

# NATIONAL INCOME AND EXPENDITURE OF THE UNITED KINGDOM, 1870-1952

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## INTRODUCTION<sup>1</sup>

THE work of constructing historical series to show the trends in the national income and expenditure of the United Kingdom from the Industrial Revolution to the present day may be said to have reached a half-way stage. On the one hand, a great deal of research has been undertaken, particularly in the last ten years, yielding results which provide year-by-year estimates for a number of the components of national income and expenditure over the period 1870-1952. On the other hand, facts are lacking and little research has been started on the growth of national income in the first half of the nineteenth century; and there still remain a number of important gaps in the data relating to the past seventy-five years; for example, little is known about stocks, about distribution costs or about the importance and interrelationships of different sectors of the economy.

The results of research that are available, however, covering the years 1870-1952 are sufficiently complete to make it possible and useful at this half-way stage to review the progress made. An account can be given of the work done and of the gaps that remain to be filled. An effort can be made to fit together the various series of different research workers and to test these series for consistency with each other. Finally, it is now possible to present, with some measure of confidence, overall estimates of the main quantities and to indicate some of the trends in the national income and expenditure of the United Kingdom since the last quarter of the nineteenth century. These are the aims of this article.

For convenience of reading, the discussion is divided into three sections. First, there is a general account of the methods of construction of the main series of United Kingdom income and expenditure, 1870-1952, together with a discussion of the sources of these series, the gaps that remain to be filled and the

<sup>1</sup> The authors wish to thank the many persons who kindly made available to them the results of unpublished research work and in particular they wish to thank Mr. Deryck Rowe for his help and advice.

problems and discrepancies to be solved. The new series that have been constructed are mainly expenditure series, though some adjustments have been made to the existing estimates of income for this period. In the second section a partial analysis is made, for the periods and for the aspects where the data are most complete and appear to be most reliable, of some of the trends in the pattern of income and expenditure. The analysis follows closely the approach adopted by Simon Kuznets in relation to the United States.<sup>1</sup> The third section sets out the yearly estimates of the individual series making up the national income and expenditure totals, together with a detailed discussion of the sources and of the methods of construction.

#### I. NATIONAL INCOME AND EXPENDITURE, 1870-1952

The definition of net national income and expenditure adopted in the paper may be set out in table form as follows:

<i>Income</i>	<i>Expenditure</i>
1. Wages.	1. Personal expenditure on goods and services.
2. Salaries.	2. Public authorities' current expenditure on goods and services.
3. Pay and allowances of the armed forces.	3. Gross capital formation.
4. Professional earnings.	4. Overseas lending.
5. Income from farming.	5. Value of physical increases in stock.
6. Profits of sole traders, partnerships, companies, public corporations and enterprises.	6. <i>Less</i> depreciation and maintenance.
7. Rent from land and buildings.	7. <i>Less</i> rates and taxes on expenditure, net of subsidies.
8. Employers' insurance contributions.	
Net National Income (Product) at factor cost.	Net National Expenditure at factor cost.

To make this table complete two adjustments have to be made for those years for which data are available. On the income side a deduction has to be made for provision for stock appreciation and on the expenditure side a deduction for net grants, if any, made from abroad to the United Kingdom.

#### *The national income series*

The national income series used in this paper for the years 1870-1937 is based on the estimates made by A. R. Prest.<sup>2</sup>

<sup>1</sup> International Association for Research in Income and Wealth, *Income and Wealth of the United States, Trends and Structure. Income and Wealth Series II*, paper by Simon Kuznets, 'Long-Term Changes in the National Income of the United States of America since 1870', Cambridge, 1952.

<sup>2</sup> A. R. Prest, 'National Income of the United Kingdom, 1870-1946', *Economic Journal*, Vol. LVIII, March 1948.

Prest in his estimates accepted the work done by Arthur L. Bowley<sup>1</sup> and Colin Clark<sup>2</sup> on wages and salaries, but made entirely new annual assessments of rent, interest, and profit, chiefly by attempting to unscramble the three-yearly average returns of these items made to the Inland Revenue authorities. A difficulty in making sound estimates of profits when using taxation returns is the undoubted existence of evasion, particularly in the period 1870–1900. Using the fragmentary details that were available, Prest made allowances for evasion; these amounted to about 10 per cent of the national income in 1870, falling to about 5 per cent in 1900.

To bring the estimates of net national income made by Prest into line with the definition set out above, adjustments, noted by Prest, had to be made. The methods adopted to make these adjustments, which relate to farm income, to the incomes of non-profit making bodies such as Co-operative Societies, charities and hospitals, and to employers' insurance contributions, are discussed later in Section III. The most important adjustment and the one on which the least satisfactory information is available relates to farm income. The general effect of the adjustments has been to raise the original Prest estimates of national income by about 3 per cent in 1870 and 2 per cent in 1907.

The Prest national income series for the inter-war years was adjusted to include employers' insurance contributions and a slight adjustment has been made to fit the level of the Prest series to the estimate of national income in 1938 made by the Central Statistical Office. The national income series used for 1938–52 is that of the Central Statistical Office.<sup>3</sup>

*The national expenditure series: personal consumption and public authorities' consumption of goods and services*

For the period 1870–1913, an attempt has been made to construct a new series for personal and public authorities' consumption of goods and services. The personal consumption series for these years has been built up from four main sources. First, for a somewhat heterogeneous group of commodities,

<sup>1</sup> A. L. Bowley, *Wages and Income in the United Kingdom since 1860*, Cambridge, 1937.

<sup>2</sup> Colin Clark, *National Income and Outlay*, London, 1937.

<sup>3</sup> Central Statistical Office, *National Income and Expenditure, 1946–1953*, H.M.S.O., 1954, and *Annual Abstract of Statistics*, No. 90, H.M.S.O., 1953.

direct estimates were available or were calculated of personal consumption at current retail prices; the commodities included tobacco, alcohol, coal, tea, coffee, fish, and motor vehicles. Secondly, from the work being done at the University of Oxford Agricultural Economics Research Institute, estimates were available of the yearly output and value of those farm products that enter directly into final consumption.<sup>1</sup> A deduction was made for exports, and the remainder at farm-gate prices was converted to retail prices by the addition of distributive margins, yielding a yearly series of the consumers' expenditure on these goods. Farmers' own consumption was kept at farm-gate prices.

Thirdly, since no yearly output or consumption series was available for all manufactured consumer goods, other than for those included in the group mentioned above, use was made of the output indicators of various consumer goods that have been calculated by W. Hoffmann.<sup>2</sup> These individual series were weighted to provide an index of the total output of manufactured consumer goods with the year 1907 as the base year of the index. A somewhat similar method was adopted by J. Tinbergen.<sup>3</sup> The 1907 value of the output of finished manufactured consumer goods at factory prices was determined by a detailed examination of the results of the 1907 census of production<sup>4</sup> and the weights given to the various output indicators of Hoffmann were also derived from the census data. This index provided a series for the period 1870-1913 of the output of manufactured consumer goods at 1907 prices. To obtain estimates of home consumption, exports of these goods had to be deducted, also at constant 1907 prices. The residual series was then converted to current retail prices using a retail price index of manufactured consumer goods.

To the agricultural output series and the manufactured con-

<sup>1</sup> The results of the work being undertaken by the Oxford Agricultural Economics Research Institute on farm output have not yet been published, but the Institute kindly made them available.

<sup>2</sup> Walther Hoffmann, *Wachstum und Wachstumsformen der englischen Industriewirtschaft von 1700 bis zur Gegenwart*, Jena, 1940.

<sup>3</sup> J. Tinbergen, *Business Cycles in the United Kingdom, 1870-1914*, Amsterdam, 1951.

<sup>4</sup> *Final Report of the First Census of Production of the United Kingdom (1907)*, Cd. 6320, H.M.S.O., 1912. 1907 has to be taken as a base year for the index as this is the first year for which full data on manufacturing output are available. Tinbergen, in his series, indirectly used the estimates given by Sir Arthur Flux in the Introduction to this volume, but direct calculation of finished consumer goods output seemed advisable.

sumer good series were then added estimates of the imports of finished consumer goods at retail prices and estimates of expenditure on the individual commodities mentioned above, to yield a series of total personal expenditure on goods at current retail prices.

The fourth group of estimates is related to expenditure on services, including rent, rates, communications, domestic service, personal services and so on. To determine this component of consumers' expenditure, an index of the volume of the output of services was constructed from what material existed in relation to individual items; the value of services in 1901 as given by A. R. Prest<sup>1</sup> was taken as the base of the index. A services price index was used to translate the series into current prices. This series together with the series of personal expenditure on goods provided a total series of personal current consumption of goods and services at current market prices.

For the years 1900-19 the estimates made by A. R. Prest of consumers' expenditure on goods and services are available. These estimates were built up for individual commodities and commodity groups from available output and import statistics. Over the period 1900-13, for which both the present series and the Prest series are available there is a relatively close correspondence between the two. The greatest difference between the two series is £81 million, or about 5 per cent of consumers' expenditure, and the average difference over the fourteen years is 2.5 per cent. No significant trend appears in the year-by-year differences but the present estimates are below the Prest estimates in every year.

The series of personal expenditure on goods and services for the years 1920-37 are based on the work of Richard Stone and D. A. Rowe,<sup>2</sup> and for the years 1938-52 the estimates of

<sup>1</sup> A. R. Prest assisted by A. A. Adams, *Consumers' Expenditure in the United Kingdom, 1900-1919*, Cambridge, 1954. Studies in the National Income and Expenditure of the United Kingdom, Vol. III, published under the joint auspices of the National Institute of Economic and Social Research and the Department of Applied Economics, University of Cambridge.

<sup>2</sup> Richard Stone assisted by D. A. Rowe and W. J. Corlett, Renée Hurstfield and Muriel Potter, *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*, Vol. I, Cambridge, 1954; and Richard Stone and D. A. Rowe, *Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*, Vol. II (to be published). The figures used here are provisional estimates only, kindly made available by Richard Stone and D. A. Rowe.

personal consumption made by the Central Statistical Office<sup>1</sup> have been used.

The estimates of public authorities' current expenditure on goods and services in the period 1870–1913 have been calculated directly from the central and local government accounts for these years.<sup>2</sup> The series used for the years 1920–37 are those of J. E. G. Utting,<sup>3</sup> and for 1938–52 those of the Central Statistical Office.

From these different sources it has therefore been possible to build up a series of current expenditure on goods and services over a period of eighty-two years, 1870–1952.<sup>4</sup> To obtain a series of the net expenditure, indirect taxes on outlay and rates had to be deducted and subsidies, if any, to be added. Data for these two components were obtained from the yearly accounts of central and local government and from 1938–52 from the publications of the Central Statistical Office.

### *Home and overseas capital formation*

The estimates of gross and net domestic capital formation, including the value of physical increases in stocks, for the years 1870–1913 and 1924–37 are based on the work of A. K. Cairncross<sup>5</sup> and E. H. Phelps Brown.<sup>6</sup> The details of the adjustments made to the series of the above authors are discussed later in Section III. It must be stressed, however, that as full data are lacking, the methods of estimating depreciation in

<sup>1</sup> Central Statistical Office, *Statistical Digest of the War*, H.M.S.O., 1951; and *National Income and Expenditure, 1946–1953*, H.M.S.O., 1954.

<sup>2</sup> It should be noted that in the estimates of consumers' expenditure on goods and services and public authorities' current expenditure, there is an element of double counting in the years 1870 to 1913. A part of the consumers' expenditure series is based on output indicators rather than consumption and no deduction has been made for the very small part of the output which was purchased by public authorities.

<sup>3</sup> J. E. G. Utting, assisted by Gisela Eisner, *Income and Expenditure of Public Authorities in the United Kingdom, 1920–1938*, to be published by the Cambridge University Press. Studies in the National Income and Expenditure of the United Kingdom, Vol. IV, to be published under the joint auspices of the National Institute of Economic and Social Research and the Department of Applied Economics, University of Cambridge.

<sup>4</sup> Estimates of public authorities' expenditure are not as yet available for the years 1914–19 and 1939–45.

<sup>5</sup> A. K. Cairncross, *Home and Foreign Investment, 1870–1913*, Cambridge, 1953.

<sup>6</sup> E. H. Phelps Brown, with S. J. Handfield-Jones, 'The Climacteric of the 1890's: A Study in the Expanding Economy', *Oxford Economic Papers*, Vol. 4, No. 3, October 1952; and Phelps Brown and Bernard Weber, 'Accumulation, Productivity and Distribution in the British Economy, 1870–1938', *Economic Journal*, Vol. LXIII, No. 250, June 1953.

the period 1870–1913 and the value of physical increases in stocks and work in progress in the whole period 1870–1937 are unsatisfactory. In the former case as an estimate is available for the year 1907 only, it has been assumed, following Phelps Brown, that the trend of depreciation was that of the national income combined with yearly variations of gross fixed investment. In the latter case, the yearly change in the value of stocks has been assumed, again following Phelps Brown, to be equal to 40 per cent of the first difference between national income estimates in successive years. No estimates of gross or net capital formation exist as yet for the years 1914–23.

The estimates of net overseas lending for the years 1870–1913 are based on C. K. Hobson<sup>1</sup> as revised by A. K. Cairncross<sup>2</sup>. The figures for the years 1924–37 are taken from the estimates of the Board of Trade. The estimates used of gross and net capital formation, of the value of physical increases in stocks, of net overseas lending and of net grants from abroad for the years 1938 and 1946–52, are those of the Central Statistical Office.

#### *Consistency of the income and expenditure series*

The yearly estimates of the net national income and of the main components of net national expenditure for the years 1870–1952, constructed in the way described above, are set out in Table I. In this table also the yearly discrepancy between the two series is shown. Estimates for all the items are not available for the years 1914–23 and 1939–45.

The two main features that stand out when considering these series are firstly, the estimates of expenditure exceed the estimates of income in most years, and secondly, while the size of the discrepancy between the two main series shows considerable fluctuations, particularly in the earlier years of the period, there is a downward trend up to about 1900 in its magnitude. This appears more clearly in Table II which shows, for overlapping decades 1870–1913 and for overlapping five-yearly periods 1924–38, the discrepancy expressed as a percentage of the national income.

<sup>1</sup> C. K. Hobson, *The Export of Capital*, London, 1914.

<sup>2</sup> *Op. cit.* Albert H. Imlah, 'British Balance of Payments and Export of Capital, 1816–1913', *Economic History Review*, Second Series, Vol. V, No. 2, 1952, has also made estimates for these years. Imlah's estimates are slightly higher than those of Hobson and Cairncross.

TABLE I

## Net National Income and Expenditure of the United Kingdom, 1870-1952

Year	Net National Income at Factor Cost (£ million)	Consumers' Expenditure on Goods and Services (£ million)	Public Authorities' Current Expenditure on Goods and Services (£ million)	Net Domestic Capital Formation including Value of Physical Increase in Stocks and Net Overseas Lending (£ million)	Less Rates and Taxes on Expenditure Net of Subsidies (£ million)	Net National Expenditure at Factor Cost (£ million)	Discrepancy, Excess of Expenditure over Income (£ million)	Discrepancy as a Percentage of the National Income %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1870 . . .	965	954	55	110	71	1,048	83	8.6
1871 . . .	1,023	1,004	56	145	73	1,132	109	10.7
1872 . . .	1,078	1,065	57	168	76	1,214	136	12.6
1873 . . .	1,171	1,123	55	184	78	1,284	113	9.6
1874 . . .	1,173	1,123	58	154	78	1,257	84	7.2
1875 . . .	1,124	1,118	60	94	79	1,193	69	6.1
1876 . . .	1,125	1,126	61	89	81	1,195	70	6.2
1877 . . .	1,130	1,133	62	81	81	1,195	65	5.8
1878 . . .	1,106	1,120	64	82	82	1,184	78	7.1
1879 . . .	1,051	1,057	69	66	79	1,113	62	5.9
1880 . . .	1,104	1,146	70	110	79	1,247	143	13.0
1881 . . .	1,144	1,125	71	142	82	1,256	112	9.8
1882 . . .	1,188	1,157	74	144	84	1,291	103	8.7
1883 . . .	1,216	1,190	76	120	84	1,302	86	7.1
1884 . . .	1,169	1,162	76	98	85	1,251	82	7.0
1885 . . .	1,149	1,138	83	88	84	1,225	76	6.6
1886 . . .	1,164	1,126	81	116	85	1,238	74	6.4
1887 . . .	1,193	1,162	79	130	86	1,285	92	7.7
1888 . . .	1,276	1,186	77	161	87	1,337	61	4.8
1889 . . .	1,364	1,227	80	173	89	1,391	27	2.0
1890 . . .	1,431	1,253	85	186	92	1,432	1	0.1
1891 . . .	1,419	1,315	89	113	93	1,424	5	0.4
1892 . . .	1,393	1,314	92	92	94	1,404	11	0.8
1893 . . .	1,360	1,311	95	92	96	1,402	42	3.1
1894 . . .	1,406	1,318	98	116	99	1,433	27	1.9
1895 . . .	1,472	1,336	103	136	104	1,471	-1	-0.1
1896 . . .	1,500	1,381	108	129	108	1,510	10	0.7
1897 . . .	1,551	1,409	114	144	110	1,557	6	0.4
1898 . . .	1,633	1,465	119	182	112	1,654	21	1.3
1899 . . .	1,706	1,525	134	209	119	1,749	43	2.5
1900 . . .	1,791	1,609	185	220	125	1,889	98	5.5
1901 . . .	1,759	1,600	206	162	132	1,836	77	4.4
1902 . . .	1,775	1,630	195	175	139	1,861	86	4.8
1903 . . .	1,751	1,627	165	150	143	1,799	48	2.7
1904 . . .	1,779	1,650	155	167	147	1,825	46	2.6
1905 . . .	1,857	1,694	153	224	150	1,921	64	3.4
1906 . . .	1,978	1,756	151	266	151	2,022	44	2.2
1907 . . .	2,076	1,813	152	277	150	2,092	16	0.8
1908 . . .	1,967	1,767	154	153	146	1,928	-39	-2.0
1909 . . .	2,016	1,770	163	203	146	1,990	-26	-1.3



TABLE 1 (Continued)

Year	Net National Income at Factor Cost (£ million)	Consumers' Expenditure on Goods and Services (£ million)	Public Authorities' Current Expenditure on Goods and Services (£ million)	Net Domestic Capital Formation including Value of Physical Increase in Stocks and Net Overseas Lending (£ million)	Less Rates and Taxes on Expenditure Net of Subsidies (£ million)	Net National Expenditure at Factor Cost (£ million)	Discrepancy, Excess of Expenditure over Income (£ million)	Discrepancy as a Percentage of the National Income %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1910 . . .	2,108	1,842	171	250	166	—	—	—
1911 . . .	2,185	1,898	174	286	165	2,097	-11	-0.5
1912 . . .	2,318	1,982	180	329	165	2,193	8	0.4
1913 . . .	2,424	2,040	189	358	172	2,326	8	0.3
1914 . . .	(2,312)	(2,089)	—	—	—	2,415	-9	-0.4
1915 . . .	(2,643)	(2,420)	—	—	—	—	—	—
1916 . . .	(3,124)	(2,632)	—	—	—	—	—	—
1917 . . .	(3,701)	(3,057)	—	—	—	—	—	—
1918 . . .	(4,458)	(3,708)	—	—	—	—	—	—
1919 . . .	(5,565)	(4,613)	—	—	—	—	—	—
1920 . . .	5,753	5,049	646	—	469	—	—	—
1921 . . .	4,541	4,386	524	—	502	—	—	—
1922 . . .	3,937	3,896	453	—	494	—	—	—
1923 . . .	3,926	3,767	408	—	464	—	—	—
1924 . . .	4,004	3,834	402	330	437	4,129	125	3.1
1925 . . .	4,066	3,931	413	316	438	4,222	156	3.8
1926 . . .	4,005	3,891	422	217	450	4,080	75	1.9
1927 . . .	4,242	3,948	426	460	472	4,362	120	2.8
1928 . . .	4,251	4,000	424	385	486	4,323	72	1.7
1929 . . .	4,275	4,043	433	368	472	4,372	97	2.3
1930 . . .	4,051	3,987	442	186	454	4,161	110	2.7
1931 . . .	3,757	3,855	440	10	457	3,848	91	2.4
1932 . . .	3,659	3,731	420	97	474	3,774	115	3.1
1933 . . .	3,823	3,738	417	243	490	3,908	85	2.2
1934 . . .	3,980	3,849	430	254	496	4,037	57	1.4
1935 . . .	4,213	3,982	472	354	518	4,290	77	1.8
1936 . . .	4,498	4,130	534	376	546	4,494	-4	-0.1
1937 . . .	4,730	4,338	621	367	564	4,762	32	0.7
1938 . . .	4,867	4,407	772	273	585	4,867	—	—
1939 . . .	(5,234)	(4,524)	—	—	—	—	—	—
1940 . . .	(6,187)	(4,776)	—	—	—	—	—	—
1941 . . .	(7,076)	(5,058)	—	—	—	—	—	—
1942 . . .	(7,765)	(5,339)	—	—	—	—	—	—
1943 . . .	(8,201)	(5,429)	—	—	—	—	—	—
1944 . . .	(8,392)	(5,708)	—	—	—	—	—	—
1945 . . .	(8,433)	(6,203)	—	—	—	—	—	—
1946 . . .	8,316	7,099	2,291	90	1,164	8,316	—	—
1947 . . .	8,794	7,822	1,743	543	1,314	8,794	—	—
1948 . . .	9,772	8,408	1,761	1,052	1,449	9,772	—	—
1949 . . .	10,347	8,814	1,977	1,013	1,457	10,347	—	—
1950 . . .	10,826	9,286	2,067	1,059	1,586	10,826	—	—
1951 . . .	11,943	9,987	2,439	1,321	1,804	11,943	—	—
1952 . . .	13,057	10,440	2,886	1,598	1,867	13,057	—	—

TABLE II

*Discrepancy between Estimates of National Income and National Expenditure, Decade and Five-year Averages, 1870-1913 and 1924-38*

Years	Discrepancy as Percentage of National Income (decade average)	Years	Discrepancy as Percentage of National Income (five-year average)
1870-79	8.0	1924-28	2.7
1875-84	7.7	1926-30	2.3
1880-89	7.3	1929-33	2.5
1885-94	3.4	1931-35	2.2
1890-99	1.1	1934-38	0.8
1895-1904	2.5		
1900-09	2.3		
1905-13 (9 years)	0.3		

Taking the period as a whole it may be suggested that, given the weakness of some of the individual series, a discrepancy of under 10 per cent is not unsatisfactory. The actual figure of net national product would appear to lie somewhere between the two series, probably much nearer to the income estimate than the expenditure estimate. Further, from about the middle 1880s onwards, with the discrepancy falling to 5 per cent and below, it would appear permissible to use the estimates of individual components of the main series to indicate shifts within sectors of the economy. The year-by-year fluctuations in the discrepancy should, however, be a warning against attempts to use particular series in short-term trade cycle analysis.

#### *Possible factors causing the discrepancy*

The existence of a discrepancy and of a trend in the size of the discrepancy in the earlier years of the period calls, however, for some suggestions as to possible explanations, and an indication of the weakest links in the estimates.

The estimates of national income, since they are based on fairly consistent data throughout the period are, as suggested above, probably rather more reliable than the expenditure estimates. The estimates by Prest<sup>1</sup> of rent and profits – based on income tax returns – include an allowance for evasion, but the

<sup>1</sup> A. R. Prest, 'National Income of the United Kingdom', *loc. cit.*

significance of this element must be somewhat conjectured. However, the allowance is higher in the earlier years than in the later years and in the revised estimates of the national income for the period 1870-1913 presented here, the figures for farm income, a part of which must be profits, have been raised. There would not on balance therefore, appear to be any good reason at present for suggesting that the rent and profits figures for the years up to 1920 are seriously at fault.

The estimates for the years 1870-1913 of wages and salaries used by Prest are based on those of Bowley.<sup>1</sup> Certainly the farther back from the first wage census of 1886 that estimates of wages are pushed, the greater the possibility of error, particularly in relation to the wages of unskilled workers. But apart from possible understatement of the total wages bill due to a failure to allow sufficiently for supplementary earnings over and above the normal occupation, there is no evidence at present to suggest that the wages and salaries figures are seriously open to question in the period 1870-90, thereby influencing the discrepancy.

More doubts can be expressed in regard to the expenditure series. Firstly, in relation to consumers' expenditure on goods, the use in the period 1870-1913 of the output indices of Hoffmann as a measure of the output of a range of finished manufactured consumer goods and indirectly of consumption is far from satisfactory. Apart from the difficulty that the commodity indicators are not wholly representative of final consumer goods, the main weakness lies in the fact that the indicators are in a large part input rather than gross output indicators. And the use of input indicators in a period of increasing fabrication as an index of output or consumption gives the index a downward bias.

In a developing economy with new methods of production and increasing fabrication, the ratio of input to net output is unlikely to remain constant. It is practically certain that the ratio of input to net output will fall. If input indicators are used the index will, over the period in which increased fabrication occurs, tend to have a downward bias and therefore will understate the trend in output or consumption. In other words, a consumption series built up in this way will not be steep enough, and if the value in the base year (1907) is correct,

<sup>1</sup> A. L. Bowley, *Wages and Income since 1860*, *op. cit.*

consumption will tend to be overstated in the earlier years.

In defence of the use of the Hoffmann indicators, it should be added that when consumption estimates calculated in this way were tested against the consumption figures as estimated by Prest<sup>1</sup> and Stone and Rowe<sup>2</sup> for the years 1900-31, the fit, except in the war years, was a good one. This, however, may be due in a large part to the improvement in the weighting and quality of the indicators, as the results of the 1907 and 1924 censuses of production were available; it cannot be taken as evidence that the indicators are necessarily sound as indices of consumption back to 1870.

The estimates of personal expenditure that are linked with the Hoffmann indicators represent, over the whole period 1870-1913, some 23 per cent of the total personal expenditure on goods and services. The relative significance of the estimates linked with Hoffmann is, however, greater in the earlier years, particularly 1870-85, than in the later years of this period. In 1870-79 the proportion is 26.7 per cent, in 1885-94, 21.4 per cent, and in 1900-09 it is 22.8 per cent. This in itself increases the doubt regarding the reliability of these estimates up to 1885 as the relative importance of manufactured goods in total expenditure could be expected to increase over this period and the price of foodstuffs fell more rapidly than the price of non-food goods. The construction of indicators that will reflect personal consumption more closely or the replacement of this method by the calculation of direct estimates of consumers' expenditure on particular commodity groups would appear essential if the existing discrepancy between income and expenditure is to be reduced.

A second possible weakness regarding the construction of the expenditure series arises from the use of constant distributive margins when calculating retail prices of agricultural goods, imported goods and finished manufactured goods. It has been assumed in the absence of positive evidence to the contrary that distributive margins changed little, if at all, over the years 1870-1913. If, as is sometimes suggested though never proven, there was an increase in distributive margins over the period this would have the effect of reducing the expenditure totals in the earlier years. If distributive margins were, for example,

<sup>1</sup> A. R. Prest, *Consumers' Expenditure, 1900-1919, op. cit.*

<sup>2</sup> Richard Stone, *Consumers' Expenditure, 1920-1938, op. cit.*

5 per cent lower in 1870 than in 1910 the estimated total expenditure in 1870 would be reduced by some £17 million.

A third problem on the expenditure side is related to the services series. For only some of the items comprising services has it been possible to build up an independent annual series, and interpolation between census of population years had to be used. This tends to give the series an exaggerated smoothness and may account for some of the fluctuations in the size of the discrepancy. The absence of a reliable price index of services is also a difficulty in the earlier years.

A final difficulty on the expenditure side is the unsatisfactory nature of the series relating to depreciation and to the value of physical changes in stocks. As explained above, the methods used are very crude and may account for some of the fluctuations in the size of the discrepancy. Until detailed research work has been undertaken on these items there is, however, no alternative to the present estimates.

This brief discussion on some of the major weaknesses in the estimates is both a warning against any refined statistical use of the individual series and an indication of the present gaps in our knowledge and the areas for further research. However, as suggested above, the series for the national income and for expenditure constructed independently show reasonable consistency with each other at least from the 1880s onwards, and with the framework in place, some preliminary attempts can be made to examine the trends in the economy as shown by some of the series. A start along these lines is made in the next section.

## II. ANALYSIS OF SOME OF THE TRENDS OF GROWTH

This analysis of some of the trends of growth follows as closely as the United Kingdom data will permit, the approach adopted by Simon Kuznets in his study of the economy of the United States of America.<sup>1</sup> Comment on the trends shown in the United Kingdom is deliberately limited at this stage as only isolated segments of the economy are being considered.

### *National income per head*

First, using the estimates of national income given in Table I above, Table III shows the relative rates of increase of population of the United Kingdom and of the net national income

<sup>1</sup> *Income and Wealth of the United States, op. cit.*

per capita at constant prices between 1870 and 1952. This table is comparable to Table 4 in Kuznets.

TABLE III  
*Population and Net National Income Per Capita at  
Constant 1912-13 Prices, United Kingdom, 1870-1952<sup>1</sup>*

Period	Population (decade averages) (million)	Percentage Change per Decade %	Net National Income per Capita (decade averages) £	Percentage Change per Decade %
(1)	(2)	(3)	(4)	(5)
1870-79	32.7	—	30.4	—
1875-84	34.4	—	32.0	—
1880-89	35.9	9.9	35.6	17.0
1885-94	37.4	8.8	40.1	25.3
1890-99	39.1	8.9	44.4	25.0
1895-1904	41.0	9.6	46.9	16.8
1900-09	42.9	9.7	48.0	8.0
1905-14	44.6	8.9	50.0	6.6
1910-19	46.0	7.3	49.7	3.5
1915-24	45.4	1.8	49.3	-1.3
1920-29	44.9	-2.5	52.7	6.1
1925-34	45.8	0.9	56.4	14.5
1930-39	46.8	4.3	62.0	17.7
1935-44	47.9	4.5	70.2	24.3
1940-49	49.1	4.9	73.5	18.6
1945-52 (8 years)	50.0	—	74.0	—
1870/79- 1940/49	—	6.1	—	13.7

The price index used in this table is set out in Section III. It is not a wholly satisfactory price index although it may be adequate to indicate long-term trends. The discrepancy between the national income and national expenditure estimates in the years 1870-85 discussed above, may perhaps mean that the rate of increase of net national income per capita in these years is slightly overstated though, as suggested, the estimates of income appear to be more reliable in these years than the estimates of expenditure.

#### *Flow of goods to consumers*

Using the expenditure estimates, an attempt can be made to show the trends in the flow of goods and services to consumers

<sup>1</sup> The decline in the population after 1920 is due to the exclusion of Southern Ireland.

at constant prices over the years 1870-1952. This is done in Table IV and is comparable in some respects to Table 5 in Kuznets.

TABLE IV

*Flow of Goods and Services to Consumers, United Kingdom, Total and Per Capita at Constant 1912-13 Prices, 1870-1952*

Decade (1)	Flow of Goods to Consumers (decade averages) (£ million) (2)	Percentage Change per Decade % (3)	Flow of Goods per Capita (decade averages) £ (4)	Percentage Change per Decade % (5)
1870-79	982	—	30.1	—
1875-84	1,098	—	32.0	—
1880-89	1,237	26.0	34.5	14.6
1885-94	1,407	28.1	37.7	17.8
1890-99	1,590	28.5	40.7	18.0
1895-1904	1,748	24.2	42.7	13.3
1900-09	1,854	16.6	43.3	6.4
1905-14	1,956	11.9	43.8	2.6
1910-19	1,959	5.7	42.6	-1.6
1915-24	2,012	2.9	44.3	1.1
1920-29	2,244	14.5	50.0	17.4
1925-34	2,518	25.1	54.9	23.9
1930-39	2,753	22.7	58.8	17.6
1935-44	2,683	6.6	56.0	2.0
1940-49	2,779	1.0	56.6	-3.7
1945-52 (8 years)	3,090	—	61.8	—

The expenditure series relate to market prices, that is, including taxes on outlay and rates. Again the existence of a 7-8 per cent discrepancy between the income and expenditure series in the decades 1870-89 may mean that the increase in the flow of goods in these years is somewhat understated.

This analysis, however, relates only to the direct purchases of goods and services by private consumers including farmers' own consumption and payments in kind. Public authorities also purchased goods and services in order to provide services to private consumers, and the measurement of the total flow of goods and services to consumers should also include the activities of public authorities. Table V therefore shows, for the years for which full data are available, the flow of goods and services at constant prices to consumers, including the expenditure of public authorities.

TABLE V

*Flow of Goods and Services to Consumers and Current Expenditure of Public Authorities, United Kingdom, at Constant 1912-13 Prices, Totals and Per Capita, 1870-1952*

Period	Flow of Goods and Services to Consumers (five year average) £ million	Current Expenditure of Public Authorities £ million (five year average)	Total (2)+(3) £ mill.	Percentage Change per Period %	Flow of Goods to Consumers and Expenditure of Public Authorities per Capita £	Percentage Change per Period %
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1870-74	917	49	966	—	30.4	—
1875-79	1,047	60	1,107	14.6	33.0	8.6
1880-84	1,148	73	1,221	10.3	34.7	5.2
1885-89	1,326	91	1,417	16.0	38.7	11.5
1890-94	1,489	105	1,594	12.5	41.7	7.8
1895-99	1,691	137	1,828	14.7	45.7	9.6
1900-04	1,806	202	2,008	9.8	47.9	4.8
1905-09	1,903	167	2,070	3.1	47.3	-1.3
1910-13 (4 yrs.)	1,985	183	2,168	—	47.8	—
1920-24	2,115	243	2,358	—	53.2	—
1925-29	2,373	254	2,627	11.4	57.9	8.8
1930-34	2,660	299	2,959	12.6	63.9	10.5
1935-38 (4 yrs.)	2,838	402	3,240	—	68.7	—
1948-52	3,159	743	3,902	—	77.3	—

This table shows a greater increase in the total flow of goods and services to consumers than that shown in Table IV and the increase in the relative importance of public authorities' expenditure appears clearly. Between 1870 and 1895, the current expenditure on goods and services by public authorities represented some 5-7 per cent of the total expenditure on goods and services. Between 1900 and 1935, with the exception of the war years and the immediate pre-war and post-war years, the average was 9-10 per cent. In the years 1935-38, the proportion rose to some 12 per cent, and 1946-52 to 20 per cent.

It will be appreciated that the current expenditure on goods and services by public authorities includes expenditure on the armed forces and military equipment. Exactly comparable figures are not available over the whole period to indicate the



precise importance of this type of expenditure, but from 1870-1910, with a significant variation in 1900-03 (the Boer War), the expenditure on the armed forces represented approximately 42 per cent of total current expenditure by public authorities on goods and services. In the inter-war years, the proportion fell from some 45-50 per cent in the immediate post-war years to about 25-30 per cent in the late twenties and early thirties. By 1938, it had risen to 43 per cent and the average for the years 1948-52 was 44 per cent.

Of the total flow, therefore, of goods and services to con-

TABLE VI

*Flow of Goods and Services to Consumers including Current Expenditure of Public Authorities and Capital Formation at Constant 1912-13 Prices, United Kingdom, 1870-1952<sup>1</sup>*

Period	Flow of Goods to Consumers including Expenditure of Public Authorities. Yearly average per period (£ million)	Gross Capital Formation including Stock Changes and Net Overseas Lending. Yearly average per period (£ million)	Net Domestic Capital Formation including Stock Changes and Net Overseas Lending. Yearly average per period (£ million)	Column 3 as Percentage of Columns 2+3	Column 4 as Percentage of Columns 2+4
(1)	(2)	(3)	(4)	(5)	(6)
1870-74	966	164	135	14.5	12.2
1875-79	1,107	112	83	9.2	7.0
1880-84	1,221	170	136	12.2	10.0
1885-89	1,417	201	166	12.4	10.5
1890-94	1,594	191	148	10.7	8.5
1895-99	1,828	260	209	12.4	10.3
1900-04	2,008	257	198	11.4	9.0
1905-09	2,070	293	242	12.4	10.4
1910-13 (4 yrs.)	2,168	364	314	14.4	12.7
1924-28	2,565	255	182	9.0	6.6
1929-33	2,898	205	107	6.6	3.6
1934-38	3,205	321	189	9.1	5.6
1948-52	3,902	374	242	8.7	5.8

<sup>1</sup> The price indices used in this table are described and set out in Section III.

sumers, including expenditure by public authorities, that is shown in Table V, about 2 per cent in the 1870s was represented by expenditure of a military nature, 4 per cent in the 1900s, about 3 per cent in the 1925-34 period and 8.5 per cent in the years 1948-52.

*Flow of goods and capital formation*

A third analysis of trends may be attempted by distinguishing as far as the data allow between the flow of goods and services

TABLE VII

*Flow of Goods and Services to Consumers, including Current Expenditure of Public Authorities at Factor Cost and Net Capital Formation at Current Prices, United Kingdom, 1870-1952<sup>1</sup>*

Period	Flow of Goods to Consumers and Expenditure of Public Authorities at Factor Cost		Net Domestic Capital Formation including Stock Changes and Net Overseas Lending	
	Yearly averages (£ million)	Percentage	Yearly averages (£ million)	Percentage
(1)	(2)	(3)	(4)	(5)
1870-74	1,035	87.2	152	12.8
1875-79	1,093	93.0	82	7.0
1880-84	1,146	90.3	123	9.7
1885-89	1,161	89.7	133	10.3
1890-94	1,299	91.5	120	8.5
1895-99	1,428	90.0	159	10.0
1900-04	1,667	90.5	175	9.5
1905-09	1,766	88.7	225	11.3
1910-13 (4 years)	1,952	88.8	245	11.2
1924-28	3,882	91.9	342	8.1
1929-33	3,832	95.5	181	4.5
1934-38	4,165	92.3	325	7.2
1948-52	9,980	89.2	1,209	10.8

<sup>1</sup> All taxes on outlay and rates have been deducted from private consumers' expenditure and the expenditure of public authorities. This is not satisfactory as expenditure on capital goods and exports are also taxed. No analysis of the incidence of indirect taxation, however, exists except in the years 1946-52, when the average proportion of total taxes on outlay allocated to personal and public authorities' expenditure was some 92 per cent, the remainder being allocated to capital expenditure and exports.

to consumers, including the expenditure of public authorities, on the one hand and capital formation on the other. These trends are shown in Table 6, which is comparable to Table 34 in Kuznets.

Another way of analysing the trends in the flow of goods to consumers and capital formation is to express the former at factor cost, that is net of taxes on outlay and rates. Table 7 shows the division between the flow of goods to consumers, including the expenditure of public authorities, at factor cost and net capital formation.

In relation to the pattern of growth of the British economy, it is important, however, to distinguish as far as is possible between net domestic capital formation and net overseas lending. This is attempted in the following table.

TABLE VIII

*Flow of Goods and Services to Consumers and Expenditure of Public Authorities at Factor Cost, Net Domestic Capital Formation, and Net Overseas Lending, at Current Prices, United Kingdom, 1870-1952*

Period	Flow of Goods to Consumers at Factor Cost		Net Domestic Capital Formation including Stock Changes		Net Overseas Lending	
	Yearly averages (£ million)	Per-centage	Yearly averages (£ million)	Per-centage	Yearly averages (£ million)	Per-centage
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1870-74	1,035	87.2	93	7.8	59	5.0
1875-79	1,093	93.0	77	6.6	5	0.4
1880-84	1,146	90.3	90	7.1	33	2.6
1885-89	1,161	89.7	70	5.4	63	4.9
1890-94	1,299	91.5	69	4.9	51	3.6
1895-99	1,428	90.0	130	8.2	29	1.8
1900-04	1,667	90.5	153	8.3	22	1.2
1905-09	1,766	88.7	118	5.9	107	5.4
1910-13 (4 yrs.)	1,952	88.8	65	3.0	180	8.2
1924-28	3,882	91.9	280	6.6	62	1.5
1929-33	3,832	95.5	186	4.6	- 5	-0.1
1934-38	4,165	92.8	347	7.7	-22	-0.5
1948-52	9,980	89.2	1,181	10.6	28	0.2

This table helps to correct to some extent the impression given in Table VII of a significant decline in net capital formation in the inter-war years compared with the years before 1914. In fact, net domestic capital formation expressed as a percentage of the net national income was only slightly lower in the fifteen years 1924–38 as compared with the 1900–13 years. The feature of the inter-war years was the decline in overseas net lending. In the years following 1946, there has been a marked increase in the relative importance of domestic capital formation.

*Components of the flow of goods to consumers*

A fourth analysis that may be attempted is that of classifying the flow of goods and services to consumers according to the main types of goods and according to durability. From 1900 onwards such a classification can be undertaken with a measure of confidence, but before 1900 the absence of a series relating to individual groups of commodities is a serious obstacle. However, on the assumption that the weighting of the food and non-food groups in the manufactured goods series linked with the Hoffmann indicators did not change significantly back to 1880 (the weights in 1907 were 28.5 per cent food and 71.5 per cent non-food), the following table shows for decade averages

TABLE IX

*Percentage Distribution of the Total Flow of Goods and Services to Consumers by Main Types of Goods, at Current Prices, United Kingdom, 1880–1949*

Period	Commodities				Services	
	Food	Alcoholic Drinks	Tobacco	Other Goods	Rent and Rates	Other Services
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1880–89	33.6	13.2	1.6	22.2	10.4	19.0
1890–99	31.4	12.8	1.6	22.0	10.8	21.4
1900–09	31.6	10.8	1.9	23.1	11.5	21.1
1910–19	34.3	8.2	2.1	25.9	9.5	20.0
1920–29	33.9	8.7	2.9	26.3	8.7	19.5
1930–39	30.3	7.2	3.8	26.5	10.9	21.3
1940–49	28.3	9.9	8.3	24.8	8.9	19.8

the distribution of total consumers' expenditure between main types of goods and services. It must be stressed, however, that the estimates for 1880-1900 can only be approximate.

The classification of the flow of consumer goods by the durability of the goods can be undertaken for the period 1900-52, as in these years a more detailed breakdown of consumers' expenditure is available. Using the same general categories as those used by Kuznets, i.e. perishable, semi-durable, durable, and services, the following table shows the

TABLE X

*Percentage Distribution of the Total Flow of Goods and Services to Consumers, by Durability of the Goods, at Current Prices, United Kingdom, 1900-1952<sup>1</sup>*

Period (1)	Commodities			Services		
	Perish- able (2)	Semi- durable (3)	Durable (4)	Rent (5)	Other (6)	Total (7)
1900-04	53.7	9.5	4.8	11.2	20.8	32.0
1905-09	52.3	9.5	4.9	11.8	21.5	33.3
1910-14	51.9	10.1	5.1	11.4	21.5	32.9
1915-19	57.8	10.1	5.2	8.3	18.6	26.9
1920-24	53.3	12.7	7.0	8.1	18.9	27.0
1925-29	51.6	11.6	7.5	9.3	20.0	29.3
1930-34	49.3	10.8	7.8	10.8	21.3	32.1
1935-39	48.7	10.8	8.2	11.1	21.2	32.3
1940-44	57.3	9.4	4.2	9.9	19.2	29.1
1945-49	55.6	10.1	6.1	7.9	20.3	28.2
1950-52	55.8	11.3	7.6	7.1	18.2	25.3
Decade averages						
1900-09	53.0	9.5	4.9	11.5	21.1	32.6
1910-19	54.8	10.1	5.2	9.9	20.0	29.9
1920-29	52.4	12.2	7.2	8.7	19.5	28.2
1930-39	49.0	10.8	8.0	10.9	21.3	32.2
1940-49	56.3	9.8	5.2	8.9	19.8	28.7

<sup>1</sup> The definitions used in classifying the goods as perishable, semi-durable, and durable follow closely those used by Kuznets. Perishable commodities include food, drink, tobacco, paper, fuel, etc., which do not last more than six months in ultimate use. Semi-durables - clothing, fancy goods, toys, etc. - are goods which last over six months but generally not more than three years. Durables - furniture, house furnishings, jewellery, musical instruments, books, passenger cars, etc. - last well over three years.

percentage distribution by five-yearly and decade averages of the flow of goods by major components at current prices. The price indices for the individual components are not yet sufficiently reliable to enable the series to be presented at constant prices. This table is comparable to some extent with Table 37 in Kuznets.

In interpreting the trends shown in these tables it must be appreciated that the estimates are at market prices and include taxes on outlay and subsidies; also public authorities' current expenditure on goods and services is not included.

Data are not available over the whole period to permit the allocation of taxes on outlay and subsidies between the different classes of goods and services, but exist only in fairly complete detail for the years 1946-52. In these years, however, the difference in the pattern of expenditure at factor cost and at market prices is very small. The high rates of indirect taxation on such perishables as tobacco goods and alcohol were to some extent offset by subsidies on food, and perishables represented an average of 54.4 per cent of total expenditure at current factor cost for the years 1948-52 and 55.4 per cent at current market prices.

The slight downward trend in the proportion of consumers' expenditure going to services other than rent as contrasted with the rise in the United States over the same period, is influenced both by the change in the pattern of social life and by the relative growth in the importance of public authorities' expenditure. Between the 1930s and 1950s the decrease in the number of domestic servants in Britain had a marked influence on the relative importance of expenditure on services, as the substitute for domestic servants was not other services but goods. Expenditure by public authorities, apart from expenditure on the armed forces and military equipment, takes mainly the form of services and to a certain extent the stability in the relative importance of services shown in Tables IX and X is a reflection of the shift from private expenditure on services, e.g. medical and health services, education, and so on, to the supply of these services by the State. Using very provisional figures, if public authorities' expenditure, other than estimated expenditure on armed forces, was included with services, the proportion of the total flow of goods and services to consumers represented by all services would be: 1920-24, 30.4 per cent;

1925-29, 34.2 per cent; 1930-34, 36.7 per cent; 1935-38, 38.0 per cent; and 1948-52, 33.4 per cent.

As suggested in the introduction these attempts to indicate some of the trends in the British economy over the past eighty years as revealed by the national income and expenditure estimates are only tentative. Detailed analysis requires on the one hand an improvement of the data and of the price indices, and on the other hand a fuller discussion than it is possible to give here of the difficulties inherent in comparisons of national income and expenditure estimates over long periods of time. Money incomes and expenditures, for example, are misleading as an indication of the flow of goods to consumers in a period when a transition from partial family self-sufficiency to the purchase in the market of all goods is taking place. To be meaningful, figures showing the statistical trends in the national income of a country have to be accompanied by an account of the changes in the social and economic background of the country to which they relate. Nevertheless it is hoped that the review of national income research in Britain that has been attempted here will interest others to help in improving the data already available and in filling the many gaps that remain.

### III. THE CONSTRUCTION OF THE INDIVIDUAL SERIES

In this section the details of the methods of construction of the individual series are discussed, along with tables showing the components of some of the main series.

#### *Net National Income at Factor Cost* (Table I, column 2, and Table XI)

The Prest<sup>1</sup> estimates of net national income at factor cost form the basis of the income series. From 1870-1913, the Prest series has been adjusted to include additions for profits of Co-operative Societies, income of charities, hospitals, etc., and, 1909-13, for employers' insurance contributions. Incomes paid to persons not resident in the United Kingdom have been excluded. These adjustments were made for each year of the period 1870-1913, partly on the basis of published material and partly using extrapolation from 1900-13 data.

An attempt has been made to allow for the understatement

<sup>1</sup> A. R. Prest, 'National Income of the United Kingdom', *loc. cit.*

of agricultural income noted by Bowley,<sup>1</sup> when comparing estimates of agricultural income from tax returns with the net output of agriculture from the census of production, 1907.<sup>2</sup> It has been assumed that this understatement was not peculiar to one year but existed throughout the period; it should be noted, however, that no direct evidence at present exists to confirm this assumption either in relation to the practice of understatement or to the relative importance of the understatement. The method of adjustment used was to take the understatement in 1907 (£26 million) and to relate this to the estimates of agricultural income made by J. R. Bellerby<sup>3</sup> from 1870 to 1913.

The national income series, after the adjustments noted above, exceeded the original Prest series by £36 million in 1870 and £41 million in 1907. The year-by-year adjustments for 1870–1913 are set out in Table XI.

The estimates of the national income 1914–19 are based on those of Prest, but the adjustments have been interpolated and not worked out for each year. The figures are therefore approximate and are placed in brackets.

The net national income estimates for 1920–37 are again based on Prest.<sup>4</sup> Southern Ireland has been excluded after 1920. Additions were made to the Prest series to include employers' insurance contributions; these are given in Chapman.<sup>5</sup> The level of the Prest series (which includes profits on the appreciation of stocks) has been raised to correspond with the estimates of national income including stock appreciation in 1938, made by the Central Statistical Office.<sup>6</sup> It should be noted that the national income estimates used here for 1938 and 1946–52 are exclusive of stock appreciation; however, for the period 1924–37, the estimates made by T. Barna<sup>7</sup> indicate that stock

<sup>1</sup> A. L. Bowley, 'The Division of the Product of Industry', *Three Studies on the National Income*, London School of Economics reprint No. 6, London, 1938.

<sup>2</sup> *Final Report of First Census of Production*, *op. cit.*

<sup>3</sup> J. R. Bellerby, 'Distribution of Farm Income in the United Kingdom, 1867–1938', *Journal of Proceedings of the Agricultural Economics Society*, Vol. X, No. 2, February, 1953.

<sup>4</sup> A. R. Prest, 'National Income of the United Kingdom', *loc. cit.*

<sup>5</sup> Agatha L. Chapman, assisted by Rose Knight, *Wages and Salaries in the United Kingdom, 1920–1938*, Cambridge, 1953, Vol. V, in the series published under the joint auspices of the National Institute of Economic and Social Research and the Department of Applied Economics, University of Cambridge.

<sup>6</sup> Central Statistical Office, *Annual Abstract of Statistics*, No. 90, H.M.S.O., 1953.

<sup>7</sup> T. Barna, 'Valuation of Stocks and the National Income', *Economica*, Vol. IX, 1942.



TABLE XI  
*Construction of Net National Income Series,  
United Kingdom, 1870-1913*

Year  (1)	Net National Income at Factor Cost (Prest) (£ million)  (2)	Adjustments for Income not Included, <sup>1</sup> etc. (£ million)  (3)	Adjustments for Estimated Understatement of Agricultural Income (£ million)  (4)	Net National Income at Factor Cost (£ million)  (5)
1870	929	3.8	31.7	965
1871	987	4.2	31.7	1,023
1872	1,041	4.3	32.6	1,078
1873	1,133	4.9	33.5	1,171
1874	1,133	5.1	34.4	1,173
1875	1,085	4.5	34.4	1,124
1876	1,088	4.6	32.6	1,125
1877	1,093	5.7	31.7	1,130
1878	1,071	5.6	28.9	1,106
1879	1,020	5.1	25.8	1,051
1880	1,073	5.7	25.3	1,104
1881	1,113	4.9	26.5	1,144
1882	1,156	5.0	26.5	1,188
1883	1,184	6.3	26.0	1,216
1884	1,136	5.8	26.9	1,169
1885	1,118	5.7	25.5	1,149
1886	1,135	4.9	24.0	1,164
1887	1,164	4.9	24.2	1,193
1888	1,246	5.4	24.2	1,276
1889	1,333	5.8	25.3	1,364
1890	1,399	6.2	26.2	1,431
1891	1,386	6.0	26.7	1,419
1892	1,361	5.7	26.0	1,393
1893	1,330	5.9	24.4	1,360
1894	1,377	5.7	23.3	1,406
1895	1,442	7.3	22.6	1,472
1896	1,470	7.3	22.8	1,500
1897	1,519	8.7	22.8	1,551
1898	1,601	9.2	23.1	1,633
1899	1,672	10.7	23.5	1,706
1900	1,756	12.2	23.1	1,791
1901	1,724	10.8	24.4	1,759
1902	1,738	12.1	24.4	1,775
1903	1,714	11.7	25.3	1,751
1904	1,742	12.2	24.6	1,779
1905	1,818	13.9	25.5	1,857
1906	1,939	13.0	25.5	1,978
1907	2,035	14.6	26.0	2,076
1908	1,926	13.6	27.4	1,967
1909	1,973	14.1	28.7	2,016
1910	2,063	14.8	30.3	2,108
1911	2,140	14.3	30.7	2,185
1912	2,268	20.4	29.6	2,318
1913	2,368	26.6	29.6	2,424

<sup>1</sup> These adjustments are additions for the profits of Co-operative Societies, for the income of charities and for employers' insurance contributions less income paid to persons not resident in the United Kingdom.

appreciation would not be more than 1–2 per cent of the national income. Ideally the net national income figures should for this purpose exclude profits on stock appreciation but the available estimates are not sufficiently reliable to enable this to be done in the years prior to 1938.

The estimates of the national income 1939–45 are based on the figures of the Central Statistical Office.<sup>1</sup> Adjustments were made to these estimates to bring them into line with the revised figures published subsequently of the national income in 1938 and 1946. The figures therefore are approximate and are placed in brackets.

For 1938 and 1946–52, the Central Statistical Office<sup>2</sup> estimates of national income excluding profit on the appreciation of stocks have been used.

*Consumers' Expenditure on Goods and Services, 1870–1913*

(Table 1, column 3, and Table XII, column 8)

1. *Consumption of home-produced finished agricultural products*  
(Table XII, column 3)

The Oxford Agricultural Economics Research Institute<sup>3</sup> has made provisional estimates of the value of output of those agricultural products which are ready for consumption, e.g. vegetables, potatoes, fruit, milk and milk products, poultry, eggs, sheep, pigs, cattle, and estimates of farmers' own consumption. From the several output series in current prices, it was possible to obtain the total value of output of finished agricultural products 1870–1913. Exports of finished agricultural consumer goods were deducted from output at farm-gate prices. Output (excluding exports) was raised from farm prices to retail prices using a margin of 40 per cent, but keeping farm consumption at farm prices. The final series represented consumption of home-produced finished agricultural consumer goods at current retail prices.

2. *Consumption of home-manufactured finished consumer goods, 1870–1913* (Table XII, column 2)

An index of production of finished manufactured consumer goods was constructed by taking eleven indices of manufac-

<sup>1</sup> Central Statistical Office, *Statistical Digest of the War*, *op. cit.*

<sup>2</sup> Central Statistical Office, *National Income and Expenditure, 1948–1953*, *op. cit.*, and *Annual Abstract of Statistics*, *op. cit.*

<sup>3</sup> Data, as yet unpublished, supplied by the Agricultural Economics Research Institute, University of Oxford.

Year (1)	Consumption of Home-Manufactured Consumer Goods at Current Prices (£ million) (2)	Consumption of Home-produced Finished Agricultural Consumer Goods (£ million) (3)	Imports of Finished Consumer Goods at Current Retail Prices (£ million) (3)	Expenditure on Tea, Coffee, Alcohol, Tobacco, Fish, Coal, Motor Cars and Cycles at Current Retail Prices (£ million) (5)	Total Consumption Finished Consumer Goods at Current Retail Prices (£ million) (6)	Consumption of Services at Current Prices (£ million) (7)	Total Personal Consumption of Goods and Services at Current Prices (£ million) (8)
1870	274.6	195.7	61.3	183.7	715.3	238.8	954
1871	294.6	200.6	68.7	194.4	758.3	246.2	1,004
1872	323.8	204.4	71.1	211.5	810.8	253.8	1,065
1873	334.5	212.2	85.2	229.9	861.8	261.7	1,123
1874	316.2	214.2	91.5	232.0	853.9	268.7	1,123
1875	279.4	234.0	94.3	234.9	842.6	275.8	1,118
1876	276.0	228.3	100.3	238.1	842.7	282.9	1,112
1877	286.8	213.2	107.8	236.0	843.8	289.5	1,133
1878	265.8	209.2	112.1	235.7	822.8	297.5	1,120
1879	227.1	190.2	111.2	224.8	753.3	303.3	1,057
1880	287.8	194.3	128.6	224.5	835.2	310.8	1,146
1881	264.3	194.6	123.3	224.3	806.5	318.6	1,125
1882	284.0	199.8	120.6	224.1	826.5	328.8	1,157
1883	291.2	199.0	133.8	228.2	852.2	338.0	1,190
1884	271.7	184.1	129.7	229.4	814.9	347.2	1,162
1885	243.4	185.5	126.2	226.6	781.7	355.9	1,138
1886	229.5	183.9	123.4	224.5	761.3	364.6	1,126
1887	249.8	181.5	130.5	226.7	788.5	373.3	1,162
1888	261.7	177.9	136.1	227.8	803.5	382.1	1,186
1889	276.2	169.0	151.1	239.4	835.7	391.7	1,227
1890	278.5	170.1	152.9	250.2	851.7	401.4	1,253
1891	302.2	189.4	162.9	250.9	905.4	409.9	1,315
1892	275.4	190.8	174.0	252.9	893.1	420.8	1,314
1893	260.0	187.6	175.0	255.3	877.9	432.6	1,311
1894	267.7	178.5	175.4	251.3	872.9	444.8	1,318
1895	270.2	175.4	177.0	256.1	878.7	456.9	1,336
1896	279.8	174.3	189.3	267.0	910.4	470.4	1,381
1897	277.7	176.8	199.5	272.1	926.1	482.8	1,409
1898	310.8	175.9	204.3	279.7	970.7	494.5	1,465
1899	310.9	195.4	217.1	294.1	1,017.5	507.5	1,525
1900	345.7	202.0	226.5	313.2	1,087.4	521.1	1,609
1901	315.1	201.9	239.2	307.9	1,064.1	535.5	1,600
1902	323.1	206.2	245.6	307.7	1,082.6	547.6	1,630
1903	321.2	204.7	242.9	298.8	1,067.6	559.8	1,627
1904	347.4	203.0	231.7	296.5	1,078.6	571.5	1,650
1905	372.8	208.5	238.3	291.7	1,111.3	582.4	1,694
1906	398.0	219.1	250.6	294.8	1,162.5	593.6	1,756
1907	425.7	227.6	249.5	306.4	1,209.2	603.8	1,813
1908	383.1	226.6	248.8	295.6	1,154.1	613.3	1,767
1909	392.6	223.2	244.1	286.9	1,146.8	623.0	1,770
1910	420.0	226.5	253.9	306.8	1,207.2	634.7	1,842
1911	432.9	241.1	261.5	317.1	1,252.6	645.7	1,898
1912	480.3	256.9	270.1	318.8	1,326.1	656.2	1,982
1913	507.5	240.4	287.4	335.2	1,370.5	669.9	2,040

turing output 1870–1913 from the Hoffmann<sup>1</sup> data on industrial production (Table XVI, column 2). The series included were: furniture, wool, cotton and silk, woven goods, leather goods, paper, soap and candles, sugar, sweet goods, flour and bakers' goods. The individual series were weighted according to the relative value of their output in 1907, based on the 1907 census of production.<sup>2</sup>

The estimate of the value of output of finished manufactured consumer goods for the base year (1907) was derived from a detailed examination of the 1907 census of production. Intermediate products and capital goods were excluded, and only those goods which were finished and ready for consumer consumption were included. In the case of products that were both final and intermediate in use, an attempt was made whenever possible to estimate the value of the part entering into direct consumption.

This 1907 value of output of finished consumer goods was used as the base of the index of production of finished manufactured goods, to yield a series for 1870–1913 of the value of output of finished manufactured consumer goods at constant 1907 prices.

From this series were subtracted finished manufactured consumer good exports at 1907 prices. (Exports in current prices were converted to 1907 prices using the Tinbergen<sup>3</sup> price index of finished consumer good exports). The resultant series of output at constant 1907 factory prices was raised to retail prices by the addition of a distributive margin. The margin used was 35 per cent. A retail price index of home-manufactured and home-consumed finished consumer goods was constructed from data on retail manufactured food prices<sup>4</sup> and from Bowley's<sup>5</sup> price index of clothing and sundries (Table XVI, column 3). Weights for the components of this price index were calculated for 1907 using the value of output in 1907 from the census of production, adjusted to exclude exports. This retail price index was used to convert the series of finished manufactured output (excluding exports) at constant 1907 prices, to current retail prices.

<sup>1</sup> Walther Hoffman, *Wachstum und Wachstumsformen*, op. cit.

<sup>2</sup> *Final Report of the First Census of Production*, op. cit.

<sup>3</sup> J. Tinbergen, *Business Cycles in the United Kingdom*, op. cit.

<sup>4</sup> *Report on Wholesale and Retail Prices in the United Kingdom*, House of Commons Paper 321, 1903.

<sup>5</sup> A. L. Bowley, *Wages and Incomes in the United Kingdom*, op. cit.

### 3. *Exports of finished consumer goods*

Exports of finished consumer goods were estimated by comparing a 'short' list of exports taken from the Statistical Abstracts, 1870-1913, with the total value of finished consumer good exports in 1870, 1890 and 1907 from the Annual Statements of Trade. The short list representing 75 per cent of the total finished consumer exports in these years was raised to the level of total value of finished consumer good exports in 1907. This series of the total value of finished consumer good exports was converted to factory prices by deducting an allowance of 7.3 per cent for carriage, etc., to the ports, and was then split into finished manufactured exports and finished agricultural exports. The former series of finished manufactured exports was converted to 1907 prices using the Tinbergen price index and subtracted from the series of finished manufactured output; the finished agricultural exports were deducted at current prices from the agricultural output series.

### 4. *Imports of finished consumer goods* (Table XII, column 4)

The import series (imports less re-exports) was calculated by constructing 'short' lists of finished consumer good imports (food and non-food separately) for each year 1870-1913 from data in the Statistical Abstracts. The short lists represented some 75 per cent of the total value of finished consumer imports (excluding alcohol, tobacco, tea, coffee, fish and motor vehicles, covered separately elsewhere) in 1870, 1890 and 1907. The food and non-food short lists were separately raised to the level of the total value of finished consumer imports, food and non-food, in 1907. Import duty on finished consumer good imports was estimated for 1870-1913 from data in the Statistical Abstracts and the Customs and Excise Returns and added to the value of imports for each year. The food and non-food import series were separately converted to retail prices by the use of a distributive margin of 26.5 per cent in the former case and 43.5 per cent in the latter. The sum of the food and non-food series gave a series, 1870-1913, of the total value of finished consumer imports at current retail prices.

### 5. *Expenditure on tobacco goods, alcohol, tea, coffee, fish, coal and motor vehicles* (Table XII, column 5, and Table XIII)

Consumers' expenditure on tobacco goods, alcohol, tea,

coffee and motor vehicles was taken directly from Prest.<sup>1</sup>

Domestic consumers' expenditure on coal was obtained by using the estimates made by Prest of personal consumption in tons for 1900-13, and the estimates of domestic consumption in 1869, 1870, and 1871 taken from the Report of the Select Committee on Coal,<sup>2</sup> 1873. It was assumed that the quantity of coal consumed by domestic users could be interpolated on a straight line from 1871 to 1900. This series in tons was valued at 1907 prices taken from Prest.

A retail price index of coal was constructed from coal prices given in the Select Committee Report on Coal mentioned above, and from data in later reports.<sup>3</sup> These estimates were interpolated on the Bowley<sup>4</sup> price index of fuel. The series of domestic coal consumption in 1907 prices was converted to current prices using this price index.

Consumers' expenditure on fish was estimated from data on price and quantity of imports and exports, fish landings, herring curing in Scotland, and fish transported by rail.

The estimates of personal expenditure on these goods at decade intervals, 1870-1910, are set out in Table XIII.

TABLE XIII

*Estimated Personal Expenditure on Individual Commodities, 1870-1910*

Year	Tea (£m.)	Coffee (£m.)	Alcoholic Drinks (£m.)	Tobacco (£m.)	Fish (£m.)	Coal (£m.)	Motor Cars, Motor Cycles and Running Expenses (£m.)	Total (£m.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1870	11.8	2.9	136.6	13.5	5.0	13.9	—	183.7
1880	15.8	2.6	157.4	17.8	9.2	21.7	—	224.5
1890	17.8	2.4	165.5	19.4	13.3	31.8	—	250.2
1900	18.6	2.4	194.7	27.0	18.6	51.3	0.6	313.2
1910	22.1	2.4	170.7	36.7	21.2	43.6	10.1	306.8

<sup>1</sup> A. R. Prest, *Consumers' Expenditure, 1900-1919, op. cit.*

<sup>2</sup> *Report of the Select Committee on Coal, 1873 (BPP 1873, Vol. X).*

<sup>3</sup> e.g. *British and Foreign Trade and Industrial Conditions*, Cd. 1761, Board of Trade, 1903.

<sup>4</sup> A. L. Bowley, *Wages and Income in the United Kingdom, op. cit.*

6. *Consumption of services* (Table XII, column 7, and Table XIV)

The consumption of services series consists of separate estimates of consumers' expenditure on rent, rates, domestic servants, laundry, railways, communications and tramways, and other services (including medical, educational, etc.).

The rent series was constructed from a price index for rent taken from Cd. 2337<sup>1</sup> and extrapolated on data from Singer<sup>2</sup> and Prest,<sup>3</sup> and a quantity series of houses which was derived from census of population<sup>4</sup> estimates of numbers of houses. Rates were calculated directly from data in the Statistical Abstracts. The domestic service series was based on the estimates of numbers employed in 'service' trades given in the censuses of population and an index of wage rates of domestic workers from Layton.<sup>5</sup>

Personal expenditure on communications was estimated as 32 per cent (based on Prest) of the Post Office revenue for postal and telegraph services. Expenditure on railway services was based on gross receipts of railways for passenger traffic and excess baggage, assuming that 83 per cent of the former and 57 per cent of the latter (percentages based on Prest) represented personal expenditure on these services. Tramway personal expenditure was estimated as 95 per cent of gross receipts on tramways. The data on revenue and gross receipts on Post Office, railway and tramway accounts were taken from the Statistical Abstracts. Where there was a break in the consistency of the Abstract series after 1900, estimates by Prest were used to complete the series from 1870 to 1913.

To cover expenditure on services not included above, an index of the number of persons employed in service industries (including medical, education, gas, water and electricity) was constructed from the census of population. This series was combined with an index of wage rates based on the Tinbergen<sup>6</sup> price index of services and the Wood<sup>7</sup> wage rate index.

<sup>1</sup> *British Foreign Trade and Industrial Conditions*, Cd. 2337, Board of Trade, 1904.

<sup>2</sup> As given in Herbert W. Robinson, *The Economics of Building*, London, 1939.

<sup>3</sup> A. R. Prest, *Consumers' Expenditure, 1900-1919*, *op. cit.*

<sup>4</sup> *Census of Population*, England and Wales, 1871, 1881, 1891, 1901, 1911.

<sup>5</sup> W. T. Layton, 'Changes in the Wages of Domestic Servants during 50 Years', *Journal of the Royal Statistical Society*, Vol. LXXI, 1908.

<sup>6</sup> J. Tinbergen, *Business Cycles in the United Kingdom*, *op. cit.*

<sup>7</sup> G. H. Wood, 'Real Wages and the Standard of Comfort since 1850', *Journal of the Royal Statistical Society*, Vol. LXXII, 1909.

The expenditure series for rent, domestic service, and other services were weighted according to their relative values in 1901 from Prest, and interpolated between census years. Railway, tramway and communications receipts, and rates were added to this series for each year 1870–1913.

The estimates of personal expenditure on individual services in the census years from 1871 to 1911 are set out in Table XIV.

TABLE XIV

*Estimated Personal Expenditure on Different Types of Services,  
Census Years, 1871–1911*

Year	Rent	Rates	Rail- ways	Tram- ways	Post Office	Domestic Service and Laundry	Other Services <sup>1</sup>	Total Services
(1)	(£m.)	(£m.)	(£m.)	(£m.)	(£m.)	(£m.)	(£m.)	(£m.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1871	73.2	18.2	14.6	—	1.7	34.7	103.8	246.2
1881	91.1	22.0	19.7	1.5	2.7	49.3	132.3	318.6
1891	107.7	26.4	24.9	3.2	4.0	62.3	181.4	409.9
1901	138.1	40.3	32.8	5.7	5.7	73.0	239.7	535.3
1911	158.8	55.9	37.1	13.2	8.1	80.4	292.2	645.7

*Consumers' Expenditure on Goods and Services, 1914–52*  
(Table I, column 3)

The estimates of consumers' expenditure on goods and services 1914–19 are those of Prest,<sup>2</sup> but as they are not calculated on the same basis as the earlier estimates, they are placed in brackets. The series 1920–37 are based on estimates of Stone and Rowe<sup>3</sup> of consumers' expenditure on food, alcohol, tobacco, tea, coffee, fuel, rents, and on further provisional estimates made available by these authors of consumers' expenditure on other goods and services. The estimates for 1939–45 are based on estimates of the Central Statistical Office.<sup>4</sup> Subsequent revisions of the figures for 1938 and 1946 have, however, made necessary adjustments to these figures. As the adjustment has been attempted by interpolation, the figures are placed in brackets.

<sup>1</sup> Other services include electricity and gas, medical services and education, entertainment, catering, religion and other travel.

<sup>2</sup> A. R. Prest, *Consumers' Expenditure, 1900–1919, op. cit.*

<sup>3</sup> Richard Stone, *Consumers' Expenditure, 1920–1938, op. cit.*

<sup>4</sup> Central Statistical Office, *Statistical Digest of the War, op. cit.*



The estimates for 1938 and 1946-52 are those of the Central Statistical Office.

*Public Authorities' Current Expenditure on Goods and Services*  
(Table I, column 4)

The figures for the years 1870-1913 are based on the published accounts of Central and Local Governments. The principles used to classify the different items of expenditure are those adopted by the Central Statistical Office. The estimates, particularly in the early years, are approximate and subject to error as detailed information on the type of expenditure, e.g. distinguishing between current and capital expenditure, is not readily available.

The main expenditure items of the Central Government which have been classed as current expenditure on goods and services, are management of National Debt, all expenditure on supply services including expenditure of a capital nature, the cost of civil administration (less any grants to local authorities and transfer payments, e.g. pensions, expenditure on education and the cost of collection of Customs excise and taxes). The local government accounts presented more complicated problems in that trading services, e.g. gas, water, tramways, electricity, have to be distinguished from other types of expenditure. Up to the turn of the century, when accounts began to be available in greater detail, the problem of distinguishing in local government accounts between current and capital expenditure was found easier to approach from the income side. Working on the assumption that the difference between current income and current expenditure would not be very great, it was possible to identify some income as payment for trading services, which income could then be eliminated. All loans were treated as earmarked for capital expenditure. Interest payments on local government loans could be calculated from the figures given of the amount of loans outstanding each year, and the distinction between loans for trading services and loans for other purposes was made. After excluding receipts from, and payment for, trading services including loan payments for trading services, the remaining income was treated as current expenditure on goods and services except for the transfer payments made, for example, outdoor poor relief. Interest payments on loans (other than loans for trading services) following

the practice of the Central Statistical Office were treated as current expenditure as a measure of the notional net rental charge for the use of local authorities' buildings and other fixed assets. With the publication of fuller accounts by local authorities after 1900, the distinction between the different items of expenditure could be made with greater surety and the figures of expenditure on current goods and services become more reliable.

For the years 1920-37, the provisional estimates of Utting<sup>1</sup> of Central Authorities' and local governments' expenditures have been used, after adjusting the figures to the 1938 estimate made by the Central Statistical Office. The estimates for 1938 and 1946-52 are those of the Central Statistical Office.

*Gross and Net Domestic Capital Formation including Value of Physical Increases in Stocks and Net Overseas Lending*  
(Table 1, column 5, and Table XV)

1. *Gross and net fixed domestic capital formation and depreciation*

The gross capital investment series was constructed using the Cairncross<sup>2</sup> series of the total value of new construction in building, shipbuilding and railways and by local authorities. This series was raised to the level of the value of gross domestic fixed investment (net of repairs) estimated by Cairncross at £150 million for 1907.

Depreciation was calculated on the method used by Phelps Brown<sup>3</sup> of combining the trend of national income and the yearly variations of gross fixed investment. (The gross investment and national income series used in the calculation of the index of depreciation are those given here.) Depreciation was estimated by Cairncross as £50 million in 1907 and the index of depreciation was given this value in 1907. Net fixed domestic investment was derived by deducting depreciation from gross fixed domestic investment.

The estimates, 1924-37 of gross and net capital formation, and depreciation were based on those of Phelps Brown and Weber.<sup>4</sup> To these figures have been added estimates of gross and net investment of Central and Local Government, other

<sup>1</sup> J. E. G. Utting, *Income and Expenditure of Public Authorities*, *op. cit.*

<sup>2</sup> A. K. Cairncross, *Home and Foreign Investment*, *op. cit.*

<sup>3</sup> E. H. Phelps Brown, 'The Climacteric of the 1890's', *loc. cit.*

<sup>4</sup> E. H. Phelps Brown, 'Accumulation, Productivity and Distribution', *loc. cit.*

than the revenue yielding investment already included by Phelps Brown. The additions for public authority expenditure were based on Utting.<sup>1</sup> The Phelps Brown estimates were at factory prices rather than at the prices paid by the consumers of the goods. No allowance for this has been made, however, as in 1938 the Phelps Brown series was running slightly higher than the Central Statistical Office estimate of net capital formation in that year. For 1938 and 1946-52, Central Statistical Office estimates have been used.

### 2. *Stocks* (Table XV, column 3)

The value of the physical change in stocks has been calculated from 1870 to 1913 and 1920 to 1937 on the assumption made by Phelps Brown that stocks represented 40 per cent of the national income. The value of the physical change in stocks was then taken as 40 per cent of the first difference between national income estimates for successive years. For 1938 and 1946-52, the series is that of the Central Statistical Office.

### 3. *Overseas lending and net grants from abroad* (Table XV, column 6)

The series for overseas lending 1870-1913 is taken from Cairncross, and represents the balance of payments on income account. From 1924 to 1937, the estimates are those of the Board of Trade; for 1938, and 1946-52, the Central Statistical Office estimates from the White Paper on Balance of Payments have been used.

For 1938 and 1946-52, it has been necessary to include in the net national expenditure total an adjustment for net current and capital grants from abroad (including war disposals, settlement, etc.). The estimates used are those of the Central Statistical Office. For convenience, this addition has been included in the tables with estimates of overseas lending.

### *Taxes on Expenditure, Rates and Subsidies*

(Table I, column 6)

The series 1870-1937 was based on published accounts of Central and Local Governments. Customs excise, and stamp and motor vehicle licence duties are included in the indirect

<sup>1</sup> J. E. G. Utting, *Income and Expenditure of Public Authorities*, *op. cit.*

TABLE XV

Gross and Net Domestic Capital Formation, Stock Changes and Net Overseas Lending, United Kingdom, 1870-1952

Year	Gross Domestic Capital Formation (£ million)	Value of Physical Increase in Stocks and Work in Progress (£ million)	Depreciation (£ million)	Net Domestic Capital Formation (£ million)	Overseas Balance of Payments on Income Account (£ million)	Total Net Domestic Investment and Overseas Lending (£ million)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1870 . . . . .	72.9	21.0	23.0	70.9	38.7	110
1871 . . . . .	87.6	23.2	24.0	86.8	57.7	145
1872 . . . . .	96.6	22.0	26.0	92.6	75.7	168
1873 . . . . .	106.1	37.2	27.0	116.3	68.1	184
1874 . . . . .	129.1	0.8	33.4	96.5	57.0	154
1875 . . . . .	110.4	-19.6	27.8	63.0	31.3	94
1876 . . . . .	115.4	0.4	28.7	87.1	-2.1	89
1877 . . . . .	125.8	2.0	31.0	96.8	-16.3	81
1878 . . . . .	120.7	-9.6	29.4	81.7	0.2	82
1879 . . . . .	105.5	-22.0	26.2	57.3	8.7	66
1880 . . . . .	109.1	21.2	27.5	102.8	6.7	110
1881 . . . . .	114.3	16.0	29.8	100.5	41.3	142
1882 . . . . .	119.6	17.6	33.1	104.1	39.7	144
1883 . . . . .	113.8	11.2	33.3	91.7	28.1	120
1884 . . . . .	98.0	-18.8	30.1	49.1	49.2	98
1885 . . . . .	82.9	-8.0	26.3	48.6	39.5	88
1886 . . . . .	72.6	6.0	24.0	54.6	60.9	116
1887 . . . . .	76.9	11.6	26.4	62.1	67.8	130
1888 . . . . .	83.1	33.2	29.5	86.8	74.6	161
1889 . . . . .	101.9	35.2	36.9	100.2	72.5	173
1890 . . . . .	101.8	26.8	37.0	91.6	94.4	186
1891 . . . . .	102.5	-4.8	36.7	61.0	52.3	113
1892 . . . . .	99.9	-10.4	35.1	54.4	37.4	92
1893 . . . . .	95.0	-13.2	32.1	49.7	42.1	92
1894 . . . . .	98.8	18.4	31.8	85.4	30.9	116
1895 . . . . .	105.6	26.4	31.8	100.2	36.1	136
1896 . . . . .	117.3	11.2	33.3	95.2	33.5	129
1897 . . . . .	137.4	20.4	36.9	120.9	23.2	144
1898 . . . . .	173.0	32.8	44.2	161.6	19.9	182
1899 . . . . .	195.0	29.2	48.2	176.0	32.5	209
1900 . . . . .	203.2	34.0	48.8	188.4	31.1	220
1901 . . . . .	205.2	-12.8	48.6	143.8	18.1	162
1902 . . . . .	201.4	6.4	48.1	159.7	15.1	175
1903 . . . . .	184.7	-9.6	45.9	129.2	20.9	150
1904 . . . . .	181.9	11.2	48.2	144.9	22.1	167
1905 . . . . .	177.5	31.2	50.3	158.4	65.3	224
1906 . . . . .	170.7	48.4	52.6	166.5	99.4	266
1907 . . . . .	150.0	39.2	50.0	139.2	138.0	277
1908 . . . . .	118.1	-43.6	42.1	32.4	120.6	153
1909 . . . . .	117.9	19.6	44.4	93.1	109.4	203

TABLE XV (continued)

Year (1)	Gross Domestic Capital Formation (£ million) (2)	Value of Physical Increase in Stocks and Work in Progress (£ million) (3)	Depreciation (£ million) (4)	Net Domestic Capital Formation (£ million) (5)	Overseas Balance of Payments on Income Account (£ million) (6)	Total Net Domestic Investment and Overseas Lending (£ million) (7)
1910 . . . . .	114.5	36.8	44.0	107.3	142.2	250
1911 . . . . .	125.8	30.8	48.0	108.6	177.3	286
1912 . . . . .	136.6	53.2	52.0	137.8	190.8	329
1913 . . . . .	158.5	42.4	53.0	147.9	210.1	358
1924 . . . . .	347	31	120	258	72	330
1925 . . . . .	372	25	127	270	46	316
1926 . . . . .	388	-24	133	231	-14	217
1927 . . . . .	432	95	149	378	82	460
1928 . . . . .	414	4	156	262	123	385
1929 . . . . .	419	10	164	265	103	368
1930 . . . . .	414	-90	166	158	28	186
1931 . . . . .	394	-118	162	114	-104	10
1932 . . . . .	343	-39	156	148	-51	97
1933 . . . . .	343	66	166	243	0	243
1934 . . . . .	384	63	186	261	-7	254
1935 . . . . .	434	93	205	322	32	354
1936 . . . . .	515	114	235	394	-18	376
1937 . . . . .	594	93	264	423	-56	367
1938 . . . . .	600	0	265	335	-62	273
1946 . . . . .	900	-107	330	463	-373	90
1947 . . . . .	1,160	280	416	1,024	-481	543
1948 . . . . .	1,396	153	478	1,071	-19	1,052
1949 . . . . .	1,544	35	623	956	57	1,013
1950 . . . . .	1,682	-216	719	747	312	1,059
1951 . . . . .	1,866	600	772	1,694	-373	1,321
1952 . . . . .	2,066	50	681	1,435	163	1,598

From 1938 onwards net grants from abroad have been deducted from column 6, Overseas Lending. These grants were as follows: 1938, -£8 million; 1946, -£75 million; 1947, -£8 million; 1948, £118 million; 1949, £180 million; 1950, £152 million; 1951, £55 million; 1952, £92 million.

taxes, as well as the excise collected by local authorities. Market dues, tolls, and similar collections of local authorities have not been included as these have been taken as payment for trading services in the earlier years of the period. To the Customs, excise and duties series has been added the net surplus of the Post Office.

The figures for 1938 and 1946–52 are those of the Central Statistical Office. The estimates for subsidies 1920–37 are based on the figures given by Ursula K. Hicks.<sup>1</sup> It has been assumed that there were no subsidies before 1913.

### *Output and Price Indices* (Tables XVI and XVI (A))

Tables XVI and XVI (A) give the main output and price indices used in the construction of the various series. Column 1 of Table XVI is the index of the output of finished manufactured consumer goods based on Hoffmann.<sup>2</sup> Column 2 of Table XVI is the retail price index of manufactured consumer goods used to convert the value of output at constant 1907 prices to current prices. Column 3 of Table XVI and column 2 of Table XVI (A) is the price index used to convert the national income and expenditure series to constant prices in Tables III, IV, V and VI. This index is a combination of the index of Bowley<sup>3</sup> for the years 1870–1913, the official cost-of-living index 1914–38,<sup>4</sup> and the retail price index of the London and Cambridge Economic Service,<sup>5</sup> 1939–52. Column 4 of Table XVI and column 3 of Table XVI (A) is the capital goods price index used to convert net and gross capital formation to constant prices in Table VI. This index is based on Phelps Brown<sup>6</sup> for the years 1870–1913 and 1924–38 and on Seers<sup>7</sup> and the Central Statistical Office,<sup>8</sup> 1938 and 1946–52.

<sup>1</sup> Ursula K. Hicks, *The Finance of British Government, 1920–36*, London, 1938.

<sup>2</sup> Walther Hoffmann, *Wachstum und Wachstumsformen*, *op. cit.*

<sup>3</sup> A. L. Bowley, *Wages and Income of the United Kingdom*, *op. cit.*

<sup>4</sup> *Ministry of Labour Gazette*, H.M.S.O.

<sup>5</sup> London and Cambridge Economic Service, *Bulletin*.

<sup>6</sup> E. H. Phelps Brown, 'The Climacteric of the 1890's', *loc. cit.*, and 'Accumulation, Productivity and Distribution', *loc. cit.*

<sup>7</sup> Dudley Seers and P. F. D. Wallis, 'Changes in Real National Income', *Bulletin of the Oxford Institute of Statistics*, Vol. II, June 1949.

<sup>8</sup> Central Statistical Office, *National Income and Expenditure*, *op. cit.*, and *Preliminary Estimates, 1948 to 1953*, *op. cit.*

TABLE XVI

*Output and Price Indices, United Kingdom, 1870-1913*

Year	Index of Output of Manufactured Consumer Goods (1907=100)	Manufactured Consumer Goods, Retail Price Index (1907=100)	Consumer Goods and Services Price Index (1912-13=100)	Capital Goods Price Index (1912-13=100)
(1)	(2)	(3)	(4)	(5)
1870 . . .	53.6	116.0	108.9	104
1871 . . .	57.7	118.6	111.9	105
1872 . . .	58.3	129.3	118.8	115
1873 . . .	59.3	131.1	120.8	120
1874 . . .	61.3	119.6	113.9	112
1875 . . .	58.6	111.1	109.9	106
1876 . . .	58.0	110.6	108.9	102
1877 . . .	59.0	113.4	108.9	99
1878 . . .	57.7	108.0	103.0	95
1879 . . .	54.2	99.6	100.0	91
1880 . . .	64.6	104.7	104.0	95
1881 . . .	62.9	101.2	102.0	91
1882 . . .	67.3	101.8	101.0	91
1883 . . .	69.6	99.4	101.0	88
1884 . . .	69.0	94.2	96.0	86
1885 . . .	65.7	89.1	90.1	84
1886 . . .	64.0	87.6	88.1	79
1887 . . .	69.3	86.7	87.1	79
1888 . . .	73.1	86.8	87.1	80
1889 . . .	74.9	89.1	88.1	82
1890 . . .	74.7	89.2	88.1	85
1891 . . .	80.1	89.1	88.1	84
1892 . . .	73.8	89.1	89.1	80
1893 . . .	73.9	83.4	88.1	78
1894 . . .	77.2	81.4	84.1	75
1895 . . .	81.0	79.1	82.2	74
1896 . . .	82.8	80.8	82.2	75
1897 . . .	80.4	82.4	84.1	75
1898 . . .	86.9	84.0	87.1	76
1899 . . .	90.1	81.0	85.1	81
1900 . . .	89.2	89.3	90.1	90
1901 . . .	89.1	82.8	89.1	88
1902 . . .	91.5	83.7	89.1	86
1903 . . .	87.7	88.3	90.1	87
1904 . . .	89.3	91.5	91.1	89
1905 . . .	94.1	93.6	91.1	90
1906 . . .	95.5	98.9	92.1	93
1907 . . .	100.0	100.0	94.1	97
1908 . . .	99.4	89.5	92.1	93
1909 . . .	100.3	92.7	93.1	92
1910 . . .	102.9	98.2	95.0	93
1911 . . .	104.7	100.4	96.0	95
1912 . . .	112.0	103.9	99.0	98
1913 . . .	113.1	107.8	101.0	102

## INCOME AND WEALTH

TABLE XVI (A)

*Price Indices, United Kingdom, 1914-1952*

Year	Consumer Goods and Services Price Index (1912-13=100)	Capital Goods Price Index (1912-13=100)
(1)	(2)	(3)
1914 . . .	99.0	—
1915 . . .	121.8	—
1916 . . .	145.5	—
1917 . . .	175.2	—
1918 . . .	201.0	—
1919 . . .	213.9	—
1920 . . .	245.5	—
1921 . . .	222.8	—
1922 . . .	181.2	—
1923 . . .	172.3	—
1924 . . .	173.2	197
1925 . . .	173.2	191
1926 . . .	170.3	188
1927 . . .	165.3	185
1928 . . .	164.3	181
1929 . . .	162.3	177
1930 . . .	155.4	173
1931 . . .	145.5	168
1932 . . .	141.5	160
1933 . . .	138.6	158
1934 . . .	139.6	157
1935 . . .	141.5	165
1936 . . .	145.5	171
1937 . . .	152.4	183
1938 . . .	154.4	185
1939 . . .	157.5	—
1940 . . .	183.7	—
1941 . . .	200.7	—
1942 . . .	214.5	—
1943 . . .	220.7	—
1944 . . .	225.3	—
1945 . . .	228.4	—
1946 . . .	233.1	350
1947 . . .	248.5	403
1948 . . .	270.2	444
1949 . . .	278.0	461
1950 . . .	285.7	476
1951 . . .	311.9	520
1952 . . .	341.2	582