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Discussion paper

Norwegian GDP by industry 1830-1930

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Preliminary version

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Abstract

The present paper offers new knowledge of historical national accounting in Norway in several ways. Firstly, a new and novel set of annual gross domestic product series by industry are presented for the period 1830-1930. Secondly, the new estimates suggest revision of the historical national accounts published by Statistics Norway. Thirdly, this may lead to necessary revisions of both Norwegian industrial history and business cycle history.

Keywords: Historical national accounting, national accounts, industrial development, Norwegian economic history.

JEL classification codes: L6, L7, L8, L9, N3, N13, N14, O11, O14, O16.

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1. Problem defined

The current annual historical national accounts for Norway stretches back to 1830. However, before 1930 the annuall records cover the expenditure side only. The present paper aims at constructing gross domestic product figures by industries, from the production side back to 1830. This will equip us to map industrial development for this period and to refine and revise the existing historical national account series.

Hence, in this paper we present new and novel series on GDP from the production side, by calculating the contribution of different industries 1830-1930. These are presented in three levels of aggregation. On the lowest level we present 30 industries, on the semi-aggregated level we present 18, and finally eight on the highest aggregated industrial level. By doing this, one might, in the first place, be able to refine the existing historical national account figures. Secondly, one might be able to revise the existing GDP series. Thirdly, it enables us to conclude more precisely on the sizes of the different industries, and thereby throw light on industrial development and business cycles.

2. Approach

National accounts represent a statistical system, which gives an overview of an economy. Its most important component is gross domestic product (GDP), which is a quantitative meassure of total walue creation or production in an economy. Thus, GDP reflects the sum of value added in all value creation units of the economy. More precisely it is a meassure of the gross values added of all resident and institutional units engaged in production, added by taxes and subtracted by subsidies on products not included in the value of their outputs.

GDP can be calculated by three major approaches.[2] The production approach, the expenditure approach and the income approach. In the production approach we sum up value added in all production units (j), by subtracting input from output:

$$\sum y_{j,t} = \sum (q_{j,t} - h_{j,t}) \quad (1)$$

where y denotes the gross value added, q is the gross value of output in period t and h denotes the value of intermediarie consumption used in production (input) in period t. Economy wide aggregates (capital letters) are found by adding the sums of all production units:

$$Y_t = Q_t - H_t \quad (2)$$

When GDP (Y)from the production side describes the supply side of the economy, GDP from the expenditure side describes the demand side, where C denotes private consumption, I, gross investments, G, public expenditures, X exports and M imports in period t.:

$$Y_t = C_t + I_t + G_t + (X_t - M_t) \quad (3)$$

Finally the income approach reports the income distribution of GDP on compensation of employees, W, gross operating surplus, S, and taxes, T, less subsidies, S, on production, Q, and imports, M, in period t.

$$Y_t = W_t + St + (T^Q_t - S^Q_t) + (T^M_t - S^M_t) \quad (4)$$

In this paper we use the production side approach in order to establish annual GDP by industry for Norway 1830-1930. Before we do that we will give a brief introduction to the state of the art in Norwegian historical national accounting.

[2] Fløttum, Erling J. 2006, *Nasjonalregnskapet: systemet og utfordringen i Norge*, Oslo: Universitetsforlaget, pp. 93-131.

3. First estimates

The history of national accounting in Norway starts as early as 1840, when Professor Anton Martin Schweigaard made estimates over total domestic production for most industries in a normal year around 1835.[3] Trade and other services were excluded, as they were not considered production. Schweigaard's work was carried out on the basis of public production, trade and census statistics, records, files and archives compiled and kept by public servants, academics, industrialists and merchants.

Schweigaard's work was followed up by M Braun Tvethe in 1848, a senior civil servant within Norwegian customs, and thus, an expert on exports and imports statistics. Tvethe estimated domestic production by industry for a normal year around 1845.[4] He principally applied similar definitions and kinds of sources as Schweigaard. However, he was able to include larger parts of the economy. Both of them tried to estimate output and input, and thus, value added. However, they were not always persistent in their approach.

The third attempt of giving estimates of the size of the total economy came in 1887. In that year the contemporary director of Statistics Norway, Anders Nicolai Kiær, published estimates of total national income.[5] Contrary to his predecessors in the field he included several services in his estimates. Kiær also had significantly richer and more valid and reliable data. Additionally he possessed a wider understanding of the importance of using value added figures in order to sum up total production by industry into national aggregates.

[3] Schweigaard, Anton Martin 1840, *Norges Statistik*, Christiania.
[4] Tvethe, M Braun 1848, *Norges Statistik*, Christiania.
[5] Kiær, Anders Nicolai 1887, "Nogle Bidrag til Bedømmelsen af den Økonomiske Udvikling.med særlig hensyn til Norge", *Statsøkonomisk Tidsskrift,* s. 193-205.

In the 1930s the take off of empirical and quantitative economics gave way to the idea of collecting data in order to produce sets of aggregated accounts for the over all economy. The idea was initiated by two of the most prominent Norwegian economists, i.e. Ragnar Frisch and Ingvar Wedervang. It resulted in the collection of relevant data by statistics Norway from 1930s onward, in addition to a historical archive of wages and prices, established and monitored by Ingvar Wedervang and his staff at the Norwegian School of Economics in Bergen. Today this archive probably is one of the richest manual archive of its kind in Europe, and has served as source for domestic and international research on the standard of living, economic growth, price, labour market, and maritime history.[6]

4. Historical national accounts by Statistics Norway

After World War II, Statistics Norway started its production of national accounts, and historical national accounts. These estimates were carried out on the basis of theoretical work, modelling and data collection started in the 1930s. The work was completed and refined after the war by Odd Aukrust.[7] Several aggregated series of macro economic key indicators were published in the 1940s and 1950s.[8] Until, in 1965, a set of historical national accounts, covering the period 1865-1960 was launched and published.[9] A second edition of this volume was published by Statistics Norway in 1968. Both of these are made on the basis of the international System of National Accounts of 1958 (SNA1958). However, some national modifications were done in order to fit into domestic data an industrial profile.[10]

Senior economist Juul Bjerke was responsible for the calculation of these series. Aggregated accounts of GDP from the expenditure side were presented annually

[6] Grytten, Ola Honningdal 2007, "Professor Dr Ingvar B. Wedervang's Historical Archive on Wages and Prices", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway – Part* II, Oslo: Norges Bank, pp. 203-230.
[7] Aukrust, Odd 1955, *National Accounts: Theoretical principles*, Oslo: Statistics Norway.
[8] Statistics Norway 1946, *National Income of* Norway, Oslo, Statistics Norway 1952, *National Accounts 1930-1939 and 1946*-1951, Oslo and Statistics Norway 1953, *National Accounts 1900-1929*, Oslo.
[9] Statistics Norway 1965, *National Accounts 1865-1960*, Oslo.
[10] Statistics Norway 1968, *National Accounts 1865-1960*, 2nd ed, Oslo.

from 1865 onwards until 1930. Thereafter, they are fairly detailed and accurate from 1930 onwards until 1960. These have served as official historical national accounts for Norway, partly challenged and supplemented by series published by the central bank, Norges Bank, in 2004.

As for the figures from the production side, only benchmark year calculations were given for main production sectors until 1930.[11] From then on, they include fairly detailed accounts on 55 industries and sub-industries. From 1946 onwards, they are extended to include 63 industries and sub-industries. This richness made Norwegian historical national accounting in the forefront internationally. However, sadly almost nothing happened in this field in Norway for almost three decades.

3. Historical national accounts by academics

In the 1990s economic historians at the Norwegian School of Economics started a new project on historical national accounting. This was part of a greater project, launched by the Swedish professor Olle Krantz, on standardisation of Nordic historical national accounts. Camilla Brautaset gave detailed accounts on Norwegian export and the size of the export industries for the period 1830-1865. This was done on the basis of rich price material from the Wedervang Archive and public archives and volume figures recorded in the trade statistics.[12]

Ola H Grytten calculated the annual GDP contribution for agriculture 1830-1865 by establishing persistent input and output series. In order to reach at fixed price calculations of agriculture's contribution to GDP a double deflation technique was used. This was possible due to the very rich price data sets in the Wedervang Archive.[13]

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[11] Bjerke, Juul 1966, *Trends in Norwegian Economy 1865-1960*, Statistics Norway, Oslo.
[12] Brautaset, Camilla 2002, *Norwegian Exports 1830-1865: in Perspective of Historical National Accounts*, Bergen: Norwegian School of Economics.
[13] Grytten, Ola H 2004a, "Output, Input and Value Added in Norwegian Agriculture1830-1865", Jonsson, Gudmundur (ed), *Nordic Historical National Accounts*, Reykjavik: Reykjavik University, pp. 47-76.

Elisabeth Bjørsvik established GDP series on public services for the same period. This was done by drawing on previous work by Fritz Hodne and published and unpublished public records kept by Statistics Norway and the National Archive. Bjørsvik series cover both local and central government levels. Due to the nature of the services she has not been able to apply any double deflation method for the public sector in her figures.[14]

Christian Venneslan calculated detailed series for value added in manufacturing by nine industries and 51 sub-industries, covering the period 1896-1939 (Sometimes they are presented as twelve main industries and 48 sub-industries). His calculations were carried out on the basis of detailed manufacturing statistics recorded and kept by Statistics Norway. Again, rich price material made it possible for him to calculate fixed price series by adopting a valid and reliable double deflation technique.[15]

Recently Jan Tore Klovland has revised the series on gross output in manufacturing by presenting detailed production figures for 45 industries from 1896 to 1948. Klovland's figures by large support Venneslan's findings on aggregated levels. However, on branch levels, in particular for sub-industries, we find significant deviations during the first years of the period covered.[16]

Fritz Hodne and Ola H Grytten computed estimates of total GDP 1835-1865 on the basis of the state of the art in 1994.[17] Finally, in 2004 the latter concluded with historical GDP series, covering the entire period 1830-2003. These were published

[14] Bjørsvik, Elisabeth 2004, *Public services in Norway 1830-1865 within the framework of historical national accounts*, Bergen: Norwegian School of Economics.
[15] Venneslan, Christian 2007, *Industrial development in Norway 1896-1939: in view of historical national accounts*, Bergen: Norwegian School of Economics.
[16] Klovland, Jan T. 2015, "Measuring trends and cycles in industrial production in Norway 1896-1948", Oslo: Norges Bank.
[17] Hodne Fritz and Grytten, Ola Honningdal 1994, "Gross Domestic Product of Norway 1835-1865", Krantz, Olle (ed), *Nordiska Historiska Nationalräkenskaper*, Umeå: University of Umeå, pp. 93-113.

by the Norwegian central bank as part of a project on establishing key historical monetary series as far back as to 1516. These latter historical national accounts have been updated and revised until present times.[18]

However, a full set of historical national accounts from the production side has not been published for the period before 1930 yet, despite bench mark calculations for the major sectors of the economy for 1865, 1875, 1890, 1900, 1910 and 1920. These calculations coincide with the population censuses. This is basically due to their dependence on employment figures. In this paper we present aims at calculating valid and reliable annual series of GDP from the production side. The methodology and historical data sets, which are used, are described in the next sections of the paper.

4. New series

This paper presents a production approach to historical national accounts for Norway covering every year 1830-1930. We have been able to follow 23 industries and sub-industries until 1896, and from then on 35, as 12 manufacturing industries are included. The new series are spliced with the accounts by Statistics Norway in 1930. In consequence, we now have consistent annual historical GDP series by industry for Norway stretching back another one hundred years in time.

In principle SNA-2010 has been followed as far as possible. However, the new series are spliced with the old in 1930, which has made it necessary to adjust somewhat to the standards of the previous historical accounts. Annual series of input and output by industries have been calculated, and in order to come up with relevant fixed price series, a double deflation technique has been applied as far as possible. This is a novel approach in historical national accounting, as data usually limits one to apply double deflation techniques. However, basically due to the rich price material in the

[18] Grytten, Ola Honningdal 2004b, The gross domestic product for Norway 1830-2003", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway 1819-2003*, Oslo: Norges Bank, pp. 241-288.

Wedervang Archive kept at the Norwegian School of Economics, it is possible to use a double deflation approach in the case of Norway.

5. GDP by industry

In order to make the new series comparable with existing historical national accounts series we present three levels of disaggregated GDP series here. The highest level of disaggregation consists of 30 sub-industries, stretching from 1896. The second level consists of 18 series, and the lowest of eight.

Different approaches have been used in order to come up with consistent annual series of GDP contribution by industry. The chosen approaches are very much dependent on what kind of sources that are available. In the following section we offer a description of approaches followed and sources available in order to calculate value added by industry for Norway 1830-1930.

5.1. Primary industries

5.1.1. Agriculture

There already exist annual series for value added for arable production and cattle production 1830-1865. These series are constructed on the basis of volume and price figures. In order to establish volume figures six benchmark years were used. Value added figures for these years were estimated on the basis of figures taken from farm censuses and county reports every fifth to tenth year and farm accounts from the Wedervang Archive.[19]

In order to interpolate between the benchmark years production reports from counties, farm accounts, exports and imports statistics were used. For some years there was lack of sufficient data. Hence, demand and production functions were constructed in order to estimate volumes. Relevant price data are found in the

[19] Wedervang Archive, files W501-W519.

foreign trade statistics, in public records and in the Wedervang Archive. These contain both input and output prices. Thus, on the basis of these sources, fairly reliable series on annual value added in agriculture 1830-1865 were published in 2004.[20]

On the basis of the same kinds of sources, it has been possible to continue these calculations until 1910. In these new calculations 1865, 1875, 1890, 1900 and 1910 serve as benchmark years. In addition work by Grytten and Hodne on volumes and prices of land crops 1830-1910 serves as a major source.[21] Another major source of prices is the Wedervang Archive.[22]

As for 1910 and onwards, we find reliable annual estimates of the production of milk, milk products, meat, and to some degree different kinds of crops. These are taken from publications from Statistics Norway, the Dairy Producers' organisations and in work done by economic historians.[23] However, farm input and output according to the agricultural censuses and the farm accounts still serve as important sources for the estimates. From the late 1920s Statistics Norway published annual series of farm production, which are used here.[24]

5.1.2. Forestry

In her dissertation on the Norwegian export sector, Camilla Brautaset offers detailed series of forestry exports from 1830 onwards until 1865.[25] Thereafter, it is possible to make similar calculations on the basis of records from foreign trade accounts, tax

[20] Grytten, Ola H. 2004a, pp. 47-76.
[21] Grytten, Ola H. and Fritz Hodne 1998, "Norwegian Production of Landcrops in the Nineteenth Century: Prices and Output 1830-1910", Christen, Jørgen Peter (ed), *Nordiske historiske nasjonalregnskaper*, Copenhagen: University of Copenhagen, 115-142.
[22] Wedervang Archive, files W139, W269, W271, W269, W 272, W273 and W383
[23] Mork, R 1941, *Melkeomsetning og meieridrift i Norge*, Oslo: , Benterud, O. 1978, *Norske Meieriers Salgssentral 50 år,* Oslo: NMS, pp. 22-24 and 194-278, Grytten, Ola Honningdal 1997, "The Consumers' Burden: What did regulations of the Norwegian milk market in the 1930s cost consumers?", Basberg, Bjørn L. et al (eds), *I det lange løp*, Bergen: Fagbokforlaget, pp. 143-164, Statistics Norway 1949, *Statistical Survey 1948*, Oslo, pp. 64-93.
[24] Statistics Norway 1978, *Statistical Survey 1978*, pp. 143-148.
[25] Brautaset 2002, pp. 168-189.

records and production records from Statistics Norway. They also serve as sources for input and production for domestic use.

The foreign trade statistics make up the main source until 1886. From then on the volumes of timber floated in domestic waterways along with previous estimates on use of firewood, provide reliable estimates of the size of forest production. From 1901 Statistics Norway report annual series of key variables regarding cultivation of private forests.[26]

Along with the foreign trade statistics these data make it possible to construct volume series of both input and output.[27] To reach at value series we use price series from Brautaset, the Wedervang Archive and Statistics Norway, where we find both input and output prices.[28]

5.1.3. Fisheries

The contribution of fisheries to GDP is by definition limited to the values of catches on board vessels. This means that the preserving of fish is considered food industry. If fish preservation were included, fisheries would have been at least twice as big in our accounts.

Thus, we have to find the value of the fishermen's catches. This is possible on the basis of volume series of exports and domestic fish consumption. Brautaset offers detailed series of fish exports 1830-1865. According to her 80-90 percent of the volume of fish catches were exported.[29] Consumption surveys give us information on domestic fish consumption. Thus, it is possible to calculate total production figures.

[26] Statistics Norway 1949, pp. 88-91.
[27] Statistics Norway 1949, pp. 162-184.
[28] Brautaset 2002, pp. 262-268, Statistics Norway 1949, pp. 80-91, Wedervang Archive, W139, W269, W271, W272 and W383.
[29] Brautaset 2002, pp. 251-256.

After 1865 we find detailed figures on volumes and prices on fish exports and consumption in benchmark years in publications from Statistics Norway. From 1866 Statistics Norway report quantity of fish brought to land and value to fishermen. From 1908 Statistics Norway reports annual values of catches.[30] Thus, on the basis of adequate information we are able to calculate input, output and, thus, value added series.

5.1.4. Whaling

This industry includes the catching of whales, seals and miscellaneous catches. Contrary from fisheries, where only the value of catches on board is considered as primary industry, the production of oil on board ships is considered part of this industry. Thus, whaling should be considered a hybrid between primary and secondary industries.

The data, basically taken from Statistics Norway, are fairly good from the early 1900s onwards. Before then we have to look at the foreign trade statistics in order to reach at output series. With the help of Anders Nicolai Kiær's work and population censuses we are able to establish benchmark data on input, output and value added for almost every tenth year 1835-1930.[31]

To interpolate we use foreign trade statistics and records on catches and oil production from Statistics Norway. These are splices to the 1930 values of the whaling industry according to the historical national accounts by industry published Statistics Norway.[32]

[30] Statistics Norway 1949, pp. 91-104.
[31] Kiær, Anders Nicolai 1877, *Bidrag til belysning af Skibsfartens Økonomiske* Forhold, Oslo: Statistics Norway.
[32] Statistics Norway 1949, pp. 105 and 168-171.

5.2. Secondary industries

5.2.1. Manufacturing

Both Shweigaard and Tvethe give reliable estimates of input and output in manufacturing industry for 1835 and 1845. In addition we can add 1865, 1875, 1890, 1900, 1910,1920 and 1930 as benchmark years, on the ground of calculations carried out by Bjerke.[33] By drawing on population and manufacturing censuses, export and import statistics and public reports from county officials, it has been possible to come up with fairly valid and reliable accounts of input, output and value added in manufacturing until 1896.

As for the period from 1896, we use reliable and detailed accounts for 12 manufacturing industries calculated by Venneslan. These are established on the basis of impressively informative manufacturing production statistics recorded and kept by Statistics Norway. These provide us with a unique set of detailed input and output data on volumes and values.[34] Admittedly, Venneslan had to make some courageous assumptions on productivity development for some of the industries for the late 1890s and early 1900s. However, a check-cross with Klovlands's new production data for 45 manufacturing industries very much confirm Venneslan's aggregated levels for the manufacturing sector, despite deviations at disaggregated levels.[35]

Thus, from 1896, on the aggregated level, the manufacturing series are some of the most valid and reliable in this set of GDP by industry. From around 1907 the same accounts for these figures on sub-industry level.

5.2.2. Construction and power supply

We find output figures for power supply in a paper by Kjell Bjørn Minde. His estimates are made on the basis of different sources, basically sources from the, the

[33] Schweigaard 1840, Tvethe 1848, Bjerke 1966, pp. 53-56.
[34] Venneslan 2007, appendix, pp. 12-48.
[35] Klovland 2015, pp. 51-73.

Statistical Office (Tabellkontoret) connected to the Ministry of Domestic Affairs from 1830 and Statistics Norway from 1876.[36] Input figures are found in work by Fritz Hodne on the size of the Norwegian infrastructure.[37] From 1914 onwards, we find relevant series in public budgets and accounts from both the central and local governments, along with data for private power supply companies.[38]

We find volumes and values of construction in the work of Schweigaard and Tvethe for 1835 and 1845 respectively. In addition Bjerke's benchmark year calculations enable us to extract construction by deducting manufacturing and mining from the secondary sector calculations. Hence, construction is seen as a residual in these estimates. Thus, we also have benchmark years of construction for 1865, 1875, 1890, 1900, 1910, 1920 and 1930.[39] We interpolate between the benchmark years by using annual figures on public spending on construction and private spending on key sub-industries within construction, e.g. private road, railway, port and telecommunication construction.[40]

5.2.3. Mining

As for mining, we again find valid and reliable estimates with Schweigaard, Tvethe and Bjerke. These are refined in the historical national accounts published by the Norwegian central bank.[41] These benchmark years estimates provide us with both input and output figures, and, thus, with valid value added numbers.

We find reliable data on the development of volumes and partly values in the foreign trade statistics. Production for domestic use has been interpolated between

[36] Minde 2015, "Norwegian energy consumption in the nineteenth and twentieth century", unpublished manuscript, Stord: HSH.
[37] Hodne, Fritz 1983, *Stortingssalen som markedsplass: Statens grunnlagsinvesteringer 1840-1914*, Oslo: Universitetsforlaget, pp. 298-313.
[38] Statistics Norway 1949, pp. 151-155.
[39] Schweigaard 1840, pp. 72-91, Tvethe 1848, pp. 93-118 and Bjerke 1966, pp. 53-56.
[40] Statistics Norway 1949, pp. 279-288 and 390-414.
[41] Grytten 2004b, pp. 249-258.

industrial censuses and county reports by using series of mining as input into other industries of the economy and as fuel, after imports have been deducted.

From 1901 we also find annual production data for mining from Statistics Norway. We have been able to refine these with data from Venneslan's work on the manufacturing sector from 1896.[42] The series is spliced with the GDP contribution of mining in 1930 according to Statistics Norway's historical national accounts.[43]

5.3. Commerce

5.3.1. Trade

Annual trade statistics is missing for the early 19th century as trade was not esteemed as value creation activity. However, Schweigaard, Braun Tvethe and Kiær all give us some information on both volumes and values. The same is found in population censuses and county reports. These have been compiled and summed up to aggregated trade figures in benchmark years in the historical national accounts published by the central bank.[44] Adding the work by Bjerke to these sources, we reach at benchmark years figures for trade about every tenth year 1830-1930. These report input, output and value added figures.[45]

In order to reach at annual figures we have to interpolate between the benchmark year figures. For the 19th century, the Wedervang Archive holds records on trade activity, monthly prices, but to some degree volumes and values. As for the 20th century we find better records at Statistics Norway.[46]

However, in order to reach at consistent annual trade series we also had to use other indicators. Thus, we interpolate with annual figures of money supply, i.e.

[42] Statistics Norway 1949, pp. 111-146 and Venneslan 2007, appendix, pp. 12-48.
[43] Statistics Norway 1965, pp. 68-71.
[44] Grytten 2004b, pp. 250-258.
[45] Bjerke 1966, pp. 53-56.
[46] Wedervang Arvhive, files W139, W267, W268, W269, W271, W272, W273 and W383.

banknotes and coins in circulation, since the great bulk of trade was paid in cash at the time of our calculations.[47]

5.3.2. Finance

Due to detailed work by Klovland, published by the central bank of Norway, very reliable historical data on input, output and value added for the banking sector are available. Klovland has collected and compiled data for almost every savings and commercial bank in Norway from 1822 onwards until present time.[48] Using similar data for publicly owned banks and other public and private credit institutions, compiled by a former governor of the central bank, Hermod Skånland, we arrive at valid and reliable series on value added in the registered finance market.[49]

In addition we have to add the volumes of unregistered finance services provided by private credits. This is done by following the hints given in the historical national accounts by the central bank and in a newly published banking history, published in 2013, on one of the largest banks throughout Norwegian banking history.[50]

Cross checks with the mentioned bank history from 2013 and a quantitative study of the bank market by Sara Liseth confirm the new series.[51] By splicing these with the finance industries contribution to GDP in 1930 according to Statistics Norway, we arrive at adequate value added series for the entire Norwegian finance industry 1830-1930.

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[47] Klovland, Jan T. 2004, "Monetary aggregates in Norway 1819-2003", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway 1819-2003*, Oslo: Norges Bank, pp .181-240.
[48] Klovland, Jan T 2007b, "A reconstruction of the balance sheets of savings banks in Norway 1822-1875", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway – Part II*, Oslo: Norges Bank, pp. 109-160 and Klovland, Jan T 2007c, "A reconstruction of the balance sheets of commercial banks in Norway 1848-1900", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway – Part II*, Oslo: Norges Bank, pp. 161-202.
[49] Skånland, Hermod, 1967, *Det norske kredittmarked siden 1900*, Oslo: Statistics Norway, pp. 262-385.
[50] Grytten, Ola Honningdal (ed) 2013, *Banken i samfunnet*, Bergen: Bodoni, pp. 9-76 and 403-411
[51] Grytten 2013, pp. 403-411 and Liseth, Sara 2012, *Bergen Banks markedsposisjon: En kvantitativ analyse av bankens stilling i markedet 1855*-1990, Bergen: NHH, pp. 91-131.

5.4. Property

5.4.1 Housing and commercial properties

Due to the extensive project on historical monetary statistics monitored by the Norwegian central bank it has been possible to trace values of Norwegian housing and property management back to 1830. The series presented here reflect the value creation of providing private housing and properties for the business community. The value of the stock of dwellings consists of the housing volume and its value.

Stocks of dwellings are calculated on the basis of popular and industrial censuses 1825-1930. Between the census data, we interpolate on the basis of population records and estimated numbers of people per square meter.[52] Thus, we arrive at annual volume figures of the stock of buildings. These are multiplied with prices of buildings as they are reported in the central bank's house price index.[53]

Since housing in national accounts should reflect the value creation of housing and not the market price of buildings, we should not use markets annual prices to conclude with values. Thus, we use smoothed series, with the help of a HP-filter, with a smoothing parameter (lambda) of ten. This makes it possible to construct annual numbers of value added provided by housing.

5.5. Transportation

5.5.1. Ocean going transport

For the period in question the great bulk of the ocean going transport was either between domestic and foreign ports or between foreign ports only. Thus, Brautaset's and later Kiær's estimates of the scale of value creation in the

[52] Statistics Norway 1994, *Historical Statistics 1994*, Oslo: Statistics Norway, pp. 77-79.
[53] Eitrheim, Øyvind and Solveig K Erlandsen 2004, "House price indices for Norway 1819-2003", Eitrheim, Øyvind et al (eds). *Historical Monetary Statistics for Norway 1819-2003*, Oslo: Norges Bank, pp. 349-376.

Norwegian merchant fleet serve as reliable sources on this industries contribution to GDP from 1830 and towards the turn of the century.[54]

Thereafter, and even before, the Wedervang Archive give us detailed information on income and cost structures, freights and wages in the merchant fleet. The data is best for the fleet engaged in foreign ports. However, the data for the coastal fleet is also adequate.[55]

In addition, publications by Statistics Norway report volumes of the fleet and the ships' engagements.[56] Thus, drawing on this information and splicing the new time series with the 1930 figures of value creation in ocean going transport, we reach at value added series for this industry 1830-1930.

5.5.2. Other transport and communication

Other transportation includes horse, railway and auto car transportation as well as telephone, telegraph and postal services. The number of horses is taken from the agricultural census held about every tenth year. Freight incomes and costs from horse transport are taken from the Wedervang Archive.[57]

Statistics Norway provides information on kilometres of road, number of cars, kilometres of railways and other types of communication, public income and costs from transport and communication.[58] With the help of these data we have been able to interpolate between benchmark years and spilice with the 1930 estimates by Statistics Norway.

[54] Brautaset 2002, pp. 257-261, Kiær, Anders N., *Bidrag til Belysningen af Skibsfartens økonomiske* Forhold, Kristiania: Malling and Kiær, Anders N. 1900, "Norges Siøfart", manuskript, Wedervang Arkivet., NHH, Bergen.
[55] Wedervang Archive, W030, W032, W034, W035, W036, W038, W039, W043, W044, W063, W172, W173, W174, W176, W182, W184, W185, W186, W187, W188, W189, W193, W320, W327, W329, W330 and W407.
[56] Statistics Norway 1978, pp. 376-408.
[57] Wedervang Archive, W118, W119A, W120A and W249.
[58] Statistics Norway 1978, pp. 419-445.

5.6. Public administration and defence

5.6.1. Public administration

For the period 1830-1865 we use Bjørsvik's series on GDP contribution from public administration. These are basically constructed on the basis of wages, depreciation and estimates of increase in productivity within public administration.[59] In addition we use detailed datasets from Hodne and Statistics Norway in our calculations until 1914.[60] These rich and precise sources make these series relevant, valid and reliable.

From 1915 onwards we use computations of the size of public administration by Grytten. Computes on the grounds of public accounts, these also, provide us with generous information on wages, depreciations and productivity growth.[61] By splicing them with our series in 1914 and Statistics Norway's GDP series by industry from 1930, we establish a persistent GDP series for public administration 1830-1930.

5.6.2. Defence

Again, for the period 1830-1865 we use Bjørsvik's series on value added in defence. These are basically constructed on the basis of wages, depreciation and estimates of increase in productivity within public administration.[62] Records from the Wedervang Archive give us relevant information on the income and cost structure of Norwegian garrisons during the nineteenth century.[63] Additionally, we use detailed datasets from Hodne and Statistics Norway in our calculations until 1914.[64]

From 1915 onwards we use compilations of the expenditure and income side of military services made by Grytten. These taken from public records, and give us

[59] Bjørsvik 2004, pp. 293-310.
[60] Hodne 1983, pp. 300-313.
[61] Grytten, Ola H. 2014, "Growth in public finances as tool for control: Norwegian development 1850-1950", paper presented to ESSHC, Wien april 2014, pp. 24-30.
[62] Bjørsvik 2004, pp. 293-310.
[63] Wedevang Archive, files W052-W078.
[64] Hodne 1983, pp. 300-313.

necessary information on depreciation rates and productivity growth.[65] By splicing them with our series in 1914 and Statistics Norway's GDP series by industry from 1930, we establish persistent GDP series for value added in the armed forces 1830-1930.

5.7. Services

5.7.1. Education

The same records and publications as for public administration serve as sources for this series. In addition we use the above described sources and data provided, compiled and processed by Bjørsvik, Hodne and Grytten on public education until 1865, 1914 and 1930 respectively.

We have included estimates of private schooling and education, where schools, and training programs connected to the church were quite important. This is done by drawing on information on the scale of these from popular censuses and county reports, reported annually in statistical yearbooks for Norway.[66] We assume the same value creation per employee in private and public schools.

5.7.2. Health

Bjørsvik, Hodne and Grytten are also our primary sources for this series, as they report the volumes and values of public health production until 1865, 1914 and 1930 respectively.

However, we have to add a substantial part for private health care. According to contemporary sources, private health care made up the bulk of this industry until 1930. And again, churches and Christian and humanitarian organisations and bodies played an important role. Around 1930 the public and the private sector of health

[65] Grytten, Ola H. 2014, "Growth in public finances as tool for control: Norwegian development 1850-1950", paper presented to ESSHC, Wien april 2014, pp. 24-30.
[66] Bjørsvik 2004, pp. 293-310, Hodne 1983, pp. 300-313, Grytten 2014, pp. 24-30 and Statistics Norway 1876-1930, *Statisitcal yearbook for Norway 1876-1930*, Oslo.

care were about even in their contribution to GDP, with local governments as the most important contributors in the public sector.[67]

5.7.3. Other services

This industry consists of both public sector and private sector services. The public records are again found in the work by Bjørsvik until 1865, thereafter Hodne up to 1914 and Grytten until 1930.[68]

The challenge is to find the size of private services. However, we already have benchmark year calculations for 1835, 1845, 1865, 1875, 1890, 1900, 1910, 1920 and 1930.[69] By refining these on the basis of SNA 2010 and new knowledge of other industries' contribution to GDP, presented here, we find a sound departure for interpolating annual series of other services in the private sector.

The interpolation itself is made as a weighted average of other services in the public sector, starting at 30 percent in 1830, and ending at 50 percent in 1930, and private services within other industries, starting at 70 in 1830, anding at 50 percent in 1930.

5.8. Private services

5.8.1. Domestic services

This series is basically calculated on the basis of rich wage data sets on domestic services from urban and rural districts. We find an impressive amount of data in this field in the Wedervang Archive and in the historical wage series as part of the central bank's monetary history project.[70]

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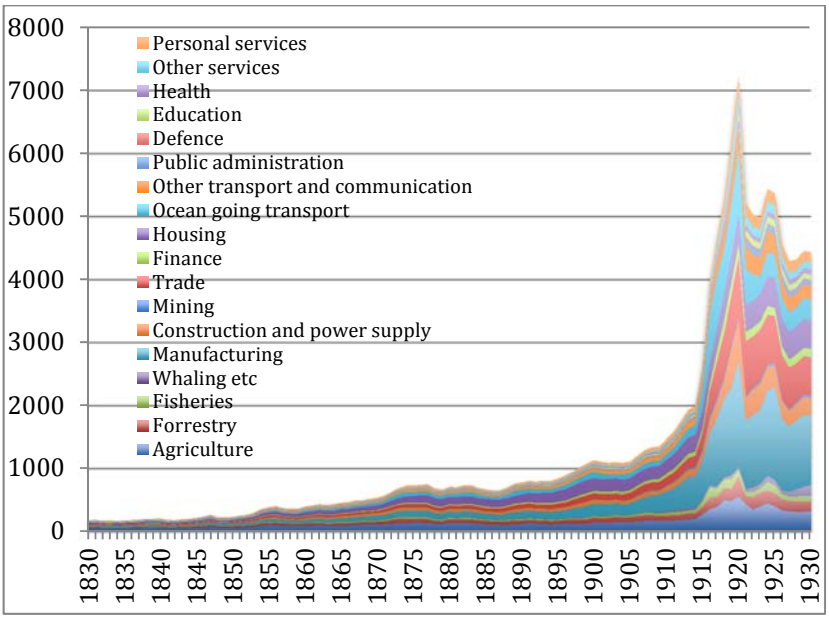
[67] Larsen, Øyvind, Ole Berg and Fritz Hodne 1986, *Legene og samfunnet*, Oslo: Den Norske Lægeforening.
[68] Bjørsvik 2004, pp. 293-310, Hodne 1983, pp. 300-313, Grytten 2014, pp. 24-30
[69] Grytten 2004b, pp. 252-255 and Bjerke 1966, pp. 51-54.
[70] Grytten, Ola H. 2009, "Purchasing power of labour: Norwegian real wages 1726-2006", Scandinavian Economic History Review, vol 57, 1/200., pp. 48-87 and Wedervang Archive, W009; W013; W014, W021, W028 and W204.

These sources provide us with a very good coverage of domestic services in households and some data relevant for value added calculations in other kinds of private services, such as accounts and income and cost profiles. Thus, it is possible to construct value added series for this industry. Since board and lodging was a significant part of wages in this industry, they are of course added to the wage data, as described in the publications referred to here.

6. Aggregated GDP by industry

By adding the value added series for the different industries, we are able to conclude with annual gross domestic series for Norway 1830-1930 in current values calculated by a production side approach. Like other historical national account series the new series will be subject for revisions and improvements. Their deviations from previous series give us a hint of satisfactory reliability of both the new and the old series. The deviations are limited, but however, significant for critical moments in historical national accounting. The new series of Norwegian GDP by 18 industries in current prices 1830-1930 are reported in chart 1.

Chart 1. Norwegian GDP by industry in current million NOK 1830-1930.



Sources, See text.

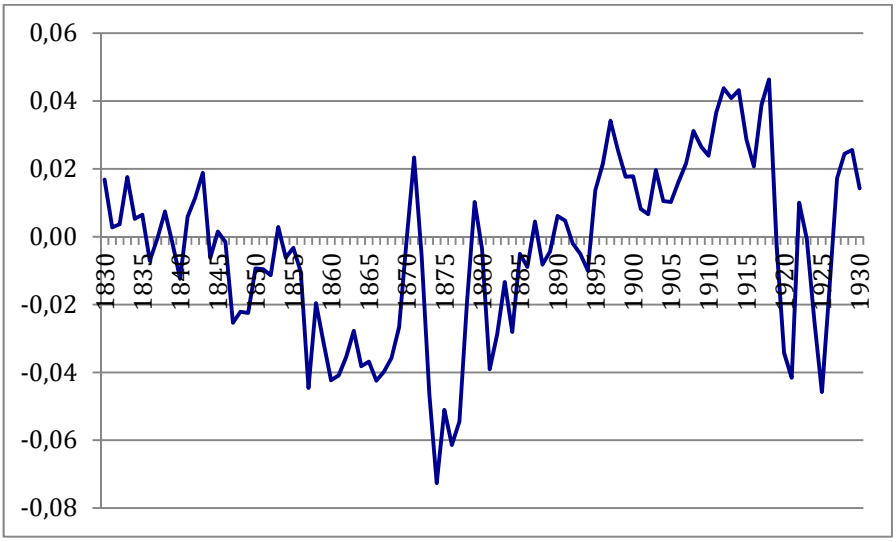
Chart 2 reports the annual GDP gaps (Y^G) between the new (Y^N) and the old (Y^O) historical series in logs. The old series being those published by the central bank of Norway from 1830 and Statistics Norway from 1865. The gaps are quite marginal for most years:[71]

(5) $$YG_t = lnY^N_t - lnY^O_t$$

A partial explanation for the high similarities of the new and the old series is that the benchmark year calculations in the old series to a considerable extent serve as benchmarks in the new series. However, they have still been revised, meaning that the new series very much stand on their own feet.

The significant deviations are mostly evident during booms and busts, when the new series clearly tend to show higher volatility than the old ones. This implies that booms and busts seem to be stronger then believed hitherto.

Chart 2. Relative gaps between new and old GDP series in current values 1830-1930.



Sources, See text.

[71] Grytten, 2004b, pp. 249-288.

Also, the new figures show that the long depression started in the mid 1870s and not in the late 1870s as suggested by the old series. This means that the new series are more in line with the international picture and domestic business cycle analyses.[72]

7. Fixed price calculations

In order to reach at gross domestic product in fixed prices a set of deflators for each industry and sub-industry is offered. By deflating the nominal figures by these deflators, we arrive at fixed price series.

7.1. Method

We use the standard Paasche price index (P_P) to calculate the deflators, where p denotes price, q denotes volume, i denotes industry or sub-industry, t denotes time in period, where $t=0$ is the base year:

(6) $$P_P = \sum(p_{i,t})*(q_{i,t})/\sum(p_{i,t=0})*q(q_{i,t})$$

By using a double deflation technique, i.e. deflating both the input and output series, we arrive at value added (y) in fixed prices (f) for agriculture, forestry, fishing, whaling, mining, construction, manufacturing and trade:

(7) $$y^f_{i,t} = \{q_{i,t}/[\sum(p_{i,t})*(q_{i,t})/\sum(p_{i,t=0})*q(q_{i,t})] - h_{i,t}/[\sum(p_{i,t})*(q_{i,t})/\sum(p_{i,t=0})*q(q_{i,t})]\}$$

For the rest of the service industries, we apply a single deflation technique, i.e. deflating the value added series only.

[72] Klovland, Jan T. 1998, "A reassessment of the United Kingdom business cycle chronology", Dick, T.J.O, (ed), *Business cycles since 1820: New international perspectives from historical evidence*, Cheltenham, pp. 49-90.

Adding the sub-industry series we reach at value added per key industry (y) in fixed prices (*f*). Adding these again, we reach at national GDP in fixed prices (Y^F). By dividing GDP in nominal prices (Y^N) with GDP in fixed prices we find the implicit GDP deflator at aggregated level:

(8) $$P_D = Y^N{}_t / Y^F{}_t$$

The same principle is applied for finding implicit deflators for key industries made up by sub-industries.

7.2. Price data

The explicit deflators are calculated on basis of direct price observations of prices. These are taken from a wide range of sources. For the previously published series for agriculture, public services, export industries and manufacturing industries, we use the established deflators.[73] In addition 19th century price records kept in the Wedevang Archive and in Statistics Norway publications serve as key data.[74] Some of these are already published as price indices by the Norwegian central bank constructed by Klovland and Grytten.[75] Admittedly, it is not always easy to construct annual price series for both input and output, particularly for the service sector. However, the bulk of the new series follow the double deflation technique.

In principle the fixed price series are calculated by deflating the nominal series with Paasche price indices. However, for some time spans it has been difficult to find

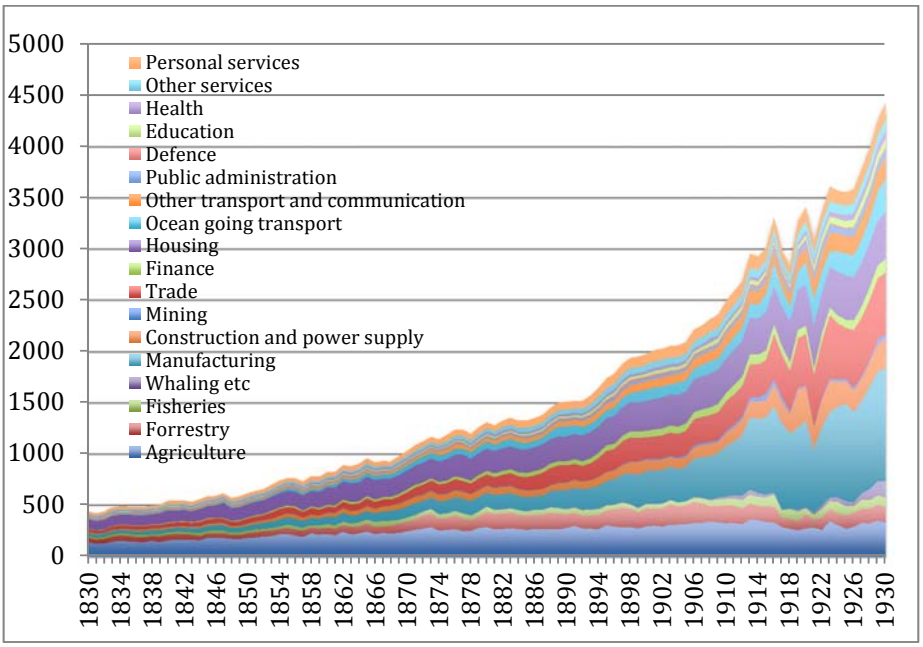
[73] Grytten 2000, "Deflateringsprinsipper for nordiske historiske nasjonalregnskaper, Lindmark, Magnus and Peter Vikström (eds), *Nordic Historical National Accounts*, Umeå: Umeå University, pp. 21-47, Grytten 2004b, pp. 241-288, Brautaset 2002, pp. 251-268, Bjørsvik 2004, pp. 293-310, Venneslan 2007, sttistical appendix, pp. 7-138.
[74] Wedervang Archive, files W051, W128, W137, W138, W139, W140, W141, W142, W206, W207, W208, W209, W210, W213, W217, W218, W219, W220, W268, W269, W270, W271, W272,W273, W275, W276, W383, W386, W397 and W397 and Statistics Norway 1949, pp. 333-359.
[75] Klovland, Jan T. 2014, "New methods for construction of historical price indices, with an illustration from Norway, 1777-1920", *European Review of Economic History*, 02/18, pp. 277-305.Grytten, Ola H 2004c, "A consumer price index for Norway 1516-2003", Eitrheim, Øyvind et al (eds), *Historical Monetary Statistics for Norway 1819-2003*, Oslo: Norges Bank, pp. 47-98.

annual volumes, and Laseyres indices have been used. Thus, fixed price periodizations have in principle been set to every 20th year until 1890, and thereafter every tenth year. The base years chosen are as far as possible representative years towards the middle of the periods.

7.3. GDP by industry in fixed prices

By using the constructed deflators, we arrive at annual series of gross domestic product by industry in fixed prices. These are presented in 1930 Norwegian kroners (NOK), which might make the early figures somewhat over or under estimated due to different price developments of the industries.

Chart 3. Norwegian GDP by industry 1830-1930 in mill 1930-NOK.



Sources, See text.

8. Reliability of new series

One has to make assumptions in historical national accounting. Thus, historical national accounts will always be subject to disputes. Hence, it is important to have an idea of how reliable the accounts might be. In order to throw light on their

accountability we will compare them with the already existing historical GDP series for Norway and our knowledge of the business cycle development. These cycles will here be operationalized as output gaps according to the annual data established here.

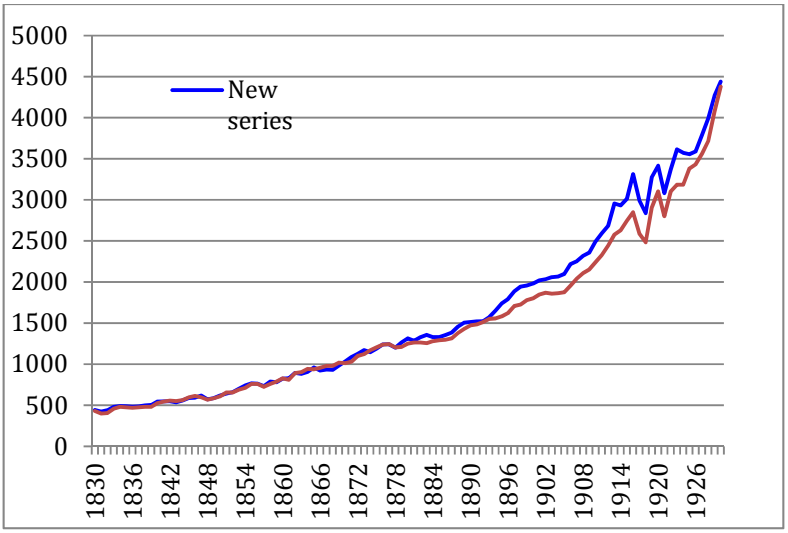
8.1. Comparison of old and new series

When comparing the old and the new fixed price calculations one finds that the gaps become stronger than for the current price figures. One major feature is that GDP according to the new series was slightly higher than reported by the old series for most of the nineteenth century and the first decades of the twentieth century. A second feature is that the tremendous economic growth reported at the end of the period under investigation in the old series is significantly downgraded.

Taking into account the huge problems in the Norwegian economy with the greatest Norwegian bank crisis ever and rocketing and persistent unemployment problems in the 1920s, the new series might solve an unexplainable dilemma for economic historians. That of irreconcilable crises and substantial growth rates during the decade leading up to 1930.[76]

Chart 4. Norwegian GDP, old and new series, in mill 1930-NOK.

[76] Grytten, Ola H and Arngrim Hunes 2014, "An anatomy of financial crises in Norway, 1830-2010, *Financial History Review*, 01/21, pp. 25-57.



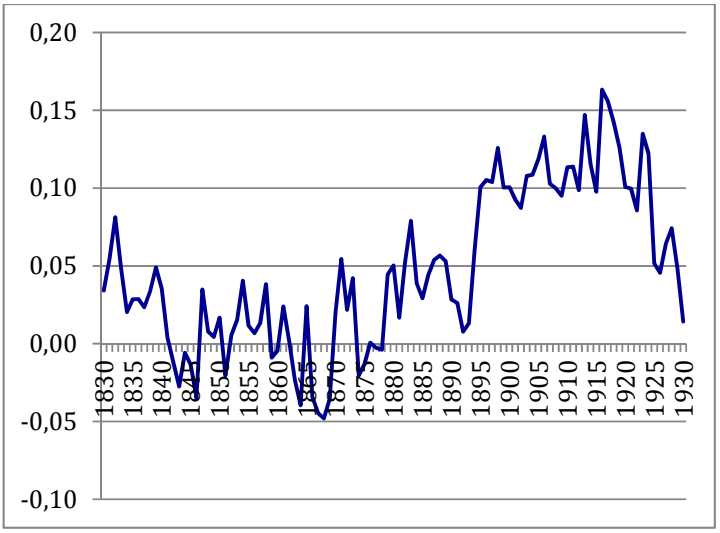
Sources, See text.

Again, we find that booms and busts are being more distinct in the new series. Particularly the boom of the 1890s and the bust during the long depression from the mid 1870s to the early 1890s. Also, the long depression starts earlier according to the new series, witch is in line with other qualitative and quantitative records and evidence.[77]

Admittedly, the gaps during World War I seem very high. But still the results for the greater part of the new series are within the suggested margins of error in the old series according to Statistics Norway.[78] Also, it has to be said that the old estimates were not based on detailed annual production side calculations, but rather on interpolations between fairly aggregated benchmark years estimates. Thus, the new series should be both more valid and reliable than the old ones.

Chart 5. Relative gaps between new and old GDP series in fixed NOK-1930values 1830-1930.

[77] Klovland 1998, pp. 49-90.
[78] Bjerke 1966, pp. 8-14.



Sources, See text.

8.2. Output gaps

The deviations between levels and annual fluctuations between the series have some impact on the output gaps, the new series reflecting a development more in line with international business cycles and alternative domestic qualitative and quantitative sources.[79]

Chart 6 reports output gaps, or cycles (C) according to the old and new GDP series calculated as annual log-differences between annual estimated GDP (Y) and a HP-trended series (T) for every year (t) with 2,500 as smoothing parameter (lambda).

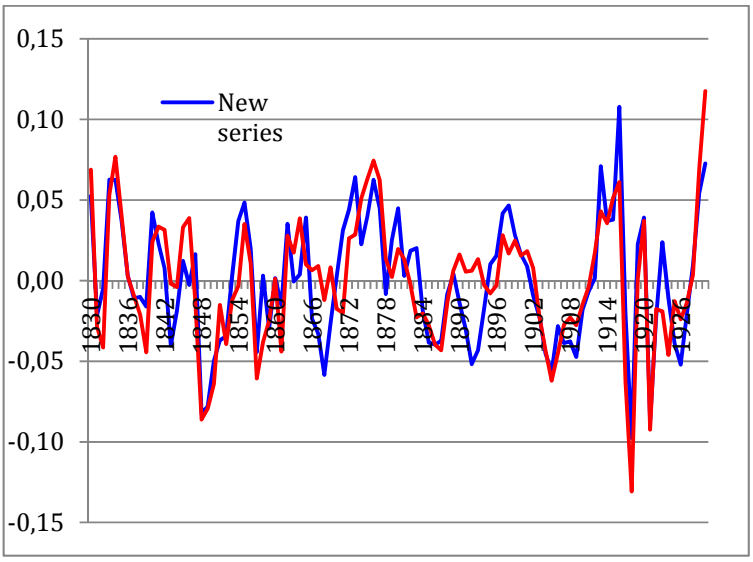
(8) $$C_t = lnY_t - lnT_t$$

The output gaps also confirm that Norway, as a small open economy experienced the international bust in the early 1890s, contrary to the story told by the old series.[80] In addition the new estimates reports more significant slumps during the 1848-crisis, the Crimean crisis in the late 1850s and the domestic deflationary crisis

[79] Hanisch, Tore J. 1996, *Om valget av det gode samfunn*, Kristiansand: Høyskoleforlaget, pp. 53-84.
[80] Statistics Norway 1965, pp. 348-349.

in the mid 1920s. All these findings seem to be reasonable, as they are in better in line with or knowledge in Norwegian economic history than the old series.

Chart 6. Relative output gaps 1730-1830 according to old and new GDP-series. Calculated by HP-filter with lambda value 2,500.



Sources, See text.

9. Conclusions

The present paper presents calculations of Norwegian gross domestic product from the production side in three levels. It presents series for 30 industries on the lowest, level, 18 on the next level, and finally eight on the highest level. These are the first annual series of Norwegian GDP by industry presented for this hundred-year period.

The calculations are conducted on the basis of available sources on input, output volumes and prices. The new figures measured in current values correspond well with the old series. However, they seem to mirror the international business cycles better.

The fixed price calculations are carried out with a double deflation technique approach when possible, i.e. for primary and secondary industries along with trade. As for other services, a simple deflation technique has been used.

The old and the new fixed price series are still in good accordance both regarding levels and developments. However, some differences exist. The new aggregated series is more in line with international trends and domestic business cycles than the old one. The new series also revise the growth rates of the 1920s down to a level, which is easier to understand and explain for writers on Norwegian economic history. Thus, the new series on GDP by industry, presented in this paper seem fairly consistent, valid and reliable.

Table 1. Norwegian GDP per industry 1830-1930 in current 1000 NOK

	Primary production					Manufacturing industry				Commerse			Property
	Agriculture	Forestry	Fisheries	Whaling etc	Total	Manufacturing	Construction & utilities	Mining	Total	Trade	Finance	Total	Dwellings & commercial properties
1830	55168	16555	6786	494	79003	18386	7321	2400	28107	10715	2494	13209	21436
1831	60351	14886	7085	498	82820	19473	7885	2514	29872	10715	2577	13292	21700
1832	51319	14177	8377	515	74389	17893	6758	2430	27081	11557	2628	14185	17613
1833	49816	16802	8971	524	76113	18860	8448	2550	29858	11926	2628	14554	18781
1834	48345	14875	7558	504	71283	17638	6758	2600	26996	12401	2719	15120	19042
1835	51569	14150	7223	499	73441	19000	8000	2800	29800	12612	2868	15480	19430
1836	53918	15102	7295	500	76815	20475	9844	2950	33269	13034	3003	16037	18391
1837	54978	16303	7157	499	78937	20956	9630	2900	33486	12665	3347	16012	18810
1838	63133	16490	7649	506	87778	21984	10903	3000	35887	12137	3496	15633	20151
1839	58130	18593	9473	531	86727	22070	11624	3100	36794	13140	3660	16800	19772
1840	61526	16751	9808	535	88620	21926	9935	2700	34561	13534	3754	17288	21240
1841	53240	15958	8165	513	77876	19221	7389	2500	29110	13140	3726	16866	20660
1842	50371	15546	8262	514	74692	18940	7611	2450	29001	12562	3860	16422	19638
1843	55170	19956	7603	505	83234	21865	7856	2500	32221	13087	4034	17121	21567
1844	52195	21725	9642	533	84095	23300	9354	3000	35654	13562	4404	17966	20553
1845	61110	23051	9007	524	93692	23800	10000	3600	37400	14459	4721	19180	21698
1846	66836	22175	9170	527	98707	25785	10365	3480	39630	16087	5062	21149	26791
1847	80918	22602	7916	496	111931	28993	11725	3500	44218	16985	5477	22462	27940
1848	68396	19689	8532	511	97127	24365	9019	2720	36104	14980	5175	20155	24401
1849	61447	20882	10106	539	92974	24579	9393	2700	36672	14742	4879	19621	25311
1850	65043	22256	8323	515	96137	25619	10159	2600	38378	16471	5004	21475	27308
1851	68782	25683	9316	529	104310	28659	12534	2567	43760	17270	5382	22652	30710
1852	75155	24902	8991	528	109576	30509	13678	2567	46754	18004	5712	23716	31474
1853	76667	27421	8785	521	113394	34210	16012	3000	53222	23756	7157	30913	35704
1854	88186	40549	9454	531	138720	42949	22304	3200	68453	27756	8728	36484	37118
1855	98007	38665	12768	577	150016	48277	25363	3500	77140	29184	9761	38945	41109
1856	101776	38190	15093	609	155668	50000	25842	4000	79842	29717	10900	40617	44445
1857	94721	35969	14789	605	146085	44441	20009	2405	66855	25064	8042	33106	47607
1858	97248	32476	11174	555	141453	41929	18738	2405	63072	25597	8729	34326	48149
1859	91420	30950	12267	570	135207	40957	16314	2405	59676	23682	9247	32929	54483
1860	97970	32718	14066	601	145354	46360	23324	3000	72684	25759	9679	35438	56115
1861	97024	33060	16857	688	147629	52333	26611	3109	82053	25033	10413	35446	55336
1862	104405	33920	16346	761	155433	55366	29254	3218	87838	27533	11428	38961	56916
1863	88601	36226	15540	749	141117	53975	30797	3220	87992	27608	12460	40068	58444
1864	94184	33821	17034	1285	146324	55760	31456	3330	90546	26119	12313	38432	56810
1865	96303	35975	20863	1296	154437	60010	32369	3472	95851	31011	12702	43713	61559
1866	99064	35000	20656	1082	155802	62139	33752	3555	99446	30438	12792	43230	63578
1867	106894	35585	21792	1437	165708	66354	35002	3862	105218	33267	13161	46428	66841

1868	114481	38052	20080	1346	173959	69107	36248	4005	109360	30922	13540	44462	63447
1869	113480	41767	18644	1478	175368	71502	38014	4070	113586	32243	13485	45728	68572
1870	115335	41801	20816	1669	179621	74169	40261	4091	118521	34037	13817	47854	72281
1871	118268	46421	25304	1764	191756	78837	42603	4577	126017	38129	14315	52444	76815
1872	123628	61893	22556	1764	209841	86229	45937	6432	138598	44032	15208	59240	84346
1873	136497	68337	24904	2019	231757	91800	48539	5979	146318	49075	16535	65610	88494
1874	134596	66472	25320	1860	228248	101780	52243	5617	159640	52867	17944	70811	102828
1875	141728	58772	25796	1653	227948	102459	51189	6738	160386	50034	18675	68709	109728
1876	139862	66969	25268	1788	233886	101878	49511	5606	156995	50799	19258	70057	116173
1877	133352	64488	29434	1796	229070	102178	48269	5109	155556	49970	19786	69756	126246
1878	125302	47418	23054	1866	197640	97597	45199	4262	147058	44282	19515	63797	122227
1879	124159	41929	23341	2138	191566	95067	44435	3937	143439	45272	19407	64679	115612
1880	138306	59342	24579	1319	223545	95151	45060	4358	144569	49047	20157	69204	113439
1881	131741	62313	21616	2078	217748	95559	43570	4815	143944	46776	20962	67738	116941
1882	133540	63466	22117	2186	221309	98335	44459	5603	148397	48893	21524	70417	119304
1883	131665	60788	26328	2754	221535	98055	42917	4312	145284	52036	21983	74019	118228
1884	122963	56644	26386	3016	209009	94201	41324	4505	140030	49252	22443	71695	113743
1885	115876	54894	21190	2569	194529	88487	39074	3772	131333	48905	22864	71769	122524
1886	113083	52220	24276	2285	191864	86991	38212	2912	128115	50070	22319	72389	118329
1887	107167	52381	18762	2762	181072	87950	37731	2493	128174	56031	21746	77777	123772
1888	107525	57695	23852	3222	192294	97142	36931	3638	137711	59707	21856	81563	123493
1889	114088	59116	24311	3036	200551	110686	42109	3247	156042	64845	22726	87571	124727
1890	123361	51868	23212	3115	201557	116812	46221	3505	166538	65342	23974	89316	132280
1891	134867	51835	25966	4044	216712	119736	45659	2908	168303	65503	24635	90138	141183
1892	129489	49267	24794	3689	207239	118203	42797	2441	163441	62990	24825	87815	147497
1893	123173	51647	23617	3262	201699	120761	43238	2366	166365	62638	25787	88425	160216
1894	113961	51839	22900	3328	192028	123020	43674	2715	169409	66228	26620	92848	160111
1895	122948	51243	22210	3182	199583	127295	45402	2465	175162	72410	27906	100316	169792
1896	123522	60952	21714	3207	209396	134612	46143	3284	184039	72100	29091	101191	180614
1897	121670	70055	24207	3214	219146	148075	51012	3830	202917	81097	31115	112212	186716
1898	125535	68471	20653	3471	218129	167047	60377	4277	231701	91004	35637	126641	200445
1899	126500	68817	24292	3141	222750	184322	69929	5353	259604	92519	37760	130279	207402
1900	141599	78819	29395	2571	252383	192528	65784	6814	265126	91016	40443	131459	196225
1901	146066	69378	27593	3135	246172	194492	61050	6626	262168	90843	41373	132216	194532
1902	141227	75355	29364	3502	249449	187056	57300	7037	251393	92382	41824	134206	198626
1903	154666	81621	28915	3233	268436	186329	53587	7740	247656	90668	42967	133635	198237
1904	149993	71664	26910	3473	252041	178286	56419	7840	242545	93962	43087	137049	191221
1905	154514	75518	31337	3589	264958	189738	53669	9236	252643	100323	43576	143899	185408
1906	160941	87015	33179	4109	285243	214997	63221	11612	289830	110941	45001	155942	197806
1907	169615	88546	39054	7173	304388	240762	74204	12813	327779	119037	47540	166577	195703
1908	179407	79993	38624	10525	308549	265214	75352	12167	352733	118942	49940	168882	201410
1909	170728	78059	41514	16691	306992	275693	68929	11057	355679	124432	52220	176652	206181
1910	172175	83553	47344	23595	326667	314298	79112	13265	406675	131807	54572	186379	220727
1911	178067	81413	54480	31438	345398	342224	94879	15436	452539	141263	58674	199937	230180
1912	182692	83257	54172	38904	359025	410395	102913	20811	534119	152910	63420	216330	245245
1913	195329	91647	53768	37242	377986	488833	111327	25982	626142	162569	67517	230086	262239
1914	203094	86130	61947	30518	381690	502220	117820	27795	647835	173435	71398	244833	269160
1915	275384	118476	87294	37385	518540	611756	136649	51183	799588	244598	81453	326051	292752
1916	357117	177111	162058	35332	731618	820285	213079	49140	1082504	410420	122481	532901	327742
1917	392021	159566	135494	29243	716324	1070662	268598	52913	1392173	582674	172669	755343	363125
1918	496013	194617	135150	35330	861111	1237970	311924	44858	1594752	701791	210835	912626	403585
1919	491585	186382	159038	60739	897744	1376239	623711	38566	2038516	809384	201503	1010887	431754
1920	558115	324960	96721	38373	1018170	1694858	655191	25408	2375457	965281	200621	1165902	467867
1921	433863	131636	65708	46434	677641	1084942	368470	17837	1471249	878150	138549	1016699	436949
1922	351690	195907	86589	68161	702346	1148479	400360	25549	1574388	823844	139760	963604	424971
1923	403819	208779	77507	66806	756911	1172459	415048	33276	1620783	828373	130534	958907	436269
1924	448606	207000	132098	96939	884642	1351064	375237	39956	1766257	795689	136978	932667	462034
1925	405499	203810	129487	82263	821059	1472918	342316	39424	1854658	743672	130671	874343	476894
1926	338915	178640	74945	61191	653691	1138841	273267	28481	1440589	714801	129678	844479	440912
1927	321843	164430	69518	75833	631623	1039578	246477	24163	1310218	662105	126688	788793	437582
1928	313236	165120	81575	114456	674387	1087386	261435	30924	1379745	624965	133906	758871	446025
1929	316791	163200	88906	141840	710737	1138998	280071	39539	1458608	614408	133041	747449	452475
1930	327307	157000	89915	161000	735222	1104553	283000	38000	1425553	614000	131000	745000	452000

Table 1. Norwegian GDP per industry 1830-1930 in current 1000 NOK

	Transport & communication			Government services			Community & business services				Personal services	GDP
	Ocean going	Other	Total	Public adm	Defence	Total	Education	Health	Others	Total	Domestic services & misc	
1830	6962	6200	13162	3364	1912	5276	3464	4079	4631	12174	10661	183027
1831	7277	6544	13821	3457	1910	5367	3522	4548	4878	12948	10700	190519
1832	7180	6097	13277	4062	1913	5975	3530	4961	4608	13099	12035	177652
1833	7179	6200	13379	4070	1897	5967	3530	4660	4643	12833	11675	183160
1834	7939	5993	13932	4042	1881	5923	3534	4310	4596	12440	10185	174920
1835	8603	6200	14803	4008	1877	5885	3568	4205	4772	12545	9783	181166
1836	9162	6544	15706	4003	1891	5894	3596	4163	4842	12601	9938	188651
1837	9616	6682	16298	4099	1909	6008	3628	4282	4866	12776	11587	193913
1838	9024	7027	16051	4321	1908	6229	3656	4268	5017	12941	10841	205512
1839	9087	7164	16251	4508	2144	6652	3720	4457	5135	13312	11263	207570
1840	10852	7440	18292	4704	2221	6925	3748	4653	5476	13877	12520	213323
1841	8734	6579	15313	4555	2120	6675	3728	4548	4971	13247	12391	192138
1842	7696	6303	14000	4325	2137	6462	3764	4457	4935	13156	11721	185091
1843	7029	6751	13780	4374	2236	6610	3780	4506	5006	13292	11865	199689
1844	10116	7199	17315	4377	2272	6649	3824	4706	5358	13888	11586	207706
1845	10105	7400	17505	4467	2135	6602	3886	4818	5711	14415	11848	222340
1846	13268	8027	21296	4475	2343	6818	3966	4981	6075	15022	12206	241619
1847	18167	9286	27454	5031	2466	7497	4068	5067	6921	16056	13382	270939
1848	9715	7939	17654	4902	2422	7324	4056	5209	6193	15458	12559	230782
1849	10111	7893	18004	4757	2509	7266	4112	5206	6052	15370	12545	227763
1850	10831	8188	19019	4956	2544	7500	4146	5094	6169	15409	12527	237753
1851	11326	8933	20259	4946	2233	7179	4196	5150	6486	15832	12802	257503
1852	12169	9480	21649	5051	2458	7509	4398	5248	6792	16438	13779	270895
1853	18553	10522	29075	4878	2883	7761	4470	5395	7345	17210	15585	302864
1854	23359	12737	36096	4925	3352	8277	4618	5360	8415	18393	17227	360766
1855	24822	13887	38709	4975	3580	8555	4748	5682	8920	19350	17869	391693
1856	25397	14696	40093	5188	3619	8807	4908	5794	9438	20140	19045	408657
1857	20284	14155	34439	6110	2815	8925	5082	6095	9250	20427	19928	377371
1858	16540	13461	30001	6015	3371	9386	5298	6270	9049	20617	18684	365688
1859	20940	13737	34677	5772	3384	9156	5384	6641	9121	21146	18924	366198
1860	27339	15408	42747	5849	3286	9135	5466	6774	9755	21995	19714	403183
1861	29725	16070	45794	5750	3025	8775	5674	6963	9979	22616	20519	418169
1862	29097	16888	45985	5686	3555	9241	5812	7201	10461	23474	21001	438850
1863	30344	16484	46827	5697	3242	8939	6010	7250	10497	23757	21604	428748
1864	33453	17202	50655	5797	5641	11438	6120	7334	10697	24151	21183	439540
1865	33495	18195	51690	5867	3158	9025	6250	7446	11014	24710	21329	462314
1866	33500	18782	52282	6003	2932	8935	6551	7180	11337	25067	22765	471106
1867	35110	19914	55023	6218	3119	9337	6550	7594	11643	25787	23042	497383

1868	35389	20286	55676	6318	3227	9545	6082	8284	11973	26339	22481	505268
1869	40570	20936	61506	6303	3278	9581	6227	8202	11650	26078	22267	522687
1870	43700	21280	64980	6518	3322	9840	5839	7591	11925	25356	23025	541479
1871	45078	22221	67299	6733	3370	10103	5909	8184	12295	26388	24292	575116
1872	55737	25483	81220	6733	3449	10182	5925	7586	13637	27148	25708	636284
1873	65993	29232	95225	7164	3655	10819	6593	7615	15301	29509	27404	695137
1874	67061	31901	98961	7594	3705	11299	6644	7549	16841	31033	29773	732594
1875	57874	31353	89227	8239	3892	12131	7278	7835	17110	32223	31282	731634
1876	63807	32721	96528	8455	4378	12833	7553	8020	17086	32659	30789	749920
1877	61171	32869	94040	8885	4378	13263	7684	8818	18014	34516	31218	753665
1878	59766	29321	89087	8024	3892	11916	7582	8736	15493	31810	28744	692280
1879	55060	27688	82748	8455	4015	12469	7765	9760	14915	32440	25832	668785
1880	62172	30326	92498	8455	4070	12524	8133	10572	15927	34632	27037	717449
1881	56809	31346	88155	8670	4135	12805	8205	10558	16579	35343	27479	710152
1882	68803	32464	101267	8885	4378	13263	8232	11214	16532	35978	28230	738165
1883	72421	32262	104683	8885	4120	13005	8007	9733	16784	34524	28709	739987
1884	59969	31233	91203	8670	4171	12841	8265	9194	16226	33685	28539	700744
1885	51484	29621	81105	8885	4206	13091	8431	9539	15631	33602	27603	675557
1886	47174	29303	76477	9100	4292	13392	8534	9419	15390	33342	27156	661064
1887	47996	29156	77151	9315	4378	13694	8821	9602	14990	33412	26888	661939
1888	61403	31633	93036	9315	4676	13992	9122	9372	15931	34425	27639	704152
1889	83266	34548	117814	9745	4865	14610	9382	9936	17030	36348	28967	766630
1890	76886	35244	112130	9745	5021	14766	9231	11331	17524	38086	30091	784764
1891	68253	36493	104746	9961	5064	15024	9503	10184	18694	38381	31294	805781
1892	64359	36613	100972	10821	5219	16040	10657	12449	18786	41892	32520	797416
1893	59377	37333	96709	11252	5351	16603	11338	12607	18991	42936	31969	804922
1894	60287	37921	98208	11467	6198	17665	11371	13402	19337	44110	33485	807864
1895	59508	38937	98445	12327	7679	20006	12641	13690	19848	46179	34023	843506
1896	68696	41238	109934	13833	9730	23563	14555	14041	20759	49356	35740	893834
1897	74957	43617	118575	14179	9964	24143	13871	14621	21563	50056	36648	950413
1898	81027	47701	128728	14909	10572	25481	15005	15078	23456	53539	38688	1023353
1899	93462	51262	144724	14845	11676	26521	14301	11487	25165	50953	41638	1083870
1900	106587	54047	160634	15276	10703	25978	15705	16087	26503	58295	44759	1134860
1901	89360	53744	143105	15706	10216	25922	18674	16199	26695	61569	44368	1110052
1902	77231	53484	130715	15706	9243	24949	18529	16035	26706	61270	44615	1095222
1903	70572	53515	124087	15276	8270	23546	18029	15334	26729	60092	46524	1102213
1904	86344	53892	140236	14845	7297	22143	17803	15771	26235	59810	47287	1092333
1905	81871	55477	137348	15061	7784	22844	18042	15877	26894	60814	48399	1116313
1906	81435	60014	141448	15276	7895	23171	18529	15876	28017	62422	50219	1206080
1907	90734	64408	155142	15921	8006	23927	19811	16214	29786	65811	52945	1292272
1908	85666	66606	152272	16352	8070	24421	22226	21918	30808	74952	56256	1339476
1909	80613	67953	148566	17212	8270	25482	23280	17477	31565	72321	59096	1350970
1910	88521	75060	163581	18073	8757	26829	25824	17363	33404	76591	61820	1469271
1911	104602	79732	184334	18933	9243	28177	26003	19784	35243	81030	64320	1585916
1912	125302	85805	211107	21730	10946	32676	28995	21757	38092	88844	66210	1753556
1913	140201	98108	238309	23236	11822	35058	29282	22082	40882	92247	70860	1932926
1914	150727	101409	252136	24592	15568	40159	28073	22504	42984	93561	72469	2001844
1915	342893	134236	477129	33779	25395	59173	28189	27220	53000	108409	86589	2668231
1916	772503	182605	955108	43030	32838	75868	31341	30118	71865	133324	112124	3951189
1917	809410	225803	1035213	62394	46849	109243	33989	32474	95486	161949	130121	4663491
1918	712925	279061	991987	84770	47286	132056	42699	45590	119119	207407	178481	5282004
1919	817916	357547	1175463	99830	37459	137290	55265	61858	150624	267746	219586	6178987
1920	1019760	419694	1439454	112955	29189	142144	93277	94167	181643	369087	265166	7243248
1921	565225	364399	929624	119194	27243	146437	108221	79936	152157	340314	202551	5221465
1922	415659	315763	731422	111879	25784	137663	103819	68437	140242	312498	182826	5029718
1923	273420	312959	586379	100045	22865	122910	99549	68985	135692	304226	207323	4993710
1924	387254	347581	734835	96388	21659	118047	112238	82527	144778	339543	200290	5438315
1925	374636	311764	686400	93376	21548	114924	109377	91587	141246	342210	204745	5375233
1926	323582	272209	595791	85415	21892	107307	99920	80342	119488	299749	190480	4572998
1927	313192	234473	547666	80252	20432	100684	97099	84679	111154	292932	180910	4290408
1928	294903	222622	517525	75303	18973	94276	94163	80284	103603	278050	175267	4324145
1929	338172	218884	557056	72721	18742	91463	85019	80399	102246	267663	170535	4455986
1930	329000	223000	552000	71000	18000	89000	82996	80358	104320	267674	173000	4439449

Table 1. Norwegian GDP per industry in manufacturing 1830-1930 in current 1000 NOK

	Foodstuff	Textiles	Clothing	Leather & rubber	Lumber products	Fabricated wood products	Wood processing	Chemicals	Non-metallic minerals	Metal products	Electrochemicals & metallurgicals	Oils & fat	Total
1896	36776	9680	9491	4381	23789	3586	16161	3229	9676	16470	-	1373	134612
1897	42090	9959	10244	4793	26564	3811	18369	3581	10935	18222	-	1507	150075
1898	47223	10251	11594	4958	27876	4265	21771	4123	12873	20637	-	1476	167047
1899	51993	10987	13281	5728	29757	4786	23185	4677	15318	23142	59	1409	184322
1900	54139	11542	14917	5902	33667	5315	23001	4546	13338	24032	894	1235	192528
1901	54646	11556	16490	5771	32597	5026	23343	4709	13321	24903	408	1722	194492
1902	53289	10962	17243	5024	29158	4596	22866	4004	12640	24747	518	2009	187056
1903	52076	10546	17135	4657	30801	4691	22796	4227	11957	24484	1260	1699	186329
1904	50519	10014	13062	4448	28441	4647	22809	4539	12146	24429	1598	1634	178286
1905	53097	11116	15486	5036	27747	5274	25684	4764	12436	25474	2153	1471	189738
1906	61007	12571	16670	5228	31256	5947	29299	5386	13497	28555	3744	1837	214997
1907	66745	13894	16969	5651	34545	6908	33894	5935	13536	34346	6193	2146	240762
1908	70981	14641	19426	6270	30038	7460	41804	6909	14794	38901	11220	2770	265214
1909	72498	16546	21032	5961	30078	7679	46160	7068	15292	38884	11532	2963	275693
1910	82153	17405	23366	6135	32592	8951	55065	7447	16962	45105	15902	3215	314298
1911	85316	18180	25674	6619	32166	9992	59882	7830	18893	50655	23239	3778	342224
1912	101825	20068	32421	7370	33758	10917	75245	9193	21850	66964	38513	4271	422395

1913	126458	22166	37433	8109	33030	13359	90804	9681	23489	78610	41392	4302	488833
1914	133844	23024	39086	8171	31182	14370	94241	9623	22428	79228	41522	5501	502220
1915	155945	27617	47350	13449	33155	24036	115230	12548	23424	92110	57079	9813	611756
1916	193228	41496	60526	20178	48680	48926	143538	19705	29055	114397	86729	13827	820285
1917	238683	52314	77663	32165	60916	76802	144636	32274	34983	150487	153060	16679	1070662
1918	236550	59569	91783	35178	75329	70741	201036	37953	53204	204039	149778	22810	1237970
1919	317643	67867	107576	36346	78090	70177	221794	38052	54380	242896	117403	24015	1376239
1920	410626	78401	155527	45124	80207	78317	269791	57168	61921	295633	136147	25996	1694858
1921	321420	43507	88346	31127	49399	41484	163762	29971	44338	180324	68957	22307	1084942
1922	332988	46989	109210	27485	50576	38627	196893	28197	47143	189076	60591	20704	1148479
1923	332404	46646	111806	28372	49213	46056	187041	30443	51215	190032	74826	24405	1172459
1924	399956	51885	119394	33487	76058	51660	182489	39912	62655	207077	92327	34164	1351064
1925	432349	59507	128521	36323	62288	53201	220836	40618	61309	232455	112314	33197	1472918
1926	373235	47747	100902	26786	41650	35312	166578	34432	37752	166025	82287	26135	1138841
1927	346655	45802	96659	23844	37647	30807	160619	30183	40738	140627	66107	19890	1039578
1928	316982	44305	101197	21529	43528	31773	162867	33813	45630	174577	86369	24816	1087386
1929	346620	48952	97736	20691	39975	32660	162592	32024	47758	190669	96950	22371	1138998
1930	329388	49115	99388	20737	30311	33909	146192	33678	50198	186099	108272	17266	1104553

Table 2. Norwegian GDP by industry 1830-1930 in fixed million NOK-1930.

	Primary production					Manufacturing industry				Commerse			Property
	Agriculture	Forestry	Fisheries	Whaling etc	Total	Manufacturing	Construction & utilities	Mining	Total	Trade	Finance	Total	Dwellings & commercial properties
1830	137849	46831	16354	894	201928	28167	11216	3677	43060	25680	4924	30604	88853
1831	122858	41284	17974	949	183065	28726	11632	3709	44066	23312	4619	27930	90478

1832	125581	43594	19793	915	189882	27273	10301	3704	41278	26686	4999	31685	92100
1833	141382	50033	23247	1020	215682	29987	13432	4054	47473	30140	5473	35613	93784
1834	153109	50096	21180	1061	225446	28192	10802	4156	43149	33995	6141	40136	95454
1835	147536	54093	20009	1037	222675	30466	12828	4490	47783	32245	6041	38285	97229
1836	143293	45937	19534	1006	209770	33290	16005	4796	54091	32048	6083	38131	99045
1837	138184	45215	24999	1308	209706	33566	15425	4645	53636	30232	6583	36815	100791
1838	151533	47601	18251	907	218293	36171	17939	4936	59046	27796	6596	34392	102511
1839	140634	53671	20385	857	215547	36038	18981	5062	60080	30562	7013	37575	104153
1840	156674	52652	25693	1053	236073	33969	15392	4183	53543	33336	7617	40954	119958
1841	164936	53742	22110	1043	241831	35271	13559	4588	53417	36427	8510	44937	107750
1842	163910	52984	23424	1094	241412	38235	15365	4946	58546	34987	8857	43844	109840
1843	164231	48668	19287	962	233148	41121	14775	4702	60597	35572	9033	44605	102463
1844	156248	42095	29046	1206	228595	44766	17972	5764	68502	37874	10133	48006	114112
1845	180401	45284	24389	1066	251141	46078	19360	6970	72408	38921	10470	49390	116418
1846	182167	45130	29863	1288	258447	46525	18702	6279	71507	38096	9877	47973	118839
1847	177986	45670	28054	1319	253029	52376	21181	6323	79881	33736	8962	42698	147483
1848	172316	36886	24189	1087	234479	42888	15876	4788	63552	37950	10800	48751	123355
1849	168340	40461	28654	1148	238602	43015	16438	4725	64178	40361	11005	51365	125726
1850	179809	47338	23597	1097	251842	47126	18687	4783	70596	45570	11407	56977	128223
1851	184637	50808	29157	1243	265846	51222	22402	4588	78212	44756	11492	56247	130803
1852	193461	53367	23811	1050	271689	55446	24858	4665	84969	44478	11625	56104	133437
1853	198552	55409	25205	1123	280288	59457	27829	5214	92499	56806	14099	70905	135921
1854	213833	54365	22784	960	291943	67297	34948	5014	107259	61345	15892	77237	138620
1855	221050	58806	30167	1023	311046	70190	36875	5089	112154	58607	16150	74757	141504
1856	203686	59361	31907	967	295921	74485	38497	5959	118941	55962	16912	72874	144446
1857	190821	60568	28064	863	280316	66598	29985	3604	100187	52902	13984	66887	147339
1858	225543	56711	23622	881	306758	69364	30999	3979	104342	61666	17326	78992	150399
1859	212954	59560	28703	1001	302218	67682	26959	3974	98616	56339	18124	74463	153737
1860	220500	61295	34946	1121	317862	71094	35768	4601	111463	55664	17233	72897	172405
1861	206797	64947	31738	973	304455	79130	40237	4701	124069	52520	17999	70518	175871
1862	239536	64400	36142	1264	341342	84733	44771	4925	134429	58203	19903	78107	178449
1863	214840	72170	34359	1244	322612	77875	44434	4646	126955	59939	22288	82227	181438
1864	224546	71400	36654	2076	334676	75011	42316	4480	121806	58786	22831	81618	185487
1865	242338	77099	39904	1861	361202	84961	45827	4916	135704	70441	23771	94212	187757
1866	218741	70100	47813	1881	338535	82491	44807	4719	132017	62232	23299	85530	190551
1867	229635	66322	50009	2476	348442	90715	47853	5280	143848	64211	23970	88180	178284
1868	221923	77561	49368	2485	351336	93969	49289	5446	148703	56498	24660	81158	180827
1869	229738	91513	34697	2065	358014	101612	54022	5784	161417	66248	25470	91718	183291
1870	245489	94008	38807	2336	380640	106604	57868	5880	170352	75029	26098	101127	185766
1871	259556	98514	44679	2340	405088	115175	62240	6687	184101	81594	27291	108885	188429
1872	271192	122870	41899	2461	438422	105519	56213	7871	169603	91459	23326	114785	191126
1873	286631	134156	42685	2599	466070	112901	59696	7353	179951	94769	22487	117256	194003
1874	252919	115647	43117	2379	414061	124371	63839	6864	195073	94974	22595	117570	202972
1875	260541	112719	45972	2212	421443	126101	63001	8293	197395	96888	24737	121625	210485
1876	265593	136097	41746	2219	445656	134377	65305	7394	207076	103709	26907	130616	209976
1877	246138	123681	51114	2343	423276	142229	67189	7112	216530	98408	28625	127033	228142
1878	249623	105126	43908	2669	401327	140305	64978	6127	211410	99557	30622	130179	211124
1879	277908	111899	48203	3315	441325	140931	65872	5836	212640	109699	32990	142689	214744
1880	285311	152059	48661	1960	487991	135423	64131	6202	205757	108805	33982	142787	217886
1881	265270	148133	40295	2909	456607	144670	65962	7290	217921	100149	35933	136082	220376
1882	268160	151765	38345	2847	461116	150605	68091	8581	227277	110639	35990	146629	222420
1883	275178	156048	38116	2994	472336	147664	64630	6494	218788	123298	37060	160358	224608
1884	267369	137783	44860	3851	453862	140012	61420	6696	208128	120745	39129	159874	227442

1885	259544	138529	40468	3685	442225	137617	60769	5866	204251	127852	42019	169871	230651
1886	267770	137037	49407	3493	457707	133231	58524	4460	196214	137983	42549	180532	233892
1887	268328	144004	40002	4422	456756	139057	59656	3942	202655	157740	41848	199589	237077
1888	266567	159855	52611	5337	484370	152743	58069	5720	216533	164757	42460	207217	240072
1889	263307	155711	52903	4961	476882	173085	65848	5077	244010	169206	41025	210230	243244
1890	278135	131126	49190	4958	463410	183672	72677	5511	261860	164538	40417	204955	246791
1891	298159	129537	47071	5506	480273	193060	73620	4689	271369	154244	42229	196472	250612
1892	272185	124217	54234	6061	456696	201047	72792	4152	277991	150277	44422	194699	254426
1893	270639	129756	55399	5746	461540	207527	74304	4066	285897	162937	47390	210326	258160
1894	267041	140602	52093	5685	465422	226677	80474	5003	312154	185447	49365	234812	262568
1895	304217	144961	46785	5034	500997	237190	84598	4593	326381	204817	52708	257526	267428
1896	290334	170383	41544	4609	506869	248728	85260	6068	340057	202434	52985	255419	272501
1897	281930	192781	50889	5075	530675	269802	92947	6979	369728	223780	55676	279457	277753
1898	284510	179017	42694	5389	511610	301556	108993	7721	418270	233092	60080	293172	283194
1899	273364	155990	42115	4090	475558	323339	122670	9390	455400	228965	58799	287764	288565
1900	294108	177101	41753	2742	515704	319452	109152	11306	439910	210756	61568	272323	293563
1901	300577	165624	43247	3690	513138	325794	102265	11099	439158	220892	68615	289507	298485
1902	290936	178986	45182	4047	519152	326770	100098	12293	439161	225290	67711	293001	303228
1903	310247	198366	38623	3243	550480	328493	94472	13645	436611	222016	70685	292701	307378
1904	312665	176288	36453	3533	528940	324103	102563	14252	440918	227153	71458	298611	311327
1905	314477	185285	36836	3168	539767	341272	96532	16612	454416	236503	70548	307051	315458
1906	327125	208253	40610	3777	579765	377678	111058	20398	509135	254075	69544	323619	319756
1907	328019	189907	48222	6651	572799	396612	122238	21107	539957	252275	71306	323580	324049
1908	343057	149269	52322	10708	555356	425639	120932	19527	566097	260946	74907	335853	328985
1909	331038	161301	62822	18970	574130	437140	109294	17532	563967	274145	81315	355460	334465
1910	322684	175864	63239	23670	585459	495932	124831	20931	641694	289021	83700	372722	339706
1911	328938	165107	71798	31117	596960	524221	145336	23645	693202	297115	86732	383847	345186
1912	315664	152635	82012	44235	594546	589924	147933	29915	767771	299016	91106	390122	351154
1913	360243	156307	88199	45855	650604	706545	160909	37554	905007	323356	94334	417690	357316
1914	353353	138582	89926	37957	619817	723988	169846	40069	933903	323978	96454	420421	345478
1915	336340	153079	88941	26608	604968	754955	168636	63164	986754	331988	90795	422783	370113
1916	330958	155705	118149	17195	622008	840067	218218	50325	1108610	441283	87667	528950	376337
1917	285762	93520	72634	6951	458868	842086	211255	41617	1094957	418271	81723	499994	382860
1918	269842	100279	90488	7526	468136	736032	185454	26670	948156	395516	88494	484010	389294
1919	256101	87812	96266	15811	455991	806318	365423	22595	1194336	475204	82872	558077	395620
1920	272914	136341	60789	9393	479437	848181	327886	12715	1188783	503190	77804	580994	402503
1921	280753	78226	49443	21020	429441	619011	210230	10177	839417	509276	67132	576408	409489
1922	258457	124325	82978	35189	500950	768944	268054	17106	1054104	547511	74829	622340	388585
1923	343197	116746	78482	34708	573133	841801	297996	23891	1163688	613964	77182	691146	394733
1924	306420	113885	111696	43722	575722	886475	246205	26216	1158896	537280	78710	615990	427506
1925	269005	132168	89247	48234	538654	951363	221103	25464	1197930	492205	79332	571537	433392
1926	289256	138375	64030	38317	529979	883905	212095	22105	1118106	559590	95154	654744	420037
1927	326072	141087	86700	63841	617699	905181	214612	21039	1140832	571961	109505	681466	425076
1928	322681	143970	82660	109034	658345	1000946	240653	28466	1270065	580991	123042	704033	430513
1929	351245	153137	93941	135837	734160	1079207	265369	37463	1382040	596547	126817	723364	435947
1930	327307	157000	89915	161000	735222	1104553	283000	38000	1425553	614000	131000	745000	452000

Table 2. Norwegian GDP by industry 1830-1930 in fixed million NOK-1930.

	Transport & communication			Government services			Community & business services				Personal services	GDP
	Ocean going	Other	Total	Public adm	Defence	Total	Education	Health	Others	Total	Domestic services & misc	
1830	4637	7130	11767	7973	4684	12657	7722	9587	10884	28192	25983	443044
1831	4487	6832	11319	7960	4337	12297	7781	10238	10406	28425	23679	421260
1832	4879	6755	11635	9476	4352	13828	7885	11238	10433	29556	28263	438227
1833	5312	7518	12831	9629	4405	14034	7997	10743	11505	30244	29998	479658
1834	5287	7883	13171	9677	4410	14087	8105	10044	12353	30502	28387	490333
1835	5617	7606	13223	9542	4286	13827	8200	9675	11962	29836	25428	488287
1836	5811	7721	13532	9441	4181	13623	8264	9417	11674	29355	24846	482393
1837	6042	7654	13696	9647	4128	13775	8372	9589	11389	29350	28124	485892
1838	5951	7722	13672	10160	4044	14204	8480	9476	11267	29224	25255	496596

1839	6650	7996	14646	10624	4552	15176	8638	9910	11711	30259	26642	504078
1840	7228	8793	16021	11042	4512	15554	8776	10135	13224	32136	31358	545596
1841	6925	8751	15676	10860	4481	15341	8803	10165	13513	32482	34932	546366
1842	7022	8424	15446	10299	4483	14782	8869	9910	13478	32258	33194	549322
1843	6594	8805	15399	10089	4224	14312	8823	9405	13341	31569	32803	534896
1844	8637	9647	18284	10087	4349	14436	8889	9880	14672	33440	32909	558283
1845	8855	9558	18413	10145	4011	14156	8930	9959	15073	33963	32425	588314
1846	9502	9121	18623	9998	4310	14308	9012	10122	14106	33241	29391	592329
1847	10614	8850	19464	10907	4267	15174	9050	9850	13479	32379	27030	617138
1848	9377	9651	19028	10826	4485	15311	9050	10545	15383	34978	32350	571803
1849	10861	10369	21230	10499	4714	15213	9157	10616	16245	36018	34930	587263
1850	12022	10870	22892	10979	4892	15871	9205	10511	16736	36453	35246	618099
1851	13233	11108	24341	10905	4311	15216	9298	10641	16483	36421	33744	640830
1852	13286	11237	24524	10992	4643	15636	9621	10651	16453	36725	34612	657695
1853	16258	12073	28331	10515	5392	15906	9637	10819	17221	37676	37895	699422
1854	18972	13508	32480	10296	6012	16308	9730	10394	18236	38360	38716	740922
1855	23284	13381	36665	10172	6310	16482	9800	10813	17565	38178	36490	767275
1856	27281	13280	40561	10235	6162	16397	9856	10684	17427	37968	36470	763577
1857	22516	14336	36852	12660	4836	17496	10810	11580	19143	41533	42778	733387
1858	21184	15560	36744	12807	6228	19035	11477	12515	21376	45368	45785	787423
1859	24903	15681	40584	12289	6305	18594	11686	13329	21275	46290	45787	780289
1860	26011	15977	41988	12322	6004	18325	11841	13435	20670	45946	43337	824223
1861	28691	16177	44868	12388	6373	18760	12232	14897	20528	47658	43780	829979
1862	29362	17130	46492	12251	7489	19740	12518	15400	21683	49600	45141	893300
1863	34252	17172	51424	12193	6830	19023	12882	15469	22346	50696	47698	882073
1864	39087	18577	57664	12466	11883	24350	13067	15620	23607	52294	48484	906380
1865	39835	19832	59667	12464	6653	19116	13281	15823	24532	53636	49262	960556
1866	40403	18426	58829	12469	6040	18509	13611	14917	22728	51256	47337	922565
1867	43571	18443	62014	12366	6151	18517	13030	15106	22036	50172	45221	934679
1868	42882	17785	60668	12052	6104	18157	11606	15807	21449	48862	41775	931487
1869	48249	20640	68890	13092	6752	19844	12938	17041	23470	53449	46526	983149
1870	49672	22508	72180	12963	6551	19514	11617	15102	25776	52494	51625	1033699
1871	49068	22817	71884	13832	6865	20698	12142	16818	25799	54758	52865	1086708
1872	59165	25753	84919	12221	6207	18428	10757	13772	27773	52303	54308	1123894
1873	58864	29805	88669	11957	6050	18008	11008	12714	28971	52694	53823	1170474
1874	58795	30524	89319	12675	6133	18809	11093	12603	29664	53361	54387	1145552
1875	56961	41106	98067	13753	6442	20195	12151	13082	32487	57721	61592	1188521
1876	60041	40889	100930	14112	7247	21359	12610	13390	34203	60204	63910	1239726
1877	60207	37990	98197	15238	7447	22685	13182	15128	34786	63096	62515	1241475
1878	62410	31565	93976	14707	7073	21780	13900	16016	34153	64069	65728	1199593
1879	62863	29064	91927	17368	8179	25547	15957	20056	35437	71449	63669	1263991
1880	69139	35280	104419	15965	7621	23586	15362	19969	34644	69975	61002	1313403
1881	61317	36733	98051	16371	7743	24114	15499	19943	34805	70247	59837	1283235
1882	69860	39670	109530	16126	7880	24006	14946	20359	36681	71986	64976	1327941
1883	74415	39424	113839	16610	7638	24247	14974	18200	38995	72169	69172	1355519
1884	69393	38698	108091	17617	8404	26021	16799	18688	39005	74491	71165	1329075
1885	65799	38117	103916	18455	8663	27119	17519	19820	40069	77408	73379	1328820
1886	64119	37140	101259	19332	9041	28373	18134	20016	41584	79734	76129	1353841
1887	64891	36692	101583	20016	9330	29346	18959	20639	41377	80975	76983	1384964
1888	77322	40094	117415	20016	9965	29981	19607	20144	43103	82855	77547	1455990
1889	96786	45481	142267	19803	9803	29606	19071	20195	43572	82839	76864	1505942
1890	94502	47133	141635	20243	10342	30585	19180	23543	43268	85991	77050	1512278
1891	85947	49174	135120	19809	9987	29796	18905	20259	43163	82327	74941	1520911
1892	86109	52191	138299	21521	10292	31813	21201	24765	43944	89911	78901	1522736
1893	80704	59170	139874	23114	10902	34016	23298	25907	48438	97644	84569	1572026
1894	79420	60704	140124	23818	12767	36585	23626	27846	53093	104564	95369	1651598
1895	75677	62330	138007	25606	15817	41422	26264	28446	55050	109760	97843	1739364
1896	85251	65360	150612	28418	19821	48239	29911	28854	57151	115916	102069	1791682
1897	92574	66120	158694	29128	20298	49426	28505	30046	58344	116894	102827	1885453
1898	93760	74642	168402	29033	20415	49448	29229	29370	58910	117509	100790	1942395
1899	105762	80215	185977	27478	21430	48908	26478	21268	61065	108811	104820	1955803
1900	109636	82320	191956	27197	18896	46093	27970	28649	60176	116795	105425	1981769
1901	111822	83447	195268	28232	18211	46443	33578	29127	63648	126352	109731	2018082
1902	107784	86482	194266	29071	16966	46036	34307	29688	63859	127853	110642	2033340
1903	97955	87504	185459	28557	15332	43889	33715	28674	64177	126566	115843	2058925
1904	118613	84661	203274	28033	13665	41698	33628	29790	62188	125607	116270	2066645
1905	110732	88985	199717	27603	14147	41750	33078	29108	62166	124353	116034	2098545
1906	107853	94930	202784	27197	13939	41136	32999	28275	62915	124188	116951	2217334
1907	116664	98008	214672	27306	13616	40922	33988	27817	61895	123700	114091	2253769
1908	121323	103116	224439	27539	13477	41016	37444	36926	66273	140643	125549	2317939
1909	111082	104294	215376	29793	14196	43989	40308	30260	68188	138757	132381	2358525
1910	114848	113891	228739	30166	14351	44517	43117	28990	71820	143927	137869	2494632
1911	124028	118841	242869	30778	14608	45386	42283	32170	72683	147136	137589	2592174
1912	130807	117031	247838	33573	16282	49855	44811	33625	73038	151473	131651	2684411
1913	141750	132339	274089	34475	16565	51040	43459	32772	79733	155964	143353	2955063
1914	135741	130901	266642	35638	20338	55976	40694	32622	78731	152048	137693	2931987
1915	177912	121771	299682	41544	28156	69700	34680	33488	70535	138703	119538	3012242
1916	226183	121399	347581	42338	29127	71465	30846	29643	75765	136253	122619	3313823
1917	171659	102693	274353	43041	29134	72175	23453	22409	67210	113072	94991	2991270
1918	149773	109078	258852	47305	23789	71094	23835	25449	65826	115109	102300	2836949
1919	171992	145886	317878	55215	19112	74327	30576	34223	86712	151510	131109	3278847
1920	221868	150868	372736	56928	13494	70423	43498	43913	92845	180256	140580	3415711
1921	255571	185920	441490	67400	14513	81913	58153	42954	86524	187631	115845	3081635
1922	220682	177053	397735	77521	16029	93550	64490	41725	89679	195894	116019	3369176
1923	154522	188126	342648	70817	15247	86065	66963	46404	98612	211978	150498	3613889
1924	198135	178953	377088	60599	12828	73427	67056	49305	95856	212217	132638	3573485
1925	215269	173277	388545	62696	13271	75967	67952	56900	91664	216516	133251	3555792
1926	212502	193214	405716	70173	16497	86670	75955	61073	91721	228749	145745	3589746
1927	232099	197453	429552	72775	17455	90230	83675	72972	94151	250798	154034	3789688
1928	238771	194436	433207	69083	16829	85912	84251	71833	94437	250521	160061	3992656
1929	289004	201420	490424	68315	17459	85775	79565	75550	97340	252456	162283	4266449
1930	329000	223000	552000	71000	18000	89000	82996	80358	104320	267674	173000	4439449

Table 2. Norwegian GDP by industry 1830-1930 in fixed million NOK-1930.

	Foodstuff	Textiles	Clothing	Leather & rubber	Lumber products	Fabricated wood products	Wood processing	Chemicals	Non-metallic minerals	Metal products	Electrochemicals & metallurgicals	Oils & fat	Total
1896	155726	22164	27459	6249	18040	18775	23454	8964	34416	24701		2527	351087
1897	174998	22152	28764	7250	19569	19350	26078	9120	38040	27862		2689	385977
1898	193497	22170	31562	7173	19965	21020	30139	10478	43544	31782		2557	425654

1899	204823	23118	35117	8324	20737	22912	31226	11088	50403	33829	81	2371	456402
1900	202092	23645	38513	7806	22843	24735	30262	10866	42201	33838	1207	2020	450915
1901	206146	23676	42784	7204	22118	23392	30581	11043	42417	35432	551	2816	459867
1902	208357	23065	45986	6681	20319	22649	30148	10566	41334	35899	718	3479	461245
1903	208382	22555	46589	6370	21818	23119	30936	11488	39722	36306	1776	2942	463677
1904	209129	21900	35732	6421	20600	22903	32194	12154	41528	37273	2509	2829	457480
1905	216665	23906	41416	7129	19763	24545	36127	12691	41821	38857	3233	2407	481715
1906	243627	26450	43433	7322	21781	26222	40511	13594	44162	43075	5467	2846	533103
1907	250937	28169	42340	7640	23196	28934	45198	14685	42290	49943	8739	3159	559829
1908	256082	29225	47924	8456	19858	31250	55336	17545	45769	54979	14930	4078	600801
1909	253041	33200	52040	8083	19988	33858	61370	18637	47777	53566	15953	4591	617036
1910	285851	34417	56503	8746	27172	40470	70614	20215	51010	62739	22229	5556	700022
1911	284324	35239	60634	10470	32933	46384	73883	21054	53895	70837	32864	7162	739952
1912	319154	37133	73035	11782	39758	48331	85852	21700	58232	91809	53344	7940	857042
1913	396622	39928	81012	14063	44814	59505	98222	22002	58776	105006	56501	8596	997308
1914	401184	41768	84462	15074	49454	63073	101593	20853	55003	109339	58395	11170	1021929
1915	392639	43925	90516	21146	52284	75388	108821	20744	47600	120114	73543	14489	1065640
1916	416653	46431	107409	23108	64779	102669	117214	24823	46939	133608	93671	13722	1185779
1917	373381	49079	115773	28489	68140	108333	106823	26783	43571	157108	113441	11056	1188628
1918	284499	41256	98415	24881	62479	96311	107218	25467	45604	145792	107974	15039	1038930
1919	350061	45562	108177	25503	63144	100337	113938	25505	45642	160662	89328	17250	1138140
1920	364017	46301	131356	26432	58105	98068	121153	31509	46441	172065	87257	16231	1197232
1921	303751	29709	82494	21561	40490	62819	86117	19725	36195	113059	56294	18041	873751
1922	360473	40047	124696	24266	52045	74264	126314	22707	45415	141250	67723	21955	1107094
1923	356281	43616	137144	26486	56166	88007	134158	24480	54055	157570	84533	26586	1188226
1924	365837	45928	134658	29170	83026	93329	129190	27610	61506	164256	92095	33529	1251285
1925	376872	52359	142509	32984	70033	91148	158906	28019	58899	185055	113793	37608	1342875
1926	373465	51310	135835	29693	58062	76519	148757	28382	42885	158048	105769	40185	1247657
1927	388827	54313	143741	30291	57999	79265	156093	29093	51318	147075	101973	36886	1277688
1928	374234	54367	159980	29323	71841	79201	163056	35113	64744	199735	135471	54418	1412864
1929	422973	62923	151875	26308	70858	81932	170039	37217	65141	236292	151388	51818	1523332
1930	406215	65387	144561	24119	65287	86205	165530	37063	70796	232528	254608	34683	1559052

Table 3. Deflators for Norwegian GDP per industry 1830-1930 (1930=100).

	Primary production					Manufacturing industry				Commerse			Property
	Agriculture	Forestry	Fisheries	Whaling etc	Total	Manufacturing	Construction & utilities	Mining	Total	Trade	Finance	Total	Dwellings & commercial properties
1830	40,02	35,35	41,49	55,26	39,12	65,27	65,27	65,27	65,27	41,72	50,65	43,16	24,13
1831	49,12	36,06	39,42	52,50	45,24	67,79	67,79	67,79	67,79	45,96	55,80	47,59	23,98
1832	40,87	32,52	42,32	56,31	39,18	65,61	65,61	65,61	65,61	43,31	52,57	44,77	19,12
1833	35,24	33,58	38,59	51,37	35,29	62,89	62,89	62,89	62,89	39,57	48,02	40,87	20,03
1834	31,58	29,69	35,68	47,49	31,62	62,56	62,56	62,56	62,56	36,48	44,28	37,67	19,95
1835	34,95	26,16	36,10	48,10	32,98	62,37	62,37	62,37	62,37	39,11	47,48	40,43	19,98
1836	37,63	32,88	37,35	49,70	36,62	61,51	61,51	61,51	61,51	40,67	49,37	42,06	18,57
1837	39,79	36,06	28,63	38,15	37,64	62,43	62,43	62,43	62,43	41,89	50,85	43,49	18,66
1838	41,66	34,64	41,91	55,82	40,21	60,78	60,78	60,78	60,78	43,66	53,00	45,46	19,66
1839	41,33	34,64	46,47	61,93	40,24	61,24	61,24	61,24	61,24	42,99	52,19	44,71	18,98
1840	39,27	31,81	38,17	50,80	37,54	64,55	64,55	64,55	64,55	40,60	49,28	42,21	17,71
1841	32,28	29,69	36,93	49,17	32,20	54,50	54,50	54,50	54,50	36,07	43,78	37,53	19,17
1842	30,73	29,34	35,27	46,98	30,94	49,54	49,54	49,54	49,54	35,90	43,58	37,46	17,88
1843	33,59	41,00	39,42	52,48	35,70	53,17	53,17	53,17	53,17	36,79	44,66	38,38	21,05
1844	33,41	51,61	33,20	44,21	36,79	52,05	52,05	52,05	52,05	35,81	43,46	37,42	18,01
1845	33,87	50,90	36,93	49,16	37,31	51,65	51,65	51,65	51,65	37,15	45,09	38,83	18,64
1846	36,69	49,14	30,71	40,92	38,19	55,42	55,42	55,42	55,42	42,23	51,25	44,09	22,54
1847	45,46	49,49	28,22	37,61	44,24	55,36	55,36	55,36	55,36	50,35	61,11	52,61	18,94
1848	39,69	53,38	35,27	47,00	41,42	56,81	56,81	56,81	56,81	39,47	47,91	41,34	19,78
1849	36,50	51,61	35,27	46,94	38,97	57,14	57,14	57,14	57,14	36,53	44,33	38,20	20,13
1850	36,17	47,02	35,27	46,93	38,17	54,36	54,36	54,36	54,36	36,14	43,87	37,69	21,30
1851	37,25	50,55	31,95	42,55	39,24	55,95	55,95	55,95	55,95	38,59	46,83	40,27	23,48
1852	38,85	46,66	37,76	50,26	40,33	55,02	55,02	55,02	55,02	40,48	49,13	42,27	23,59
1853	38,61	49,49	34,85	46,41	40,46	57,54	57,54	57,54	57,54	41,82	50,76	43,60	26,27
1854	41,24	74,59	41,49	55,30	47,52	63,82	63,82	63,82	63,82	45,25	54,92	47,24	26,78
1855	44,34	65,75	42,32	56,39	48,23	68,78	68,78	68,78	68,78	49,80	60,44	52,10	29,05
1856	49,97	64,34	47,30	62,95	52,60	67,13	67,13	67,13	67,13	53,10	64,45	55,74	30,77
1857	49,64	59,39	52,70	70,13	52,11	66,73	66,73	66,73	66,73	47,38	57,51	49,50	32,31
1858	43,12	57,27	47,30	62,96	46,11	60,45	60,45	60,45	60,45	41,51	50,38	43,45	32,01
1859	42,93	51,96	42,74	56,95	44,74	60,51	60,51	60,51	60,51	42,04	51,02	44,22	35,44
1860	44,43	53,38	40,25	53,63	45,73	65,21	65,21	65,21	65,21	46,28	56,17	48,61	32,55
1861	46,92	50,90	53,11	70,71	48,49	66,14	66,14	66,14	66,14	47,66	57,85	50,27	31,46
1862	43,59	52,67	45,23	60,20	45,54	65,34	65,34	65,34	65,34	47,30	57,42	49,88	31,89
1863	41,24	50,20	45,23	60,21	43,74	69,31	69,31	69,31	69,31	46,06	55,91	48,73	32,21
1864	41,94	47,37	46,47	61,89	43,72	74,34	74,34	74,34	74,34	44,43	53,93	47,09	30,63
1865	39,74	46,66	52,28	69,64	42,76	70,63	70,63	70,63	70,63	44,02	53,43	46,40	32,79
1866	45,29	49,93	43,20	57,52	46,02	75,33	75,33	75,33	75,33	48,91	54,90	50,54	33,37
1867	46,55	53,66	43,58	58,03	47,56	73,15	73,15	73,15	73,15	51,81	54,91	52,65	37,49
1868	51,59	49,06	40,67	54,17	49,51	73,54	73,54	73,54	73,54	54,73	54,91	54,78	35,09
1869	49,40	45,64	53,73	71,56	48,98	70,37	70,37	70,37	70,37	48,67	52,94	49,86	37,41
1870	46,98	44,47	53,64	71,43	47,19	69,57	69,57	69,57	69,57	45,36	52,94	47,32	38,91
1871	45,57	47,12	56,64	75,40	47,34	68,45	68,45	68,45	68,45	46,73	52,45	48,16	40,77
1872	45,59	50,37	53,83	71,67	47,86	81,72	81,72	81,72	81,72	48,14	65,20	51,61	44,13
1873	47,62	50,94	58,34	77,68	49,73	81,31	81,31	81,31	81,31	51,78	73,53	55,95	45,61
1874	53,22	57,48	58,72	78,20	55,12	81,84	81,84	81,84	81,84	55,66	79,42	60,23	50,66
1875	54,40	52,14	56,11	74,72	54,09	81,25	81,25	81,25	81,25	51,64	75,49	56,49	52,13
1876	52,66	49,21	60,53	80,59	52,48	75,82	75,82	75,82	75,82	48,98	71,57	53,64	55,33
1877	54,18	52,14	57,58	76,67	54,12	71,84	71,84	71,84	71,84	50,78	69,12	54,91	55,34
1878	50,20	45,11	52,50	69,90	49,25	69,56	69,56	69,56	69,56	44,48	63,73	49,01	57,89
1879	44,68	37,47	48,42	64,49	43,41	67,46	67,46	67,46	67,46	41,27	58,83	45,33	53,84
1880	48,48	39,03	50,51	67,28	45,81	70,26	70,26	70,26	70,26	45,08	59,32	48,47	52,06
1881	49,66	42,07	53,64	71,43	47,69	66,05	66,05	66,05	66,05	46,71	58,34	49,78	53,06
1882	49,80	41,82	57,68	76,79	47,99	65,29	65,29	65,29	65,29	44,19	59,81	48,02	53,64
1883	47,85	38,95	69,07	91,98	46,90	66,40	66,40	66,40	66,40	42,20	59,32	46,16	52,64
1884	45,99	41,11	58,82	78,32	46,05	67,28	67,28	67,28	67,28	40,79	57,36	44,84	50,01
1885	44,65	39,63	52,36	69,72	43,99	64,30	64,30	64,30	64,30	38,25	54,41	42,25	53,12
1886	42,23	38,11	49,13	65,43	41,92	65,29	65,29	65,29	65,29	36,29	52,45	40,10	50,59
1887	39,94	36,37	46,90	62,46	39,64	63,25	63,25	63,25	63,25	35,52	51,96	38,97	52,21
1888	40,34	36,09	45,34	60,37	39,70	63,60	63,60	63,60	63,60	36,24	51,47	39,36	51,44
1889	43,33	37,97	45,95	61,19	42,05	63,95	63,95	63,95	63,95	38,32	55,40	41,65	51,28
1890	44,35	39,56	47,19	62,83	43,49	63,60	63,60	63,60	63,60	39,71	59,32	43,58	53,60
1891	45,23	40,02	55,16	73,45	45,12	62,02	62,02	62,02	62,02	42,47	58,34	45,88	56,34
1892	47,57	39,66	45,72	60,87	45,38	58,79	58,79	58,79	58,79	41,92	55,88	45,10	57,97
1893	45,51	39,80	42,63	56,77	43,70	58,19	58,19	58,19	58,19	38,44	54,41	42,04	62,06
1894	42,68	36,87	43,96	58,54	41,26	54,27	54,27	54,27	54,27	35,71	53,92	39,54	60,98
1895	40,41	35,35	47,47	63,21	39,84	53,67	53,67	53,67	53,67	35,35	52,94	38,95	63,49
1896	42,54	35,77	52,27	69,59	41,31	54,12	54,12	54,12	54,12	35,62	54,90	39,62	66,28
1897	43,16	36,34	47,57	63,33	41,30	54,88	54,88	54,88	54,88	36,24	55,89	40,15	67,22
1898	44,12	38,25	48,37	64,41	42,64	55,40	55,40	55,40	55,40	39,04	59,32	43,20	70,78
1899	46,28	44,12	57,68	76,80	46,84	57,01	57,01	57,01	57,01	40,41	64,22	45,27	71,87
1900	48,15	44,51	70,40	93,75	48,94	60,27	60,27	60,27	60,27	43,19	65,69	48,27	66,84
1901	48,60	41,89	63,80	84,96	47,97	59,70	59,70	59,70	59,70	41,13	60,30	45,67	65,17
1902	48,54	42,10	64,99	86,53	48,05	57,24	57,24	57,24	57,24	41,01	61,77	45,80	65,50
1903	49,85	41,15	74,86	99,68	48,76	56,72	56,72	56,72	56,72	40,84	60,79	45,66	64,49
1904	47,97	40,65	73,82	98,29	47,65	55,01	55,01	55,01	55,01	41,37	60,30	45,90	61,42
1905	49,13	40,76	85,07	113,27	49,09	55,60	55,60	55,60	55,60	42,42	61,77	46,86	58,77
1906	49,20	41,78	81,70	108,80	49,20	56,93	56,93	56,93	56,93	43,66	64,71	48,19	61,86
1907	51,71	46,63	80,99	107,84	53,14	60,70	60,70	60,70	60,70	47,19	66,67	51,48	60,39
1908	52,30	53,59	73,82	98,29	55,56	62,31	62,31	62,31	62,31	45,58	66,67	50,28	61,22
1909	51,57	48,39	66,08	87,99	53,47	63,07	63,07	63,07	63,07	45,39	64,22	49,70	61,64

1910	53,36	47,51	74,86	99,68	55,80	63,38	63,38	63,38	63,38	45,60	65,20	50,00	64,98
1911	54,13	49,31	75,88	101,03	57,86	65,28	65,28	65,28	65,28	47,54	67,65	52,09	66,68
1912	57,88	54,55	66,05	87,95	60,39	69,57	69,57	69,57	69,57	51,14	69,61	55,45	69,84
1913	54,22	58,63	60,96	81,22	58,10	69,19	69,19	69,19	69,19	50,28	71,57	55,09	73,39
1914	57,48	62,15	68,89	80,40	61,58	69,37	69,37	69,37	69,37	53,53	74,02	58,23	77,91
1915	81,88	77,40	98,15	140,50	85,71	81,03	81,03	81,03	81,03	73,68	89,71	77,12	79,10
1916	107,90	113,75	137,16	205,47	117,62	97,65	97,65	97,65	97,65	93,01	139,71	100,75	87,09
1917	137,18	170,62	186,54	420,69	156,11	127,14	127,14	127,14	127,14	139,31	211,29	151,07	94,85
1918	183,82	194,08	149,36	469,42	183,94	168,20	168,20	168,20	168,20	177,44	238,25	188,56	103,67
1919	191,95	212,25	165,21	384,15	196,88	170,68	170,68	170,68	170,68	170,32	243,15	181,14	109,13
1920	204,50	238,34	159,11	408,51	212,37	199,82	199,82	199,82	199,82	191,83	257,86	200,67	116,24
1921	154,54	168,28	132,90	220,91	157,80	175,27	175,27	175,27	175,27	172,43	206,38	176,39	106,71
1922	136,07	157,58	104,35	193,70	140,20	149,36	149,36	149,36	149,36	150,47	186,77	154,84	109,36
1923	117,66	178,83	98,76	192,48	132,07	139,28	139,28	139,28	139,28	134,92	169,13	138,74	110,52
1924	146,40	181,76	118,27	221,72	153,66	152,41	152,41	152,41	152,41	148,10	174,03	151,41	108,08
1925	150,74	154,20	145,09	170,55	152,43	154,82	154,82	154,82	154,82	151,09	164,71	152,98	110,04
1926	117,17	129,10	117,05	159,69	123,34	128,84	128,84	128,84	128,84	127,74	136,28	128,98	104,97
1927	98,70	116,55	80,18	118,78	102,25	114,85	114,85	114,85	114,85	115,76	115,69	115,75	102,94
1928	97,07	114,69	98,69	104,97	102,44	108,64	108,64	108,64	108,64	107,57	108,83	107,79	103,60
1929	90,19	106,57	94,64	104,42	96,81	105,54	105,54	105,54	105,54	102,99	104,91	103,33	103,79
1930	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Table 3. Deflators for Norwegian GDP per industry 1830-1930 (1930=100).

	Transport & communication			Government services			Community & business services				Personal services	GDP
	Ocean going	Other	Total	Public adm	Defence	Total	Education	Health	Others	Total	Domestic services & misc	
1830	150,15	86,96	111,86	42,19	40,82	41,68	44,86	42,55	42,55	43,18	41,03	41,31
1831	162,17	95,79	122,10	43,43	44,04	43,65	45,26	44,42	46,88	45,55	45,19	45,23
1832	147,15	90,26	114,12	42,87	43,96	43,21	44,77	44,14	44,17	44,32	42,58	40,54
1833	135,14	82,46	104,27	42,27	43,06	42,52	44,14	43,38	40,36	42,43	38,92	38,19
1834	150,15	76,02	105,78	41,77	42,65	42,05	43,60	42,91	37,21	40,78	35,88	35,67
1835	153,15	81,52	111,95	42,01	43,80	42,56	43,51	43,46	39,89	42,05	38,47	37,10
1836	157,66	84,75	116,06	42,40	45,22	43,27	43,51	44,21	41,48	42,93	40,00	39,11
1837	159,16	87,30	119,00	42,49	46,24	43,61	43,34	44,65	42,73	43,53	41,20	39,91
1838	151,64	91,00	117,40	42,53	47,18	43,85	43,11	45,04	44,53	44,28	42,93	41,38
1839	136,64	89,60	110,96	42,43	47,10	43,83	43,07	44,97	43,85	43,99	42,28	41,18
1840	150,14	84,61	114,18	42,60	49,22	44,52	42,71	45,91	41,41	43,18	39,93	39,10
1841	126,12	75,18	97,68	41,94	47,31	43,51	42,35	44,74	36,79	40,78	35,47	35,17
1842	109,60	74,82	90,64	41,99	47,67	43,72	42,44	44,97	36,61	40,78	35,31	33,69
1843	106,60	76,67	89,49	43,36	52,94	46,18	42,84	47,91	37,52	42,10	36,17	37,33
1844	117,12	74,63	94,70	43,39	52,24	46,06	43,02	47,63	36,52	41,53	35,21	37,20
1845	114,11	77,42	95,07	44,03	53,22	46,64	43,51	48,38	37,89	42,44	36,54	37,79
1846	139,63	88,00	114,35	44,76	54,37	47,65	44,01	49,21	43,07	45,19	41,53	40,79
1847	171,17	104,92	141,05	46,12	57,80	49,41	44,95	51,44	51,35	49,59	49,51	43,90
1848	103,61	82,26	92,78	45,28	54,00	47,83	44,82	49,40	40,26	44,19	38,82	40,36
1849	93,10	76,12	84,81	45,31	53,22	47,76	44,91	49,04	37,25	42,67	35,92	38,78
1850	90,09	75,33	83,08	45,14	52,00	47,26	45,04	48,46	36,86	42,27	35,54	38,47
1851	85,59	80,42	83,23	45,35	51,80	47,18	45,13	48,40	39,35	43,47	37,94	40,18
1852	91,59	84,36	88,28	45,95	52,94	48,03	45,71	49,27	41,28	44,76	39,81	41,19
1853	114,12	87,15	102,63	46,39	53,47	48,79	46,39	49,87	42,65	45,68	41,13	43,30
1854	123,12	94,29	111,13	47,84	55,76	50,76	47,46	51,57	46,14	47,95	44,50	48,69
1855	106,61	103,78	105,57	48,91	56,73	51,90	48,45	52,55	50,78	50,68	48,97	51,05
1856	93,09	110,66	98,85	50,69	58,73	53,71	49,80	54,23	54,16	53,04	52,22	53,52
1857	90,09	98,74	93,45	48,26	58,20	51,01	47,01	52,63	48,32	49,18	46,58	51,46
1858	78,08	86,51	81,65	46,97	54,12	49,31	46,16	50,10	42,33	45,44	40,81	46,44
1859	84,09	87,60	85,44	46,97	53,67	49,24	46,07	49,82	42,87	45,68	41,33	46,93
1860	105,10	96,44	101,81	47,47	54,73	49,85	46,16	50,42	47,19	47,87	45,49	48,92
1861	103,60	99,34	102,06	46,42	47,47	46,77	46,39	46,74	48,61	47,45	46,87	50,38
1862	99,10	98,59	98,91	46,41	47,47	46,81	46,43	46,76	48,25	47,33	46,52	49,13
1863	88,59	95,99	91,06	46,72	47,47	46,99	46,66	46,87	46,98	46,86	45,29	48,61
1864	85,59	92,60	87,84	46,50	47,47	46,97	46,83	46,95	45,31	46,18	43,69	48,49
1865	84,08	91,75	86,63	47,07	47,47	47,21	47,06	47,06	44,90	46,07	43,30	48,13
1866	82,92	101,93	88,87	48,14	48,54	48,27	48,13	48,13	49,88	48,91	48,09	51,06
1867	80,58	107,97	88,73	50,28	50,71	50,42	50,27	50,27	52,84	51,40	50,95	53,21
1868	82,53	114,06	91,77	52,42	52,86	52,57	52,40	52,41	55,82	53,90	53,81	54,24
1869	84,08	101,43	89,28	48,14	48,55	48,28	48,13	48,13	49,64	48,79	47,86	53,16
1870	87,98	94,54	90,02	50,28	50,71	50,42	50,26	50,27	46,26	48,30	44,60	52,38
1871	91,87	97,39	93,62	48,68	49,09	48,81	48,67	48,66	47,66	48,19	45,95	52,92
1872	94,21	98,95	95,64	55,09	55,56	55,25	55,08	55,08	49,10	51,91	47,34	56,61
1873	112,11	98,08	107,39	59,91	60,41	60,08	59,89	59,89	52,81	56,00	50,91	59,39
1874	114,06	104,51	110,80	59,91	60,41	60,07	59,89	59,90	56,77	58,16	54,74	63,95
1875	101,60	76,27	90,99	59,91	60,42	60,07	59,89	59,89	52,67	55,83	50,79	61,56
1876	106,27	80,02	95,64	59,91	60,41	60,08	59,90	59,90	49,95	54,25	48,18	60,49
1877	101,60	86,52	95,77	58,31	58,79	58,47	58,29	58,29	51,79	54,70	49,94	60,71
1878	95,76	92,89	94,80	54,56	55,02	54,71	54,55	54,54	45,36	49,65	43,73	57,71
1879	87,59	95,27	90,02	48,68	49,09	48,81	48,66	48,66	42,09	45,40	40,57	52,91
1880	89,92	85,96	88,58	52,96	53,40	53,10	52,94	52,94	45,97	49,49	44,32	54,63
1881	92,65	85,33	89,91	52,96	53,40	53,10	52,94	52,94	47,63	50,31	45,92	55,34
1882	98,49	81,84	92,46	55,10	55,56	55,25	55,08	55,08	45,07	49,98	43,45	55,59
1883	97,32	81,83	91,96	53,49	53,94	53,63	53,47	53,48	43,04	47,84	41,50	54,59
1884	86,42	80,71	84,38	49,21	49,63	49,35	49,20	49,20	41,60	45,22	40,10	52,72
1885	78,24	77,71	78,05	48,14	48,55	48,27	48,13	48,13	39,01	43,41	37,62	50,84
1886	73,57	78,90	75,53	47,07	47,47	47,20	47,06	47,06	37,01	41,82	35,67	48,83
1887	73,96	79,46	75,95	46,54	46,93	46,66	46,53	46,52	36,23	41,26	34,93	47,79
1888	79,41	78,90	79,24	46,54	46,93	46,67	46,52	46,52	36,96	41,55	35,64	48,36
1889	86,03	75,96	82,81	49,21	49,63	49,35	49,20	49,20	39,08	43,88	37,69	50,91
1890	81,36	74,78	79,17	48,14	48,55	48,28	48,13	48,13	40,50	44,29	39,05	51,89
1891	79,41	74,21	77,52	50,28	50,71	50,42	50,27	50,27	43,31	46,62	41,76	52,98
1892	74,74	70,15	73,01	50,28	50,71	50,42	50,27	50,27	42,75	46,59	41,22	52,37
1893	73,57	63,09	69,14	48,68	49,08	48,81	48,66	48,66	39,21	43,97	37,80	51,20
1894	75,91	62,47	70,09	48,14	48,55	48,28	48,13	48,13	36,42	42,18	35,11	48,91
1895	78,63	62,47	71,33	48,14	48,55	48,30	48,13	48,13	36,05	42,07	34,77	48,50
1896	80,58	63,09	72,99	48,68	49,09	48,85	48,66	48,66	36,32	42,58	35,02	49,89
1897	80,97	65,97	74,72	48,68	49,09	48,85	48,66	48,66	36,96	42,82	35,64	50,41
1898	86,42	63,91	76,44	51,35	51,79	51,53	51,34	51,34	39,82	45,56	38,38	52,69
1899	88,37	63,91	77,82	54,03	54,48	54,23	54,01	54,01	41,21	46,83	39,72	55,42
1900	97,22	65,66	83,68	56,17	56,64	56,36	56,15	56,15	44,04	49,91	42,46	57,26
1901	79,91	64,41	73,29	55,63	56,10	55,81	55,61	55,62	41,94	48,73	40,43	55,01
1902	71,65	61,84	67,29	54,03	54,48	54,19	54,01	54,01	41,82	47,92	40,32	53,86
1903	72,05	61,16	66,91	53,49	53,94	53,65	53,48	53,48	41,65	47,48	40,16	53,53
1904	72,79	63,66	68,99	52,96	53,40	53,10	52,94	52,94	42,19	47,62	40,67	52,86
1905	73,94	62,34	68,77	54,56	55,02	54,72	54,54	54,54	43,26	48,90	41,71	53,19
1906	75,51	63,22	69,75	56,17	56,64	56,33	56,15	56,15	44,53	50,26	42,94	54,39
1907	77,77	65,72	72,27	58,31	58,80	58,47	58,29	58,29	48,12	53,20	46,41	57,34
1908	70,61	64,59	67,85	59,38	59,88	59,54	59,36	59,36	46,49	53,29	44,81	57,79
1909	72,57	65,16	68,98	57,77	58,26	57,93	57,76	57,76	46,29	52,12	44,64	57,28

1910	77,08	65,90	71,51	59,91	61,02	60,27	59,89	59,89	46,51	53,22	44,84	58,90
1911	84,34	67,09	75,90	61,51	63,27	62,08	61,50	61,50	48,49	55,07	46,75	61,18
1912	95,79	73,32	85,18	64,72	67,23	65,54	64,71	64,70	52,15	58,65	50,29	65,32
1913	98,91	74,13	86,95	67,40	71,37	68,69	67,38	67,38	51,27	59,15	49,43	65,41
1914	111,04	77,47	94,56	69,01	76,55	71,74	68,98	68,98	54,60	61,53	52,63	68,28
1915	192,73	110,24	159,21	81,31	90,19	84,90	81,28	81,28	75,14	78,16	72,44	88,58
1916	341,54	150,42	274,79	101,63	112,74	106,16	101,61	101,60	94,85	97,85	91,44	119,23
1917	471,52	219,88	377,33	144,96	160,80	151,36	144,92	144,92	142,07	143,23	136,98	155,90
1918	476,00	255,84	383,23	179,20	198,78	185,75	179,15	179,15	180,96	180,18	174,47	186,19
1919	475,56	245,09	369,78	180,80	196,00	184,71	180,75	180,75	173,71	176,72	167,48	188,45
1920	459,62	278,19	386,19	198,42	216,31	201,84	214,44	214,44	195,64	204,76	188,62	212,06
1921	221,16	196,00	210,56	176,84	187,72	178,77	186,10	186,10	175,86	181,37	174,85	169,44
1922	188,35	178,34	183,90	144,32	160,86	147,16	160,98	164,02	156,38	159,52	157,58	149,29
1923	176,95	166,36	171,13	141,27	149,96	142,81	148,66	148,66	137,60	143,52	137,76	138,18
1924	195,45	194,23	194,87	159,06	168,84	160,77	167,38	167,38	151,04	160,00	151,00	152,19
1925	174,03	179,92	176,66	148,94	162,37	151,28	160,96	160,96	154,09	158,05	153,65	151,17
1926	152,27	140,88	146,85	121,72	132,70	123,81	131,55	131,55	130,27	131,04	130,69	127,39
1927	134,94	118,75	127,50	110,27	117,05	111,59	116,04	116,04	118,06	116,80	117,45	113,21
1928	123,51	114,50	119,46	109,00	112,74	109,74	111,76	111,76	109,71	110,99	109,50	108,30
1929	117,01	108,67	113,59	106,45	107,35	106,63	106,85	106,42	105,04	106,02	105,08	104,44
1930	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Table 3. Deflators for Norwegian GDP per industry 1830-1930 (1930=100).

	Foodstuff	Textiles	Clothing	Leather & rubber	Lumber products	Fabricated wood products	Wood processing	Chemicals	Non-metallic minerals	Metal products	Electrochemicals & metallurgicals	Oils & fat	Total
1896	29,12	58,14	50,27	81,55	284,03	48,56	78,02	39,64	39,65	83,31		109,14	54,12
1897	29,66	59,85	51,80	76,89	292,38	50,07	79,76	43,21	40,54	81,72		112,59	54,88
1898	30,10	61,56	53,43	80,39	300,73	51,58	81,79	43,30	41,69	81,13		115,96	55,39
1899	31,31	63,27	55,01	80,04	309,07	53,10	84,07	46,42	42,86	85,48	170,71	119,36	57,00
1900	33,04	64,99	56,34	87,94	317,45	54,63	86,06	46,04	44,58	88,74	174,20	122,83	60,27
1901	32,69	64,98	56,06	93,17	317,43	54,62	86,43	46,93	44,29	87,82	174,28	122,83	59,70
1902	31,54	63,27	54,54	87,46	309,09	51,59	85,88	41,70	43,13	86,13	169,73	115,98	57,24
1903	30,82	62,25	53,50	85,02	304,08	51,58	83,43	40,49	42,45	84,26	166,86	115,99	56,72
1904	29,79	60,88	53,17	80,57	297,38	51,58	80,22	41,10	41,25	81,89	149,79	116,02	55,01
1905	30,22	61,90	54,39	82,17	302,41	54,63	80,50	41,31	41,94	81,91	156,62	122,78	55,60
1906	30,88	63,27	55,83	83,05	309,09	57,66	81,89	43,60	43,10	82,83	161,05	129,66	56,92
1907	32,80	65,66	58,29	86,03	320,78	60,70	84,91	44,48	45,14	85,93	166,64	136,45	60,70
1908	34,18	66,69	58,96	86,24	325,80	60,69	85,54	43,34	45,59	88,41	176,72	136,46	62,31
1909	35,33	66,35	58,78	85,77	324,13	57,66	85,17	41,74	45,14	90,70	169,99	129,65	63,07
1910	35,44	67,32	60,15	81,58	258,36	56,23	88,30	40,54	46,90	89,83	168,22	116,24	63,37
1911	37,01	68,68	61,59	73,53	210,37	54,76	91,77	40,93	49,44	89,35	166,29	105,97	65,28
1912	39,35	71,95	64,57	72,75	182,89	57,42	99,24	46,62	52,92	91,14	169,78	108,06	69,56
1913	39,32	73,91	67,21	67,06	158,75	57,07	104,68	48,42	56,36	93,54	172,27	100,53	69,18
1914	41,14	73,39	67,31	63,05	135,81	57,92	105,03	50,78	57,51	90,54	167,21	98,93	69,37
1915	48,98	83,70	76,09	73,97	136,59	81,05	119,90	66,57	69,40	95,82	182,51	136,05	81,03
1916	57,19	118,98	81,96	101,56	161,86	121,15	138,66	87,36	87,30	106,98	217,73	202,41	97,64
1917	78,83	141,91	97,57	131,32	192,56	180,23	153,31	132,61	113,24	119,68	317,28	303,03	127,14
1918	102,54	192,23	135,65	164,44	259,69	186,73	212,30	164,01	164,54	174,87	326,20	304,67	168,19
1919	111,90	198,30	144,64	165,75	266,37	177,81	220,41	164,19	168,03	188,90	309,06	279,65	170,68
1920	139,11	225,43	172,22	198,56	297,32	203,02	252,14	199,67	188,04	214,68	366,92	321,73	199,82
1921	130,50	194,96	155,77	167,91	262,78	167,88	215,32	167,21	172,76	199,29	288,05	248,37	175,26
1922	113,92	156,21	127,39	131,73	209,31	132,23	176,50	136,66	146,40	167,25	210,39	189,42	146,42
1923	115,06	142,38	118,58	124,59	188,73	133,04	157,86	136,86	133,62	150,69	208,15	184,40	139,27
1924	134,83	150,40	128,96	133,52	197,31	140,72	159,94	159,09	143,67	157,52	235,75	204,68	152,40
1925	141,48	151,30	131,17	128,08	191,57	148,39	157,36	159,54	146,80	156,95	232,10	177,31	154,82
1926	123,25	123,88	108,04	104,92	154,51	117,32	126,79	133,51	124,15	131,25	182,95	130,64	128,84
1927	109,95	112,27	97,81	91,55	139,81	98,81	116,51	114,17	111,96	119,47	152,45	108,31	114,84
1928	104,46	108,49	92,01	85,39	130,50	101,99	113,10	105,98	99,40	109,21	149,92	91,60	108,63
1929	101,06	103,57	93,60	91,47	121,51	101,34	108,27	94,69	103,40	100,82	150,60	86,72	105,54
1930	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

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25/14 June, **Ragnhild Balsvik**, **Sissel Jensen**, and **Kjell G. Salvanes**, "Made in China, sold in Norway: Local labor market effects of an import shock".

26/14 August, **Kristina Bott, Alexander W. Cappelen, Erik Ø. Sørensen**, and **Bertil Tungodden**, "You've got mail: a randomized field experiment on tax evasion"

27/14 August, **Alexander W. Cappelen, Sebastian Fest, Erik Ø. Sørensen**, and **Bertil Tungodden**, "The freedom to choose undermines the willingness to redistribute."

28/14 August, Marianne Bertrand, Sandra Black, **Sissel Jensen**, and Adriana Lleras-Muney, "Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labor Market Outcomes in Norway."

29/14 August, **Astrid Kunze**, "The family gap in career progression".

30/14 September, **Ragnhild Balsvik** and **Morten Sæthre**, "Rent Sharing with Footloose Production. Foreign Ownership and Wages Revisited".

31/14 October, **Nicola D. Coniglio** and Giovanni Pesce, "Climate Variability and International Migration: an empirical analysis"

32/14 November, **Kurt R. Brekke**, Armando J. Garcia Pires, Dirk Schindler, and Guttorm Schjelderup, "Capital Taxation and Imperfect Competition: ACE vs. CBIT"

33/14 November, **Jan I. Haaland** and Anthony J. Venables, "Optimal trade policy with monopolistic competition and heterogeneous firms".

34/14 December, Rolf Aaberge, **Kai Liu**, and Yu Zhu, "Political Uncertainty and Household Savings".

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01/15 January**,** Antonio Mele**, Krisztina Molnár,** and Sergio Santoro, "On the perils of stabilizing prices when agents are learning".

02/15 March, **Liam Brunt**, "Weather shocks and English wheat yields, 1690-1871".

03/15 March, **Kjetil Bjorvatn, Alexander W. Cappelen**, Linda Helgesson Sekei, **Erik Ø. Sørensen**, and **Bertil Tungodden**, "Teaching through television: Experimental evidence on entrepreneurship education in Tanzania".

04/15 March**, Kurt R. Brekke**, **Chiara Canta**, Odd Rune Straume, "Reference pricing with endogenous generic entry".

05/15 March, Richard Gilbert and **Eirik Gaard Kristiansen**, "Licensing and Innovation with Imperfect Contract Enforcement".

06/15 March, **Liam Brunt** and Edmund Cannon, "Variations in the price and quality of English grain, 1750-1914: quantitative evidence and empirical implications".

07/15 April, Jari Ojala and **Stig Tenold**, "Sharing Mare Nostrum: An analysis of Mediterranean maritime history articles in English-language journals".

08/15 April, **Bjørn L. Basberg**, "Keynes, Trouton and the Hector Whaling Company. A personal and professional relationship".

09/15 April, Nils G. May and **Øivind A. Nilsen**, "The Local Economic Impact of Wind Power Deployment".

10/15 May, **Ragnhild Balsvik** and Stefanie Haller, "Ownership change and its implications for the match between the plant and its workers".

11/15 June, **Kurt R. Brekke**, **Chiara Canta**, Odd Rune Straume, "Does Reference Pricing Drive Out Generic Competition in Pharmaceutical Markets? Evidence from a Policy Reform".

12/15 June, **Kurt R. Brekke**, Tor Helge Holmås, Karin Monstad, and Odd Rune Straume, "Socioeconomic Status and Physicians'Treatment Decisions".

13/15 June, **Bjørn L. Basberg**, "Commercial and Economic Aspects of Antarctic Exploration - From the Earliest Discoveries into the 19th Century".

14/15 June, **Astrid Kunze** and Amalia R. Miller, "Women Helping Women? Evidence from Private Sector Data on Workplace Hierarchies"

15/15 July, **Kurt R. Brekke**, Tor Helge Holmås, Karin Monstad, Odd Rune Straume, «Do Treatment Decisions Depend on Physicians Financial Incentives?"

16/15 July, **Ola Honningdal Grytten**, "Norwegian GDP by industry 1830-1930".

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