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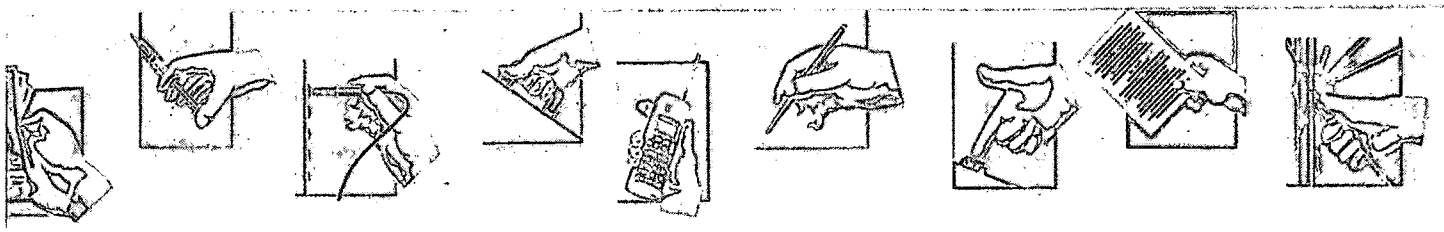
ABSTRACT

This document, which contains information relevant to individuals planning their careers, employers, human resource planners, and training institutions, examines the skill needs of the South African labor market in 1998-2003. The preface presents a brief overview of the factors that have contributed to the high levels of unemployment and patterns of poor job creation that will likely persist in South Africa through 2003. The introduction describes two major sources of the data: (1) a survey that asked 273 randomly selected South African companies across 8 broad economic sectors about future labor market trends and their future work force needs; and (2) a mail survey in which 22,585 university graduates answered questions regarding their income, occupation, work status, employer, and years of work experience. The remaining 85% of the document consists of a series of tables, charts, and lists detailing future employment prospects and income projections for more than 200 occupations in the following 13 categories: professionals; engineers; engineering technologists and technicians; architecture; natural science; medical; health-related; educational; humanities; accountants, financial, and economic; art, sport, and entertainment; managers; and clerical, artisan, and semiskilled. (Thirty-nine tables/figures are included.) (MN)

SKILLS NEEDS OF THE SA LABOUR MARKET: 1998 – 2003

HUMAN SCIENCES RESEARCH COUNCIL
UNIT: LABOUR MARKET ANALYSIS



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PREFACE

South Africa is faced with high levels of unemployment and poor performance with regard to job creation. Gone are the days when a job would be readily available after completion of school, or when a degree would automatically assure one of a position somewhere. Even people with excellent skills and years of experience are now having to explore new occupational directions. It is no longer strange to find professionals prospering in areas quite different from those in which they received their initial training.

Globalisation, accompanied by increased competition and unstable markets, and changes in the work environment caused by the impact of technology, necessitate that individuals, organisations and training institutions position themselves accordingly. Besides knowing what their personal abilities and interests are, school leavers need information on the labour market to plan their careers. Cognisance should be taken of future occupational demand, for example, which occupations are going to grow, the reasons behind these trends as well as shortages experienced in certain skills. For effective human resources planning, companies require a broad perspective on the labour market, especially with regard to the skills they currently utilise as well as future requirements. Educational institutions as the main providers of these skills can benefit from information on labour market trends and workforce needs to ensure that ample numbers of appropriately skilled people enter the labour force.

In order to provide in the information needs of the various role players, the Division for Labour Market Analysis, of the Human Sciences Research Council (HSRC), has endeavoured to make a detailed analysis of current employment and to forecast the occupational demands in the South African labour market. Forecasts were done for the five-year period 1998 to 2003 and focused on *formal employment* of high-level human resources (HLHR) in the *non-agricultural sectors* of the economy. HLHR refer to those occupations that typically require at least three years' post-matric education and training.

The research team is aware of the limitations of forecasts – after all, nobody can really see into the future. However, the thorough study of past and international trends and our discussions with knowledgeable people across all industries and occupations, have enabled us to publish these results with a fair degree of confidence. Readers are nevertheless urged to take cognisance of the assumptions underlying our occupational demand forecasts – especially economic growth assumptions.

It is our intention to regularly review our forecasts and to evaluate it in terms of its accuracy. These forecasts will also be validated by looking at other labour market signals such as salary trends and the results of graduate and other tracer studies. By doing so, the methodologies used in this study will be refined over time.

In addition to the information on current and future employment, this publication provides an overview of the income of HLHR. Information on the income of professionals was derived from the *Occupational Incomes of Graduates Survey*, a project the Division has been involved in since 1971. The most recent of these surveys was conducted in March 1997 and reflected the national occupational income of 21 077 graduates.

It is the wish of the HSRC that this publication may contribute towards enhancing the quality of decision making at all levels of labour market involvement.

Elize van Zyl

DIRECTOR: LABOUR MARKET ANALYSIS

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INTRODUCTION

This publication contains information derived from two separate research projects conducted by the Division for Labour Market Analysis of the HSRC. *SA Labour Market Trends and Future Workforce Needs, 1998 – 2003* was completed in 1998, while the *Remuneration of Graduates* reflects the occupational income of graduates as at 1 March 1997[1].

SA LABOUR MARKET TRENDS AND FUTURE WORKFORCE NEEDS

Employment forecasts of demand for the period 1998 to 2003 were made for 81 professional and artisan occupational categories[2] in the formal sector. These occupations usually require at least three years of education or training after matric. The demand for people in other occupations was only forecast in their broad occupational categories, for example, clerical occupations.

These forecasts are based on an extensive analysis of existing employment databases and time series and of a survey of 273 randomly chosen South African companies across eight broad economic sectors namely:

- Mining and Quarrying
- Manufacturing
- Electricity, Gas and Water Supply
- Construction
- Wholesale, Retail and Accommodation
- Transport, Storage and Communication
- Finance, Real Estate and Business Services
- Community, Social and Personal Services

[1] Comprehensive and detailed technical reports of both projects are also available from the HSRC publishers. See page next to Preface for contact information.

[2] *Standard classification of occupations (SCO)*. Central Statistical Service. Pretoria: 1986.

The agricultural sector was excluded because of its diversity and the relatively few professionals employed in the sector.

The demand for labour is derived from the economic activity of a country. Assumptions regarding economic growth are therefore central to any forecast of future demand. Ideally, a number of scenarios should be developed given the uncertain nature of economic forecasting. Resource constraints have not allowed for this and this project therefore relies on a single economic growth scenario, which could be considered a "moderate" scenario. Under this scenario the economy is expected to grow at an average of 2,7 % p.a. between 1998 and 2003[3]. This growth is headed by strong growth in the financial (3,9 % p.a.) and manufacturing sectors (3,5 %). The overall growth rate is slowed by the low growth expected in agriculture, mining and government.

REMUNERATION OF GRADUATES

Information on the remuneration of graduates was derived from a postal survey conducted during 1997. Questionnaires were sent to a sample of graduates on the HSRC Register of Graduates.

The Register of Graduates is the most comprehensive source of names and addresses of university graduates in South Africa. This database, which is managed by the Division of Labour Market Analysis of the HSRC, contains information on more than half a million graduates. The Register is maintained continuously by updating existing records (using information obtained from graduates as well as universities), removing obsolete records (such as those of deceased persons) and adding information on new graduates (technikon graduates will soon be added).

In total, 22 585 completed questionnaires were returned. Besides occupational income, the respondents were also questioned on, among other things, occupation, work status, employer, and years of work experience.

The aim of this publication is to provide a summarised overview of employment, future employment prospects and income of people in different occupational categories with a strong emphasis on professionals.

[3] For more information refer to the technical report which is available at the HSRC Bookshop.

FUTURE DEMAND

1 The South African Labour Market

- The total number of formal positions in the South African non-agricultural labour market amounted to ± 5 951 000 in 1998.

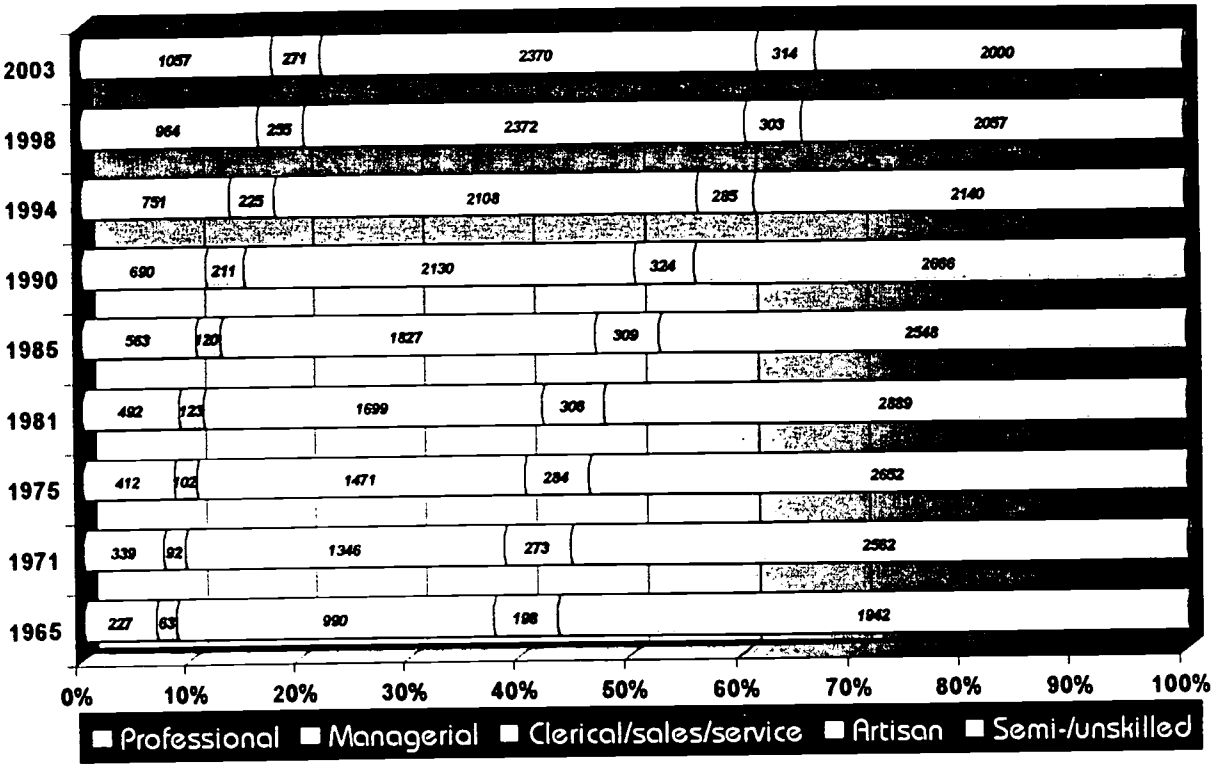
- Total employment in the formal economy (excluding agriculture) is expected to increase by about 45 000 job opportunities between 1998 and 2003, which amounts to growth of less than 1 % over the entire period.

- Growth rates vary considerably across broad occupational categories. The highest growth rates are expected among professionals (9,6 %) and managers (6,2 %), followed by artisans (3,9 %). Little change is expected at the level of clerical/sales/service workers and a substantial decline in employment is expected at the level of semiskilled and unskilled workers (-3,4 %).

- Most jobs are expected to be created at the professional level, with total employment of professionals likely to rise by 93 000 between 1998 and 2003. Employment rises of 16 000 and 12 000 are expected for managers and artisans, respectively. An estimated 71 000 semiskilled and unskilled positions are expected to be lost over the five-year period.

- The differing expected employment growth rates are likely to result in a continuation of the change in the occupational structure of employment experienced in South Africa since 1965. The professional, managerial and artisan occupations are expected to increase their shares of total employment over the period 1998 to 2003. Professionals show the largest gain, from 16,2 % of total employment in 1998 to 17,6 % in 2003. Clerical/sales/service workers and semiskilled/unskilled workers are both expected to show a decline in their shares of total employment over the five-year period. The latter category is expected to show the largest decline, from 34,6 % to 33,1 %.

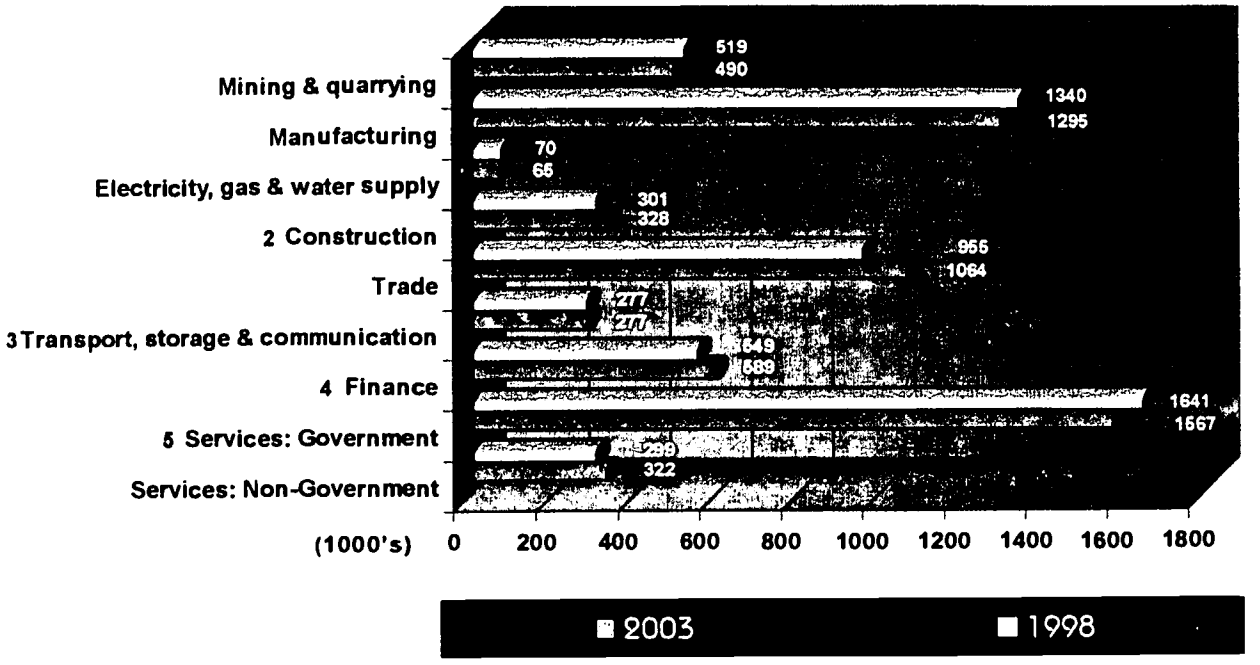
Change in the Occupational Structure of Employment in South Africa: 1965 - 2003 (1000's)



- There are considerable differences between employment forecasts in the government (central, provincial and local government) and non-government sectors. Whereas total employment in the private economy is expected to grow by almost 3 % between 1998 and 2003, it is expected to decline by 4,5 % in government. The major reason for these differences is the budgetary constraints facing government, coupled with a commitment to downsize the public service.

2 Employment growth per sector[1]

Sectorial Distribution of Total Employment: 1998 and 2003



- For the period 1998 to 2003, a *decline* in employment is expected in four sectors (Mining and Quarrying; Manufacturing; Electricity, Gas and Water Supply; and the Government section of Community, Social and Personal Services), an *increase* in three (Construction; Wholesale, Retail and Accommodation and Finance, Real Estate and Business Services), as well as the non-government section of Community, Social and Personal Services. The remaining sector (Transport, Storage and Communication) will more or less stay the same.

- The **Mining and Quarrying** sector will experience job losses due to the shift from underground mining to open-cast mining, the latter being more capital intensive than the former. There is also an increasing use of labour-saving technology in underground mining.

- In the **Manufacturing** sector, only clothing and leather and footwear are expected to create new employment opportunities over the next five years. Subsectors such as furniture, printing and publishing and wood and wood products are all subject to increasing levels of mechanisation, which will likely result in employment losses. The largest absolute decreases are expected in the food and chemicals subsectors.

[1] See Glossary for description
[2] Wholesale, Retail and Accommodation
[3] Finance, Real Estate and Business Services sector
[4] Community, Social and Personal Services sector
[5] Transport, Storage and Communication

- The **Electricity** sector is expected to decrease (± 5 000 jobs) due to the rationalisation that is likely to occur after the amalgamation of municipal electricity departments with Eskom. Most of these job losses are expected to occur in the municipalities since the functions of these positions will duplicate functions of existing positions in Eskom.

- Both the building and the civil engineering subsectors (which collectively make up the **Construction** sector) are highly labour intensive and moderate growth (± 26 000 jobs) is expected in these sectors.

- The **Wholesale, Retail and Accommodation** sector is expected to be the fastest-growing major sector (in terms of employment growth) as well as the largest absolute contributor of jobs (±109 000 new positions). Moderate growth is expected in wholesale and retail, while fast growth is expected in catering and accommodation.

- Total employment in the **Transport, Storage and Communication** sector is not expected to show any change over the period, since jobs created in the communication industry are matched by job losses in the transport industry.

- The **Finance, Real Estate and Business Services** sector is expected to be the second-largest contributor to employment creation over the period under review and it is estimated that a net 46 000 jobs will be created in this sector.

- **Banking** and **insurance** (subsectors within the Finance, Real Estate and Business Services sector) are expected to show net job losses (12 000 and 6 000, respectively). However, these losses will be more than compensated for by rapid growth in other business services, for example accounting, management consultancy, security, and information technology, which are expected to grow by ± 59 000 positions.

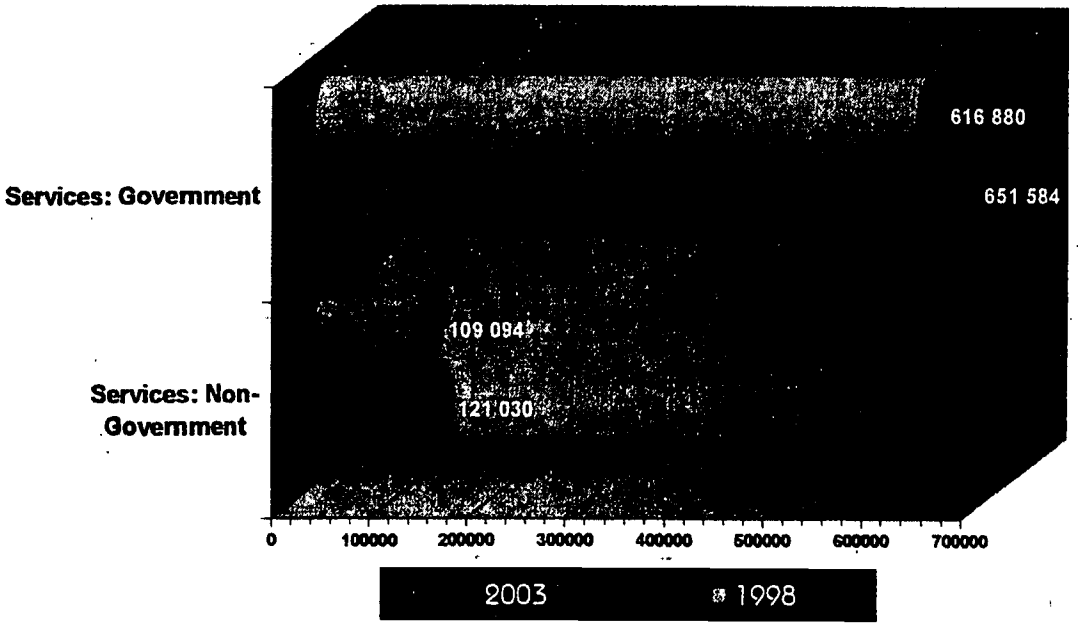
- The **Community, Social and Personal Services** sector is expected to be the one that sheds the most jobs, largely due to the expected decrease in employment within central, provincial and local government (collectively, -74 000). These job losses are to some extent likely to be neutralised by ± 22 000 positions that are expected to be created in the non-government part of the sector, which includes private health, cultural and recreational services and education (especially private educational institutions).

3 Professionals

➧ Most jobs are expected to be created at the professional level, with total employment of professionals likely to rise by almost 10% from 964 006 in 1998 to 1 056 703 in 2003, Nearly two thirds (64%) of professionals are employed in government, which forms part of the Community, Social and Personal Services sector. A further tenth of professionals are employed in the non-government part of the Services sector and the remainder is employed outside the Services sector.

➥ The adjacent two figures show the expected growth in employment of professionals in the Services as well as the Non-services sectors over the next five years.

Employment of Professionals per Broad Economic Sector: 1998 and 2003 – Service Sectors



➧ Although slow growth in professional employment (5,6 %) is expected in **government**, this subsector is still the largest absolute contributor (33,4 % of total professional growth) to the growth in professional employment, since such a large proportion of professionals are employed in government.

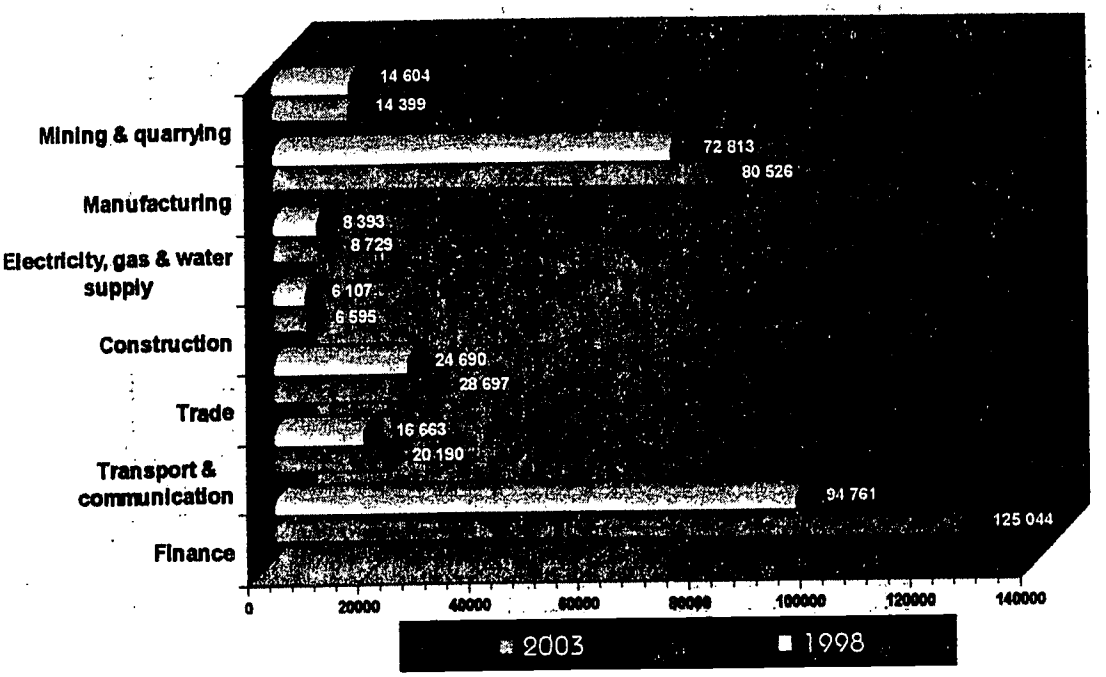
➥ Teachers dominate the subsector. However, the number of teachers employed is expected to grow by just 6 %. The second-largest occupation in government is that of registered and staff nurses, which is likely to rise by 6 % over the next five years.

➥ Higher growth rates are expected from professional groups such as law professionals, chartered accountants, agriculturists, engineers, veterinary surgeons and natural science technicians/technologists in government.

➥ Low growth rates are anticipated for zoologists, botanists, nature conservationists, librarians and geologists.

- Strong growth (11,3 %) in professional employment is expected in the non-government section of the **community and social services** subsector, which is dominated by *private* health care and non-government education.
  - Growth in this subsector is anticipated to account for more than 12 % of the total growth in professional employment, which makes it the third-largest contributor to professional employment growth.
  - High-growth groups include medical practitioners, nurses and other medical professionals. This increase is due to the rapid growth in private health services.
  - Teachers are expecting to show high growth in this subsector because of rapid growth in private schools.

Employment of Professionals per Broad Economic Sector: 1998 and 2003 – Non-service Sectors

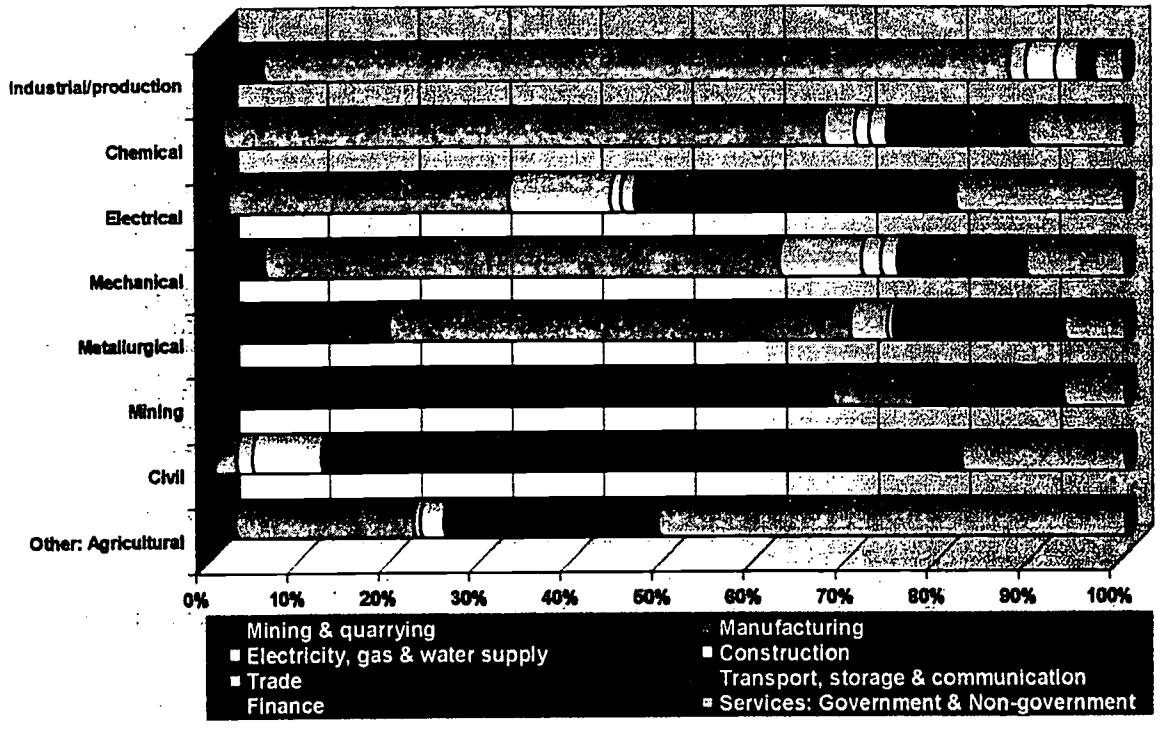


- The **business services** subsector is expected to show a high rate (32 %) of professional growth. Coupled with the fact that this subsector employs such a large number of professionals, it is expected that it will be the second-largest contributor to professional employment growth (more than 25 % of total growth).
  - Business services include the fast-growing information technology industry, as well as many organisations that benefit from the outsourcing of functions, such as industrial relations, human resource training and marketing, as well as security, cleaning and gardening services.
- The highest rate of growth (50 %) in professional employment is expected in the **banking**[1] subsector. This is ascribed to the rapid advance of technology in the industry, the increasing complexity of financial services and the trend towards globalisation, all of which necessitate a large increase in high-level staff. Banking is expected to be the fourth-largest contributor to professional employment growth.
  - High-growth professional groups in the subsector include chartered accountants, accountants, investment professionals as well as IT professionals.
- Other important contributors to professional employment growth are the **retail and wholesale trade** (3,4 % of total professional growth), **communications** (2,4 %) and **chemical manufacturing**.

[1] Subsectors within Finance, Real Estate and Business Services sector.

3.1 Engineers

Sectorial distribution: Engineers



- Engineers are people who obtain a recognised BSc(Eng) or BEng degree after four years of university training. After gaining at least three years of appropriate practical experience an engineer may register as a Professional Engineer under the auspices of the Engineering Council of South Africa (ECSA).

- The shift towards the use of high-technology, labour-saving capital equipment in the manufacturing sector is expected to be a major contributor to the high growth in demand for engineers. They are required to develop, implement and operate the new technology.

- *High-growth* (15 % – 40 %) is expected in the demand for electrical engineers (including electronic engineers) and chemical engineers.

- *Moderately high growth* (10 % – 15 %) is forecast in the demand for industrial/production engineers, *moderate growth* (5 % – 10 %) for mechanical and civil engineers and less than 5 % growth for metallurgical and mining engineers.

- Electrical engineers (including electronic engineers) are expected to show the highest growth since so much of the new technology is electronically based.

- Chemical engineers are expected to show high growth, largely as a result of strong growth and innovation in the chemicals sector.

- Strong growth for mechanical engineers in most manufacturing sectors is being dampened to some extent by slow demand growth in the motor-manufacturing sector, which is not highly innovative and imports much of its technology.

- Low to moderate growth in the civil engineering and building industries is expected to result in moderate growth in the demand for civil engineers.

- The stagnant state of the mining industry is expected to be the major contributor to the slow growth in demand for mining engineers as well as metallurgical engineers.

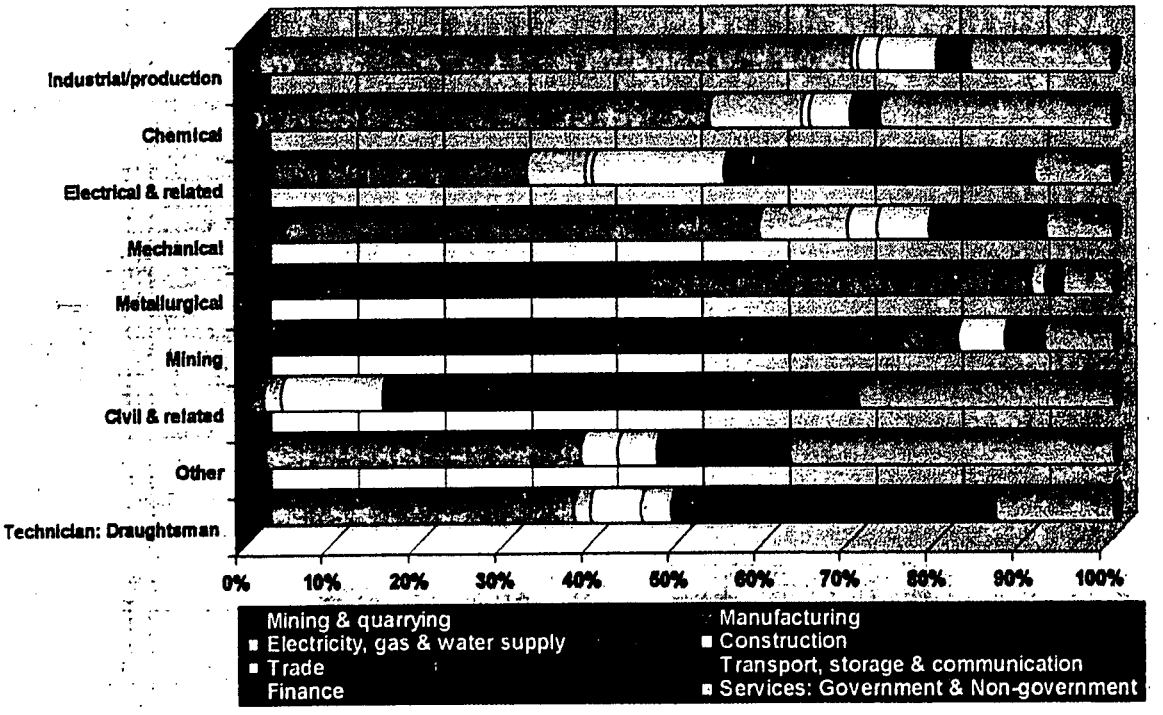
- Shortages of engineers were reported by most of the employing organisations that participated in the study: More than 50 % of these organisations said that they were experiencing problems in recruiting professional engineers. Electrical (including electronic), industrial, as well as mechanical and civil engineers were often mentioned. However, the biggest demand seemed to be for more experienced and skilled engineers at senior level.

Engineer	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Industrial/production	2 109	10 – 15%	500 – 999	44%	56%
Chemical	1 018	15 – 40%	250 – 499	51%	49%
Electrical & related **Electrical** **Electronic**	4 462	15 – 40%	1 000 – 1 999	55%	45%
Mechanical	3 058	5 – 10%	500 – 999	39%	61%
Metallurgical	596	Less than 5%	Less than 250	18%	82%
Mining	601	Less than 5%	Less than 250	8%	92%
Civil & related	5 934	5 – 10%	1 000 – 1 999	30%	70%
Other: **Agricultural** **Engineer n.e.c.**[1]	1 043	10 – 15%	250 – 499	42%	58%

[1] Not elsewhere classified

3.2 Engineering technologists/technicians

Sectorial distribution: Engineering technologists/technicians



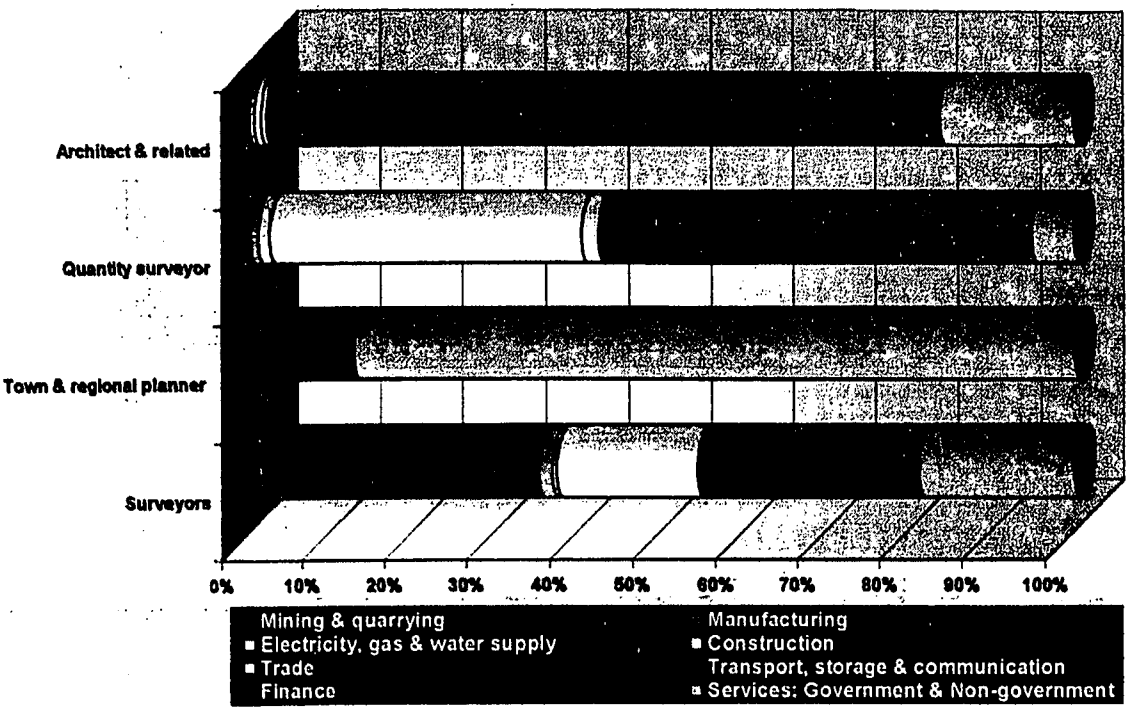
- Engineering technologists obtain a recognised BTech or MTech degree after at least four years of technikon training. After gaining at least three years of appropriate practical experience an engineering technologist may register as a Professional Technologist (Engineering) under the auspices of the Engineering Council of South Africa (ECSA).
- An engineering technician who has obtained a recognised National Diploma (three years) may, after gaining between two to four years of appropriate practical experience, register under the auspices of the Engineering Council of South Africa (ECSA) as a registered certificated engineer or a registered engineering technician.
- The telecommunications industry is one of the fastest-growing areas of the economy and is expected to be an important contributor to the high growth in positions for electrical engineers and electrical engineering technologists/technicians.
- The stagnant state of the mining industry is also expected to influence the demand for engineering technologists/technicians as slow growth in the demand for mining engineers and mining engineering technologists/technicians, as well as metallurgical engineers and technologists/technicians, is foreseen.
- Electrical (including electronic) engineering technicians/technologists are expected to show *moderately high growth* (10 % – 15 %) in demand to serve the needs of the fast-growing telecommunications industry. Mechanical and civil engineering technicians/technologists will experience *moderate growth* (5 % – 10 %).
- A quarter of the companies that employed engineering technicians experienced shortages of these skills. The need for more technicians emanates mainly from increased automation in organisations. Highly multiskilled technicians are in demand to ensure optimum performance of electronic systems and machines. They are also needed for technical support and maintenance of equipment.

Engineering technologists/technicians	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Industrial/production Industrial/production eng.[1] technologist Industrial eng. technician	3 470	10 – 15%	500 – 999	42%	58%
Chemical Chemical eng. technologist Chemical eng. technician	908	10 – 15%	250 – 499	48%	52%
Electrical & related Electrical eng. technologist Electronic eng. technologist Instrumentation & control technologist Telecommunications technologist Electrical technologist & related n.e.c. Electrical eng. technician Electronic eng. technician Instrumentation & control technician Telecommunication technician Electrical & related technician n.e.c.	20 546	10 – 15%	5 000 – 8 000	52%	48%
Mechanical Mechanical eng. technologist Mechanical eng. technician	4 280	5 – 10%	1 000 – 1 999	38%	62%
Metallurgical Metallurgical eng. technologist Metallurgical eng. technician	635	Less than 5%	Less than 250	13%	87%
Mining Mining eng. technologist Mining eng. technician	436	Less than 5%	Less than 250	5%	95%
Civil & related Civil eng. technologist Civil eng. technician	7 618	5 – 10%	1 000 – 1 999	36%	64%
Other Engineering technologist n.e.c. Agricultural eng. technologist Agricultural eng. technician Engineering technician n.e.c.	4 001	10 – 15%	1 000 – 1 999	43%	57%
Technician: Draughtsman Engineering draughtsman Architectural draughtsman Draughtmans n.e.c. Cartographer	9 843	5 – 10%	1 000 – 1 999	47%	53%

[1] engineering

3.3 Architecture and related occupations

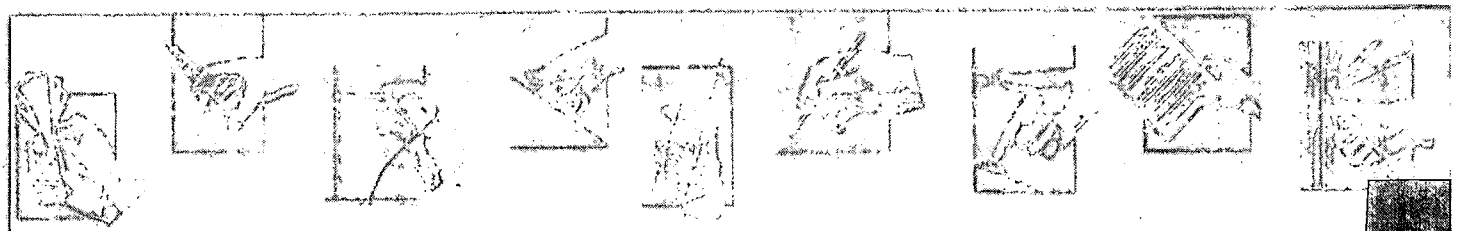
Sectorial distribution: Architecture and related occupations



- *Moderate growth* (5 % – 10 %) in demand is forecast for architects and related occupations as well as quantity surveyors and *low growth* (less than 5 %) for town and regional planners. This is due mainly to the expected low to moderate growth in the civil engineering and building industries. Although the majority of the companies that employ professionals such as architects and quantity surveyors are classified in the business services subsector, the demand for their services is highly influenced by changes in the construction sector.

- *Low growth* (less than 5 %) in occupational demand is anticipated for surveyors. This occupational category includes land and mine surveyors, building and construction and topographical surveyors.

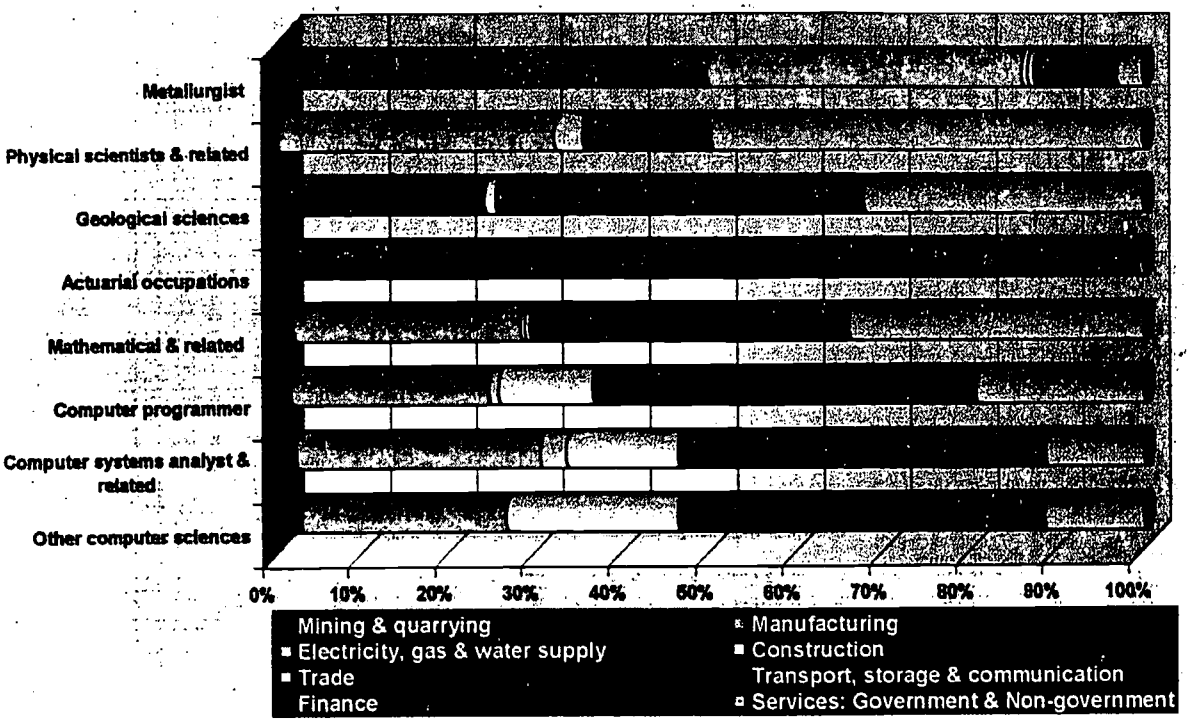
- The stagnant state of the mining industry is expected to be the major contributor to the slow growth in demand for surveyors, while the expected low to moderate growth in the civil engineering and building industries will also have a restraining influence.



Architecture & related occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Architect & related Architect Landscape architect Architect & related n.e.c.	2 323	5 – 10%	250 – 499	34%	66%
Quantity surveyor	2 686	5 – 10%	250 – 499	42%	58%
Town & regional planner	981	Less than 5%	Less than 250	38%	62%
Surveyors Land surveyor Surveyor (general) Building & construction surveyor Topographical surveyor Mine surveyor Surveyor n.e.c.	3 623	Less than 5%	500 – 999	23%	77%

3.4 Natural science occupations

Sectorial distribution: Natural science occupations



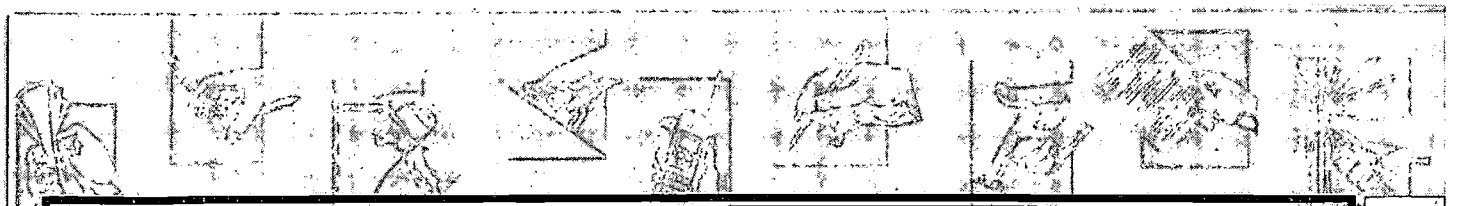
- Rapid computerisation in companies is expected to result in a *massive increase* (40 %+) in demand for **information technology professionals** such as systems analysts, programmers and other computer science occupations.

- Shortages of IT professionals were reported in half of the organisations that employ these people. These shortages stem mainly from organisations' increased dependency on computer technology as a means to remain competitive. Shortages in certain occupational categories such as computer programmers (e.g. SAP), as well as systems analysts and software systems engineers, already exist.

- IT shortages are not only the result of the inability of the education sector to meet the demand for skills, but also of the loss of skills to the international market.

- The convergence of information and telecommunication technology has resulted in new skill requirements. Many IT professionals are, for instance, trained in the field of electronic or electrical engineering. Shortages of engineering skills will therefore also impact on skill shortages in the IT field.

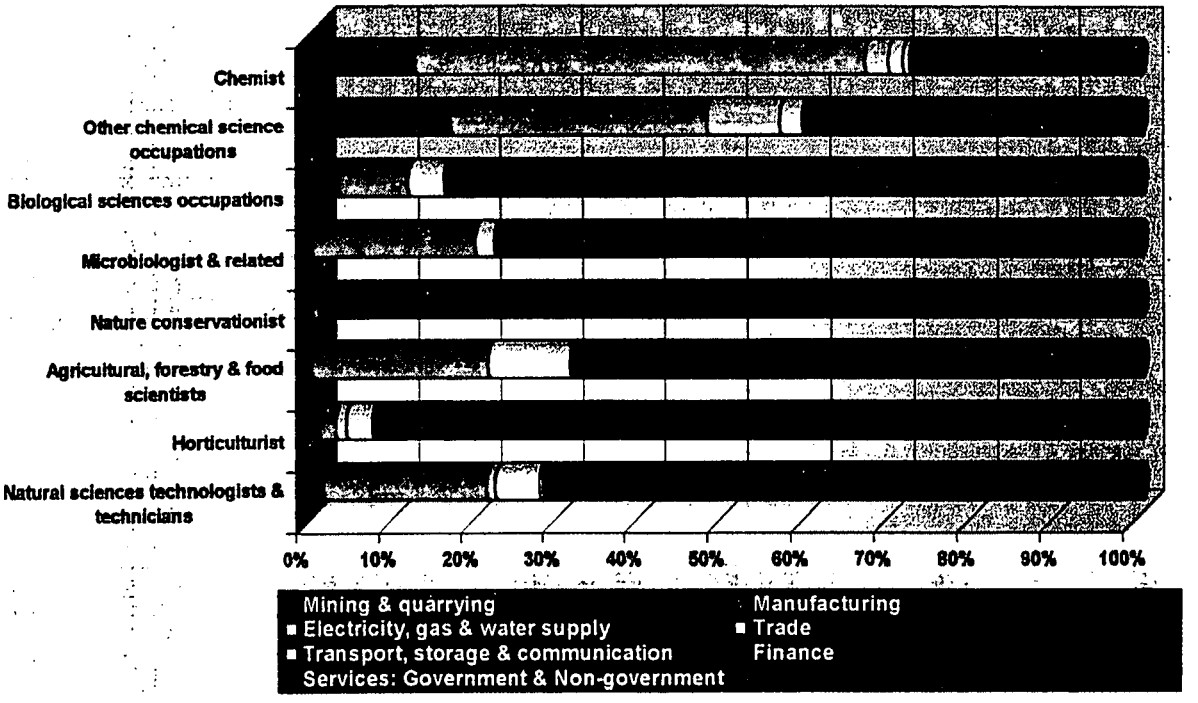
- Rapid growth and changes (e.g. in occupational composition) in the financial industry, which includes the banking, insurance and business services subsectors, will result in *high growth* (15 % – 40 %) in the demand for **actuarial as well as mathematical and related occupations**.



Natural science occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replace-ment
Metallurgist	554	Less than 5%	Less than 250	13%	87%
Physical scientists & related	699	5 – 10%	Less than 250	43%	57%
Astronomer					
Physicist					
Biophysicist					
Metallurgist					
Physical science n.e.c.					
Geological sciences	2 469	Less than 5%	250 – 499	22%	78%
Geologist					
Geophysicist & related					
Geological science n.e.c.					
Actuarial	801	15 – 40%	Less than 250	69%	31%
Mathematical & related	1 205	15 – 40%	250 – 499	68%	32%
Mathematical					
Operational researcher					
Statistical					
Meteorologist					
Mathematical & related n.e.c.					
Computer programmer	10 059	40% +	5 000 – 8 000	88%	12%
Computer systems analyst & related	11 504	40% +	5 000 – 8 000	87%	13%
Other computer science	7 108	40% +	2 000 – 4 999	87%	13%
Database administrator					
Software systems engineer					
Computer consultant					
Computer science n.e.c.					

3.4 Natural science (cont.)

Sectorial distribution: Natural science occupations (cont.)



Moderately high growth (10 % – 15 %) in the demand for **chemists** and **natural** (e.g. geological; mathematical, biological) **sciences technologists and technicians** is expected. However, a sizeable proportion of natural sciences technologists/technicians is employed in government. Growth in the demand for those occupations is therefore restricted.

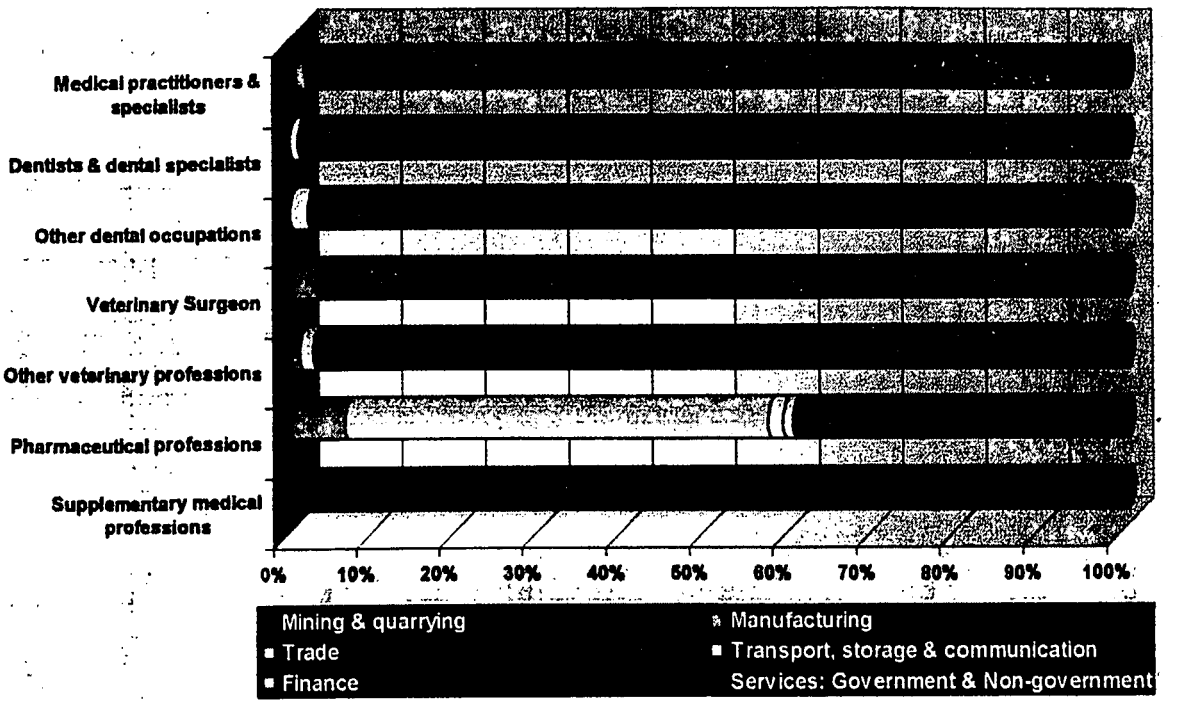
Occupations in the fields of **agriculture, forestry, food science, chemical science, physical science** and **microbiology** are expected to show overall *moderate growth* (5 % – 10 %). Government and local government spending constraints will probably slow the growth in demand for these occupations. Higher growth in demand is expected in non-public sectors.

Government and local government budgetary constraints are expected to *limit growth* to less than 5 % in a number of other occupational categories including **biological science** (e.g. zoology, botany), **nature conservation**, the **geological sciences, metallurgy** and **horticulture**. Occupations in these categories tend to be concentrated in government or in organisations that are dependent on government funding.

Natural science occupations (cont.)	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replace-ment
Chemist	2 077	10 – 15%	500 – 999	53%	47%
Other chemical science	882	10 – 15%	Less than 250	51%	49%
Biochemist					
Chemical science n.e.c.					
Biological sciences	1 122	Less than 5%	Less than 250	28%	72%
Biologist					
Zoologist & related					
Botanical & related					
Hydrobiologist & related					
Biological sciences n.e.c.					
Microbiologist & related	1 230	5 – 10%	Less than 250	45%	55%
Nature conservationist	1 604	Less than 5%	Less than 250	25%	75%
Agricultural, forestry & food scientists	3 369	5 – 10%	500 – 999	49%	51%
Agricultural					
Animal scientist & related					
Agronomic					
Forestry					
Food					
Agriculture, forestry, etc. n.e.c.					
Horticulturist	1 895	Less than 5%	Less than 250	11%	89%
Natural sciences technologists & technicians	8 518	10 – 15%	1 000 – 1 999	55%	45%
Physical science technologist					
Biological science technologist					
Agric., forestry, food science technologist					
Natural sciences technologist n.e.c.					
Physical sciences technician					
Earth sciences technician					
Mathematical sciences technician					
Chemical technician					
Biological science technician					
Agriculture, forestry, food technician					
Natural science technician n.e.c.					

3.5 Medical and related occupations

Sectorial distribution: Medical and related occupations



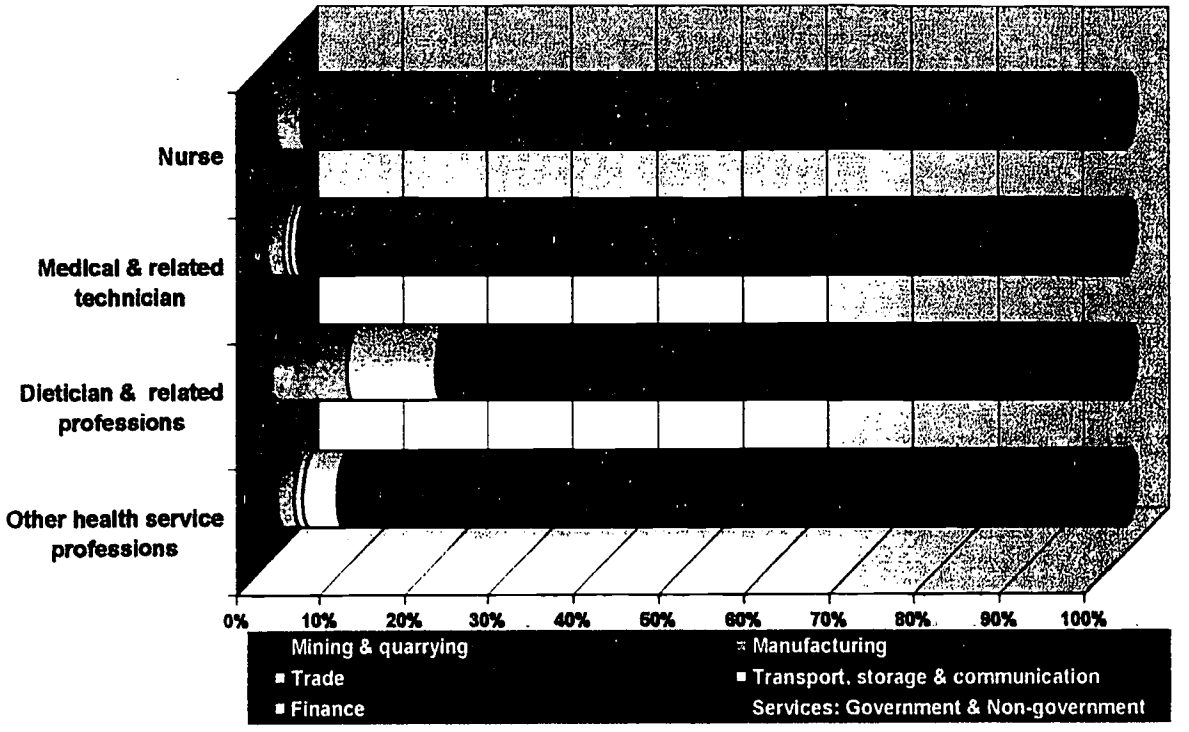
- A medical student has to register with the Interim National Medical and Dental Council of South Africa (INMDC)[1] as a medical student and, on completion of his/her training, as a medical doctor.
- Medical specialists require postgraduate study of four years to obtain a MMed or FCP(SA). On successful completion of the examination to qualify as a specialist, the candidate must register with the IMDC as a specialist, for example a paediatrician.
- *Moderotely high growth* (10 % – 15 %) in the demand for **medical practitioners and specialists** is expected outside government. However, because a sizeable proportion of people in these fields are employed in government, growth in demand is restricted.
- A dentist must register with the INMDC after completion of the required training (BDS or a BChD degree). *Moderote growth* (5 % – 10 %) in demand for **dentists and dental specialists** is foreseen.
- Veterinarians have to undergo six years' (duration period depends on Minister of Education's approval) theoretical and practical training, after which a BVSc degree is obtained. Qualified veterinarians should register with the SA Veterinary Council. *Moderote growth* (5 % - 10 %) in demand for **veterinary surgeons** is foreseen.
- Overall, **pharmaceutical professions** are expected to show *moderote growth* of 5 % – 10 % in demand over the next five years. Growth in demand for employment in government is, however, restricted, although moderately high growth can be experienced in the non-government economy.
- Most **supplementary medical professions** have to register with the INMDC of South Africa. Included here are physiotherapists, occupational therapists, speech therapists, dental therapists, audiologists and radiographers. *Moderote growth* (5 % – 10 %) in demand is anticipated until 2003.

[1] From the middle of May 1999 it will be the Health Professions Council of South Africa (HPCSA)

Medical and related occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replace-ment
Medical practitioners & specialists Medical practitioner General medical practitioner Intern Clinical assistant Medical practitioner n.e.c. Surgeon Gynaecologist Physician Paediatrician Medical pathologist Anaesthetist Ophthalmologist Orthopaedist, orthopaedic surgeon Psychiatrist Radiologist Medical specialist n.e.c. Medical n.e.c. Medical technologist	28 163	10 – 15%	5 000 – 8 000	46%	54%
Dentists & dental specialists	3 305	5 – 10%	500 – 999	18%	82%
Other dental Dental technician Dental n.e.c.	812	10 – 15%	Less than 250	40%	60%
Veterinary surgeon	1 758	5 – 10%	250 – 499	34%	66%
Other veterinary professions Veterinary n.e.c.	853	5 – 10%	Less than 250	48%	52%
Pharmaceutical Pharmacist Pharmaceutical n.e.c.	9 007	5 – 10%	1 000 – 1 999	44%	56%
Supplementary medical Physiotherapist Occupational therapist Masseuse Speech therapist & audiologist Therapist n.e.c. Radiographer Supplementary medical n.e.c.	14 933	5 – 10%	2 000 – 4 999	53%	47%

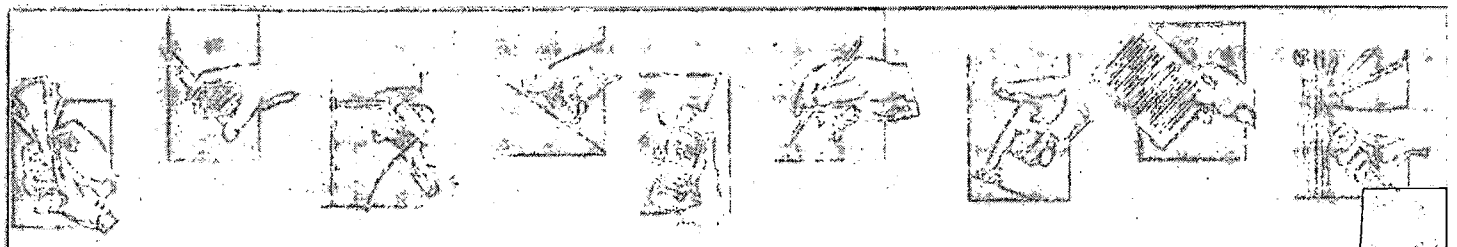
3.6 Health-related occupations

Sectorial distribution: Health-related occupations



- Qualified **nurses** have to register with the South African Nursing Council. The nursing profession is expected to *grow moderately* (5 % – 10 %). Higher growth is foreseen outside government (private health care) than in the government subsector (limited finances).

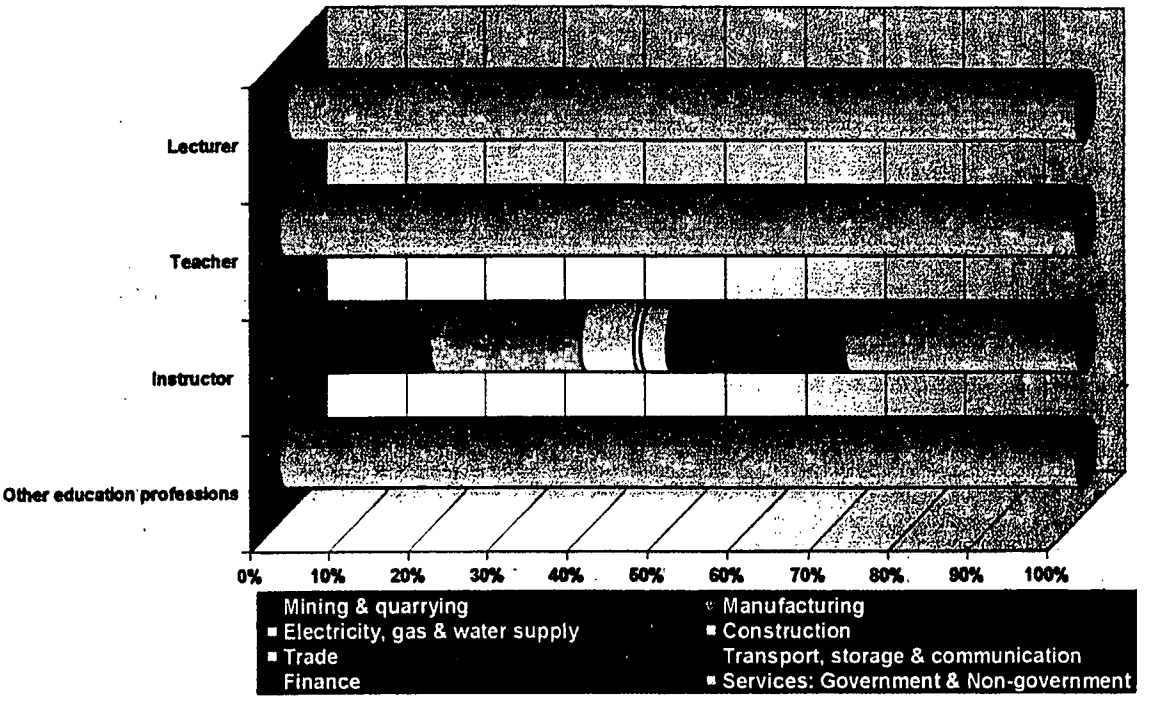
- Optometrists, health inspectors, chiropractors, naturopaths and homeopaths form part of the **other health service professions** category. These professions will most likely experience *moderate growth* (5 % – 10 %) over the next five years



Health-related occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replace-ment
Nurse	132 230	5 – 10%	15 000 – 20 000	38%	62%
Nursing administrator/manager/matron					
Professional nurse					
Psychiatric nurse					
Nurse: midwife					
Industrial nurse					
Community nurse					
Staff nurse					
Student, pupil nurse					
Student nurse					
Pupil nurse					
Nursing n.e.c.					
Medical & related technician	2 547	10 – 15%	250 – 499	57%	43%
Medical technician					
Ophthalmic technician					
Industrial hygiene technician					
Other medical technicians					
Dietician & related	714	10 – 15%	Less than 250	56%	44%
Other health service professions	3 409	5 – 10%	500 – 999	47%	53%
Optometrist					
Health inspector					
Health service inspector n.e.c.					
Chiropractor, naturopath, homeopath					
Health services professions n.e.c.					

3.7 Education and related occupations

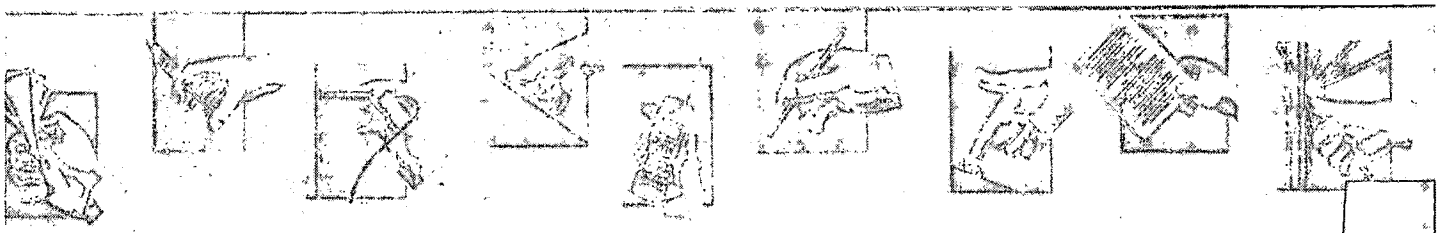
Sectorial distribution: Education and related occupations



The Education Department employs almost 97 % of the teachers in South Africa. Given the department's restricted budget, the employment of teachers over the next five years is expected to increase by not much more than 6 %.

The employment of teachers in the government sector accounts for a substantial part of total employment of professionals in South Africa, and the slow expected growth in demand for teachers is likely to have a substantial slowing effect on the growth of professional employment over the next five years.

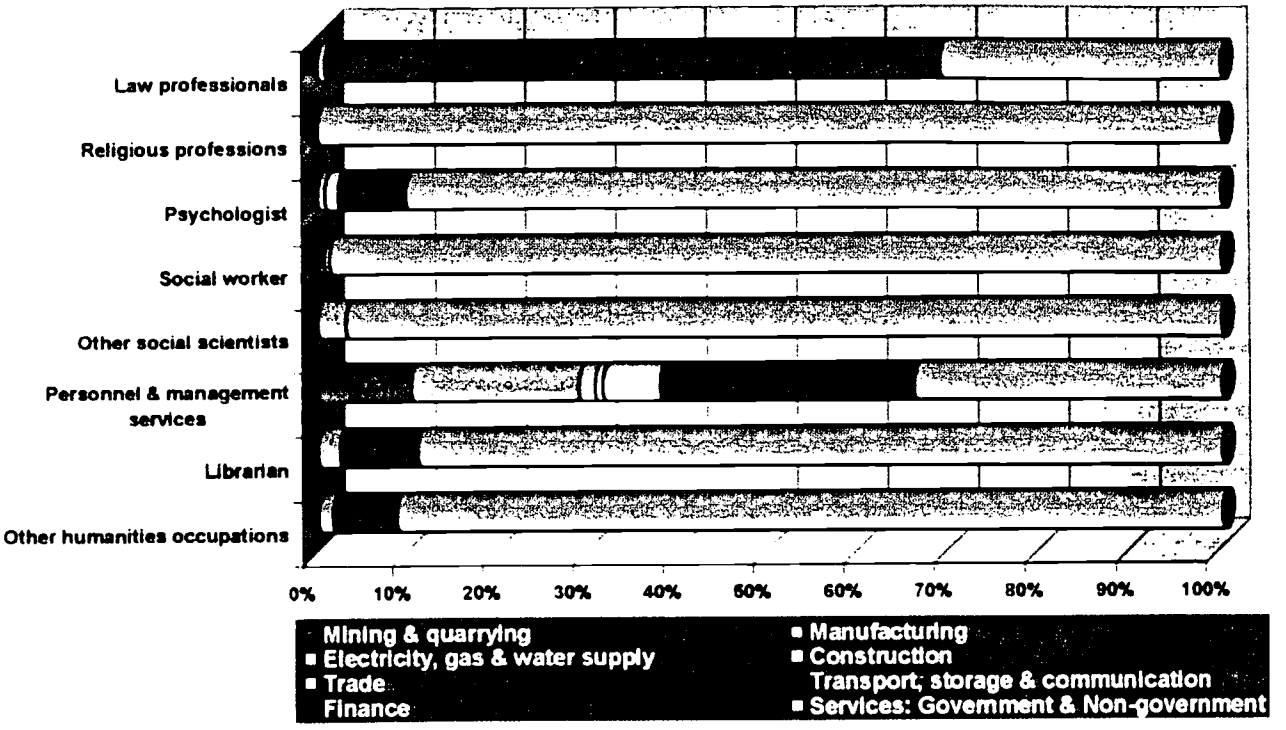
Low to moderate growth (0 % – 10 %) in demand is forecast for all other education-related occupations such as instructors and lecturers, mainly as a result of slow growth in higher educational institutions.



Education and related occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Lecturer Lecturer (university) Lecturer (technikon, etc)	21 660	Less than 5%	2 000 – 4 999	29%	71%
Teacher Secondary school teacher Primary school teacher Nursery school teacher Adult education teacher Special education teacher Teacher: private tuition	380 799	5 – 10%	40 000 +	53%	47%
Instructor Instructor at training centre	4 835	5 – 10%	500 – 999	39%	61%
Other education professions Other instructors Rector, vice-rector (university, technikon) School principal, school vice-principal Inspector/superintendent of education Educational planner Educational technologist Education occupations n.e.c.	34 905	Less than 5%	5 000 – 8 000	11%	89%

3.8 Humanities and related fields

Sectorial distribution: Humanities and related fields



- *Moderate* (5 % – 10 %) growth in demand is expected for **law professionals** such as advocates, attorneys, judges and prosecutors. These professions will probably experience higher growth in government than elsewhere.
- Growth of less than 5 % is anticipated for **religious and spiritual workers** in the formal sectors.

- **Psychologists** have to register with the Interim National Medical and Dental Council in one of five recognised categories (clinical, counselling, educational, industrial or research psychology) before practising. The demand for psychologists will show a *moderate* (5 % – 10 %) increase up to 2003.

- Overall growth of *less than 5 %* is predicted for **social workers**, although moderate growth in demand is foreseen in government.

- The demand for human resources professionals such as **industrial relations officers, management consultants, training and personnel officers** is expected to grow at a moderately high (10 % – 15 %) rate. Growth will take place mainly in the non-government sector, especially in some parts of the manufacturing sector, due to the training needs that will arise from the adoption of new technologies and production methods.
  - Increasingly sophisticated labour laws necessitate the appointment of HR professionals with knowledge of labour law.
  - The need to train professionals to assess competency levels according to the requirements of the NQF and the South African Qualifications Authority will also enhance growth in this category.

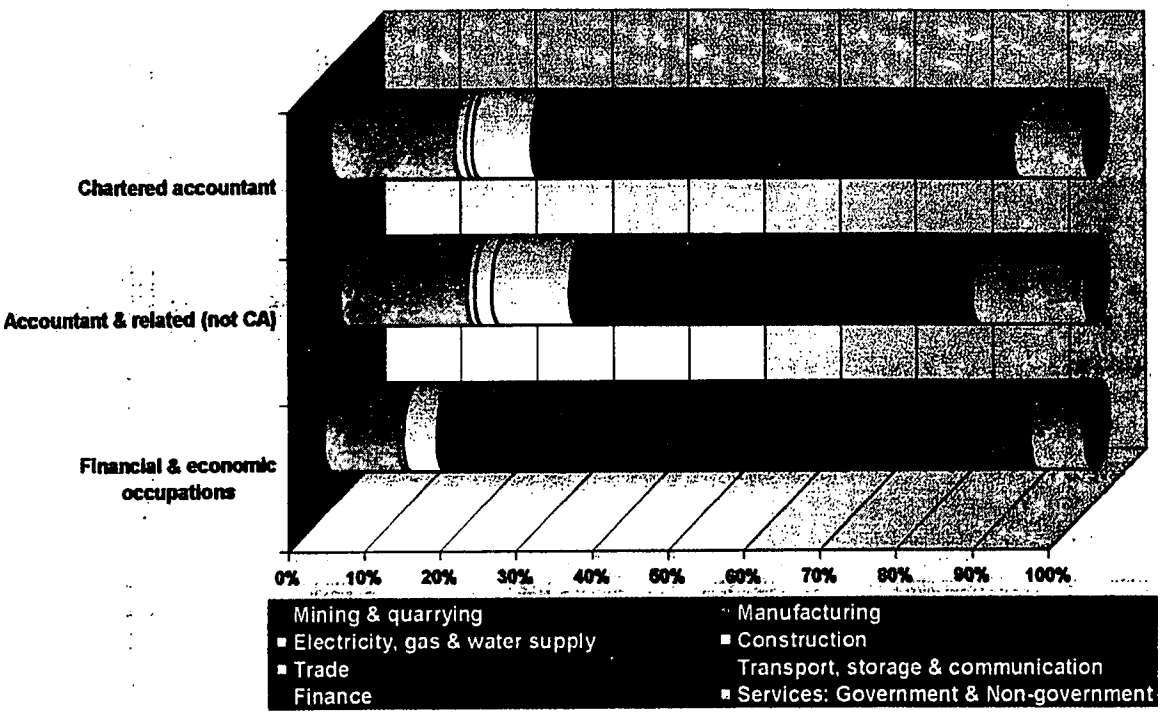
Local governments face similar budgetary constraints as the government and occupations such as **librarians and museum curators/directors/officers** that are mainly concentrated in local government are also likely to be negatively affected. Local governments are reprioritising their spending and functions such as libraries are bearing the brunt of expenditure cuts. *Less than 5 % growth* in demand is forecast for professions such as librarians, archivists, historians and linguistic occupations over the next five years.

Humanities and related fields	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Law professionals Judge, magistrate Legal officers n.e.c. Advocate Advocate, legal advisor Attorney Attorney's clerk Legal occupations n.e.c.	18 135	5 – 10%	2 000 – 4 999	46%	54%
Religious professions Minister, priest, chaplain Religious & spiritual workers n.e.c.	16 014	Less than 5%	2 000 – 4 999	1%	99%
Psychologist	1 361	5 – 10%	Less than 250	43%	57%
Social worker	6 946	Less than 5%	500 – 999	20%	80%
Other social scientists Social scientist n.e.c.	116	5 – 10%	Less than 250	42%	58%
Personnel & management services Industrial & management services Management consultant Manpower planner Public relations, liaison officer Training officer, consultant Personnel / HR officer Work study / O & M[1] officer Personnel & management occ. n.e.c.	34 290	10 – 15%	5 000 – 8 000	51%	49%
Librarian Librarian / information officer	4 729	Less than 5%	500 – 999	0%	100%
Other humanities occupations Archivist Museum / art curator / director Cultural officer Historian / heraldist Linguistic occupations	3 291	Less than 5%	500 – 999	30%	70%

[1] Organisation and methods

3.9
Accountants, other financial and economic occupations

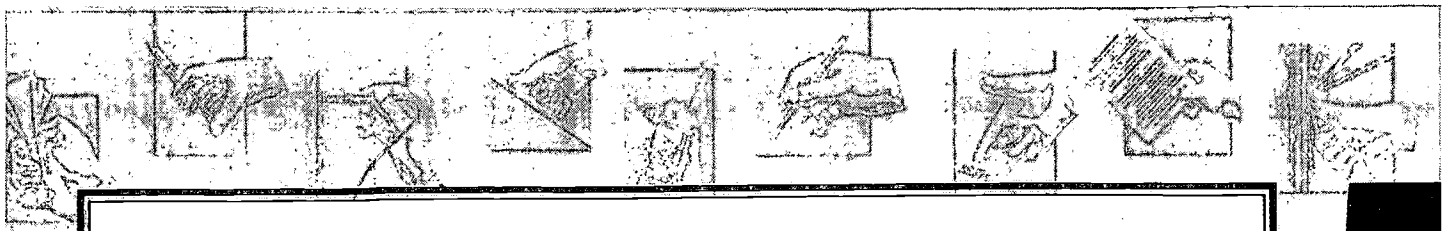
Sectorial distribution: Accountants, other financial and economic occupations



- Strong growth and changes in the financial services industry (which is spread across the banking, insurance and business services subsectors) will result in *very high* (40 %+) growth in the demand for **chartered accountants** and *high* growth (15 % – 40 %) in the demand for accountants and people in **other financial and economic occupations**, for example economists, financial analysts and investment advisers.

- Apart from strong anticipated growth in financial services, the nature of this industry's business is becoming increasingly complex, which necessitates the replacement of lower-level staff such as clerks with professionally trained personnel.

- The rapid growth in demand for chartered accountants and accountants arises from the fact that they are needed in all sectors of the economy. Employers across various sectors have recognised that the high-level skills of chartered accountants, for instance, can be used in a diverse range of functions, including strategic planning and productivity monitoring.



- Nearly a fifth (17 %) of the organisations that employ **accountants and related accounting professionals** experienced a lack of these skills. Shortages of registered as well as unregistered accountants were reported. However, organisations across sectors indicated the importance of experience – accountants should understand the business environment, organisational systems and the culture in which they operate – as well as business ethics.

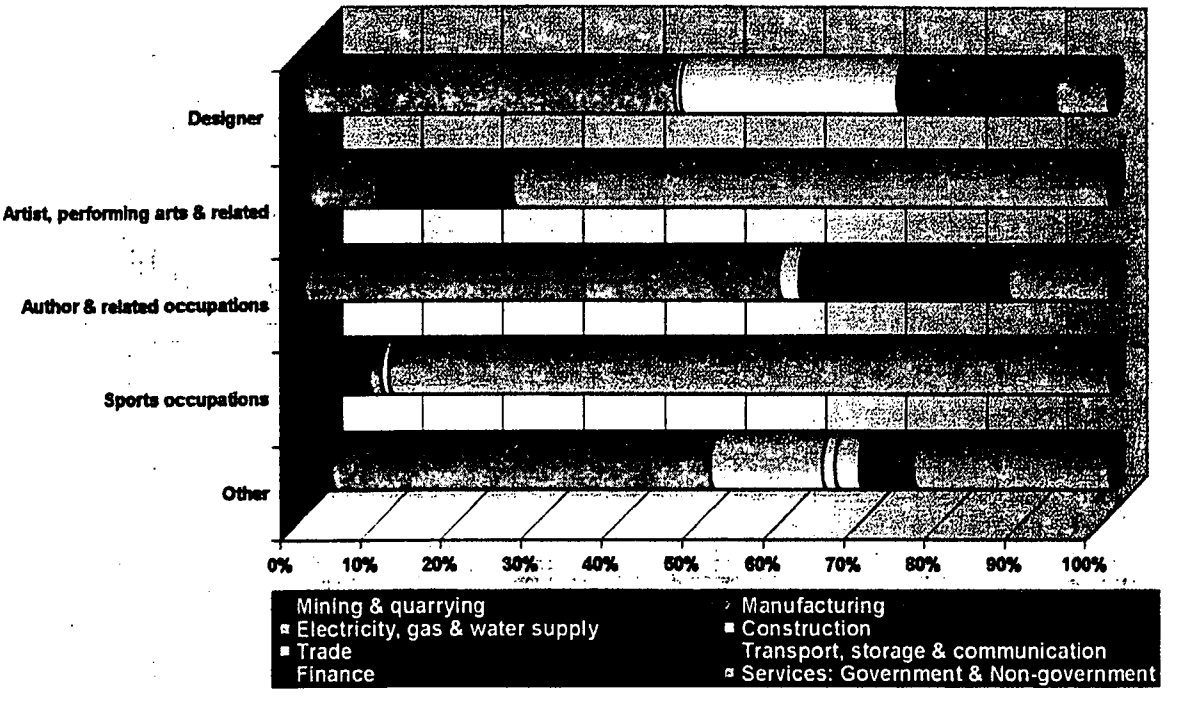
- More marketers were required, especially in the manufacturing sector, to break into new international markets, while fierce competition in the trade sector necessitated aggressive marketing strategies.

- Highly skilled black South Africans were especially in demand with regard to these professions.

Accountants, other financial and economic occupations	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replace-ment
Chartered accountant (CA)	13 179	40% +	5 000 – 8 000	78%	22%
Accountant & related (not CA) Accountant (not CA) Articled clerk with accountant/auditor Tax consultant Accounting & financial n.e.c.	36 583	15 – 40%	15 000 – 20 000	69%	31%
Financial & economic Economist Financial analyst Investment advisor Market researcher Economic & financial n.e.c.	11 465	15 – 40%	5 000 – 8 000	80%	20%

3.10 Art, sport and entertainment

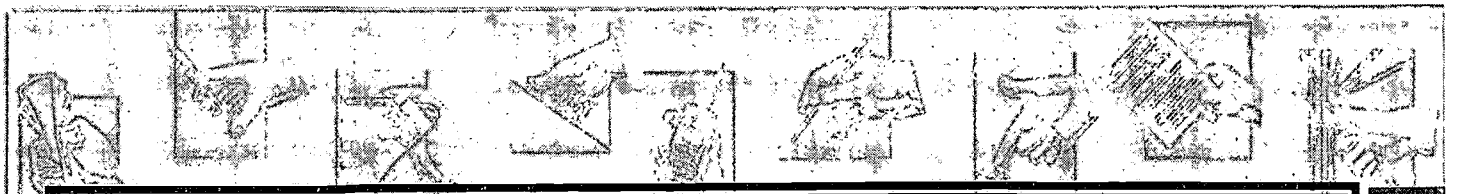
Sectorial distribution: Art, sport and entertainment



- Government and local government budgetary constraints are also expected to limit growth in a number of other numerically smaller occupational categories, including **art and entertainment occupations**. These occupations tend to be concentrated in government or in organisations dependent on government funding. The demand for artists, performing artists and people in related occupations, such as musicians, TV/film/radio producers and announcers is expected to grow by *less than 5 %* until 2003.

- **Authors and publishers** will probably experience growth of *between 10 % and 15 %*, due mainly to growth in the printing and publishing sector, where an increased demand for desktop publishing specialists, graphic designers and commercial artists was identified.

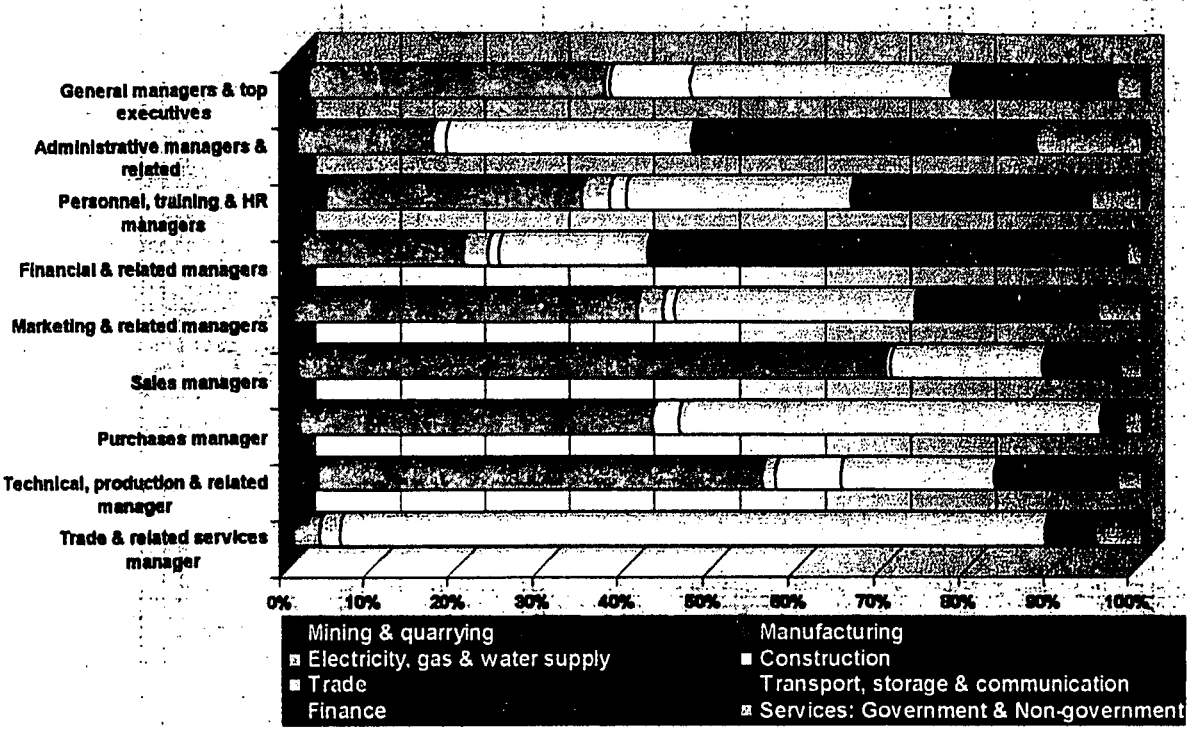
- The growth in demand for **sports administrators**, promoters, trainers and coaches as well as professional sport people is anticipated at between *5 % and 10 %*.



Art, sport and entertainment	Positions in: 1998	1998 – 2003		Vacancies arising from:	
		Growth in demand	Needing filling	New demand	Need for replacement
Designer	5 354	10 – 15%	1 000 – 1 999	60%	40%
Product, industrial designer					
Designer: textile, fashion, costume					
Interior decorator/designer					
Graphic designer, commercial artist					
Designer n.e.c.					
Artist, performing arts & related	10 253	Less than 5%	1 000 – 1 999	22%	78%
Sculptor					
Artist, cartoonist, painter					
Glass, ceramics artist, potter					
Photographer, cameraman					
Fine artist n.e.c.					
Musician					
Singer					
Producer, actor, comedian					
Choreographer, dancer					
TV/film/radio producer/director					
Stage manager, theatre technician					
Announcer (radio, TV)					
Performing artists & related					
Art & entertainment n.e.c.					
Author & related	6 219	10 – 15%	1 000 – 1 999	49%	51%
Editor, publisher					
Journalist, reporter					
Writer, script writer, poet					
Advertisement, copy writer					
Author & related n.e.c.					
Sports	1 805	5 – 10%	250 – 499	41%	59%
Sports administrator, manager, promoter, official, referee, coach, trainer, PT instructor					
Sportsman (professional)					
Sports n.e.c.					
Other professional, semi-professional & related	19 070	Less than 5%	2 000 – 4 999	26%	74%
Inspector: factories, mines, works					
Inspector: constructions, sites, housing					
Inspector: products, machinery					
Safety advisor, loss control officer					
Technical inspector n.e.c.					
Professional and semi-prof. n.e.c.					

4 Managers

Sectorial distribution: Managers



- Although managers are classified as high-level human resources along with professionals, they are expected to show very different growth patterns over the period 1998 – 2003. The number of managers employed is expected to grow by 6,4 % over the period under review, which is lower than the expected growth in professionals. The sources of this growth, however, differ substantially.

- Whereas the **financial sector** is expected to account for almost one-third of the growth in the demand for professionals, it is expected to account for less than 5 % of the growth in the demand for managers. In fact, the banking subsector is expected to reduce its number of managers since the average level of personnel employed is likely to rise dramatically, which means that the sector will require fewer managers. The insurance subsector is also expected to employ fewer managers.

- The **trade sector** is expected to account for the greatest growth in managerial employment, which will be almost evenly shared between the retail and wholesale subsector on the one hand, and the accommodation and catering subsector on the other. These sectors are highly labour intensive and much of the employment growth will arise from the opening up of new establishments, such as new retail outlets or hotels. These establishments require proper management and growth in the trade sector will therefore give rise to an increased need for managers.

- A modest increase in the number of managers is expected in the **services sector**, due mainly to the growth in demand for managers by government and community and social services. Collectively, the services sector should account for more than 12 % of the growth in managerial employment.

- A flattening of management structures is also expected in a number of **manufacturing** subsectors. As in the case of the banking subsector, these subsectors are expected to see an increase in the average skill level of employees, as the manufacturing firms will employ more professionals and fewer semiskilled and unskilled workers, and thus require fewer managers.

- Modest levels of growth in management are expected in the **construction and the transport, storage and communication sectors**, while negative growth is expected in the **mining and electricity sectors**. The latter two sectors are both likely to rationalise their total human resource complements.

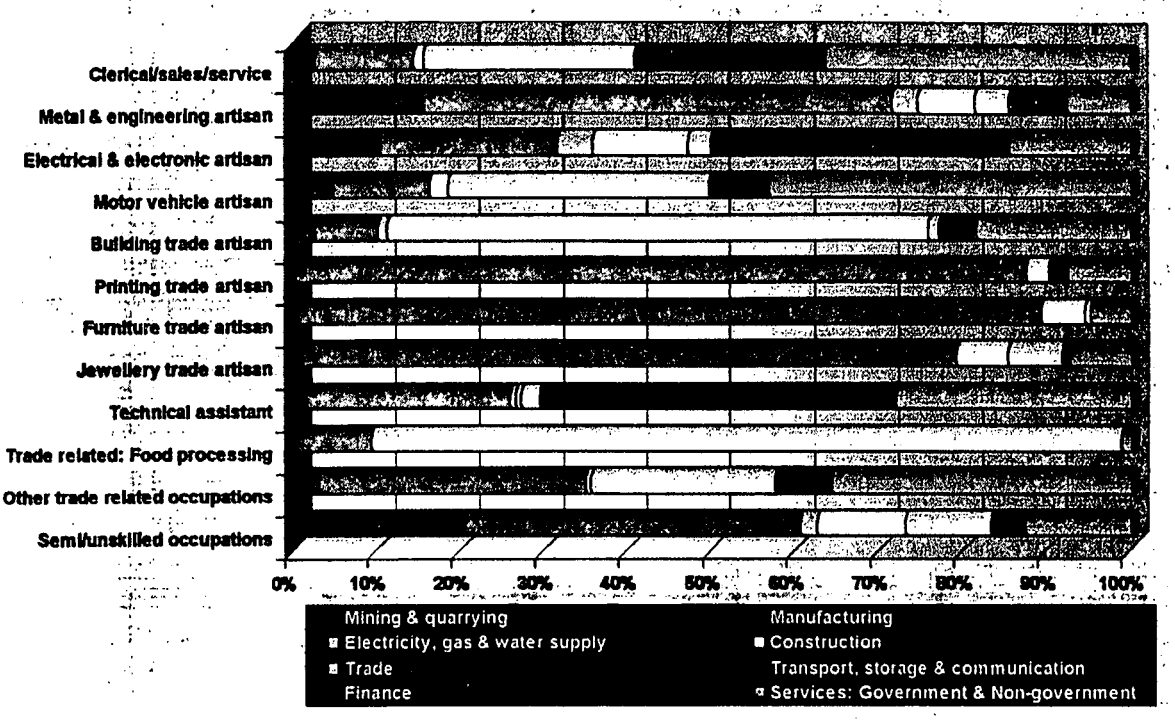
- Sixty (22 %) of the organisations that participated in the study, indicated shortages in the managerial occupational group. Various occupations were mentioned ranging from different types of administrative and technical managers to operational and retail managers. Shortages, however, seemed to exist especially in the administrative and technical areas of management. Within the administrative category, finance and sales featured prominently.

- Organisations were specifically interested in **multi-skilled managers** with an understanding of business and the industry in which they operate. The combination of technical skills (relevant to the specific industry), business and financial skills and "people skills" (e.g. leadership and the ability to manage organisational change processes) were often cited as being in short supply.

- Experienced and **skilled black managers** were hard to find, while stricter labour legislation increased the pressure on organisations to employ more black people in the higher skills categories. The scarcity of these managers put upward pressure on remuneration packages. Recruiting and retaining skilled black managers therefore is perceived to put further strain on organisations' financial resources already burdened by unstable financial markets, international competition and lack of economic growth.

5 Clerical, Artisan and Semiskilled occupations

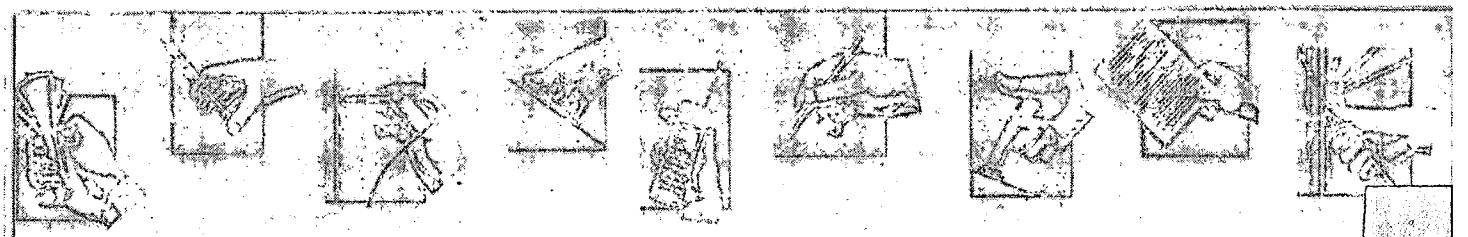
Sectorial distribution: Clerical, Artisan and Semiskilled occupations



- It is estimated that employment in the category of **clerical/sales/service workers** will remain more or less constant over the period 1998 to 2003. Although the category as a whole is expected to show no change, the three subgroups are expected to show very different employment patterns.

  - A considerable number of clerical jobs are expected to be lost as a result of the computerisation of administrative tasks and office automation. Clerical jobs are likely to be lost across all major sectors, but the greatest losses are expected in **government**, which will be the major contributor to the expected loss of almost 70 000 jobs in the services sector.

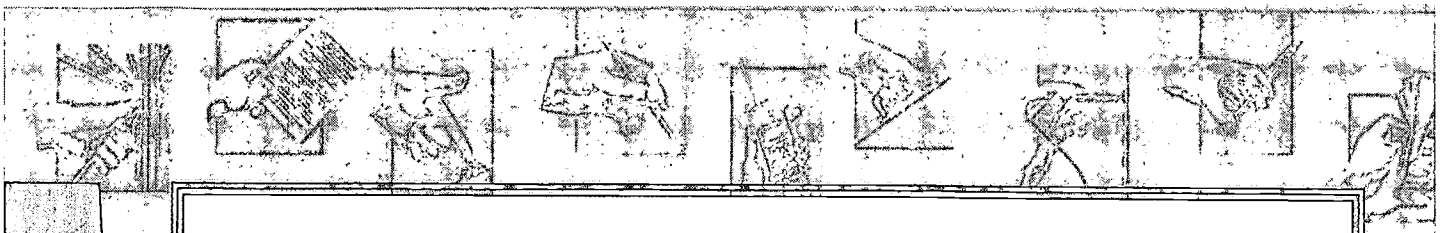
  - The net number of sales and service jobs is likely to rise, as these jobs are not really threatened by technological advances. The **trade sector** is expected to be the largest creator of jobs in this category, since it incorporates the highly labour-intensive subsectors of the retail and wholesale trade and catering and accommodation.



- The growth in **artisan employment** is expected to be moderate and it is estimated that approximately 12 000 net artisan positions will be created between 1998 and 2003. The greatest generator of artisan jobs is the **building subsector**. The moderate level of growth expected in this sector is likely to translate into moderate growth in the demand for artisans such as bricklayers and plumbers.

  - Substantial growth in artisan employment is expected in the **trade sector**, with the employment of trade-related artisans such as butchers and confectioners expected to grow in the retail and wholesale trade subsector, and that of motor mechanics in the motor trade subsector.

  - The **manufacturing sector** is the largest employer of artisans but is expected to show only moderate growth in the employment of artisans. This sector is characterised by declining employment due to the use of labour-saving technology, and this process appears to introduce two opposing forces in the employment of artisans. First, in some cases the new technology replaces the artisan. An example of this is the printing and publishing industry, in which computerisation of the publishing process is reducing the need for artisans such as compositors and typesetters. A further example is that of the furniture-manufacturing subsector, where computer-controlled machinery is taking over the tasks of artisans such as furniture makers and joiners. Second, in other cases the introduction of labour-saving technology requires the increased use of artisans such as electricians and fitters and turners to maintain the new machinery. This force is the dominant force in most manufacturing subsectors since artisan employment is expected to increase in 14 of the 18 subsectors.



- Approximately 71 000 **semiskilled and unskilled** job opportunities are expected to be lost, which includes occupations such as production workers and labourers.

- In the **manufacturing sector** substantial substitution of capital for labour is expected to take place, with the result that this sector is likely to be the largest net destroyer of semiskilled and unskilled jobs. Substantial job losses are also expected in the **services sector** (largely due to downsizing of the public service) and in the **mining sector** (in which mines are expected to undertake further rationalisation).

- The largest creator of semiskilled and unskilled jobs is expected to be the **construction sector**. This sector is highly labour intensive and there is little scope for substituting labour for capital, and growth in output in the sector inevitably results in employment creation.

- The **trade sector** is expected to be the second-largest generator of jobs at this skill level because of the sector's labour-intensive character.

- The **finance sector** is also expected to create a number of jobs; mostly in the business services subsector, where businesses such as cleaning and gardening services are likely to create new positions.

Artisans	Positions in:	
	1998	1998 – 2003
		Growth in demand
Metal & engineering	96 072	0 – 5%
Electrical & electronic	53 738	0 – 5%
Motor vehicle	48 213	5 – 10%
Building trade	45 827	5 – 10%
Printing trade	10 073	-10 – 0%
Furniture trade	5 104	-10 – 0%
Jewellery trade	5 598	5 – 10%
Technical assistant	18 387	0 – 5%
Trade related in food processing	7 193	5 – 10%
Other trade related	12 384	5 – 10%

6 Income of professionals and managers

- The income of graduates has been surveyed since 1971. The most recent of these surveys was conducted in March 1997 and reflected the national occupational income of 21 077 graduates.

- 17% of the participants in the survey were employed in *government* (central government or provincial administration).

- 18% were employed in *semi-government,* which includes regional or local authorities, universities, technikons, public corporations (e.g. the SABC, ESCOM, ARMSCOR, Rand Water Board) and government-controlled or government-aided organisations (e.g. the HSRC, CSIR, control boards, SABS).

- 42% were employed in the *private sector,* which consists of professional practices (e.g. those of auditors, attorneys), business enterprises (e.g. close corporations or companies), statutory councils (e.g. the IDC, ECSA, OROR, SAMDC) and non-government organisations without profit motive, such as churches, welfare organisations and trade unions.

- 24% *worked for themselves* or were partners in professional firms, and/or directors of private practices/businesses.

- Only occupations with at least five respondents were included in the table.

- Income package refers to the *total income of permanent, full-time employees* and includes salary plus fringe benefits such as pension, medical, transport or petrol allowance, entertainment allowance, housing and other fringe benefits such as employer's contribution towards clothing, telephone, insurance premiums, study aid, subsidised purchases and cafeteria facilities.

- Income package figures are indicated by means of percentile values. At the percentile value of a quarter of people in a specific occupation receive less than the income indicated (See columns A).

- The median or 50th percentile value shows the point where 50% of people receive less and 50% receive more than the income indicated (See columns B).

- At the percentile value of 75 a quarter of the people receive more than the income indicated (See columns C).

- Experience is an important factor when income packages are compared. The median years of experience in a specific occupation are given in the table column *years of experience*. At this point 50% of graduates in an occupation have less experience and 50% have more.

- The highest earners were usually self-employed, although overall, no major differences in income were identified between the self-employed and the private sector.

- The biggest differences in income existed between government and the other sectors.

- Dental specialists, mechanical and civil engineers, chartered accountants and other economic-related occupations were some of the highest earners among the *self-employed*.

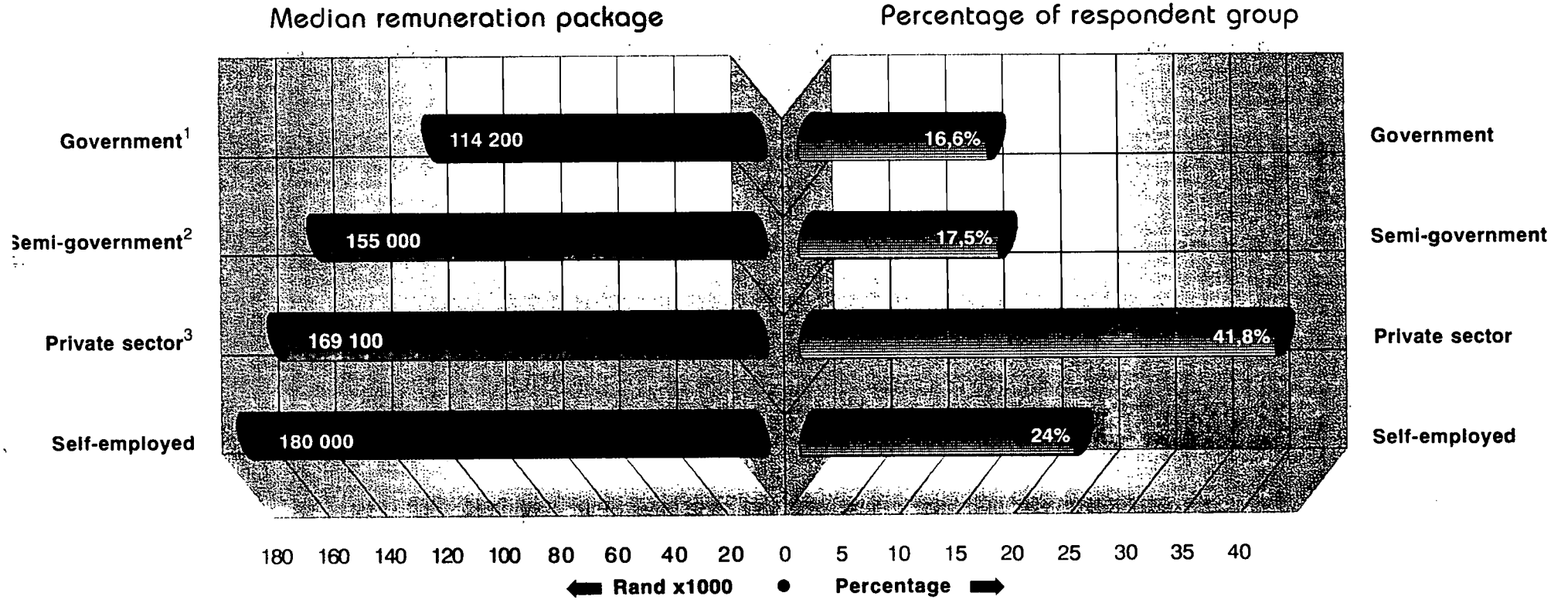
- In the *private sector*, graduates in geological science occupations, computer science, medical practitioners, psychologists, accountants and top management earned more than their counterparts in other sectors.

- In *semi-government*[1], the income of the following occupations was higher than that of their equivalents in other sectors:
  - technical and related managers,
  - commercial and related managers,
  - physicists,
  - town and regional planners,
  - computer systems analysts and related as well as computer programmers,
  - chemists,
  - lecturers,
  - nursing tutors, administrators and professional nurses,
  - human resources officers,
  - authors and related occupations,
  - public relations occupations,
  - microbiologists,
  - dieticians and related occupations.

- Teachers and social workers earned higher incomes in government than in any of the other three sectors.

[1] Semi-government mainly consists of universities/technikons and science councils

Median remuneration package and percentage distribution of permanent full time professionals and managers according to employer sector



[1] Central government and provincial administration.
[2] Includes regional/local authorities, universities, technikons, public corporations and government-controlled or government-aided organisations.
[3] Professional practices, business enterprises, statutory councils and non-government organisations without profit motif.

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Engineers	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Industrial/Production engineer	.	.	.	.	9	140800	169400	207000
Chemical engineer	.	.	.	.	9	133000	182700	229400
Electrical engineer and related	.	.	145300	.	12	160000	195000	250000
Mechanical engineer	15	112600	175300	189100	8	144900	166200	205300
Metallurgical engineer	.	.	.	.	4	133500	145000	185100
Mining engineer	.	.	.	.	5	.	.	.
Civil engineer	22	164000	188500	204700	19	170700	205900	244800
Engineer n.e.c.[1]	.	.	.	.	7	.	123200	.

[1] Include agricultural engineer

Architecture and related	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Architect/Landscape architect	13	.	147300	.	10	.	133000	.
Quantity surveyor	21	.	183400	.	17	.	175700	.
Town and regional planner	13	112600	155900	256400	10	114600	174700	203000
Land surveyor	.	.	155600	.	7	.	135100	.

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Engineers
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
10	152300	192800	225700	20	.	242000	.	Industrial/Production engineer
10	166200	207600	258000	22	.	224700	.	Chemical engineer
9	150000	189400	250000	21	140000	200000	265800	Electrical engineer and related
8	141500	180900	235000	26	140000	202000	240000	Mechanical engineer
11	173900	232300	320200	.	.	.	.	Metallurgical engineer
12	187000	250000	380000	.	.	.	.	Mining engineer
18	149200	203300	272600	25	180000	263200	350000	Civil engineer
4	84000	120000	166000	.	.	.	.	Engineer n.e.c.[1]

Private Sector				Self-employed				Architecture and related
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
6	69400	107800	165700	22	109000	156500	216500	Architect/Landscape architect
9	105300	129700	182900	22	140000	180000	214100	Quantity surveyor
3	66200	84100	115000	19	138000	150000	226700	Town and regional planner
.	.	.	.	31	130000	157800	185600	Land surveyor

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Natural science	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Physicist	7	.	98200	.	21	147500	185000	206000
Geological science occupations	15	84900	128900	156400	12	105900	130600	196700
Actuary	.	.	.	.	.	.	.	.
Mathematical occupations	.	.	.	.	17	105200	130400	219900
Computer programmer	.	.	.	.	4	.	104000	.
Computer systems analyst/related	.	.	.	.	10	123700	156000	190900
Computer science n.e.c.[2]	16	.	132100	.	13	117900	172600	207700

[2] Include network specialist, data base administrators, software systems engineers, IT consultants and scientists and software developer/support

Natural science (cont.)	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Chemist	.	.	.	.	13	122000	155100	194700
Biochemist	.	.	.	.	14	105000	121600	154500
Botanical and related	15	.	128000	.	15	80800	110400	160000
Microbiologist	.	.	96500	.	10	92000	100300	133100
Nature conservation	11	.	121600	.	14	.	117300	.
Agricultural	12	101500	118300	139200	15	99600	123500	162900
Horticulturist	.	.	.	.	.	.	.	.
Natural sciences n.e.c.	.	.	.	.	13	.	81000	.

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Natural science
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
.	.	.	.	.	.	.	.	Physicist
16	149000	216100	281700	17	135000	206000	252500	Geological science occupations
8	250000	354300	450000	.	.	.	.	Actuary
.	.	.	.	.	.	.	.	Mathematical occupations
4	72800	84000	112700	.	.	.	.	Computer programmer
10	114000	142100	163900	.	.	.	.	Computer systems analyst/rel.
13	130300	187000	250700	15	102000	167300	235500	Computer science n.e.c.[2]

Private Sector				Self-employed				Natural science (cont.)
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
12	100100	145600	191300	.	.	.	.	Chemist
.	.	.	.	.	.	.	.	Biochemist
7	.	92900	.	.	.	.	.	Botanical and related
8	.	79700	.	.	.	.	.	Microbiologist
15	.	.	.	.	.	.	.	Nature conservation
13	121800	157500	198400	19	110500	159000	225800	Agricultural
9	.	116600	.	.	.	.	.	Horticulturist
2	.	.	.	.	.	.	.	Natural sciences n.e.c.

Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Medical & related	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Medical practitioner	7	129400	159000	187200	12	.	.	.
Medical specialist	19	202800	241500	293100	20	230000	280000	336400
Medical occ.[3] n.e.c.[4]	26	104400	129300	161300	10	62300	98700	128200
Dentist	10	.	198200	.	.	.	.	.
Dental specialist	.	.	250000	.	.	.	.	.
Veterinarian	16	138500	158300	179900	14	.	135600	.
Pharmacist	20	88000	95800	114400	16	.	114200	.
Suppl.[5] medical occ.	7	53700	62500	74300	9	.	.	.

[3] occupations
[4] Include researchers, technologists, advisors, biokeneticists
[5] Supplementary e.g. physiotherapist, speech therapist

Health-related	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Nursing admin.[6]/manager/matron	26	81200	96800	107700	21	.	104900	.
Nursing tutor/lecturer	20	71800	76000	90900	22	93000	111200	138600
Professional nurse	15	52700	61200	69300	11	.	69700	.
Dietician and related occ.	6	.	69200	.	7	.	71400	.
Health services prof.[7] n.e.c.	.	.	.	.	.	.	.	.

[6] administrator
[7] professions

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Medical & related
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
16	168000	200000	255200	18	120000	180000	242000	Medical practitioner
19	234000	348800	395200	21	205000	300000	440000	Medical specialist
8	94800	108900	160300	10	.	90000	.	Medical occ.[3] n.e.c.[4]
8	.	135000	.	18	110400	135000	180000	Dentist
.	.	.	.	20	240000	320000	472000	Dental specialist
6	84000	99800	148000	17	100000	138200	180000	Veterinarian
10	81900	106900	146200	21	81600	120000	150000	Pharmacist
5	54000	65000	74000	10	53500	72000	99800	Suppl.[5] medical occ.

Private Sector				Self-employed				Health-related
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
24	77000	102000	138800	.	.	.	.	Nursing admin.[6]/manager/matron
.	.	.	.	.	.	.	.	Nursing tutor/lecturer
12	53000	58400	74500	.	.	.	.	Professional nurse
4	46100	52500	90200	.	.	68200	.	Dietician and related occ.
4	.	84000	.	8	122500	145400	180000	Health services prof.[7] n.e.c.

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Education and related	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Principal	25	121300	134600	147400	22	.	.	.
Dean, head-faculty (university)					31	.	225600	
Lecturer	17	95000	106800	120700	19	120000	140000	162700
Teacher (including Head-dept.)	11	64800	80700	95300	11	.	.	.
Education occ. n.e.c.[8]	21	115800	132600	158900	16	74700	94700	141700

[8] Include advisors/consultants/specialists

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:

Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Education and related
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
28	105600	133400	176400	.	.	.	.	Principal
								Dean, head-faculty (university)
14	.	78000	.	.	.	.	.	Lecturer
11	48000	72000	98200	19	24200	35400	58100	Teacher (including Head-dept.)
15	76900	104200	160600	.	.	100000	.	Education occ. n.e.c.[8]

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Humanities and related	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Magistrate	23	167000	183500	206900	.	.	.	.
Public prosecutor	8	82800	106000	122900	.	.	.	.
Advocate	17	.	180000	.	.	.	.	.
Attorney	17	.	.	.	.	.	.	.
Legal advisor, consultant	.	.	.	.	15	160800	188500	213200
Legal officer	9	.	131400	.	.	.	.	.
Minister, pastor, missionary	18	.	122400	.	.	.	.	.
Psychologist	13	86900	110500	131100	15	114700	140000	154500
Social worker	11	58000	69400	83600	13	38200	67900	93500
Industrial relations occ.	17	.	.	.	10	.	132000	.
Management consultant	.	.	.	.	17	.	225000	.
Public relations occ.	9	.	91900	.	16	90600	106200	137700
HR officer/consultant	12	75000	97800	121000	12	91500	108400	161000
Work study / O&M[9] occ.	12	98000	113100	139000	13	.	185500	.
Humanities n.e.c.[10]	14	67400	85000	106900	18	79000	102000	131000

[9] Organisation and method
[10] Include librarians, art directors, museum scientists, linguistic occupations

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Humanities and related
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
.	.	.	.	.	.	.	.	Magistrate
.	.	.	.	.	.	.	.	Public prosecutor
.	.	.	.	18	150000	230000	360000	Advocate
5	70000	96500	150000	20	120000	180000	270000	Attorney
10	122400	191400	263500	11	.	200000	.	Legal advisor, consultant
8	.	.	.	.	.	.	.	Legal officer
18	95200	122800	148300	.	.	.	.	Minister, pastor, missionary.
11	137400	172000	230000	16	84000	120000	151000	Psychologist
8	42000	56700	68600	.	.	.	.	Social worker
14	.	155200	.	16	.	250000	.	Industrial relations occ.
12	161800	197600	241100	22	180000	230000	308000	Management consultant
6	.	81300	.	15	.	.	.	Public relations occ.
8	80200	106300	153300	18	.	79300	.	HR officer/consultant
14	.	219000	.	17	.	244000	.	Work study / O&M[9] occ.
10	62400	76100	122400	21	.	100000	.	Humanities n.e.c.[10]

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Accountants, other financial & economic	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Accountant (CA)	12	.	197600	.	14	190600	235600	295100
Accountant (not CA)	13	.	108000	.	13	124100	150000	188000
Auditor, internal auditor	12	85200	115000	206100	14	129200	170600	202200
Income-tax consultant, advisor	7	81200	108600	145100	.	.	.	.
Financial advisor/analyst	.	.	.	.	10	112700	178500	235400
Economist	9	82700	138000	159600	16	172000	276700	310000
Economic advisor/analyst[11]	.	.	.	.	11	106000	140000	204000

[11] Include Investment consultants/analysts, market researchers, business analysts/advisors

Managers	Government				Semi-Government			
		A	B	C		A	B	C
	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more
Top management	.	.	.	.	26	279000	331400	413300
Director: Admin. & related	.	.	.	.	.	.	.	.
Manager: Admin. & related	.	.	.	.	18	171700	205700	260000
Director: Technical & related	.	.	.	.	.	.	.	.
Manager: Technical and related	.	.	.	.	21	200100	231000	283500
Manager: Commerce & diverse	21	.	242900	.	19	167000	209800	240000
Art, sport & entertainment								
Artist & related[12]	.	.	.	.	20	.	.	.
Author and related occ.[13]	.	.	93600	.	14	.	106500	.

[12] Include performing artists, photographers, fine artists, sculptors
[13] Include editors, publishers, journalists

PERMANENT FULL TIME PROFESSIONALS AND MANAGERS:
Total remuneration package (Rand) in 1997, according to occupation and employer sector.

Private Sector				Self-employed				Accountants, other financial & economic
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
10	170500	222500	300500	21	180000	250000	364500	Accountant (CA)
13	108200	153300	201500	18	80000	120000	150000	Accountant (not CA)
8	110500	163300	200000	15	175000	200000	360000	Auditor, internal auditor
7	105100	171200	193500	16	150000	200000	348000	Income-tax consultant, advisor
12	124700	206200	274600	21	150000	183000	305400	Financial advisor/analyst
11	151200	202800	256900	25	.	272500	.	Economist
8	115000	166800	250000	23	100000	180000	258000	Economic advisor/analyst[11]

Private Sector				Self-employed				Managers
	A	B	C		A	B	C	
Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	Years of experience	25% earn less	50% earn less/more (Median)	25% earn more	
23	282600	377300	499000	23	200000	286000	400000	Top management
20	277000	366200	472000	22	.	170600	.	Director: Admin. & related
16	164000	211200	271400	15	.	210100	.	Manager: Admin. & related
21	281500	333800	437200	.	.	.	.	Director: Technical & related
16	167000	214500	278500	20	100000	135000	211100	Manager: Technical and related
18	122700	189200	258100	.	.	.	.	Manager: Commerce & diverse
Art, sport & entertainment								
.	.	96000	.	18	48000	60000	90000	Artist & related[12]
14	77600	99400	174500	25	.	74600	.	Author and related occ.[13]

GLOSSARY

Economic sector

The eight broad economic sectors comprise of 36 subsectors[1] namely:

- **Mining and Quarrying**

  ♦ Coal ♦ Gold and Uranium mining ♦ Other mining.

- **Manufacturing**

  ♦ Food ♦ Beverage & Tobacco Products ♦ Textiles ♦ Clothing ♦ Leather & Footwear ♦ Wood & Wood Products ♦ Furniture ♦ Paper & Paper Products ♦ Printing & Publishing ♦ Chemicals ♦ Rubber & Plastic Products ♦ Non-Metallic Mineral Products ♦ Basic Metals ♦ Fabricated Metal Products ♦ Machinery ♦ Electrical Equipment ♦ Motor Vehicles & Spares ♦ Other manufacturing.

- **Electricity, Gas and Water Supply**

- **Construction**

  ♦ Building ♦ Civil engineering.

- **Wholesale, Retail and Accommodation**

  ♦ Retail & wholesale trade ♦ Motor trade ♦ Accommodation & catering.

- **Transport, Storage and Communication**

  ♦ Transport e.g. Land/Railway/Motor transport

  ♦ Communications e.g. post and telecommunications

- **Finance, Real Estate and Business Services**

  ♦ Banking ♦ Insurance ♦ Business services e.g. computer and related activities, research and development, other business activities such as legal, accounting, architectural, engineering and advertising.

- **Community, Social and Personal Services**

  ♦ Government (central & provincial) ♦ Local government ♦ Community & social services ♦ Recreational & cultural services.

[1] *Standard industrial classification of all economic activities (SIC).* 5th ed. Central Statistical Service. Pretoria: 1993.

Formal sector employment

People who are employed in a business that has a value added (VAT) tax number. A person in formal employment can be self-employed, an employer or an employee. It excludes that part of the economic activity that is not nationally recorded and which is mostly unregulated.

Professionals

Professionals were regarded as staff members who occupied positions typically requiring at least three years of education or training after matric e.g. engineers, medical doctors.

Managers

Managers were defined as staff members who were involved with managerial functions for more than 50 % of their workday.

Artisans

A person who has served an apprenticeship, passed a trade-test and had artisan status granted to him/her by, for instance, the Department of Labour.

Clerical occupations

People who do or supervise clerical and related work.

Semi-skilled occupations

Semi-skilled occupations are those for which the required expertise is acquired after a short period (a few days or weeks). Candidates must possess basic literacy and numeracy skills prior to training, while primary education is sufficient as an entry requirement for training.

Unskilled occupations

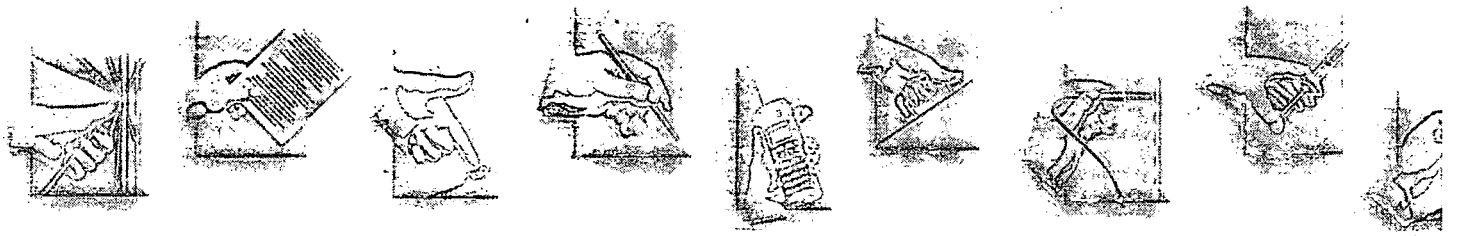
Unskilled occupations are those for which no formal education or training is required.

Growth in demand

New positions being created in each occupation as a result of economic growth.

Demand arising from replacement needs

Apart from the demand arising from the growth in the number of positions for each occupation in the economy, additional demand arises since existing positions become vacant and need to be filled. Positions become vacant for various reasons including retirement, death, disablement and emigration.



Did you know that...

- during the course of the next five years (until 2003) fewer than 50 000 jobs will be created in the formal sector of the South African economy (agriculture excluded)?
- by far the majority of these jobs are likely to be created for skilled professionals?
- a substantial decline is expected in the number of job opportunities for which lower-level skills are required?

Career decisions can no longer be made on the basis of personal abilities and interests only. Nowadays, successful entry into the job market also depends on the employability in the market of the skills that jobseekers have to offer. It is therefore important to remain abreast of the major trends that have an effect on the economy, as well as of the particular skills that are required and/or in short supply.

"*Skills needs of the SA labour market: 1998 - 2003*" provides valuable information on future workforce needs and includes detail about the growth/decline that is expected in 78 professional and artisan occupational categories. The authors not only give reasons for the demand expected in certain skills, but also discuss the shortages currently experienced in others. An overview of the income of professionals in the government, semi-government and private sectors, as well as those who are self-employed, is also included.

Whether you are a new entrant into the labour market, an individual planning your career, an employer, HR planner, or training institution – if you are involved in the labour market, you can benefit from and should make a point of reading this book.

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