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Where Has All the Growth Gone? South African Manufacturing Industry 1970-2000

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NIEP

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SOUTH AFRICAN MANUFACTURING INDUSTRY 1970-2000

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1. INTRODUCTION

At the end of the 1960s, after a half century of rapid industrialisation, South Africa had a relatively advanced and diversified manufacturing sector. By the standards of today's advanced industrial countries, which feature in Gerschenkron's (1952) seminal analysis, South Africa was a very late industrialiser, but it was a very much earlier industrialiser than those East Asian countries which have been the stars of the manufacturing growth firmament since the 1960s.

Since the early 1970s, however, South Africa's manufacturing growth performance has deteriorated greatly, and has been especially poor since the early 1980s. This is the central fact which any account of South African manufacturing in the period 1970-2000 must seek to explain.

An account of how South Africa industrialised in the decades before 1970 is necessary for understanding subsequent developments, and the forces which dislodged South Africa from its earlier, robust growth trajectory. Section 2 thus provides a short description of the main features of South African industrial development from the eve of the First World War through to the beginning of the 1970s. Section 3 deals with developments during the 1970s, a decade notable for the great gold-led commodity price boom which began in 1972; and Section 4 with the period from the early 1980s through to the late 1990s, during which manufacturing output stagnated and employment declined. In the light of the discussion in earlier sections, Section 5 considers some further perspectives on the problems of South African manufacturing over the past thirty years, and their implications for the future sectoral growth path of the economy.

It should be emphasized that the aim of this study is to provide an overview of the evolution of South African manufacturing industry as a whole over the past thirty years, and

of the larger forces which have resulted in changes in its growth and sectoral structure. Details of the development of particular, individual manufacturing sectors, such as textiles and clothing, or the motor vehicle industry, are therefore not discussed. Furthermore, though the discussion may have policy implications, policies relating to the development of South African manufacturing, and ongoing attempts to formulate an effective response to the decline of this important part of the economy, are not a significant focus of this study.

2. THE DRIVE TO INDUSTRIALIATION THROUGH IMPORT SUBSTITUTION: 1911-1970

Hard data on the rate of growth and structure of manufacturing industry before World War I are it seems hard to come by. One view, however, is that with some notable exceptions[1], South African manufacturing industry grew relatively slowly during the first great wave of investment in gold mining, 1886-1911, and at the end of this period was in general of a rudimentary kind. The reasons for the rapid growth of manufacturing which began shortly thereafter are controversial.[2] One probably fundamental factor, however, was the abrupt collapse of new investment in gold mining in 1911 (Frankel 1967), which until then had absorbed most of the capital and technical expertise available to South Africa (Van Eck, 1961:101).

The emphasis in South African development shifted, thus, to exploiting the huge scope which existed at the time for industrialisation through import substitution. In 1916/7, the ratio of South Africa's imports to its GDP, and the ratio of manufactured imports to the domestic supply of manufactured goods (that is, the ratio of imports to gross output plus imports), both exceeded fifty per cent (Bell and Farrell, 1997:596). Furthermore, in the case of non-durable consumer goods, generally the focus of industrialisation in its early stages, imports consisted to a major extent of products of the most basic kind (De Kock, 1936). There was thus much scope for relatively easy import substitution.

Given the relatively large internal market created by gold, domestic producers took good advantage of the opportunities for profitable import substitution. From World War I

through to the end of the 1960s, South Africa industrialised largely through a process of import substitution.[3]

As Table 1 shows, manufacturing value added (MVA) grew rapidly. The highest MVA growth rate, though not the highest GDP growth rate, in any full decade shown in the table occurred in the period 1926/7 – 1936/7, which included the Great Depression.[4] Both the MVA and GDP growth rates, however, reached their peaks at 9.9 per cent and 6.3 per cent during 1960-65, with average annual growth rates during the 1960s as a whole of 8.6 per cent and 5.7 per cent respectively.[5]

As a result, the economy diversified considerably, away from primary commodities, towards manufacturing. The percentage share of manufacturing in the GDP increased from 6.2 in 1916/7 to 19.4 in 1956/7 (in constant 1956/7 prices) (TA du Plessis, 1965), and further to 22.8 per cent (in current prices) in 1970. Manufacturing output also became increasingly diversified.[6]

Also, manufactured exports became an increasingly large proportion of South Africa's total exports, rising from 8.2 per cent in 1916/7 to 26.3 per cent in 1956/7[7] and to 31.4 per cent in 1972 (owing partly to a leveling off of gold exports in 1965-70). The composition of manufactured exports also changed considerably, with the share of non-durable goods (especially food, beverages and tobacco) decreasing substantially in the thirty years to 1956/7; and those of natural resource-based manufactures (such as chemicals, iron and steel, non-ferrous metals, and pulp and paper), and of downstream durable goods industries (fabricated metal products, machinery, electrical machinery and transportation equipment) rising. (Bell et al, 1999:8).

Table 1

Average Annual Rates of Growth of GDP, Manufacturing Value Added (MVA), and Manufacturing Employment in South Africa 1916-2000 (%)

	GDP	MVA	Employment
1916/7-1926/7	4.00	6.80	1.82
1926/7-1936/7	3.90	8.90	5.60
1936/7-1946/7	3.70	6.10	6.38
1946/7-1956/7	5.50	7.50	5.12
1946-1950	4.10	9.03	7.02
1950-1955	4.89	7.48	5.39
1955-1960	4.11	4.56	0.66
1960-1965	6.28	9.85	6.93
1965-1970	5.15	7.38	2.84
1970-1975	3.65	5.93	3.93
1975-1980	3.09	4.47	1.90
1980-1985	1.35	0.95	0.47
1985-1990	1.67	1.59	1.09
1990-1995	0.86	0.15	-1.25
1995-1998	2.43	0.71	-1.66
1995-2000	2.45	1.11	N/A
1950-1960	4.50	6.01	3.00
1960-1970	5.71	8.61	4.87
1970-1980	3.37	5.20	2.91
1980-1990	1.51	1.27	0.78
1990-1998	1.45	0.36	-1.40
1990-2000	1.65	0.63	N/A
1970-1975	3.65	5.93	3.93
1975-1978	1.71	2.05	0.85
1978-1981	5.25	8.55	4.21
1975-1981	3.47	5.25	2.52
1970-1981	3.55	5.56	3.16

Source: GDP and MVA growth rates calculated for 1916/7-1956/7 from data in TA du Plessis (1965), and for 1946-2000 from South African Reserve Bank data. Employment growth rates for years from 1920 to 1970 derived from data in South African Statistics 1990, and for subsequent years from WEFA database.

Note: Employment growth rate for earliest period is for 1920-1926

The upshot of these developments was that, as noted earlier, by the early 1970s, South Africa had a relatively mature and diversified manufacturing sector. Comparison with South Korea helps put this in perspective. In 1970, some 58.3 per cent of South Korea's total MVA was still contributed by sub-sectors producing non-durable consumer goods, higher than for any year in South Africa since 1916/7; and the combined MVA share of fabricated metal products, the various capital goods sectors, and the motor vehicle industry, in South Korea was only 12.4 per cent, compared with 33.3 per cent in South Africa in 1972.[8]

Though with a considerable time lag, and at much lower levels of per capita income, South Africa, like some other natural resource abundant countries, such as Australia and Canada, had apparently made effective use of the internal market for manufactures, and of the rents, created by its natural resource abundance, to achieve a considerable degree of industrialisation.[9]

3. THE ONSET OF THE DECLINE IN MANUFACTURING VALUE ADDED AND GDP GROWTH DURING THE COMMODITY PRICE BOOM OF THE 1970S

3.1 Declining growth

As noted earlier, the average annual rates of growth of both GDP and MVA reached their peak of 6.3 per cent and 9.9 per cent respectively in 1960-65. They fell to 5.2 per cent and 7.4 percent respectively in 1965-70, further (to 3.7 per cent and 5.9 per cent) in 1970-75 and yet further (to 3.5 per cent and 5.3 per cent) in 1975-81 (averaging 3.5 per cent and 5.6 per cent in 1970-81 as a whole) (Table 1).[10] These MVA growth rates, in both 1970-75 and 1975-81, were lower than in any earlier full decade or five year period since World War I, for which figures are shown in Table 1, excepting only 1955-60.

This was the beginning of the decline of growth rates, and of the descent towards stagnation of the economy as a whole, but especially of manufacturing, which has characterised the period since the early 1980s. As is argued later, in so far as factors peculiar to South Africa are concerned, though other factors may have compounded and

propagated it, the initial impulse to decline was fundamental change in the South African economy in the years between 1965 and 1975.

Nearer to the surface, and more readily observable, however, the major feature of the 1970s was the great, gold-led commodity price boom which took off from about 1972.

3.2 The commodity price boom of the 1970s and the effect on relative prices

Superficially, conditions for growth were very favourable in the 1970s as a whole. The commodity price boom resulted in huge foreign exchange windfalls. Though interrupted by declines in the mid-1970s, the price of gold increased from a yearly average of about 52 US dollars in 1972 to 613 US dollars in 1980, before beginning its descent. Commodity prices in general followed a roughly similar pattern, with a large upswing from 1972 to 1980, interrupted by declines from late 1974 through to 1976-77.

The effect on the foreign currency value of South Africa's exports of goods was dramatic. Whereas total exports of goods (measured in constant US dollars) increased at an average annual rate of 5.03 per cent in 1965-70, in 1970-80 they grew at 12.4 per cent a year.[11] Exports of gold and 'other mining' (coal, diamonds, platinum, iron ore, etc) grew at 16.4 per cent and 15.3 per cent respectively between 1970 and 1980 (Table A1) (compared to absolute declines at 0.9 per cent and 1.9 per cent respectively in 1965-70) (Bell et al, 1999:Table 1).

A major effect of this was a substantial real appreciation of the foreign exchange value of the rand. Relative to its level in 1970-72, the real effective exchange rate (REER) was 9.4 per cent higher in 1974-78, 24.8 per cent higher in 1979-81, and 28.2 per cent higher in 1982-83.

3.3 The effects of the commodity price boom on manufacturing industry

3.3.1 Inter-sectoral differences in export growth rates

The commodity price boom, and the resulting real appreciation of the Rand, thus, represented a huge change in relative prices which impacted on manufacturing industry in various ways. One of these is reflected in the rate of growth and structure of manufactured exports. Whereas South Africa's total exports of goods including gold (measured in constant US dollars) grew at rates unprecedented at least since World War II, the average annual rate of growth of manufactured exports in the aggregate in 1970-80 (7.2 per cent) (Table 2) was slightly lower than in 1960-70 (8.0 per cent) (Bell et al, 1999:Table 1).

This is particularly remarkable considering that (measured in constant US dollars) the export growth rate of natural resource-based manufactures (represented by chemicals, iron and steel, non-ferrous metal basic industries, and pulp and paper) grew rapidly at 11.9 per cent a year in 1970-80 (Table 2). (The share of these sectors in total manufactured exports thus increased from 24.3 per cent in 1970 to 37.1 per cent in 1980. Table A2.)

As these figures suggest, the exports of non-natural resource-based, more downstream manufactures grew slowly in 1970-80. For instance, measured in constant US dollars, the export growth rate of the downstream durable goods group of industries (represented in this study by fabricated metal products, machinery, electrical machinery, motor vehicles and other transportation equipment) fell from an estimated 8.0 per cent a year in 1960-70, to 2.1 per cent in 1970-80 (Table 2). (Their share in total manufactured exports which had been strongly on the rise before 1956/7, and held steady in the 1960s, fell from 15.7 per cent in 1970 to 9.1 per cent in 1980. Table A2).

Table 2 : AVERAGE ANNUAL RATES OF GROWTH OF SOUTH AFRICA'S MANUFACTURED EXPORTS BY SECTOR AND INDUSTRY GROUP (%)																	
	Based on Exports in Constant (1995) US Dollars										Based on Constant Price Trade-Weighted Foreign Currency Units						
	1970-75	1975-80	1970-80	1980-85	1985-90	1980-90	1990-95	1995-98	1990-98		1970-80	1980-85	1985-90	1980-90	1990-95	1995-98	1990-98
CHEMICALS	7.06	13.61	10.29	-5.73	10.56	2.09	10.65	-1.91	5.76		8.9	1.47	3.66	2.56	10.92	3.16	7.94
IRON AND STEEL	9.14	18.73	13.83	-1.72	16.14	6.84	8.71	1.46	5.93		12.38	5.74	8.89	7.3	8.98	6.7	8.12
NON-FERROUS BASIC METALS	17.60	15.80	16.70	5.41	3.87	4.64	2.83	11.60	6.04		15.06	13.4	-2.62	5.09	3.08	17.37	8.23
PULP AND PAPER	2.24	8.68	5.41	4.14	14.58	9.23	13.40	-11.83	3.19		4.1	12.02	7.41	9.69	13.69	-7.28	5.32
TOTAL NATURAL RESOURCE-BASED GRP	8.58	15.31	11.89	-1.31	11.73	5.01	8.94	0.35	5.64		10.47	6.2	4.75	5.47	9.21	5.54	7.82
FABRICATED METAL PRODUCTS	4.29	4.71	4.50	-9.18	30.82	9.00	10.09	3.83	7.70		3	-2.23	22.58	9.48	10.36	9.21	9.93
MACHINERY And Equipment	-2.03	2.40	0.16	-7.29	20.29	5.61	13.47	-2.45	7.22		-1.16	-0.21	12.76	6.08	13.76	2.59	9.44
ELECTRICAL MACHINERY	0.10	5.22	2.63	-11.38	24.46	5.02	15.14	0.43	9.39		1.09	-4.73	16.6	5.39	15.41	5.62	11.64
MOTOR VEHICLES	3.60	6.23	4.91	-2.45	23.70	9.85	14.02	5.36	10.69		3.84	4.94	15.95	10.31	14.3	10.8	12.98
OTHER TRANSPORT EQUIPMENT	4.11	1.93	3.02	-10.09	19.35	3.59	10.17	2.85	7.37		1.35	-3.2	12	4.12	10.47	8.2	9.61
TOTAL DURABLE GOODS GROUP	0.46	3.71	2.07	-7.26	23.43	6.99	12.85	1.37	8.40		0.72	-0.2	15.7	7.46	13.13	6.61	10.64
TEXTILES	-0.70	5.95	2.57	-3.92	12.67	4.05	5.94	-2.20	2.81		1.2	3.4	5.61	4.5	6.2	2.86	4.93
WOOD AND WOOD PRODUCTS	15.89	38.10	26.51	-7.76	17.08	3.92	5.01	-2.16	2.26		22.81	-0.96	9.79	4.28	5.31	2.86	4.39
LEATHER PRODUCTS	-1.66	15.12	6.40	1.80	6.52	4.13	19.25	-2.71	10.49		4.33	9.9	-0.1	4.78	19.55	2.32	12.77
FURNITURE	2.34	41.70	20.42	-10.37	35.73	10.30	30.02	5.20	20.09		18.18	-3.18	26.86	10.82	30.38	10.62	22.59
FOOTWEAR	5.06	25.90	15.01	-11.81	15.77	1.04	11.79	-11.85	2.26		15.75	-4.93	8.33	1.49	11.95	-7.23	4.33
CLOTHING	4.88	15.41	10.02	-5.30	10.76	2.41	6.02	-4.28	2.03		8.27	1.98	3.77	2.87	6.29	0.68	4.15
TOTAL LABOUR-INTENSIVE GROUP	1.03	12.78	6.74	-4.83	13.57	3.96	10.16	-1.30	5.72		5.2	2.45	6.44	4.42	10.44	3.81	7.9
TV, RADIO & COMMUNICATION EQUIPMT	-2.19	0.33	-0.94	1.77	21.00	10.96	20.79	8.80	16.15		-1.84	8.97	13.67	11.3	21.18	14.41	18.6
PROFESSIONAL & SCIENTIFIC EQUIPMT	-4.54	1.63	-1.50	-4.38	19.55	6.92	12.18	1.93	8.22		-2.52	3.02	12.04	7.43	12.43	7.19	10.44
OTHER MANUFACTURING SECTORS	9.91	2.21	5.99	-14.22	14.69	-0.81	4.49	-2.97	1.63		4.68	-7.7	7.52	-0.38	4.75	2.05	3.73

Total Manufactured Exports	7.55	6.94	7.24	-7.26	14.19	2.91	8.42	-0.38	5.03		5.88	-0.21	7.05	3.36	8.69	4.77	7.21

Source :Calculated from the WEFA and S A Reserve Bank databases

The effect of the commodity price boom on real exchange rates probably contributed to these inter-sectoral differences in export growth rates. It resulted in a substantial deterioration in the international competitiveness of the more downstream manufacturing sectors. Exporters of minerals and of natural resource-based manufactures were insulated from any adverse effects of the appreciation of the rand on their competitiveness by rising world prices for their output. The price competitiveness of downstream durable goods, however, fell both relative to foreign producers of such goods, and relative to domestically produced primary products and natural resource-based manufactures.[12]

3.3.2 Sectoral allocation of manufacturing investment

The substantial change in relative prices resulting from the commodity price boom also had a significant effect on the sectoral allocation of investment within manufacturing industry. The most striking feature of manufacturing investment, in the 1970s, is that the share of the chemicals sector in manufacturing gross fixed capital formation increased from 7.2 per cent in 1974 to 55.7 per cent in 1979, and remained high for several years thereafter. This remarkable increase was due mainly to investment in two new, large-scale, capital-intensive synthetic fuel plants, known as Sasol II and Sasol III (Sasol I, as noted earlier, having been constructed in the early 1950s).

As the discussion in Section 2 indicated, by the 1970s, import/domestic supply ratios, and consequently the scope for further import contribution, were considerably lower than in earlier decades. Because of this, and the appreciation of the Rand, conditions in general were not conducive to import substitution. One major exception, however, was production of alternative energy sources, that is, of alternatives to imported crude oil. The price of oil had increased five-fold in a short space of time after the 1973 oil crisis, and trebled again after the second, in 1979. Also, when the decisions were taken to construct the Sasol II and Sasol III plants, in 1974 and 1979 respectively, real interest rates in South Africa (as in the world economy in general) were low, indeed, at times negative,[13] and the strong Rand made for relatively low prices of imported capital equipment.

Together these three factors (high oil prices, low real interest rates, and a strong Rand) resulted in a relatively low user cost of capital. It is debatable whether Sasol II and Sasol III were then, or subsequently, commercially justifiable propositions or should be seen simply as late, gross examples of South Africa's (allegedly inefficient) traditional import-substituting strategy, necessitated now by political circumstances.[14] At the time, however, conditions for them could hardly have been more favourable.[15]

Earlier in the decade, as a result of decisions taken before the major commodity price upswing, another capital-intensive, natural resource-based sector which accounted for a sizeable proportion of manufacturing investment, was the iron and steel industry. This was apparently related to the expansion of ISCOR's steelworks in Pretoria and Vanderbijlpark in 1973, and its completion of a new plant in Newcastle in 1974 (McCarthy 1999:150).

3.3.3 Inter-sectoral differences in value-added growth rates

The effects of the commodity price boom discussed so far were those stemming mainly from the change in relative prices which it brought about. However, it also had a substantial effect on the level of expenditure in the economy. That is, it had spending effects as well as price effects.

The most striking spending effect of the commodity price boom was a substantial increase in gross domestic fixed capital formation, in the economy as a whole, including the large scale investments in synthetic fuels discussed above. The ratio of economy-wide fixed capital formation to GDP increased substantially between 1970 and 1975, fell through to 1978, but with the cyclical upswing, thereafter, increased considerably again through to 1981 (almost to the 1975 level, the highest GDFI/GDP ratio since World War II) (Figure A1).[16]

The output of the sectors comprising the downstream durable goods group of industries — fabricated metal products, machinery, electrical machinery, motor vehicles, and

other transport equipment — consists to a significant extent of capital goods, the demand for which is very sensitive to variations in the level of investment. These are the major capital goods-producing manufacturing sectors. The general increase in investment in 1970-81 resulted in rapid growth of value added in this category of manufacturing industries.[17] Despite the much lower export growth rates of these sectors collectively in the 1970s, compared to the 1960s, and to natural resource based sectors in the 1970s, thus, their average annual output growth, in 1970-81, was relatively rapid, at 7.3 per cent compared to the 6.2 per cent of the natural resource-based sectors (Table 3).[18] Any negative effects of the commodity price boom on the price competitiveness of these sectors, and hence on their exports, thus, were much more than offset by the positive spending effects of the boom on their output.

The sensitivity of the rate of growth of these sectors, and hence to a significant extent of total MVA, to the level of investment, evident in 1970-81, is crucial to understanding the stagnation of South African manufacturing industry since the early 1980s. The tendency for the degree of export orientation, and the rate of growth of output of these sectors to be inversely related, remains, but now with relatively rapid export growth, and increasing export orientation, associated with declining output.

3.3.4 The motor vehicle industry and the last throes of import-substituting industrialisation

One sub-sector amongst those in the downstream durable goods category which benefited from the spending effects of the commodity price boom, and which should perhaps be singled out for more detailed discussion, is the motor vehicle industry.

A new motor industry policy, the so-called Phase III of the local content programme, was announced in 1969. In terms of this, South African assemblers were required to increase the local content of locally assembled passenger vehicles, in stages, to 66 per cent of the total component weight of vehicles, by 1976.[19]

Table 3 : AVERAGE ANNUAL RATES OF GROWTH OF VALUE ADDED IN SOUTH AFRICAN MANUFACTURING INDUSTRY AT CONSTANT (1995) PRICES BY SECTOR AND INDUSTRY GROUP (%)

	1970-75	1975-78	1978-81	1975-81	1970-81	1980-85	1985-90	1980-90	1990-95	1995-98	1990-98
CHEMICALS	4.54	11.31	8.33	9.81	7.38	6.77	-0.72	2.96	0.37	4.10	1.75
IRON AND STEEL	7.52	0.96	3.11	2.03	4.49	-1.96	0.42	-0.78	3.94	2.98	3.58
NON-FERROUS BASIC METALS	16.91	-4.34	12.07	3.54	9.42	4.18	1.33	2.75	6.55	18.45	10.86
PULP AND PAPER	6.61	2.87	4.11	3.49	4.89	5.21	1.36	3.27	2.01	-2.65	0.24
TOTAL NATURAL RESOURCE-BASED GRP	6.63	5.31	6.32	5.81	6.19	4.08	0.02	2.03	1.93	4.00	2.70
FABRICATED METAL PRODUCTS	5.46	-2.04	12.64	5.05	5.23	-2.44	-4.48	-3.46	-0.78	4.06	1.01
MACHINERY AND EQUIPMENT	8.65	-0.80	13.59	6.15	7.28	-1.83	-2.15	-1.99	0.76	-9.41	-3.18
ELECTRICAL MACHINERY	14.33	6.23	9.41	7.81	10.72	1.11	-5.27	-2.13	2.96	-1.66	1.21
MOTOR VEHICLES	10.73	-1.12	17.79	7.92	9.19	-4.97	3.54	-0.81	0.43	-5.30	-1.76
OTHER TRANSPORT EQUIPMENT	5.94	-5.63	3.96	-0.95	2.12	-2.17	-6.91	-4.57	-5.92	5.27	-1.87
TOTAL DURABLE GOODS GROUP	8.62	-0.66	13.60	6.23	7.31	-2.48	-1.71	-2.09	0.41	-3.58	-1.11
TEXTILES	1.81	8.31	8.30	8.31	5.30	-2.71	-4.30	-3.51	0.84	-1.38	0.00
WOOD AND WOOD BASED PRODUCTS	3.94	1.79	10.14	5.88	5.00	0.69	-1.99	-0.66	2.38	0.04	1.50
LEATHER PRODUCTS	5.77	-6.07	8.08	0.75	3.00	5.87	0.14	2.96	1.85	4.38	2.79
FURNITURE	3.25	1.39	17.23	9.02	6.36	1.52	2.76	2.14	-0.64	1.46	0.14
FOOTWARE	1.15	0.97	4.19	2.57	1.92	2.36	1.58	1.97	-1.89	-9.25	-4.72
CLOTHING	3.26	2.97	14.10	8.39	6.03	1.37	2.13	1.75	-0.08	-3.04	-1.20
TOTAL LABOUR-INTENSIVE GROUP	2.75	3.80	10.66	7.18	5.14	0.15	-0.39	-0.12	0.36	-1.53	-0.35
TV, RADIO AND COMMUNICATION EQUIPMENT	8.25	-8.45	6.98	-1.04	3.08	6.95	12.91	9.89	-3.12	9.82	1.54
PROFESSIONAL & SCIENTIFIC EQUIPMENT	-9.71	-4.40	13.90	4.35	-2.30	14.59	7.21	10.84	2.10	-6.34	-1.15

OTHER MANUFACTURING SECTORS	4.21	1.91	4.69	3.29	3.71	1.71	5.49	3.58	-1.28	0.82	-0.50
TOTAL MANUFACTURING VALUE ADDED	5.93	2.05	8.55	5.25	5.56	0.95	1.59	1.27	0.15	0.65	0.33
Source : Calculated from the WEFA database											

This would be expected to have resulted in import substitution in the motor industry, and thus perhaps to have contributed to accelerated growth of the sector. The motor vehicle industry was indeed one of the most import-intensive manufacturing sub-sectors in the early 1970s.[20] It has been estimated that more than a third of the import substitution that occurred in manufacturing industry as a whole, in 1972-80, was contributed by the motor vehicle industry (Bell and Farrell, 1997:599, Table 16). The motor vehicle industry grew relatively rapidly in 1970-81 (at 9.2 per cent a year), but some other manufacturing sub-sectors grew even faster ('other chemicals' at 10.2 per cent, plastics 13.7 per cent, and electrical machinery, 10.7 per cent). It's not clear, thus, to what extent motor industry policy as such contributed to the rapid growth of this sector, as distinct from the spending effects of the commodity price boom on an industry where sales volumes are very sensitive to cyclical movements in incomes (and indeed also to real interest rates which, as noted earlier, were very low in the 1970s).

3.4 The slowdown in the world economy in the 1970s

The discussion of the 1970s has so far touched on the relative price and spending effects of the commodity price boom on South Africa as a minerals-rich economy. Especially, it has emphasized inter-sectoral differences in the performance of manufacturing industry caused by the boom. Beneath the surface, however, various real forces were at work slowing the growth of the economy as a whole, including in particular manufacturing industry. As indicated earlier, some of these forces, to be described later, were peculiar to South Africa, and involved fundamental changes in the structure of the economy. One major real factor, external to South Africa, however, was the slowdown in the growth of the world economy in the 1970s.

A deterioration in growth performance in the 1970s was obviously not peculiar to South Africa. The OECD recession of 1974-77, was the most severe since World War II. Its effects are reflected in the variations in output growth rates in South African manufacturing during the period 1970-81, noted in Section 3.3.3.[21] This was probably the major external reason for the worsening of South Africa's growth performance in the 1970s.

It is now widely accepted that a long-term decline in the growth trajectory of the world economy (of which the mid-1970s OECD recession was a manifestation) took effect from about 1972-73. Pritchett (2000:224, Table 2), for instance, finds that in the case of developed countries, the average (mean) GDP per capita growth rate fell from 4.26 per cent in 1960-73, to 2.05 per cent in 1973-82, while the median per capita rate fell from 3.97 per cent to 1.79 per cent a year. In developing countries, the mean per capita GDP growth rate fell from 2.68 per cent in 1960-73 to 1.74 per cent in 1973-82, while the median fell from 2.72 per cent to 1.99 per cent. There was, thus, a general decline in per capita growth rates in the 1970s, but with a larger proportional decline in per capita growth rates for developed than for developing countries, in 1973-82, compared to 1960-73.

It is striking, though, that the percentage points decline in South Africa's per capita growth rate was greater than that of developing countries in general. As the figures above indicate, in developing countries the mean per capita growth rate fell by 0.94 percentages points, and the median by 0.73 percentage points. In South Africa, however, the per capita growth rate fell from 2.44 per cent in 1960-73 (roughly the same as the mean and median in developing countries in general in this period) to 0.75 per cent in 1973-82, that is by 1.69 percentage points, significantly more than in developing countries in general. This suggests the possibility of some special factor operating in the case of South Africa, in the 1970s, which made for a larger proportional decline than in developing countries in general. It seems, thus, that the deterioration in South Africa's per capita growth and hence in the growth of manufacturing industry, in the 1970s, must be explained both in terms of factors which made for the slowdown in the world economy as a whole from about 1973, and in terms of some factor peculiar to itself.

4. ECONOMIC CRISIS, THE SHIFT TO EXPORT-ORIENTED INDUSTRIALISATION AND THE STAGNATION OF MANUFACTURING INDUSTRY : THE 1980S AND 1990S

4.1 The shift to export-oriented industrialisation under conditions of economic crisis

For a while, between 1965 and 1972, there had been the possibility of South Africa shifting from its traditional strategy of import-substituting industrialisation (ISI) to export-oriented industrialisation (EOI), in relatively placid economic conditions. As the rapid growth of gold output from 1951 onwards (following the opening of the Orange Free State gold fields) came to an end, gold exports, measured in constant US dollars, reached their peak in 1965 and declined (at a rate of 0.9 per cent a year) in 1965-70 (Bell et al, 1999:Table 1). The resulting slow growth of South Africa's exports led to the appointment of the Reynders Commission, in 1969, to inquire into South Africa's export trade. Its report, published in 1972, emphasized the need for diversification into non-gold exports, including manufactures, and proposed the use of direct export promotion measures.

For a moment, thus, there had been the possibility of South Africa making the transition to EOI. The ink had hardly dried on the Reynders Commission report, however, when it was overtaken by events, and, for the time-being at least, rendered superfluous by the natural resource boom of the 1970s. A shift to EOI between 1972 and 1981 was neither necessary nor economically feasible.

The problem of sustaining export growth in the face of declining gold exports, however, returned with a vengeance in the early to middle 1980s (Bell et al, 1999).

With the collapse of the commodity price boom, and in the context of the OECD downturn of 1980-1983, the exports of all the main sectors of the economy fell sharply. The Rand began to depreciate in late 1983, and fell precipitously from mid-1984, culminating in the debt crisis of August 1985, and the rescheduling of foreign debt. As in many other developing countries which had been subjected to such debt shocks in the early 1980s, the

immediate effect was a sharp reduction in gross domestic expenditure, particularly investment, which fell by 20 per cent between 1984 and 1986. The most urgent requirement for recovery was accelerated growth of exports, including, especially, manufactured exports, to compensate for the decline of gold and other commodities. The effect of these events was an abrupt, involuntary shift to export-oriented industrialisation (EOI) in conditions of economic crisis.

In a mood of optimism before the debt crisis, a deliberate voluntary process of import liberalisation had in fact been instituted in 1983, which resulted in a substantial reduction in quantitative restrictions (QRs) in 1983-85.[22] The real depreciation of the Rand, together with domestic recession, however, were the decisive factors in the shift to a system of incentives less biased towards production for the domestic market, and more favourable to exports. Following the debt crisis, in 1985-90, QRs were relaxed further, systems of duty-free-imports-for-exports were introduced in the motor vehicles, textiles and clothing industries in early 1989, and export subsidies, in the form of the General Export Incentive Scheme were introduced in April 1990. Between 1990 and 1995, import surcharges, which had been imposed earlier in response to the foreign exchange crisis, were removed. Comprehensive tariff reductions began with the commencement of the Uruguay Round implementation period in January 1995.

4.2 The growth and changing structure of manufactured exports : 1985-1998

In 1985-90, following the debt crisis and the real depreciation of the rand, and in the context of revival of OECD economics, the average annual rate of growth of manufactured exports, measured in constant US dollars, accelerated to 14.2 per cent, considerably faster than the 7.2 per cent growth rate of the 1970s (Table 2).

The period 1985-90, however, was one in which, following the Plaza Accord of September 1985, the US dollar depreciated substantially against other major currencies, especially the yen and the mark. The real increase in the foreign currency value of South Africa's exports, in 1985-90, thus, was not nearly as great as the rate of growth of exports measured in constant US dollars suggests.

To get a truer reflection of the increase in South Africa's capacity to import essential intermediate and capital goods, resulting from export growth, thus, South Africa's exports in rands have been converted into what we shall call constant-price trade-weighted foreign currency values.[23] Measured in these terms, South Africa's manufactured exports in the aggregate grew at an average annual rate of 7.1 per cent in 1985-90, only slightly higher than the 5.9 per cent a year rate of the 1970s (Table 2).

The question of the effect of export growth on South Africa's capacity to import essential inputs and capital goods is important and we return to it in Section 5.2 below. Of particular interest at this point, however, is the change in the sectoral structure of manufactured exports after 1985.

What is striking is that, whereas the average annual rate of growth of the exports of the natural resource-based group of sectors (measured in constant trade-weighted foreign currency) fell to 4.8 per cent in 1985-90, compared to 11.9 per cent in 1970-80; that of the downstream durable goods group accelerated considerably to 15.7 per cent in 1985-90, from 0.7 per cent in 1970-80 (Table 2).[24]

In the 1990s, the average annual rate of growth of South Africa's manufactured exports in the aggregate increased to 8.7 per cent in 1990-95 (owing to especially rapid growth in 1993-95, with the revival of OECD economics); but this could not be sustained, and it fell to 4.8 per cent in 1995-98 (a period which ended with the East Asian crisis). Particularly pertinent at this juncture, however, is that in both these parts of the 1990s, as in 1985-90, the durable goods group of industries performed better, in terms of export expansion, than the other major categories of manufacturing industry shown in Table 2 – averaging a growth rate, in trade-weighted foreign currency, of 10.6 per cent per annum in 1990-98 as a whole.

With the end of the commodity price boom, thus, it seemed there was a shift in South Africa's comparative advantage within manufacturing towards the downstream

durable goods sectors. This has in effect represented a return to underlying trends which were in operation before the aberration caused by the commodity price boom.[25]

There was also a significant increase in the degree of export-orientation in manufacturing industry. The ratio of total manufactured exports to the total sales of manufacturing industry, in the aggregate, fell during the commodity price boom, but thereafter increased from 9.1 per cent in 1983, to 12.7 per cent in 1990, 19.1 per cent in 1995, and 21.1 per cent in 1998. This impressive display of increased export-orientation, however, is a sign, not of the success of manufacturing industry, but of its deepseated problems.

4.3 Export-oriented stagnation

As noted earlier, the rate of growth of manufacturing value added in 1970-81, 5.6 per cent a year, was the lowest MVA growth rate in any full decade since World War I. It fell considerably further, however, to an average annual rate of 1.6 per cent in 1985-90[26], and to 0.2 per cent in 1990-95, recovering only slightly to 0.7 per cent in 1995-98(Table 3). The increases in the degree of export orientation of manufacturing industry, as measured by the ratio of exports to total sales, noted above, thus, have been largely due to the stagnation of manufacturing output.

It is noteworthy, indeed, that since 1985, the very manufacturing category that has experienced the most rapid export growth, and the largest increases in export orientation – the durable goods group - has had the lowest output growth rates, and shown the biggest proportional decline in output growth compared to the 1970s.

As noted earlier, the output of the downstream, durable goods group of industries — fabricated metal products, machinery, electrical machinery, motor vehicles, and other transport equipment — consists to a greater extent of capital goods than in other manufacturing sectors. These sectors which collectively were the laggards in export growth, but the best performers in terms of output growth, in 1970-81, have had relatively rapid export growth, and the largest increase in export orientation[27] since 1985, but absolute

decline in real value-added. Value-added in these sectors fell at an average annual rate of 2.1 per cent in 1980-90 and at 1.1 per cent in 1990-98. By contrast – a fact of some significance for the future sectoral growth path of the economy – value-added in the natural resource-based manufacturing industries (which has increased in every five-year sub-period since 1970), grew at 2.0 per cent in 1980-90 and 2.7 per cent in 1990-98 (Table 3).

The decline of value added in the downstream durable goods manufacturing sectors is clearly largely due to the decline in the economy-wide rate of investment, to which demand for their output is particularly sensitive. The significance of these sectors, thus, is not only that their decline has impeded the growth of manufacturing industry in general, but that they are a barometer of the state of the domestic economy as a whole. By comparison, the natural resource-based category of manufacturing sectors has put in a relatively solid output growth performance.[28]

Just as the downstream, durable goods sectors grew fastest in 1970-81, when the rate of investment rose to unprecedented levels in 1975 and 1981, so they have been hardest hit by the substantial declines in levels of capital formation. Revival of growth in these sectors, and thus in manufacturing as a whole, thus, depends heavily on a revival of the domestic demand for capital goods.

As things are, there is a situation in which South Africa's comparative advantage, judging by shares in exports, has shifted within manufacturing, towards these downstream durable goods sectors, and towards manufacturing in general, but in which both the shares of these sectors in MVA (Table A3), and of manufacturing in GDP, have fallen (Table A4).

Before going on to consider the reasons for the deterioration in the growth performance of South African manufacturing industry since the 1960s, and in particular the decline `of investment and the stagnation of the economy since the early 1980s (in Section 5), it should be noted that the extent of the decline in South Africa's growth since the early 1980s, has been apparently very much in line with the experience of developing countries in general.

4.4 The slowdown in developing countries in general since the early 1980s

In Section 3.4 it was noted that the per capita growth of both developed and developing countries declined in 1973-82 compared to 1960-73; and that the proportional decline in growth rates was greater in developed than in developing countries. The percentage points decline in South Africa's per capita growth between 1960-73 and 1973-82, however, was significantly greater than for developing countries in general, a fact taken to suggest some factor peculiar to South Africa at that stage.

By contrast with the changes at that stage, the per capita growth of developing countries in general has declined considerably further, both compared to the period 1973-82, and especially relative to developed countries.

Easterly (2001:3) finds that the median per capita growth of developing countries was 2.5 per cent a year in 1960-79, but 0.0 per cent in 1980-98 as a whole, and, indeed, in both the 1980s and 1990s separately. The decline in South Africa's per capita growth since the early 1980s, compared to earlier years, has it seems been of about the same order of magnitude as the decline of the median for developing countries in general. Compared to Easterly's 2.5 percentage points decline in the median for developing countries, between 1960-79 and 1980-98, South Africa's per capita growth rate fell from 1.73 per cent to –0.43 per cent, that is by 2.16 percentage points.

It seems, thus, that so far as the relatively large decline in South Africa's per capita growth rate between 1960-73 and 1973-82 is concerned, the causes must be sought in factors peculiar to South Africa, as well as in factors common to developing and developed countries. Though factors peculiar to South Africa may clearly also partly account for the further decline since the early 1980s, it seems that a crucial question for understanding the case of South Africa concerns the reasons for the deterioration in the growth of developing countries in general relative to developed countries.

In the light of this, the next section is devoted to consideration of possible reasons for the decline of manufacturing industry in South Africa since the 1960s

5. SOME PERSPECTIVES ON THE DECLINE OF MANUFACTURING INDUSTRY IN SOUTH AFRICA

5.1 The decline in the output of gold

One factor peculiar to South Africa, which has probably contributed significantly to the decline in the rate of GDP and MVA growth since the 1960s is the decline in the physical volume of gold output. This probably accounts at least partly for the size of the decline in South Africa's growth rate between 1960-73 and 1973-82, relative to the average for developing countries.

With the opening of the Orange Free State gold fields, gold output increased almost uninterruptedly from 348 thousand kilograms in 1951, to a peak of 1 million kilograms in 1970, but at a declining rate from 1965 on, as the maximum output permitted by existing deposits was approached. Despite the huge increase in the gold price in the 1970s, the output of gold in physical terms began falling after 1970, and in the year 2000 was only 43 per cent of its 1970 level.

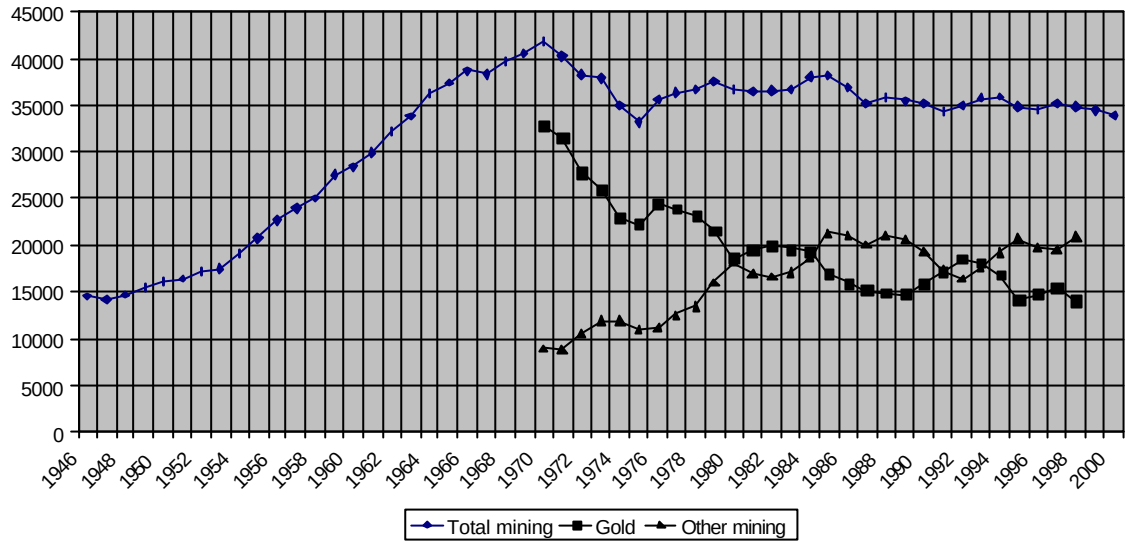
These changes in the physical output of gold resulted in a significant decline in the rate of growth of real value-added in mining as a whole in 1965-70, compared to 1960-65, and a substantial absolute decline in 1970-75 (Figure 1 and Table A5).[29] This would clearly have had a significant negative impact on GDP, and probably largely accounts for the 1.50 percentage points decline in the GDP growth rate from 5.15 per cent in 1965-70 to 3.65 per cent in 1970-75.[30] This would have contributed significantly to a sudden lowering of the long-term growth trajectory of the economy in the early 1970s, and made for lower GDP growth in 1973-82 than in 1960-73.[31] While perhaps the whole of the decline in GDP growth between these two periods cannot be explained in these terms, this factor, apparently peculiar to South Africa, seems to account for a significant part of the decline in South Africa's per capita growth in 1973-82, relative to the past, and to other developing countries.

Whereas conditions during the commodity price boom of the 1970s seemed favourable, thus, underneath it all real forces were at work to slow the growth of the South African economy, as a whole.

5.2 The problem of foreign exchange constrained growth and excess capacity since the early 1980s

As argued in Bell et al (1999), there has since the early 1980s apparently been a substantial reduction in the ability of the South African economy to grow without running into balance of payments difficulties. This is suggested by evidence of a significant unfavourable change since the early 1980s in the historical relationship between the rate of growth of the GDP and the ratio of the current account deficit to GDP. Current account deficit/GDP ratios in the years since 1994, for instance, have been such as would on average have been associated with much higher GDP growth rates in earlier decades.

FIGURE 1
Value added in South African mining industry in constant 1995 prices:1946-2000(RMillions)



This is seen as suggesting a foreign exchange constraint on South African economic growth. Given the complementarity between domestic resources and imported intermediate and capital goods in domestic output and investment,[32] this view implies that the upper limit on output and investment since the early 1980s has been set by the availability of foreign exchange.

There are various possible reasons for this. One possibility is a decline in the rate of growth of South Africa's exports. As noted in Section 4.1, for a while, between 1965 and 1972, South Africa faced the problem of sustaining the growth of its total exports, and the prospect of a tightening foreign exchange constraint.[33]

In 1985-90, South Africa's total exports measured in constant US dollars grew at a relatively good rate (of 5.8 per cent a year) (Table 4), but, as indicated earlier, this gives a misleading impression of the effect of export growth on import capacity. In constant price trade-weighted currency units, a more appropriate measure, South Africa's total exports, in 1985-90, fell at 0.8 per cent a year, owing to an 8.2 per cent a year decline in gold exports (Table 4). This aggravated the problems caused by the foreign debt crisis, which had involved a sudden, massive withdrawal of foreign exchange, and produced a substantial contraction of the economy.

In the 1990s, merchandise exports (i.e. exports of goods other than gold), increased at average annual rates of 5.4 per cent and 6.1 per cent, in 1990-95 and 1995-2000 respectively.[34] Both of these growth rates were higher than the average annual rates of growth of merchandise exports in 1950-70. Weighed down by declining gold exports, however, total exports increased at average annual rates of 3.1 per cent and 4.1 per cent in 1990-95 and 1995-2000 respectively, both lower than the average of 4.5 per cent for 1950-70. Following the absolute declines in total exports in the 1980s, these export growth rates, in the 1990s, have not been sufficient to generate the foreign exchange earnings needed to raise GDP and MVA growth rates significantly towards pre-1980 levels.[35]

If the period of the global and South African economic downswing, from 1990 to 1992, is excluded, however, South Africa's export performance in the 1990s improves considerably. Measured in trade-weighted foreign currency units, the average annual rate of growth of total exports was especially rapid, at 5.8 per cent, in 92-95, in the initial phase of recovery from the recession, but despite slower growth thereafter, and absolute decline in 1998 and 1999, was 4.7 per cent in 1992-2000. This was higher than the average in 1950-70, shown in Table 4.[36]

As would be expected, in a situation in which foreign exchange is a binding constraint, this improved export growth performance was accompanied by accelerated GDP growth. GDP increased at an average annual rate of 2.48 per cent in 1992-2000, a substantial improvement on the 1.67 per cent of 1985-90. The GDP growth rate in 1992-2000, however, was modest by the standards of earlier decades;[37] and, though the rate of growth of manufacturing value-added also increased, it remained relatively low, at 1.8 per cent a year, in 1992-2000.

It seems, therefore, that other factors may have changed in ways which have prevented rapid export growth, in 1992-2000, from alleviating the foreign exchange constraint sufficiently to move GDP and MVA growth rates closer to their pre-1980 levels. One striking difference between earlier and more recent decades is a significant decline in the rate of import substitution (Bell and Farrell, 1997:595-599).[38] In earlier decades, the effect of GDP growth on import growth was contained in some measure by rapid import replacement.[39]

In the period after 1992, however, merchandise imports grew rapidly despite the relatively modest GDP growth. In 1992-98, when total exports increased at an average annual rate of 5.0 per cent, merchandise imports increased at 9.0 per cent a year. This was just short of the rate of growth of merchandise imports in 1960-65 (Table 4), though GDP growth of 2.48 per cent a year in 1992-98 was less than half the level of 6.3 per cent a year in 1960-65. Import penetration ratios in manufacturing industry also increased substantially in the 1990s, especially after 1993.[40]

Table 4

Average Annual Rates of Growth of South Africa's Total Exports and Imports of Goods (%)

	Merchandise exports	Net Gold Exports	Total exports	Merchandise imports
	In constant (1995) US Dollars			
1950-1955	9.34	3.00	6.98	8.11
1955-1960	2.22	6.04	3.55	1.38
1960-1965	3.43	7.51	5.03	9.50
1965-1970	4.65	-1.12	2.39	4.79
1970-1975	9.42	13.09	10.77	9.61
1975-1980	9.56	19.78	13.99	5.46
1980-1985	-8.93	-14.24	-11.43	-13.06
1985-1990	10.38	-2.11	5.77	7.46
1990-1995	5.16	-3.80	2.88	8.13
1995-2000	1.67	-9.94	-0.31	-1.34
1950-1960	5.72	4.51	5.25	4.69
1960-1970	4.04	3.10	3.70	7.12
1970-1980	9.49	16.39	12.37	7.52
1980-1990	0.26	-8.38	-3.21	-3.34
1950-1970	4.88	3.80	4.47	5.90
1970-2000	3.65	-0.90	2.65	2.73
1985-2000	5.68	-5.34	2.75	4.66
1990-2000	3.40	-6.92	1.27	3.28
	In Constant Price Trade-Weighted Foreign Currency			
1970-1975	7.32	10.93	8.65	7.51
1975-1980	8.93	19.09	13.34	4.85
1980-1985	-2.00	-7.72	-4.69	-6.45
1985-1990	3.48	-8.23	-0.84	0.75
1990-1995	5.42	-3.56	3.14	8.40
1995-2000	6.14	-5.98	4.07	2.99
1970-1980	8.12	14.94	10.97	6.17
1980-1990	0.70	-7.97	-2.78	-2.92
1970-2000	4.82	0.24	3.78	2.89
1985-2000	5.01	-5.94	2.10	4.00
1990-2000	5.78	-4.78	3.60	5.66

Source: Calculated from the South Africa Reserve Bank database

Another factor which may have been an obstacle to the alleviation of a foreign exchange constraint is the evident long-term tendency for output-capital ratios to decline. Given the complementarity between domestic resources and imported capital goods in domestic fixed investment,[41] the long-term decline in the output-capital ratio in the economy as a whole seems to imply that the increase in capital goods imports, as a proportion of GDP, required to support a one percentage point increase in capacity GDP, has tended to increase over the past three decades. Faster growth of total exports, thus, has been needed partly simply to offset this tendency. It may well be one reason for the rapid growth of imports in 1992-98, as the rate of growth of real fixed capital formation, and the fixed capital formation to GDP ratio, increased in 1994-98 (Figure A1).

Against this long-term downward trend in the output-capital ratio, however, there was a tendency in 1992-2000 for the output-capital ratio of the economy as a whole to increase. Indeed, in this period, output-capital ratios increased in all the main sectors of the economy, excepting – significantly – Manufacturing and Community, Social and Personal Services. In manufacturing industry, but for increases in 1995 and 2000, the output-capital ratio appears to have continued to decline, virtually without interruption (Figure A2). A consequence of this is that though the real fixed capital stock grew at 2.89 per cent a year, in manufacturing industry, faster than in any other main economic sector in 1992-2000, and at only 1.25 per cent a year in the economy as a whole, manufacturing value added, as noted earlier, grew at a slower rate than GDP.

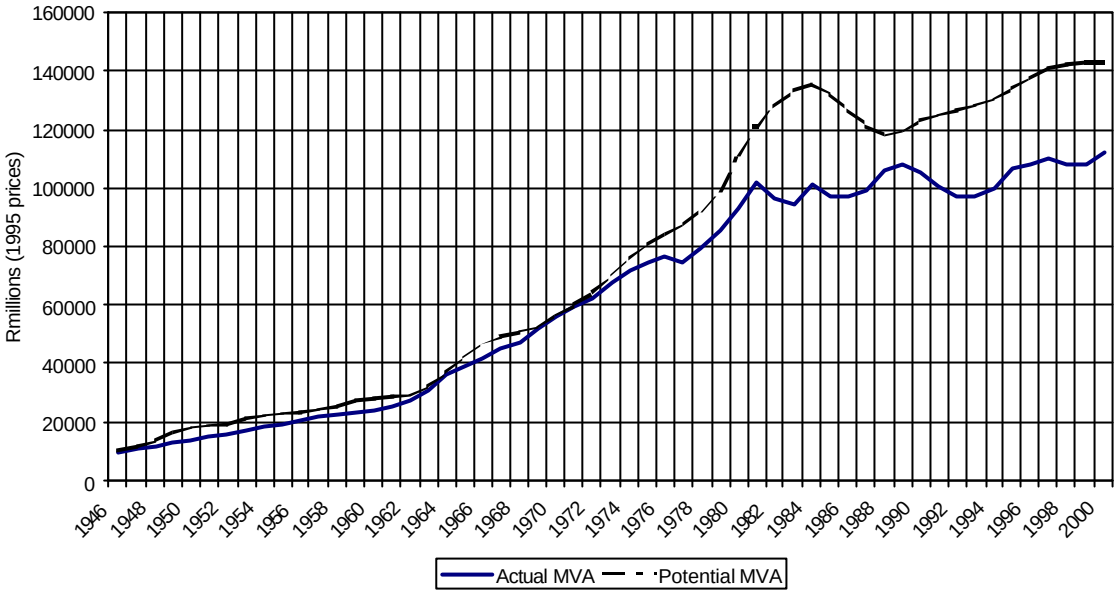
The result of this has been persistently high levels of excess capacity in manufacturing industry. Owing to rising output-capital ratios in virtually all other main sectors, in the relatively favourable domestic economic conditions that prevailed in 1992-2000, there was apparently a tendency for the degree of capacity utilisation in the economy as a whole to increase – but not in manufacturing.

Figure 2 shows actual manufacturing real value added, together with our estimates of capacity (or potential) manufacturing value added, for each year from 1946 to 2000.[42]

Capacity utilisation, measured by actual as a percentage of capacity value added, is shown in Figure A3. Capacity utilisation increased from 1987 to 1989, but as inspection of Figure 2 reveals, this was largely a result of a decline in capacity MVA from 1984 to 1988. In the 1990s, capacity utilisation increased moderately in 1994 and 1995, but then fell through to 1999, with a slight increase in 2000, as economic growth picked up again.[43]

The persistence of substantial excess capacity in manufacturing industry is symptomatic of a foreign exchange constraint on the growth of the economy as a whole, and especially on the most import-intensive part of it, manufacturing industry itself. Within manufacturing industry, it seems that the main causes of the problem have been trends in the durable goods group of industries.[44] This capital goods-producing group of industries, initially (in the mid-1980s) strongly oriented to the domestic market, has had to rely increasingly on export expansion, based largely on existing production capacity.[45] Also consistent with the existence of a foreign exchange constraint is the fact that the rate of growth of fixed capital stock within manufacturing industry has been highest (at 3.78 per cent a year in 1992-98) in the natural resource-based group of industries. Being strongly export-oriented (with an export/gross output ratio in 1998 of 34.8 per cent, compared to 21.4 per cent in durable goods), these sectors have had a greater foreign exchange hedge against increases in the price of imported capital goods, as the real exchange rate has depreciated.

FIGURE 2
ACTUAL VERSUS POTENTIAL MANUFACTURING VALUE ADDED IN SOUTH AFRICA 1946-2000



Whether a foreign exchange constraint, and a consequent reduction in the ability to grow without running into balance of payments difficulties, is a problem common to developing countries, and hence whether it is a reason for the decline in the average per capita growth rates of developing countries, since the early 1980s, is unclear. That it is at least not unique to South Africa is suggested by Ros (1995) on Mexico.

It is a problem, however, which does seem to apply to South Africa and which probably accounts to a significant extent for the decline in the level of investment, and hence in the rate of growth of the economy, since the early 1980s. It has impacted particularly on manufacturing industry, as the most import-intensive sector of the economy, and within manufacturing, on the principal capital goods-producing sectors which, as we have seen, have been in decline since the early 1980s.

It raises questions, though. Why has the foreign exchange constraint persisted? Part of the answer is the persistent decline in gold exports. There is, however, a host of factors which may have impeded expansion of domestic production of other tradable goods (both importables and exportables), especially of manufactures, and hence prevented the removal of the foreign exchange constraint. One of these factors, much emphasised in South Africa today, is a shortage of skills.

5.3 Is an inadequate supply of skills a fundamental reason for the stagnation of manufacturing industry?

There is evidence of a significant increase in the demand for skilled relative to unskilled labour in South Africa. For instance, Edwards (2000: Table 1), and calculations based on his data, indicate that the number of skilled workers employed increased in all the main sectors of the economy – primary, secondary and tertiary – between 1984 and 1997, and that only in the skilled category did employment increase (with the minor exception of the number of 'elementary' workers in manufacturing). In all other categories, in all sectors, employment fell. The result was a substantial increase in the proportion of skilled workers in each sector.[46]

This suggests a growing scarcity of skilled relative to unskilled labour, consistent perhaps with the idea that a scarcity of skills is a key reason for the stagnation of manufacturing industry. Yet it poses a puzzle, brought out more clearly by other evidence.

Using a different dataset, Bhorat (2001:12) finds that in manufacturing industry, between 1993 and 1997, there was an increase of 16283 in 'highly skilled' workers, but a decline of 4589 'skilled' and 28192 'unskilled' workers, giving an overall job loss of 16478 in manufacturing. In marked contrast, in the Finance, Insurance, Real Estate and Business Services sector (commonly called FIRE for short), there were increases of 27302 'highly skilled' and 30487 'skilled' workers, but a decrease of 9709 'unskilled' workers, giving an overall increase of 48080 jobs.

It should be noted too that according to Bhorat's (2001:12-14) figures, the FIRE sector is a great deal more skills-intensive than manufacturing as a whole.[47] Furthermore, though the total labour force in FIRE was only one-third of that of manufacturing in 1993, the increase in employment of 'highly skilled' workers in FIRE in 1993-97 (27802) was more than two-thirds greater than in manufacturing as a whole (16288).

The puzzle is this: If a shortage in the supply of skills, as such, is a binding constraint on the growth of manufacturing industry, how come that the output and employment growth performance of the FIRE sector, a far more skills-intensive sector, was so vastly superior to that of manufacturing, especially in the 1990s?[48]

The relatively rapid output and employment growth rates of the FIRE sector, suggest that an inadequate supply of skills as such may not be a key reason for the stagnation of manufacturing; but, rather, that various factors have resulted in huge differences in their respective demands for skilled labour and, indeed, for labour in general. The problems of manufacturing, in short, rather than lying in skills shortages, may lie more deepseatedly within South African manufacturing itself.

The FIRE sector, commonly associated with the New Economy, seems, unlike manufacturing, to have grown rapidly worldwide in the 1990s. In this context, South Africa with its well developed financial system, good accounting standards, and a legal system conducive to such activities, has been well-placed for growth in this area.[49] These factors, which have given South Africa a comparative advantage in this area, have enabled employers to use productively, and hence to attract, skilled people.[50] Supply, thus, has responded to demand.[51]

This clearly does not mean that the supply of skills, as distinct from the demand for them, is irrelevant. The ability of supply to respond to demand presupposes a potential supply. South Africa, as a middle-income country, had a skills-endowment (as measured by average number of years of schooling) in 1990 intermediate to those of poorer and richer nations, and apparently slightly better than the average for Latin America (Wood and Meyer 1998:17, Figure 4b). This should give South Africa a comparative advantage at intermediate levels of skill-intensity. Indeed, Edwards (2000:10) finds, for the period 1993-97, a high correlation between the skill-intensity of (three-digit SIC) sectors and their export growth rates, suggesting a comparative advantage recently in relatively skills-intensive sectors.

As we have seen, though, neither the exports nor (especially) the output of manufacturing industry has grown nearly fast enough over the past two decades. The question is whether a shortage of skills at the higher levels is now the major obstacle to the substantial increase in the output of tradable manufactured goods that is needed. The argument here is that conditions for manufacturing itself have simply not been such as to enable manufacturers to compete with the FIRE sector and other areas of skills-intensive non-manufacturing activity (including, for instance, the communications industry), for the supply, such as it is, of high level skills.[52]

The idea that there is a shortage of skills which is a fundamental obstacle to growth, has also relied on evidence of large and possibly increasing disparities between the earnings of skilled and unskilled people in South Africa (Bhorat, 2000:26). As is well known, however, growing skilled/unskilled earnings differentials have also been a feature of the United States over the past few decades.[53] It clearly does not follow from this that the long-

term relative decline of US manufacturing industry is due to a shortage of skills.[54] The reasons for this decline, as for the decline in the growth trajectories of industrial and developing countries in general since the 1960s – and for the deterioration in the growth performance of South Africa in particular – must it seems be sought elsewhere.

5.4 Brenner's falling rate of profit thesis

The earlier discussion (in Sections 5.1 and 5.2) of the problems of the decline in real value added in mining since the early 1970s, and of the foreign exchange constraint (due partly to the decline of gold exports), suggests one possible perspective on the decline in the growth of the South African economy, and its stagnation (especially in manufacturing) since the early 1980s. It is (the rather pessimistic one) that, having seen the rise of an unusually minerals-rich economy from about 1870 to about 1970, we are now witnessing its more or less inevitable decline.

It seems, however, that the problems of the South African economy, and the prospects for its recovery, cannot be seen simply in such South Africa-centred terms. Factors operating at a global level must also have contributed to the deterioration of South Africa's growth performance in the past, and will affect its growth trajectory in future.

In essence, Brenner (1998) sees the 'long downswing' in the advanced industrial countries, beginning in about 1973, as originating in intensifying competition for United States manufacturing industry from Japan and Germany in the period 1965-73. This resulted in overproduction and excess capacity in world manufacturing industry, putting downward pressure on the price of manufactured goods, and making for a decline in the rate of profit (hence in the growth of output, employment and the capital stock) in manufacturing industry. Non-manufacturing (in the United States mainly services), not being subject to the same downward pressure on output prices, experienced a much smaller adverse effect on its rate of profit, and in due course achieved considerable further output and employment growth.

The main initial impact of downward pressure on manufacturing output prices, and profit rates, was on the United States, but via various mechanisms this had repercussions for all the major industrial economies, and indeed evidently on the world economy as a whole. The intense competition resulting from the emergence of excess capacity and overproduction, Brenner apparently sees as having persisted from the 1970s right through to the 1990s. Even in the early period 1965-73, the four East Asian NICs were making their presence felt (p.149) but in the 1980s 'the problems that resulted from ongoing over-capacity and over-production in manufacturing among the advanced capitalist economies were exacerbated...by the accelerated intrusion of the four Asian NICs, and East Asia more generally, into the world market.' (p.185)

Any such downward pressure on manufacturing output prices would be expected to have affected all producers of manufactured goods, including those in South Africa.[55] It may well have contributed to the decline in growth, and, from the early 1980s, stagnation, of South African manufacturing industry. Profit rates in South Africa evidently did decline substantially (from 31.6 per cent in 1964 to 23.6 per cent in 1970, and further to 15.1 per cent in 1975) (Nattrass 1990:107, Table 7.1), but whether this was due to downward pressure on output prices is unclear.[56]

While Brenner's argument may shed light on the decline in the growth trajectory of the world economy as a whole since about 1973, however, it does not seem to account for the sharper decline in the growth rate of developing countries – including South Africa – than of developed countries, since the early 1980s.

5.5 Skills-biased technical change

Easterly (2001:2) speculates that 'worldwide factors like the increase in world interest rates, the increased debt-burden of developing countries, the growth slowdown in the industrial world, and skill-biased technical change may have contributed to the developing countries' stagnation' since the early 1980s.

The first two of these, higher real interest rates and the burden of foreign debt, would clearly have impacted on South Africa, at least during the 1980s, and made for slower

growth relative to developed countries.[57] It is the fourth of these possibilities, skill-biased technical change since the early 1980s, on which attention is focused here.

Easterly (2001:21) elaborates as follows: 'The LDC growth during 1960-79 may have reflected the adoption in developing countries of undemanding technologies of mass production that did not place a premium on skill-level. Skill-biased technological advances of the 80s and 90s may have favored the countries that were already developed, leaving behind the poor countries...as happened in previous technological revolutions.'

Easterly (2001) does not develop this suggestion. No more detailed indications seem to be given of what he has in mind. Whether it accords with Easterly's thinking or not, it is striking that two manufacturing sectors which Jorgenson and Stiroh (2000) find have contributed particularly significantly to output and productivity growth in the United States economy as a whole, over the period 1958-96, and which are therefore singled out by them for special mention, are SIC 35 and SIC 36, the counterparts of which in South Africa are called Machinery and Equipment, and Electrical Machinery, respectively.[58] The first of these, as Jorgenson and Stiroh (1999:164) point out, includes computer production, and the second semi-conductor production, and, thus, in the US are manufacturing sectors central to the IT revolution. Presumably, thus, the relatively rapid growth of output in these sectors is seen as reflecting increased production of these two IT-related products.

Nordhaus (2001), focusing particularly on the now widely acknowledged rebound in labour-productivity growth in the US after 1995, confirms the importance of the contribution of these two sectors to accelerated productivity growth in the US in 1995-98. Mainly due to these two manufacturing sectors, which he also notes, include computers and semi-conductors, new-economy sectors directly contributed about a third of both total labour-productivity growth in 1996-98, and of the percentage points increase in total labour-productivity growth in this three-year period. Also due mainly to these two sectors, durable goods manufacturing was the most important contributor to overall total productivity growth in 1996-98. Of the behaviour of industries within manufacturing he says (p.20) that the 'importance of industrial machinery (notably computers) and electronic machinery (notably semi-conductors) is striking.'

What is striking in the South African context is that these two sectors are part of the downstream durable goods group of manufacturing industries which, as emphasized above, has had particularly poor output growth since the early 1980s. Output in both Machinery and Equipment (SIC 35) and Electrical Machinery (SIC 36) declined in absolute terms between 1985 and 1998. Output in SIC 35 increased at 0.76 per cent a year in 1990-95, but fell at 9.41 per cent a year in the three years 1995-1998, averaging –3.18 per cent in 1990-98 as a whole; while the respective growth rates for SIC 36 were 2.96 per cent, -1.66 per cent and 1.21 per cent (Table 3).

Some IT-related production may be taking place in these two manufacturing sectors in South Africa, but in sharp contrast to the US, their output growth rates — whatever has been happening to their labour productivity growth — have not yet shown signs of benefiting from the New Economy.[59] This suggests the possibility that an inability to penetrate significantly into skills-intensive, high-tech manufacturing of products central to the IT revolution (for various reasons, not just the shortage of skills) may be one reason developing countries, like South Africa, have fallen behind since the early 1980s (but especially in the 1990s).[60]

In so far as the IT revolution has benefited South African manufacturing industry, thus, it seems it would have had to be through the application of IT to various stages of the manufacturing process, from design to marketing, in other manufacturing sectors rather than through the manufacture of major new IT products. Some in South Africa seem to be pinning their hopes on this. A major part of Nordhaus' argument, indeed, (which distinguishes it from Gordon, 2000 for instance) is that, after stripping out the new-economy sectors, it is found that there was also an acceleration, after 1995, in non-new-economy labour-productivity growth. So, it seems, 'it is clear the productivity rebound is not narrowly focused in a few new-economy sectors.' Significantly, though, the one non-new-economy part of the US economy which, according to Nordhaus (2001:20), has been excluded from this is non-new-economy manufacturing. Nordhaus (2001:20) thus concludes that 'up through 1998, the acceleration in manufacturing productivity was limited to the two major new-economy sectors led by computers and semi-conductors.'

Judging by US experience so far, thus, there seems to be no reason to expect that the indirect benefits of the IT revolution for South African manufacturing, through the application of IT to non-new-economy sectors, will be significant. We are thus left, so far, only with the stark contrast between the direct effects of the two major new-economy manufacturing sectors in the US, and their counterparts in South Africa.

If skill-biased technical change has left developing countries behind since the early 1980s (as Easterly and our discussion suggest) the effects of 'previous technological revolutions' seem to have been very different — at least so far as South Africa is concerned.

5.6 Gordon's 'one big wave' and South Africa

Gordon (2000:2) argues that in the United States 'there was a glorious half-century between World War I and the early 1970s during which U.S. productivity growth was much faster than before or after.' There was thus, as he calls it, 'one big wave' in US productivity growth. The problem as he sees it, thus, is not to explain 'the post-1972 slowdown' – which he seems to regard as a return to some sort of normality, following the aberration represented by the 'one big wave' – but to explain the 'post-1913 speedup' which created 'the one big wave'. As Gordon (2000:42) states, his 'preferred hypotheses combine several explanations', but 'most notably the concurrence of a multitude of important inventions occurring simultaneously prior to and at the beginning of the rapid growth period.'

This suggests a reason for South Africa's rapid industrialisation in the fifty years or so from World War I through to the early 1970s, described in Section 2; and would at least partly explain the slowdown in South Africa since then. It also seems to have a bearing on Easterly's distinction between the 'undemanding technologies' of the past and the 'skill-biased technical change' in more recent times. Whatever the effect of 'previous technological revolutions' on 'poor countries', to which Easterly (2001) alludes in the passage quoted above, it seems that they did not all leave South Africa (very far) behind. To take but one of many possible examples of Gordon's 'important inventions', the development of the internal combustion engine made itself felt in South Africa in the

manufacture of major new products (as distinct from merely new ways of producing old ones) relatively quickly. Only sixteen years after the appearance of the Model T, in the US, and only eleven years after the full development in Detroit of mass production, the Ford Motor company established an assembly plant in Port Elizabeth, in 1924 – earlier it seems than the establishment of any such plant in any other of today's middle-income developing countries.

In some measure, thus, South Africa, between World War I and the 1960s, apparently industrialised and grew in parallel with the US economy, during its 'one big wave', albeit always several lengths behind and never on its crest, but – unlike today – without showing any signs of drowning in the backwash. Even within the limitations of South Africa's technological capabilities – and the economics of the local production of sophisticated capital equipment and intermediate goods, which a minerals-rich economy with flourishing exports could well afford to import – there was enough scope to keep manufacturing industry growing rapidly decade after decade.

Whether the contrast with today is due to the ebbing of the tide of growth of the world economy in the early 1970s – due for instance to the petering out of Gordon's 'one big wave' or to Brenner's falling rate of profit and 'long downswing' – or to Easterly's 'undemanding technologies' of that earlier era, compared to his 'skill-biased technical change' since the early 1980s, is debatable. The question remains though: What counterparts of the local manufacture of major new products during the earlier technological revolution, either already exist, or are in the offing, in South African manufacturing industry during this, the IT, revolution?

5.7 Does manufacturing matter in the information age?

Only a few years ago it was taken for granted that an improvement in the performance of manufacturing industry was the key to the revival of economic development in South Africa. The shares of services in the GDP (Table A4) and in formal employment, however, have increased considerably since the mid-1980s.[61] Furthermore, during the 1990s, the FIRE sector, discussed in Section 5.3, and the Transport, Storage and

Communication sector (which includes the cellular phone industry), both associated with the New Economy, were in terms of value-added the fastest growing components of the services sector.[62] In the face of the impressive performance of these sectors, a more sanguine view of the stagnation of manufacturing is now prevalent, with the shift to services apparently seen as a natural and beneficial transition from the old to the new economy.

Even in the United States, the epitome of the New Economy, however, the shift towards services is not accepted with complete equanimity. It is seen by Brenner (1998:204-5) not as 'an expression of economic rejuvenation' but as a 'manifestation of US economic decline' – despite the fact that there 'the reverse side' of the decline of manufacturing employment has been a massive increase in the number of jobs in services.

In South Africa there has been no such compensating increase in employment in services. Between 1990 and 1998, employment fell in both manufacturing (by 161827 or 10.6 per cent), and services as a whole (by 71241 or 3.2 per cent). In South Africa, furthermore, unlike the US, the problem of the decline of manufacturing employment has been greatly compounded by the decline in employment in the primary sector.[63] The increased share of services in GDP has not been due to particularly rapid growth of value added in this sector, but to very slow growth in the rest of the economy (Table A3); and its increased share in formal employment so far, is due entirely to larger proportional declines in employment in other sectors.[64]

In the case of the US, Brenner (1998:205) sees the substantial growth of employment in services as due to 'the emergence of the low wage economy into which the US began to descend as early as the first part of the 1960s.' In South Africa, employment growth outside formal sector manufacturing has predominantly been in relatively low income informal sector service activities, with some much less significant amount in the form of sub-contracting in informal manufacturing.

As the discussion of the findings of Nordhaus (2001) in Section 5.5 indicated, too, the direct contribution of the two new-economy manufacturing, sectors SIC 35 and SIC 36, accounted for a significant proportion of the acceleration of US labour productivity growth in

1995-98. Manufacturing, thus, has evidently mattered a good deal in the US in recent years, despite the lacklustre performance of non-new-economy manufacturing.[65] Similarly as the discussion above suggests, the revival of growth in the South African economy depends to a significant extent on an improvement in the performance of the downstream durable goods-producing sectors, of which SIC 35 and SIC 36 are part. Indefinitely continuing increases in the relative importance of the services sector in South Africa are unsustainable, and are incompatible with a significant increase in the rate of growth of GDP.

A revival of the growth of manufacturing output and employment, thus, is vital for the future of the South African economy, even in this, the era of the New Economy.

5.8 Restructuring a natural resource abundant economy: the challenges

Manufacturing, thus, still matters a good deal. Given trends in other sectors of the economy, it is hard to see how growth rates of the sort needed not only for economic, but also for political reasons, can be achieved without a substantial acceleration of the growth of manufacturing industry.

The obstacles to significantly faster growth of South African manufacturing industry, however, are formidable in today's global conditions. The challenge facing South Africa is that of climbing the international ladder of industrial production to more high-tech, more skills-intensive, and higher value-added manufacturing activities.

This is in some respects particularly difficult for a natural resource abundant economy such as South Africa's. As Findlay and Lundahl (2000:36) observe, there is 'the possibility that under certain circumstances pursuing a pattern of primary specialisation makes it difficult to switch at all' to a more diversified export pattern. And, as we have seen above, it can be yet more difficult sustaining a rapid rate of growth of output while transforming the export pattern, especially in unfavourable world economic conditions such as have prevailed for the past thirty years.

In these conditions, South Africa, as a country of intermediate skills endowment, faces fierce competition in activities at all levels of the skill-intensity of production. Owing largely to its natural resource abundance, South Africa's transition to export oriented industrialisation was considerably delayed – indeed to the mid-1980s – by nearly thirty years, compared to natural resource poor South Korea, for instance. Thus, having had a relatively advanced and diversified manufacturing sector at the beginning of the 1970s, as noted at the outset, South Africa in the mid-1980s found itself a relative latecomer in relation even to developing countries like Korea which had in the meantime entrenched themselves in world markets for (even quite skills-intensive) manufactures. A problem is that most developing countries have improved their skills endowments over the past few decades, and, like South Africa, are striving to raise them further. Raising levels of educational and skills attainment – while very necessary – thus, does not necessarily increase comparative advantage in skills-intensive activities, or therefore increase the growth rate.[66]

The important implication of the foregoing is that dependence on natural resource-based (primary and manufactured) products may today be more of a blessing and less of a curse for South Africa than it has sometimes appeared to be in the past.[67] Wood and Mayer (1998:64) state: 'Africa's comparative advantage in primary exports, which arises basically from its abundance of natural resources, is in our view at worst neutral, and quite possibly favourable, to its long-term development prospects, as compared with those of Asia. Exporting manufactures is no longer a barometer of national prosperity. Over the past few decades the world has changed: both developed and developing countries are now exporters of manufactures on a large scale...'.[68] Furthermore, it suggests that though this dependence may gradually diminish as it has done in the past, South Africa is likely to remain heavily dependent on natural resource-based products for a considerable time to come.[69] This does not mean that South Africa can significantly increase its rate of economic growth, without a major increase in the MVA growth rate, and considerable diversification of not only exports, but also of output, towards more high-tech and more skills-intensive downstream manufacturing activities. It does mean, in keeping with the advice given by Wood and Mayer (1998:65-68) to African economies in general, that South Africa should make the most of its comparative advantages in natural resource-based

products, to increase its exports and output, while upgrading its skills and educational levels, and in other possible ways trying to promote the necessary further diversification of the economy.

Much, however, seems to depend on the future growth of the advanced industrial countries. South Africa's 2.45 per cent a year GDP growth rate in 1995-2000 was substantially higher than in any other five year period since 1980 (though not as high as in any such period before 1980). Growth rates in virtually all the main sectors, excepting mining, improved in the latter half of the 1990s (Table A5).

This improvement in South Africa's growth rate, however, has occurred in the context of, and is probably due to, the protracted US upswing, beginning in 1992, which saw US GDP growth accelerate to 3.9 per cent a year in 1995-2000 (DeLong, 2001:11). Though South Africa has not yet been pulled up to these levels, a quick and sustained resumption of such growth rates in the US could well raise further the rate of growth of the South African economy, and facilitate its restructuring.

We must hope, thus, that the analyses with pessimistic implications for the US economy are wrong, and that the optimists are right. That is, for instance, we must hope that it is not the case that Western capitalism is in terminal decline, as Brenner's (1998) analysis seems to imply; or that the benefits of the IT revolution in the US have been limited to one key new-economy sector (Gordon, 2000b: 12-17); or that 'the greatest benefits of the computer age', rather than 'awaiting us in the future' have already been left 'in the past'. (Gordon, 2000a: 43). We must hope, thus, that Nordhaus is right in finding that there has been a significant productivity growth rebound since 1995, which has not been narrowly focused on a few new-economy sectors; that DeLong's (2001:9-16, and Abstract) confidence is not misplaced when he declares (despite the current downturn and collapse of IT stocks) that the 'boom in information technology investment' is not a flash in the pan, but will 'pay dividends in the form of accelerated labor productivity growth for at least a decade to come' — and, hence perhaps that we have seen only the beginnings of another 'big wave'.

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NOTES

[1] Probably the most notable exception was the chemicals industry, which (owing to the establishment of a substantial explosives plant to meet the needs of mining) was in 1916/7 strikingly more advanced than in other countries at a comparable stage of development. See T A du Plessis (1965).

[2] See for instance Martin (1990) and Christie (1991).

[3] The import/domestic supply ratio for manufacturing in the aggregate fell from 57.2 per cent in 1926/7 to 38.5 per cent in 1946/7, 28.7 per cent in 1956/7, and was down to 19.6 per cent by 1972. (Bell and Farrell, 1997:596).

[4] Particularly rapidly growing sub-sectors in the inter-war period were basic metals (owing to the establishment of ISCOR, which came into production in 1933); motor vehicles (Ford and GM having established plants in 1924 and 1926 respectively); rubber products (Firestone having begun production in 1936); machinery; paper and paper products, and fabricated metal products.

[5] A major development in the 1950s was the establishment of South Africa's first oil-from-coal synthetic fuel plant, at Sasolburg. In the 1960s, various substantial plants were established in the basic metals sector (such as Highveld Steel, RMB Alloys, Southern Cross Stainless Steel, and the Alusaf aluminium smelter); and in the chemicals sector (such as the AECI-Sasol polythene plant, SA Nylon Spinners, the AECI petrochemicals plant at Sasolburg, the Karbchem synthetic rubber plant, Sentrachem-Hoechst production of polyethylene, and the Natref oil refinery).

[6] Between 1926/7 and 1972, non-durable consumer goods, as a proportion of MVA, fell from 48.9 per cent to 21.7 per cent; the major consumer durable, motor vehicles, rose from 2.0 to 5.7 per cent; intermediate goods increased from 24.8 per cent to 45.8 per cent; and capital goods from 3.1 per cent to 15.1 per cent (Bell and Farrell, 1997:602, Table 2).

[7] Derived from T A du Plessis (1965).

[8] See Bell and Farrell (1997:602, Table 2, and pp.608-9) and World Bank (1987:1-5) for South Korean data.

[9] See Findlay and Lundahl (1999:13-15) on resource-led growth.

[10] The year 1981 is taken as the end date for this period rather than 1980, since the cycle peaked in August 1981.

[11] See Table 4 in Section 5.2 below.

[12] See Bell et al (1999) for more detail, including estimation of separate real exchange rates for natural resource-based and downstream durable goods manufactures.

[13] These low real interest rates, it might be noted, may also be seen as a consequence of the increase in oil prices in 1973. See Bruno and Sachs (1986:23-26).

[14] It might be noted that, in 1970-75, real fixed capital formation increased at relatively low rates, of 5.6 per cent and 3.7 per cent respectively, in both the natural resource-based and durable goods manufacturing groups. In 1975-8, fixed capital formation in the natural resource-based group increased rapidly (at 19.7 per cent a year), due virtually entirely to investment in basic chemicals (Sasol II); whereas there was absolute decline in the durable goods group (at 7.0 per cent a year), understandably in view of the major economic downturn from September 1974 to December 1977. In 1978-81, a period of rapid growth, however, real fixed capital formation in the durable goods group increased at no less than 24.5 per cent a year and in the labour-intensive group at 28.6 per cent a year; whereas in the natural resource-based group it increased at 9.4 per cent a year (despite Sasol II). This evidence renders questionable the idea that the investments in Sasol II and III (promoted by government) created distortions which squeezed out, and thus were largely at the expense of more economic investments in other sectors, which would otherwise have taken place – and that this slowed the growth of manufacturing value added. The effect of Sasol II and Sasol III and other basic chemicals investments, thus, was to raise the fixed investment/GDP ratio to record-breaking levels in 1975 and 1981 (noted below) rather than to reallocate some fixed pool of investible resources.

[15] It is interesting to note that the period 1974-1979, when the decisions to construct these two plants were taken, coincides almost exactly with the period of South Korea's heavy and chemical industries (HCI) programme.

[16] Gross domestic fixed capital formation grew relatively rapidly (at 7.6 per cent a year) in 1970-75, faster than in any earlier five-year period since World War II, except 1960-65, fell (at 3.00 per cent a year) in 1975-78, and increased rapidly again thereafter (at 9.7 per cent a year) in 1978-81, to reach the highest absolute level of investment attained in any one year, before or since, in 1981.

[17] Indicative of the sensitivity of these sectors to economy-wide investment, is that their collective value added increased at rates of 8.6 per cent in 1970-75, fell at 0.7 per cent during the recession of 1975-78, and increased rapidly at 13.6 per cent a year in 1978-81. (Table 3)

[18] As would be expected, given the incentive to expand output in the chemicals sector, provided by higher output prices, and the consequent investments in it, the chemicals industry was the major driving force behind the growth of value added in the natural resource-based group of industries in 1970-81. The Machinery and Equipment and Electrical Machinery sectors, however, both recorded considerably faster output growth than manufacturing in the aggregate, in 1970-81 (Table 3), as they did during the periods of rapid manufacturing output growth from 1926/7 to 1956/7 (Bell and Farrell, 1997:603, Table 3). This contrasts markedly with the period since 1985, considered below.

[19] The incentive to achieve this was a rebate on excise duties related to local content. The penalty for failure to meet the local content targets made non-compliance prohibitively costly, so that the stipulated requirements were in effect compulsory minimum local content levels.

[20] Its import/domestic supply ratio in 1970 was 40.1 per cent, higher than for any other 3-digit SIC manufacturing sub-sector excepting Machinery and Equipment (50.9 per cent) and Professional and Scientific Instruments (67.4 per cent). Also, in 1972, the motor vehicle industry accounted for 13.6 per cent of South Africa's total manufactured imports, lower than for Machinery and Equipment (19.6 per cent) and Other Industries (20.9 per cent), but much higher than for other manufacturing sub-sectors.

[21] Cyclical movements in the South African economy, it seems, followed the OECD cycle but with a lag of a year or so. South African cyclical peaks, for instance, occur in August 1974 and August 1981, whereas OECD cyclical downturns occur more immediately following the 1973 and 1979 oil crises. In the case of South Africa, and perhaps also of other natural resource abundant oil-importing, developing countries, the adverse impact of higher oil prices was probably delayed due to continued increases in the world prices of their primary commodity exports.

[22] For more detailed description of developments in trade policy see Bell (1993:83-90).

[23] These values have been derived by multiplying exports in rands by the nominal effective exchange rates, such as those for 1978-2000 in South African Reserve Bank (2001:B-217), and using an estimated trade-weighted index of the price level of South Africa'' major trading partners as a deflator.

[24] As noted earlier, Bell et al (1999) estimate real exchange rates for exporters of natural resource-based and downstream durable goods manufacture separately. These indicate a significant increase in the price competitiveness of exporters of durable goods manufactures, relative to foreign products, and relative to exporters of natural resource-based manufactures, after 1985.

[25] Exports of the durable goods group of industries as a proportion of total manufactured exports, increased substantially from 9.6 per cent in 1985 to 18.82 per cent in 1998, somewhat higher than the 15.7 per cent level reached by 1970. (Table A3)

[26] The fastest growing major manufacturing sector in 1980-85 was chemicals (Table 3), owing probably to the coming on-stream of Sasol III, after the long gestation period of the investment in it, which began in 1979, after second oil crisis.

[27] The export/gross output ratio of this category of sectors increased from 4.9 per cent in 1985 to 21.4 per cent in 1998, proportionally much more than the increase from 19.9 per cent to 34.8 per cent in the case of the natural resource-based sector, and

from 10 per cent to 21.3 per cent in the case of the group of labour-intensive industries.

[28] There are three reasons for this: a significantly larger proportion of the sales of the natural resource-based sectors is in foreign markets, so that they are less dependent on the state of the domestic economy, their exports have grown at a reasonably good rate; and they are not as directly dependent on the level of investment, which has fallen sharply as a proportion of gross domestic expenditure since the early 1980s.

[29] The average annual rate of growth of mining value added as a whole was 5.15 per cent in 1950-55, 6.47 per cent in 1955-60, and 5.7 per cent in 1960-65, but fell to 2.23 per cent in 1965-70, and then in 1970-75 was minus 4.51 per cent (Table A5).

[30] In 1970, mining accounted for 15 per cent of GDP (at constant 1995 prices) The direct effects alone of the absolute decline in mining value-added (which involved a 6.75 percentage points swing from a positive 2.23 per cent growth rate in 1965-70 to a negative 4.51 per cent in 1970-75), thus, would, it seems, account for about 0.67 of a percentage point of the 1.50 percentage point decline in the GDP growth rate between 1965-70 and 1970-75.

[31] While, as noted above, mining value-added declined at 4.51 per cent in 1990-95, it fell at 3.16 per cent a year in 1970-73 and more rapidly at 6.50 per cent a year in 1973-75. It increased at an average annual rate of 2.26 per cent in 1960-73 but fell at 0.41 per cent a year in 1973-82.

[32] Bell et al (1999) estimate that the ratio of imported capital goods to gross domestic fixed investment in South Africa in 1975-90 averaged about 20 per cent.

[33] See the prescient analysis of JC du Plessis (1965).

[34] Unlike the period 1985-90, during 1995-2000 the US dollar appreciated significantly against other key currencies, so that export growth rates in constant US dollars in 1995-2000 are much lower than in trade-weighted foreign currency units, as Table 4 shows.

[35] It should also be noted that these improvements in export growth rates, in the 1990s, occurred during a period which has included the long US upswing, which began in 1992, and which continued, with relatively minor corrections, through to 2000. There are thus doubts about their sustainability.

[36] A possibly positive sign for future export growth, evident in the table, is that, owing to the substantial decline in gold exports as a proportion of total exports (from 38.9 per cent in 1985 to 13.7 per cent in 1998), the negative impact on total exports of any particular decline in gold exports has diminished considerably. Assuming that gold exports will continue to decline, this is clearly advantageous.

[37] Two-year moving averages of GDP growth in 1994-2000, varied between a low of 1.3 per cent (in 1999) and a high of 3.6 per cent (in 1996), and the ratio of the current account deficit to GDP varied between –0.07 per cent (in 1994) and 1.75 per cent (in 1998). By contrast with earlier decades, thus, the economy has moved within a relatively confined space.

[38] As noted earlier, the exceptions in the 1970s, were the motor vehicle industry, and the natural resource-based chemicals and iron and steel industries.

[39] See Krugman (1995:49) on the possible beneficial effects of growth which is biased towards import-competing industries.

[40] The ratio of imports to domestic demand (that is, the ratio of imports to gross output plus imports minus exports) rose from 23.1 per cent in 1993 to 32.5 per cent in manufacturing as a whole. In particular categories, the percentage increased from 17.4 per cent to 26.4 per cent in the natural resource-based group; 35.8 to 49.1 in durable goods; and 12.8 to 20.0 in the labour-intensive group.

[41] Bell et al (1999) estimate that the ratio of imported capital goods to gross domestic fixed investment in 1975-90 averaged about 20 per cent.

[42] The method used there in estimating potential or capacity output is an adaptation of Panic (1978), as described by Christiano (1981: 151-154). Capacity output is obtained by multiplying the estimated output/capital ratio (Y/K) (derived from a shifted regression of Y/K), for each year, by the actual capital stock in that year. The capital stock data used in the estimation of capacity GDP are from the South African Reserve Bank.

[43] Capacity utilisation as shown in Figure A3, and the index of capacity utilisation in manufacturing industry available from the database of the South African Reserve Bank for 1970-2000, move in unison in virtually all years. Considering that they are derived in completely different ways (the Reserve Bank indices originally obtained by Statistics South Africa through survey methods), this is remarkable, and, indeed, reassuring.

[44] The output-capital ration in this group fell throughout the period 1994-98, whereas in the natural resource-based group it showed a tendency to increase over this period.

[45] It is noteworthy that though real capital stock in the durable goods group as a whole increased at 2.2 per cent a year in 1993-98 (compared to 3.28 per cent a year in manufacturing as a whole), within this group real fixed capital stock declined in absolute terms in the two key capital goods-producing sectors, Machinery and Equipment and Electrical Machinery, and only in these two sectors. Amongst other individual manufacturing industries listed in our tables, only Textiles and Footwear experienced absolute declines in fixed capital stock, in 1992-98.

[46] As a percentage, it increased from 2.1 to 6.9 in mining; 9.6 to 20.2 in manufacturing; and 15.1 to 25.7 in services.

[47] In FIRE and manufacturing, 23.0 per cent and 10.2 per cent respectively were 'highly skilled', and 'highly skilled' and 'skilled' workers together comprised 97.9 per cent and 38.2 per cent of employees respectively.

[48] By contrast with the stagnation of manufacturing, described earlier, the average annual growth of value-added in FIRE was 2.0 per cent in 1985-90, 1.92 per cent in 1990-95, and rose sharply to 5.6 per cent in 1995-98. (Table A5). And, whereas the average annual percentage rates of employment growth in manufacturing were 1.09, -1.25 and –1.66, in 1985-90, 1990-95 and 1995-98 respectively; in FIRE they were 2.96, 1.38 and 2.69 respectively.

[49] See Bell et al (1999) on aspects of this.

[50] Another advantage of this sector in the context of a foreign exchange constraint is that it is less dependent on imported inputs.

[51] The fact that, unlike manufacturing, there is a worldwide demand for skilled people in this sector, has also given people the incentive to position themselves for work in it.

[52] On emigration as a problem, see Bhorat (2001:17-20).

[53] Indeed, Bhorat (2000:24, Table 17) shows both higher 50-10 and 90-10 percentile wage differentials for the US than for South Africa. South Africa has a higher 90-10 percentile wage differential than the other developed countries. This is to be expected given their much higher levels of educational attainment. But none of this on its own tells us that skills-scarcity is an effective constraint on South African growth.

[54] Contrary to Bhorat (2000:26), it also does not follow from relatively high skilled/unskilled wage differentials that measures such as South Africa's Skills Development Policy are warranted on economic grounds: this depends on entirely different considerations. See, for instance, Archer (1997).

[55] It has been argued that the geographical dispersal of manufacturing industry, which was a feature of industry in South Africa from the 1960s on, was a result of such intensified international competition e.g. Bell (1987).

[56] Crucial to Brenner's argument is that profit rates fell sharply in manufacturing relative to services. He rejects the idea that this is explicable in terms of differences between the two sectors in the rate of growth of real wages relative to labour productivity growth. In South Africa, in keeping with Brenner's argument for the US, it seems that real wage growth in manufacturing fell progressively from the late 1950s to the end of the 1970s, while labour productivity growth rose or at least did not fall significantly. Comparable information for services, necessary to test Brenner's argument, however, is not as yet available to us.

[57] So far as the OECD slowdown is concerned, it is not clear to us why this should have made for larger declines in developing countries, except perhaps by causing a long decline in the relative prices of natural resource-based products.

[58] They differ thus in name from their US counterparts, Industrial Machinery and Equipment, and Electronic and Electrical Equipment.

[59] Two possible, minor exceptions to this are the Television, Radio and Communications (SIC 371-373) and Professional and Scientific Equipment (SIC 374-376), manufacturing sectors, which do perhaps increasingly manufacture ICT products, and which have done relatively well in terms of output and export growth. The TV etc sector has had positive output growth in every sub-period since 1980, excepting 1990-95, and was the second fastest growing

manufacturing sub-sector (at 9.82 per cent a year) in 1995-98. The Professional etc sub-sector had positive output growth in all periods from 1975-80, excepting 1995-98 (Table 3). They have probably been the fastest growing manufacturing sub-sectors in the past two decades, though off very small bases. Of manufacturing sub-sectors, TV etc had the second fastest export growth rate (18.6 per cent a year) in 1990-98, and the export growth of Professional etc (10.4 per cent a year) was tenth fastest (Table 2).

60 Given the probably substantial increases, in the 1990s, in imports of manufactured IT equipment, produced abroad in these two sectors, the inability to penetrate into these areas may well have aggravated significantly the problem of foreign exchange scarcity discussed in Section 5.2.

61 The shares of services in formal employment at these dates were 37.9 per cent, 38.7 per cent and 43.25 per cent.

62 The Transport, Storage and Communications sector indeed had a higher rate of output growth (4.47 per cent a year) in 1990-98 than any other main sector (Table A5), or any manufacturing sub-sector, but for one (non-ferrous basic metals).

63 Employment in mining has fallen virtually without interruption since 1980. It fell at 5.23 per cent a year in 1990-95, and by 4.68 per cent a year in 1995-98, involving a loss of 347308 jobs or 45 per cent of the 1990 mining labour force, between 1990 and 1998.

64 It should be noted too that despite FIRE and the communication sector, the great bulk of employment in services in South Africa, as in the US, is relatively unskilled.

65 Nordhaus (2001:20) finds that the two non-manufacturing sectors retail and wholesale trade also made significant contributions to overall productivity growth in the US in 1995-98, but he seems to regard these findings as anomalous. They are, he says, 'more surprising' than in the case of durable manufacturing; and 'the data in these sectors are somewhat of a mystery.'

66 See Wood and Mayer (1998:17, Figure 4b) and Easterly (2001:9). Easterly (p.20) also remarks on the analagous problem that 'all countries reforming [their economic policies] together', in an attempt to attract 'worldwide financial (and other kinds of) capital'...will not increase their average growth rate'.

67 It is indeed noteworthy that natural resource-based manufacturing has been the sheet-anchor of manufacturing value-added since 1980 (Table 3).

68 It is perhaps significant that the 'Asian tigers', heavily dependent on the US market, and on IT-related exports, were predicted by the IMF to be worst affected by the current global downturn, whereas natural resource abundant Africa and Latin America were expected to be much less affected by its adverse effects. (The Economist, April 28th 2001, p.88).

69 The combined share in South Africa's exports of goods and non-factor services, of primary products and the four sectors treated above as representing natural resource-based manufactures, has fallen from its 76 per cent level in 1985, but was still substantial, at 60 per cent, in 1998 (Tables A2 and A6).

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Table A1									
AVERAGE ANNUAL RATES OF GROWTH OF SOUTH AFRICA'S TOTAL EXPORTS OF GOODS AND NON-FACTOR SERVICES BY MAIN SECTOR (%)									
	1970-75	**1975-80**	**1970-80**	**1980-85**	**1985-90**	**1980-90**	**1990-95**	**1995-98**	**1990-98**
	Exports in Constant (1995) US Dollars								
Agriculture, forestry and fishing	9.94	3.00	6.41	-20.45	8.58	-7.06	3.08	4.10	3.46
Other mining	13.00	17.63	15.29	-7.80	5.53	-1.36	2.74	0.91	2.05
Manufacturing	7.55	6.94	7.24	-7.26	14.19	2.91	8.42	-0.38	5.03
Exports of goods excluding gold	9.35	10.11	9.73	-8.52	10.51	0.54	6.38	0.18	4.01
Gold	13.06	19.88	16.42	-14.36	-2.14	-8.45	-3.82	-8.91	-5.76
Total exports of goods including gold	10.80	14.57	12.67	-11.36	5.69	-3.21	3.74	-1.54	1.73
Wholesale and retail trade, catering etc.	4.38	-1.49	1.40	-8.28	15.59	2.97	2.60	5.17	3.55
Transport, storage and communication	10.66	6.07	8.34	-12.77	8.01	-2.93	2.71	2.02	2.45
Finance, insurance, real estate & business services	14.46	-0.37	6.79	-3.80	10.08	2.91	2.11	9.31	4.75
Community, social and personal services	34.88	-9.99	10.19	-0.34	13.97	6.58	3.79	2.56	3.32
TOTAL	**10.54**	**12.90**	**11.71**	**-11.19**	**6.31**	**-2.83**	**3.59**	**-0.70**	**1.96**
	Exports in Constant-Price Trade-Weighted Foreign Currency								
Agriculture, forestry & fishing	7.83	2.4	5.08	-14.4	1.79	-6.65	3.34	9.48	5.6
Mining excluding gold	10.82	16.96	13.85	-0.78	-1.07	-0.93	3	6.13	4.16
Manufacturing	5.46	6.3	5.88	-0.21	7.05	3.36	8.69	4.77	7.21
Total exports excluding gold	7.23	9.46	8.34	-1.56	3.6	0.99	6.64	5.36	6.16
Gold	10.89	19.19	14.96	-7.84	-8.26	-8.05	-3.58	-4.2	-3.81
Total exports including gold	8.66	13.9	11.25	-4.62	-0.91	-2.78	4	3.55	3.83
Wholesale & retail trade, catering etc.	2.39	-2.08	0.13	-1.3	8.36	3.42	2.85	10.61	5.69
Transport, storage and communication	8.52	5.49	6.99	-6.14	1.26	-2.51	2.97	7.29	4.57
Finance, insurance. Real estate & business services	12.26	-0.89	5.48	3.48	3.21	3.34	2.37	14.96	6.92
Community, social and personal services	28.78	-10.28	7.49	6.99	6.84	6.92	4.04	7.88	5.46

TOTAL	**8.43**	**12.24**	**10.32**	**-4.45**	**-0.33**	**-2.41**	**3.84**	**4.44**	**4.06**
Source: Calculated from the WEFA and SA Reserve Bank databases									

Table A2

SHARES OF SECTORS AND INDUSTRY GROUPS IN SOUTH AFRICA'S TOTAL MANUFACTURED EXPORTS (%)

	1970	1975	1980	1985	1990	1995	1998
CHEMICALS	11.01	10.76	14.56	15.80	13.44	14.88	14.2
IRON AND STEEL	7.50	8.07	13.62	18.21	19.82	20.06	21.21
NON-FERROUS BASIC METALS	2.73	4.28	6.36	12.07	7.52	5.77	8.11
PULP AND PAPER	3.01	2.33	2.53	4.52	4.59	5.75	3.99
TOTAL NATURAL RESOURCE-BASED GROUP	24.25	25.44	37.07	50.60	45.37	46.48	47.51
FABRICATED METAL PRODUCTS	2.39	2.05	1.84	1.66	3.27	3.53	4.00
MACHINERY AND EQUIPMENT	8.63	5.41	4.36	4.35	5.65	7.09	6.66
ELECTRICAL MACHINERY	1.57	1.09	1.01	0.80	1.24	1.67	1.71
MOTOR VEHICLES	2.13	1.77	1.71	2.20	3.28	4.22	4.99
OTHER TRANSPORT EQUIPMENT	1.01	0.86	0.68	0.58	0.72	0.78	0.86
TOTAL DURABLE GOODS GROUP	15.73	11.18	9.60	9.59	14.16	17.29	18.22
TEXTILES	5.28	3.54	3.38	4.03	3.77	3.36	3.18
WOOD AND WOOD BASED PRODUCTS	0.19	0.28	1.01	0.98	1.11	0.95	0.90
LEATHER PRODUCTS	0.55	0.35	0.51	0.81	0.57	0.92	0.86
FURNITURE	0.11	0.09	0.35	0.29	0.70	1.73	2.03
FOOTWEAR	0.14	0.12	0.28	0.22	0.23	0.27	0.19
CLOTHING	1.34	1.19	1.74	1.93	1.65	1.48	1.31
TOTAL LABOUR-INTENSIVE GROUP	7.61	5.57	7.26	8.27	8.04	8.71	8.47
TELEVISION, RADIO AND COMMUNICATION EQUIPMENT	0.47	0.29	0.21	0.34	0.46	0.78	1.02
PROFESSIONAL & SCIENTIFIC EQUIPMENT	0.71	0.39	0.30	0.35	0.45	0.53	0.57
OTHER MANUFACTURING SECTORS	51.23	57.12	45.55	30.84	31.53	26.21	24.22

TOTAL MANUFACTURED EXPORTS	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Source: Calculated from the WEFA database							

Table A3

SHARES OF SECTORS AND INDUSTRY GROUPS IN SOUTH AFRICAN MANUFACTURING VALUE ADDED IN CONSTANT (1995) PRICES (%)

	1970	1975	1980	1985	1990	1995	1998
CHEMICALS	10.11	9.46	11.98	15.86	14.14	14.30	15.82
IRON AND STEEL	7.66	8.25	7.23	6.25	5.89	7.10	7.60
NON-FERROUS BASIC METALS	1.09	1.78	1.49	1.75	1.73	2.35	3.84
PULP AND PAPER	4.05	4.18	3.99	4.91	4.85	5.32	4.82
TOTAL NATURAL RESOURCE-BASED GROUP	22.90	23.67	24.70	28.77	26.61	29.07	32.08
FABRICATED METAL PRODUCTS	8.77	8.57	8.28	6.98	5.13	4.90	5.41
MACHINERY AND EQUIPMENT	8.54	9.69	9.52	8.28	6.86	7.07	5.16
ELECTRICAL MACHINERY	2.34	3.42	3.85	3.88	2.73	3.14	2.93
MOTOR VEHICLES	7.06	8.81	9.28	6.86	7.54	7.65	6.37
OTHER TRANSPORT EQUIPMENT	1.73	1.73	1.29	1.10	0.71	0.52	0.60
TOTAL DURABLE GOODS GROUP	28.42	32.22	32.21	27.10	22.98	23.28	20.47
TEXTILES	3.97	3.25	3.95	3.28	2.43	2.52	2.37
WOOD AND WOOD PRODUCTS	1.85	1.68	1.81	1.79	1.49	1.67	1.64
LEATHER PRODUCTS	0.47	0.46	0.34	0.43	0.40	0.44	0.49
FURNITURE	1.43	1.26	1.46	1.50	1.59	1.53	1.57
FOOTWEAR	1.36	1.08	0.92	0.98	0.98	0.89	0.65
CLOTHING	2.68	2.36	2.71	2.77	2.84	2.81	2.51
TOTAL LABOUR-INTENSIVE GROUP	11.76	10.09	11.18	10.75	9.74	9.84	9.22
TELEVISION, RADIO AND COMMUNICATION EQUIPMENT	0.73	0.81	0.53	0.71	1.20	1.02	1.33
PROFESSIONAL & SCIENTIFIC EQUIPMENT	0.28	0.13	0.11	0.21	0.28	0.31	0.25
OTHER MANUFACTURING SECTORS	35.91	33.09	31.26	32.46	39.19	36.48	36.67

TOTAL MANUFACTURING VALUE ADDED			100.00	100.00	100.00	100.00	100.00	100.00	100.00
Source: Calculated from the WEFA database									

Table A4							
SHARES OF MAIN SECTORS IN TOTAL VALUE ADDED IN SOUTH AFRICA IN CONSTANT (1995) RANDS (%)							
	1970	**1975**	**1980**	**1985**	**1990**	**1995**	**1998**
PRIMARY	**19.62**	**14.30**	**14.18**	**13.13**	**12.30**	**10.82**	**11.03**
Agriculture, forestry and fishing	4.70	4.69	4.96	4.49	4.95	3.86	4.53
Gold mining	11.72	6.43	4.67	3.83	3.32	2.83	2.61
Other mining	3.19	3.18	4.55	4.82	4.02	4.14	3.89
Total mining	14.91	9.61	9.22	8.65	7.34	6.96	6.50
SECONDARY	**27.15**	**29.88**	**30.65**	**29.07**	**28.87**	**27.85**	**26.91**
Manufacturing	19.97	21.62	23.32	22.03	22.00	21.22	20.18
Electricity, gas and water	1.74	2.06	2.40	2.90	3.16	3.48	3.60
Construction	5.44	6.20	4.93	4.15	3.71	3.15	3.14
TERTIARY	**53.23**	**55.82**	**55.17**	**57.80**	**58.83**	**61.33**	**62.05**
Wholesale and retail trade, catering etc	13.88	15.97	13.88	14.84	14.31	14.34	13.75
Transport, storage and communication	6.75	7.50	8.26	7.89	7.88	8.90	9.99
Finance, insurance, real estate & business services	14.37	14.18	14.43	15.30	15.60	16.42	17.63
Community, social and personal sercvices	18.24	18.17	18.60	19.77	21.04	21.66	20.69
TOTAL VALUE ADDED	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Source : Calculated from the WEFA database							

Table A5

AVERAGE ANNUAL RATES OF GROWTH OF VALUE ADDED BY MAIN SECTOR IN SOUTH AFRICA AT CONSTANT 1995 PRICES: 1950-2000

	1950-55	1955-60	1960-65	1965-70	1970-75	1975-80	1975-81	1970-81	1980-85	1985-90	1990-95	1995-98	1990-98	199 200
PRIMARY	**4.98**	**5.26**	**4.55**	**2.38**	**-2.58**	**2.61**	**2.39**	**0.10**	**0.59**	**0.15**	**-1.59**	**1.95**	**-0.28**	**1.4**
Agriculture, forestry & fishing	4.53	1.71	0.26	3.03	4.20	4.06	4.35	4.28	0.07	3.66	-4.04	5.28	-0.64	4.6
Total mining	5.15	6.47	5.70	2.23	-4.51	2.06	1.62	-1.22	0.80	-1.65	-0.19	0.02	-0.12	-0.5
SECONDARY	**6.58**	**4.09**	**9.72**	**7.54**	**6.28**	**3.90**	**4.43**	**5.26**	**-0.28**	**0.75**	**0.32**	**1.22**	**0.66**	**1.3**
Manufacturing	7.48	4.56	9.85	7.38	5.93	4.47	5.25	5.56	0.95	1.59	0.15	0.71	0.36	1.1
Electricity, gas, and water	8.61	6.05	6.41	7.02	7.80	6.09	6.96	7.34	6.02	3.40	2.83	3.53	3.09	3.4
Construction	2.25	0.67	11.19	8.59	7.03	-1.71	-0.54	2.84	-1.37	-0.61	-2.36	2.08	-0.72	0.2
TERTIARY	**3.84**	**3.64**	**5.05**	**5.78**	**5.26**	**2.83**	**3.22**	**4.15**	**2.86**	**1.98**	**1.61**	**3.04**	**2.15**	**3.2**
Wholesale and retail trade catering etc.	3.46	4.26	7.33	7.20	7.23	0.06	1.56	4.10	3.48	0.89	0.92	0.89	0.91	1.8
Transport storage and communication	4.81	2.97	5.58	6.51	6.49	4.91	5.15	5.76	1.16	1.60	3.37	6.92	4.69	6.9
Finance,insurance,real estate & business services	4.27	4.12	5.11	6.57	4.00	3.26	3.58	3.77	3.31	2.00	1.92	5.55	3.26	5.5
Communuty,social and personal services	3.78	2.74	3.93	4.14	4.20	3.40	3.32	3.72	3.34	2.90	1.47	0.80	1.22	0.4
GDP	**4.89**	**4.11**	**6.28**	**5.15**	**3.65**	**3.09**	**3.47**	**3.55**	**1.35**	**1.67**	**0.86**	**2.43**	**1.45**	**2.4**

	1950-60	1960-70	1970-80	1980-90	1990-2000

PRIMARY	**5.12**	**3.46**	**-0.02**	**0.37**	**-0.10**										
Agriculture, forestry & fishing	3.11	1.63	4.13	1.85	0.19										
Mining	5.81	3.95	-1.28	-0.43	-0.37										
SECONDARY	**5.33**	**8.62**	**5.08**	**0.23**	**0.82**										
Manufacturing	6.01	8.61	5.20	1.27	0.63										
Electricity, gas, and water	7.32	6.72	6.94	4.70	3.13										
Construction	1.46	9.88	2.57	-0.99	-1.05										
TERTIARY	**3.74**	**5.42**	**4.04**	**2.41**	**2.40**										
Wholesale and retail trade, catering etc.	3.86	7.27	3.58	2.17	1.36										
Transport,storage and communication	3.89	6.05	5.70	1.38	5.15										
Finance, insurance,real estate & business services	4.20	5.84	3.63	2.66	3.72										
Communuty, social and personal services	3.26	4.04	3.80	3.12	0.95										
GDP	**4.50**	**5.71**	**3.37**	**1.51**	**1.65**										
Source : Calculated from the South African Reserve Bank database															

Table A6

SHARES OF MAIN SECTORS IN SOUTH AFRICA'S EXPORTS OF GOODS AND NON-FACTOR SERVICES (%)

	1970	1975	1980	1985	1990	1995	1998
PRIMARY	50.85	55.85	68.69	62.79	49.12	40.26	37.62
Agriculture, forestry and fishing	7.05	6.86	4.33	2.5	2.78	2.71	3.12
Gold	30.84	34.52	46.59	38.86	25.69	17.72	13.68
Other mining	12.97	14.48	17.77	21.43	20.65	19.83	20.81
SECONDARY	31.52	27.39	20.91	26.03	37.15	46.66	47.1
Manufacturing	31.37	27.35	20.85	25.9	37.03	46.52	46.98
Electricity, gas and water	0.01	0.03	0.05	0.1	0.1	0.11	0.1
Construction	0.14	0.02	0.01	0.03	0.03	0.03	0.03
TERTIARY	17.62	16.76	10.39	11.18	13.73	13.08	15.28
Wholesale and retail trade, catering etc.	6.6	4.96	2.51	2.95	4.48	4.27	5.07
Transport, storage and communication	8.39	8.43	6.17	5.64	6.11	5.86	6.35
Finance, insurance, real estate and business services	2.47	2.94	1.57	2.35	2.8	2.6	3.47
Community, social and personal services	0.16	0.43	0.14	0.25	0.35	0.35	0.39
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Calculated from the WEFA database

FIGURE A1
THE RATIO OF GROSS DOMESTIC FIXED CAPITAL FORMATION TO GDP IN SOUTH AFRICA 1946-2000 (%)

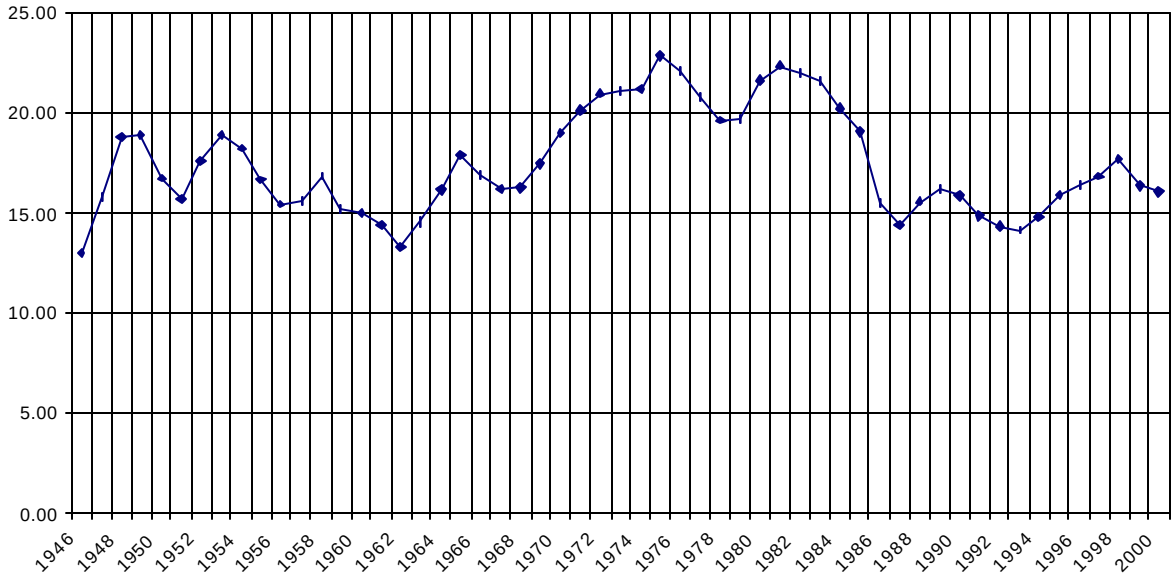

FIGURE A2
ACTUAL VERSUS POTENTIAL OUTPUT-CAPITAL RATIOS IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1946-2000

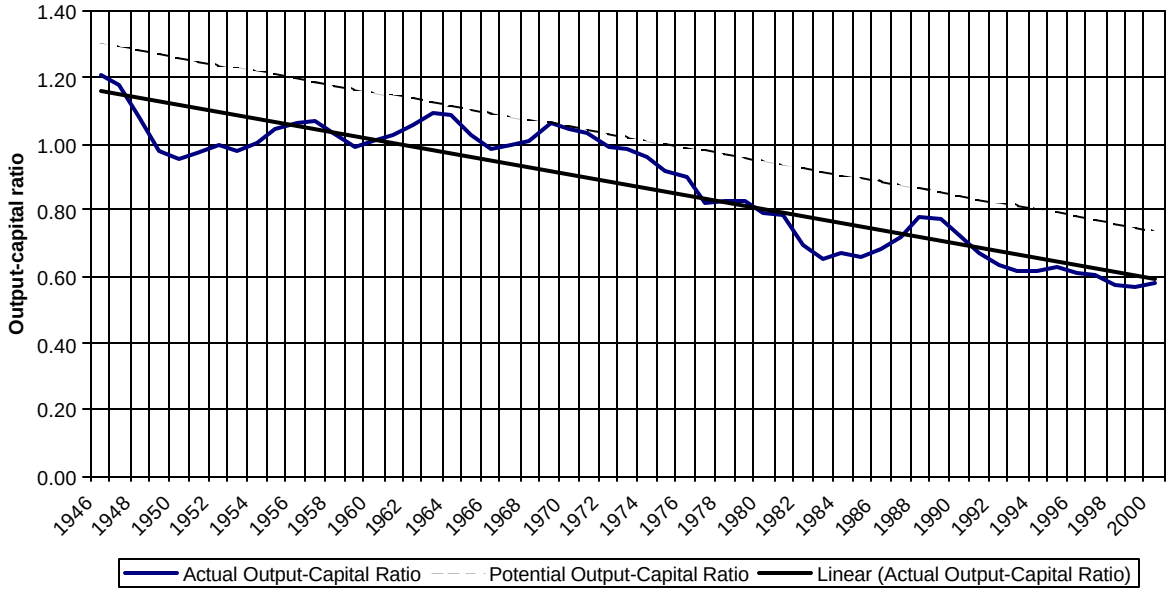

FIGURE A3
INDEX OF CAPACITY UTILISATION IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1946-2000