The role of mining in South Africa

Presidential Address

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SYNOPSIS

The contribution made to the economy of South Africa by the minerals industry is discussed according to four of its aspects.

Firstly, the industry supports both students and lecturers in technical and academic intsitutions. This support covers virtually the whole range of courses available at the universities and technikons, although most is obviously devoted to the engineering and science faculties.

Secondly, the industry makes a direct financial contribution to the State in that it contributes about 40 per cent of the State's receipts from direct tax paid on incomes and 30 per cent of the contributions to the total State revenue. It provides employment for 28 per cent of the total active labour force, and contributes 24 per cent directly to the gross domestic product.

Thirdly, the industry is responsible for over 65 per cent of the country's foreign earnings in spite of the significant rise in exports from the manufacturing sector. South African minerals are of crucial importance to the word, since the country has the world's largest reserves of seven minerals and features very prominently in many others.

Finally, the industry makes an indirect contribution, referred to as the *multiplier effect*. This is the ripple effect on the economy made by a large injection of money by which that money acquires an added effective value. A study made of the total production of the mining industry in 1978, for instance, showed this multiplier to have a value of 1,5. Thus, if this effect is included, the industry's contribution to the gross domestic product is 44,5 per cent. Similarly, the industry is responsible for the creation of jobs both within itself and in other industries, which could amount to 100 000 for the period 1981 to 1985.

SAMEVATTING

Die bydrae wat die mineraalbedryf tot die ekonomie van Suid-Afrika gemaak het, word volgens vier aspekte daarvan bespreek.

In die eerste plek ondersteun die bedryf sowel studente as dosente aan tegniese en akademiese inrigtings. Hierdie steun dek feitlik die hele bestek van kursusse wat aan die universiteite en technikons beskikbaar is, hoewel die grootste deel daarvan vanselfsprekend na die ingenieurs- en wetenskapfakulteite gaan.

Tweedens betaal die bedryf 'n regstreekse finansiële bydrae aan die Staat in dié sin dat dit ongeveer 40 persent van die Staat ontvangste vanaf belasting direk betaal op inkomste en 30 persent van die bydraes aan die totale Staat inkomste. Dit verskaf werk aan 28 persent van die totale aarbeidsmag tot die bruto binnebandse produk by.

In die derde plek is die bedryf verantwoordelik vir meer as 65 persent van die land se buitelandse verdienste ten spyte van die beduidende toename in die uitvoer van die vervaardigingsektor. Suid-Afrikaanse minerale is van kritieke belang vir die wêreld aangesien die land oor die wêreld se grootste reserwes van sewe minerale beskik en 'n baie belangrike rol ten opsigte van baie ander minerale speel.

Ten slotte maak die bedryf 'n regstreekse bydrae waarna verwys word as die *vermenigvuldigereffek*. Dit is die rimpeleffek van 'n groot geldinspuiting op die ekonomie waardeur daardie geld 'n ekstra effektiewe waarde kry. 'n Studie wat in 1978 van die totale produksie van die mynbedryf gemaak is, het byvoorbeeld getoon dat die waarde van hierdie vermenigvuldiger 1,5 is. As hierdie effek dus bygereken word, is die bedryf se bydrae tot die bruto binnelandse produk 44,5 persent. Net so is die bedryf verantwoordelik vir die skepping van werkgeleenthede in homself en in ander bedrywe wat vir die tydperk 1981 tot 1985 100 000 kan beloop.

Introduction

In selecting a topic for my address, I wondered whether other prospective presidents had gone through the same thought processes as I have done. Does one try to express profound thoughts on a technical subject, or can one take the opportunity to cover a subject in which one has a personal interest? I have decided on the latter approach.

Something that has always intrigued me is the extent to which mining (that is, the minerals industry) has contributed to the economic well-being of South Africa, to its peoples, and, indeed, to the West in general. The word *contribution* is used in its widest sense, and therefore, although the industry has contributed most prominently in generating employment and revenue, it is not my intention to restrict myself to these narrow confines, but rather to show exactly how great the industry's total contribution has been. Many of these aspects have been discussed by others, but the total contribution has seldom, if ever, been presented in a complete, all-embracing review.

The contribution of the minerals industry has, in my opinion, been quite astonishing when one considers that South Africa, at a time when the rest of the world was experiencing the mixed blessings of industrialism, was a pastoral country with virtually a subsistence type of economy.

The Development of South Africa

Today, the Republic's economy is booming, the

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catalyst in the transformation being the discovery of diamonds near Kimberley in 1866. In the early 1890s, South African exports were made up largely of wool and diamonds, but, by the end of the first decade of the twentieth century, exports had increased to approximately 100 million rands, of which gold contributed just over 60 per cent.

The glitter of diamonds stimulated the activities of prospectors, and attracted the men who provided the capital and the know-how for exploiting gold when this was discovered on the Witwatersrand twenty years later. When President Paul Kruger of the Transvaal Republic proclaimed the Witwatersrand Goldfields in 1886, he saw gold mining as a temporary source of revenue for his impoverished country. The inhabitants of the mining settlement that was to become Johannesburg then numbered 40 000, about half of the Transvaal's entire population. Isolated farmers, previously contented to provide for their own needs, now had an important market close at hand.

Then came the railways – the 'links of iron' to quote one South African historian – 'which were destined to bind all South Africa together economically and politically'. The increasing need for efficient communications led to the creation of a network of railways from the ports to the Highveld, so making thousands of square kilometres of land more accessible.

Gold not only gave impetus to the railways at the turn of the century, but also gave life to secondary industry and brought into being the biggest industrial complex in Africa – one of the few sizable complexes in the world that has no direct access to a waterway. The need for power in the Transvaal created the need for coal, which fortunately soon became available – initially on the East Rand, and later in greater abundance in the eastern Transvaal and Natal. Coal has since been the major source of energy for South Africa's mines and industries.

Table I highlights the strategic importance of the South African minerals industry in the world's supply of minerals. There are seven minerals of which South Africa has the world's largest reserves, and many others in which this country features very prominently.

It should be noted that the figures given in Table I are conservative. The U.S. Bureau of Mines, for example, estimates South African gold reserves at 18 040 t, which is equivalent to some 50 per cent of the total world reserves. However, both the U.S. figure and that given in the table are only estimates, and include only fully developed or blocked-out reserves for current mining operations that were calculated at relatively low-gold prices.

This overview of the development and growth of South Africa simply illustrates the fact that the minerals industry can be classified as a primary industry very akin to agriculture in providing the impetus for the 'opening up' of our country.

Four Main Contributions

I shall deal with the economic contribution of the South African minerals industry in four phases:

(1) the influence and support provided by the minerals industry to the professional and technical training and development of its employees, and in many cases to members of this Institute,

(2) the direct financial contribution that the industry has made to the State, the country, and its peoples,

(3) the financial and strategic value, within the world context, of South Africa's mineral industry,

(4) the most neglected facet of all, namely, the 'multiplier effect', which has to do with the ripple effect of large injections of money (in this case the expenditure incurred by the minerals industry) on the money supply and gross domestic product of the economy.

Professional and Academic Support

From the point of view of the profession and this Institute, it is probably natural at the outset that the

TABLE I

SOUTH AFRICA'S ROLE IN THE WORLD'S RESERVES, SUPPLY, AND PRODUCTION OF MINERALS

Mineral commodity	S.A.'s reserves 1979 t	World reserves		Exports 1978		Production 1979	
		Rank	%	Rank	%	Rank	%
Manganese ore	12 139 800 000	1	78	1	52	2	22
Ferromanganese	—	—	—	1	20	3	±10
Vanadium	7 760 000	1	49	1	59	1	45
Platinum-group metals (metal, 60 m depth)	30 200	1	75	1	58	1	51
Chromium ore (300 m depth)	3 096 830 000	1	81	1	28	1	36
Ferrochromium	—	—	—	1	51	1	±25
Gold metal	16 500	1	51	1	51	1	53
Fluorspar (CAF_2 content)	31 400 000	1	35	2	15	3	10
Andalusite, sillimanite	104 000 000	1	34	1	±42	1	42
Vermiculite (crude)	73 000 000	2	29	1	78	2	32
Diamonds (carats)	72 000 000	2 (Gem)	21	3 (Gem)	20	3	18
				3 (Ind)	15		
Uranium (metal, up to \$50/lb of U_3O_8)	391 000	N/A		N/A		N/A	
Asbestos (fibre)	8 500 000	4	5	4	9	3	5
Coal (bituminous)	82 000 000 000	6	6	6	8	7	3
Iron ore (30 m depth)	9 500 000 000	7	3	8	4	9	4

Sources: Minerals Bureau of South Africa
U.S. Bureau of Mines

contribution of the mining industry to academic and technical areas should be assessed.

It goes without saying that the Institute owes its very existence to the mining industry, and we should find it extremely difficult, if not impossible, to meet our obligations to the profession without the highly appreciated assistance we receive from the industry.

The Institute receives many direct and indirect contributions in cash and kind – of course, never enough! Indirect assistance is probably greatest in the facilities and encouragement given to employees in the industry to support and participate in the activities of the Institute. A scrutiny of the Company Affiliates of the Institute indicates that most of the operating mining companies are members.

The success of the vacation schools and colloquia is largely due to the large numbers who participate, the majority of whom are employed within the industry. This is not insignificant when one considers that 230 delegates attended the last mining vacation school, and another session is still to be held, so that a number of about 300 would probably be more realistic.

The support extends over a broad spectrum of academic and technical training. Unfortunately, the statistics have not been correlated or published, and it has therefore been necessary to make some broad assumptions.

There are probably about 760 students attending universities under the direct or indirect sponsorship of the mining industry. They are following studies in all the disciplines relevant to the minerals industry, the majority being in the engineering and science faculties, but it must be recorded that there is hardly a degree course that is not being followed by at least one of these students.

The support from the industy ranges from full sponsorship, often including salaries for employees on full-time studies, to the refunding of fees on the successful completion of courses. The total cost involved for full-time students studying at universities is of the order of 2,5 million rands per annum.

Students sponsored by the mining industry at the technikons probably number about 700, who mainly follow courses in the engineering disciplines. These students are generally in the employment of mining companies, and receive the normal employee benefits in addition to full sponsorship of all costs during their studies, which amounts to approximately 7 million rands per annum.

The industry also assists the universities, technikons, and other educational institutions by way of subventing the establishment of chairs, facilities, etc., and, in times of shortage, has even seconded staff to various institutions. It is extremely difficult to place a value on this type of assistance, which must amount to more than 10 million rands per annum, since the real value of the assistance does not lie in the cold costs, but in the value of the finished product to the industry, the economy, and the country.

In addition to the above, the various mining groups in the country also conduct in-house tutoring services for all their personnel assisting them, for example, to obtain government certificates of competency or a grasp of an official language, and so facilitating their advancement.

Financial Contribution

To the Country as a Whole

Statistics relating to the direct contribution made by the minerals industry to the internal and external revenues of the country are often published, but, to make the picture as complete as possible, a few of the salient features need to be highlighted.

South Africa enjoys a unique position in that it has been dependent on the minerals industry as the prime generator of growth throughout the history of its economic development. With the possible exception of the developing economies of the oil-producing Arab countries, no other country has been in the position where both the spark for initial development and the means for the sustainment of growth have rested so heavily on the production and treatment of minerals.

Initially, the commodities required by the mines and their employees were substantially met by imports. This large and stable market provided the basis for the first major industry to replace importation. First in the field were food-processing plants, and simple manufacturing and repair establishments. Later followed the more complex manufacturing industry, on which South Africa's existing engineering, chemical, and clothing industries are based.

Today mining is more important in the South African economy than ever, employing about 710 000 people during 1980 and remaining the major supplier of foreign exchange. In 1980 the value of minerals exported amounted to 13 869,6 million rands, which together with that of processed minerals, constituted approximately three-quarters of the total South African exports in that year. Mining thus holds the unusual position of providing, directly and indirectly, the market, or at least a significant part of the base load, for much of the products of other industries, while at the same time providing a substantial proportion of the foreign exchange needed for the purchase of the imports, be they capital items or consumer goods, required by those industries.

A considerable injection of capital has been required for the development of the gold and other mines, and the capital expenditure incurred from 1950 to 1980 amounted to some 8786* million rands. Much of this capital was attracted from abroad, and has served the purpose, firstly, of demonstrating that South Africa is a sound area of investment as a result of the stability and profitability of the mining industry. Secondly, this foreign capital has helped to speed up the economic development of the Republic, which would necessarily have been slower if it had been solely dependent on domestic investment. Thirdly, the influx of foreign capital to the mining industry has enabled much of the domestic savings to be channelled into other industries.

To Private Enterprise

The mining industry spent approximately 3500 million rands on stores in 1979, the major components being those shown in Table II.

When the expenditure on certain major items is compared with the relevant totals within the Republic, some significant relationships are found. If we look at

*Source: South African Reserve Bank.

timber, for example, it is interesting to note that the mining industry consumes approximately 29 per cent of all the round timber purchased.

In the case of electricity, the mines consume some 30 per cent of the total power generated. Although, as Table II indicates, the mining industry spends 24 million rands annually on coal, the industry is, in fact, indirectly responsible for the consumption of 16 per cent of the total coal output. This statement is based on the fact that 52 per cent of the country's total coal output is used by the power utilities, and that the mining industry consumes about one-third of the total output.

The mines annually consume approximately 30 per cent of the country's cement production at a cost of 24 million rands per annum.

Of agricultural products, 112 million rands worth is consumed annually by the mines, although this amounts to only about 2½ per cent of the total annual production.

In 1980 the average number of employees directly employed on mines constituted 14 per cent of the total active labour force employed in industry and commerce within the Republic (excluding agricultural and domestic labour).

To the State

The State's share of the revenues earned by the minerals industry makes interesting reading.

It is estimated that, in the 1980/81 financial year, the mining industry was responsible for approximately 40 per cent of the State's receipts from direct tax paid on incomes which is expected to total some 7500 million rands.

Moving on to the total State revenue, including indirect taxes paid, such as lease fees, excise duties and general sales tax, one finds that an estimated 30 per cent of total state revenue was contributed directly and indirectly by the mining industry.

As far as general sales tax is concerned, the mines are

TABLE II

CONSUMPTION OF STORES IN THE MINING INDUSTRY, 1979

Commodity consumed	Cost to industry per annum R×10⁶
Building material	30
Buildings, railways, and roads	370
Chemicals	88
Cement	24
Clothing	23
Coal	24
Electricity consumed	428
Electrical (stores from industry)	280
Explosives	159
Foodstuffs (supply to labour)	112
Fuel	174
Machinery and plant	885 (other than electrical)
Iron and steel (not fabricated)	200
Piping and tubing	115
Timber (total for mines belonging to the Chamber	117
Timber (round)	64
Water	26

Sources: Minerals Bureau of South Africa
Chamber of Mines of South Africa

TABLE III

VALUES OF MINING PRODUCTS SOLD FROM 1950 TO 1980
(in R×10⁶)

Year	Gold	Diamonds	Coal	Other	Total
1950	289,6	28,8	27,8	47,2	393,4
1951	285,9	32,7	25,7	67,0	411,3
1952	294,3	29,6	28,3	78,6	430,8
1953	295,1	27,9	32,3	76,2	431,5
1954	329,4	26,5	31,8	109,8	497,5
1955	365,5	26,4	34,3	147,4	573,6
1956	396,9	26,8	41,2	183,8	648,7
1957	425,2	28,9	43,0	208,7	705,8
1958	440,1	31,1	47,1	209,9	728,2
1959	500,3	31,3	49,3	207,9	788,8
1960	536,0	33,9	55,0	231,8	856,7
1961	574,9	38,4	59,6	220,6	893,3
1962	636,6	36,5	65,1	213,3	951,5
1963	686,3	36,6	67,7	221,5	1 012,1
1964	730,5	44,2	72,2	237,9	1 084,8
1965	766,5	49,6	81,4	255,4	1 152,9
1966	776,2	61,6	81,5	343,9	1 263,2
1967	768,1	59,3	86,9	373,0	1 287,3
1968	784,9	75,6	96,9	408,4	1 365,8
1969	840,5	103,9	106,1	436,3	1 486,8
1970	831,2	75,5	107,9	548,8	1 563,4
1971	899,0	64,7	120,4	485,9	1 570,0
1972	1 159,9	90,0	126,8	565,6	1 942,3
1973	1 789,3	162,4	152,1	740,7	2 844,5
1974	2 619,8	143,0	200,0	965,7	3 928,5
1975	2 560,4	174,2	316,1	1 083,5	4 134,2
1976	2 380,2	215,1	517,8	1 355,5	4 468,6
1977	2 814,9	257,6	755,4	1 702,9	5 530,8
1978*	3 900,0	445,8	874,5	1 944,3	7 164,6
1979	5 842,0	547,4	1 143,4	2 235,6	9 768,4
1980	10 369,6	553,0	1 495,0	2 576,1	14 993,7

*Including Bophuthatswana
Sources: Annual Reports of the Department of Mines
Minerals Bureau of South Africa

liable for 140 million rands or 4 per cent of the total paid.

It is estimated that mine employees are levied about 83 million rands as their PAYE deductions, which amounts to 3,4 per cent of the total received within this category by the Receiver of Revenue.

Monetary and Strategic Value

The monetary and strategic value of the products of the minerals industry is illustrated by Table III.

The Republic of South Africa is indeed fortunate to have the solid base of the minerals industry upon which to build and mould a stable and well-balanced economy. Apart from the sheer magnitude of the earnings over the years, the progression from 1950 to 1980 as shown in Table III is interesting: the total value amounted to 393 million rands in 1950 as against 15 000 million rands in 1980. Of particular interest is the marked increase between 1979 and 1980. The value of gold earnings, as can be seen, increased by approximately 77,5 per cent during that time, whereas the total value of the mineral sales increased by 53,5 per cent.

We must not, however, be dazzled by the performance of gold at the expense of coal, which is also performing very well as Table III illustrates. Not to be completely outdone by gold, coal earned 30,8 per cent more between 1979 and 1980. The future of coal seems to be very bright indeed.

If we now take the exercise a step further and examine the position of the minerals industry relative to the other industries that earn foreign exchange, it is interesting to see (Table IV) that, since 1973, the industry has annually provided over 60 per cent of the total value of exports, reaching 65 per cent in 1979. The latest available figures indicate a 5 per cent increase in 1980. This brings the value of mineral exports to 70 per cent (excluding platinum and uranium) of the total value of exports from this country, notwithstanding the significant estimated rise in the value of exports from the manufacturing sector to 27 per cent, i.e., from 4209 to 5348 million rands.

Multiplier Effect

Finally, I want to cover an area that is probably the least known and has only recently been the subject of a study by two professors from the University of Pretoria – Professors J. A. Lombard and J. J. Stadler. The project was sponsored by the Chamber of Mines. The objective was the determination of the multiplier effect of the expenditure emanating from the mining industry, the *multiplier* effect being the ripple effect made by a large injection of money on the economy by which the money injected acquires an added effective value.

As we have seen, the mining industry spends an enormous amount of money on the purchase of mining and capital equipment, as well as on services and supplies from other industries, and thereby provides the injection referred to. To show the magnitude of this effect, the conclusions of the study were based on the production of a specific mineral, gold being chosen for the detailed analysis. It should be mentioned that, because 1971 is the latest year for which adequate data are available, the study did not go beyond 1971.

The analysis indicated that, for each 1000 million rands worth of gold produced, 697 million rands were immediately added to the gross domestic product. The balance of 303 million rands was spent on intermediate inputs, i.e., goods required for the production of the gold. The multiplier effect, i.e., the wider impact of the expenditure of this 303 million rands on the economy, was of the order of 1789, which increased the 303 million rands to 542 million rands. In other words, the value that was generated indirectly by the gold-mining industry through its outlay on intermediate products amounted to 240 million rands.

In summary, then, an output of 1000 million rands by the gold-mining industry generated a total value added of 937 million rands, which was the sum of the value added directly (697 million rands) and indirectly (240 million rands). Expressed another way, 93,7 per cent of the value of the gold produced contributed both directly and indirectly to the gross domestic product. This figure is influenced by the fact that the mining industry spends only a limited amount on imports; in fact, its domestic expenditure amounts to between 90 and 94 per cent of its total expenditure.

The study has highlighted the issue that the mining industry, in addition to producing minerals, is a source of final demand for the other services produced by the domestic economy. This demand is the result of the industry's expenditure on both the increase and replacement of items of a capital nature. The total expenditure of the gold mines on stores consumed on the capital account of 82,4 million rands in 1971 gave rise to a total value added, directly and indirectly, of 57,7 million rands, or 70 per cent of the total value of the stores consumed on the capital account.

The study applied a similar approach to the total production of the mining industry in 1978, and came to the conclusion that the industry autonomously generated a value-added sum of 6426 million rands. If the 1,5 expenditure multiplier is applied to the total, the value of the added expenditure is 9639 million rands, or 26 per cent of the gross domestic product. It is interesting to note that in 1978 the *direct* contribution of the mining industry to the gross domestic product of South Africa was 13,6 per cent (Table V). In other words, the total value added to the gross domestic product was almost twice that of the direct contribution.

This impact can be demonstrated further by the finding that, for every 3,5 employees of the mining industry, another is in the employment of those industries supplying goods and services to the mines. Therefore, since, as was stated above, the industry employs a labour force of about 710 000, it provides about 203 000 jobs in those other industries.

Furthermore, the analysis indicated that, to produce 78 Mt of gold ore, 400 000 workers are required within the industry and 118 000 in supporting industries. At 1971 gold prices, this would be equivalent to 899 million rands worth of gold output. In 1979 some 86 Mt of ore were mined, and 408 000 jobs were maintained on the mines and 118 000 in the supporting industries. Owing to the higher gold price, however, the value of the output was about 10 000 million rands. The critical

TABLE IV

EXPORTS AND RE-EXPORTS OF MERCHANDISE FROM SOUTH AFRICA

(EXPORTS – I.S.I.C. BASIS)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Value in R × 10⁶												
Agriculture, forestry, fishing* ..	248,1	235,5	236,1	401,1	400,1	498,4	591,0	597,1	598,0	773,7	621,2	650,6
Mining and quarrying (total) ..	1 412,7	1 379,6	1 418,2	1 781,5	2 642,1	3 561,0	3 648,8	3 952,6	4 976,7	6 389,1	9 063,5	13 869,6
Gold†	829,1	830,3	892,8	1 159,9	1 789,3	2 619,8	2 560,4	2 380,2	2 815,0	3 900,0	5 842,0	10 369,6
Other‡	583,6	549,3	525,4	621,6	852,8	941,2	1 088,4	1 572,4	2 161,7	2 489,1	3 221,5	3 500,0
Manufacturing industry‡	698,4	743,2	771,7	969,3	1 111,1	1 566,4	1 646,0	1 983,2	2 595,4	2 982,7	4 209,0	5 348,2
TOTAL	2 359,2	2 358,3	2 426,0	3 151,9	4 153,3	5 625,8	5 885,8	6 532,9	8 170,1	10 145,5	13 893,7	19 868,4
% of total												
Agriculture, forestry, fishing ..	10,5	10,0	9,7	12,7	9,6	8,9	10,0	9,1	7,3	7,6	4,5	3,2
Mining and quarrying (total) ..	59,9	58,5	58,5	56,5	63,6	63,3	62,0	60,5	60,9	63,0	65,2	69,9
Gold	35,1	35,2	36,8	36,8	43,1	46,6	43,5	36,4	34,4	38,4	42,0	52,3
Other	24,8	23,3	21,7	19,7	20,5	16,7	18,5	24,1	26,5	24,6	23,3	17,6
Manufacturing industry	29,6	31,5	31,8	30,8	26,8	27,8	28,0	30,4	31,8	29,4	30,3	26,9
TOTAL	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

*The 1980 figures are estimates.

†Sources: Foreign Trade Statistics, Department of Customs and Excise.
Department of Mines and Minerals Bureau of South Africa.

‡In order to get a more reliable indication of exports of manufacturers, the published figures of the Department of Customs and Excise were adjusted, by excluding from the manufacturing industry and including under mining and quarrying, diamonds (cut), refined and unrefined copper, nickel, lead, zinc, pig iron, tin, and ferro-alloys. Allowance was not made for platinum and uranium since these amounts are not disclosed.

TABLE V

CONTRIBUTION OF MINING TO THE GROSS DOMESTIC PRODUCT OF SOUTH AFRICA, EXCLUDING SOUTH WEST AFRICA, AT CURRENT PRICES, 1950–1980

Year	Value added in mining			Total	Contribution of mining to GDP, %		
	Gold mining R×10⁶	Other mining R×10⁶	Total R×10⁶	GDP R×10⁶	Gold	Other	Total
1950	236,0	84,2	320,2	2 494,0	9,4	3,4	12,8
1951	240,2	95,6	335,8	2 697,0	8,9	3,5	12,4
1952	234,0	104,1	338,1	2 893,0	8,1	3,6	11,7
1953	233,8	99,3	333,1	3 281,0	7,1	3,0	10,1
1954	261,9	103,5	365,5	3 524,0	7,4	2,9	10,3
1955	308,8	114,7	423,5	3 699,0	8,4	3,1	11,5
1956	346,2	125,0	471,2	3 987,0	8,7	3,1	11,8
1957	387,3	132,4	519,7	4 207,0	9,2	3,2	12,4
1958	407,3	126,1	533,4	4 314,0	9,4	2,9	12,3
1959	453,2	129,1	582,3	4 561,0	9,9	2,8	12,7
1960	488,3	148,0	636,3	4 838,6	10,1	3,1	13,2
1961	503,6	158,6	662,2	5 115,4	9,8	3,1	12,9
1962	534,4	159,0	693,5	5 457,5	9,8	2,9	12,7
1963	564,9	165,4	730,3	6 057,9	9,3	2,7	12,0
1964	592,6	203,6	796,2	6 633,1	8,9	3,1	12,0
1965	601,6	234,1	835,7	7 252,6	8,3	3,2	11,5
1966	599,2	283,3	882,5	7 884,1	7,6	3,6	11,2
1967	606,5	300,9	907,4	8 750,1	6,9	3,4	10,2
1968	625,4	350,7	976,1	9 427,8	6,6	3,7	10,3
1969	679,6	400,0	1 079,6	10 489,3	6,5	3,8	10,3
1970	660,9	440,5	1 101,4	11 610,0	5,7	3,8	9,5
1971	706,8	370,9	1 077,7	12 852,0	5,5	2,9	8,4
1972	946,8	449,5	1 396,3	14 507,0	6,5	3,1	9,6
1973	1 471,7	588,3	2 060,0	18 002,0	8,2	3,3	11,5
1974	2 132,3	772,8	2 905,1	22 362,0	9,5	3,5	13,0
1975	2 064,1	825,9	2 890,0	25 182,0	8,2	3,3	11,5
1976	1 866,2	1 239,2	3 105,4	28 233,0	6,6	4,4	11,0
1977	2 155,9	1 419,0	3 574,9	31 434,0	6,9	4,5	11,4
1978	3 117,9	1 751,6	4 869,5	35 728,0	8,7	4,9	13,6
1979	4 793,0	3 274,0	8 067,0	44 575,0	10,8	7,3	18,1
1980*	9 900,0	3 800,0	13 700,0	57 300,0	17,3	6,6	23,9

*Estimated

Source: Department of Statistics

NOTE: From 1979 South West Africa is included

point to note, however, is that the amount of ore being mined has remained fairly constant (between 78 Mt and 86 Mt) as has the labour complement (between 400 000 and 408 000) and, from a job-creation point of view, it is clear that the mining industry has provided a very stable labour requirement over the past decade (if the fluctuation in job availability over this period is borne in mind).

Finally, in addition to the above, for every 1000 million rands invested in the gold-mining industry, it is estimated that an additional 6500 jobs arise within the industry as well as 1800 in those industries supplying capital goods and services. It is forecast that during 1981 the capital expenditure within the industry will total 1500 million rands, which means that the minerals industry will be responsible for the creation of about 12 500 jobs during this year. The total capital expenditure for the minerals industry forecast for the five-year period 1981 to 1985 is projected to be some 12 000 million rands. This could result in the creation of up to 100 000 jobs, which, to say the least, is impressive.

Conclusion

In conclusion, the contribution of the mining industry to South Africa and its economy is probably very much greater than is generally realized.

The industry has fulfilled, and continues to fulfil, its obligations in the sphere of technical and academic training. In fact, this support covers virtually the whole range of courses available at the universities and technikons, although a far greater proportion is devoted to the engineering and science faculties. Both students and staff receive assistance under the various schemes. The total contribution in this field amounts to some 20 million rands, which excludes the direct and indirect training and development that take place on the mines.

The internal and external revenues accruing to the State are squarely based on the funds that flow from the mining industry, which contributes about 40 per cent of the total income-tax receipts and 30 per cent of the total contributions to the Department of Inland Revenue. As far as the foreign earnings of the industry are concerned, these amount to over 65 per cent of the total exports of the country.

The mining industry, directly and indirectly, is providing employment for about 28 per cent of the total active labour force within the Republic, and is contributing 24 per cent directly to the gross domestic product. If the multiplier effect is included, this figure rises to approximately 37,5 per cent—a not insignificant proportion.

We have seen how crucial the minerals industry of South Africa is to the world, and we have illustrated the incredible indirect contribution that the industry makes to this country and its peoples. Therefore, in conclusion, I express the wish that, in these uncertain times, the minerals industry will continue to play the important role it has always accepted unflinchingly, both inside and outside the borders of this country.