

## CAPITAL ACCUMULATION AND ECONOMIC GROWTH IN SOUTH AFRICA

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### I. CAPITAL ACCUMULATION DURING THE PRE-UNION PERIOD

THE economic growth of a country can only be interpreted in a historical context. In the case of South Africa, an investigation of the past growth of the Nation's capital stock calls for explicit recognition of the role played by two major structural changes, viz. (1) the advent, during the seventies and eighties of the last century, of the diamond and gold mining industries, and (2) the final achievement, in 1910, of the goal of the political and economic unification of the country. Two principal sub-periods may accordingly be distinguished in a survey of the capital accumulation process during the recent past, viz. (1) the development from 1870 until the formation of the Union of South Africa in 1910, and (2) the post-Union period.

Before 1910, there were four different colonial governments operating in the territory thereafter known as the Union of South Africa, and this lack of unity in the political and economic field resulted in a paucity of comparable information about economic trends. Much more is known about economic tendencies during the post-Union period, and hence this paper is mainly concerned with the post-1910 era. In this section a few general observations will nevertheless be made about, firstly, the role of the mineral discoveries in stimulating capital formation during the forty-year period, 1870-1910 - the *Gründerzeit* of modern capitalism in South Africa - and, secondly, the approximate order of magnitude of capital accumulation in the main sectors of the pre-Union economy.

Until the time of the discovery of diamonds (1867) and, subsequently, of gold (1886), South Africa was a typical example of a geographically isolated, pre-industrial society, with little scope for the production of surpluses and hence for the formation of capital. Apart from land, the most important possession of the European and non-European sections of the population was livestock. Moreover, the majority of the non-Europeans lived

under tribal conditions, thereby escaping contact with the market economy.

The mineral discoveries changed South Africa's economic climate overnight. Not only was a vast amount of capital required for the opening up of the mines, but also for the removal of formidable physical bottlenecks, such as the total lack of modern transport facilities and communications in the inland regions where the minerals were located. Furthermore, the combination of capital and labour in the changed environment called for a complete readjustment of human values, in that it implied, among others, the willing acceptance, especially in the case of the tribal natives employed on the mines and elsewhere, of an entirely different way of life.

Chronologically, the diamond industry was in the van of South Africa's mineral development, but, not being a capital intensive industry, its own contribution to capital accumulation, in a physical sense, was limited, although its secondary influence in this regard was considerable. Thus, for example, it supplied the economic incentive for the construction of a railway network linking Kimberley, the 'diamond city', with the principal harbours. In the financial sphere, too, its influence was considerable, as it provided a formerly capital-starved country with a source of easily won wealth, and also attracted foreign risk capital to the South African capital market. The role of the latter factor was especially significant from the nineties onwards, and, fortunately for South Africa, its development of diamond and gold deposits took place at a time that Europe, and, more especially, the United Kingdom, were still in a position to undertake heavy overseas investments.

The opening up during the eighties of what eventually proved to be the world's largest gold-mining industry was the decisive factor in the consolidation of the gains accruing from the period of feverish development initiated by the diamond industry. The influence of gold on the country's subsequent economic growth is briefly summarized below.

In the first place, the mining of gold broadened the economic base of a country whose prosperity was formerly dependent on the fortunes of agriculture and diamonds. It should be borne in mind that the diamond industry, as a producer of a luxury commodity, was extremely sensitive to cyclical changes. Gold, on the other hand, exerted a stabilizing influence on the country's

rate of growth, in that the continuous annual increase in the output of the industry, as well as the stability of its price,<sup>1</sup> tended to dampen the effect of cyclical fluctuations, and at the same time reinforced the upward secular trend of real income. This, in turn, reacted favourably on the level of domestic savings and capital formation. It cannot be denied, however, that the mining industry introduced the familiar elements of financial instability and overspeculation into the South African capital market, but the recurring financial crises did not impair the steady expansion of the South African gold output, which, from 1886 to 1909 with the exception of the years of the Anglo-Boer War (1899–1902), presented a remarkable picture of sustained growth.

Secondly, as gold is a unique example of a commodity enjoying an infinite elasticity of demand at the ruling price, its preponderance in South Africa's export trade during the latter part of the pre-Union period helped to solve the transfer problem usually encountered when an undiversified economy develops its natural resources at a rapid rate. The sale of gold abroad provided foreign exchange, not only for the importation of capital goods required for development purposes, but also for an increasing volume of imported consumer goods, the demand for which was rising as a result of the increase in the national income and general living standards.

Thirdly, the gold industry, like the diamond industry before it, stimulated capital investment in other fields, such as, for example, transport, communications, and urban development. Unlike the diamond industry, however, its direct contribution to capital formation was very substantial, as the mining of gold under the conditions obtaining in South Africa called for an industry with a high capital-output ratio. During the first few years after the discovery of gold on the Witwatersrand, mine operators confined their efforts to the exploitation of outcrops, but soon it became necessary to mine at greater depth. Deep-level mining demanded the outlay of large sums on shafts and specialized equipment. Moreover, gold could only be extracted profitably from the low-grade ore mined on the Rand by chemical treatment in expensive plants. The capital outlay required in order to bring a new mine to the production stage

<sup>1</sup> The price of gold in the United Kingdom remained at £4.24773 per fine ounce throughout the period 1884–1909.

amounted to about £1-£3 million during this early period, and as small-scale undertakings were not in a position to raise the necessary funds, the tendency towards financial consolidation, which was also apparent in the case of the diamond industry, soon made its appearance.

The changes in the size and composition of the nation's capital stock since 1870 can be illustrated by data culled from official and other sources, but unfortunately the available data do not enable one to construct a balance sheet of the economy in 1870. Nevertheless, it is obvious that in the then existing pastoral economy non-farming assets were of minor importance. By 1909, however, mining and ancillary developments in the private and public sectors of the economy had shifted the balance of power from the farming to the non-farming industries. The trends of capital accumulation in the principal industrial categories are set out below under five headings.

(i) *Farming*. It is estimated that the share of farming assets in the total capital stock declined from what must have been the very high 1870 percentage figure to about 30 per cent at the close of the pre-Union period. As pastoral production was still predominant in 1909, it is further estimated that about three-fourths of the total farming assets (valued at about £136 million) existing at that date was represented by livestock. The changes since 1870 in the value of the different kinds of livestock are shown in Table I.

TABLE I  
*Value of Livestock, in Current Prices, for Selected Years  
(1870-1909)*  
(£ million)

Year	Cattle	Woolled Sheep	Non-woolled Sheep	Goats	Pigs	Ost-riches	Mules and Asses	Horses	Poultry	TOTAL
1870	5	5	1	1	—	1	1	2	—	16
1875	11	15	2	3	—	1	1	6	—	40
1891	18	14	2	3	1	4	1	8	1	52
1895	18	12	3	3	1	4	1	8	1	51
1899	24	24	6	6	1	7	2	13	2	85
1904	30	13	5	7	1	9	3	8	2	78
1909	33	15	5	4	2	19	3	11	3	95

(ii) *Mining*. The stake of the mining industry in the capital stock of the private sector is estimated at about one-sixth in 1909, as against virtually nothing in 1870. It should be borne in mind, however, that the total amount of money poured into

this industry far exceeded the value of the reproducible assets employed for mining purposes. Accordingly, the concept of reproducible capital does not provide an adequate measure of the accumulation of capital required for the opening up of the various mining properties. By far the greatest portion of the initial capital raised by the various diamond companies, for example, was devoted to the purchase of mining properties and rights.

From the available evidence it would appear that the gross fixed capital formation of the diamond industry until the end of the seventies amounted to only about £1 million. During the eighties the same observation applied to the gold-mines, but the introduction, at the end of this decade, of the deep-level gold-mining techniques, referred to above, marked the beginning of the capital-intensive phase of this industry. During the two decades 1890-99 and 1900-9, gross capital formation in the mining industry amounted to £21 million and £31 million, respectively, as against the very low figure of about £3-£5 million for the eighties. The depreciated original cost of mining assets at the end of 1909 is estimated at £53 million.

(iii) *Manufacturing*. Manufacturing industry was still in its infancy during the pre-Union period, as is borne out by the low figures for reproducible capital employed in this field in 1904, when the first official Census data were collected. The relevant figures are shown in Table II.

TABLE II  
*Book Value of Buildings and Improvements, Machinery and Equipment of Manufacturing Industry in the Four Colonies, 1904*<sup>1</sup>

Colony	Buildings and Improvements	Machinery and Equipment
Cape . . . . .	3.9	2.2
Transvaal . . . . .	1.2	1.9
Natal . . . . .	1.3	1.4
Orange Free State . . . . .	0.1	0.2
Total . . . . .	6.5	5.7

<sup>1</sup> The census covered private and public establishments, although the role of the latter was negligible during this early period. Furthermore, the generation of electric power and the building industry were also covered by the 1904 census. According to a census taken in the Cape Colony for the year 1891, the value of buildings and improvements and machinery and equipment amounted to £1.3 million and £1.6 million respectively.

The number of persons employed in manufacturing in 1904 was about 75,000, while the most important industrial category was the manufacture of food and drink, i.e. grain mills, bakeries, breweries, and distillers. During this period, manufacturing activity was mainly confined to the so-called 'sheltered' industries, whose further development was to a large extent determined by the rate of growth of the population. Already during this early phase, however, the capital and current requirements of the gold-mining industry for such commodities as explosives fostered local manufacturing development.

(iv) *Building and construction.* The economic expansion of South Africa greatly stimulated urban growth, especially in the mining areas. This is reflected in the figures relating to the municipal valuation of fixed property, i.e. land and improvements, which are set out in Table III.

TABLE III  
*Municipal Valuation of Fixed Property*<sup>1</sup>  
(£ million)

Year	Cape Colony	Transvaal		Natal		Orange Free State
		Johannesburg	Other Municipalities	Durban	Other Municipalities	
1891	..	3	..	2	..	..
1894	18	5	..	..	..	..
1899	30	22	..	..	..	..
1904	55	39	..	..	..	..
1909	57	37	8	8	6	7

.. Not available.

<sup>1</sup> Broadly speaking, the ratio of land to improvements in the various centres varied from 30 to 35 per cent.

(v) *The public sector.* No less than one-third of the total capital assets existing at the end of 1909 must be classified as falling under the 'public sector'. By far the most important single item in this category was the assets of the state-owned railways and harbours system.

The building of a railway network proved to be a very expensive undertaking, not only on account of the great distances between the inland areas where the mines were situated and the nearest harbours, but also on account of topographical factors.

In 1909 the depreciated original cost of railways and harbours assets already amounted to no less than £85 million.

The combined capital outlay of the Railways and Harbours Administrations operating in the different colonies is set out in Table IV.

TABLE IV  
*Gross Capital Formation – Railways and Harbours*

Decade	£ million
1870-79	9
1880-89	12
1890-99	39
1900-9.	43

## II. CAPITAL ACCUMULATION DURING THE POST-UNION PERIOD

### 1. *Methods of calculation*

Before discussing capital accumulation during the post-Union period, a few comments on the methods of calculation are called for. The sources of the data are specified in Appendix II. The capital stock figures refer to reproducible assets, although estimates of the value of land, sub-soil wealth, and consumer durables<sup>1</sup> are given in Appendix III.<sup>2</sup>

Annual capital expenditure data were not available for the period prior to 1910, and, accordingly, the computation of a net capital stock series for the whole period, 1910-55, required, firstly, an estimate of the reproducible wealth existing at the beginning of the year 1910, and, secondly, an estimate of the net additions to this initial figure from 1910 onwards. The first step in the calculations was the determination of capital stock in terms of depreciated original cost (or book value) in the benchmark year, 1909. This entailed direct and detailed computations of the value of the stocks of the different types of capital goods employed in the various industries, such as mining, agriculture, manufacturing industry, etc.

The second step was the calculation of the gross capital-

<sup>1</sup> Motor vehicles only; a survey of the other items has not yet been undertaken.

<sup>2</sup> Transfer costs on immovable property have not been included in the capital-stock figures discussed in the present paper, although estimates of this item are given in the Gross and Net Capital Formation Tables in Appendix I (see Tables IV and V). For this reason, therefore, the net capital formation figures obtained as the difference between successive net capital stock data, valued at original cost (see Table I, Appendix I), will differ from the net capital formation figures appearing in the final columns of Tables IV and V in the same Appendix.

expenditure figures, in current prices, for each year during the period under review; finally, *net* capital stock figures from 1910 onwards were derived by adding, for example in the case of the initial year 1910, the gross capital expenditure of 1910 to the written-down capital stock figure of 1909 (obtained by means of direct investigation, as mentioned above), and then depreciating<sup>1</sup> the resulting total in accordance with the reducing-balance method. Similar calculations were undertaken for all subsequent years. Thus, in general, for any specific year, the initial net capital stock *plus* gross capital formation in prices of that year *minus* depreciation at pre-determined rates will yield the terminal net value of the capital stock.

Three capital-stock series are distinguished in Appendix I, viz. (a) capital stock, at depreciated original cost; (b) depreciated capital stock, in 1938 prices, and, finally, (c) depreciated capital stock, in current prices. Series (a) was derived in accordance with the statistical process outlined in the foregoing paragraph.

In the case of series (b), two sub-classes of the official Wholesale Price Index, namely, 'Metals' and 'Building Materials', were used as deflators. As mentioned above, no information about the annual capital expenditure on fixed assets was available for the pre-Union period, and hence, as the first step in the calculations, the net capital stock for the bench-mark year 1909 was expressed in 1938 prices by dividing the 1909 values, in terms of depreciated original cost, by the relevant price indexes for 1909 (base: 1938 = 100) – a procedure which rests, of course, on far-reaching assumptions. The present authors are confident, however, that future research will provide answers to this and other similar problems encountered in the attempt to trace capital accumulation back to the year 1910.

The next step in the derivation of series (b) was the expression of the annual gross capital expenditure series in terms of 1938 prices by means of the deflators already mentioned. As in the case of series (a), the method of deriving the net capital stock figures in 1938 prices was, firstly, that of adding, in each specific year, the deflated gross capital expenditure to the written-down value of the capital stock existing at the beginning of the year, and, secondly, depreciating the total thus obtained at the same rates as those utilized in the calculation of series (a).

<sup>1</sup> At rates set out in Table V in the text.



In the case of inventories, the book values were taken to represent both the cost and the market (or current) price of the goods. The general wholesale price index for the last quarter of each year was used to derive the value of inventories at base-year prices. The value, in 1938 prices, of the livestock component of the inventory series was obtained by multiplying the number of each type of livestock at the end of each year by the respective average price ruling during the year 1938.

For series (c), annual values, in current prices, of the capital stock were obtained by multiplying the net value, in 1938 prices, of the various types of assets (i.e. series (b)) by each year's price index.

The methods used in the calculation of gross capital formation and depreciation allowances for the different industrial categories were largely determined by the nature of the basic data. The sources of information on the Public Sector (including Public Corporations), as well as industries such as building and

TABLE V  
*Annual Rates of Depreciation*

	Buildings	Other Con- struction	Machinery, Plant, and Equip- ment
	(%)	(%)	(%)
<i>I. Public Authorities</i>			
1. Union Government			
(a) South African Railways and Harbours . . . . .	1	1	1
(b) Other government enterprises	1½	1½	10
(c) General government . . . . .	2	—	—
2. Provincial administrations . . . . .	2	—	10 <sup>2</sup>
3. Local authorities			
(a) Trading departments . . . . .	2	2	10
(b) Non-trading departments . . . . .	2	—	10 <sup>2</sup>
<i>II. Public Corporations</i> . . . . .	2	2	10
<i>III. Private Business Enterprises</i>			
1. Residential building . . . . .	2	—	—
2. Farming . . . . .	1½	1½	10
3. Mining . . . . .	3	3	6½
4. Manufacturing . . . . .	2	2	12½
5. Commercial and service estab- lishments, banks and other financial institutions and pro- fessional persons . . . . .	2	—	10

<sup>1</sup> Actual depreciation taken from the Auditor-General's Annual Reports.

<sup>2</sup> In respect of heavy machinery for road-building.

mining, were in such a form that the actual expenditure on capital assets could be ascertained, also for the earlier years of the period under review. Although the expenditure method is useful for an investigation of this early period, it should be mentioned that the improvement in basic statistics since World War II will in due course make it possible to check the results obtained thus far by applying the commodity-flow method.

The work done for the purpose of this paper on the measurement of capital consumption is very limited in scope. The calculations were based on the national capital stock, valued at original cost, and hence further research will have to be undertaken in future in order to refine the estimates of the value of the capital stock at replacement cost.

Except in the case of the South African Railways and Harbours,<sup>1</sup> the reducing-balance method of calculating depreciation was used.<sup>2</sup>

The rates of depreciation employed in the present calculations are given in Table V.

## *2. The pattern of growth of the national capital stock*

Since 1910, a great expansion has occurred in the range and size of South Africa's overall capital requirements, mainly as a result of the diversification of the economy. The most important single factor in this development was the growth of manufacturing industry,<sup>3</sup> whose capital assets, in 1938 prices, increased from a mere £22 million, in 1909, to no less than £352 million, in 1955. In percentage terms, its share in the total reproducible assets of the economy rose from about 4 per cent, in 1909, to 16 per cent in 1955, while that of mining declined from 13 to 10 per cent, and that of the railways from 20 to 12 per cent.

<sup>1</sup> The Railways and Harbours Administration calculates the average lives of the various types of assets, and hence the straight-line method can be applied.

<sup>2</sup> Owing to limitations of the basic information, it was not possible to determine the age structure of reproducible assets existing in 1910.

<sup>3</sup> The expansion of manufacturing industry was stimulated, among other things, by the two world wars, which restricted the normal flow of imported goods into the local market, thereby encouraging the establishment of local plants; by the policy of protection – although of a relatively mild character – adopted in the twenties; by the availability of cheap electric power as a result of the establishment of a number of integrated power plants serving large regions; by the emergence, during the past three decades, of modern heavy industries – a development which was made possible by the presence of ample deposits of iron ore and other important base minerals, as well as virtually unlimited quantities of cheap coal; and by the growth in size and purchasing power of the internal market.

The growth of manufacturing industry was also associated with an expansion of urban centres,<sup>1</sup> which, in turn, gave rise to a great increase in capital expenditure on residential buildings and other structures and municipal amenities. The greater relative expansion of the secondary and tertiary industries, as compared with primary industries, lessened the dependence of the economy on mining and agriculture, which were the main sources of wealth in the pre-1910 period. Thus the share of the two latter industries in the real geographical income of the Union declined from about 44 per cent in 1910, to 27 per cent in 1955.

Other general factors which helped to sustain the upward secular trend in production, employment and capital accumulation since 1910 were the rapid growth of the labour force; the contra-cyclical influence of the Union's built-in stabilizer, viz. the gold-mining industry, especially during the thirties — when the increase in the price of gold greatly stimulated expansion in this and other allied industries; the capital inflow from abroad; and, finally, the shift of unemployed or under-employed workers from rural areas to more productive work in urban centres.<sup>2</sup>

(a) *The rate of growth of the capital stock.* Over the period 1910–55 the average annual rate of growth of the Union's capital stock, valued in current prices, amounted to 5.9 per cent. The influence of changes in (1) the size of the Union's population, (2) the prices of capital goods, and (3) the real capital stock *per capita*, on the aggregate value of the capital stock is shown in Table VI. It is seen that, in real terms, the latter increased at an average annual rate of 3.1 per cent during 1909–55.

The relationship between the rates of growth of the *real* capital stock and the Union's population is made more explicit in Table VII. As shown by the data cited in Table VI, the Union's population has grown very rapidly since 1910, the average annual rate of growth over the period 1909–55 being 1.9 per cent. Accordingly, a correspondingly high rate of increase in the real capital stock was called for in order to maintain the existing relationship between capital and population.

<sup>1</sup> The percentages of the European and non-European sections of the population living in urban areas were 78.4 and 32.9 per cent, respectively, in 1951, as against 51.6 and 17.4 per cent in 1911.

<sup>2</sup> This applied especially to the so-called 'migrant' workers from the native tribal villages, where, in particular, a large measure of disguised unemployment existed as a result of the limited scope for division of labour in a peasant society.

In point of fact, however, capital formation during this period was such that it did not only lead to a broadening of the capital stock, but also enabled production processes generally to become more capital intensive. Thus the data set out in Table VII show that total capital stock *per capita* (in 1938 prices) increased from £94, in the 1909-18 decade, to £133 in the 1944-53 decade.

TABLE VI  
*Changes in Population, Prices, and Capital Stock*  
(Average annual percentage changes)

Decade	Popula- tion	Prices	Capital Stock <i>Per Capita</i> (1938 Prices)	Total Capital Stock (Current Prices)	Total Capital Stock (1938 Prices)
1909-18	1.8	10.3	-0.5	11.8	1.3
1914-23	1.6	2.7	-0.7	3.6	0.9
1919-28	1.9	-7.2	1.3	-4.2	3.2
1924-33	2.2	-3.2	0.9	-0.1	3.2
1929-38	2.0	0.3	2.0	4.4	4.1
1934-43	1.8	7.5	1.7	11.3	3.5
1939-48	1.8	7.0	0.9	9.9	2.7
1944-55 <sup>1</sup>	1.9	4.2	2.6	9.0	4.6
1909-55	1.9	2.7	1.2	5.9	3.1

Since the thirties a contributory factor in the expansion of the capital stock was the persistent labour shortage, as this factor led to more mechanisation, especially in such industries as farming and mining.

(b) *The relation between capital stock and real income.* Over the period 1918-55,<sup>2</sup> the real<sup>3</sup> domestic or geographical income of the Union increased at an average annual rate of 4.4 per cent, as against 3.8 per cent in the case of the real capital stock. The annual changes since 1918 in the relation between these two magnitudes (i.e. the 'capital coefficient') are set out in Table VIII.

Table VIII shows four capital coefficient series; the first two columns give coefficients based on total and fixed capital stock figures of *all* industries, while the last two columns show these coefficients after excluding capital stock in the form of residential buildings from the all-industry totals.

<sup>1</sup> Twelve-year period.

<sup>2</sup> At the present time geographical figures of the Union are only available on an annual basis since 1918.

<sup>3</sup> Due to the lack of appropriate indexes, the official retail price index was used to deflate the geographical income figures.

TABLE VII  
*The Relation between Capital Stock and Population*  
 (Geometric averages for overlapping decades)

Decade	Capital Stock (in 1938 prices)				Population of the Union		Capital Stock <i>Per Capita</i> (in 1938 prices)			
	Total		Fixed				Total		Fixed	
	£ million	Percentage change from decade to decade	£ million	Percentage change from decade to decade	Thousands	Percentage change from decade to decade	£	Percentage change from decade to decade	£	Percentage change from decade to decade
1909-18	589		436		6,261		94		70	
1914-23	619	5.1	460	5.5	6,763	8.0	92	-2.1	68	-2.9
1919-28	692	11.8	502	9.1	7,400	9.4	94	2.2	68	—
1924-33	822	18.8	599	19.3	8,262	11.6	100	6.4	72	5.9
1929-38	987	20.1	739	23.4	9,153	10.8	108	8.0	81	12.5
1934-43	1,187	20.3	916	24.0	10,063	9.9	118	9.3	91	12.3
1939-48	1,356	14.2	1,057	14.7	10,999	9.3	123	4.2	96	5.5
1944-53	1,607	18.5	1,255	19.4	12,074	9.8	133	8.1	104	8.3
1909-18 to 1944-53 (decade average)		15.5		16.5		9.8		5.2		5.9

TABLE VIII  
*Capital Coefficients of the Union, 1918-55*

Year	Reproducible Capital Stock Including Residential Buildings		Reproducible Capital Stock Excluding Residential Buildings	
	Total Capital Stock	Fixed Capital Stock	Total Capital Stock	Fixed Capital Stock
1918 . . .	3.5	2.6	3.3	2.3
1919 . . .	3.2	2.4	2.9	2.1
1920 . . .	4.0	2.9	3.7	2.6
1921 . . .	4.4	3.2	4.2	2.9
1922 . . .	3.7	2.7	3.4	2.4
1923 . . .	3.3	2.4	3.1	2.1
1924 . . .	3.3	2.4	3.1	2.2
1925 . . .	3.4	2.4	3.1	2.2
1926 . . .	3.3	2.4	3.1	2.1
1927 . . .	3.2	2.3	3.0	2.1
1928 . . .	3.3	2.4	3.0	2.1
1929 . . .	3.5	2.5	3.3	2.3
1930 . . .	3.8	2.7	3.5	2.4
1931 . . .	4.0	2.9	3.7	2.6
1932 . . .	3.8	2.9	3.6	2.6
1933 . . .	3.3	2.5	3.1	2.3
1934 . . .	3.1	2.4	2.9	2.1
1935 . . .	3.1	2.3	2.8	2.1
1936 . . .	3.0	2.3	2.8	2.0
1937 . . .	3.0	2.3	2.8	2.1
1938 . . .	3.2	2.5	3.0	2.2
1939 . . .	3.1	2.4	2.9	2.2
1940 . . .	3.0	2.3	2.7	2.1
1941 . . .	2.8	2.2	2.6	2.0
1942 . . .	2.8	2.2	2.5	1.9
1943 . . .	2.7	2.1	2.5	1.9
1944 . . .	2.6	2.1	2.4	1.8
1945 . . .	2.6	2.0	2.3	1.8
1946 . . .	2.6	2.0	2.4	1.8
1947 . . .	2.7	2.0	2.4	1.8
1948 . . .	2.7	2.1	2.7	1.9
1949 . . .	2.7	2.1	2.4	1.8
1950 . . .	2.5	1.9	2.2	1.7
1951 . . .	2.5	1.9	2.3	1.7
1952 . . .	2.6	2.1	2.3	1.8
1953 . . .	2.6	2.1	2.3	1.8
1954 . . .	2.5	2.1	2.3	1.8
1955 . . .	2.6	2.1	2.4	1.9
	Arithmetic Averages for Overlapping Decades			
	Total Assets	Fixed Assets	Total Assets	Fixed Assets
1919-28 . . .	3.5	2.5	3.3	2.3
1924-33 . . .	3.5	2.5	3.3	2.3
1929-38 . . .	3.4	2.5	3.2	2.3
1934-43 . . .	3.0	2.3	2.8	2.1
1939-48 . . .	2.8	2.1	2.5	1.9
1944-55 <sup>1</sup> . . .	2.6	2.0	2.4	1.8

<sup>1</sup> Twelve-year period.

The data for overlapping decades since 1919 do not reveal a tendency towards a 'deepening of capital', i.e. that more capital was utilized per unit of output. This, in turn, indicates that the changes in the structural relationships of the economy tended to divert a greater proportion of the available capital assets into the less capital-intensive industries, i.e. secondary and tertiary industries, as compared with the capital-intensive industries, such as, for example, railway transportation and public utilities.

The capital coefficients attained their peak during the world depression on account of the under-utilization of the then existing capital stock. Since then, however, a state of near-full, and, more recently, of over-full employment, has prevailed in the Union's economy. Moreover, mainly as a result of war conditions, which interfered with the normal flow of goods destined for capital works, a serious backlog developed in the provision of new facilities in a number of sectors, especially basic industries, such as railway transport, electric-power generation, and public utilities generally. To the extent that their capacity had been under-utilized previously, the new situation naturally led to a lowering of the capital coefficients in these sectors.<sup>1</sup>

(c) *Capital coefficients of individual industries.* Although it is particularly difficult to obtain reliable estimates of capital coefficients for individual industries, the figures given in Table IX below do permit the drawing of broad conclusions.

While all the coefficients given above show a tendency to decline, it is most noticeable in the case of the South African Railways and Harbours and Agriculture, both based on the total capital stock. As regards the former, this was brought about by the fuller utilization of the existing permanent way and rolling stock, while in the latter case it was due to the relative decline of inventories (i.e. livestock) in the agricultural field.

It will also be noted that of the three major industrial categories distinguished in Table IX, Agriculture had the highest capital-output ratio, followed by Mining and Manufacturing industry. In view of the declining importance of Agriculture, and, to a lesser extent, Mining, in the total capital stock, and the

<sup>1</sup> This is, of course, the reverse of the situation which existed in the pre-Union period, when indivisible items, such as railway lines, had to be constructed ahead of the existing demand for their services, thus causing an unavoidable under-utilization of these resources.

increase in the percentage share of Manufacturing, it may be expected that the trend towards a lower overall capital-output ratio will continue.

TABLE IX  
*Capital Coefficients of Individual Industries*  
(Arithmetic averages for overlapping decades)

Decade	Agriculture		Mining		Manufacturing		South African Railways and Harbours
	Total Capital Stock	Fixed Capital Stock	Total Capital Stock	Fixed Capital Stock	Total Capital Stock	Fixed Capital Stock	Total Capital Stock
1919-23	5.4	2.3	2.1	2.0	1.8	1.2	7.5
1924-33	6.3	2.9	1.8	1.8	1.8	1.1	7.1
1929-38	6.5	3.2	1.7	1.6	1.8	1.1	6.6
1934-43	5.5	2.9	1.6	1.5	1.7	1.0	5.9
1939-48	4.8	2.6	1.8	1.7	1.6	0.9	5.4
1944-45	3.5	2.1	2.0	1.9	1.6	0.9	4.5

(d) *The composition of the capital stock.* Mention has been made above of the changes in the Union's capital structure as a result of the industrialization process since 1910. Details of the changes in the percentage distribution, by industry, of the reproducible capital stock are given in Table X. Manufacturing industry's share in the total stock exceeded that of mining since the 1939-48 decade. Although the recent growth of manufacturing was more rapid than that of mining, it is nevertheless remarkable that the gold-mining industry, which is based on wasting assets, and which acted as a pioneer in the modern development of the economy in the last century, continued to experience steady secular expansion.<sup>1</sup>

Attention must also be drawn to the substantial percentage

<sup>1</sup> Pessimistic forecasts about the future of the industry were dispelled from time to time by geological surveys which revealed the existence of other areas where gold could be mined on a profitable basis. During the twenties the original mining area on the Central and Western Rand was expanded by the addition of the goldfields on the 'Far East Rand', while ultra-deep mining (i.e. depths more than 7,500 feet) was resorted to in the older mines. Since the thirties, further new goldfields have been opened up in three other areas in Transvaal and in the Orange Free State. As in the pre-Union period, the opening up of new fields stimulated vast capital investment in ancillary activities, e.g. transportation, urban development, public utilities, etc. During recent years, the lives of many gold-mines have also been extended by the exploitation of a valuable by-product viz. uranium.



share of the public sector (excluding public corporations) in the national capital stock. According to the available data, it would appear that this share remained practically stationary at about one-third during the period under review. The capital assets of

TABLE X  
*Percentage Distribution of Reproducible Stock, in 1938 Prices,  
by Industries*

Decade	Agriculture	Mining	Manufacturing <sup>1</sup>	Residential Buildings <sup>2</sup>	Other Private	Total Private	South African Railways and Harbours	Other Public	Total Public	Grand Total
<i>A. Total Assets</i>										
1909-18	27	13	5		23	68	19	13	32	100
1914-23	28	12	6		22	68	19	13	32	100
1919-28	29	11	6		22	68	18	14	32	100
1924-33	28	10	7	11	12	68	17	15	32	100
1929-38	26	10	8	12	12	68	16	16	32	100
1934-43	22	11	10	12	12	67	15	18	33	100
1939-48	21	10	11	13	12	67	14	19	33	100
1944-55 <sup>3</sup>	19	10	13	13	12	67	13	20	33	100
<i>B. Fixed Assets</i>										
1909-18	15	16	5		22	58	25	17	42	100
1914-23	16	16	5		21	58	24	18	42	100
1919-28	17	14	6		20	57	24	19	43	100
1924-33	17	13	6	15	6	57	23	20	43	100
1929-38	17	12	7	16	6	58	20	22	42	100
1934-43	15	13	7	16	7	58	19	23	42	100
1939-48	15	12	8	16	7	58	17	25	42	100
1944-45 <sup>3</sup>	15	11	11	16	7	60	15	25	40	100

<sup>1</sup> Including Public Corporations.

<sup>2</sup> It is noteworthy that the percentage share of residential buildings in the Union's total capital stock is lower than similar figures for other Western countries. The reasons for this are, among others, that: (1) for technical reasons, European farm-houses were included under the heading 'Agriculture' in this table, and (2) municipal returns, which were the main source on residential buildings in the present study, cover dwellings of non-Europeans living in the urban areas, but not those of non-Europeans in rural and tribal areas. Almost three-fourths of the Natives, and a substantial portion of the Coloured and Asiatic population groups, live in non-urban areas. Unfortunately, however, it was not possible to include an estimate of the value of these rural dwellings in the present calculations, as that would have entailed extensive field surveys.

<sup>3</sup> Twelve-year period.

the South African Railways and Harbours Administration (a government enterprise, as mentioned earlier) used to form the main component of the public sector's reproducible capital, but as a result of the establishment and expansion of other public projects, it no longer dominates the capital formation of this sector.

A further breakdown of the capital stock, viz. by type of assets, is given in Table XI. Since 1909 the percentage share of machinery and equipment in the total remained more or less the same, but that of inventories declined.<sup>4</sup>

<sup>4</sup> One reason for this is the decline in the share of agricultural inventories (i.e. livestock) in all agricultural assets, viz. from 59 per cent in 1909-18, to 39 per cent in 1944-53.

(e) *Additions to the capital stock.* The data set out in Table XII show a high ratio of gross domestic capital formation to gross national expenditure since 1910. The table also illustrates

TABLE XI  
*Percentage Distribution of Capital Assets in 1938 Prices by Type of Asset*

Decade	Buildings and Structures	Machinery and Equipment	Inventories	Total
1909-18 . . .	57	17	26	100
1914-23 . . .	58	16	26	100
1919-28 . . .	58	15	27	100
1924-33 . . .	58	15	27	100
1929-38 . . .	60	15	25	100
1934-43 . . .	61	16	23	100
1939-48 . . .	62	16	22	100
1944-55 <sup>1</sup> . . .	61	18	21	100

TABLE XII  
*Consumption, Domestic Capital Formation, and the Balance on Current Account (in Current Prices)*  
(Annual averages for decades)

Decade	Consumption	Gross Domestic Capital Formation	Total Domestic Expenditure	Balance on Current Account	Gross National Product at Market Prices
<i>A. £ Million</i>					
1919-28	203	46	249	- 7	242
1924-33	228	40	268	- 3	265
1929-38	261	57	318	- 1	317
1946-55	1,021	364	1,385	-88	1,297
<i>B. Percentage Distribution</i>					
1919-28	84	19	103	- 3	100
1924-33	86	15	101	- 1	100
1929-38	82	18	100	- 0	100
1946-55	79	28	107	- 7	100

balance on current account in the Union's national accounts. It is seen that throughout this period <sup>2</sup> domestic expenditure, or the contribution of the foreign sector, as measured by the

<sup>1</sup> Twelve-year period.

<sup>2</sup> The figures do not cover the war period 1939-45, as no estimates of the balance on current account are available for these years.

total available supply, exceeded the gross national expenditure, thus allowing consumers, entrepreneurs, and government authorities additional latitude for the satisfaction of their current requirements over and above the limits imposed by the size of the nation's own productive efforts.

The relationship between gross and net capital formation, on the one hand, and the gross and net national product, on the other, is shown in Table XIII.

TABLE XIII  
*Domestic Capital Formation as a Percentage of National Product  
for Overlapping Decades*

Decade	Gross Capital Formation as Percentage of Gross National Product		Net Capital Formation as Percentage of Net National Product	
	Current Prices	1938 Prices	Current Prices	1938 Prices
1919-28 . . .	18.8	18.7	13.3	12.1
1924-33 . . .	15.1	17.4	8.7	10.8
1929-38 . . .	18.0	19.1	11.9	12.7
1934-43 . . .	17.6	15.1	12.2	8.9
1939-48 . . .	19.7	13.7	15.2	8.0
1944-55 <sup>1</sup> . . .	26.6	17.7	21.9	12.2

<sup>1</sup> Twelve-year period.

The percentage share of the Union's Gross Capital Formation in the Gross National Product amounted to 16.9 per cent over the period 1919-55, and 17.7 per cent during the post-war period (1944-55). It follows, therefore, that during the period under review the Union offered attractive investment opportunities, not only for the employment of capital in the exploitation of previously untapped natural resources but also for the expansion of existing material assets as a result of rapid population growth.

# APPENDIX I

## TABLES

### TABLE I

*Capital Stock at Depreciated Original Cost*  
(£ million)

Year	Fixed Assets									Inventories	GRAND TOTAL	
	Agriculture	Mining	Manufac- turing <sup>1</sup>	Residential Buildings	Other Private	Total Private	South African Railways and Harbours	Other Public	Total Public			Total Private and Public
1909	41	47	13		67	168	82	56	138	306	149	455
1910	44	50	14		69	177	83	60	143	320	153	473
1911	46	56	17		71	190	86	62	148	338	158	496
1912	48	58	18		73	197	88	66	154	351	170	521
1913	51	61	18		75	205	92	68	160	365	173	538
1914	55	61	19		77	212	96	70	166	378	153	531
1915	58	61	20		77	216	99	72	171	387	145	532
1916	58	62	23		77	220	100	73	173	393	158	551
1917	59	63	25		79	226	100	74	174	400	167	567
1918	61	64	28		79	232	100	77	177	409	206	615
1919	65	65	30		81	241	103	80	183	424	233	657
1920	72	68	32		86	258	109	84	193	451	266	717
1921	77	70	34		90	271	114	89	203	474	227	701
1922	79	70	37	61	32	279	117	93	210	489	185	674
1923	82	71	38	64	33	288	120	98	218	506	200	706
1924	88	75	38	67	33	301	127	102	229	530	215	745
1925	93	76	39	69	34	311	132	108	240	551	221	772
1926	97	76	41	74	35	323	138	113	251	574	222	796
1927	102	76	44	77	35	334	143	119	262	596	231	827
1928	106	77	46	82	37	348	148	124	272	620	241	861
1929	113	77	47	88	39	364	153	130	283	647	243	890
1930	115	78	48	93	40	374	158	135	293	667	221	888
1931	117	79	48	97	40	381	160	141	301	682	192	874
1932	118	78	49	99	40	384	160	146	306	690	161	851
1933	118	80	51	101	40	390	160	150	310	700	181	881
1934	121	84	53	106	42	406	162	156	318	724	213	937
1935	125	92	60	113	45	435	164	165	329	764	225	989
1936	128	100	67	120	50	465	171	176	347	812	243	1,055
1937	133	110	71	128	56	498	178	190	368	866	269	1,135
1938	138	120	76	137	62	533	190	206	396	929	284	1,213
1939	142	127	80	147	67	563	197	225	422	985	293	1,278
1940	146	130	83	153	70	582	201	240	441	1,023	310	1,333
1941	150	133	86	159	72	600	202	252	454	1,054	343	1,397
1942	152	133	90	161	74	610	205	259	464	1,074	369	1,443
1943	156	130	95	161	74	616	207	269	476	1,092	399	1,491
1944	162	131	105	167	75	640	212	279	491	1,131	421	1,552
1945	169	132	119	176	79	675	221	292	513	1,188	435	1,623
1946	180	136	132	192	83	723	233	315	548	1,271	479	1,750
1947	196	145	150	215	92	798	248	344	592	1,390	637	2,027
1948	224	158	181	243	103	909	267	382	649	1,558	707	2,265
1949	252	176	219	272	120	1,039	296	422	718	1,757	727	2,484
1950	275	204	255	297	137	1,168	316	462	778	1,946	779	2,725
1951	309	237	299	330	158	1,333	331	505	836	2,169	971	3,140
1952	339	287	353	375	190	1,544	356	559	915	2,459	1,025	3,484
1953	370	333	430	420	222	1,775	399	616	1,015	2,790	1,028	3,818
1954	404	380	502	467	252	2,005	434	679	1,113	3,118	1,070	4,188
1955	440	416	556	520	281	2,213	465	748	1,213	3,426	1,153	4,579

<sup>1</sup> Including public corporations.

TABLE II  
*Depreciated Capital Stock in 1938 Prices*  
 (£ million)

Year	Fixed Assets										Inventories	GRAND TOTAL
	Agriculture	Mining	Manufacturing <sup>1</sup>	Residential Buildings	Other Private	Total Private	South African Railways and Harbours	Other Public	Total Public	Total Private and Public		
1909	53	60	17		87	217	105	63	168	385	149	534
1910	56	64	19		89	228	107	66	173	401	152	553
1911	59	65	20		92	236	107	69	176	412	160	572
1912	62	74	22		94	252	109	73	182	434	167	601
1913	65	76	22		96	259	112	77	189	448	161	609
1914	69	76	22		98	265	115	79	194	459	157	616
1915	71	75	22		98	266	115	80	195	461	147	608
1916	71	74	23		97	265	114	81	195	460	146	606
1917	71	73	24		95	263	112	80	192	455	139	594
1918	71	71	24		93	259	110	81	191	450	151	601
1919	72	70	24		93	259	109	82	191	450	147	597
1920	75	69	24		93	261	110	83	193	454	163	617
1921	77	69	25		94	265	111	86	197	462	183	645
1922	79	68	26	66	30	269	111	88	199	468	176	644
1923	81	69	27	68	31	276	114	92	206	482	184	666
1924	85	72	28	71	32	288	117	97	214	502	194	696
1925	91	73	29	73	32	298	121	102	223	521	205	726
1926	95	73	32	77	33	310	126	107	233	543	209	752
1927	99	74	34	81	34	322	130	112	242	564	221	785
1928	106	75	37	86	36	340	135	119	254	594	231	825
1929	113	76	39	93	38	359	140	124	264	623	247	870
1930	116	77	40	98	39	370	144	131	275	645	249	894
1931	118	79	40	103	40	380	145	139	284	664	236	900
1932	119	79	43	106	41	388	146	145	291	679	222	901
1933	121	81	45	109	42	398	145	150	295	693	216	909
1934	126	86	48	115	44	419	147	158	305	724	233	957
1935	129	96	56	123	49	453	150	168	318	771	249	1,020
1936	135	107	64	132	55	493	157	181	338	831	268	1,099
1937	140	116	69	140	61	526	163	195	358	884	279	1,163
1938	143	126	73	148	66	556	174	212	386	942	288	1,230
1939	147	132	75	158	71	583	181	230	411	994	292	1,286
1940	149	133	76	162	72	592	181	240	421	1,013	289	1,302
1941	151	133	76	164	72	596	181	246	427	1,023	286	1,309
1942	151	130	77	164	71	593	179	250	429	1,022	268	1,290
1943	151	127	77	163	70	588	179	254	433	1,021	262	1,283
1944	153	125	81	165	70	594	179	258	437	1,031	269	1,300
1945	156	124	86	168	71	605	181	264	445	1,050	273	1,323
1946	161	124	92	176	72	625	187	275	462	1,087	323	1,410
1947	168	126	100	187	76	657	192	289	481	1,138	369	1,507
1948	180	131	112	199	80	702	199	307	506	1,208	390	1,598
1949	191	138	129	211	86	755	210	325	535	1,290	387	1,677
1950	199	147	143	221	93	803	215	340	555	1,358	381	1,739
1951	211	157	155	231	98	852	218	355	573	1,425	405	1,830
1952	217	170	168	243	107	905	222	369	591	1,496	378	1,874
1953	226	184	192	257	117	976	233	388	621	1,597	374	1,971
1954	237	199	216	272	127	1,051	243	409	652	1,703	383	2,086
1955	247	209	231	289	135	1,111	251	431	682	1,793	400	2,193

<sup>1</sup> Including public corporations.

TABLE III  
*Depreciated Capital Stock in Current Prices*  
 (£ million)

Year	Fixed Assets										Inventories	GRAND TOTAL
	Agriculture	Mining	Manufacturing <sup>1</sup>	Residential Buildings	Other Private	Total Private	South African Railways and Harbours	Other Public	Total Public	Total Private and Public		
1909	41	47	13		68	169	82	49	131	300	149	449
1910	44	50	15		69	178	83	51	134	312	153	465
1911	47	51	16		73	187	84	55	139	326	158	484
1912	48	57	17		72	194	84	56	140	334	170	504
1913	53	62	18		78	211	91	63	154	365	173	538
1914	62	68	20		87	237	102	71	173	410	153	563
1915	79	83	24		109	295	127	89	216	511	145	656
1916	100	104	32		137	373	161	114	275	648	158	806
1917	135	139	46		179	499	213	152	365	864	167	1,031
1918	161	161	54		211	587	249	184	433	1,020	206	1,226
1919	145	141	48		189	523	220	166	386	909	233	1,142
1920	167	153	53		207	580	245	184	429	1,009	266	1,275
1921	139	125	45		170	479	201	155	356	835	227	1,062
1922	101	87	33	84	38	343	142	112	254	597	185	782
1923	96	81	32	80	37	326	134	109	243	569	200	769
1924	95	81	31	80	36	323	131	109	240	563	215	778
1925	96	76	30	76	34	312	126	107	233	545	221	766
1926	96	74	33	78	34	315	128	109	237	552	222	774
1927	98	73	34	80	34	319	129	111	240	559	231	790
1928	99	70	35	80	34	318	126	111	237	555	241	796
1929	104	70	36	85	35	330	129	114	243	573	243	816
1930	107	71	37	91	36	342	133	121	254	596	221	817
1931	102	69	35	90	35	331	126	121	247	578	192	770
1932	95	63	34	85	33	310	117	116	233	543	161	704
1933	101	68	38	91	35	333	121	126	247	580	181	761
1934	107	73	41	98	37	356	125	134	259	615	213	828
1935	110	82	48	104	42	386	128	143	271	657	225	882
1936	116	91	55	113	47	422	134	155	289	711	243	954
1937	139	114	68	138	60	519	161	192	353	872	269	1,141
1938	143	126	73	148	66	556	174	212	386	942	284	1,226
1939	147	133	75	159	71	585	182	231	413	998	293	1,291
1940	192	170	97	207	92	758	232	307	539	1,297	310	1,607
1941	230	201	116	250	110	907	275	375	650	1,557	343	1,900
1942	256	221	131	279	121	1,008	304	425	729	1,737	369	2,106
1943	268	226	137	290	125	1,046	318	452	770	1,816	399	2,215
1944	272	223	145	295	125	1,060	320	460	780	1,840	421	2,261
1945	273	217	150	294	124	1,058	317	461	778	1,836	435	2,271
1946	280	215	160	306	125	1,086	325	477	802	1,888	529	2,417
1947	320	240	191	357	145	1,253	366	551	917	2,170	637	2,807
1948	363	264	226	401	161	1,415	401	619	1,020	2,435	707	3,142
1949	399	288	270	441	180	1,578	439	679	1,118	2,696	727	3,423
1950	441	325	316	489	206	1,777	476	752	1,228	3,005	779	3,784
1951	555	413	408	608	258	2,242	574	934	1,508	3,750	971	4,721
1952	674	528	521	754	332	2,809	689	1,145	1,834	4,643	1,025	5,668
1953	634	517	539	722	329	2,741	654	1,090	1,744	4,485	1,028	5,513
1954	643	539	586	737	344	2,849	659	1,109	1,768	4,617	1,070	5,687
1955	697	589	651	815	381	3,133	708	1,215	1,923	5,056	1,153	6,209

<sup>1</sup> Including public corporations.

TABLE IV  
*Gross and Net Capital Formation (Union Total) - by  
 Type of Asset*  
 (£ million)

Year	Building and Construction			Machinery, Plant, and Equipment			Change in Inventories	Transfer Costs	Total		
	Gross	Depreciation	Net	Gross	Depreciation	Net			Gross	Depreciation	Net
1910	13.8	3.6	10.2	8.3	5.2	3.1	3.9	0.3	26.3	8.8	17.5
1911	15.9	3.7	12.2	10.9	5.5	5.4	6.4	0.5	33.7	9.2	24.5
1912	15.5	3.8	11.7	8.1	5.7	2.4	7.0	0.5	31.1	9.5	21.6
1913	15.7	4.1	11.6	7.6	6.0	1.6	1.8	0.6	25.7	10.1	15.6
1914	15.2	4.1	11.1	8.3	6.1	2.2	-5.4	0.3	18.4	10.2	8.2
1915	11.4	4.2	7.2	7.0	6.2	0.8	-5.7	0.3	13.0	10.4	2.6
1916	9.4	4.6	4.8	8.3	6.3	2.0	4.8	0.5	23.0	10.9	12.1
1917	9.7	4.6	5.1	8.8	6.4	2.4	0.6	0.5	19.6	11.0	8.6
1918	10.9	4.7	6.2	9.3	6.9	2.4	17.3	0.6	38.1	11.6	26.5
1919	15.7	5.0	10.7	11.8	7.4	4.4	19.4	1.2	48.1	12.4	35.7
1920	22.0	5.5	16.5	17.8	7.9	9.9	30.4	1.4	71.6	13.4	58.2
1921	21.4	5.8	15.6	16.4	8.7	7.7	-14.2	0.8	24.4	14.5	9.9
1922	18.6	6.0	12.6	10.7	8.9	1.8	-11.8	0.7	18.2	14.9	3.3
1923	22.0	6.0	16.0	10.7	9.3	1.4	11.1	0.8	44.6	15.3	29.3
1924	25.2	6.4	18.8	14.2	9.5	4.7	9.4	0.9	49.7	15.9	33.8
1925	23.6	6.7	16.9	14.0	10.1	3.9	8.3	0.9	46.8	16.8	30.0
1926	26.1	7.1	19.0	15.1	10.6	4.5	7.7	1.1	50.0	17.7	32.3
1927	25.1	7.2	17.9	14.6	10.7	3.9	7.1	1.0	47.8	17.9	29.9
1928	27.0	7.4	19.6	15.9	10.9	5.0	10.9	1.2	55.0	18.3	36.7
1929	29.2	7.9	21.3	16.0	11.4	4.6	4.6	1.1	50.9	19.3	31.6
1930	28.9	8.2	20.7	12.3	11.5	0.8	-0.8	0.7	33.9	19.7	14.2
1931	24.4	8.3	16.1	9.6	11.3	-1.7	-14.8	0.7	19.9	19.6	0.3
1932	19.2	8.4	10.8	8.1	11.2	-3.1	-24.3	0.4	3.4	19.6	-16.2
1933	19.3	8.7	10.6	10.8	11.5	-0.7	10.0	0.6	40.7	20.2	20.5
1934	27.9	8.9	19.0	17.1	11.8	5.3	10.4	1.0	56.4	20.7	35.7
1935	37.6	9.3	28.3	24.2	12.8	11.4	14.5	1.0	77.3	22.1	55.2
1936	45.4	9.9	35.5	27.2	14.1	13.1	18.6	1.2	92.4	24.0	68.4
1937	51.8	10.6	41.2	29.0	15.4	13.6	17.7	1.2	99.7	26.0	73.7
1938	57.3	11.4	45.9	33.2	16.5	16.7	3.7	1.2	95.4	27.9	67.5
1939	57.8	12.1	45.7	27.7	17.6	10.1	10.4	1.0	96.9	29.7	67.2
1940	45.8	12.4	33.4	22.4	18.1	4.3	14.0	1.0	83.2	30.5	52.7
1941	41.3	13.0	28.3	21.6	18.8	2.8	16.9	1.4	81.2	31.8	49.4
1942	33.3	13.2	20.1	18.6	19.1	-0.5	2.2	1.8	55.9	32.3	23.6
1943	31.9	13.5	18.4	19.4	19.2	0.2	4.3	2.5	58.1	32.7	25.4
1944	43.3	13.9	29.4	29.3	20.0	9.3	8.7	3.4	84.7	33.9	50.8
1945	53.3	14.4	38.9	39.7	21.8	17.9	8.2	3.9	105.1	36.2	68.9
1946	74.7	15.4	59.3	48.1	24.1	24.0	79.6	5.2	207.6	39.5	168.1
1947	98.8	16.5	82.3	65.1	27.9	37.2	94.4	5.5	263.8	44.4	219.4
1948	120.8	18.0	102.8	99.1	34.2	64.9	66.0	5.6	291.5	52.2	239.3
1949	137.9	19.7	118.2	122.5	41.4	81.1	12.5	4.0	276.9	61.1	215.8
1950	142.1	21.9	120.2	116.2	47.8	68.4	35.3	4.2	297.8	69.7	228.1
1951	167.1	24.2	142.9	136.5	55.9	80.6	149.0	6.1	458.7	80.1	378.6
1952	216.3	27.2	189.1	165.6	65.4	100.2	7.5	6.3	395.7	92.6	303.1
1953	236.7	30.4	206.3	202.0	77.4	124.6	-13.2	6.8	432.3	107.8	324.5
1954	240.7	33.8	206.9	211.6	88.6	123.0	29.3	8.1	489.7	122.4	367.3
1955	249.6	37.2	212.4	196.7	99.2	97.5	72.7	8.2	527.2	136.4	390.8

TABLE V  
*Gross and Net Capital Formation (Union Total) - by Sector*  
 (£ million)

Year	Public Authorities			Public Corporations			Private Businesses			Transfer Costs	Total		
	Gross	Depreciation	Net	Gross	Depreciation	Net	Gross	Depreciation	Net		Gross	Depreciation	Net
1910	6.2	1.8	4.4	—	—	—	19.8	7.0	12.8	0.3	26.3	8.8	17.5
1911	6.7	1.8	4.9	0.1	—	0.1	26.4	7.4	19.0	0.5	33.7	9.2	24.5
1912	8.3	1.9	6.4	0.1	—	0.1	22.2	7.6	14.6	0.5	31.1	9.5	21.6
1913	9.0	2.1	6.9	0.1	—	0.1	16.0	8.0	8.0	0.6	25.7	10.1	15.6
1914	8.4	2.1	6.3	0.1	—	0.1	9.6	8.1	1.5	0.3	18.4	10.2	8.2
1915	5.6	2.1	3.5	—	—	—	7.1	8.3	-1.2	0.3	13.0	10.4	2.6
1916	4.2	2.2	2.0	—	—	—	18.3	8.7	9.6	0.5	23.0	10.9	12.1
1917	3.9	2.3	1.6	0.1	—	0.1	15.1	8.7	6.4	0.5	19.6	11.0	8.6
1918	5.6	2.4	3.2	0.1	—	0.1	31.8	9.2	22.6	0.6	38.1	11.6	26.5
1919	10.1	2.6	7.5	0.1	—	0.1	36.7	9.8	26.9	1.2	48.1	12.4	35.7
1920	14.5	2.9	11.6	0.2	—	0.2	55.5	10.5	45.0	1.4	71.6	13.4	58.2
1921	13.2	3.1	10.1	0.3	—	0.3	10.1	11.4	-1.3	0.8	24.4	14.5	9.9
1922	9.0	3.3	5.7	0.5	—	0.5	8.0	11.6	-3.6	0.7	18.2	14.9	3.3
1923	10.7	3.4	7.3	0.2	—	0.2	32.9	11.9	21.0	0.8	44.6	15.3	29.3
1924	14.8	3.5	11.3	0.2	0.1	0.1	33.8	12.3	21.5	0.9	49.7	15.9	33.8
1925	15.2	3.9	11.3	0.9	0.2	0.7	29.8	12.7	17.1	0.9	46.8	16.8	30.0
1926	15.5	4.1	11.4	1.0	0.3	0.7	32.4	13.3	19.1	1.1	50.0	17.7	32.3
1927	15.4	4.1	11.3	1.2	0.3	0.9	30.2	13.5	16.7	1.0	47.8	17.9	29.9
1928	14.6	4.2	10.4	0.9	0.4	0.5	38.3	13.7	24.6	1.2	55.0	18.3	36.7
1929	15.4	4.5	10.9	0.6	0.4	0.2	33.8	14.4	19.4	1.1	50.9	19.3	31.6
1930	15.2	4.8	10.4	1.5	0.4	1.1	16.5	14.5	2.0	0.7	33.9	19.7	14.2
1931	12.4	4.9	7.5	0.6	0.4	0.2	6.2	14.3	-8.1	0.7	19.9	19.6	0.3
1932	8.7	5.1	3.6	2.0	0.5	1.5	-7.7	14.0	-21.7	0.4	3.4	19.6	-16.2
1933	9.0	5.2	3.8	2.6	0.6	2.0	28.5	14.4	14.1	0.6	40.7	20.2	20.5
1934	13.5	5.2	8.3	2.3	0.7	1.6	39.6	14.8	24.8	1.0	56.4	20.7	35.7
1935	18.1	5.5	12.6	3.4	0.9	2.5	54.8	15.7	39.1	1.0	77.3	22.1	55.2
1936	23.9	5.8	18.1	3.3	1.1	2.2	64.0	17.1	46.9	1.2	92.4	24.0	68.4
1937	28.8	6.2	22.6	2.9	1.2	1.7	66.8	18.6	48.2	1.2	99.7	26.0	73.7
1938	36.6	6.8	29.8	3.5	1.3	2.2	54.1	19.8	34.3	1.2	95.4	27.9	67.5
1939	32.9	7.3	25.6	2.3	1.3	1.0	60.7	21.1	39.6	1.0	96.9	29.7	67.2
1940	27.4	7.6	19.8	2.3	1.3	1.0	52.5	21.6	30.9	1.0	83.2	30.5	52.7
1941	21.6	8.0	13.6	3.0	1.5	1.5	55.2	22.3	32.9	1.4	81.2	31.8	49.4
1942	19.3	8.3	11.0	4.8	1.7	3.1	30.0	22.3	7.7	1.8	55.9	32.3	23.6
1943	20.2	8.4	11.8	5.2	1.9	3.3	30.2	22.4	7.8	2.5	58.1	32.7	25.4
1944	25.0	8.7	16.3	2.5	1.9	0.6	53.8	23.3	30.5	3.4	84.7	33.9	50.8
1945	31.7	9.0	22.7	1.8	1.9	-0.1	67.7	25.3	42.4	3.9	105.1	36.2	68.9
1946	42.2	9.7	32.5	3.5	1.9	1.6	156.7	27.9	128.8	5.2	207.6	39.5	168.1
1947	58.0	10.6	47.4	6.0	2.1	3.9	194.3	31.7	162.6	5.5	263.8	44.4	219.4
1948	74.3	12.0	62.3	11.8	2.8	9.0	199.8	37.4	162.4	5.6	291.5	52.2	239.3
1949	87.6	13.5	74.1	17.6	3.7	13.9	167.7	43.9	123.8	4.0	276.9	61.1	215.8
1950	72.8	14.8	58.0	19.5	4.8	14.7	201.3	50.1	151.2	4.2	297.8	69.7	228.1
1951	74.4	16.3	58.1	22.6	5.8	16.8	355.6	58.0	297.6	6.1	458.7	80.1	378.6
1952	102.0	18.2	83.8	30.4	7.4	23.0	257.0	67.0	190.0	6.3	395.7	92.6	303.1
1953	121.5	20.2	101.3	49.6	10.5	39.1	254.6	77.1	177.3	6.8	432.3	107.8	324.5
1954	121.0	22.5	98.5	40.7	12.8	27.9	319.9	87.1	232.8	8.1	489.7	122.4	367.3
1955	126.6	24.6	102.0	31.0	14.1	16.9	361.4	97.7	263.7	8.2	527.2	136.4	390.8



TABLE VI  
*National Product and Expenditure*  
 (£ million)

Year	Gross National Product at Factor Cost	Consumption Expenditure	Gross Domestic Capital Formation	Balance on Current Account	Gross National Expenditure at Market Prices ((2) + (3) + (4))	Less Indirect Tax Plus Subsidies	Gross National Expenditure at Factor Cost ((5) + (6))
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1918	176	145	38	4	187	-11	176
1919	214	160	48	20	228	-14	214
1920	219	202	72	-39	235	-16	219
1921	189	188	24	-6	206	-17	189
1922	192	194	18	-6	206	-14	192
1923	211	182	45	-1	226	-15	211
1924	222	194	50	-6	238	-16	222
1925	232	207	47	-5	249	-17	232
1926	241	224	50	-15	259	-18	241
1927	258	236	48	-6	278	-20	258
1928	270	244	55	-8	291	-21	270
1929	264	248	51	-14	285	-21	264
1930	249	242	34	-7	269	-20	249
1931	230	231	20	-3	248	-18	230
1932	232	232	3	17	252	-20	232
1933	258	217	41	20	278	-20	258
1934	290	250	56	5	311	-21	290
1935	315	258	77	3	338	-23	315
1936	348	288	92	-8	372	-24	348
1937	373	314	100	-14	400	-27	373
1938	389	328	95	-6	417	-28	389
1939	420	..	97	..	447	-27	420
1940	460	..	83	..	487	-27	460
1941	507	..	81	..	538	-31	507
1942	554	..	56	..	589	-35	554
1943	600	..	58	..	636	-36	600
1944	644	..	85	..	682	-38	644
1945	686	..	105	..	736	-50	686
1946	730	645	208	-65	788	-58	730
1947	803	762	264	-156	870	-67	803
1948	886	843	291	-178	956	-70	886
1949	978	883	277	-118	1,042	-64	978
1950	1,153	929	298	-9	1,218	-65	1,153
1951	1,283	1,010	459	-115	1,354	-71	1,283
1952	1,387	1,143	396	-74	1,465	-78	1,387
1953	1,533	1,260	432	-70	1,622	-89	1,533
1954	1,668	1,322	490	-45	1,767	-99	1,668
1955	1,778	1,412	527	-51	1,888	-110	1,778

## APPENDIX II

NOTES ON SOURCES OF INFORMATION ABOUT CAPITAL  
ACCUMULATION

The notes on the different sources of information are grouped below under three main headings, viz. (a) Public Authorities, (b) Public Corporations, and (c) Private Business Enterprises.

## (a) PUBLIC AUTHORITIES

(i) *Union Government*

*South African Railways and Harbours.* Data from the *Annual Report of the Controller and Auditor-General on the S.A. Railways Accounts* and the *Estimates of Expenditure*. Figures adjusted to exclude purchases of land and existing assets. For the period 1910-51, financial-year figures adjusted to calendar years. From 1952 onwards expenditure on calendar year basis estimated by the South African Railways and Harbours Administration directly.

*Other government enterprises.* Included hereunder are the Department of Posts, Telegraphs and Telephones, the South African Mint, the Government Printing Works, the Government Alluvial Diggings, the Government Garage, the Government Guano Islands, and the State Saw Mills. Information from the *Annual Report of the Controller and Auditor-General on the Appropriation and Miscellaneous Accounts (exclusive of Railways and Harbours)* and the *Finance Statements*, and directly from the enterprises concerned. Adjusted from financial to calendar years.

*General government.* Data from the *Annual Report* mentioned above. Includes capital expenditure from extra-budgetary funds, such as the South African Native Trust and other Native Councils and the National Parks Board, as well as the expenditure on houses built by the National Housing and Planning Commission for its own account; excludes expenditure on machinery and equipment and changes in inventories. Figures adjusted from financial to calendar years.

(ii) *Provincial administrations*

Information extracted from *Annual Reports* of the various Provincial Auditors. Includes the expenditure of the National Road Fund; excludes changes in inventories and expenditure on machinery and equipment, but includes expenditure on heavy machinery for road building.

(iii) *Local authorities*

*Fixed Assets. 1922-55.* Based on returns of capital expenditure submitted by local authorities under Statistics Act, 1914. Excludes expenditure on equipment by non-trading departments, but includes expenditure on heavy machinery for road building; includes expenditure on housing financed by the National Housing and Planning Commission.

Original statistics adjusted (a) by exclusion of purchases of land and existing assets (adjustment based on accounts of four largest municipalities); (b) from financial to calendar years.

Allocation between construction and equipment estimated by reference to accounts of four largest municipalities.

1910-21. Based on trend shown by four largest municipalities only.

*Inventories.* Comprehensive information available only from 1948. Estimates for earlier years based on accounts of four largest municipalities.

## (b) PUBLIC CORPORATIONS

The following organizations are included hereunder: Electricity Supply Commission, South African Iron and Steel Industrial Corporation, South African Coal, Oil, and Gas Corporation, Phosphate Development Corporation, Klipfontein Organic Products, South African Broadcasting Corporation, Rand Water Board, South African Reserve Bank, Land and Agricultural Bank of South Africa, Industrial Development Corporation, Fisheries Development Corporation.

Data from *Annual Reports* published by the various organizations listed above, supplemented by additional information obtained directly from the enterprises concerned and adjusted to calendar years where necessary.

## (c) PRIVATE BUSINESS ENTERPRISES

(i) *Farming*

*Fixed Assets. 1949-55.* Data from annual *Agricultural Census*.

1910-48. Census figures for construction extrapolated back to 1910 by means of a weighted index of: (a) net farm income; (b) value of construction in rural areas, and (c) value of fencing material used. Expenditure on machinery and implements (excluding motor vehicles) estimated from import, export, and local production figures. Motor vehicles estimated from: (a) the number of new registrations of passenger cars and commercial vehicles; (b) average price of each type of vehicle, and (c) percentage of vehicles belonging to farmers in 1936/37, 1946/47, and 1949/50. Fifty per cent of cost of passenger cars allocated to farming operations.

*Livestock.* Numbers of various types of livestock on farms from annual *Agricultural Census*. Prices for recent years obtained from the Division of Economics and Markets of the Department of Agriculture and extrapolated back to 1910 by means of the various meat-price indexes.

Other farm inventories ignored. Inventories held by Agricultural Control Boards included under item (vi).

All figures adjusted to calendar years.

(ii) *Mining*

Data from the table on 'Statistics of Capital' in the *Annual Report of the Government Mining Engineer*, adjusted to exclude Public Corporations with ancillary mining activities.

Excludes expenditure on mineral rights, options, and/or prospecting agreements over property and general prospecting work and boreholes.

(iii) *Manufacturing*

*Fixed Assets.* Information from *Population Census* of 1911 and annual *Census of Industrial Establishments* since 1915/16. All figures adjusted from financial to calendar years.

1910-48. As the figures supplied in returns refer to book values, depreciation allowances were added back so as to obtain gross values. Seventy per cent of land and buildings taken to represent buildings.

1949-55. Based on actual expenditure on new capital assets.

*Inventories.* See item (vi).

(iv) *Building construction*

Estimates based on annual and monthly data collected by the Bureau of Census and Statistics on the value of building plans passed and buildings completed in urban areas; figures adjusted to a 'work done' basis in accordance with an estimated construction period for the various types of buildings.

The Census Bureau's figures exclude farm and mine buildings. To exclude industrial and public buildings (which would otherwise be duplicated, as they are already accounted for in the returns of the Public Sector and the Manufacturing Census) an adjustment was made for the period 1910-46, based on information for later years.

Includes additions and alterations to existing structures, and a 2 per cent adjustment to take account of architects' and other fees.

A breakdown by type of building, i.e. residential and non-residential, was only possible since 1922.

(v) *Equipment of commercial and service establishments: banks and other financial institutions and professional persons*

1947-55. Based on the book value of equipment of commercial and service establishments in 1947 (from Distribution Census 1946/47), marked up to include other organizations, and extrapolated to 1955 by means of a sample of public companies. Depreciation at 10 per cent per annum added to net change in book values.

1910-47. Estimates based on the assumption that the expenditure of Commercial and Service establishments, etc., on equipment, constitutes a fixed percentage of the combined outlay of agriculture, mining, and manufacturing on fixed assets.

(vi) *Manufacturing and commercial inventories*

1910-38. In the absence of direct information, total investment in inventories (excluding farm inventories) taken as 40 per cent of the year-to-year change in national income over the years 1919-38, with arbitrary adjustments for the depression years 1930-33. Figures for 1910-18 estimated from import figures and the relationship between national income and imports during 1918-29 (excluding 1920); no national-income series is available for the whole period 1910-17.

Manufacturing component of the overall inventory total based on the relationship between manufacturing inventories and the gross value of output of manufacturing for 1938-53.

1939-55. Estimates of the calendar year changes since 1952 in both commercial and manufacturing inventories based on bench-mark data extracted from the *Census of Distribution and Service Establishments*, 1946/47 and 1951/52, and the *Census of Industrial Establishments*, 1948/49 to 1951/52, and sample data compiled by the South African Reserve Bank on a monthly basis.

Financial year estimates for the years 1938 to 1951 derived from (a) the above-mentioned bench-mark figures and (b) sample data compiled by the Reserve Bank on an annual basis. Financial year figures adjusted to calendar years on the basis of the half-yearly import figures.

Includes inventories held by Agricultural Control Boards for their own account.

(vii) *Transfer costs*

Includes indirect tax (viz. transfer duty) and  $\frac{3}{4}$  per cent of the value of immovable property transferred for conveyancers' fees and stamp duties.

## APPENDIX III

## SUMMARY TABLE OF NATIONAL WEALTH

(£ million)

Type of Asset  (1)	Estimate <sup>1</sup> <sup>2</sup>			
	Current Value		Base Price (1938) Value	
	Latest Year 1955 (2)	Comparison Year 1945 (3)	Latest Year 1955 (4)	Comparison Year 1945 (5)
<b>I. Reproducible Assets</b>				
1. Structures				
(a) Private				
(1) Dwellings . . . . .	629	239	223	136
(2) Other . . . . .	1,501	570	532	326
(b) Public <sup>3</sup>				
(1) Dwellings . . . . .	79	22	30	12
(2) Other civilian . . . . .	1,579	656	558	376
(3) Military . . . . .	..	..	..	..
2. Equipment				
(a) Private				
(1) Producer durables . . . . .	790	208	280	119
(2) Consumer durables <sup>4</sup> . . . . .	188	..	67	..
(b) Public <sup>3</sup>				
(1) Civilian . . . . .	479	141	170	81
(2) Military . . . . .	..	..	..	..
3. Livestock . . . . .				
	398	213	126	128
4. Inventories				
(a) Private				
	693	200	251	131
(b) Public				
(1) Civilian . . . . .	62	22	23	14
(2) Military . . . . .	..	..	..	..
5. Monetary metals . . . . .				
	75	206	43	171
6. Net foreign assets				
(a) Private . . . . .				
	..	..	..	..
(b) Public . . . . .				
	..	..	..	..
<b>II. Non-reproducible Assets</b>				
1. Land				
(a) Private				
(1) Agricultural . . . . .	1,182	498	224	226
(2) Other . . . . .	899	288	150	144
(b) Public . . . . .				
	329	102	55	51
2. Subsoil assets				
(a) Private . . . . .				
	..	..	..	..
(b) Public . . . . .				
	..	..	..	..

<sup>1</sup> All figures refer to net value, i.e. after allowing for accumulated depreciation.<sup>2</sup> Assets for which no estimates are available, are indicated by the sign ..<sup>3</sup> I.e. central and local governments and government-owned or controlled corporations and institutions.<sup>4</sup> Passenger cars only.