80.1	121.6	124.4	115.0	112.1	92.9	104.5	75.5	105.9	98.2	NA
1943	98.9	72.5	119.8	125.0	107.6	109.0	87.3	100.2	68.0	100.6	93.9	NA
1944	92.8	65.3	114.8	120.4	101.4	104.8	79.6	93.8	67.5	82.4	76.3	NA
1945	81.1	52.9	103.9	105.3	101.2	96.3	65.5	83.8	24.9	73.5	67.3	NA
1946	130.2	92.0	160.2	160.7	160.5	151.3	107.9	134.2	42.5	125.6	115.3	NA
1947	156.6	111.5	191.9	196.0	182.3	183.3	128.7	161.0	64.5	148.4	136.8	NA
1948	173.9	125.4	211.6	219.0	192.4	201.2	145.0	178.8	72.4	165.8	152.9	NA

ALL = all industries, EXP = export industries, HOM = home industries,
H-I = import competing home industries, H-S = sheltered home industries,
CON = consumer goods industries, PRO = producer goods industries,
MAN = manufacturing industries, MIN = mining ,
SSB1 and SSB2 - Statistics Norway indices of industrial production, see text,
VEN = Venneslan real gross output

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	1 **HER**	2 **SLA**	3 **MAR**	4 **MEI**	5 **MOL**	6 **BAK**	7 **KJK**	8 **SJO**	9 **AFD**	10 **BRV**	11 **OEL**	12 **TOB**
1896	0.546	1.877	2.916	0.704	3.877	1.504	0.156	0.313	0.830	8.344	9.574	1.750
1897	0.818	1.900	2.640	0.697	3.457	1.445	0.150	0.384	0.923	9.167	9.070	1.633
1898	0.767	2.041	2.667	0.721	3.566	1.443	0.170	0.496	0.933	9.467	9.676	1.632
1899	0.809	2.042	3.079	0.740	3.396	1.468	0.169	0.566	0.927	8.240	9.458	1.581
1900	0.973	1.915	3.101	0.714	2.921	1.439	0.160	0.440	0.785	6.246	7.950	1.426
1901	0.926	1.911	3.613	0.776	3.008	1.478	0.186	0.501	0.868	7.311	7.918	1.547
1902	0.712	2.097	4.450	0.847	3.187	1.636	0.226	0.560	1.003	7.852	5.704	1.858
1903	0.807	2.012	4.076	0.824	3.275	1.579	0.211	0.630	1.063	7.384	4.539	1.848
1904	0.912	1.964	3.993	0.809	3.092	1.532	0.210	0.684	1.031	8.114	4.109	1.827
1905	1.120	1.896	3.814	0.804	3.112	1.533	0.203	0.697	1.027	6.967	4.428	1.925
1906	1.315	1.810	3.716	0.714	2.919	1.335	0.196	0.813	0.871	7.243	3.992	1.826
1907	1.440	1.803	3.489	0.687	3.210	1.390	0.215	0.937	0.873	4.970	2.692	1.840
1908	1.980	1.746	3.789	0.711	3.405	1.482	0.214	0.880	1.015	3.732	2.806	1.995
1909	2.170	1.793	3.647	0.731	3.162	1.575	0.225	0.844	1.017	1.727	2.843	2.038
1910	2.315	1.777	3.529	0.710	2.418	1.576	0.215	0.910	0.991	2.064	2.763	1.866
1911	2.445	1.844	3.266	0.712	2.545	1.639	0.238	1.042	1.080	1.629	2.921	1.915
1912	2.968	1.768	3.116	0.624	2.330	1.539	0.238	1.265	0.940	2.421	2.368	1.669
1913	2.699	1.670	2.761	0.595	1.953	1.589	0.205	1.054	0.843	3.769	2.480	1.645
1914	2.753	1.607	2.814	0.582	2.302	1.565	0.267	1.004	0.871	3.758	3.258	1.528
1915	4.135	1.540	2.725	0.474	2.611	1.245	0.360	0.969	0.785	1.782	2.544	1.442
1916	4.066	1.498	3.099	0.413	2.183	1.113	0.306	0.987	0.796	2.279	2.424	1.236
1917	2.960	1.446	2.555	0.344	2.161	0.941	0.383	0.712	0.736	1.221	2.528	1.162
1918	1.711	2.093	2.043	0.337	2.095	0.857	0.325	0.427	0.712	0.727	1.446	0.935
1919	1.706	2.034	3.390	0.496	2.239	1.584	0.311	0.728	0.932	2.134	3.345	1.522
1920	1.461	1.552	2.740	0.450	1.923	1.899	0.321	1.152	0.883	2.264	3.609	1.312
1921	1.712	2.627	3.985	0.657	2.854	2.971	0.442	1.783	1.285	2.113	6.926	1.919
1922	1.742	2.283	3.358	0.689	2.369	2.879	0.408	1.405	1.008	2.380	7.948	1.823
1923	1.442	2.308	3.129	0.659	2.158	2.570	0.375	1.262	1.074	1.570	5.031	2.056
1924	3.880	2.303	3.505	0.636	2.492	2.252	0.435	1.080	0.987	1.217	3.960	2.199
1925	1.592	2.058	3.407	0.710	2.574	2.416	0.374	1.022	0.982	1.219	4.264	2.226
1926	1.841	2.038	3.422	0.806	2.786	2.920	0.348	1.193	1.095	1.715	4.314	2.537
1927	3.185	1.971	3.322	0.922	1.687	3.113	0.363	1.329	1.172	2.810	4.099	2.482
1928	2.085	1.888	2.765	0.852	2.213	2.734	0.257	1.161	0.950	1.981	3.589	2.430
1929	3.273	1.754	2.628	0.737	1.750	2.561	0.228	1.172	1.026	2.770	3.356	2.155
1930	1.134	1.803	2.844	0.795	1.768	2.750	0.243	1.259	0.885	2.804	3.759	2.300
1931	2.121	1.952	3.324	1.049	2.439	3.316	0.307	1.632	1.223	2.709	3.754	2.609
1932	2.403	1.491	3.168	1.328	1.964	3.680	0.260	1.338	1.015	2.160	3.491	2.091
1933	2.052	1.546	3.154	1.302	1.966	3.471	0.269	1.277	1.070	2.043	3.208	2.411
1934	1.389	1.660	2.809	1.313	2.133	3.187	0.449	1.274	0.953	2.057	3.025	2.455
1935	1.793	1.612	2.215	1.232	2.070	3.033	0.291	1.169	1.020	1.906	2.910	2.343
1936	1.706	1.524	1.803	1.144	1.894	2.706	0.286	1.212	0.836	1.814	2.796	2.125
1937	1.636	1.505	1.695	1.120	1.574	2.478	0.287	1.130	0.857	1.694	2.615	1.882
1938	1.830	1.433	1.750	1.221	1.655	2.676	0.294	1.273	0.797	1.651	2.669	1.982
1939	1.794	1.304	1.687	1.209	1.537	2.501	0.283	1.257	0.819	1.766	2.622	1.910

HER = canning, SLA = slaughtering, MAR = manufacture of margarine,
MEI = dairies, MOL = grain mills, BAK = bakeries,
KJK = manufacture of biscuits, SJO = manufacture of chocolate, AFD = other food industries,
BRV = production of spirits, OEL = breweries, TOB = manufacture of tobacco,

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	1 **HER**	2 **SLA**	3 **MAR**	4 **MEI**	5 **MOL**	6 **BAK**	7 **KJK**	8 **SJO**	9 **AFD**	10 **BRV**	11 **OEL**	12 **TOB**
1940	2.472	1.270	1.872	1.248	1.185	2.474	0.330	1.119	0.878	1.868	2.726	1.965
1941	2.422	0.407	1.403	1.077	0.752	2.367	0.395	0.808	0.887	1.631	3.186	1.537
1942	1.953	0.396	0.715	1.119	0.665	2.544	0.411	0.510	1.043	1.773	3.903	1.380
1943	1.820	0.311	0.765	1.010	0.705	2.711	0.400	0.523	1.152	2.525	3.057	1.097
1944	1.738	0.274	0.698	1.018	0.374	2.782	0.377	0.507	1.072	4.201	2.904	1.490
1945	2.200	0.425	0.896	1.317	0.950	3.555	0.290	0.562	1.201	3.499	2.483	1.945
1946	1.863	0.719	1.084	1.016	0.836	2.867	0.323	0.747	1.326	4.274	1.773	1.687
1947	2.658	0.831	0.867	0.956	0.895	2.466	0.304	0.698	0.992	3.074	1.307	1.551
1948	2.873	0.538	0.932	0.960	0.718	2.238	0.366	0.677	1.041	1.801	1.174	1.261

HER = canning, SLA = slaughtering, MAR = manufacture of margarine,
MEI = dairies, MOL = grain mills, BAK = bakeries,
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BRV = production of spirits, OEL = breweries, TOB = manufacture of tobacco,

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	13 **TEK**	14 **KON**	15 **SKO**	16 **GAR**	17 **LRV**	18 **GUM**	19 **SAG**	20 **MOB**	21 **TRM**	22 **CEL**	23 **PPP**	24 **PPV**
1896	6.794	0.129	0.248	1.304	0.006	0.021	18.213	1.076	3.834	2.714	3.078	0.579
1897	6.032	0.154	0.325	1.075	0.009	0.023	19.490	1.147	4.034	3.000	2.884	0.525
1898	6.020	0.192	0.691	0.951	0.008	0.067	17.189	1.391	3.728	2.641	2.787	0.644
1899	5.923	0.241	1.117	0.922	0.010	0.089	15.471	1.605	3.653	2.541	2.463	0.550
1900	5.711	0.361	0.922	0.922	0.008	0.072	17.316	1.673	5.250	3.375	2.397	0.496
1901	5.932	0.365	0.928	0.988	0.007	0.113	16.487	1.560	4.691	3.191	2.836	0.578
1902	6.516	0.468	0.903	0.944	0.018	0.130	15.329	1.581	4.714	2.899	2.592	0.539
1903	6.415	0.409	0.893	0.898	0.051	0.084	17.865	1.776	4.017	2.717	2.489	0.543
1904	6.665	0.512	1.069	0.834	0.060	0.125	15.512	1.634	4.224	3.166	2.885	0.581
1905	7.369	0.662	1.292	0.877	0.060	0.170	13.105	1.561	5.012	3.811	3.492	0.636
1906	7.462	0.742	1.249	0.798	0.068	0.151	14.295	1.667	3.616	3.905	3.483	0.680
1907	7.417	0.787	1.344	0.798	0.085	0.125	14.685	1.797	4.695	3.492	3.326	0.715
1908	7.239	0.815	1.607	0.835	0.104	0.188	11.777	1.874	5.292	4.371	3.863	0.815
1909	7.757	0.936	1.959	0.865	0.120	0.146	12.715	2.260	5.156	4.325	4.152	0.807
1910	7.511	1.106	2.022	0.814	0.143	0.191	14.249	2.628	3.537	4.111	4.297	0.784
1911	7.616	1.238	2.076	0.752	0.180	0.218	13.097	2.661	3.275	3.546	3.916	0.801
1912	6.885	1.275	2.103	0.659	0.175	0.178	10.792	2.216	3.382	4.332	3.938	0.737
1913	6.743	1.361	2.229	0.650	0.198	0.214	10.135	2.304	2.955	4.348	4.553	0.767
1914	6.457	1.410	2.260	0.627	0.203	0.162	9.835	2.442	2.719	4.955	3.731	0.643
1915	5.839	1.455	2.179	0.705	0.246	0.196	8.988	2.901	2.228	4.197	4.540	0.699
1916	5.117	1.422	1.864	0.591	0.371	0.110	8.368	3.229	2.366	6.425	3.715	0.608
1917	5.655	1.778	2.141	0.703	0.436	0.076	7.625	3.176	1.630	3.967	1.969	0.650
1918	4.707	1.684	2.199	0.804	0.423	0.063	6.974	2.871	1.867	3.289	3.296	0.794
1919	6.363	2.252	2.147	0.784	0.528	0.066	8.386	3.824	3.238	3.342	2.963	0.766
1920	5.214	2.140	1.774	0.517	0.381	0.080	8.036	3.450	5.288	7.637	4.710	0.763
1921	5.025	1.640	2.033	0.567	0.339	0.166	6.856	3.205	3.030	3.941	3.274	0.958
1922	6.050	2.636	2.132	0.558	0.348	0.166	5.016	2.281	3.277	4.515	5.521	0.778
1923	5.613	2.756	1.921	0.550	0.344	0.228	5.625	3.084	4.064	5.560	4.934	0.651
1924	5.944	2.869	1.860	0.606	0.369	0.378	6.185	3.264	3.198	4.010	4.134	0.625
1925	5.907	2.785	2.166	0.586	0.299	0.474	5.510	3.052	3.247	5.013	5.394	0.600
1926	5.304	3.021	1.675	0.439	0.360	0.464	4.791	2.939	3.603	4.864	5.438	0.625
1927	5.111	3.119	1.919	0.530	0.417	0.454	3.777	2.814	2.486	4.710	6.322	0.619
1928	4.934	2.904	1.938	0.597	0.404	0.463	4.058	2.805	2.278	4.743	6.012	0.668
1929	5.221	3.079	1.799	0.473	0.394	0.463	3.475	2.803	2.254	4.626	5.728	0.694
1930	5.414	3.092	2.047	0.529	0.403	0.483	2.733	3.070	2.302	3.773	4.964	0.746
1931	6.431	3.450	1.912	0.665	0.396	0.653	2.434	3.331	1.682	2.058	3.778	0.841
1932	6.663	3.216	2.168	0.686	0.405	0.705	2.338	3.205	2.019	4.032	5.201	0.806
1933	6.387	3.303	2.173	0.713	0.448	0.617	2.364	3.183	2.006	4.217	4.098	0.881
1934	6.523	3.416	2.201	0.579	0.484	0.781	2.894	3.218	2.225	4.474	4.250	0.852
1935	6.217	3.506	2.112	0.631	0.508	1.000	2.539	3.402	1.170	3.900	4.539	0.870
1936	6.133	3.635	1.923	0.586	0.486	1.090	2.628	3.706	1.347	4.575	4.154	0.913
1937	5.557	3.621	1.878	0.530	0.507	1.112	3.123	3.663	1.734	4.385	4.645	0.910
1938	5.219	3.657	1.776	0.493	0.551	1.089	2.347	3.750	1.381	3.400	3.297	0.788
1939	5.846	3.774	1.793	0.454	0.600	1.211	2.742	3.805	1.281	3.028	4.304	0.833

TEK = manufacture of textiles, KON = clothing, SKO = manufacture of footwear,
GAR = tanneries, LRV = manufacture of leather goods,
GUM = manufacture of rubber goods, SAG = saw mills,
MOB = manufacture of furniture and wooden goods,
TRM = manufacture of mechanical wood pulp, CEL = manufacture of chemical pulp,
PPP = manufacture of paper, PPV = manufacture of paper goods

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	13 **TEK**	14 **KON**	15 **SKO**	16 **GAR**	17 **LRV**	18 **GUM**	19 **SAG**	20 **MOB**	21 **TRM**	22 **CEL**	23 **PPP**	24 **PPV**
1940	6.061	3.414	2.118	0.724	0.664	1.294	4.592	5.589	0.674	2.815	3.301	0.804
1941	5.363	3.732	1.662	0.602	0.561	0.761	5.609	6.466	0.593	2.663	3.755	1.338
1942	5.267	3.376	1.277	0.534	0.525	0.983	4.574	7.198	0.620	2.281	3.402	1.460
1943	5.581	3.068	1.534	0.630	0.535	1.187	3.765	7.142	0.541	1.991	2.921	1.520
1944	5.304	4.017	1.930	0.515	0.495	1.590	3.229	6.902	0.307	1.139	2.556	1.392
1945	5.411	3.253	1.643	0.550	0.491	1.266	2.798	6.931	0.534	1.442	4.319	1.389
1946	5.312	3.314	1.655	0.599	0.535	1.412	2.756	5.633	1.310	2.110	7.018	1.196
1947	5.624	3.621	1.527	0.489	0.634	1.419	2.751	5.696	1.776	3.625	6.772	1.493
1948	5.802	3.614	1.747	0.413	0.699	1.669	2.718	5.958	2.394	4.113	5.946	1.484

TEK = manufacture of textiles, KON = clothing, SKO = manufacture of footwear,
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1929=100.

Year	25 **GRA**	26 **FEX**	27 **FRT**	28 **KJL**	29 **KJT**	30 **ELK**	31 **ORE**	32 **BME**	33 **KUL**	34 **STB**	35 **CEM**	36 **MUR**
1896	3.662	0.551	0.214	0.172	0.140	0.000	1.794	0.410	0.000	2.485	0.256	0.745
1897	3.458	0.456	0.212	0.175	0.118	0.000	1.814	0.404	0.000	2.756	0.262	0.761
1898	3.616	0.443	0.188	0.172	0.136	0.000	1.798	0.311	0.000	3.068	0.586	0.961
1899	3.239	0.402	0.215	0.214	0.161	0.208	2.045	0.408	0.000	3.273	0.402	1.027
1900	2.817	0.368	0.176	0.156	0.152	0.152	2.356	0.402	0.000	2.714	0.405	0.863
1901	3.226	0.410	0.195	0.185	0.180	0.228	2.401	0.402	0.000	3.255	0.262	0.561
1902	3.191	0.483	0.194	0.154	0.188	0.342	2.700	0.458	0.000	3.132	0.222	0.659
1903	2.969	0.557	0.202	0.172	0.158	0.456	2.877	0.517	0.000	2.835	0.315	1.240
1904	3.034	0.600	0.208	0.200	0.199	0.426	2.909	0.706	0.000	2.717	0.280	1.204
1905	2.886	0.649	0.277	0.193	0.185	0.640	3.254	0.636	0.000	2.579	0.236	1.114
1906	2.668	0.589	0.230	0.215	0.214	0.719	3.541	0.731	0.000	2.336	0.233	1.065
1907	2.723	0.617	0.213	0.233	0.201	1.462	3.593	0.885	0.002	1.952	0.248	0.806
1908	2.979	0.729	0.219	0.290	0.242	2.345	3.414	0.534	0.008	2.147	0.089	0.876
1909	3.116	0.774	0.221	0.317	0.272	2.693	3.079	0.674	0.005	2.221	0.173	0.939
1910	2.857	0.774	0.279	0.331	0.178	2.859	3.312	0.956	0.005	2.143	0.406	0.887
1911	2.903	0.777	0.199	0.365	0.173	3.453	3.688	1.450	0.024	2.240	0.478	0.989
1912	2.638	0.670	0.184	0.365	0.145	5.049	4.737	1.465	0.028	1.986	0.444	1.063
1913	2.719	0.634	0.248	0.371	0.127	6.418	4.642	1.815	0.035	1.947	0.598	1.020
1914	2.522	0.596	0.248	0.403	0.137	6.456	4.730	2.759	0.042	1.753	0.570	0.823
1915	2.402	0.648	0.242	0.347	0.145	7.408	6.314	3.379	0.024	0.971	0.547	0.696
1916	2.027	0.794	0.340	0.485	0.311	9.194	3.418	4.234	0.033	0.667	0.492	0.953
1917	2.078	0.645	0.381	1.101	0.338	9.027	3.419	4.051	0.111	0.544	1.016	0.944
1918	2.830	0.811	0.561	1.475	0.428	9.447	2.552	2.886	0.199	0.592	0.941	1.096
1919	3.028	1.104	0.719	0.834	0.609	4.899	2.298	0.651	0.166	0.610	1.493	1.158
1920	2.696	1.052	0.373	0.583	0.776	4.536	1.085	1.181	0.205	0.622	1.615	0.975
1921	4.125	1.290	0.595	0.466	0.488	4.326	1.301	1.725	0.206	0.905	1.499	1.020
1922	3.696	1.228	0.756	0.636	0.236	3.285	1.841	1.200	0.179	0.925	0.999	0.958
1923	3.477	1.055	0.725	0.441	0.240	3.329	2.245	2.045	0.266	1.095	1.319	1.301
1924	3.067	1.373	0.768	0.404	0.204	3.709	2.309	3.185	0.250	1.687	1.445	1.122
1925	3.390	1.186	0.707	0.448	0.163	4.356	2.257	3.432	0.185	1.698	1.327	0.835
1926	3.897	1.219	0.876	0.535	0.286	4.119	2.198	3.729	0.225	1.276	0.418	0.702
1927	4.056	0.947	0.837	0.512	0.305	4.496	2.822	3.415	0.206	1.518	0.946	0.719
1928	3.775	0.942	0.853	0.510	0.292	4.597	2.982	4.304	0.132	1.737	0.892	0.915
1929	3.595	0.856	0.613	0.448	0.334	3.342	3.632	4.748	0.134	1.721	0.842	0.853
1930	3.870	0.932	0.587	0.504	0.342	6.076	3.163	4.384	0.095	1.961	0.870	0.839
1931	4.206	0.847	0.740	0.612	0.268	6.871	2.039	4.305	0.145	1.930	0.767	0.808
1932	4.291	0.692	0.722	0.572	0.345	5.177	2.354	4.110	0.122	1.410	0.829	0.875
1933	4.212	0.743	0.721	0.649	0.363	5.412	2.854	5.147	0.143	1.534	0.769	0.695
1934	4.144	0.742	0.763	0.673	0.359	3.317	2.749	5.372	0.150	1.924	0.835	0.750
1935	4.004	0.829	0.784	0.700	0.345	4.928	3.296	5.059	0.135	1.758	0.797	0.875
1936	3.828	0.760	0.818	0.653	0.313	4.054	3.697	4.939	0.125	1.752	0.804	1.009
1937	3.576	0.729	0.819	0.675	0.293	4.013	3.553	6.193	0.124	1.642	0.767	0.856
1938	3.825	0.642	0.797	0.775	0.344	4.660	4.464	5.852	0.133	1.557	0.758	0.800
1939	3.526	0.710	0.846	0.771	0.382	4.873	3.886	6.049	0.131	1.487	0.864	0.966

GRA = printing and allied industries, FEX = manufacture of matches and explosives,
FRT = manufacture of paints, varnishes and tar products,
KJL = manufacture of pharmaceuticals and other light chemicals
KJT = manufacture of compressed gases and other heavy chemicals
ELK = manufacture of electrochemicals, ORE = metal mining,
BME = basic metal industries, KUL = coal mining, STB = stone and mineral quarrying,
CEM = manufacture of cement, MUR = manufacture of cement products and bricks,

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	25 **GRA**	26 **FEX**	27 **FRT**	28 **KJL**	29 **KJT**	30 **ELK**	31 **ORE**	32 **BME**	33 **KUL**	34 **STB**	35 **CEM**	36 **MUR**
1940	2.818	0.747	0.725	0.783	0.377	3.967	2.577	5.883	0.247	1.142	0.926	0.760
1941	3.158	0.863	0.704	0.923	0.339	4.122	2.949	3.862	0.109	1.515	0.577	1.061
1942	3.731	1.205	0.768	1.133	0.414	3.625	2.867	3.370	0.000	2.001	0.728	0.856
1943	3.617	0.977	0.880	1.079	0.459	4.430	2.803	4.401	0.000	2.227	0.508	0.822
1944	3.763	0.921	1.114	1.204	0.297	2.783	3.389	3.921	0.000	2.085	0.604	0.817
1945	4.567	0.746	0.993	1.270	0.278	4.688	1.074	1.536	0.008	1.405	0.317	0.916
1946	3.760	0.547	0.898	0.940	0.235	4.150	1.120	2.949	0.083	1.240	0.694	1.135
1947	3.184	0.510	1.060	0.970	0.246	3.559	1.497	2.863	0.228	1.230	0.581	1.179
1948	2.972	0.390	1.090	1.187	0.249	2.851	1.614	3.695	0.306	1.179	0.529	1.152

GRA = printing and allied industries, FEX = manufacture of matches and explosives,
FRT = manufacture of paints, varnishes and tar products,
KJL = manufacture of pharmaceuticals and other light chemicals
KJT = manufacture of compressed gases and other heavy chemicals
ELK = manufacture of electrochemicals, ORE = metal mining,
BME = basic metal industries, KUL = coal mining, STB = stone and mineral quarrying,
CEM = manufacture of cement, MUR = manufacture of cement products and bricks,

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	37 **GLA**	38 **MMA**	39 **SKB**	40 **EMA**	41 **GSM**	42 **TRA**	43 **FAT**	44 **SOP**	45 **GAS**
1896	0.731	8.282	5.402	0.461	0.514	2.162	0.488	0.164	0.977
1897	0.718	8.497	5.451	0.524	0.472	1.595	0.320	0.176	0.849
1898	0.763	8.520	5.624	0.832	0.476	1.291	0.306	0.247	0.774
1899	0.841	9.716	6.510	1.126	0.519	1.122	0.461	0.263	0.788
1900	1.213	10.832	6.751	1.117	0.522	0.856	0.509	0.257	0.809
1901	1.046	8.980	6.710	0.954	0.500	1.111	0.517	0.275	0.880
1902	0.965	8.917	7.080	0.840	0.520	1.419	0.518	0.284	0.968
1903	1.669	8.582	6.881	0.789	0.538	1.071	0.464	0.335	0.968
1904	1.686	8.804	7.035	0.896	0.616	1.142	0.434	0.363	0.998
1905	1.610	8.963	6.948	0.874	0.632	1.015	0.363	0.372	1.000
1906	1.628	9.658	6.924	0.965	0.703	0.961	0.362	0.386	1.008
1907	1.221	10.935	7.467	1.320	0.771	0.821	0.346	0.377	0.996
1908	1.467	10.746	6.673	1.143	0.770	0.955	0.396	0.411	1.032
1909	1.464	10.790	5.354	1.133	0.761	1.086	0.490	0.409	1.056
1910	1.296	10.769	5.259	1.175	0.776	1.281	0.581	0.362	0.987
1911	1.286	10.821	5.080	1.103	0.876	1.447	0.580	0.355	1.061
1912	1.237	11.418	5.250	1.419	0.978	1.170	0.592	0.298	0.952
1913	1.080	10.565	4.642	1.245	0.963	1.044	0.878	0.270	1.018
1914	1.017	9.726	4.232	1.152	0.809	1.537	1.480	0.240	1.014
1915	0.947	9.492	3.911	1.514	0.784	2.871	1.478	0.308	0.787
1916	0.968	9.969	3.751	1.492	0.672	3.133	1.473	0.480	0.526
1917	0.634	16.380	6.586	2.235	0.674	0.342	1.399	0.659	0.482
1918	0.808	17.685	7.673	3.359	0.703	0.488	1.144	1.021	0.623
1919	0.987	13.146	6.359	2.067	0.974	1.027	1.454	0.552	0.785
1920	0.892	12.367	6.026	1.691	0.752	1.054	1.190	0.462	0.313
1921	0.801	10.032	5.345	1.491	0.926	0.842	1.142	0.686	0.483
1922	0.846	11.542	3.808	1.359	0.802	0.766	1.325	0.654	1.388
1923	0.927	12.110	4.177	1.315	0.868	0.813	1.405	0.766	1.119
1924	0.994	11.070	3.699	1.394	0.783	0.962	1.664	0.698	0.822
1925	0.952	10.370	4.129	1.547	0.801	0.843	2.135	0.701	0.657
1926	0.828	10.511	3.840	1.420	0.683	1.377	1.718	0.764	0.842
1927	0.744	10.184	3.191	1.449	0.692	1.267	1.187	0.822	0.949
1928	0.677	12.000	4.488	1.381	0.599	1.214	1.370	0.740	0.890
1929	0.770	11.848	5.492	1.795	0.629	1.208	1.228	0.709	0.785
1930	0.876	12.095	5.706	1.609	0.653	0.781	1.276	0.726	0.755
1931	0.850	11.957	3.500	1.653	0.761	0.702	1.112	0.838	1.026
1932	0.831	12.062	3.317	1.939	0.587	0.921	1.331	0.797	0.883
1933	0.718	11.946	3.484	1.927	0.610	0.967	1.249	0.783	0.919
1934	0.784	12.653	3.837	2.306	0.572	0.535	1.266	0.829	0.836
1935	0.801	13.012	4.012	2.421	0.542	0.775	1.270	0.880	0.789
1936	0.759	13.816	4.517	2.820	0.520	0.892	1.383	0.834	0.685
1937	0.874	14.303	4.770	2.884	0.567	0.601	1.224	0.796	0.602
1938	0.699	14.528	5.962	3.266	0.560	0.711	1.183	0.934	0.570
1939	0.849	14.282	4.831	3.181	0.512	0.835	1.181	0.986	0.493

GLA = manufacture of glass, clay products and cement,
MMA = manufacture of metal products and machinery, SKB = building and repearing of ships
EMA = manufacture of electrical machinery and equipment,
GSM = manufacture of gold and silver products, music instruments,
TRA = manufacture of fish-oil and meal, FAT = manufacture of whale fats and vegetable oils,
SOP = manufacture of soap, GAS = manufacture of gas, coke and coal tar

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	37 **GLA**	38 **MMA**	39 **SKB**	40 **EMA**	41 **GSM**	42 **TRA**	43 **FAT**	44 **SOP**	45 **GAS**
1940	0.862	14.412	4.891	3.265	0.415	1.315	0.921	1.114	0.399
1941	0.714	15.990	6.340	3.286	0.429	0.440	0.574	1.783	0.286
1942	0.603	17.252	6.684	3.064	0.487	0.404	0.470	2.043	0.385
1943	0.661	17.512	6.377	2.856	0.591	0.520	0.517	1.979	0.294
1944	0.733	18.500	7.053	2.434	0.532	0.539	0.376	1.815	0.309
1945	0.729	18.251	7.689	2.703	0.629	0.856	0.472	1.455	0.063
1946	0.790	16.156	7.235	2.753	0.575	0.833	1.347	1.054	0.144
1947	0.693	16.446	6.634	3.118	0.686	0.773	1.396	0.941	0.178
1948	0.742	16.827	6.312	3.326	0.713	0.995	1.587	0.936	0.213

GLA = manufacture of glass, clay products and cement,
MMA = manufacture of metal products and machinery, SKB = building and repearing of ships
EMA = manufacture of electrical machinery and equipment,
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SOP = manufacture of soap, GAS = manufacture of gas, coke and coal tar

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	A1 **EXP**	A2 **H-I**	A3 **H-S**	A4 **CON**	A5 **PRO**	A6 **MAN**	A7 **MIN**	A8 **TOT**
1896	42.765	32.894	24.342	51.770	48.230	98.206	1.794	100
1897	44.208	32.629	23.164	50.422	49.578	98.186	1.814	100
1898	41.471	34.084	24.445	52.892	47.108	98.202	1.798	100
1899	40.696	34.885	24.419	52.081	47.919	97.955	2.045	100
1900	44.609	33.500	21.892	47.145	52.855	97.644	2.356	100
1901	44.297	32.832	22.872	50.035	49.965	97.599	2.401	100
1902	43.604	33.917	22.479	50.479	49.521	97.300	2.700	100
1903	44.933	33.837	21.230	49.105	50.895	97.123	2.877	100
1904	43.977	35.296	20.727	50.409	49.591	97.091	2.909	100
1905	43.885	35.442	20.673	51.264	48.736	96.746	3.254	100
1906	43.881	36.591	19.528	50.643	49.357	96.459	3.541	100
1907	45.901	36.146	17.953	47.614	52.386	96.405	3.595	100
1908	45.581	35.499	18.920	49.306	50.694	96.578	3.422	100
1909	46.080	34.705	19.216	49.168	50.832	96.916	3.084	100
1910	47.070	34.490	18.440	48.659	51.341	96.683	3.317	100
1911	46.551	34.562	18.887	48.933	51.067	96.288	3.712	100
1912	47.712	34.751	17.537	47.518	52.482	95.235	4.765	100
1913	48.149	34.824	17.027	48.217	51.783	95.323	4.677	100
1914	48.977	33.798	17.225	47.661	52.339	95.227	4.773	100
1915	52.400	32.108	15.492	46.670	53.330	93.661	6.339	100
1916	52.893	32.045	15.062	44.653	55.347	96.548	3.452	100
1917	45.914	39.849	14.236	42.031	57.969	96.470	3.530	100
1918	44.384	41.584	14.033	42.135	57.865	97.249	2.751	100
1919	40.464	40.603	18.934	50.545	49.455	97.536	2.464	100
1920	46.375	36.145	17.480	47.096	52.904	98.711	1.289	100
1921	38.472	33.904	27.624	56.982	43.018	98.494	1.506	100
1922	36.456	36.054	27.489	59.748	40.252	97.980	2.020	100
1923	40.182	35.765	24.052	54.121	45.879	97.489	2.511	100
1924	42.430	35.491	22.079	54.942	45.058	97.441	2.559	100
1925	43.102	34.837	22.061	54.097	45.903	97.557	2.443	100
1926	41.525	34.692	23.784	56.129	43.871	97.577	2.423	100
1927	41.442	34.410	24.148	58.447	41.553	96.972	3.028	100
1928	42.652	35.351	21.997	53.533	46.467	96.886	3.114	100
1929	43.450	36.017	20.533	53.925	46.075	96.235	3.765	100
1930	40.940	37.117	21.943	53.171	46.829	96.741	3.259	100
1931	35.368	39.812	24.821	58.902	41.098	97.816	2.184	100
1932	37.149	39.158	23.693	58.193	41.807	97.524	2.476	100
1933	37.965	38.789	23.246	56.281	43.719	97.003	2.997	100
1934	36.763	40.505	22.731	56.229	43.771	97.101	2.899	100
1935	37.684	40.964	21.352	55.633	44.367	96.569	3.431	100
1936	38.043	42.005	19.953	53.689	46.311	96.177	3.823	100
1937	39.871	41.585	18.544	52.012	47.988	96.323	3.677	100
1938	38.842	41.730	19.428	51.559	48.441	95.403	4.597	100
1939	38.684	42.572	18.744	52.860	47.140	95.983	4.017	100

EXP = export industries, H-I = import competing home industries,
H-S = import competing home industries, CON = consumer goods industries,
PRO = producer goods industries, MIN = mining, MAN = manufacturing including gas,
TOT = total industrial production including mining, gas and manufacturing

Table A4. Annual nominal value added. Percentage shares 1896 - 1948.
1929=100.

Year	A1 **EXP**	A2 **H-I**	A3 **H-S**	A4 **CON**	A5 **PRO**	A6 **MAN**	A7 **MIN**	A8 **TOT**
1940	37.101	44.806	18.094	54.026	45.974	97.176	2.824	100
1941	37.171	45.361	17.468	52.764	47.236	96.942	3.058	100
1942	35.227	46.781	17.992	53.318	46.682	97.133	2.867	100
1943	34.950	48.464	16.586	52.497	47.503	97.197	2.803	100
1944	31.711	51.533	16.756	54.447	45.553	96.611	3.389	100
1945	31.278	50.246	18.476	57.193	42.807	98.917	1.083	100
1946	36.498	47.194	16.308	56.131	43.869	98.797	1.203	100
1947	37.616	47.921	14.463	54.955	45.045	98.275	1.725	100
1948	38.238	48.342	13.419	53.372	46.628	98.079	1.921	100

EXP = export industries, H-I = import competing home industries,
H-S = import competing home industries, CON = consumer goods industries,
PRO = producer goods industries, MIN = mining, MAN = manufacturing including gas,
TOT = total industrial production including mining, gas and manufacturing

Table A5. Annual indices labour productivity 1896 - 1948 by industry groups.
1929=100.

Year	1 **NAR**	2 **TEK**	3 **BEK**	4 **LAR**	5 **TRE**	6 **PAP**	7 **GRA**	8 **KJM**	9 **MAM**	10 **STN**	11 **MET**	12 **OLJ**
1896	68.9	46.2	49.6	63.1	66.9	31.3	71.7	10.2	20.3	42.6	43.3	74.6
1897	72.7	47.3	50.8	62.8	67.2	32.2	72.3	10.8	20.8	44.3	44.0	93.3
1898	76.3	48.4	52.1	62.5	67.5	32.7	72.9	11.3	23.0	44.6	44.9	88.6
1899	76.2	49.6	53.4	62.5	67.9	35.6	73.6	12.0	21.6	44.9	45.7	94.5
1900	74.4	50.7	54.7	62.6	68.4	38.8	74.2	12.5	25.9	46.0	46.5	80.4
1901	74.7	51.9	56.0	62.6	68.8	37.7	74.8	13.8	24.0	46.8	47.4	87.5
1902	75.0	53.2	57.4	62.7	69.2	37.9	75.5	14.9	24.9	47.9	48.2	75.9
1903	73.0	54.4	58.9	63.0	69.7	38.6	76.1	14.4	24.8	48.9	49.1	55.1
1904	75.8	55.7	60.3	63.3	70.1	39.9	76.8	15.9	25.3	50.1	50.0	75.9
1905	75.7	57.1	61.9	63.9	70.6	43.2	77.5	17.6	19.2	51.3	50.9	105.7
1906	78.5	58.4	63.4	64.7	71.1	45.4	78.1	17.9	19.2	52.5	51.9	104.2
1907	75.4	59.8	65.0	65.5	71.6	44.6	78.8	19.0	22.1	53.6	52.8	96.5
1908	74.5	61.2	66.6	66.3	72.1	46.9	79.5	20.5	24.2	53.6	53.8	93.4
1909	73.5	62.7	68.3	67.4	72.7	48.0	80.2	25.5	30.9	56.1	54.8	93.5
1910	73.7	65.0	69.6	68.4	73.4	49.4	80.8	28.7	31.6	58.7	54.7	87.4
1911	73.6	67.5	70.9	69.7	74.1	49.6	81.5	33.7	34.2	61.2	54.5	80.8
1912	75.7	70.0	72.3	71.5	74.8	54.2	82.2	35.3	38.2	62.9	54.4	88.9
1913	77.8	72.6	73.8	73.3	75.5	55.4	83.0	41.3	40.2	64.6	54.3	89.7
1914	80.2	75.4	75.3	75.4	76.3	58.6	83.7	42.4	46.3	66.9	54.2	109.0
1915	78.8	78.2	76.8	77.5	77.2	60.4	84.4	43.7	46.0	67.0	54.2	96.2
1916	82.8	81.1	78.3	79.8	78.3	58.0	85.1	47.9	36.1	68.7	54.1	81.8
1917	83.3	82.5	80.5	82.5	79.6	53.1	85.9	53.0	34.5	68.2	55.7	43.3
1918	78.5	83.8	82.7	85.6	80.9	56.1	86.6	48.2	28.7	61.7	57.4	44.5
1919	84.6	85.2	85.0	88.8	82.3	54.3	87.3	48.0	25.2	62.8	59.1	54.0
1920	96.2	86.6	87.3	92.2	83.7	68.9	88.1	53.4	37.1	69.5	60.9	72.1
1921	96.8	88.0	89.6	95.6	85.1	60.4	88.9	52.8	59.7	72.3	62.7	83.6
1922	92.0	89.4	92.1	98.4	86.6	72.1	89.6	58.3	66.7	64.5	64.7	85.6
1923	92.5	90.9	94.5	101.3	88.1	77.0	90.4	60.2	69.6	74.7	66.6	83.7
1924	94.7	92.3	97.0	103.9	89.8	75.3	91.2	69.2	77.8	79.9	68.5	83.2
1925	92.8	93.9	99.6	105.9	91.4	82.2	92.0	67.4	84.5	86.0	70.5	80.7
1926	94.2	95.4	102.2	107.3	93.2	84.0	92.8	71.2	92.0	80.6	72.6	89.3
1927	95.8	96.9	104.9	108.6	90.5	91.7	93.6	78.4	104.8	89.7	74.8	85.2
1928	94.1	94.3	100.8	100.8	96.0	94.7	98.4	82.8	100.3	97.0	85.1	91.5
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	98.6	102.3	98.8	94.8	98.4	98.6	101.2	108.3	101.8	100.3	98.5	99.2
1931	102.8	104.8	95.9	101.3	95.3	93.8	106.9	108.8	106.4	100.4	81.4	104.0
1932	101.8	105.5	95.0	102.0	100.6	105.0	107.4	113.3	114.1	104.5	84.7	107.2
1933	102.9	107.9	94.8	96.5	98.0	106.0	108.7	113.3	119.3	102.3	84.1	106.5
1934	104.6	110.5	92.8	97.3	96.1	110.0	110.0	119.7	116.1	101.6	86.3	108.9
1935	105.7	111.2	93.2	110.0	97.7	111.3	111.9	129.5	117.3	111.6	90.4	115.9
1936	112.5	108.8	92.7	112.4	92.3	112.8	112.7	125.7	117.5	115.2	95.7	109.5
1937	113.5	113.8	93.6	117.8	89.4	115.1	116.7	128.3	117.4	115.9	98.5	112.4
1938	112.6	111.5	88.7	113.3	88.6	109.6	120.1	131.9	122.7	115.9	96.5	117.6
1939	117.7	116.8	89.7	122.0	93.2	125.5	119.6	134.1	126.5	126.1	97.2	120.0

NAR = food, beverages and tobacco, TEK = textiles, BEK = clothing and footwear,
LAR = leather and rubber products, TRE = wood products and furniture, PAP = pulp and paper,
GRA = printing, KJM = chemicals, MAM = ores and basic metals,
STN = stone, cement and glass, MET = metal products, machinery and transport equipment,
OLJ = oils and fats

Table A5. Annual indices labour productivity 1896 - 1948 by industry groups.
1929=100.

Year	1 **NAR**	2 **TEK**	3 **BEK**	4 **LAR**	5 **TRE**	6 **PAP**	7 **GRA**	8 **KJM**	9 **MAM**	10 **STN**	11 **MET**	12 **OLJ**
1940	118.3	113.8	94.9	110.7	86.5	117.5	107.4	121.2	103.1	123.8	84.7	87.8
1941	108.3	89.3	86.5	103.4	77.1	107.2	119.0	104.0	77.9	115.8	73.6	62.6
1942	97.2	82.1	81.1	86.6	70.2	95.1	118.6	95.2	71.0	103.7	65.2	62.4
1943	99.9	90.5	77.3	82.7	63.8	88.3	105.1	92.6	68.3	96.5	61.5	58.8
1944	98.1	92.8	78.4	83.0	58.2	85.5	116.1	90.3	60.5	84.9	57.0	53.3
1945	90.4	87.3	74.8	67.4	57.3	69.1	109.1	89.3	37.7	75.7	54.4	49.5
1946	118.8	107.9	98.5	100.7	63.2	95.2	113.1	101.8	84.7	102.3	72.1	79.5
1947	137.0	115.3	100.8	113.2	68.8	108.0	118.0	102.9	93.7	105.2	77.6	97.0
1948	137.6	125.6	108.8	120.6	70.9	111.9	121.0	113.9	103.0	109.7	78.7	107.8

NAR = food, beverages and tobacco, TEK = textiles, BEK = clothing and footwear,
LAR = leather and rubber products, TRE = wood products and furniture, PAP = pulp and paper,
GRA = printing, KJM = chemicals, MAM = ores and basic metals,
STN = stone, cement and glass, MET = metal products, machinery and transport equipment,
OLJ = oils and fats

Table A5. Annual indices labour productivity 1896 - 1948 by industry groups.
1929=100.

Year	13 **GAS**	14 **EXP**	15 **H-I**	16 **H-S**	17 **CON**	18 **PRO**	19 **MAN**	20 **MIN**	21 **ALL**
1896	61.9	41.3	48.1	65.1	54.6	42.0	49.8	18.7	48.8
1897	62.8	42.7	50.6	66.5	57.0	43.1	51.6	19.2	50.5
1898	63.7	43.1	52.0	69.8	59.1	43.7	52.8	22.0	51.8
1899	64.6	44.2	52.6	70.0	59.8	44.5	53.7	20.0	52.6
1900	65.5	45.7	52.5	69.7	59.5	45.8	54.1	24.8	53.2
1901	66.5	45.6	54.2	68.3	60.0	46.0	54.6	21.8	53.5
1902	67.4	45.8	54.7	69.4	61.1	45.9	55.0	22.6	54.0
1903	68.4	45.6	55.1	67.8	60.6	45.9	54.8	21.9	53.7
1904	69.3	47.1	56.8	69.8	62.3	47.4	56.7	20.4	55.4
1905	70.3	48.4	57.2	70.9	63.5	48.2	58.0	16.4	56.4
1906	71.3	49.3	59.5	71.6	65.3	49.2	59.7	15.4	57.8
1907	72.4	50.0	58.6	72.1	64.4	50.1	59.6	16.6	57.9
1908	73.4	51.5	58.8	73.1	64.7	51.6	60.1	20.9	58.9
1909	74.4	54.5	58.8	74.4	65.4	54.1	61.5	26.1	60.7
1910	75.5	55.7	60.3	73.7	66.5	55.1	62.8	22.6	61.7
1911	76.6	57.0	61.2	74.2	67.4	56.2	63.7	24.8	62.8
1912	77.7	59.6	63.3	74.4	69.3	58.4	65.4	29.8	64.9
1913	78.8	61.8	65.7	73.8	71.3	60.1	67.4	30.1	66.8
1914	79.9	64.9	67.4	75.5	73.3	62.8	69.6	33.9	69.3
1915	81.0	65.0	66.9	77.5	74.1	62.6	69.7	34.8	69.5
1916	82.2	62.2	69.5	79.0	76.5	59.9	70.7	23.7	69.0
1917	83.4	58.8	70.3	83.2	75.7	58.6	69.6	22.4	67.8
1918	84.6	56.4	71.3	80.1	75.6	56.8	68.4	21.0	66.5
1919	85.8	55.6	74.7	83.5	78.7	57.0	69.3	26.4	67.9
1920	87.0	65.2	77.4	93.2	86.9	63.3	76.4	34.2	75.2
1921	88.2	66.5	77.8	92.1	86.0	65.0	76.8	44.2	75.9
1922	93.5	70.9	78.6	90.7	86.5	68.1	78.2	65.2	77.7
1923	96.1	74.2	80.4	92.0	87.8	71.6	80.4	70.0	80.0
1924	88.9	78.1	82.3	91.7	89.8	74.0	82.7	71.4	82.3
1925	91.5	79.8	85.1	92.0	90.7	76.8	84.2	83.3	84.2
1926	89.3	82.4	87.6	92.5	92.8	79.0	86.3	86.3	86.3
1927	91.9	88.6	89.3	93.5	95.8	83.1	89.4	105.7	89.9
1928	100.4	90.8	92.2	97.1	95.7	89.4	92.4	99.3	92.6
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	96.2	97.3	101.3	101.8	99.4	100.0	99.6	102.2	99.7
1931	101.1	94.9	94.5	107.0	100.9	93.2	97.2	98.5	97.2
1932	105.2	101.8	96.6	104.6	101.7	98.8	99.9	110.5	100.1
1933	108.9	102.1	97.7	104.2	102.3	99.0	100.2	116.8	100.5
1934	108.9	103.3	99.9	105.3	103.5	101.1	101.8	116.3	102.1
1935	107.1	107.3	103.0	106.5	105.4	105.4	104.9	116.6	105.1
1936	107.1	107.4	104.9	112.8	107.4	107.8	107.1	116.7	107.3
1937	107.8	110.9	105.3	114.0	108.6	110.2	109.0	115.4	109.1
1938	112.1	110.7	102.9	115.4	106.8	110.3	107.9	120.7	108.2
1939	116.6	115.8	106.0	120.6	112.1	113.5	112.2	123.6	112.4

GAS = gas supply, EXP = export industries,
H-I = import competing home industries, H-S = sheltered home industries,
CON = consumer goods industries, PRO = producer goods industries,
MAN = manufacturing industries, MIN = mining ,
ALL = total manufacturing, gas and mining

Table A5. Annual indices labour productivity 1896 - 1948 by industry groups.
1929=100.

Year	13 **GAS**	14 **EXP**	15 **H-I**	16 **H-S**	17 **CON**	18 **PRO**	19 **MAN**	20 **MIN**	21 **ALL**
1940	108.7	103.9	97.4	118.4	109.4	97.8	103.8	103.9	103.7
1941	94.0	87.8	87.9	103.3	99.0	82.3	90.7	99.0	90.8
1942	90.1	77.2	81.1	94.6	90.6	73.6	82.2	86.1	82.2
1943	107.5	70.8	81.2	90.0	88.7	69.5	79.3	77.0	79.1
1944	113.7	65.6	78.7	87.0	87.6	63.6	75.8	67.1	75.3
1945	63.5	59.1	70.5	85.2	79.1	58.7	69.9	42.5	68.8
1946	109.1	83.2	86.3	117.7	101.1	79.4	91.1	79.9	90.1
1947	124.3	90.5	95.7	125.5	113.2	84.4	99.6	98.2	98.6
1948	127.5	95.2	98.1	132.8	115.9	89.5	103.6	101.0	102.6

GAS = gas supply, EXP = export industries,
H-I = import competing home industries, H-S = sheltered home industries,
CON = consumer goods industries, PRO = producer goods industries,
MAN = manufacturing industries, MIN = mining ,
ALL = total manufacturing, gas and mining

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1896												
Export industries	20.7	20.6	20.9	21.1	21.2	21.3	21.5	21.7	21.8	22.0	22.2	22.6
Home ind. Imp. competing	23.1	23.3	23.7	24.5	25.2	25.6	25.9	26.1	26.0	26.1	26.4	27.2
Home ind. Sheltered	33.3	33.5	33.9	34.9	35.5	36.0	36.4	36.5	36.3	36.5	36.9	37.8
Consumer goods industries	26.3	26.5	26.7	27.2	27.6	27.8	28.2	28.4	28.5	28.6	29.0	29.7
Producer goods industries	21.8	21.7	22.0	22.2	22.3	22.4	22.7	22.8	23.0	23.2	23.4	23.7
Manufacturing	25.4	25.5	25.6	25.9	26.2	26.3	26.7	26.9	27.0	27.1	27.5	28.1
Mining	5.3	4.3	6.9	7.9	7.3	7.7	7.7	8.0	7.9	6.8	7.0	6.8
Total industrial production	24.5	24.6	24.9	25.2	25.5	25.7	26.0	26.2	26.3	26.4	26.8	27.3
1897												
Export industries	22.9	23.4	23.8	24.1	24.4	24.8	24.9	25.1	25.3	25.9	25.8	25.3
Home ind. Imp. competing	27.7	28.0	27.2	27.0	27.2	28.0	28.5	28.8	29.1	29.5	29.9	29.9
Home ind. Sheltered	38.5	38.9	38.0	37.8	38.0	39.0	39.8	40.2	40.7	41.1	41.7	41.8
Consumer goods industries	30.4	30.6	30.2	30.2	30.5	31.1	31.5	31.8	32.3	32.6	33.1	33.3
Producer goods industries	23.9	24.4	24.8	25.1	25.4	25.8	25.8	26.1	26.3	26.9	26.8	26.4
Manufacturing	28.6	28.9	28.9	29.0	29.3	29.8	30.1	30.4	30.8	31.1	31.3	31.5
Mining	6.5	7.1	8.3	7.9	8.9	8.7	8.5	8.2	7.6	10.0	10.0	7.1
Total industrial production	27.6	28.1	28.1	28.3	28.6	29.1	29.3	29.6	29.9	30.3	30.6	30.5
1898												
Export industries	26.0	26.2	25.8	25.8	25.9	25.8	25.8	26.0	26.2	26.4	26.4	26.6
Home ind. Imp. competing	30.3	30.9	31.7	32.6	32.8	32.5	32.1	32.4	32.9	33.4	33.8	33.9
Home ind. Sheltered	42.1	43.2	44.3	45.6	45.9	45.4	45.1	45.6	46.3	47.1	47.8	48.2
Consumer goods industries	33.7	34.2	34.9	35.6	35.9	36.0	35.9	36.2	36.4	36.8	37.2	37.6
Producer goods industries	27.1	27.4	27.1	27.1	27.3	27.2	27.3	27.5	27.8	28.0	28.1	28.2
Manufacturing	31.7	32.1	32.5	32.8	33.1	33.1	33.2	33.4	33.7	33.9	34.3	34.5
Mining	12.1	12.2	8.9	9.3	8.9	7.8	6.9	7.9	8.6	8.3	7.9	8.6
Total industrial production	30.9	31.4	31.6	32.0	32.2	32.2	32.3	32.5	32.7	32.9	33.3	33.5
1899												
Export industries	27.2	27.1	26.8	27.2	27.4	27.7	28.1	28.1	28.3	28.4	28.7	29.0
Home ind. Imp. competing	34.4	35.1	35.3	35.4	34.9	34.6	34.5	34.7	34.8	34.6	34.3	34.2
Home ind. Sheltered	49.0	50.1	50.7	51.1	50.4	50.1	50.2	50.6	50.8	50.6	50.4	50.3
Consumer goods industries	38.1	38.6	39.0	39.1	38.9	38.7	38.8	39.0	39.3	39.1	38.8	38.6
Producer goods industries	28.9	28.8	28.5	28.9	29.1	29.4	29.8	29.8	30.0	30.1	30.3	30.6
Manufacturing	34.9	35.2	35.5	35.7	35.7	35.6	35.8	36.0	36.3	36.2	36.2	36.2
Mining	11.4	10.1	7.4	8.7	8.9	9.7	11.2	10.5	9.9	9.9	10.2	10.2
Total industrial production	34.0	34.2	34.4	34.6	34.7	34.7	35.0	35.1	35.3	35.2	35.3	35.3
1900												
Export industries	29.0	29.2	29.6	29.8	29.5	30.0	30.5	30.6	30.6	30.6	30.8	30.9
Home ind. Imp. competing	34.4	32.9	32.1	32.3	34.2	34.9	35.0	34.8	34.7	34.8	34.8	34.8
Home ind. Sheltered	50.5	48.5	47.7	47.9	50.3	51.0	51.0	50.6	50.2	50.1	49.8	49.5
Consumer goods industries	38.6	37.4	36.9	36.8	38.3	39.0	39.1	38.9	38.8	38.8	38.8	38.6
Producer goods industries	30.6	30.7	31.1	31.3	31.0	31.4	31.8	31.9	31.8	31.8	31.9	32.0
Manufacturing	36.3	35.8	35.7	35.8	36.5	36.8	37.0	37.1	37.0	37.0	37.1	37.0
Mining	9.0	8.6	10.7	10.6	8.9	11.9	12.7	11.1	10.9	10.5	11.3	12.1
Total industrial production	35.2	34.7	34.8	34.8	35.4	35.9	36.3	36.2	36.1	36.1	36.1	36.1
1901												
Export industries	31.2	31.2	30.9	30.9	31.1	31.1	30.8	31.0	31.0	31.1	30.7	30.6
Home ind. Imp. competing	34.8	34.5	33.8	33.8	34.3	35.0	34.9	35.0	35.2	35.5	35.5	35.4
Home ind. Sheltered	49.2	48.5	47.3	47.1	47.6	48.3	48.2	48.4	48.8	49.3	49.4	49.4
Consumer goods industries	38.6	38.4	37.9	37.9	38.2	38.8	38.8	39.0	39.3	39.6	39.7	39.8
Producer goods industries	32.2	32.2	31.9	31.9	32.0	32.0	31.7	31.9	31.8	32.0	31.6	31.4
Manufacturing	37.0	36.9	36.7	36.8	36.9	37.2	37.2	37.2	37.2	37.5	37.4	37.5
Mining	12.7	12.8	11.1	9.7	11.1	9.8	8.8	10.5	11.3	11.4	10.4	8.4
Total industrial production	36.2	36.1	35.8	35.7	36.0	36.1	36.1	36.2	36.3	36.6	36.4	36.3
1902												
Export industries	30.3	30.3	30.7	30.9	30.9	31.0	30.8	30.6	30.7	30.9	31.0	31.3

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Home ind. Imp. competing	35.4	35.6	35.8	35.3	35.0	34.5	34.6	34.7	34.5	34.3	34.0	34.1
Home ind. Sheltered	49.7	50.2	50.6	50.2	49.7	49.1	49.0	49.1	48.8	48.3	47.7	47.5
Consumer goods industries	39.8	40.0	40.3	40.0	39.6	39.2	39.1	39.0	38.7	38.3	38.2	38.3
Producer goods industries	31.2	31.2	31.5	31.7	31.7	31.8	31.7	31.5	31.6	31.7	31.8	32.0
Manufacturing	37.5	37.4	37.5	37.3	37.1	36.9	36.8	36.7	36.6	36.6	36.5	36.6
Mining	6.2	8.2	12.4	14.1	14.6	14.8	13.7	13.2	13.5	13.0	13.4	14.2
Total industrial production	36.2	36.3	36.7	36.5	36.4	36.2	36.1	36.0	35.9	35.8	35.8	36.0
1903												
Export industries	30.9	31.3	31.1	31.3	31.3	31.2	31.6	31.5	31.7	32.0	32.2	32.1
Home ind. Imp. competing	34.3	34.4	34.3	34.4	34.8	35.4	35.7	35.8	36.0	36.2	36.7	36.6
Home ind. Sheltered	47.4	47.2	46.8	46.8	47.0	47.7	47.7	47.6	47.7	47.8	48.2	47.8
Consumer goods industries	38.5	38.5	38.4	38.5	38.8	39.3	39.4	39.4	39.5	39.7	40.0	40.0
Producer goods industries	31.7	32.1	31.8	32.0	32.0	32.0	32.3	32.2	32.3	32.6	32.7	32.5
Manufacturing	36.6	36.9	36.7	36.8	37.0	37.3	37.5	37.4	37.6	37.7	37.9	37.8
Mining	12.7	11.7	11.5	12.8	12.1	11.2	12.8	13.1	11.7	14.2	14.5	14.7
Total industrial production	35.9	36.0	35.9	36.0	36.2	36.4	36.7	36.6	36.7	36.9	37.2	37.1
1904												
Export industries	33.2	32.5	33.3	32.8	32.7	31.9	31.9	32.0	32.2	31.5	32.2	30.4
Home ind. Imp. competing	37.1	37.6	38.5	37.5	37.0	36.3	36.7	36.9	36.8	36.4	35.8	36.4
Home ind. Sheltered	47.9	48.7	49.6	48.4	47.7	47.2	47.6	47.8	47.4	47.3	47.3	47.7
Consumer goods industries	40.2	40.7	41.5	40.6	40.2	40.1	40.4	40.6	40.7	40.8	40.9	41.2
Producer goods industries	33.9	33.2	33.9	33.5	33.3	32.6	32.4	32.5	32.7	31.8	32.0	30.3
Manufacturing	38.7	38.8	39.3	38.7	38.4	37.8	37.8	38.1	38.4	37.7	38.0	37.2
Mining	13.6	9.8	13.3	13.6	13.1	14.8	15.0	13.1	11.2	14.0	13.9	12.7
Total industrial production	37.9	37.7	38.4	37.9	37.6	37.1	37.2	37.3	37.5	37.0	37.2	36.4
1905												
Export industries	31.0	30.9	31.4	32.1	35.1	34.7	35.0	35.0	34.9	35.5	35.3	35.4
Home ind. Imp. competing	36.4	36.2	36.5	36.4	37.2	37.7	37.8	37.8	38.1	38.8	39.1	40.3
Home ind. Sheltered	48.2	48.1	48.3	47.9	48.6	49.2	48.9	48.7	48.8	48.8	48.8	49.6
Consumer goods industries	41.0	40.9	41.1	41.3	42.0	42.5	42.8	42.8	43.2	43.4	43.5	44.3
Producer goods industries	31.0	30.9	31.2	31.7	34.4	34.4	34.4	34.2	34.1	35.0	34.9	35.0
Manufacturing	37.3	37.1	37.2	37.9	39.8	40.2	40.1	40.1	39.9	40.8	40.9	41.3
Mining	14.4	15.7	16.0	14.1	14.6	13.8	14.0	15.1	16.4	14.9	14.1	15.9
Total industrial production	36.7	36.6	36.7	37.2	39.1	39.2	39.3	39.4	39.4	40.0	40.0	40.5
1906												
Export industries	36.4	36.4	35.8	36.2	35.3	37.7	36.6	37.6	37.7	37.8	39.1	39.4
Home ind. Imp. competing	41.3	42.9	44.0	43.0	42.5	41.5	42.0	41.9	42.2	42.5	43.1	43.4
Home ind. Sheltered	50.5	52.2	53.3	51.7	50.6	49.4	49.3	48.9	49.5	50.1	51.0	51.6
Consumer goods industries	45.2	46.3	47.8	47.4	46.6	45.7	45.9	45.8	45.9	45.9	46.4	47.0
Producer goods industries	35.9	36.0	34.8	35.1	34.8	37.6	36.8	37.5	37.6	37.8	38.8	39.2
Manufacturing	42.2	42.6	42.7	43.0	42.1	43.4	43.0	43.4	43.2	43.4	44.2	44.8
Mining	16.5	16.9	15.3	13.3	16.3	16.7	15.0	16.8	18.2	17.9	19.1	19.8
Total industrial production	41.4	41.9	41.9	41.9	41.5	42.5	42.1	42.6	42.6	42.7	43.7	44.1
1907												
Export industries	38.9	39.8	42.0	41.8	39.3	37.9	37.0	39.2	42.2	41.6	41.6	42.8
Home ind. Imp. competing	43.3	42.9	42.3	42.0	43.1	43.5	44.2	44.2	44.2	44.7	45.3	45.5
Home ind. Sheltered	51.7	51.5	51.2	51.1	52.6	53.3	53.9	53.9	54.0	54.6	55.0	55.1
Consumer goods industries	47.0	46.4	46.2	46.0	46.1	46.4	46.6	46.8	47.4	48.3	48.7	49.0
Producer goods industries	38.8	39.5	41.3	41.2	39.7	39.3	38.6	40.2	42.2	41.5	41.3	42.7
Manufacturing	44.6	44.8	45.2	45.0	44.4	44.3	43.7	45.1	46.3	46.7	47.1	47.9
Mining	18.1	18.0	21.4	22.1	20.3	21.3	23.6	23.0	21.6	19.8	17.6	18.8
Total industrial production	43.9	44.0	44.8	44.7	44.0	43.8	43.5	44.8	45.9	46.0	46.2	47.0
1908												
Export industries	41.8	42.2	42.1	42.0	42.3	41.8	43.2	43.7	41.1	42.4	40.1	42.4
Home ind. Imp. competing	45.3	45.2	45.6	45.5	45.1	44.5	45.4	46.6	46.5	46.5	46.0	45.4
Home ind. Sheltered	54.9	54.9	55.3	55.4	54.6	54.2	55.3	56.9	57.1	57.7	57.9	57.5

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Consumer goods industries	48.6	48.9	48.9	49.0	49.0	48.6	49.2	50.0	49.9	49.7	49.8	49.1
Producer goods industries	41.9	42.1	42.0	41.9	42.7	42.2	43.5	44.0	41.6	43.0	40.4	42.6
Manufacturing	46.6	47.1	47.0	47.1	47.5	47.2	47.9	49.0	47.5	48.1	46.7	47.9
Mining	23.8	23.0	20.6	21.7	21.1	20.4	23.4	21.7	19.4	21.9	21.0	20.4
Total industrial production	46.3	46.6	46.4	46.5	46.9	46.5	47.4	48.4	46.7	47.5	46.2	47.1
1909												
Export industries	40.7	42.3	43.1	43.9	42.8	44.3	42.6	43.9	44.7	44.1	45.1	45.3
Home ind. Imp. competing	44.6	44.6	45.1	45.5	46.2	46.2	46.0	45.6	45.4	44.5	44.6	44.8
Home ind. Sheltered	56.9	57.4	58.0	58.7	59.5	59.8	59.7	59.6	59.4	58.4	58.2	57.7
Consumer goods industries	48.0	48.3	49.4	49.9	50.6	50.7	50.7	51.4	50.2	50.1	49.8	49.6
Producer goods industries	41.5	43.0	43.2	43.9	43.0	44.5	43.0	43.3	44.4	43.7	44.7	45.0
Manufacturing	46.4	47.6	48.0	48.7	48.3	49.3	48.6	49.4	49.1	48.7	49.2	49.2
Mining	19.9	19.0	20.0	21.5	23.2	23.3	20.1	19.3	21.3	20.8	22.1	23.3
Total industrial production	45.8	46.8	47.4	48.1	47.9	48.8	47.8	48.6	48.5	48.1	48.6	48.6
1910												
Export industries	48.7	45.8	44.8	46.9	49.0	48.6	50.7	48.7	50.6	49.2	50.6	50.6
Home ind. Imp. competing	46.1	46.9	47.6	48.2	49.1	49.3	50.0	50.4	50.6	50.7	50.9	51.0
Home ind. Sheltered	58.8	59.5	60.2	60.7	61.3	61.4	61.9	62.0	62.5	63.1	63.5	63.8
Consumer goods industries	50.9	51.9	52.7	53.4	53.9	54.5	55.4	55.2	55.7	55.6	55.3	56.0
Producer goods industries	47.9	45.2	44.1	46.1	48.6	47.7	49.6	49.0	49.6	48.8	50.2	49.5
Manufacturing	51.4	50.4	50.1	51.7	53.2	53.0	54.4	53.7	54.3	53.8	54.5	54.6
Mining	23.3	22.4	22.3	22.6	24.0	25.2	24.3	27.2	29.0	29.0	29.9	29.0
Total industrial production	50.8	49.8	49.5	51.0	52.6	52.5	53.8	53.3	54.0	53.5	54.2	54.1
1911												
Export industries	50.1	51.3	51.7	50.1	51.7	50.6	41.0	45.7	55.0	54.9	55.8	53.0
Home ind. Imp. competing	50.7	50.6	50.5	51.0	52.1	48.4	46.6	54.3	54.0	52.9	52.6	53.0
Home ind. Sheltered	63.6	64.0	64.4	65.2	66.1	66.6	67.4	68.0	67.7	66.6	66.0	66.0
Consumer goods industries	57.1	56.2	56.3	56.6	56.8	56.9	55.1	56.7	59.4	58.2	58.2	58.4
Producer goods industries	48.0	50.2	50.8	49.5	51.8	48.0	40.0	49.0	54.2	54.3	54.7	51.9
Manufacturing	54.2	55.1	55.2	54.4	55.8	54.4	49.5	54.2	58.5	58.0	58.2	56.7
Mining	27.9	28.3	30.0	34.2	34.1	25.0	14.0	29.6	34.1	33.9	35.1	38.0
Total industrial production	53.7	54.6	54.9	54.3	55.7	53.9	48.3	53.8	58.3	58.0	58.1	56.7
1912												
Export industries	58.9	58.0	58.9	57.6	57.5	58.8	61.4	64.1	63.6	59.9	64.4	62.1
Home ind. Imp. competing	53.5	54.3	55.7	57.0	58.2	59.1	59.3	58.4	59.6	61.1	62.4	63.4
Home ind. Sheltered	66.7	67.5	68.7	70.2	70.9	71.4	71.3	70.3	71.8	73.6	74.3	74.8
Consumer goods industries	58.5	59.6	60.1	60.8	61.2	61.1	64.6	69.1	66.2	65.8	67.0	67.4
Producer goods industries	58.3	57.5	58.8	57.9	58.9	60.3	60.3	59.1	61.0	59.2	62.8	60.6
Manufacturing	60.0	59.9	60.8	60.9	61.8	62.3	63.9	65.0	65.2	63.9	66.6	65.8
Mining	40.6	43.7	43.2	41.7	39.6	42.9	45.6	44.5	43.5	45.4	44.2	44.4
Total industrial production	60.2	60.4	61.2	61.1	61.8	62.8	64.1	65.2	65.4	64.4	66.7	65.8
1913												
Export industries	64.7	63.3	65.7	66.4	66.8	65.3	64.1	67.9	65.5	69.2	65.1	64.5
Home ind. Imp. competing	63.5	63.5	63.2	62.3	62.6	63.1	63.8	64.5	65.3	65.2	65.8	65.5
Home ind. Sheltered	74.8	74.1	73.1	71.8	71.5	71.7	72.1	72.5	73.8	74.6	75.4	75.2
Consumer goods industries	67.4	67.8	68.8	68.7	68.5	67.8	68.2	69.3	69.8	72.1	71.8	70.7
Producer goods industries	64.2	62.6	63.7	63.7	64.3	63.7	63.7	67.0	63.8	65.5	61.9	61.6
Manufacturing	67.6	66.8	67.9	68.0	68.2	67.3	67.3	68.8	68.1	70.4	68.2	67.9
Mining	44.5	44.7	45.8	45.8	44.6	48.4	49.8	52.1	50.1	48.5	47.8	47.0
Total industrial production	67.7	67.2	68.2	68.1	68.3	67.9	67.5	69.4	68.6	70.9	68.5	67.9
1914												
Export industries	65.0	72.4	67.8	70.2	68.9	73.3	69.1	66.8	69.7	69.8	68.3	72.6
Home ind. Imp. competing	66.4	66.4	66.1	65.1	64.5	64.2	61.6	60.8	63.9	64.6	65.7	65.0
Home ind. Sheltered	76.3	76.3	75.8	74.9	74.1	74.0	71.1	71.0	75.1	76.9	78.5	78.2
Consumer goods industries	71.0	72.8	71.4	71.2	71.8	71.4	70.5	68.1	71.6	72.6	72.4	73.6
Producer goods industries	62.6	68.2	64.4	66.6	65.6	69.6	66.8	65.0	65.9	66.1	65.0	67.3

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Manufacturing	68.2	71.9	69.2	70.4	69.9	71.3	70.0	67.8	70.8	71.5	70.7	73.0
Mining	49.5	50.2	51.4	51.1	55.1	65.1	52.8	40.9	43.4	43.6	43.3	43.9
Total industrial production	68.6	72.6	69.7	70.9	70.5	72.9	70.2	67.8	70.7	71.5	70.6	72.6
1915												
Export industries	72.5	70.8	70.8	71.8	73.7	76.3	76.4	73.7	73.1	73.9	74.2	75.3
Home ind. Imp. competing	62.1	61.1	61.8	63.9	65.2	66.2	66.8	67.6	68.1	69.2	70.8	72.2
Home ind. Sheltered	74.6	73.4	74.4	77.2	79.1	80.1	80.7	81.4	81.9	83.3	84.5	85.8
Consumer goods industries	73.7	70.9	71.3	72.1	74.3	76.5	79.6	76.2	76.1	77.5	78.0	78.7
Producer goods industries	65.4	66.1	67.0	67.8	68.8	69.7	69.4	70.0	69.8	70.1	70.7	71.9
Manufacturing	71.3	69.4	70.1	70.9	72.8	74.3	76.0	73.5	74.3	75.3	75.9	77.6
Mining	49.9	55.0	59.3	59.2	58.9	58.3	52.9	56.3	57.2	54.9	53.8	53.6
Total industrial production	71.5	70.6	71.1	72.0	73.5	75.4	75.8	74.4	75.0	75.9	76.3	77.5
1916												
Export industries	74.7	74.2	73.9	72.6	70.7	72.7	76.9	80.3	75.7	73.6	75.5	77.1
Home ind. Imp. competing	73.0	74.3	75.6	74.9	72.1	73.3	74.2	74.0	73.4	72.3	72.0	72.2
Home ind. Sheltered	86.3	87.1	88.2	88.0	87.0	86.5	86.6	86.6	86.2	85.5	85.6	86.5
Consumer goods industries	79.4	83.6	85.2	84.6	82.1	81.6	82.7	85.5	82.4	81.0	81.9	82.5
Producer goods industries	72.0	69.7	68.4	67.7	66.0	68.5	74.3	74.3	71.5	70.0	71.2	72.2
Manufacturing	78.1	80.5	80.9	80.5	79.0	78.7	80.6	81.3	80.0	78.6	79.4	80.5
Mining	49.6	23.5	21.9	17.3	11.8	27.5	52.4	49.1	39.2	38.2	40.3	43.5
Total industrial production	77.9	78.5	78.4	77.7	75.5	76.9	79.9	81.2	78.9	77.5	78.5	79.5
1917												
Export industries	69.1	64.9	68.1	69.1	68.2	67.5	66.2	65.9	61.6	60.7	60.6	60.3
Home ind. Imp. competing	72.6	70.9	69.5	68.5	67.8	67.4	66.6	66.0	65.2	64.2	63.5	62.6
Home ind. Sheltered	88.1	86.4	84.6	83.7	83.0	82.2	81.2	80.0	78.7	76.8	75.1	73.3
Consumer goods industries	79.4	74.8	74.0	73.4	73.3	72.2	72.8	73.8	68.3	66.3	66.0	64.9
Producer goods industries	67.4	65.7	68.2	68.5	67.1	67.0	65.4	63.1	61.7	61.2	60.5	60.2
Manufacturing	76.0	72.5	73.6	73.5	72.8	72.4	72.2	71.1	68.7	67.1	66.4	66.3
Mining	42.9	40.7	44.7	44.2	42.7	40.2	33.1	26.5	25.2	27.5	29.0	25.2
Total industrial production	75.2	72.1	73.2	73.2	72.2	71.9	70.6	69.7	67.1	65.8	65.2	64.7
1918												
Export industries	63.2	63.0	63.3	62.2	60.2	59.3	57.1	58.7	59.9	60.3	58.5	56.9
Home ind. Imp. competing	62.9	62.7	63.3	63.7	64.2	64.4	64.5	64.5	65.0	64.6	64.7	64.8
Home ind. Sheltered	72.7	71.2	70.7	70.4	70.1	69.6	69.2	69.0	69.0	68.8	68.9	69.2
Consumer goods industries	65.8	64.9	64.8	65.1	66.0	65.0	63.9	64.7	65.2	65.8	65.3	66.2
Producer goods industries	61.7	62.2	62.8	62.2	60.6	60.1	59.9	60.3	60.7	60.7	59.8	58.3
Manufacturing	67.4	66.9	67.3	66.7	66.3	65.7	64.8	64.8	65.7	65.9	65.4	65.2
Mining	27.7	28.6	28.5	32.9	30.9	28.1	32.5	35.5	37.6	36.0	31.1	29.5
Total industrial production	66.0	65.8	66.1	65.9	65.1	64.5	63.7	64.2	65.1	65.3	64.4	64.1
1919												
Export industries	56.1	53.9	52.9	51.8	53.7	53.0	53.4	55.4	57.2	57.4	57.8	60.4
Home ind. Imp. competing	66.4	68.4	69.5	70.6	71.9	72.9	72.9	73.6	72.5	72.7	73.4	74.3
Home ind. Sheltered	71.8	73.8	75.5	76.9	77.9	79.4	80.4	81.1	80.8	82.1	84.1	86.9
Consumer goods industries	68.3	69.8	70.8	71.8	72.2	73.8	75.1	75.8	76.1	76.5	78.2	80.9
Producer goods industries	57.7	56.6	55.9	55.6	57.7	57.4	57.8	59.0	59.7	59.5	58.8	59.9
Manufacturing	65.5	65.1	65.2	65.7	67.1	67.7	68.8	69.5	70.6	70.6	70.6	72.7
Mining	34.3	33.6	31.7	27.6	28.2	29.6	27.0	28.0	27.2	24.1	25.2	26.8
Total industrial production	64.6	64.4	64.4	64.6	65.8	66.5	67.3	68.2	69.1	69.0	69.0	71.2
1920												
Export industries	59.7	62.1	64.3	66.1	65.8	67.8	66.2	64.8	62.8	61.9	58.0	56.0
Home ind. Imp. competing	73.3	73.0	73.2	72.9	73.1	72.4	71.6	70.5	69.3	68.1	67.9	62.5
Home ind. Sheltered	85.7	85.7	85.8	85.9	86.6	87.1	87.6	87.3	88.1	87.9	89.7	85.0
Consumer goods industries	80.4	81.8	82.5	82.1	81.8	81.1	80.1	78.9	78.2	77.4	76.7	71.0
Producer goods industries	59.3	60.5	62.3	63.9	64.4	65.9	64.7	63.3	61.9	61.3	58.6	57.1
Manufacturing	72.5	73.4	74.9	75.8	75.5	76.3	75.4	73.9	73.1	71.9	69.8	66.4
Mining	26.2	27.2	27.3	26.2	27.9	28.3	27.9	26.7	25.7	27.0	25.4	25.8

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Total industrial production	70.9	71.9	73.4	74.1	73.9	74.7	73.7	72.2	71.4	70.4	68.3	65.0
1921												
Export industries	52.3	52.3	51.8	47.8	36.8	28.0	36.4	34.2	30.7	36.4	42.4	44.5
Home ind. Imp. competing	59.1	56.6	55.7	54.5	46.5	37.4	46.9	46.4	51.0	50.5	53.4	56.2
Home ind. Sheltered	84.1	83.5	83.0	83.2	80.5	78.9	83.7	80.8	86.7	85.6	86.4	87.2
Consumer goods industries	66.2	64.9	63.5	62.6	59.2	55.2	61.3	59.3	62.4	64.1	66.0	66.8
Producer goods industries	54.4	53.6	53.6	50.8	38.0	25.9	36.4	35.6	33.6	37.1	42.8	46.0
Manufacturing	62.8	61.4	60.9	58.8	49.2	40.3	49.5	48.2	48.4	51.1	55.1	57.6
Mining	24.3	23.7	23.9	22.4	19.6	15.2	19.7	18.8	20.1	22.8	25.9	27.5
Total industrial production	61.5	60.1	59.7	57.6	48.3	39.5	48.5	47.2	47.4	50.1	54.1	56.6
1922												
Export industries	46.8	46.8	51.3	52.0	57.6	58.5	58.3	58.4	57.8	59.8	57.9	55.4
Home ind. Imp. competing	60.0	61.3	63.7	65.0	66.1	66.7	66.7	68.3	68.6	69.6	71.0	71.4
Home ind. Sheltered	87.3	88.1	89.7	90.7	91.1	91.2	91.1	92.2	93.0	94.1	95.6	96.9
Consumer goods industries	69.5	72.2	73.7	77.2	80.2	79.0	78.1	79.5	79.5	81.6	83.0	82.5
Producer goods industries	48.2	47.7	51.8	50.9	54.8	56.3	56.1	56.5	57.0	57.4	56.0	54.8
Manufacturing	60.1	60.7	64.0	65.2	68.4	68.9	68.1	68.8	69.3	70.3	70.1	69.2
Mining	27.1	29.2	33.1	37.1	39.7	41.5	43.9	52.6	52.4	49.9	48.6	49.0
Total industrial production	59.1	59.6	63.0	64.3	67.4	68.0	67.3	68.3	68.7	69.7	69.4	68.6
1923												
Export industries	58.3	59.7	61.5	64.7	64.6	61.0	60.6	61.4	60.2	60.7	62.4	64.0
Home ind. Imp. competing	71.0	71.8	72.0	73.4	73.6	72.8	71.9	71.6	70.9	70.2	66.0	66.9
Home ind. Sheltered	97.8	97.7	97.5	98.2	98.3	97.8	97.4	96.8	96.2	94.9	94.3	94.3
Consumer goods industries	82.0	82.4	83.7	82.4	83.0	81.2	80.8	80.4	79.0	79.7	79.1	81.4
Producer goods industries	57.2	59.4	60.6	65.0	65.1	62.5	62.4	62.9	62.8	61.9	60.5	60.4
Manufacturing	70.3	71.0	73.1	74.4	74.6	72.8	72.2	72.7	71.8	71.6	70.2	71.4
Mining	53.6	53.7	54.8	56.3	57.0	55.6	54.7	47.0	50.7	52.1	55.7	56.8
Total industrial production	69.8	70.5	72.5	73.9	74.0	72.2	71.6	71.8	71.1	70.9	69.8	70.9
1924												
Export industries	75.1	62.0	48.7	46.7	59.8	73.4	78.0	81.1	82.7	80.1	76.9	79.2
Home ind. Imp. competing	70.3	66.5	62.6	63.6	73.0	79.0	79.3	79.0	79.8	80.3	81.4	81.4
Home ind. Sheltered	96.2	93.8	88.9	88.8	94.8	97.3	97.5	96.3	96.7	97.6	98.1	97.8
Consumer goods industries	90.9	85.2	72.7	72.8	80.3	87.3	89.7	93.3	95.7	91.7	91.6	91.2
Producer goods industries	65.7	57.0	47.4	47.8	60.2	72.4	73.5	73.4	74.1	75.2	73.5	75.8
Manufacturing	78.9	71.0	60.7	60.9	71.5	81.0	82.3	84.1	85.7	84.2	83.3	84.3
Mining	57.5	55.6	43.3	43.5	42.7	60.5	63.8	69.5	67.8	68.8	68.5	69.6
Total industrial production	78.2	70.5	60.1	60.4	70.3	80.4	81.7	83.6	85.1	83.7	82.8	83.8
1925												
Export industries	77.0	80.7	77.5	82.3	81.3	79.6	77.7	78.2	77.9	74.8	74.0	71.6
Home ind. Imp. competing	81.5	82.6	83.4	83.8	82.6	80.8	78.8	77.5	76.6	74.9	74.0	73.2
Home ind. Sheltered	98.8	99.6	100.8	100.7	100.4	99.6	98.5	98.3	97.3	96.3	95.7	95.2
Consumer goods industries	90.4	92.3	90.7	93.3	93.6	90.7	89.4	88.9	89.5	86.9	84.7	84.3
Producer goods industries	75.3	77.9	76.8	79.9	77.8	76.4	74.1	73.8	72.8	70.6	71.1	68.6
Manufacturing	83.1	85.3	84.3	87.4	86.8	84.6	82.4	82.4	82.0	79.6	78.8	77.2
Mining	70.5	70.9	79.0	80.0	76.7	70.9	65.8	59.6	61.7	61.5	58.3	57.8
Total industrial production	82.7	84.9	84.2	87.3	86.1	84.2	81.8	81.7	81.3	79.0	78.1	76.6
1926												
Export industries	71.9	73.4	80.0	73.4	70.6	70.9	71.4	63.7	55.5	66.1	69.2	69.6
Home ind. Imp. competing	72.8	73.5	74.2	70.7	63.5	71.4	71.7	72.3	72.2	72.4	72.9	71.7
Home ind. Sheltered	95.1	95.8	97.0	96.1	92.2	95.1	94.7	94.9	94.5	94.4	94.0	92.5
Consumer goods industries	85.2	86.0	88.0	86.3	84.2	84.8	83.5	81.6	78.4	83.4	85.9	85.8
Producer goods industries	68.2	69.4	74.9	66.4	60.8	66.0	66.7	63.1	59.0	63.6	64.8	64.6
Manufacturing	77.1	78.2	82.2	77.7	74.4	76.4	75.9	72.7	69.0	74.1	75.8	75.7
Mining	54.9	58.9	66.0	54.6	36.5	56.5	57.3	65.0	62.3	63.1	66.9	65.1
Total industrial production	76.4	77.6	81.9	77.1	72.9	75.8	75.3	72.4	68.8	73.8	75.6	75.4
1927												

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Export industries	73.4	71.0	73.5	68.7	70.4	71.1	72.9	73.6	73.8	77.7	77.1	78.4
Home ind. Imp. competing	75.7	69.7	66.6	66.1	71.2	75.2	78.0	77.6	78.5	79.8	80.1	81.3
Home ind. Sheltered	95.4	91.0	90.9	90.5	92.4	94.1	95.7	95.5	96.1	96.4	95.6	97.0
Consumer goods industries	87.9	86.3	88.1	86.6	86.9	87.8	91.1	91.3	90.3	92.9	92.0	92.5
Producer goods industries	68.6	63.5	61.5	58.0	62.1	65.8	65.6	66.7	68.6	70.5	71.2	72.8
Manufacturing	78.1	75.2	76.2	73.8	75.5	77.1	78.7	79.2	79.5	82.0	81.9	82.9
Mining	75.7	66.6	46.7	45.6	69.8	78.2	77.9	71.6	78.6	76.8	76.6	79.9
Total industrial production	78.0	75.0	75.4	73.0	75.0	77.1	78.7	78.9	79.5	81.8	81.7	82.8
1928												
Export industries	78.4	77.3	79.9	80.4	82.9	82.6	78.6	81.3	83.4	83.9	85.9	87.1
Home ind. Imp. competing	82.9	83.0	84.6	86.0	87.1	86.4	85.5	87.2	88.2	88.4	89.8	92.2
Home ind. Sheltered	97.5	97.1	97.9	97.8	97.7	97.5	95.8	96.4	97.0	96.5	97.0	97.5
Consumer goods industries	92.0	91.3	91.7	92.1	92.8	91.2	86.1	89.5	91.6	90.6	92.7	93.9
Producer goods industries	74.8	74.9	78.4	78.5	80.9	81.5	81.4	84.1	84.2	86.0	87.0	88.8
Manufacturing	83.0	83.1	85.0	85.8	87.7	86.5	83.8	86.3	88.1	88.5	90.1	91.5
Mining	84.7	84.1	87.9	86.5	83.3	84.0	83.9	85.7	81.2	85.3	85.5	86.4
Total industrial production	83.0	83.2	85.2	86.0	87.2	86.4	83.9	86.2	87.9	88.4	90.0	91.4
1929												
Export industries	86.2	88.5	89.6	96.1	97.8	119.9	112.6	114.2	102.7	99.5	98.9	94.0
Home ind. Imp. competing	93.1	95.7	96.6	98.1	99.7	100.7	101.8	102.1	102.2	102.5	103.1	104.4
Home ind. Sheltered	97.5	98.3	98.0	98.4	99.7	100.0	100.8	101.1	100.9	101.5	101.4	102.4
Consumer goods industries	92.2	93.2	93.4	94.7	96.9	116.7	108.8	111.2	100.4	98.7	98.0	95.8
Producer goods industries	90.0	92.7	95.6	99.7	100.3	101.8	103.0	104.5	103.8	103.1	103.4	102.0
Manufacturing	91.0	93.2	94.4	97.5	98.9	109.6	105.9	107.3	101.9	100.8	100.6	98.7
Mining	85.5	86.3	93.1	102.9	104.7	103.6	105.5	104.6	106.1	104.0	102.7	101.1
Total industrial production	90.8	93.0	94.4	97.8	98.9	109.4	106.0	107.1	102.0	101.0	100.8	98.8
1930												
Export industries	97.2	98.2	101.6	101.8	104.5	98.9	98.9	95.1	94.2	89.3	84.4	84.3
Home ind. Imp. competing	105.3	107.1	107.9	108.3	107.8	107.4	106.7	103.5	101.9	100.6	97.4	95.1
Home ind. Sheltered	102.6	103.9	103.8	103.3	102.6	103.1	103.4	103.2	104.0	104.3	103.5	102.8
Consumer goods industries	98.5	100.1	100.5	102.0	101.9	100.3	98.5	100.2	101.0	98.6	96.5	97.2
Producer goods industries	104.1	104.2	107.2	107.0	108.8	106.9	106.9	101.7	96.9	93.8	88.6	87.0
Manufacturing	101.0	102.1	103.4	104.9	105.3	103.0	101.8	99.9	99.1	96.7	93.1	92.6
Mining	102.3	103.1	106.2	105.5	105.9	108.9	106.3	105.7	99.6	94.5	89.3	89.8
Total industrial production	101.0	102.1	103.6	104.9	105.3	103.2	102.1	100.0	99.1	96.7	93.1	92.5
1931												
Export industries	81.7	79.8	78.1	55.8	51.4	49.4	50.8	50.0	64.3	77.6	90.5	81.0
Home ind. Imp. competing	90.4	90.6	89.6	77.6	74.4	74.7	73.4	74.3	82.4	91.7	91.5	92.1
Home ind. Sheltered	101.1	102.5	102.3	95.8	94.8	96.0	95.5	94.4	98.2	104.3	104.2	104.8
Consumer goods industries	94.7	93.3	96.1	82.5	77.9	76.6	78.7	80.8	85.8	95.5	107.3	99.8
Producer goods industries	82.5	82.5	78.8	62.6	56.9	57.4	55.0	54.6	69.7	79.6	78.2	78.0
Manufacturing	88.9	88.3	87.9	74.2	69.0	68.3	67.9	68.9	78.6	88.8	94.6	90.3
Mining	88.8	89.1	90.5	50.7	43.1	47.5	50.2	46.8	70.0	76.0	74.4	73.4
Total industrial production	88.9	88.4	87.9	73.4	68.1	67.6	67.5	68.1	78.3	88.4	94.0	89.8
1932												
Export industries	77.0	79.6	79.6	83.8	85.6	89.0	95.8	82.6	80.2	80.2	80.0	76.3
Home ind. Imp. competing	96.4	97.1	97.4	97.6	97.8	98.4	96.7	98.1	98.1	96.1	96.0	94.5
Home ind. Sheltered	107.2	106.1	107.1	107.0	106.9	107.2	105.5	105.5	105.7	102.7	102.7	99.7
Consumer goods industries	99.3	100.1	101.6	103.1	104.6	108.0	112.3	103.8	102.9	100.8	100.9	96.3
Producer goods industries	79.2	82.0	80.2	82.3	82.4	82.6	80.9	81.1	79.7	79.4	79.4	80.7
Manufacturing	90.5	92.4	92.2	94.3	94.7	96.6	97.8	93.5	92.6	91.5	91.2	89.3
Mining	74.5	79.1	77.3	77.2	82.6	83.0	77.9	73.7	76.8	79.5	81.2	83.2
Total industrial production	89.9	91.9	91.7	93.7	94.2	96.2	97.3	92.8	92.1	91.1	90.9	89.1
1933												
Export industries	82.4	82.0	84.2	85.2	85.0	84.3	82.0	82.4	83.5	83.8	85.3	85.1
Home ind. Imp. competing	96.3	96.2	95.8	97.4	98.3	98.4	101.2	99.4	98.5	99.2	99.2	101.6

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Home ind. Sheltered	101.3	102.2	101.2	102.9	103.9	103.0	106.0	106.1	105.4	105.3	105.1	107.5
Consumer goods industries	100.5	100.2	100.2	102.3	102.8	101.6	102.4	104.7	104.0	102.2	102.9	104.8
Producer goods industries	82.1	81.4	83.0	83.1	83.9	84.6	83.1	81.3	81.7	83.8	84.5	84.0
Manufacturing	92.3	91.8	92.4	93.7	94.0	93.6	92.6	93.5	93.6	93.9	94.3	95.4
Mining	83.8	87.4	91.0	93.1	94.1	99.0	105.5	101.6	100.2	98.6	94.3	94.8
Total industrial production	91.9	91.6	92.3	93.6	93.9	93.8	93.0	93.7	93.7	94.0	94.3	95.4
1934												
Export industries	82.8	85.1	88.3	89.1	87.9	90.0	92.2	91.8	91.4	90.7	90.0	94.4
Home ind. Imp. competing	100.1	101.7	103.9	107.8	106.7	108.5	108.4	109.9	110.4	111.3	109.7	111.2
Home ind. Sheltered	105.6	106.1	107.4	110.3	109.2	110.3	109.7	109.9	108.8	109.7	108.5	109.1
Consumer goods industries	102.8	103.7	106.4	107.4	107.3	108.1	107.2	108.6	108.0	108.9	108.3	111.4
Producer goods industries	83.8	86.2	88.8	89.8	89.4	92.2	94.7	94.7	95.0	94.7	93.3	95.1
Manufacturing	94.0	95.9	98.4	99.5	98.8	100.8	100.9	102.2	102.4	102.8	101.2	104.2
Mining	96.2	94.0	98.2	103.2	103.1	104.9	111.8	109.7	104.7	104.1	102.9	106.0
Total industrial production	93.9	95.8	98.3	99.5	98.9	100.9	101.2	102.3	102.4	102.7	101.3	104.2
1935												
Export industries	94.2	95.6	95.6	96.5	99.5	97.6	95.5	99.1	100.8	102.7	103.7	101.9
Home ind. Imp. competing	113.1	114.5	118.0	116.8	118.3	120.4	122.6	122.1	123.4	125.6	127.8	130.2
Home ind. Sheltered	111.0	112.3	115.7	112.8	113.0	114.5	116.1	114.3	115.9	117.7	118.7	120.3
Consumer goods industries	113.0	114.3	115.7	115.6	117.6	116.8	117.7	117.7	118.3	121.5	123.0	121.8
Producer goods industries	95.2	96.3	97.3	98.2	100.8	101.1	100.6	103.1	104.4	105.3	106.7	107.8
Manufacturing	104.9	106.2	107.4	107.7	109.6	109.5	109.6	111.0	112.1	114.3	115.1	115.6
Mining	106.8	108.9	108.9	112.1	116.0	116.0	117.8	120.0	119.7	119.4	120.6	121.6
Total industrial production	104.8	106.2	107.4	107.8	109.8	109.6	109.8	111.2	112.2	114.3	115.2	115.7
1936												
Export industries	104.9	103.9	104.3	104.2	108.0	105.7	108.5	109.5	109.9	108.4	107.9	110.0
Home ind. Imp. competing	129.6	130.8	133.0	135.1	136.9	138.0	139.0	139.6	140.0	139.5	141.1	143.4
Home ind. Sheltered	120.0	119.7	121.4	121.1	122.7	122.9	123.7	123.6	123.4	122.9	123.7	124.3
Consumer goods industries	123.3	123.2	123.3	123.8	127.7	126.1	127.6	127.3	128.8	127.9	127.9	130.3
Producer goods industries	109.2	109.6	111.2	112.8	114.9	115.0	117.1	117.8	117.6	117.8	117.9	119.7
Manufacturing	116.9	117.0	117.8	119.0	121.6	121.1	123.1	123.1	123.9	123.4	122.8	125.7
Mining	123.8	124.6	127.3	126.5	126.2	128.6	127.6	129.9	131.6	132.7	134.4	132.4
Total industrial production	117.0	117.2	118.0	119.1	121.9	121.2	123.1	123.2	124.1	123.6	123.2	125.8
1937												
Export industries	111.6	112.0	116.5	123.5	115.3	123.0	127.0	122.9	114.8	118.0	122.7	118.5
Home ind. Imp. competing	145.6	148.5	150.3	157.2	152.9	152.7	154.1	152.1	152.2	151.4	148.9	144.2
Home ind. Sheltered	124.6	126.0	127.0	133.5	127.8	127.7	129.9	129.2	130.8	130.3	129.4	126.5
Consumer goods industries	130.7	132.5	135.4	142.7	135.6	137.0	138.0	137.1	138.0	135.3	136.9	131.4
Producer goods industries	121.8	123.0	125.6	129.9	127.4	132.5	136.5	131.6	124.3	129.0	129.8	127.8
Manufacturing	127.0	128.6	131.4	137.2	133.6	135.2	137.7	134.9	131.4	132.6	133.2	129.7
Mining	131.5	130.4	132.7	143.0	88.1	142.1	149.0	145.1	148.2	147.7	150.6	152.8
Total industrial production	127.0	128.5	131.3	137.2	132.0	135.3	138.0	135.1	131.9	133.0	133.8	130.4
1938												
Export industries	119.7	122.5	119.7	119.7	119.4	118.7	116.3	114.4	114.5	116.7	113.9	114.7
Home ind. Imp. competing	144.8	143.5	144.4	145.0	145.6	144.5	143.2	145.0	145.4	147.6	147.8	145.8
Home ind. Sheltered	127.8	127.8	129.5	131.5	133.8	134.0	133.0	135.1	138.0	139.0	139.7	137.6
Consumer goods industries	131.0	131.5	130.7	131.9	131.3	132.7	131.2	131.5	131.9	133.1	133.4	133.7
Producer goods industries	130.2	132.0	131.4	131.2	132.1	129.6	127.5	126.7	127.7	128.3	126.1	125.2
Manufacturing	130.7	131.5	130.8	131.3	131.0	130.6	129.1	129.4	129.2	130.6	129.3	129.5
Mining	156.8	161.8	163.1	166.1	163.7	160.9	157.1	152.6	154.2	160.4	160.3	158.3
Total industrial production	131.5	132.4	131.8	132.3	132.2	131.4	130.0	130.0	130.0	131.6	130.4	130.3
1939												
Export industries	113.1	116.7	122.8	126.7	128.0	125.0	130.2	125.4	121.1	121.7	121.3	123.9
Home ind. Imp. competing	149.3	151.6	154.9	158.0	156.2	157.8	159.6	162.5	158.1	161.5	162.8	168.0
Home ind. Sheltered	139.5	141.0	143.1	143.3	140.5	142.1	142.3	145.5	143.0	144.0	146.7	152.9
Consumer goods industries	135.6	138.4	142.1	143.6	145.5	146.0	146.4	149.6	147.4	148.0	150.5	155.6

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Producer goods industries	125.1	128.1	133.1	137.1	137.1	136.1	139.5	135.1	133.6	132.8	131.3	131.7
Manufacturing	130.5	133.2	137.5	140.0	141.2	140.6	143.3	143.5	140.5	141.9	142.5	145.7
Mining	158.4	159.1	166.9	173.8	168.2	166.0	155.1	156.7	145.7	137.8	132.7	131.9
Total industrial production	131.3	134.0	138.4	140.9	142.2	141.2	143.6	143.7	140.6	141.6	142.0	145.0
1940												
Export industries	124.5	120.0	125.4	81.6	59.9	66.4	98.3	95.5	101.0	99.1	99.0	98.5
Home ind. Imp. competing	165.4	158.6	162.6	109.8	87.3	107.8	175.1	141.4	146.9	141.8	140.9	143.6
Home ind. Sheltered	149.0	149.1	148.4	112.3	104.6	118.2	161.6	134.0	129.7	131.0	129.5	130.0
Consumer goods industries	151.6	148.9	150.8	109.2	99.3	116.8	154.1	136.8	133.5	136.3	133.3	131.3
Producer goods industries	132.3	124.2	131.1	84.6	60.3	71.4	114.7	103.1	116.2	107.5	108.5	110.8
Manufacturing	144.0	138.4	142.8	97.5	81.4	95.3	137.0	122.4	126.1	124.3	123.2	123.4
Mining	125.4	118.3	123.2	90.3	60.6	70.9	89.3	95.2	95.1	96.4	97.1	98.1
Total industrial production	143.2	137.4	141.9	97.0	80.6	94.2	135.2	121.2	124.8	123.1	122.1	122.4
1941												
Export industries	92.7	89.4	92.9	93.5	97.1	99.3	90.3	88.8	88.2	86.0	85.5	83.9
Home ind. Imp. competing	136.2	137.6	144.3	149.6	146.1	146.6	121.0	129.7	134.3	133.3	132.3	130.1
Home ind. Sheltered	129.6	129.4	133.4	136.4	135.7	134.4	109.8	115.5	127.4	124.9	124.4	122.6
Consumer goods industries	130.0	128.5	132.4	135.7	133.9	136.2	105.9	113.3	121.8	119.1	118.8	117.8
Producer goods industries	101.6	101.4	106.4	108.2	109.4	112.7	103.8	103.2	101.3	99.2	98.3	96.4
Manufacturing	117.9	116.8	121.4	123.2	123.7	125.4	105.6	110.4	112.5	111.1	110.6	109.4
Mining	96.6	94.7	97.2	99.9	105.2	117.4	106.4	96.8	94.5	92.5	89.5	85.0
Total industrial production	116.9	115.9	120.4	122.1	122.9	124.7	105.6	109.7	111.7	110.3	109.7	108.4
1942												
Export industries	84.3	82.3	78.6	65.6	81.2	80.9	90.1	83.3	80.2	78.2	79.1	77.9
Home ind. Imp. competing	129.5	128.3	128.1	122.1	133.8	127.1	125.1	122.4	118.0	115.7	122.6	120.3
Home ind. Sheltered	122.0	118.5	116.9	114.6	119.8	117.3	116.2	112.5	111.9	110.2	110.1	109.5
Consumer goods industries	117.8	114.6	112.6	109.2	115.3	114.6	115.5	111.2	110.8	107.8	108.3	108.2
Producer goods industries	96.8	96.5	94.8	81.4	99.2	94.7	98.2	94.3	90.0	87.0	92.5	89.4
Manufacturing	109.5	107.7	105.8	96.0	109.8	106.3	108.5	105.1	101.7	99.5	102.8	101.5
Mining	84.9	81.7	74.6	74.9	75.3	74.9	80.9	77.2	72.5	70.9	69.3	68.8
Total industrial production	108.4	106.6	104.6	95.1	108.4	104.9	107.4	103.9	100.5	98.3	101.4	100.3
1943												
Export industries	77.1	78.2	80.2	79.3	77.4	76.4	72.3	68.2	67.0	66.9	64.6	62.9
Home ind. Imp. competing	122.0	124.5	124.2	126.2	126.0	129.0	128.2	127.5	124.2	126.5	121.7	119.7
Home ind. Sheltered	108.0	109.2	110.4	111.4	108.3	108.4	111.9	109.5	106.0	105.4	102.5	100.4
Consumer goods industries	107.5	109.5	111.1	113.5	110.0	111.1	111.6	109.2	107.0	107.5	105.8	104.3
Producer goods industries	90.9	92.4	92.8	91.4	91.8	93.3	86.1	84.3	83.9	84.2	80.1	76.8
Manufacturing	101.5	103.3	104.0	103.3	103.3	103.9	100.8	98.9	97.0	98.2	95.0	93.3
Mining	67.6	67.4	72.2	72.8	70.0	77.5	67.0	66.6	64.8	64.5	63.4	61.9
Total industrial production	100.2	101.9	102.7	102.1	101.9	102.7	99.4	97.6	95.7	96.8	93.7	92.1
1944												
Export industries	65.7	66.3	67.7	69.0	65.8	65.1	66.8	66.8	63.6	63.5	60.5	63.0
Home ind. Imp. competing	127.9	123.7	126.8	129.2	120.4	118.3	121.8	121.1	115.7	116.9	109.2	113.8
Home ind. Sheltered	104.1	103.9	108.2	102.9	101.7	101.5	100.7	104.1	98.5	98.1	96.0	97.4
Consumer goods industries	108.5	108.7	112.0	108.9	105.0	105.2	104.6	107.4	101.1	100.1	98.1	98.2
Producer goods industries	83.2	80.7	81.7	86.8	80.1	77.6	81.6	79.5	78.1	78.2	72.5	75.5
Manufacturing	97.8	96.3	98.4	98.4	94.0	92.5	94.7	95.0	90.7	91.3	86.9	89.9
Mining	64.5	69.1	70.1	72.7	74.6	73.6	71.1	71.0	66.8	61.9	60.3	54.5
Total industrial production	96.5	95.3	97.2	97.4	93.2	91.7	93.7	94.0	89.7	90.1	85.8	88.4
1945												
Export industries	56.1	54.9	50.5	52.8	40.5	45.2	44.8	48.3	54.0	58.9	62.6	66.2
Home ind. Imp. competing	105.4	106.3	102.2	100.1	88.0	99.0	99.2	101.4	111.8	113.0	119.5	118.2
Home ind. Sheltered	92.0	93.5	92.1	93.5	87.2	97.3	95.9	100.2	106.7	112.9	120.8	122.4
Consumer goods industries	92.4	92.7	90.9	94.4	80.2	90.6	90.4	94.5	99.4	107.0	113.1	110.5
Producer goods industries	69.3	68.4	64.1	61.0	51.7	57.3	58.1	61.1	70.7	70.7	75.0	78.2
Manufacturing	82.7	82.9	79.7	79.3	68.4	76.6	77.5	80.9	88.0	92.5	97.6	98.9

Table A6. Monthly volume indices of gross output 1896 - 1948.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mining	44.5	39.6	33.3	27.4	16.7	16.0	11.1	15.3	19.4	23.1	22.9	29.7
Total industrial production	81.1	81.0	77.7	77.1	66.1	73.9	74.5	78.0	84.9	89.4	94.3	95.8
1946												
Export industries	70.6	75.9	82.4	84.9	88.7	93.7	97.0	99.5	101.6	99.8	104.0	106.3
Home ind. Imp. competing	127.0	133.1	140.7	150.7	155.4	162.1	170.0	170.2	175.8	170.7	185.3	187.9
Home ind. Sheltered	133.6	140.6	146.7	150.4	155.6	159.5	167.5	168.8	172.5	173.4	177.9	179.4
Consumer goods industries	123.2	132.5	137.4	141.0	145.1	149.7	159.5	158.7	164.4	165.1	169.1	170.5
Producer goods industries	82.6	86.3	94.6	102.4	105.6	112.0	113.8	115.7	119.3	113.0	124.4	124.6
Manufacturing	105.9	113.3	120.0	125.1	130.1	134.9	141.9	142.3	146.1	144.5	152.2	154.6
Mining	32.3	32.8	36.0	37.7	39.6	45.1	44.7	47.1	45.8	48.2	49.2	51.3
Total industrial production	102.6	109.7	116.3	121.3	126.1	130.8	137.6	138.0	141.7	140.2	147.6	149.9
1947												
Export industries	106.3	105.1	102.0	106.5	113.9	114.5	115.3	121.9	112.4	114.0	113.6	112.7
Home ind. Imp. competing	187.1	183.0	187.0	183.9	194.6	197.1	193.6	213.2	200.3	202.9	201.6	207.3
Home ind. Sheltered	181.2	175.8	177.4	177.1	182.7	183.3	176.3	191.1	186.4	186.7	183.5	186.3
Consumer goods industries	174.5	169.2	172.3	173.5	185.9	185.4	178.0	201.9	191.1	188.5	188.0	190.8
Producer goods industries	124.0	122.5	122.9	122.0	128.3	130.8	133.0	140.5	128.8	130.7	130.0	130.8
Manufacturing	152.9	150.8	152.4	151.5	162.5	161.9	161.0	177.0	164.1	165.6	164.2	167.6
Mining	52.8	54.4	54.1	59.5	67.4	67.6	72.2	73.7	69.0	68.4	67.7	67.1
Total industrial production	148.4	146.5	148.0	147.4	158.1	157.6	156.9	172.3	159.7	161.1	159.8	163.0
1948												
Export industries	129.2	116.7	116.4	123.9	139.8	125.4	111.3	125.7	127.6	126.1	129.3	133.2
Home ind. Imp. competing	210.1	218.0	216.6	219.8	218.9	229.1	182.3	225.7	225.2	228.5	225.7	228.4
Home ind. Sheltered	185.1	189.1	191.5	196.1	193.7	194.2	177.4	195.6	195.1	196.4	196.6	197.5
Consumer goods industries	208.4	192.8	194.5	204.5	211.5	201.0	183.4	202.0	201.0	202.9	204.6	207.7
Producer goods industries	134.2	142.2	142.1	142.0	150.1	153.2	120.9	149.6	152.5	149.7	151.0	152.8
Manufacturing	174.7	173.3	173.9	178.0	187.1	181.8	156.8	182.2	182.0	183.4	184.2	188.2
Mining	64.4	67.7	70.3	69.8	78.7	71.3	72.4	72.4	76.5	76.0	76.0	72.9
Total industrial production	169.7	168.5	169.2	173.1	182.1	176.8	153.0	177.2	177.1	178.4	179.2	182.9