

Monitoring and Evaluation Directorate (CHE)

Higher Education Monitor

THE IMPACT OF CHANGING FUNDING SOURCES ON HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

Research Report for the Council of Higher Education

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FOREWORD

In 1997 the *White Paper 3 A Programme for the Transformation of Higher Education*, characterised the higher education inherited from apartheid as follows:

- ❖ There is an inequitable distribution of access and opportunity for students and staff along lines of race, gender, class and geography. There are gross discrepancies in the participation rates of students from different population groups, indefensible imbalances in the ratios of black and female staff compared to white and males, and equally untenable disparities between historically black and historically white institutions in terms of facilities and capacities.
- ❖ There is a chronic mismatch between the output of higher education and the needs of a modernising economy. In particular, there is a shortage of highly trained graduates in fields such as science, engineering, technology and commerce (largely as a result of discriminatory practices that have limited the access of black and women students) and this has been detrimental to social and economic development.
- ❖ Higher education has an unmatched obligation, which has not been adequately fulfilled, to help lay the foundations of a critical civil society, with a culture of public debate and tolerance which accommodates differences and competing interests. It has much more to do, both within its own institutions and in its influence in the broader community, to strengthen the democratic ethos, the sense of common citizenship and commitment to a common good.
- ❖ While part of the South African higher education system can claim academic achievement of international renown, too many parts of the system observe teaching and research policies which favour academic insularity and closed-system disciplinary programmes. Although much is being done, there is still insufficient attention to the pressing local, regional and national needs of the South African society and the problems and challenges of the broader African context.
- ❖ The governance of higher education at a system level is characterised by fragmentation, inefficiency and ineffectiveness, with too little coordination, few common goals and negligible systemic planning. At the institutional level, democratic participation and the effective representation of staff and students in governance structures is still contested in many campuses. (WP 1.4)

The challenge posed by this higher education system was to redress past inequalities and transform the system to serve a new social order, to meet pressing national needs and to respond to new realities and opportunities. (WP 1.1)

Funding, planning and quality assurance were the three elements singled out in the policy-making process to help steer the higher education system through its transition towards a transformed state defined by equity and redress, democratisation, development, quality, effectiveness and efficiency, academic freedom, institutional autonomy and public accountability. It is interesting that in an international climate in which state funding of higher education is decreasing and cost/efficiency and entrepreneurialism become the guiding principles of subsidy allocation, South Africa is still, to some extent, focusing on broader issues of social justice.

From this perspective it is important to remember the role and modality of higher education funding under apartheid. The apartheid state developed different administrative and accountability systems for the disbursement of the funds directed to historically white and historically black institutions. Funding in all cases was used as a weapon to curb political contestation at institutions,

and, to a large extent, as a powerful mechanism to dampen the various degrees of institutional autonomy exercised by different institutions.

Contrary to this framework, funding under the new democratic dispensation is conceptualised as a way to achieve more equitable student access, improved quality of teaching and research, increased student progression and graduation rates and achieve greater responsiveness to social economic needs (WP 4.14) within a framework of greater accountability on the institutions' part. The process of development of a new Funding Framework has been long and complex. The new Funding Framework was only introduced in the 2004/5 financial year and is still too early to assess whether it has made possible the achievement of the objectives suggested in the White Paper, or to what extent it has contributed, together with planning and quality assurance to overcoming the legacy of apartheid in higher education. Yet understanding the current state and level of public funding to higher education is a necessary point of departure for any analysis of the impact of the new Funding Framework.

This issue of the *Higher Education Monitor* presents to the higher education community, its direct stakeholders as well as to the interested public a piece of research that goes a long way in providing an analysis of the different sources of funding of higher education, how have they changed over time and with what consequences for institutions and students.

The work of Gert Steyn and Pierre de Villiers was done in the context of larger project of the CHE*. This project, funded by the Rockefeller Foundation, focused on the production of a series of specialised research pieces dealing with change taking place in several areas of higher education such as access, funding, modes of delivery and pedagogic issues, institutional culture and institutional autonomy. While the different pieces of research commissioned by the CHE will be published together in book form during this year, the CHE decided to publish this particular research report in its entirety due to the topicality and importance of the issue of funding for all public higher education institutions as well as for the broader South African society.

The research is published under the CHE *Higher Education Monitor* series because it also raises important methodological issues about the development of indicators to analyse the levels of public funding of higher education and how to measure both cost efficiency and academic efficiency. The CHE hopes that, as we understand better the mechanisms and modalities of higher education funding and the macro-economic context within which they operate, we will be able to produce increasingly sophisticated studies focused on the relationship between funding, planning and quality assurance and the outcomes of their combined effect on the higher education system.

The CHE hopes that the material and ideas presented in this report will generate further discussion among higher education institutions, higher education analysts and government officials, and also that the non-specialist public will find it helps them to understand some of the vexing questions about the funding of higher education.

Dr Lis Lange
Director: Monitoring and Evaluation
Council on Higher Education
February 2006

* The views and analyses in the report were based on documents available to the researchers up to the 30 September 2005

LIST OF ACRONYMS USED

ACU:	Advisory Council on Universities
AUT:	Advisory Council for Universities and Technikons
BER:	Bureau for Economic Research
CESM:	Classification of educational subject matter
CPIX:	Consumer price index excluding interest on mortgage bonds
CTP:	Committee of technikon principals
CUP:	Committee of university principals
DST:	Department of Science and Technology
DoE:	Department of Education
EE:	Educational expenditure
ESS:	Effective subsidy students
FET:	Further education and training
FRD:	Foundation for Research Development
FTE:	Full-time equivalent
GAAP:	Generally Accepted Accounting Practice
GATS:	General Agreement on Trade in Services
GDP:	Gross domestic product
HAIs:	Historically advantaged institutions
HATs:	Historically advantaged technikons
HAUs:	Historically advantaged universities
HDI:	Historically disadvantaged institutions
HDTs:	Historically disadvantaged technikons
HDUs:	Historically disadvantaged universities
HE:	Higher education
HECS:	Higher Education Contribution Scheme
HEFC:	Higher Education Funding Council
HEIs:	Higher education institutions
HEMIS:	Higher Education Management Information System
HEQC:	Higher Education Quality Committee
HESA:	Higher Education Association of South Africa
IDT:	Independent Development Trust
IRDP:	Institutional Research Development Programme
MRC:	Medical Research Council
MTBPS:	Medium-term budget policy statement
MTEF:	Medium Term Expenditure Framework
NCES:	National Centre for Education Statistics
NCHE:	National Commission for higher education

NFF: New Funding Framework
 NGO: Non-governmental organisations
 NIHE: National Institute of Higher Education
 NPHE: National Plan for Higher Education
 NQF: National Qualifications Framework
 NRF: National Research Foundation
 NSC: National Senior Certificate
 NSFAS: National Student Financial Aid Scheme
 OECD: Organisation for Economic Co-operation and Development
 PCS: Programme Classification System
 PQM: Programme-qualification mix
 SAPSE: South African Post Secondary Education
 SAUVCA: South African Universities Vice Chancellors Association
 SET: Science, Engineering and Technology
 SC: Senior certificate
 TEFSA: Tertiary Education Fund of SA
 THRIP: Technology and Human Resources for Industry Programme
 Umlasi: General and Further Education and Training Quality Assurance Council
 UNDP: United Nations development programme
 VC: Vice Chancellors
 WFTES: Weighted full time equivalent student
 WP3: Education White Paper 3: A Programme for the Transformation of Higher Education
 WRC: Water Research Commission

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SECTION 1: INTRODUCTION

1.1 THE PRESENT HIGHER EDUCATION LANDSCAPE

During the last decade or two, higher education (HE) worldwide has undergone some significant changes. Johnstone (1998) identifies five major themes:

- 1) expansion and diversification – both regarding enrolment and institutional types. The expansion is a result of both the expansion in basic and secondary education and the increased participation in higher education. Increasing incentives provided by many governments globally in order for students to have equal access to HE and the technology drive resulted in greater diversification in student composition and instructional modes.
- 2) fiscal pressure – characterised by declining per student expenditures, low-paid teaching staff, lack of academic equipment and deteriorating physical plants;
- 3) exploiting of the markets – the search for non-governmental revenue;
- 4) the demand for greater accountability – on the part of institutions and teaching staff, and on behalf of students, employers and those who pay; and
- 5) the demand for greater quality and efficiency – more rigour, more relevance and more learning.

Johnstone's view in 1998 of the changes in HE is perhaps even more evident today than seven years ago, especially in South Africa. What are the consequences of the above changes on South Africa's higher education institutions (HEIs)? Although this investigation focuses mainly on Theme 2 mentioned above, the interrelationships between fiscal pressure and the other four themes will ensure that they will also be important in this study.

The first focus or point of departure in this study is to investigate the major sources of income of HEIs over time in order to determine to what extent shifts in their sizes have taken place. Secondly, the impact of these changes, both from a cost efficiency and academic efficiency point of view, will be studied. This will be done by evaluating changes that occurred in important HE performance indicators.

Any investigation of the HE funding scene in South Africa must take account of the historical development of the HE landscape, especially as far as the number and type of institutions are concerned, as well as the growth in student enrolments. It is also of great importance to take note of the unbundling and merging processes that are presently taking place in HE. Very few institutions are untouched by these processes. The 36 HEIs that existed in 2002 (21 universities and 15 technikons) were established over a period of about 80 years. Over a three-year period, 2003–2005, these institutions will be restructured into only 22 institutions. After this restructuring, three types of HEIs will exist in 2005, namely, eleven universities, five universities of technology (formerly known as technikons) and six comprehensive HEIs. These comprehensive institutions will initially have a dual face since they will have been formed through mergers between universities and technikons.

Hopefully, they will soon become important and versatile entities that will fulfil a specific need in HE. Two National Institutes for Higher Education (NIHE), one in Nelspruit and one in Kimberley, offering programmes of existing public HE institutions, are in the process of being established as part of the restructuring process. The first merger, namely, the merging of the Natal Technikon and the M.L. Sultan Technikon to become the Durban Institute of Technology (DIT) took place in 2003; while in 2004, the total number of HEIs was further reduced to 18 universities and 11 technikons/universities of technology. The final mergers have been effected since January 2005.

The SAPSE information system was introduced in the early 1980s for the so-called Historically Advantaged (predominantly white) Universities (HAUs). From 1986 onwards, all universities and technikons (except initially those in the former TBVC states) annually submitted information to the state according to the formats defined by the SAPSE system. Although the SAPSE system was replaced by the HEMIS information system in 1999 and 2000 with regard to student and personnel information respectively, the characteristics of the information stayed mostly intact. Utilising the time span of 1986 to 2003 it was possible to study the most important variables (relating to financing and the academic performance of institutions) for 30 institutions for eighteen years and six institutions (joining the SA HE system from the former TBVC states in 1995) for nine years. Since the major changes in HE by means of the merger process only started in 2004 (apart from one merger in 2003 as indicated above), the study period of 1986 to 2003 can be regarded as a relatively stable period as far as the shape of the HE system is concerned. This does not mean that major changes did not occur within each institution. The Education White Paper 3: A Programme for the Transformation of Higher Education (July 1997) initiated a wide range of new policies in HE which already had a significant impact during the years 1997-2003 in the way HE institutions were performing their day-to-day activities.

Some national policies having a bearing on the topic of our investigation are discussed in the next subsection. It is very important, however, to realise that as far as state funding of higher education is concerned, the SAPSE subsidy formulae were the sole mechanism used during the period covered in this investigation. Changes in the SAPSE formulae (with effect from 1993), however, influenced student enrolments to some extent as well as the financial situation of some institutions, especially technikons.

1.2 THE NATIONAL HIGHER EDUCATION POLICY ENVIRONMENT

Although the Minister of Education had already released the Education White Paper 3 (WP3) in 1997, the National Plan for Higher Education (NPHE), which outlined the framework and mechanisms for implementing and realising the policy goals of WP3, was only released in February 2001. The intermediate four years were a period of uncertainty for institutions since they had to plan according to the very vague and sometimes confusing

pointers contained in WP3. Uncertainty, especially about two cardinal issues, namely, the so-called massification of HE and the new state funding mechanism for HE, made institutional planning very difficult during these years.

During the period 1997 to 2001, the Department of Education (DoE) requested institutions on four occasions to submit three-year projections of their student enrolments and on three occasions also three-year projections of employed personnel. In 1998 they requested a rolling plan for 1999-2001; in 1999 a rolling plan for 2000-2002 and in 2003 a rolling plan for 2004-2006. A further very comprehensive plan (the so-called Programme-qualification mix or PQM) for 2004-2006 was also requested in 2001. The formats of the four requests differed substantially. Although providing these plans was a taxing exercise for most institutions, on the whole, it was to the benefit of most. Looking back, it becomes clear that the drafting of these plans was especially worthwhile for the DoE. In the absence of accurate and complete HE information from the newly developed HEMIS information system, these plans provided them with the necessary information to finalise the NPHE and to make some progress with the development of a new funding framework. Reliable HEMIS information (although not audited) was only made officially available in 2002 in respect of reporting for the year 2001. Unfortunately, even now, only selected information from the comprehensive HEMIS database is accessible to all stakeholders.

The NPHE brought some relief for HE planning. It identified five key policy goals with related strategic objectives necessary for achieving the overall goal of the transformation of the higher education system. The five goals are:

- Goal 1: producing the graduates needed for social and economic development in South Africa;
- Goal 2: achieving equity in the South African higher education system;
- Goal 3: achieving diversity in the South African higher education system;
- Goal 4: sustaining and promoting research; and
- Goal 5: restructuring the institutional landscape of the higher education system.

Funding incentives and disincentives of the state will play an important role in achieving the five goals of the NPHE. The Minister of Education determined the New Funding Framework (NFF) for Public Higher Education in December 2003 and applied it for the first time in the division of HE funds for the 2004/05 financial year. The philosophy used in this funding framework differs completely from the SAPSE funding framework used until 2003/04. As the new framework was not in operation during our study period, it will have no bearing on the financial and behavioural trends identified in this investigation. Conclusions drawn from this investigation, as far as state funding of higher education is concerned will, however, have to be viewed against the NFF, as well as the restructured HE landscape from 2004/05 onwards.

Some of the strategies formulated in the NPHE in respect of each goal will influence (or have already influenced) institutional sources of income, expenses and also institutional efficiency in performing their line function activities. These NPHE strategies and their implications as far as funding of HE is concerned will now be briefly discussed.

Goal 1 strategies

The strategy to increase the number of graduates by a minimum of 10 000 per annum translates into a growth rate in graduates of about nine per cent per annum. In order to achieve this goal, the participation rate in HE should be increased drastically while teaching efficiency must be improved to increase flow-through rates. Graduation rate norms form part of the NPHE and should be regarded as national benchmarks for teaching improvements.

Two funding incentives for this strategy form part of the NFF, namely, the linking of the number of graduates to institutional funding and the 'additional' funding of academic development (foundation) programmes (see Section 2.2). The implementation and implications of this strategy are very important and will be discussed in more detail in other sections of this report.

Goal 2 strategies:

To enhance equity a strategy for the allocation of funded student places (within the NFF) according to an institution's past performance in enrolling and graduating black, female and disabled students, as well as stated equity objectives and targets in the institutional three-year rolling plans, will be followed.

This goal was effected in the NFF by means of the institutional factor for disadvantaged students (see Section 2.2) and possibly by one or more of the (still unknown) criteria used for the allocation of funds to HE institutions for foundation programmes for 2004/05 to 2006/07.

Goal 3 strategies:

Most of the strategies regarding the achievement of programme diversity at HE institutions centre around the regulation of the type and level of programmes (so-called programme-qualification mix or PQM) offered by HE institutions. Duplication of programmes with a small student intake at neighbouring institutions and the establishment of expensive institutional infrastructure to offer distance education in competition with dedicated distance education institutions, should be avoided.

As far as the funding of distance tuition is concerned the issue of who should offer distance education programmes and where they could be offered is, however, still unresolved. This is at present causing great uncertainty (especially as far as the modelling of institutional income is concerned) in the HE system. There are also differences of opinion on the level

of funding for distance students. A report of the Council on Higher Education (CHE) titled *Advice to the Minister of Education on Aspects of Distance Education Provision in South African Higher Education* (March 2004) was released on 29 March 2005 by the Minister of Education for discussion. Many issues of distance education, including the state funding thereof, are covered in the report. This matter is discussed in more detail in Section 2.

Goal 4 strategies:

Based on the earlier SAPSE formula, the most important strategy in the promotion of research was the introduction of a separate research component in the NFF based on research outputs of institutions. The outputs consist of approved publications, doctoral degrees awarded and research masters degrees awarded (see Section 2.2). Furthermore, a strategy for the earmarking of funding for research development on the basis of an approved research development plan is foreseen to be implemented in 2007/08.

The strategy of a better coordination of statutory funding of research (between DoE, Department of Science and Technology (DST), other state departments involved and state agencies like the National Research Foundation (NRF) and the establishment of a national and integrated research database is very important and will benefit the management of higher education. It should also improve the overall performance of researchers in South Africa. This matter is addressed in Section 2.5. There is a lack of coherence of research funding of higher education (and information on research funding) in South Africa. This, however, is to some extent a world-wide phenomenon.

Goal 5 strategies:

A very firm strategy relating to Goal 5 of the NPHE is that common regional teaching platforms should be developed by institutions for specialised post-graduate programmes. According to this strategy student places for such programmes will only be awarded regionally.

Experience since the publication of the NPHE in 2001 has shown, however, that the development of common regional teaching platforms is difficult, especially as far as the finding of an acceptable income and cost sharing model for the institutions is concerned. The implementation of this strategy by the DoE is therefore presently confined to the meticulous application of the institutional PQMs and a very conservative policy in approving new postgraduate programmes.

In Section 2.1, it is shown that there were some differences in the SAPSE subsidy formulas used for respectively universities and technikons during 1986 to 2003. With the introduction of the NFF in 2004, these differences have almost been wiped out. Under the NFF the only difference between the funding of these two sectors is the different publication norms used for the determination of research development allocations to universities and technikons as part of the research output block grant. This equalisation in

funding under the NFF obviously decreased the general level of funding of universities relative to technikons in 2004. This decrease is obscured by a migration strategy (from the SAPSE formula to the NFF), which has the consequence that the block grants allocated to institutions in 2004/05 and 2005/06 were not necessarily the allocations calculated by means of the NFF.

1.3 TRENDS AND REFORMS IN THE FUNDING AND MANAGEMENT OF HIGHER EDUCATION

According to Johnstone (1998) (see also Section 1.1), the five themes of HE changes worldwide have resulted in three major categories of reforms over the past decade or two. Irrespective of differences in politics, culture, economics and ideologies in countries these reforms were:

- 1 supplementation of public or governmental revenues with non-governmental revenues by HEIs;
- 2 reform of public sector financing; and
- 3 radical change (restructuring) of the institutions of higher education.

As far as the third reform is concerned, the restructuring of the South African HE system only began in 2000-2001 with the incorporation of teacher training colleges into the university and technikon sectors, and was followed by the big HE merger process which started in 2003. Since the registration of HE programmes on the National Qualifications Framework (NQF) became compulsory in the late 1990s, institutions were also compelled to restructure most of their academic programmes. The second reform was implemented in South Africa with the introduction of the NFF.

The extent to which the first reform is already visible, in the sizes of the different sources of income of HE institutions in South Africa, is studied in detail in this investigation. In this regard, it is of some interest to note that in a study of higher education institutions in the United States of America in 1995 the National Centre for Education Statistics (NCES) made the following findings –

- Tuition fees (in real terms) increased at all types of HE institutions during the period 1982-1993.
- Rising tuition charges appear to have little impact on student's higher educational decisions.
- Tuition and fee income has increased as a source of revenue in most types of higher education institutions.
- Student financial aid, particularly from federal sources, defrays some of the cost of students attending college.
- Most types of higher education institutions have increased the amounts (in real terms) they spend on scholarships and fellowships.

- Expenditure per FTE student (in real terms) increased at most types of higher education institutions, but the percentages of increases varied widely.
- Expenditure per FTE student (in real terms) is related to complex interactions among demographic, institutional and economic factors.
- A higher education degree confers a substantial economic advantage to college graduates.
- The earnings advantage of completing college education successfully increased between 1970 and 1993 for both male and female graduates.

The NCES study covers the first half of the 1986-2003 period used in this report and is therefore valuable for comparison purposes.

In order to compare trends in the South African HE system with other HE systems, international benchmarks on the distribution of HE institutional income according to source, namely, public funding, tuition fees and other income (including entrepreneurial income and philanthropic donations) will be needed. The same holds for efficiency and performance indicators as far as HE expenditure, HE teaching and HE research are concerned. Some benchmarks, mostly published as educational indicators by the World Bank, the Organisation for Economic Cooperation and Development (OECD) and NCES, are available. These international indicators should, however, be used with circumspection and only as ballpark figures. Even a benchmark calculated as an average of the outcome of an indicator for a number of countries could sometimes lead to erroneous conclusions when compared to a corresponding South African indicator. It is usually better and more informative to identify well-known and internationally accepted indicators, to calculate them annually for HE institutions in South Africa and to study changes that occur from year to year in the South African HE system.

1.4 PRIVATE AND PUBLIC BENEFITS ACCRUING FROM HIGHER EDUCATION

1.4.1 Theoretical background

In HE, it is sometimes difficult to distinguish between the private and public characteristics of education. Private goods are both rival and excludable. For example, if someone drinks a cool drink, there will be less available to other consumers. If I buy a cool drink, it is mine alone and I can consume it myself. With public goods, like streetlights, the situation is totally different. If one person walks underneath a lamppost, there is not less light left for other consumers. A person can make use of the light irrespective of whether he/she paid their taxes. Once a public good is produced, nobody can be prevented or excluded from consuming the good. This gives rise to the problem of free riders. To what extent is higher education a private or public good?

Cemmel (2003) distinguishes between four functions of higher education, namely, the training of highly skilled personnel, the development of new knowledge and research, the

contribution to community service and the ethical function that may include social critique. Knowledge that one student acquires in the education process does not mean that there is less knowledge available for the other students. In a lecture, the contact that one student makes with a lecturer does not decrease the time available for the other students. In this sense higher education may be regarded as a public good. However, it is true that the more individual time one student requires from a lecturer the less time is available for other students. If educational institutions reserve the number of seats available to new students, the acceptance of one student implies that fewer places are available to the other students. Therefore, higher education has certain characteristics of private goods. Certain groups can also be prevented from entering higher education by levying high fees. This is a common practice and has been used from the earliest years to prevent prospective students from poorer communities from entering higher education.

Melck (1982:105) focuses on three aspects as to why the government should be involved in education, namely, risk taking, uncertainty and insufficient liquidity. Young people are uncertain about the benefits that they will reap from further education; and they sometimes come from families that do not value education and do not receive proper guidance in this regard. If a student enrolls for the wrong programme it may be a costly mistake. Owing to the long term nature of an investment in education, people from poor communities may be reluctant to take the risk of post secondary education if it is not subsidised by the public sector.

Fundamental research and research results (Cemmel's second function) form the basis for future and applied studies. If the government does not subsidise this research, it will not be undertaken. The results of this research are published in research journals and become public assets. A strong case can thus be made for public financing of such research. At HE institutions, research is also initiated by the private sector contracting institutional experts to become involved in specific research projects. Cemmel sees this as part of the community function of universities and in this process the researchers face very few risks. Some researchers even have to sign confidentiality clauses and in the short run private institutions can thus keep these research results a secret. However, knowledge built on research of the past and the course content of higher education is a function of previous research. If basic research is not properly funded, the rate at which core research is undertaken will slow, because more research will focus on profitable activities. In this context, Cemmel sees education in the long run as a public good.

As far as the social-ethical function of education is concerned, Cemmel believes that social criticism (especially in liberal democracies) is not an excludable resource. However, if there is limited input by empowerment or design, it may be regarded as bad. There are numerous studies that focus on the indirect benefits of education, like better communication, more responsible behaviour, more law abiding behaviour, more involvement and understanding of the democratic process and contributing towards the intellectual and cultural well-being

of the community. These indirect benefits are not excludable and are passed on from one person to another as they make contact. In this light, higher education can be regarded as a public good. Higher education can also be regarded as a merit good that justifies involvement of the state in the education system because the community benefits from it. This can also be linked with externalities that are discussed in the next paragraph.

There is a difference of opinion as to how indirect benefits of education should be treated. These aspects cannot be quantified with any great deal of accuracy. Some of these benefits are seen as non-economic and some writers are of the opinion that they must not be included in the calculations. As Melck (1982: 103-105) rightly points out, the positive externalities of education may result in the undersupply and overpricing of education if the provision of education is left to market forces entirely. In this respect, the payment of state subsidies is justified to correct for market failures. The magnitude of government involvement is however uncertain. Melck (1982: 19) clearly states that no study has been done that has categorically determined the magnitude of private and public benefits of education. Since his dissertation was published, the international literature has shed no new light on this problem of quantifying the benefits of education. On the one hand, it is very difficult to quantify the benefits of education, but it is also very difficult (and some would argue impossible) to distinguish between private and public benefits.

It must be borne in mind that only a certain portion of education expenditure is usually subsidised. If free education is provided, it is normally only tuition fees that are not imposed, but other cost items, such as housing, transport and other additional costs, must usually be borne by the students themselves. For the free supply of education, bursaries must be provided that cover both the accommodation costs and earnings forgone. In the early school phase, this is done to a large extent when learners have no opportunity costs when attending schools, because they are too young to work legally. When the state subsidises higher education, the subsidy is thus normally calculated on only part of the student's costs.

The belief in South Africa that higher education is a basic right assumes that education is a public good. This, linked with Article 29 of the Constitution of South Africa, can create the belief that education should be primarily publicly financed. The most recent changes in policy by institutions like the World Bank, the World Trade Organisation and by individual countries like the United Kingdom that believe that the individual should make a greater contribution to the costs of higher education make it clear that it cannot be seen as a pure public good. It seems as though individuals will in future contribute to a greater extent towards their own higher educational costs.

When considering the costs and benefits of education, a clear distinction should be made between the private and public nature thereof. Although one can distinguish between the private and public components, it is very difficult to quantify these items. Certain

educationists believe that economists try to measure the immeasurable when they do cost-benefit analysis, growth accounting or educational production functions. Owing to the measurement problem the results of these studies must be treated cautiously.

The private costs and benefits of education are considered first. (For a detailed discussion of the difference between private and public benefits and costs of education see, for example, de Villiers [1984: 51-56 and 74-85].) One can distinguish between direct and indirect private benefits. Direct benefits refer to the higher earnings that highly skilled workers normally receive, the fact that education makes them more productive and qualifies them for more profitable occupations. Indirect benefits of education come in the form of more study opportunities that are available to highly skilled people, a greater variety of occupations that can be chosen from, greater flexibility to adapt to a changing environment and the fact that education broadens people's frame of mind and makes it possible to lead a fuller life. The individual also has direct costs like class fees, textbooks and stationery, as well as additional transport and other costs, like more expensive housing costs in a university town than in other cities. There are also indirect costs in the form of income forgone, because a person is studying and not working (and this is normally the largest cost item).

1.4.2 Profitability of investment in education and the levying of fees

One method that can be used to calculate the profitability of an investment in education is cost-benefit analysis. With this method, the costs and benefits are discounted to their present value and if the present value of the benefits is greater than the present value of the costs, it is profitable to undertake a project. Another method, and a more generally used one, is to calculate the interest rate that will equate the discounted values of the benefits and costs. This is also known as the internal rate of return. Worldwide, several studies have been done to calculate the profitability of investment in education. Psacharopoulos and Patrinos (2002) give a good summary of these results of studies that have been done in 98 countries over the period 1960-1999. These results are summarised in Table 1.1.

Table 1.1: Rate of return of investment in education

Region	Social			Private		
	Primary	Secondary	Higher	Primary	Secondary	Higher
Asia	16.2	11.1	11.0	20.0	15.8	18.2
Europe/Middle East/North Africa	15.6	9.7	9.9	13.8	13.6	18.8
Latin America	17.4	12.9	12.3	26.6	17.0	19.5
OECD	8.5	9.4	8.5	13.4	11.3	11.6
Sub-Saharan Africa	25.4	18.4	11.3	37.6	24.6	27.8
South Africa (1980)	22.1	17.7	11.8	-	-	-
World	18.9	13.1	10.8	26.6	17.0	19.0

Source: Psacharopoulos (1994) and Psacharopoulos & Patrinos (2002: 14)

From Table 1.1, certain clear tendencies can be deduced. Firstly, the private rate of return is higher than the social rate of return for all areas and all levels of education. On average for the world, the private rate of return for primary education is 7.7 percentage points higher than the social rate of return; and the corresponding figure for secondary schooling is 3.9 percentage points. More relevant for this study is the observation that, on average, the private rate of return for higher education is no less than 8.2 percentage points higher than the social rate of return. This gives the impression that there seems to be scope for individuals to pay more of their own cost for higher education. However, one has to remember that the Table includes countries where higher education is almost fully subsidised, which increases the private rates of return to artificially high levels, because the individual's contribution to their own education is very small. The private rates of return are higher than the social rates of return for all educational levels, but the rates normally decrease as the level of education increases. The rates of return in developing countries are normally higher for all levels of education than the rates in developed countries. A closer look at the situation in developing countries follows.

When one looks at the sub-Saharan Africa region (of which South Africa forms part), it is clear that the rates of return are the highest of all regions in the world for all levels of education. Especially the private rate of return on higher education is very high. Very little research on this topic has been done for South Africa. In the 1970s, research done by Smuts and Terblanche (1974) and Joubert (1976) made use of lifetime earnings functions, which are not directly comparable with the rate of return analysis. However, Smuts and Terblanche's research indicates a private rate of return of between 28% and 55% for secondary education and between 20% and 29% for tertiary education. There are no private rates of return available for South Africa that are comparable with the other studies listed in Table 1.1 but, according to Psacharopoulos (1994), the social rate of return for all levels of education is higher than the average for the world (see Table 1.1). These rates are based on studies done in metropolitan areas in Kwazulu-Natal and may not be representative of the whole of South Africa. Although there are no obvious reasons to believe that the private rates will not also be higher, there is no empirical evidence to prove it. Although not quite comparable with the studies quoted by Psacharopoulos and Patrinos, recent research by Keswell and Poswell (2004) indicates that there is a strong convex relationship between education and earnings in South Africa. This implies that the rate of return tends to increase with the level of education, especially after 12 years of schooling. This is in contrast with findings elsewhere in the world; therefore further research on this topic in South Africa is necessary.

The high private rate of return is a good argument to increase the private fees of education. The implication of these high rates is that private fees can be increased without the fear that it will become unprofitable for individuals to invest in their own education. The high social rates of return also indicate that investment in education is a profitable investment for the

state. This means that an argument can be made in favour of increased public expenditure on education. Here, it is important to draw a distinction between different fields of study, because there are not uniform rates of return for all higher education programmes. No studies on this topic have been done in South Africa, but research elsewhere in the world by Psacharopoulos (1994: 1329-1331) indicates that the social rate of return is the highest in law (12.7%), economic and business sciences (12.0%) and engineering (10.9%). The highest private rate of return is in engineering (19.0%), economic and business sciences (17.7%) and medicine (17.7%). These rates indicate that there is a case to be made in favour of the introduction of differentiated class fees for different fields of study and that certain fields of study may be financed to a larger extent by the students themselves. In this article, the results of 98 research projects were incorporated, but it is unclear for how many countries and for what time period these rates were calculated.

Differentiated rates of return are further proved by a study in Britain concerning learners who passed at least two subjects at A-level (Economist 2003b). Learners, who studied in fields like Law, Mathematics and Economics, earned 25 per cent more than graduates earn on average. Social Studies give a 10 per cent premium, but in Languages and Education it is very little, while negative returns are experienced in Arts. It should be remembered, however, that student numbers have increased by 25 per cent over the last decade in Britain and, like any product, the returns may decrease as the supply increases.

The introduction of an optimal pricing policy in HE is no easy task and falls outside the scope of this report. Therefore, only some brief comments are made. From a neo-classical economist's point of view, the optimal price policy in a perfect market is where price equals marginal costs. This follows from the implicit assumption that rational consumers base their preferences on the benefits they receive and that they are good in evaluating them. The educational market is, however, far from perfect and the product that is supplied is not homogeneous. Similar types of programmes supplied by different universities or technikons normally differ in relation to the content and the method of instruction. In such a market with differentiated goods, every HE institution acts as a monopoly in the presentation of their unique programmes. One could thus say that the educational market is typically characterised by monopolistic competition.

Several studies have been undertaken to determine the price elasticity of the demand for tertiary education. The results from the USA tend to indicate that the demand is fairly inelastic, which may be the case, because class fees are only a certain portion of a student's total costs (Melck, 1982: 122-125). This was confirmed as still being the case in a study by the Bureau of Economic Research (2004) at the University of Stellenbosch. The study covered the period 1994-2004. The results of all these studies indicate that students from higher income groups are less sensitive to price changes than students from poorer communities. One of the reasons why the price elasticity of the demand for higher education is relatively price inelastic is because forgone income of students is much higher

than the class fees they have to pay. It was, however, found that the price of higher education programmes does play an important role in influencing the length of time that students tend to stay at HE institutions. The one biggest disadvantages of prices that are too high may be that prospective students from especially poorer communities could be discouraged from finding out what forms of financial support are available (Melck, 1982: 125). As was discussed earlier, students from especially poor communities face huge financial risks, if they wish to enrol for higher education. This factor may thus prevent students from these communities from being successfully incorporated into higher education.

According to Melck (1982:114-115), there are advantages for both the supply and demand aspects of the education market in levying private fees. From an administrative point of view, it is more efficient, but fulfils the same role as the levying of a direct tax. It is less cumbersome than a system where parents pay direct taxes, the taxes are transferred to government and then distributed back to HE institutions. With different fee structures among higher education institutions, the students themselves can decide about possible rates of return. With public provision, it is frequently found that no institution excels, but that all institutions tend to be average. Efficiency, in terms of supply, can be increased by greater competition, because under such conditions institutions normally adapt more easily to a changing environment besides tending to accommodate a wider range of students. There is no conclusive proof in the South African case whether the public sector should increase its contribution to education or whether more should be paid by the individual. Part of the problem is the difficulty in quantifying all costs and benefits of education – both for the individual and society as a whole. Furthermore, it is sometimes very difficult to make a distinction between private and social benefits of education.

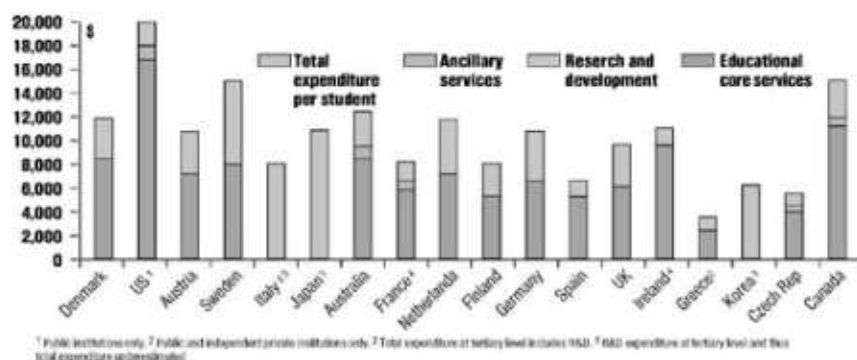
The levying of class fees has two other important advantages as well. Firstly, it makes it possible for HE institutions to plan independently; and secondly, students are more motivated. Waste takes place when the price of goods and services is below the market value – and the same applies to higher education. According to Stevens (in Economist 2004a) universities fulfil only a rite of passage for certain students. The levying of class fees also strengthens the power of students as clients. This may be the reason why higher education of a better quality is supplied in America than in most European countries. A form of selection takes place in the context that HE institutions can choose students that really want to learn and students focus on the programmes they really want to study. In the process, they try to pass at secondary school at levels that will automatically guarantee their entry into those courses. Class fees fulfil both an allocation and a rationing function in higher education – exactly the same function that prices fulfil in a market driven economy.

1.5 PUBLIC AND PRIVATE FEES IN HIGHER EDUCATION

1.5.1 The international experience

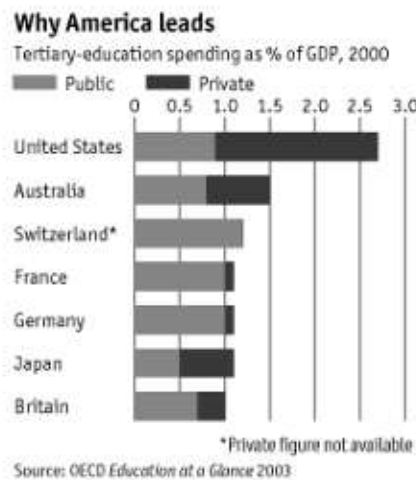
In most countries, some form of public financing of higher education is experienced despite recent arguments raised against public investment in higher education. Some people are against investment in higher education, because they first want a 100 per cent enrolment in primary and secondary education before attention should be given to higher education (World Bank, 2004). This point of view ignores the multi-dimensional role of higher education and ignores the difference of higher education relative to primary and secondary education in the training of people for the labour market and economic development (Cemmel, 2003). Higher education fulfils a unique economic role that cannot be fulfilled by the school system. The emphasis on higher education as a public good is closely linked to its status as a human right that will be compromised if market based or other discriminatory exclusions are allowed to become more prevalent, which is feared under the impact of GATS and other cost sharing initiatives. Social critique is also generated as part of the democratisation function of higher education and is the result of the self-critical method of analysis that is part of the academic learning process.

Total expenditure on higher education per student, both private and public, differs substantially among countries. In OECD countries, for example, this varied between \$4 000 in Greece in 2003 to \$20 000 in the USA (see Figure 1.1). Also, if higher educational expenditure as a percentage of the GDP is used as a yardstick, America spends the highest percentage on education (see Figure 1.2). They spend approximately 2.7% of GDP on higher education. The private component of educational expenditure, in particular, is much higher than in any other country. Although extra funds per se do not guarantee greater efficiency and quality, it does seem as though America's higher education is more successful than the systems in other developed countries. For more information on international trends in public higher education expenditure, see Section 3.2.



Source: OECD, 2003

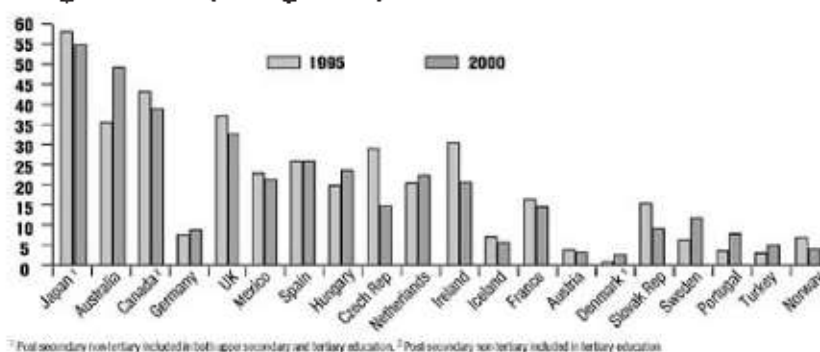
Figure 1.1: Expenditure on higher education per student in OECD countries



Source: Economist, 2004a

Figure 1.2: Expenditure on higher education as percentage of GDP

The share of private financing at higher educational institutions in OECD countries, with the exception of Australia, did not increase significantly during the period 1995-2000. Apart from the 15 per cent increase in Australia, there were only marginal increases in Germany, Hungary, Netherlands, Denmark, Sweden and Portugal, whereas in Spain, the share of private financing stayed the same. In Japan, Canada, the UK, Mexico, the Czech Republic, Ireland, Iceland, France, Austria, the Slovak Republic and Norway, the share of private financing decreased (see Figure 1.3).



Source: OECD, 2003

Figure 1.3: Share of private expenditure in relation to total expenditure at higher Education institutions in OECD countries

1.5.2 Educational support practices in selective countries

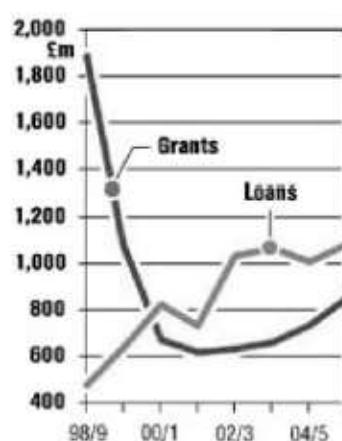
Higher education is a combination of private and public institutions. In each country, the relative combination between private and public institutions differs. In South Africa the number of students enrolled in private higher education institutions is rather small. It is a world-wide phenomenon that the relative contribution of the public sector towards higher education is decreasing. For example, the so-called 'rijksbijdrae' in the Netherlands decreased from 84.4% of total income in 1985 to 69% in 2001 (Jongbloed & Salerno, 2003: 32). It is expected that individuals will have to contribute to a greater extent to cover the cost of their own education. This is in line with the world-wide high private rate of return on higher education. Owing to this relative decrease in public funds, higher education institutions need to generate more income themselves to decrease the deficits. Although the information about this is not conclusive, it does seem that, in countries with a relatively high contribution by the public sector, class fees are treated as the balancing item of the budget of HE institutions. In almost all countries, there exist public finance schemes to enable students from poor communities to afford higher education. This support ranges from bursaries or scholarships to loans with different repayment or interest rate criteria. The practices in different countries are discussed in what follows.

In Australia, the Higher Education Contribution Scheme (HECS) is used. With this system, Australian citizens are allowed to pay back their higher education tuition fees through the tax system against their future income. They have to start paying back their fees, when they are incorporated into the labour market and their income is above \$21 000 Australian per annum. Graduates pay back their debt at a zero per cent real interest rate. With this system, the cost of higher education is rolled from the state onto individuals, who are expected to receive the benefits from the system (Maslen, 2004). One of the negative aspects of this practice is that it was found that graduates are more inclined to try to avoid paying taxes than any other citizens.

In Britain, the current higher education debate revolves around the proposed Higher Education Bill of the Blair government. The question is whether the costs of higher education should be financed primarily by the state (as is currently the case in Britain and the largest part of Europe), or whether they should rather be largely recovered from students (as is the case in America). The other issue is whether these higher fees should be financed by higher future taxes on graduates or by means of loans, and whether the state or the higher education institutions should determine the fees (*Economist*, 2003a). According to the new legislation, students at English universities will, from 2006 onwards, have to pay fees up to a maximum of £3 000 per year, while a fixed fee of £1 125 is currently levied that is controlled by the state (*Economist*, 2004a). Provision is made for students from poorer communities, because those who qualify will receive a grant of £2 700 per year with the possibility of a further loan of £3 555 (*Economist*, 2004b). The fees that students have to pay are still much lower than the minimum real costs of at least £10 000 per year in Social Sciences (with the cost in Engineering and Natural Sciences being much higher). The

graduates will start paying back through the tax system (as in Australia), once their annual income exceeds £15 000 (Maslen, 2004).

Although public funding for higher education increased from about £4 500m in 1989 to approximately £7 500m in 2004, the public expenditure per student decreased from almost £8 000 per student in 1989 to just above £5 000 in 2003 (OECD, 2003 and HEFCE, 2004). An interesting tendency is that the state's contribution towards student assistance has changed drastically over the last couple of years. From Figure 1.4, it is clear that the granting of loans to students to enable them to afford tertiary education is more popular than the supply of grants. This is in line with the tendency elsewhere in the world that students must take more financial responsibility with regard to the cost of their higher education.



Source: OECD, 2003

Figure 1.4: Public financial assistance to students in England

In America, the average tuition fee payable at universities in 2004 is \$4 500 which was \$1 000 lower than the proposed maximum in England (*Economist*, 2004a). It was found that children from more affluent families are more likely to go to higher education institutions during recessions than children from poorer regions (Hazarika, 2002). Students from poorer families frequently do not have the assets to serve as guarantee for credit and must do part-time work to supplement their income to afford higher education. They are less likely to take these risks during recessions. As was stated earlier, the American universities seem to be more efficient due to more competition between the different institutions. In most European countries, no or very low tuition fees are imposed, while tertiary institutions in America are in fairly tight competition (much more competitive than in South Africa), making it seem as though this competition enhances greater efficiency.

In Canada, it was found that increasing tuition fees led to a decrease in students enrolling at higher education institutions and that the high fees influenced the choice of professions (CAUT, 2003). Also, diversity (that is very important in a South African context) was

negatively affected, because students from poorer families could no longer afford these high fees without resorting to loans. For example, it was found that the increase in tuition fees changed the profile of the students to such an extent that the average annual family income of students in the medical faculty increased from \$80 000 to \$142 000 Canadian within three years.

In Latin America, as well as much of East Asia, cost-sharing and revenue diversification at HE institutions has moved into the direction of greater reliance on a tuition and fee-dependent private higher education system. Together with this, the public institutions ask very low fees. Students from richer families receive a superior secondary education and are thus more able to pass difficult university entrance examinations at public institutions. This has the result that students from richer communities attend the 'free' public institutions, while students from rural or poorer areas are frequently forced to pay high tuition fees at (sometimes) inferior institutions. While the concept of cost sharing has been recommended by several commissions in India, it is still not accepted as official policy (Johnstone, 2004). A more Southern African focus on student support will be provided in Sections 2.3 and 2.4.

1.6 SOURCES OF DATA

In an investigation like this, the main purpose should be the collection of relevant and reliable institutional data, a meaningful analysis of the data, the drawing of conclusions and the putting forward of proposals that can possibly help to alleviate some of the present problems in HE management. Since the HE system does not function in isolation, the utilisation of broader (non-institutional) data and information is also very important. The summarised data sets used in this investigation appear in Appendices A-D. It is, however, of some importance to provide some background on the sources from which these data sets have been extracted:

1.6.1 SAPSE database

In the late seventies, the former Department of National Education initiated a process of developing a comprehensive information system for the South African Post Secondary Education (SAPSE) system. Based on a similar information system used in the USA, the main objectives of this exercise were the creation of a common information language in terms of university activities (programmes), classification of educational subject matter (CESM), types of qualifications, income categories, expenditure categories, personnel categories, remuneration categories, classification of the use of building space, etc. The SAPSE information tables (a few hundred) were divided into six chapters, namely, information on academic programmes, on student enrolments, on the utilisation of person power, on fixed assets and on space utilisation. The tables also included the annual audited financial statements. Although the annual submission of SAPSE information was initially only required from HAIs, national education policy of 1986 made the annual submission

of this information compulsory for all universities and technikons. The SAPSE information system was terminated in 1998.

The Department of Education has kindly provided the total SAPSE database to the investigation team. The following data sets were built from the database –

- headcount of enrolled students for 1986-1998 according to institution and year;
- full-time equivalent (FTE) enrolled students for 1986-1998 according to mode of instruction (contact/distance), institution and year;
- qualifications awarded for 1986-1998 according to type of qualification, institution and year;
- headcount of personnel with permanent appointments for 1986-1998 according to personnel category, institution and year;
- FTE personnel for 1986-1998 according to personnel category, institution and year;
- summarised income statements for 1986-1998 according to type of income, institution and year; and
- summarised expenditure statements for 1986-1998 according to type of expenditure, institution and year.

1.6.2 HEMIS database

The Higher Education Management Information System (HEMIS) for student enrolments replaced the SAPSE information system in 1999, while HEMIS for the utilisation of person power only commenced in 2000. The necessary HEMIS data to extract the same data sets for students and qualifications, such as those derived from the SAPSE database, were also provided by the Department of Education for the years 1999-2003. With respect to the two personnel data sets, indicated in Section 1.6.1 above, the HEMIS data only covered the period 2000-2003. In analyses performed in this investigation where personnel data are involved, the year 1999 is therefore excluded. In some graphic representations, however, values for 1999 are estimated to ensure continuous trends.

Higher education financial reports for 2000-2003 were all supplied in a new format that was implemented by the Department of Education in 2000. This format replaced the SAPSE financial statements terminated in 1998. The new format is, in contrast to the SAPSE statements, in accordance with the concepts of Generally Accepted Accounting Practice (GAAP). The new financial reporting formats were refined annually during the years 2001 to 2003 and extended by the Department. Important financial indicators were also introduced as part of the annual information to be submitted by each institution.

The institutional financial information for 2000-2003 was also provided by the Department of Education to the researchers. Income and expenditure data sets, similar (or as nearly similar as possible) to the sets created from the SAPSE statements, were created for 2000-2003 from these institutional financial reports.

The HEMIS data were used to extend the data sets, built from the SAPSE database (see Section 1.6.1 above), to 2003.

1.6.3 Other sources of data

Various other official sources of information were used in this investigation, as is indicated in the respective data sets in the Appendices or in the Tables with information in the text. Some of the important South African sources of information used are earmarked research allocations to HE institutions provided by state agencies; the results of Census 2001 as published by Statistics SA, the annual summaries of the Senior Certificate results published by the Department of Education, and the annual information on the state budget for HE also published by the Department of Education.

The SAPSE and HEMIS databases contain missing data and also some inaccurate data. In order to conduct meaningful analysis, it was sometimes necessary to estimate missing data or correct obviously erroneous data. Such estimates or information based on estimates are as far as possible highlighted in data tables.

1.7 TRENDS IN STUDENT ENROLMENT

Student enrolments and annual changes in enrolments in higher education are the crucial parameters or determinants of both HE sources of income and expenditure patterns. Enrolments also influence the institutional teaching and research performances. A rather comprehensive overview of the trends in student enrolment as part of the introduction of this investigation is therefore necessary.

In order to understand and interpret the enrolment trends in higher education a short history of the origin and development of the HE sector during the period 1910 to 2003 is needed. This history of universities is mainly taken from Report SAPSE 204, Department of National Education (1982) and for technikons from Report NATED 02-118, Department of National Education (1988).

1.7.1 Universities

When South Africa became a Union in 1910 only one university existed, namely, the University of the Cape of Good Hope already established in 1873. The students of this university enrolled at different colleges of the University. In terms of Act no 2 of 1916, as implemented on 2 April 1918, this university was transformed into the University of South Africa (Unisa), consisting of 6 colleges while two of the other colleges of the University of the Cape of Good Hope became universities themselves, namely, the University of Cape Town and the University of Stellenbosch.

During the next 30 years, the six colleges of Unisa all gained university status and became the University of the Witwatersrand (1922), University of Pretoria (1930), University of Natal (1949), the University of the Orange Free State (1950), Rhodes University (1951) and the Potchefstroom University for CHE (1951).

The South African Native College was established by missionaries in 1916 and became the University College of Fort Hare, affiliated with Rhodes University in 1951 and later with Unisa in 1960, until it was granted full university status in 1970. Four other institutions were established under the academic guidance of Unisa between 1960 and 1962, namely, the University Colleges of the North, of Zululand, of the Western Cape and of Durban-Westville. All four were granted university status between 1970 and 1971. The University of Port Elizabeth was established in 1964, the Rand Afrikaans University in 1966, the Medical University of South Africa in 1977 and Vista University in 1981.

As already indicated national policy determined by the Minister of National Education in the middle 1980s made the submission of information according to the SAPSE information system compulsory for all universities within the RSA (thus excluding HE institutions in the former independent homelands). The SAPSE subsidy formula was also applied to all these universities since 1986.

The University of Transkei, the University of Bophuthatswana and the University of Venda were founded soon after the Transkei, Bophuthatswana and Venda were granted 'independence' by the previous government. These institutions were incorporated into the South African university sector soon after the first democratic government came into power in 1994. Although the University of Fort Hare was located in the 'independent' Ciskei before 1994, its administration and funding was (by mutual agreement) always closely linked to the South African university system by means of the SAPSE information system and the SAPSE formula.

The following classification of the 21 universities which existed in 2003 into two groups, namely, Historically Advantaged Universities (HAUs) and Historically Disadvantaged Universities (HDUs) will be used frequently in this report:

Historically advantaged Universities

University of Cape Town
University of Natal
University of the Free State
University of Port Elizabeth
Potchefstroom University for CHE
University of Pretoria
Rand Afrikaans University
Rhodes University
University of South Africa
Stellenbosch University
University of the Witwatersrand

Historically disadvantaged Universities

University of Durban-Westville
Fort Hare University
University of the North
University of the Western Cape
Vista University
Medunsa
University of Zululand
University of Transkei
University of North West
University of Venda

1.7.2 Technikons

During the middle of the twentieth century, large technical colleges were established by the Railways and the Mining sector for apprenticeship training. In the 1950s, some of these technical colleges became Technical High Schools or Commercial High Schools. The four largest colleges, however, became Colleges of Advanced Technical Education under the Advanced Technical Education Act of 1967 (Act 40 of 1967). They were the Technical Colleges of Natal, Witwatersrand, Pretoria and the Cape. In accordance with the Amended Advanced Technical Education Act of 1979 (Act 43 of 1979), these four colleges were renamed as technikons. Five new technikons were established in the period 1967 to 1979. They were Technikon Port Elizabeth, Technikon Vaal Triangle, M L Sultan Technikon, Technikon Peninsula and Mangosuthu Technikon. Since then Northern Transvaal Technikon (later renamed to Northern Gauteng) was established in 1980 and Technikon Free State in 1982. As was already indicated, Natal Technikon and the M L Sultan Technikon merged with effect from 2003 to become the Durban Institute of Technology. A distance tuition section was established at the Witwatersrand Technikon. This section became a fully fledged Technikon in 1980, namely, Technikon RSA (later Technikon SA), dedicated to distance tuition.

The SAPSE information system for universities was revised in the 1980s to accommodate the qualification structure of the technikon sector and the technikons submitted their first SAPSE information in 1986.

Technikon Eastern Cape (formerly in the Transkei), Setlegelo Technikon (established initially as a Technical Training Centre under the Bophuthatswana Education Department in 1976) and Border Technikon (established in 1984 as the Ciskei Technikon) were incorporated into the South African technikon sector soon after the first democratic government came into power in 1994. Setlegelo Technikon's name was changed to Technikon North West soon after the incorporation.

The following classification of the 15 technikons which existed in 2002 into two groups, namely, Historically Advantaged Technikons (HATs) and Historically Disadvantaged Technikons (HDTs) will be used frequently in this report:

Historically advantaged Technikons

Cape Technikon
Technikon Free State
Port Elizabeth Technikon
Technikon Pretoria
Technikon SA
Technikon Natal
Technikon Port Elizabeth
Vaal Triangle Technikon
Technikon Witwatersrand

Historically disadvantaged Technikons

Technikon Northern Gauteng
Peninsula Technikon
M.L. Sultan Technikon
Border Technikon
North West Technikon
Eastern Cape Technikon

It was already indicated in Section 1.1 that Technikon Natal and M.L. Sultan technikon had merged and became the Durban Institute of Technology with effect from 2003.

1.7.3 Distance education

After a series of amendments in acts, Unisa became a dedicated distance education (or non-residential) university in 1967. Unisa was the only university to offer tuition by means of distance education until Vista University, offering both contact and distance academic programmes, was established. In 1993, RAU introduced some distance tuition programmes. Soon other residential universities followed, especially after the Education White Paper 3 was published. In WP3 the extension of distance education and resource-based learning in HE were advocated in order to increase access of students (see par. 2.57-2.64 of WP3). By 2003, already 13 universities were involved in distance tuition.

As far as distance education in the technikon sector was concerned only Technikon SA as dedicated distance tuition institution was involved until 1997. Two other technikons, namely, Technikon Pretoria and M.L. Sultan Technikon introduced a few distance education programmes in 1997. By 2001, five residential technikons were also enrolling students for distance tuition. This was still the situation in 2003.

1.7.4 Headcount of enrolled students

Table A.1 of Appendix A shows the headcount of enrolled students for all 36 universities and technikons for the years 1986 to 2003. These enrolments do not distinguish between contact and distance tuition students. As was already indicated in Section 1.6, the data were extracted from the SAPSE information system for the years 1986 to 1998 and from the HEMIS information system for 1999-2003.

A summary of this Table's information, as well as university enrolments in five-year intervals for the earlier period 1910 to 1980 are given in Table 1.2 below. These earlier enrolment numbers came from the report SAPSE 204, Department of National Education (1982). Figure 1.5 shows a graphic representation of the headcount enrolments at universities, at technikons and in total for these two sectors. Some average annual enrolment growth rates were calculated and appear in Table 1.3.

Table 1.2: Headcount of students according to year and sector: 1910-2003

Year	Headcount of Students		
	University	Technikons	Total
1910	1 160		1 160
1915	1 176		1 176
1920	3 250		3 250
1925	6 164		6 164
1930	8 269		8 269
1935	9 727		9 727
1940	12 262		12 262
1945	18 004		18 004
1950	23 122		23 122
1955	27 959		27 959
1960	42 766		42 766
1965	59 365		59 365
1970	83 030		83 030
1975	122 869		122 869
1980	159 756		159 756
1986	240 485	46 251	286 736
1987	258 294	56 446	314 470
1988	281 687	56 815	338 502
1989	300 586	75 797	376 383
1990	304 625	92 737	397 362
1991	327 114	115 715	442 829
1992	339 788	126 946	466 734
1993	348 942	130 768	479 710
1994	363 951	158 707	522 658
1995	383 418	189 376	572 794
1996	377 723	199 149	576 872
1997	375 293	204 767	580 060
1998	375 024	206 807	581 831
1999	383 252	201 982	585 234
2000	386 288	202 730	589 018
2001	427 999	210 163	638 162
2002	460 472	214 690	675 162
2003	487 755	230 052	717 807

Source: Department of National Education (1982): Report SAPSE 204; Department of Education: SAPSE database 1986-1998; Department of Education: HEMIS database 1999-2003

Table 1.3: Headcount growth rates of students in higher education: 1910-2003

Average annual growth rates: Universities and technikons		Average annual growth rates: according to sector		
Period	Rate	Period	Universities	Technikons
1920-1930	10.32	1986-1995	5.32	16.95
1930-1950	5.28	1995-2003	3.05	2.46
1950-1970	6.60			
1970-1990	8.14			
1990-2003	4.65			

From Tables 1.2 and 1.3, as well as Figure 1.5 the following can be deduced:

- There was a sudden increase in the total HE headcount number in 1986. This is to be expected since no enrolment data prior to 1986 are available for the technikon sector.
- A slump is seen in enrolments at both universities and technikons during the years 1995 to 1999. The introduction of measures to prevent students with outstanding student fees from enrolling the next year, as well as decreasing numbers of first time entering first year students as a result of very disappointing Senior Certificate results during these years were two of the important reasons for this irregular enrolment pattern.
- During the middle 1980s to the middle 1990s technikon enrolment grew by an average rate of almost 17.0% per annum. The corresponding rate for universities was only 5.3%. Although the technikon sector was still young and relatively small in 1986 and a large growth would have been expected (compare the university growth rate of 10.3% per annum between 1910 and 1930) this difference in growth rates between the two sectors was still high. Since 1995 the growth rates in headcounts at universities and technikons are more similar with the university growth rate a little higher. The expansion of especially distance tuition at many universities and the decrease in enrolments at Technikon SA were the main contributing factors for this higher student enrolment growth at universities since 1995.

1.7.5 Higher education participation rate

The NPHE states:

“To ensure an adequate supply of high level human resources for social and economic development an increased participation rate of 20% of the age group 20-24 in public higher education should be the target over the next 10-15 years.”

The target of 20% in the NPHE is the same as the average higher education **gross** participation rate of middle income countries. A distinction is usually made in the literature

between the participation rate and the gross participation rate in higher education. Taking the age interval of 20-24 as the likely modal five-year interval for higher education participation, the higher education *participation rate* is calculated as the percentage of all 20-24 year olds in the population enrolled in higher education. The *gross participation rate*, however, calculates all enrolments in higher education as a percentage of 20-24 year olds in the population. In calculating the participation rate of 15% for higher education in South Africa for 2000 (quoted in the NPHE) the Department of Education presumably used the percentage of all higher education enrolments to the population number in age group 20-24 years. This fact and also the reference to the 20% gross participation rate of middle income countries in the NPHE is an indication that the target of 20% for South Africa (as set out in the NPHE) over the next 10-15 years actually refers to the *gross participation rate* in higher education and not to the absolute participation rate. This oversight should be corrected in the NPHE.

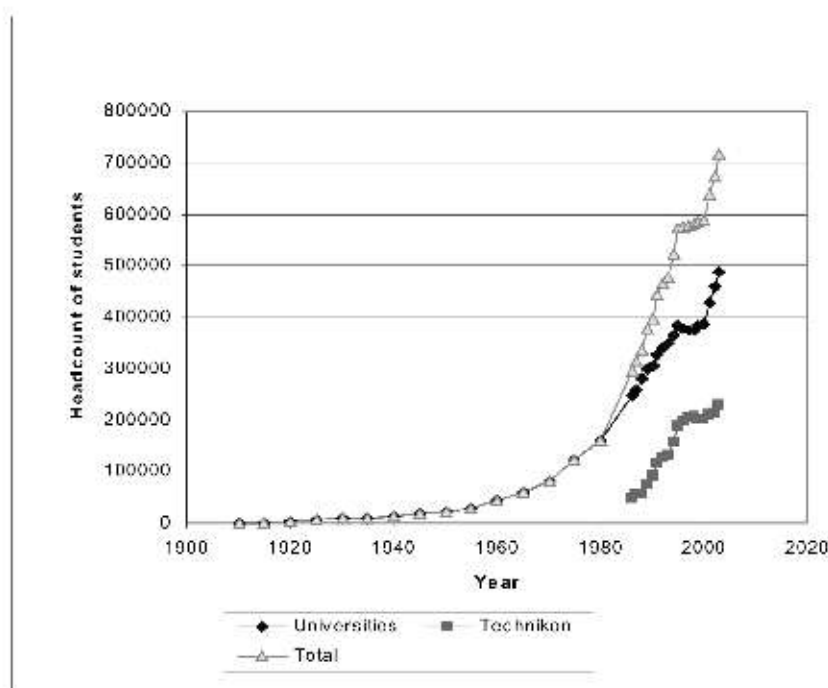


Figure 1.5: Headcount growth in higher education according to year and sector

The gross participation rate for South Africa in 1996 was 14.5% since the total enrolments at universities and technikons were 576 872 (see Table 1.2) and the RSA population in the age group 20-24 was 3 982 353 according to Census 96. Calculated similarly but using the mid year estimates of the SA population size for the age group 20-24 in 2003, the gross participation rate in higher education was 16.3% in 2003. These two percentages must, however, be interpreted with caution. If the approximate number of 90 000 students enrolled in teacher training colleges in 1996 is added (since the university and technikon

sectors included all teacher training students in 2003 as a result of the incorporation of the teacher training colleges into the university and technikon sectors in 2001-2002) to the total for universities and technikons, the percentage of 14.5% calculated above for 1996 increases to 16.7%. The higher education participation rate will therefore have to be increased by more than 3 percentage points in the next 10 years if the NPHE target is to be reached. It is therefore debatable whether the funding growth caps on student enrolments imposed under the NFF by the state with effect from 2005/06 is the correct strategy. This will be further investigated in Section 5.

1.7.6 FTE enrolled students

Headcount enrolment in HE is a valid size measure if the emphasis is mainly on student participation in HE. For other purposes, especially in determining the resources needed for higher education, student enrolments should be measured in such a way that the extent of the service required by an individual student is discounted. An aggregation of the standardised credit values of the different modules (courses/subjects) for which a student enrolls in a particular year can be calculated. This is known as the full-time equivalent (FTE) value for the student's registration at a HE institution. A full time student's (taking the full complement of modules normally prescribed for an academic programme in a specific year) FTE value will usually be about 1.0, but could differ depending on specific module choices. Obviously if a student enrolls for only one or two modules, or enrolls as a part time student, his/her FTE value will be much smaller than 1.0.

Table A.2 in Appendix A shows the annual FTE enrolled students for the 36 institutions during the period 1986 to 2003. The FTE enrolments in both the university sector and the technikon sector are also divided in two groups of institutions, namely, the Historically Advantaged (formerly White) Institutions (HAIs) and the Historically Disadvantaged (formerly Black) Institutions (HDIs). Studying possible differences in the behaviour of these institutional groups has for different reasons become standard procedure. The trends in FTE enrolled students are depicted in Figures 1.6 and 1.7.

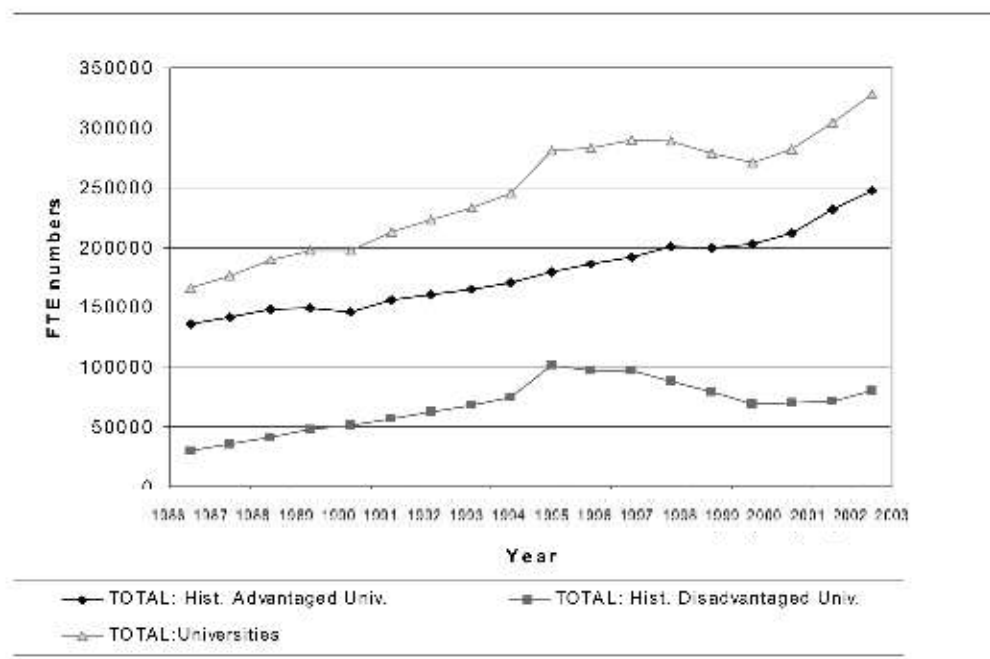


Figure 1.6: FTE enrolled students at universities according to institutional group and year

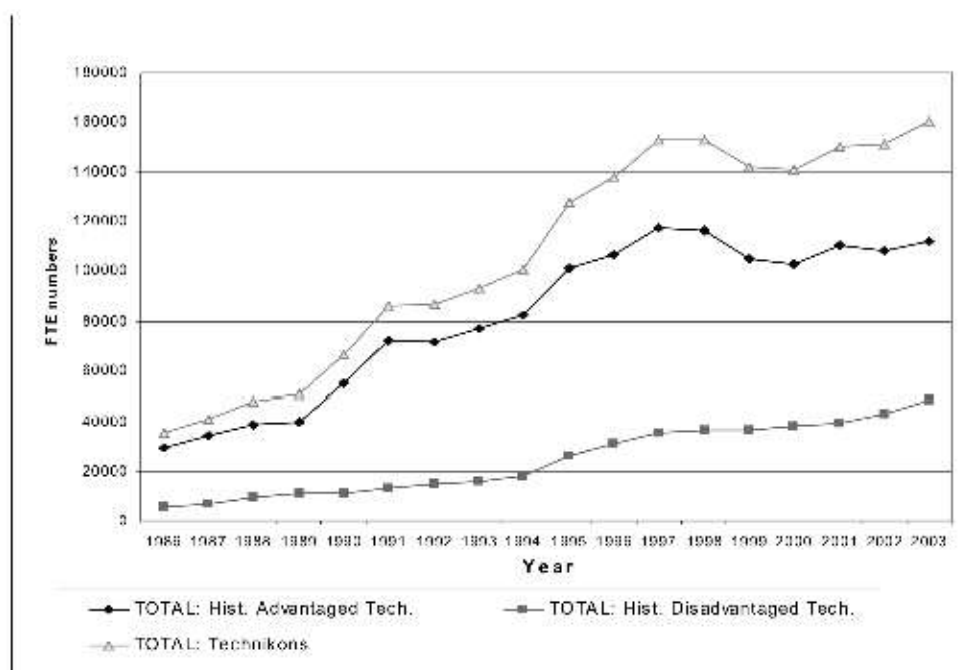


Figure 1.7: FTE enrolled students at technikons according to institutional group and year

The following are evident from these figures –

- The university sector grew by about 97% during the study period while the technikon sector grew by about 350% (the technikon's growth was obviously from a small base).
- A large increase in FTE numbers in the HDI groups in both the university sector and technikon sector in 1995. This was owing to the incorporation of the 'TBVC states' institutions in that year. There is unfortunately not sufficient information available to estimate FTE student numbers at these institutions for the years prior to 1995.
- From 1997 to 2000, a decline in total FTE students was experienced in both the university and technikon sectors. The decline in the university sector was mainly the result of the decrease in FTE students at the HDIs during 1995 to 2000, while the decline in the technikon sector was the result of the decrease of FTE students in the HAIs during 1997 to 2000.
- Since 2001 a rather stable increase in FTE students has been experienced in all four groups of institutions.

The FTE enrolled students are subdivided into FTE contact tuition students and FTE distance tuition students in Tables A.3 and A.4. of Appendix A. Generally speaking, offering programmes by means of distance education is less expensive than face-to-face instruction used in the traditional contact education situation. According to the CHE report (2004), which advises the Minister of Education on various aspects of distance education, there is a clear difference (and cost differential) between contact education and distance education when enrolments in distance education courses are high and economies of scale apply. In the cases of postgraduate courses and other courses with fewer than 100 learners, no cost benefits will be experienced by way of distance education. These findings of the CHE, however, are based on a limited cost study by them. No scientific and nationally accepted study into the cost differentials between face-to-face contact education and the variety of teaching models presently used for distance education by HE-institutions in South Africa has yet been conducted.

The SAPSE subsidy formula assumes that on average the institutional cost of servicing a FTE distance education student is 0.67 of the cost to service a FTE contact education student. In the new funding framework this factor is scaled down to 0.5 but it applies, however, only to the teaching input block grant of the framework and to undergraduate and honours (and equivalent) distance education programmes. Many researchers and lecturers in higher education currently believe that no funding penalisation should be made for distance tuition. They hold the view that the term distance education is problematic and confusing and that any reference to different modes of instruction in higher education is totally outdated and should disappear. A SAUVCA task team that had investigated distance education proposed in 2003 that equal weights for FTE contact and FTE distance

education students should be phased in as far as the state subsidisation is concerned. The cost scaling factor of 0.5 for distance education in the NFF is, however, broadly endorsed by the aforementioned CHE report.

The student data used in this investigation for the CHE about the impact of changing funding sources on HEIs in SA cover the period 1986 to 2003 when only the SAPSE subsidy formula was operative. Therefore, the factor of 0.67 was used as the weighting factor to place contact and distance FTEs on an equal funding footing. This leads to the following enrolment measure which will be used extensively in this report –

$$\text{Weighted FTE students (WFTEs)} = \text{FTE contact students} + 0.67 \times \text{FTE distance education students}$$

The annual WFTEs are shown in Table A.5 of Appendix A for the respective universities and technikons for the period 1986 to 2003.

Figures 1.8 and 1.9 show the trends in total FTE students, contact FTE students, distance FTE students and weighted FTE students for the university and technikon sectors respectively. Figure 1.8 shows that the FTE distance education students in the university sector increased slowly but surely from 1986 to 2003. The FTE numbers doubled during this time. On the other hand Figure 1.9 shows that distance education at technikons is becoming less attractive to technikon students. The decrease in distance education FTEs at technikons during the last number of years could be the result of the run-up to the merger between Unisa and Technikon SA, which only took place in 2004, but was widely propagated by government since the publication of WP3.

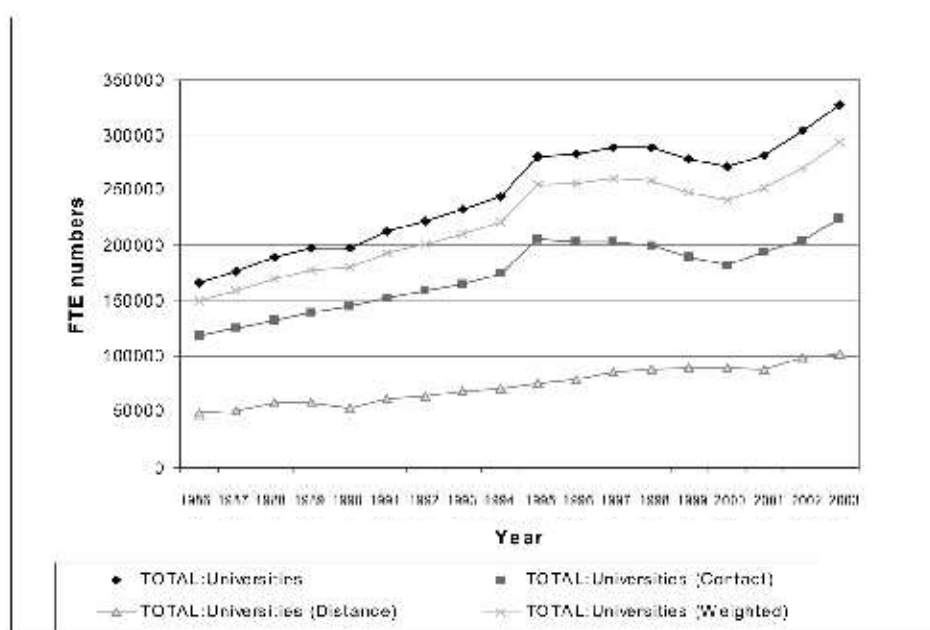


Figure 1.8: FTE enrolled students at universities according to mode of instruction and year

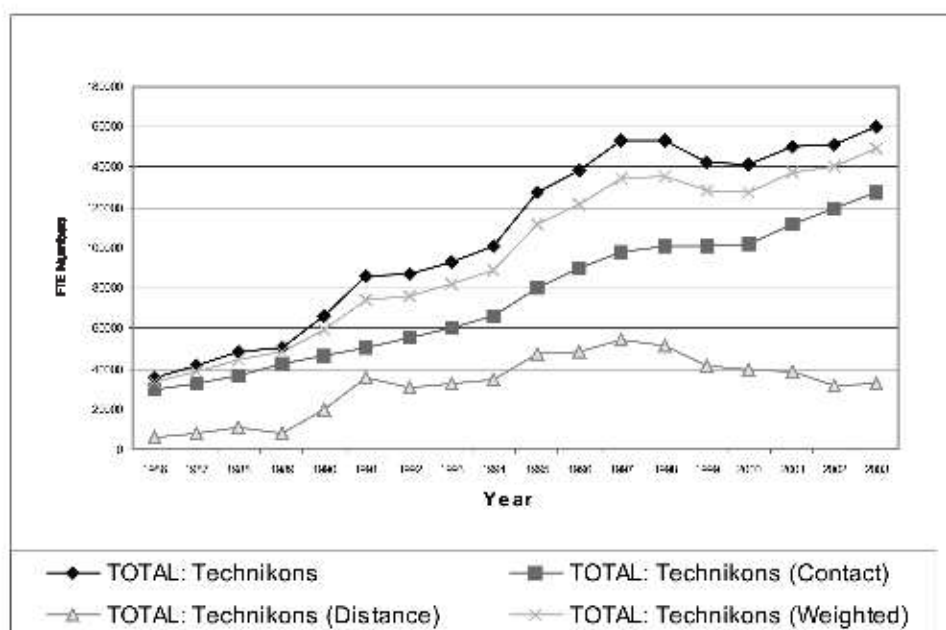


Figure 1.9: FTE enrolled students at technikons according to mode of instruction and year

1.8 OUTLINE OF REPORT

Section 2 of this report starts with an overview of the history and mechanisms of state funding of HE leading to the SAPSE subsidy formulas which were used to fund universities and technikons during the study period 1986 to 2003. The NFF is also covered in some detail and a comparison between some components of the SAPSE subsidy formulas and the NFF will be made. The problems regarding the determination and collection of student fees, as well as the history, performance and challenges facing the National Student Financial Aid Scheme (NSFAS) as primary vehicle for ensuring sufficient student access to HE are also discussed in this section. International trends in the so-called third income stream of HE institutions, mainly consisting of entrepreneurial funding, earmarked research funding and philanthropic donations are discussed lastly in Section 2.

In Section 3, the emphasis is on the analysis of the actual HE institutions' income streams and expenditure patterns for the investigation period of 1986 to 2003. A set of financial indicators (especially unit income and costs) will be used in this analysis. Trends in the relative size of government spending on HE in South Africa are investigated and comparisons are made with other countries. Expenditure indicators in terms of the various expenditure categories will be defined and calculated. The largest expense of any institution is the remuneration of personnel. The question whether the remuneration of personnel at HE institutions has kept abreast with the remuneration in other economic sectors in South Africa since 1986 will also be addressed.

Section 4 concentrates on trends in the institutional performances in line function activities, especially teaching and research. An important question that needs to be answered is whether changing sources of income and increasing student enrolments had negatively influenced institutional performances. International comparisons, if meaningful, will also be used to give more insight into the performance of the South African HE system.

The growth in HE student numbers during the next decade and the macro economic environment during the same period, which determines the capacity of the state to fund HE adequately, will determine the future size and the composition of HE income. Analysing different combinations of student growth and macro economic scenarios with special reference to the impact on HE income and expenditure is the topic dealt with in Section 5. Since preliminary state allocations to HE for 2006/07 and 2007/08 (according to the Medium Term Expenditure Framework) are available, a relatively firm basis already exists for scenario building for at least these two years.

Section 6 is a wrap-up of all the findings and conclusions of the analyses of Sections 2 to 5. Some proposals and indications of important follow-up studies are also included in this section.

SECTION 2: SOURCES OF HIGHER EDUCATION FUNDING

2.1 THE EVOLUTION OF FORMULAS FOR THE SUBSIDISING OF SOUTH AFRICAN HIGHER EDUCATION INSTITUTIONS BY THE STATE

The three main sources of HE funding in South Africa is state subsidy, tuition fees and the third money stream income. These three sources of income form the topic of this Section.

2.1.1 A public funding classification scheme – Jongbloed (2004) classified public funding of HE along two dimensions, namely, the funding base and the degree of market orientation. The funding base relates to the question: Are the funding allocations tied to educational outputs of performance, or rather to educational inputs? The degree of market orientation is tied to the question: Are publicly funded students or funded programmes regulated by central authorities or are the funding flows driven by the decisions of the clients (students, private firms, research councils) themselves? All possible answers to these two questions define a two dimensional plane containing a wide variety of public funding models for HE as indicated in the schematic representation in Figure 2.1.

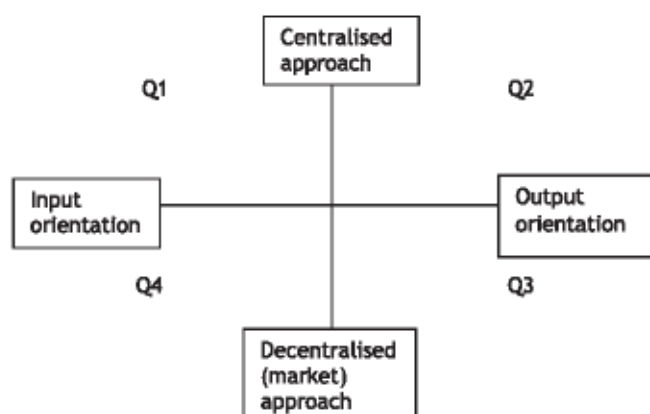


Figure 2.1: Two dimensional positioning of HE funding schemes

In his paper, Jongbloed discusses the characteristics of the four generic funding models associated with the four quadrants Q1, Q2, Q3 and Q4 in his graphical classification model. His classification is also useful in understanding the different formulas used since 1953 by the South African government to subsidise HE universities and technikons. We will later return to his classification.

The new funding framework (NFF) for public higher education, which has been applied by the South African government since the 2004/05 financial year, could in some sense be regarded as the result of an evolutionary process of formula funding which started more

than 50 years ago in 1953 with the introduction of the so-called Holloway formula for universities. This process may even have started earlier, but it is difficult to access the necessary official documentation in order to research this process further back. Some valuable lessons can be learnt from this evolutionary process, which may have a bearing on further and future developments in and adjustments to public funding of HE institutions in South Africa.

An overview of the forerunners of the new framework for public HE funding, as well as a short critical analysis of the NFF itself is given in the following subsections. Before we give the overview, it is helpful to look at the benefits accruing from public funding by means of a formula.

2.1.2 Benefits of state subsidisation of HE institutions by means of a formula –

A state subsidy policy based on a well-defined and transparent formula has several advantages, the most important of which are the following –

- A subsidy formula ensures that funding takes place in a fair and objective way, without taking subjective considerations into account. It therefore usually depoliticises the allocation of funds to a large extent.
- A subsidy formula may be regarded as a contract between two parties, in this case the state, represented by the Minister of Education, and a higher education institution. The state provides funds to institutions for specific educational purposes, while the institution renders these educational services to the public.
- Funding based on a subsidy formula gives greater recognition to the autonomy of an institution since the state usually (except in the case of limited earmarked amounts) does not prescribe how the allocated amount has to be spent. This differs radically from the so-called needs-based budgeting with extensive earmarking of amounts.
- A subsidy formula ensures that the rules of the funding game are known in advance and therefore promotes medium and even long-term planning by an institution.
- Subsidy formulas are designed to be flexible in order to accommodate as many fluctuating factors (input parameters) as possible. Cost escalation is an example of such a factor and needs to be incorporated in any legitimate subsidy formula. However, since a subsidy formula cannot discount all (sometimes institutional specific) factors, it is only an approximation and represents a funding model for an 'average' institution.

A disadvantage of any formula based funding mechanism is that the clients served by the formula will inevitably, after a year or two, start to exploit the formula by finding loopholes in its composition or in the definition or calculation of the input parameters. It is therefore crucial for the state to deem any subsidy formula as dynamic and while it will be contra

productive to revise the formula annually, it should at least be scrutinised carefully every five years with a view to a possible revision.

2.1.3 The funding mechanisms for universities and technikons since 1951 – From 1951, and until the NFF was introduced with effect from the 2004/05 financial year, four formulas have been used as a basis for funding universities. A complete description of these formulas is outlined in the Report of the Holloway Commission (1951), the Report of the Van Wyk de Vries Commission (1974), Venter (1985) and two reports of the former Department of National Education in 1992, namely, the report NASOP 02-325(92/11) and the report NATED 02-326(92/11). A brief and non-technical outline (and critical analysis) of the state funding frameworks for universities and technikons used since 1993 (subsidy formulas and earmarked funding) is included in Chapter 8 of the report of the National Commission on Higher Education (1996). Steyn and Vermeulen (1997) provide a fairly detailed summary and discussion of the relationships between the four formulas. The overview given below regarding the four formulas is to a large extent based on the last mentioned paper.

The so-called Holloway formula, flowing from the report of the Holloway Commission appointed by government in 1951 to investigate university financing, was introduced in 1953; and this was used as the state's funding instrument until the early seventies. The scrapping of the Holloway formula followed an interim recommendation of the Van Wyk de Vries Commission of Enquiry into Universities. This Commission was appointed by government in 1968, but only completed its final report in 1974. The funding formula for universities, proposed by the Van Wyk de Vries Commission, was only implemented in 1977. After the scrapping of the Holloway formula, but before the Van Wyk de Vries formula was implemented, universities were funded for a few years in an *ad hoc* way. The so-called SAPSE subsidy formula for universities was implemented in 1984 and revised with effect from 1993. An adaptation of the earlier (1984) version of the SAPSE formula was introduced in 1987 as a basis for subsidising the technikons. This technikon subsidy formula was drastically revised, also with effect from 1993. The SAPSE subsidy formulas for the funding of universities and technikons, respectively, were used for the allocation of subsidies to universities and technikons until the 2003/04 financial year when the NFF came into effect.

The four subsidy formulas mentioned above were used as a basis for subsidising both the current expenditure and the expenditure on some types of fixed assets of institutions. The acquisition of land, the erection of new buildings and land improvements other than buildings, as well as some other smaller *ad hoc* expenses of institutions (e.g. property rates) were traditionally not funded by these formulas. The history of funding mechanisms for new buildings and other land improvements (e.g. parking areas and pathways) of universities and technikons over the past 50 years will also be dealt with in Section 2.1.12.

2.1.4 The Holloway formula (1953) – The Holloway formula acknowledges three types of needs of an institution. In terms of the terminology and notation used at the time, it can therefore be written as:

$$F(H) = S_b + S_s + A$$

where: S_b = Basic instructional (teaching) provision (independent of the number of students).

S_s = Standard instructional provision (depending partly on student numbers).

A = Cost of living allowance allocated to personnel on an ad hoc basis from 1959.

The component S_b represents the remuneration of lecturers in the acknowledged 'basic' academic departments, as well as the remuneration of librarians. The remuneration of other academic personnel, who form part of component S_s , is determined separately by the total number of student courses (modules) in the different faculties, namely, Arts, Science, Commerce and Administration, Education, Applied Sciences and Medicine and Dentistry. The remainder of S_s is determined by the number of full-time students (for funding the library) and the number of laboratory courses (for funding laboratory equipment), while a fixed percentage of the provision for remuneration of academics is added for the cost of administration and other recurrent expenditures at institutions.

An amount $(k \times S_s)$, known as the standard student fee income, where k ($0 < k < 1$) is determined by the actual student number for a specific institution, is deducted from $F(H)$ in order to determine the final state subsidy for a particular institution.

The Holloway formula was used for 20 years to determine the respective subsidies for South African universities. During this time period, minor revisions to the formula were effected in 1959, 1964 and 1969. Unisa was funded according to the same formula, but with different cost factors.

Problems in the application of the Holloway formula arose when it was exploited by some universities by artificially subdividing academic courses in smaller units to receive a greater subsidy. A further major deficiency in this formula was that it did not provide for year upon year cost increases as a result of inflation – a phenomenon that became significant in the late 1960s and early 1970s.

2.1.5 The Van Wyk de Vries formula (1977) – Because of the in-depth research done by the Van Wyk de Vries Commission into various aspects of university financing, it was no surprise that the formula proposed by the Commission introduced some well-considered new principles, while retaining the best features of the Holloway formula. Two of these features, namely, a basic provision to institutions (independent of institutional size) and the sharing of the cost between the state and the institution were retained in both the Van Wyk de Vries subsidy formula and later in the SAPSE subsidy formula. The Van Wyk de Vries

formula was clearly related to the Holloway formula, but incorporated a number of significant improvements.

Firstly, weighted student numbers are the basic input parameters of the formula. Two bases of weighting are used, namely, course level (undergraduate students weight = 1, honours students weight = 2 and Master's and doctoral students weight = 3) and mode of instruction (undergraduate full-time students weight = 1, undergraduate part-time students weight = 0.75 and non-residential (Unisa) undergraduate students weight = 0.33). The weighted student numbers for the funding year (say year n) are projected from observed weighted numbers in years $n-1$ and $n-2$. Secondly the Van Wyk/De Vries formula is more nuanced than the Holloway formula. This can be seen from the following formula expression of the Van Wyk de Vries formula:

$$F(VW) = g \cdot (S_{dep} + S_{adm} + Lib + Lab + Res + RT + CS + MB)$$

where:

g = Government contribution ratio (ranging between 75% and 85%) discounting the economy of scale at institutions. This ratio replaces the practice, used in the Holloway formula, of deducting a standard student fee income from the formula amount.

S_{dep} = Remuneration (salaries plus fringe benefits) of all personnel in academic departments determined by weighted student numbers via student-lecturer ratios, as well as student-support staff ratios (different for the human sciences, natural sciences and medical sciences). Fixed post level ratio norms for the provision of academic personnel are used (professors: 20%, senior lecturers: 25%, lecturers: 40% and junior lecturers: 15%). S_{dep} also incorporates a basic or minimum provision fixed for all institutions.

S_{adm} = Remuneration of central university administration personnel determined as remuneration of five senior officials (maximum of professor's remuneration) plus a fixed percentage of S_{dep} .

Lib = Library allocation. Remuneration of Head (maximum remuneration of professor) plus fixed percentage of S_{dep} . Allocation for books and journals based on weighted student numbers according to groups.

Lab = Allocation for laboratories according to weighted student numbers according to faculty groups.

Res = Allocation for research by means of a fixed percentage of S_{dep} .

RT = Recurrent expenditure for teaching according to weighted student number.

CS = Allocation for computer services based on student numbers and a few other factors (In 1977 this expenditure was still relatively small – only about 3% of total subsidy).

MB = Maintenance of buildings, grounds and furniture based on a headcount of students.

National fixed salary scales for academic personnel and annually determined subsidy points (salary level indicators) for the salaries of non-academic personnel are used in the formula for the calculation of S_{dep} and S_{adm} .

The Van Wyk de Vries formula introduced a few new important funding principles, e.g. the weighting of student numbers and a standard basket (post level ratio norms) of posts for academic personnel. Furthermore, it attempted to model the most important expenditure categories of universities. Unfortunately, this formula was still deficient in not providing annually for the inflation in HE costs.

2.1.6 The SAPSE formula for universities (1984) – The comprehensiveness of the SAPSE information system has already been discussed in Subsection 1.6. The information of this system was applied in various policy instruments developed by the former Department of National Education in the nineteen eighties. One of the most noteworthy was the SAPSE subsidy formula for universities.

The SAPSE formula for universities was originally designed for the universities falling under the House of Assembly in the so-called tri-cameral government system of the 1980s i.e. the formerly white universities (or the HAUs), in an era when there was large-scale fragmentation of the university sector. The SAPSE formula of 1984 was based on the assumption that students are the best judges of their own welfare and therefore are best informed to decide what programme to take. The SAPSE formula and the later revised SAPSE subsidy formula of 1993 were therefore (like the Van Wyk de Vries formula) enrolment driven with funding following students as they enrol at institutions of their choice. It can therefore be considered as a market driven formula (see Figure 2.1).

Soon after the development of the SAPSE formula it was also applied to the other universities, namely the historically disadvantaged universities (HDUs) which politically and administratively fell under the administration of the House of Representatives, the House of Delegates (both within the tri-cameral system) and under the Minister of Education and Training (a 'general affairs' ministry responsible for Universities for Blacks (Africans)). Following an agreement between the RSA government and the Ciskei government in the 1980s the University of Fort Hare was also funded by means of the SAPSE subsidy formula via the portfolio of the Minister of Foreign Affairs.

Effective subsidy students (ESS) form the basic input parameters of the SAPSE subsidy formula. ESS combines full-time equivalent (FTE) enrolled and FTE degree credit students (i.e. the total credits of all the modules successfully completed by enrolled students) in equal weights, weighs the resultant figures by course level and adds 1000 so-called set-up cost students to the result. The course level weights are an extension of the weights used for enrolled students in the Van Wyk de Vries formula, namely the first three years of first B degree have the weight 1, further years of first B degree, as well as B

Honours degree have the weight 2, Master's degree the weight 3 and doctoral degree the weight 4. In the calculation of ESS for distance tuition one subsidy student counts only 0.67 of the corresponding value for contact tuition.

All instructional courses/modules on offer are divided according to their study field (CESM category) into either Natural Sciences or Human Sciences and ESS are calculated separately for these two groups. The 1 000 set-up cost ESS are also divided, namely 400 for Natural Sciences and 600 for Human Sciences. These two ESS values are respectively represented by S_N and S_H . The two ESSs for year n are determined by means of a projection formula based on the ESS for year $n-2$ and $n-3$. The projection formula takes into consideration the fact that the most recent FTE student numbers available in year $n-1$, when the state budget for year n is drafted, are for year $n-2$. The projection formula provides protection against widely fluctuating ESS.

Research output (indicated by A), measured in terms of units calculated by the former Department of National Education on the basis of approved publications (in the form of articles, patents and books for the subject specialist), also generates subsidy (over and above the so-called blind research provision component based on S_N and S_H) to universities.

The SAPSE formula can be broken down into more than one hundred components, according to HE activities (Programme Classification System (PCS) in SAPSE system) and HE expenditure categories. It is thus a much more refined formula than the Holloway and Van Wyk de Vries formulas. Only a simplified/summarised version of this detailed formula is discussed here, starting with the formula as the product of three factors, namely:

$$F(SAPSE) = a.g.R$$

where

- $a =$ Scale factor in the subsidy formula, known as the *a factor*, (with a equal to or smaller than 1) representing the capacity of the state to fund the subsidy formula.
- $g =$ Government contribution ratio, based on a sliding scale, to ensure a significant institutional contribution (mainly from tuition fees) to the institutional budget.
- $R =$ Total (theoretical) amount needed by a university to function in a specific year. It can be summarised as follows:

$$R = B_N S_N + B_H S_H + D_N I_N + D_H I_H + E_1 L + E_2 M + F_1 V + F_2 W + H.A + J.X + K.Y$$

Provision is made in the formula for additional equipment and library collections for institutions if one or both the projected S_N or S_H in year n increases to a level or levels exceeding the previous maximum values of S_N or S_H . I_N and I_H are the growth in S_N and S_H above the previous highest values. This was a new and very important principle in HE formula funding.

R also includes subsidy components for maintaining the institutional housing (mainly hostels) infrastructure (buildings, furniture and equipment) and providing for new furniture and equipment when FTE students using institutional housing L and the FTE students not using the housing M increase. V and W are the respective growth in L and M above their respective previous highest values. The inclusion of residential and non-residential students as input parameter to the subsidy formula was also a new principle in HE funding.

For institutions with veterinary science training (only University of Pretoria since the amalgamation of the two faculties of Veterinary Science at Medunsa and Pretoria in the middle 1990s), the number of experiential training students X and the increase in these students above the previous maximum Y also generate subsidy.

The coefficients in the R formula, namely $B_N, B_H, D_N, D_H, E_1, E_2, F_1, F_2, H, J$ and K are all linear functions of 10 cost units $C1, C2, \dots, C10$ that relate to current or fixed asset expenditure and reflect unit costs of specific types of expenditures of HE institutions in the funding year. The cost units are:

- $C1$ = remuneration of instruction/research personnel
- $C2$ = remuneration of other personnel (all personnel excluding instruction/research personnel and service workers)
- $C3$ = remuneration of service workers
- $C4$ = supplies and services
- $C5$ = building and other land improvements
- $C6$ = equipment
- $C7$ = books (Human Sciences)
- $C8$ = books (Natural Sciences)
- $C9$ = journals (Human Sciences)
- $C10$ = journals (Natural Sciences)

Since the above-mentioned cost units were updated annually by means of projections based on nationally determined indicators to provide for cost escalation at universities, the SAPSE formula is self adjusting from year to year as far as inflation is concerned. It is important to note that, with the implementation of the SAPSE formula for universities in 1984, State subsidisation was for the first time not only based on input parameters, but also on institutional output, namely courses successfully completed by students (degree credits) and research output of personnel.

The fact that the SAPSE subsidy formula was a linear function of the ESS and that great emphasis was placed on the provision of new fixed assets on account of growth in the ESS led to a significant decrease in the a value for the university sector and in the respective a values for individual institutions during the years 1986 to 1992 (See Table B.1 of Appendix

B in this regard). The reason for this was that some universities' FTE students increased annually at a very high rate owing to increasing enrolments. Apart from the decrease in the a-value for the university sector as a whole, the government was also forced to introduce unequal a-values for institutions. This effectively suspended the formula temporarily and led to an acknowledgement at the time by the government that the SAPSE subsidy formula has an unforeseen negative consequence, namely, to provoke unrealistically high student growth. The revision of the formula in 1993 mainly addressed this problem. Apart from the downscaling of some coefficients in the SAPSE formula, ceilings to the annual growth in student numbers to be subsidised were set for both contact and distance education students.

2.1.7 Revised SAPSE subsidy formula for universities (1993) – As a result of the aforementioned problems with the SAPSE formula of 1984 and other criticisms with some aspects of the formula, a revision of the formula was undertaken by the Advisory Council for Universities and Technikons (AUT) in 1991. The approved revised formula was used for the first time to calculate university subsidies for the 1993/94 financial year. A complete exposition of the revised SAPSE formula for universities is set out in the report NASOP 02-325 (92/11) of the Department of National Education (1992). The most important alterations of the 1984 formula were:

1. The subsidy per ESS in the Natural Sciences was increased relative to the subsidy per ESS in the human sciences.
2. The subsidisation of new fixed assets based on growth in the ESS in both the two science groups was decreased significantly.
3. The projection formula for the ESS was revised in such a way that as far as current expenditure was concerned, only an annual increase in ESS of 2.5% for contact tuition and 5% for distance tuition would be subsidised. This alteration ensured that the state was no longer liable for the funding of irresponsible growth in the university sector. It also paved the way for equal and stable a-values from year to year. This stability can be seen in Table B.1 of Appendix B.

The SAPSE subsidy formula for universities as revised was used unaltered by the state for 11 years from 1993 to 2003.

2.1.8 The SAPSE subsidy formula for technikons (1987) – Since technikons' organisational and operational systems showed many similarities to universities, the Minister of National Education decided in 1987 to use an adapted (scaled down) version of the SAPSE subsidy formula for universities to subsidise technikons. Report NATED 02-131(89/01) of the Department of National Education gives a complete exposition of the formula developed in 1987. This development came naturally since the technikons had at that stage already submitted information to the Department of National Education according to the SAPSE information system for technikons. Apart from the necessary

changes to provide for the technikons' different qualification structure the information submitted by the technikons was similar to the information submitted by universities.

The most important difference between the SAPSE formula of 1984 for universities and the SAPSE formula of 1987 for technikons was in respect of the (non earmarked or so-called blind) research allocation. The provision of instruction/research personnel for technikons in respect of research was fixed at only one third of the corresponding provision for universities. Some other provisions as far as research was concerned were also lower for technikons than for universities. The net result of this adjustment was that the allocation from the subsidy formula for technikons amounted to about 82% of the formula allocation for universities for the same ESS. An adapted measure for the calculation of high level research output of technikons was also applied as part of the SAPSE formula for technikons. This factor came into effect in 1992.

2.1.9 Revised SAPSE subsidy formula for technikons (1993) – Following criticism against various aspects of the SAPSE subsidy formulas for universities and technikons, but also criticism from the technikons sector on the large discrepancies that existed between the SAPSE formulas for universities and technikons, a revision of the SAPSE subsidy formula for technikons was undertaken jointly with the revision of the SAPSE formula for universities by the AUT in 1991. The approved revised formula for technikons was first used for the 1993/94 financial year. A complete exposition of the revised SAPSE formula for technikons is set out in the report NATED 02-326 (92/11) of the Department of National Education (1992). The most important changes of the 1987 formula were:

1. The subsidy per ESS in the Natural Sciences was increased relative to the subsidy per ESS in the Human Sciences.
2. The subsidisation of new library collections based on growth in the ESS was decreased significantly.
3. The provision for the replacement and renewal of equipment based on the ESS was increased.
4. The provision for the replacement and renewal of library collections based on the ESS was decreased.
5. A new mechanism (based on estimates of the per capita annual income of students' families) to determine the government contribution ratio g for each technikon was implemented.
6. The projection formula for the ESS was revised in such a way that as far as current expenditure was concerned, only an annual increase in the ESS of six per cent for contact tuition and eight per cent for distance tuition would be subsidised. These higher allowable growth rates of technikons in comparison with universities (See Subsection 2.1.7) were the result of a deliberate attempt by government to increase the size of the technikon sector relatively to the size of the university sector. The higher growth in the

technikon sector than the university sector during the years 1993 to 1998 can be partly ascribed to these differential growth rates. Under the revised SAPSE formula for technikons the values of the annual allocated subsidies to institutions were, as was the case for universities, equal and stable. See Table B.1 of Appendix B in this regard.

7. The subsidy formula was enriched to provide for experiential (cooperative) learning in the technikons sector.

The SAPSE subsidy formula for technikons as revised was used by the state for 11 years from 1993 until 2003.

2.1.10 Earmarked funding during 1984 to 2003 – Apart from the state's subsidy allocations by means of a formula, as described above, the following expenses of universities and technikons were funded separately per institution in an earmarked way during the years when the SAPSE formulas were used as primary source of public funding of universities and technikons –

capital projects (including the subsidisation of interest and redemption): Earmarked funding for the acquisition of land, for new buildings and for land improvements other than buildings. The policies in this regard will be discussed in Subsection 2.1.12 in more detail.

municipal assessment rates: As a result of various factors, the most important being that there were vast differences in the value of the land owned by HE institutions, these rates were always (until the implementation of the NFF when subsidy in this regard was terminated) paid in full by the state upon receiving the actual accounts from institutions.

NSFAS: The National Student Financial Aid Scheme was established in 1995. The NSFAS was administered by the Tertiary Education Fund of SA (TEFSA) which was founded in 1991 as a not-for-profit company to provide loans to HE students. In 2000 TEFSA was reconstructed by law as the NSFAS. Since 1995 the state has annually made earmarked allocations for NSFAS to each HE institution. This will be discussed in more detail in Section 2.4, as well as in Section 3.1.4.

redress funding: Amounts of respectively R28m, R60m and R30m were allocated in 1998/99, 1999/00, and 2000/01 to universities and technikons for redress purposes. While all HDIs benefited from the 1998/99 redress allocation of R28m, the division of the allocations for 1999/00 and 2000/01 was not disclosed in the DoE's official budget documents.

incorporation of Teacher Training Colleges: Ad hoc allocations for the incorporation of colleges were made available to HE institutions incorporating these colleges in 2001/02 and 2002/03. These allocations were inter alia for institutional compensation for the low class fees traditionally paid by teacher training students.

other earmarked allocations: These allocations entailed inter alia payments for motor vehicle schemes for medical specialists on the payroll of some institutions, leave gratuity payments and the amalgamation of the two faculties of Veterinary Sciences at the University of Pretoria and Medunsa. The total amounts varied from year to year, but were relatively small in comparison with other earmarked amounts.

The total earmarked funding for universities and technikons, as a percentage of total state funding of universities and technikons, has decreased from 15.6% in the 1996/97 financial year (which was an indication of the established level) to 10.0% in 1997/98.

This was mainly a result of the termination of allocations for the purpose of the erection of new buildings at institutions. Although there was some increase in the allocation of earmarked funding during the next 3 years it declined gradually to 10.3% in 2003/04 if the college incorporation and institutional restructuring allocations are disregarded. This trend was not in accordance with WP3 which stated that earmarked funding as a percentage of total state funding to universities and technikons should increase to levels well above the 1996/97 level of almost 16%.

Apart from the redress allocations referred to above some allocations were also made by the Department of Education to institutions with specific (ad hoc) financial problems during the post-1994 period. These allocations were made from savings on the higher education budget by the Department and represent an ad-hoc form of institutional redress. No information is available on these presumably small amounts.

2.1.11 The funding of teacher training colleges – Until 2001, the funding of teacher training colleges was the responsibility of provincial education departments. Different funding models for these colleges were used by the respective provincial departments, mostly based on the assessment of the individual needs of the colleges. During the 2001/02 and 2002/03 financial years, the teacher training college sector was incorporated into the university and technikon sectors. This incorporation has increased the HE sector by about 12 000 ESS.

2.1.12 Public funding of land, buildings and land improvements other than buildings at HE institutions since 1951 – State support for the erection of new buildings, land improvement other than buildings, as well as the acquisition of land (all jointly referred to as capital expenditure) at universities since the 1950s was by means of earmarked allocations. It was completely separated from the subsidy formula funding, as discussed earlier in this Section. A summary of the history of the subsidisation of capital expenditures at universities is given below. For a more detailed version of the subsidisation of capital expenditure during the pre-1997 period see Steyn and Vermeulen (1997).

Until 1955, capital expenditure at universities was subsidised at a rate of 50% for academic buildings and 30% for buildings for institutional housing (mainly residences). As a result of the proposals by the Holloway Commission the National Treasury approved that the state can subsidise building projects (including residences) at universities on a pound for pound basis if private donations are available. In the case of insufficient donations, the state would annually subsidise 40% of the interest and redemption on the private building loans of universities. Since the other 60% of loan service cost could be discounted within the standard provision of the Holloway formula, the effective state subsidisation of the servicing of long term private building loans of universities was calculated to be about 82%. In the light of this anomaly, the pound for pound basis of subsidisation of capital expenditure was terminated by the state in 1961. In 1964, a fixed subsidisation ratio of 50% was implemented on interest and redemption of long term private loans for the erection of residences, while a corresponding fixed ratio of 85% for academic buildings was implemented in 1967. With the exception of the long term private loans of the historically disadvantaged universities, these two contribution ratios stayed intact, and were also applied to technikons until 1991 when the system of the subsidisation of payments of interest and redemption on long term loans of HE institutions by the state was replaced by a system of direct capital allocations for the erection of new buildings and land improvements other than buildings. Historically black universities were established in the 1970s and the erection of their buildings were initially subsidised on a 100% basis until the rates of 85% and 50% were also phased in for these institutions in the early 1990s.

The approval of capital projects of universities (and the consequential issuing of state guarantees to ensure the securing of long term loans by institutions) by the Minister of National Education was on the advice and prioritisation of the projects by the Advisory Council on Universities (ACU), replaced in 1983 by the University and Technikons Advisory Council (AUT). A comprehensive system of space and cost norms for new buildings and land improvements other than buildings (parking areas, open air recreation areas, streets, pavements, landscaping, etc.) was developed in 1979 and adjusted in 1985 (Department of National Education, Report SAPSE-101 (1985)). Separate space and cost norms applied to universities and technikons and differed also for residential and non-residential institutions. These norms ensured that new buildings erected at HE institutions satisfied minimum space requirements, but at the same time were not so luxurious that they were unaffordable for the institutions and the state. These norms also formed the basis of the annual SAPSE information returns by universities and technikons to the Department of National Education up to 1998 on the utilisation of space. The space and cost norms for new buildings and other land improvements were revised by the Department of Education in 1996 but never officially published. In the revision the norms for universities were scaled down by about 20% and equality between universities and technikons was established to a large extent. Since the termination of the SAPSE information system in 1998 institutional space utilisation information is no longer required by the Department of Education.

To ensure a just and equitable system of allocations for capital projects the so-called capital provision formulas for the erection of new buildings and other land improvements for universities and technikons came into effect in 1987. According to these formulas, institutions earned building cost units as a result of an increase in the projected ESS. A distinction is drawn in the formula between cost units for the educational and general programmes (activities) on the one hand and the auxiliary enterprises programme (mainly residences for students) on the other hand. This capital provision formula complements the SAPSE subsidy formulas that, as part of their allocations, provide for the maintenance of buildings and other land improvements at universities and technikons.

In 1987, an important investigation into the backlogs and surpluses in buildings (separately for the education and general programmes and the auxiliary enterprises programmes) was done by the AUT. The establishment of the technikon sector in the 1980s, as well as the diverse policies in the improvement and funding for buildings at universities since 1910 made such an investigation necessary to ensure a level playing field as far as the provision of funds for buildings at all higher education institutions was concerned. Table B.2 of Appendix B contains the results of the investigation of 1987. The backlogs and surpluses are given in terms of so-called building cost units, a measure independent of time or currency. The consequence of the 1987 investigation and the annual application of the capital provision formula since 1987 was that only the institutions with large backlogs in buildings and other land improvements were entitled to take up state approved long term loans or, from 1991, to receive direct capital allocations from the state for the erection of new buildings and other land improvements. With the exception of the contractual responsibility to make annual capital allocations to the University of Pretoria in respect of their new academic hospital until 2003/04, no capital allocations to HE institutions for the erection of new buildings were made by the state since the 1996/97 financial year. The subsidisation of interest and redemption on state guaranteed long term loans taken up before 1 April 1991 on the 85%- or 50%-basis is, however, still continuing, until these loans are paid off. Subsidy amounts for this purpose obviously decrease annually.

Following the recommendation by the NCHE, WP3 (par 4.57) states that one of the categories for earmarked funding in HE is capital works. We quote:

The expansion and diversification envisaged for the HE sector requires new capital works projects. The existing capital stock needs to be adequately managed, efficiently utilised and maintained. Funding for capital works will be contingent on institutions developing a capital management plan which describes the total floor area, its condition and usage, its replacement value, and planned expenditures for maintenance and refurbishment and cash flow requirements for new construction projects.

Contrary to this undertaking in the White Paper, no provision is made in the NFF for the funding of new buildings and land improvements other than buildings. As part of earmarked funding, the state will, however, fulfil its obligation in subsidising the interest

and redemption payments (presumably still at the 85%- and 50%-basis) of HE institutions regarding state guaranteed long term loans taken up by institutions before 1 April 1991. The status of the revised space and cost norms of 1996 is unknown since the Minister of Education has since their approval shown no interest in either funding new capital projects at HE institutions or in upholding minimum standards in respect of new buildings erected at HE institutions from their own funds. The annual calculation of the so-called cost unit balance sheet, indicating the annual backlogs and surpluses in buildings at HE institutions, was presumably deemed unnecessary by the DoE and was discontinued in 2000. Table B.2 of Appendix B shows the most up to date calculations of surpluses and backlogs at HE institutions, namely, for 1999. The surpluses/backlogs for 1990 and 1994 are also shown in Table B.2. All the calculations in Table B.2 were still done on the basis of the 1985 space and cost norms. No official recalculation in terms of the new space and cost norms has yet been done. Such a calculation will substantially decrease the size of the total backlogs in HE. In terms of the unrevised norms the state's contribution to eliminate the backlog of 2 176 471 cost units that existed in 1999 (See Table B.2), would have been almost R7 billion (in constant 1999 prices).

The utilisation of the cost unit balance sheet as a management instrument by the state had been severely hampered by the fact that with the incorporation of the universities and technikons of the former TBVC states into the RSA higher education system in 1994, no official investigation was undertaken into the backlogs and surpluses in buildings at these institutions. The possible needs of these institutions, as far as physical facilities are concerned, in terms of cost units based on the space and cost norms, are therefore still unknown.

The possible astronomical cost associated with the elimination of the backlogs in buildings and other land improvements at universities and technikons makes it important to determine the actual situation at each institution. The newest information (for 1999), gathered from the cost unit balance sheet, is unreliable in many aspects since:

- The cost unit balance sheet does not reflect the fact that most institutions have erected many new buildings from their own funds since the base line position for backlogs and surpluses had been determined in 1987. The balance sheet was adjusted annually by only taking account of building needs (according to the capital provision formula) of institutions and the actual capital allocations by the state to institutions.
- As the SAPSE requirement of the reporting of space utilisation at universities and technikons was terminated in 1998, whole teacher training college campuses were transferred to some HE institutions. The effect of these additions and the possible enhancement of big inequities in an already skewed distribution of building stock in HE is therefore totally unknown.
- There was a 16% increase of FTE student numbers at universities and technikons from 1999 to 2003. No allocations for new capital projects have been made since 1996.

- As indicated above, the space and cost norms for new buildings and other land improvements were revised by the Department of Education in 1996. Backlogs and surpluses calculated by means of the revised norms will lead to different numbers than these appearing in Table B.2 of Appendix B.
- Although the space and cost norms for contact and distance education differs, the proliferation of types of instructional modes for both contact and distance education will have a definite impact on space utilisation.

Many buildings at institutions are totally run down as a result of poor or completely absent institutional building maintenance strategies. The funding of the maintenance of the buildings forms part of the subsidy allocations to institutions. Since the subsidies are block grants, building maintenance is usually not a priority for most institutions (compared, for instance, to the remuneration of personnel).

It is clear that, if deemed necessary for the state to once again become involved in the funding of new capital projects (e.g. after the HE merger exercise has been completed) or if the state wants to guard the public against the erection of inferior buildings at HE institutions, it would be very difficult to pick up the threads of the very sophisticated and broadly accepted past system of capital project funding at HE institutions. A body like the HEQC will in future without doubt, as part of its institutional audits, have to express a view on the necessity for the state to play a more active role in the funding of capital projects or at least to maintain minimum building standards for physical facilities at HE institutions.

2.2 THE NEW FUNDING FRAMEWORK (NFF) FOR PUBLIC HIGHER EDUCATION

2.2.1 Background – On 9 December 2003, the new funding framework for higher education institutions was published in terms of the Higher Education Act, No. 101 of 1997, in the Government Gazette (No. 1791). The new funding framework was implemented in the 2004/2005 financial year. The documentation made available by the Ministry of Education to Vice Chancellors on 5 December 2003 comprised:

1. funding of Public Higher Education, the formal policy framework; and
2. a statement on Higher Education Funding 2004 to 2006, which explains how the higher education budget will be divided, including an appendix indicating the implementation of the Migration Strategy for 2004/05 to 2006/07.

The introduction of the NFF completed a very long and arduous process of developing a new formula which started with the funding proposals of the National Commission on Higher Education (1996), followed by the refinement of these proposals in Chapter 4 of WP3 (1997). During the following 6 years a large number of investigations into various funding models (within the broad framework defined by WP3) were commissioned by the Department of Education, by SAUVCA and the CTP, as well as by some NGOs. The different models were fervently debated by experts, SAUVCA, the CTP and other HE

stakeholders until the first draft funding framework was published for comment in March 2001 by the Department of Education. The final (policy) version of the NFF, to be implemented during three 'migration' years differs significantly from the draft published in 2001. In all probability some further significant changes in the NFF will be effected after the three migration years have expired, namely with effect from 2007/08 onwards. A document titled *Student Enrolment Planning in Public Higher Education* of the Department of Education was released for discussion by the Minister of Education on 29 March 2005. In this document, it is proposed that the NFF should for an interim period of three financial years, namely, 2006/07 to 2008/09, be substantially adjusted in order to help curb the high growth rate experienced in HE since 2001. Some policy changes based on this document will be discussed in more detail in Section 2.2.2.

Since the NFF was widely debated after it was published in the Government Gazette, a detailed outline of the formula is not included. A very useful summary of the underlying philosophy, context and composition of the NFF can be found in a presentation by the Department of Education to the Portfolio Committee on Education on 24 August 2004. Some extracts from this presentation are given below:

- *"The central premise that underpins the policy framework for the transformation of higher education in Education White Paper 3 (A Programme for the Transformation of Higher Education (July 1997)), is that the higher education system must be planned, governed and funded as a single national co-ordinated system.*
- *the emphasis on planning is informed by the fact that if the higher education system is to respond to the national development agenda in terms of access, redress and human resource development needs, the size and shape of the system cannot be left to the vagaries of the market, in particular, uncoordinated institutional decisions on student enrolments and programme offerings.*
- *In the market model, the role of the Government is limited to funding student demand and to correcting any market failures that may occur. However, under apartheid the market model itself was distorted by ideological factors, which restricted and constrained institutional and student choices and decisions.*
- *The higher education system therefore needs to be steered to meet national goals and priorities through a combination of instruments, namely, planning, funding and quality assurance. The role and inter-relationship between these three instruments is outlined in the diagram (Figure 2.2) below.*
- *The planning model of higher education funding therefore involves three steps; (i) the Ministry determines national policy goals and objectives; (ii) institutions develop three-year rolling plans indicating how they intend to address the national goals and objectives; (iii) interaction between the Ministry and institutions resulting in the approval of institutional plans, which would be the trigger for the release of funds based on the quantum of funds available".*

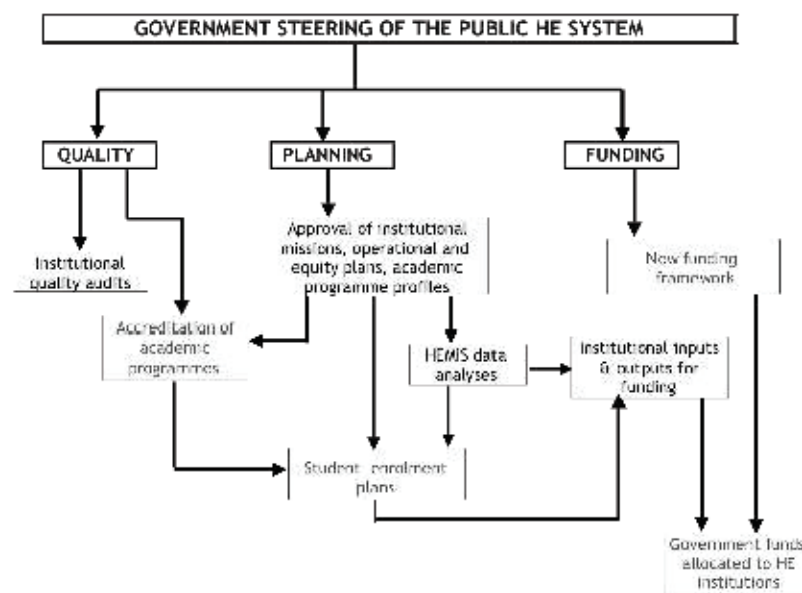


Figure 2.2: The system of government steering of the public higher education system

2.2.2 The implications and structure of the NFF – According to the Department of Education the new framework is goal-oriented and performance-related, which distributes government grants to institutions in line with national goals and priorities and approved institutional plans. According to the Department, the NFF departs from the assumptions of the old SAPSE formulas in two key respects:

- *"The size and shape of the higher education system cannot be determined by student demand and institutional decisions alone.*
- *The starting point for determining the allocation of funds cannot be institutional costs. In the old formula, the allocation of funds was linked to the generation of an 'ideal income' for individual institutions based on the determination of actual costs, irrespective of affordability criteria or whether the costs are linked to the principal activity of higher education institutions, that is, teaching, research and community service."*

The DoE stressed in its presentation to the Portfolio Committee that the funds allocated to institutions are not designed to meet specific kinds or levels of institutional costs, but are intended to pay for the delivery of teaching and research-related services and outputs linked to approved institutional three-year 'rolling' plans.

According to the DoE, the fact that costs are not the starting point of the model does not mean that they are unimportant or that it would not be possible to determine the underlying

unit costs underpinning institutional activities. It is critical for institutions to monitor costs, as it is their responsibility to decide how they design and manage their academic activities with the available funds.

The NFF has two main elements. Firstly, block grants, which are undesignated amounts to cover the operational costs of higher education institutions linked to the provision of teaching and research-related services. Secondly, earmarked grants, which are designated for specific purposes.

Block grants for year *n* are based on student numbers and institutional outputs in year *n-2* and consist of four subcategories. The four categories are discussed briefly:

i. Teaching input grants (64.1% of total block grant for 2004/05)

This grant for year *n* is based on 'approved' FTE enrolled students in year *n-2* weighted according to funding group and course level as indicated in Table 2.1. The funding groups are defined in terms of the 22 CBSM categories as set out in Table 2.2.

The weights in Table 2.1 (the so-called funding grid) represent an approximation of relative costs that were determined by a SAUVCA/CIP task team in a study of HE institutions' expenditures in 1997. The approved FTE students of a HE institution in year *n-2*, classified according to the funding groups and the course levels into 16 cells can be converted to a single figure, the total teaching input units, by multiplying the FTE students in the 16 cells by the corresponding weights of Table 2.1 and then aggregating the 16 products. The rand value of one teaching input unit for 2004/05 was about R6 300.

Table 2.1: Weighting factors for teaching inputs: 2004/05 to 2006/07

Funding group	Course level							
	Undergraduate & equivalent		Honours & equivalent		Masters & equivalent		Doctoral & equivalent	
	Contact	Distance	Contact	Distance	Contact	Distance	Contact	Distance
1	1.0	0.5	2.0	1.0	3.0	3.0	4.0	4.0
2	1.5	0.75	3.0	1.5	4.5	4.5	6.0	6.0
3	2.5	1.25	5.0	2.5	7.5	7.5	10.0	10.0
4	3.5	1.75	7.0	3.5	10.5	10.5	14.0	14.0

Table 2.2: Funding groups 2004/05 to 2006/07

Funding group	CESM categories included in funding group
1	07 Education, 13 Law, 14 Librarianship, 20 Psychology, 21 Social Services/Public Administration
2	04 Business/Commerce, 05 Communication, 06 Computer Science, 12 Languages, 18 Philosophy/Religion, 22 Social Sciences
3	02 Architecture/Planning, 08 Engineering, 10 Home Economics, 11 Industrial Arts, 16 Mathematical Sciences, 19 Physical Education
4	01 Agriculture, 03 Fine and Performing Arts, 09 Health Sciences, 15 Life and Physical Sciences

ii. Research output grant (13.1% of total block grant for 2004/05)

The research output units of an HE institution for year $n-2$ are determined in the following way –

$$\text{Research output units} = \text{DE approved publication units} + \text{Research masters graduates} + 3 \times \text{Doctoral graduates}$$

By using norms of 1.25 and 0.5 for the research output units per permanently appointed instruction/research staff member for universities and technikons, respectively, each HE institution's actual research output units per staff member for year $n-2$ determines whether the institution is under performing as far as research output is concerned. The state's research output grant for year n is divided into two parts, the bulk being distributed among all institutions according to their actual research output in year $n-2$ and a research development grant being distributed only among institutions that under performed in research in year $n-2$. The size of the under performance determines these development grants.

iii. Teaching output grant (16.0% of total block grant for 2004/05)

Teaching output units of an HE institution in year $n-2$ are determined by weighing the number of qualifications awarded in year $n-2$ according to the weights in Table 2.3 before aggregating the products.

The teaching output benchmarks given in Table 2.4, each HE institution's actual teaching output units in year $n-2$ is compared with the normative output (norm $\times$ enrolled students) for year $n-2$ to determine whether the institution is under performing in teaching or not. The state's teaching output grant is divided in two parts, the bulk being distributed among all HE institutions according to their actual teaching output and a teaching development grant being distributed only among the institutions that under performed in teaching in year $n-2$. The size of the under performance determines these grants.

Table 2.3: Weighting factors for teaching outputs

Type of qualification	Weight
1st certificates and diplomas of 2 years or less	0.5
1st diplomas and Bachelor's degrees: 3 years	1.0
Professional 1 st Bachelor's degree: 4 years and more	1.5
Postgraduate and post diploma diplomas	0.5
Postgraduate Bachelor's degrees	1.0
Honours degrees/higher diplomas	0.5
Non-research Master's degrees and diplomas	0.5

Table 2.4: Graduation benchmarks for contact and distance programmes

Qualification type	Contact	Distance
Undergraduate: up to 3 years	22.5%	13.5%
Undergraduate: 4 years or more	18.0%	9.0%
Postgraduate: up to Honours	54.0%	27.0%
Postgraduate: up to Master's	30.0%	22.5%

iv. Institutional factor grants (6.7% of total block grant for 2004/05)

Three categories of institutional factor grants are allocated:

A: Grant for disadvantaged students

Within the context of the NFE, disadvantaged students are defined as African and Coloured students. All HE institutions with more than 40% disadvantaged students (calculated by taking only the FTE contact education student enrolments) in year $n-2$ will receive this grant in year n . A disadvantage factor value between 0 and 0.1 is determined for each institution as follows –

- % disadvantaged students smaller or equal to 40%: Factor = 0
- % disadvantaged students equal to or larger than 80%: Factor = 0.1
- % disadvantaged students larger than 40% but smaller than 80%: Factor increases linearly from 0 to 0.1.

The grant for disadvantaged students for an institution in year n is calculated as the disadvantage factor for the institution multiplied by the teaching input grant for the institution.

B: Grant related to the size of the institution

The principle involved here is that economies of scale are evident when the FTE student enrolment (unweighted contact plus distance students in year $n-2$) is increasing. A size factor varying between 0.15 and 0 is determined for each institution as follows –

- size of institution smaller or equal to 4 000: Factor = 0.15
- size of institution equal to or larger than 25 000: Factor = 0
- size of institution larger than 4 000 but smaller than 25 000: Factor decreases linearly from 0.15 to 0.

The grant for the size of the institution in year n is calculated as the size factor for the institution multiplied by the teaching input grant for the institution

C: Grant for multi-campus institutions

It is indicated in the Statement on Higher Education Funding: 2004/05-2006/07 of the Minister of Education (2004) that a grant will be devised to assist institutions that are required to deliver teaching services on more than one official campus. This grant is especially important for the newly merged/incorporated institutions. Presumably this grant will be introduced in the allocations to HE institutions for 2007/08 when the migration period for the new formula has expired.

Apart from the block grants discussed above earmarked grants are also allocated by the NFF. These allocations are for specific or designated institutional purposes. In 2004/05 earmarked funding represented 13% of the total HE allocations to institutions. The earmarked categories are (the percentage in brackets represent the contributions of the respective categories to the total earmarked amount in 2004/05):

- the National Student Financial Aid Scheme (NSFAS) (44.1%);
- teaching (including foundation programmes), research and community development (independent of the teaching and research development block grants) (6.5%);
- interest and redemption payments on loans approved and guaranteed by the state before 1991 (11.1%);
- institutional restructuring, including mergers and the re-capitalisation of institutions (38.3%); and
- the higher education quality assurance framework (0%).

After the applications of the NFF for the 2004/05 and 2005/06 financial years, it has become evident that the combined effect of the high growth rate in student enrolments in HE since 2001, the big differences between the growth in enrolments at institutions, as well as the relatively low but constant state funding (in terms of the percentage of GDP) of HE (See Section 3.2 for a complete analysis) is that the real funding per teaching input unit decreases annually. In a first step towards solving this problem growth caps on 'funded' FTE student enrolments for 2003 (5% for contact students and 3% for distance students) were imposed by the Minister of Education in respect of the 2005/06 block grants to HE institutions. This was followed by a rather radical strategy proposed in March 2005 in the discussion document on student enrolment planning in

public higher education referred to in Section 2.2.1. This strategy entails the freezing of the institutional shares of the total teaching input units for 2003 (used for the 2005/06 block grants) for the application of the NFF for the financial years 2006/07 to 2008/09. Furthermore differential growth caps on 'funded' student enrolments of HE institutions until 2009 were also proposed in the document. An average allowable annual increase in funded enrolled students (both for FTE students and head count of students) in the HE system for the years 2005 to 2009 will, according to this proposal, only be 0.6%. The Statement on Higher Education Funding: 2005/06-2007/08 of the Minister of Education has indicated that the freezing of the institutional shares of total teaching input units will be imposed for the 2006/07 HE allocations. The NFF will therefore, after a short life span of only two years, effectively be suspended for 2006/07 and possibly also for the years 2007/08 and 2008/09. As far as the further capping of FTE student numbers are concerned, the Ministerial Statement on Enrolment Planning (September 2005) indicates that apart from the implicit capping on student growth in 2004 by freezing the institutional shares of teaching input units on the 2003 level, no direct capping of FTE enrolments will apply for 2005 and 2006. Funded head count and FTE student totals will, however, be determined for each HE institution for the period 2007 to 2009. This will be done during 2006 in consultation with each institution.

2.2.3 A critical analysis of the NFF – An analysis of the NFF shows that many of the characteristics of the SAPSE subsidy formula (and even some of its predecessors) have been retained in this formula. FTE student enrolments as primary input parameter, as well as student output (degrees) and research output (publications) are the main drivers of the NFF. These parameters were also the building blocks of the SAPSE formulas, although student success, in the form of degree credits, as a measure of teaching output had more emphasis in the SAPSE formulas. The differentiation in the NFF of FTE students according to four funding groups compared to the two funding groups used in the SAPSE formula has broad support and is a definite improvement on the SAPSE formulas.

Some important omissions in the NFF when compared with the SAPSE formula are: no funding for residence students; no funding (for additional fixed assets) in the case of student growth; no funding for experiential training (Veterinary Sciences) at the University of Pretoria; and no funding of capital projects. The effect of these omissions will without doubt become clear over the next few years. Especially the abdication of the state in subsidising new buildings at HE institutions may have far reaching consequences. This was already discussed in Section 2.1.12.

Critique against especially the economic/philosophical basis of the NFF, but also some other characteristics of the NFF has been expressed by many stakeholders. Some typical comments extracted (and summarised) from SAUVCA's official response on the NFF (April 2004) illustrate this point:

- One of the basic assumptions of the economic model underlying the SAPSE subsidy formulas is that students are the best judges of their own welfare and therefore are best placed to decide what study programmes to follow. Accordingly, the SAPSE formulas were enrolment driven with funds following students as they enrol at institutions of their choice. The NFF is based on central enrolment planning via approved institutional enrolment plans. Unfortunately, no clearly articulated theoretical basis is provided for the NFF. Although in some respects it is orientated towards the market model, particularly in its emphasis on outputs, i.e. the graduates needed by the economy; in other respects it is simply a mechanism for dividing the pool of funds that the National Treasury has provided.
- The SAPSE formulas were based on the assumption that university and technikon autonomy is an essential ingredient of a successful higher education sector – an approach supported almost universally. The SAPSE formulas were therefore constructed as a method for providing funding that would ensure an arm's length relationship between government and the university and technikon sectors. According to the NFF the Minister, subject to having engaged in some consultative measures with the HE sector and subject to having sought the advice of the CHE, is given complete freedom to change the values assigned to the NFF's components. The funding of HE will therefore in future be very similar to the funding of government departments.
- Few of the NFF's elements are related to the actual costs incurred by higher education institutions. The running of universities and technikons entails costs and to be efficient subsidies should be related to reasonable costs. The funding grid (teaching input grant) in the NFF weighs the FTE student according to relative costs but, as is also the case with the other three grants of the NFF, serves only as a division mechanism of a predetermined total grant allocation. Furthermore since the NFF is only a distributive mechanism it, in contrast to the SAPSE formula, makes no structured provision for inflation. The Minister of Education can therefore not use the NFF to substantiate the HE needs in negotiating for funds for HE with the Minister of Finance.
- The framework purports to provide incentives for institutions to become efficient, namely by subsidising the outputs of research and teaching. This is done by setting norms for research outputs per member of permanent academic staff and norms for graduation rates. However, the way that these norms are to be applied may have the effect of neutralising the incentives to increase efficiency. This can occur because the money not allocated to 'under-performing' institutions that have not met the norms, will be re-channelled to the same institutions in the form of development grants. The setting of output norms therefore appears to have some effects that seem to be unintentional, and can have a detrimental effect on institutions where more research is done. With the new funding framework, the higher the norms are set, the lower the amounts going to institutions that will meet or exceed these norms. Setting higher standards therefore has the inverse effect: it channels money away from institutions

producing the research that the high standards are supposed to encourage.

- Provision is made for two 'institutional factors' in the new funding framework: subsidies will be paid according to the racial composition of an institution's student body (additional funds will be generated by enrolling more black and coloured students who are South African citizens); and according to the size of the institution (small institutions will receive relatively more funds). An unintended consequence of coupling funding to an institution's demographic composition could be that thousands of black students, enrolled at formerly 'white' institutions, will be funded by government at levels lower than those applicable to their peers at formerly 'black' universities. If this eventually becomes reflected in different levels of fees, the financial incentive of this element of the funding framework, on the one hand, and the stated intention to de-racialise institutions, on the other, will contradict one another. Soon after the advent of democracy in South Africa, government acknowledged that the optimal way to assist indigent students was to establish a National Student Financial Aid Scheme (NSFAS), through which funds are allocated to all needy students, identified with a means test and irrespective of race. It is not clear why the NFF deviates from this salutary principle. Unfortunately, the division of the NSFAS funds among the HE institutions is still based on the racial composition of student enrolments at the respective institutions and not on the actual numbers of students with financial needs. Perhaps it can be argued that this practice and the additional funds can be seen as redress funding. However, this divisional mechanism should change, because although the principle of redress is supported, it should be identified directly, quantified and allocated for a specific period that is agreed upon to be long enough for correcting the inequalities of the past.
- The second institutional factor is the assumption that universities and technikons experience economies of scale as they become bigger. Although it is true that economies of scale exist in distance education institutions, and to some extent in residential institutions, this factor appears to have been overestimated in the new framework. No empirical work has been done to support the assumption of economies of scale, in other words, the assumption that average costs decrease as the size of an institution increases. Before being implemented, the new funding principle requires further study. In other words, empirical cost studies should be undertaken to determine the validity of this assumption and the degree to which such savings actually occur.
- There is a need for a further institutional factor: a multi-campus factor which would apply to those institutions affected by the government's present higher education restructuring programme whereby mergers would be creating large institutions operating on a number of campuses with consequent cost increases for them. The DoE has indicated its willingness to consider developing such a factor. SAUVCA has already proposed a model to this effect.

- The introduction of earmarked funding for the running of so-called foundation programmes is welcomed, although the information provided in the policy documentation from the Department is not clear. No criteria for the allocation of these grants are provided. Because no additional funding will be provided to the higher education sector for doing work that should have been done at the secondary school level, the introduction of earmarked funds for foundation programmes in effect amounts to a decrease in funding for the sector.

It has already been indicated that the revised SAPSE formula was used for 11 years as the instrument of the state to subsidise universities and technikons. Although many criticisms were raised against these formula at the time, it was – during the lifespan of these formula, namely, 1993 to 2003 – possible for institutions to initiate medium and even long term planning (see also Section 2.2.2). This brought a lot of stability in HE as far as funding was concerned. The possible suspension of the NFF after only two years, as proposed in the discussion document of the Department of Education (2005), will terminate most of the institutional planning already undertaken in terms of the NFF since its implementation in 2004/05.

According to the Department of Education's presentation to the Portfolio Committee on Education (2004), the size and the shape of the HE system cannot be left to the vagaries of the market, but should be informed by the human resource development needs of the country. It is of some concern that the newest proposals of the Department entails an effective shut down on HE student growth without any attempt to determine the human resource development needs of South Africa. The only factor taken into account is the presumed allocations to HE under the Medium Term Expenditure Framework for 2005/06 to 2007/08. See Section 5.6 for more analyses in this regard.

2.2.4 Subsidy formulas for HE in South Africa classified according to Jongbloed's two dimensions – The four subsidy formulas discussed in Section 2.1, as well as the NFF, can (very crudely) be classified according to Jongbloed's two dimensional scheme (see Figure 2.1) as shown in Figure 2.3.

The reasons for the classification:

- *Holloway (HF)*: Partly market oriented but basic teaching provision independent of market. Apart from courses offered by institutions no other output measures used.
- *Van Wyk de Vries (vWdV)*: Some state involvement, e.g. centrally determined personnel remuneration. No output measures used in funding.
- *SAPSE (1984)*: Completely market oriented and almost 50% based on output measures.
- *SAPSE (1993)*: Growth restrictions on student growth and almost 50% based on output measures

- *NFF*: Government determines the size and shape of HE. About 30% of funding determined by output measures.

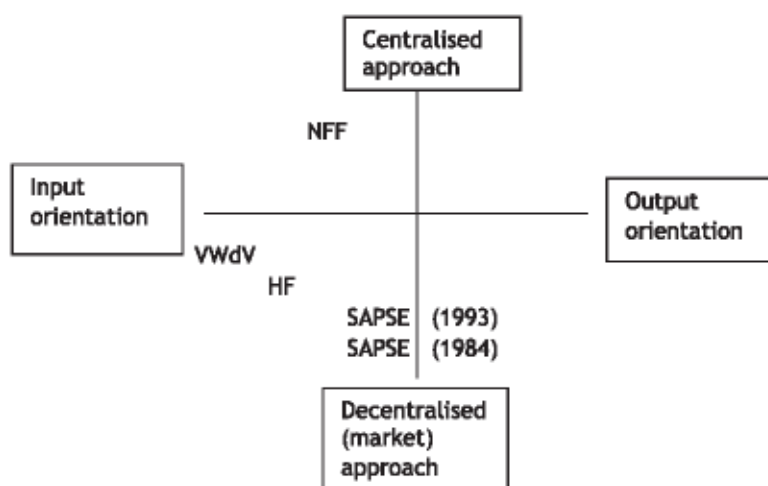


Figure 2.3: Two dimensional positioning of HE funding formulas according to Jongbloed's scheme

2.3 TUITION FEES AND BAD DEBT

As discussed in Section 1.5, cost-sharing is a world wide phenomenon and students have to pay more from own funds for HE than was the case in the past. In sub-Saharan Africa, the principle of cost-sharing has been introduced in quite a few countries (Johnstone, 2003). In some countries like Kenya, Nigeria and Mozambique, it was met with great resistance from students. This may explain why cost-sharing was only partly introduced by a lot of countries. In Ethiopia, a scheme similar to the HECS of Australia was introduced, but many problems were experienced. In many other countries, some form of student loan scheme for tertiary phase students was introduced. Many problems were encountered with these schemes: There seems to be excessive subsidisation with no way in which the cost of these schemes can be recovered. In a number of countries, like Kenya, Tanzania, Ghana and Nigeria, there was almost no cost recovery at all. These problems have been experienced in many countries. In South Africa, research tends to indicate that the NSFAS is working fairly well, although some problems are experienced with students that do not graduate, drop out of the HE system, contact is lost with them and they do not repay their loans. Despite the problems in the NSFAS, it seems to be working better in South Africa than similar schemes in most other African countries. The NSFAS is discussed in more detail in Section 2.4. It is important to first look at the magnitude of student debt in South

Africa, because the main reason for launching the NSFAS project was to enable poor students to gain access to higher education.

For the purpose of this discussion, the HE institutions are again divided into two groups, namely advantaged and disadvantaged institutions. Unfortunately, the financial information of some institutions is either incomplete or clearly wrong and could therefore not be used in this analysis. (See Section 1.7.1 for the classification of HAUs and HDUs and Section 7.1.2 for the classification of HATs and HDTs.) As far as universities are concerned, all the HAUs are included in the analysis, but for the HDUs only the data of Durban-Westville, University of Western Cape, University of Zululand, Vista University, University of the North and University Venda are used (see Section 3.1.2 for a more detailed discussion of data problems), but it still represented more than 70% of WFTE students at HDUs. All the calculations in this Section use the financial data for 2000-2003 as provided by the DoE to the researchers. Take note that student debt may also include outstanding accommodation fees. This, however, should not be so substantial because students normally have to pay boarding fees up front and they pay for food as they buy it.

Table 2.5: The size of accumulated student debt of HAUs in South Africa: 2000-2003 (in Rand)

Year	Student debt	Student debt written off	Student debt as % of tuition fees	Student debt written off as % of tuition fees
2000	-	35 464 000	-	2.4%
2001	404 910 192	36 560 000	22.9%	2.1%
2002	542 358 000	43 963 000	25.8%	2.1%
2003	644 415 712	58 445 000	25.6%	2.3%

From Tables 2.5 and 2.6, it is clear that student debt at universities is a serious problem in South Africa. Most universities nowadays do not publish results of students if they are in arrears with the payment of their tuition and/or residence fees. This practice has improved the situation somewhat, but the outstanding debt is still very high. From 2001-2003 outstanding student fees at HAUs increased from almost R405 million to more than R644 million. Annually, the debt written off has increased from R35.4 million in 2000 to R58.4 million in 2003. As a percentage of total tuition fees, the outstanding student fees and the amount written off as bad debt remained fairly constant over the four years. Although the outstanding student debt is high, the situation at HAUs seems to be reasonably under control.

Table 2.6: The size of accumulated student debt of 6 HDUs in South Africa:
2000-2003 (in Rand)

Year	Student debt	Student debt written off	Student debt as % of tuition fees	Student debt written off as % of tuition fees
2000	-	53 924 000	-	18.6%
2001	148 242 000	59 885 000	54.3%	21.9%
2002	430 100 000	43 639 000	115.0%	11.7%
2003	462 678 000	97 048 306	100.7%	21.1%

The situation at the HDUs (as represented in Table 2.6 by six institutions) is much more serious. Student debt increased dramatically from just over R148 million in 2001 to almost R463 million in 2003. In line with this, student debt written off almost doubled from R53.9 million in 2000 to R97.0 million in 2003. Much more debt is written off in HDUs than is the case with HAUs. When one looks at the outstanding debt as a percentage of tuition fees the picture becomes even bleaker. Currently student debt is equal to one full year's tuition fees. Here one must bear in mind that the debt has increased over many years and is not the outstanding debt of one particular year. It is, however, alarming that outstanding fees of about 21% of annual tuition fees are currently written off as bad debt. In 2003, the student debt per weighted FTE student at HDUs was 2.7 times the corresponding figure at HAUs.

As was the case with the universities when compiling Tables 2.7 and 2.8 not all technikons could be included due to incorrect or missing data. In the analysis of the HATs the following technikons were included: Cape, Free State, Port Elizabeth, Pretoria, SA, and Witwatersrand (representing about 80% of students at HATs). For the analysis of the HDTs the technikons included were Mangosuthu, Peninsula and Border (representing only about 40% of students at HDTs).

Table 2.7: The size of accumulated student debt of 6 HATs in South Africa:
2000-2003 (in Rand)

Year	Student debt	Student debt written off	Student debt as % of tuition fees	Student debt written off as % of tuition fees
2000	9 435 000	3 010 000	2.5%	0.8%
2001	73 260 000	20 471 000	15.6%	4.4%
2002	139 096 000	23 940 000	24.5%	4.2%
2003	170 051 000	28 038 000	29.6%	4.9%

If one compares the outstanding debt of universities and technikons it is clear that the outstanding amounts are much bigger at universities. This may be partly due to university fees that are normally higher than those of technikons. Although outstanding fees are not alarmingly high at HATs, there is a clear rising trend. Outstanding student debt increased from a mere R9.4 million, in 2000 (although the low figure may be due to underreporting) to R170 million in 2003. Student debt written off also increased sharply from R3 million in 2000 to R28 million in 2003. Both student debt as a percentage of tuition fees and student debt written off as a percentage of tuition fees increased rather sharply. Although the size of outstanding debt at HAU's is not alarmingly high the rising trend is a cause for concern.

Table 2.8: The size of accumulated student debt of 3 HDTs in South Africa:
2000-2003 (in Rand)

Year	Student debt	Student debt written off	Student debt as % of tuition fees	Student debt written off as % of tuition fees
2000	16 700 000	1 820 000	21.4%	2.3%
2001	40 619 000	3 467 000	49.6%	4.2%
2002	49 562 000	5 134 000	50.4%	5.2%
2003	60 266 000	6 677 000	48.6%	5.4%

The situation of outstanding debt at the HDTs followed the same trend as was the case at the HATs. Comparable to the university sector the situation at HDTs is rather worse than that of HATs. Outstanding student debt increased from R16.7 million in 2000 to R60.3 million in 2003 and student debt written off increased from R1.8 million to R6.7 million over the same period. Outstanding student debt is currently about 50% of a year's tuition fees, while debt written off increased to almost 5.5% of the tuition fees. In 2003, the student debt per weighted FTE student at HDTs was 1.6 times the corresponding figure at HATs. This is a much lower ratio than for the university sector.

The fact that the outstanding student fees at 26 HE institutions in South Africa, as reported in Tables 2.5 to 2.8 were about R1 337 million in 2003 and followed a rising trend is a reason for grave concern. Using the outstanding student fees per weighted FTE student in 2003 as established by Tables 2.5-2.8, it can be estimated that the total outstanding student fees at HE institutions in 2003 could have been about R1 640 million. Especially at the historically disadvantaged institutions, the picture looks rather bleak. The situation would even have been worse if the state had not started a project to provide funds for students from disadvantaged communities to be able to afford higher education. The NSFAS project was introduced in 1995 and it is discussed in the next Section.

2.4 THE NATIONAL STUDENT FINANCIAL AID SCHEME (NSFAS)

2.4.1 Background – Since the early 1990s, the problem of outstanding student debt was creating the unlikely situation that certain HE institutions in South Africa would be unable to continue with their activities if no solution for this crucial problem could be found. This Section is to a large extent based on a mid-term review of the NSFAS by the European Commission (2000).

The NCHE advocated a national financial aid scheme in its report of 1996. This was also endorsed in WP3. The Tertiary Education Fund of South Africa (TEFSA), established already in 1991 by the Independent Development Trust (IDT) as a not-for-profit company to provide loans to HE students, had the necessary infrastructure to administer the new aid scheme which would be mainly funded by the state. TEFSA was therefore contracted by the DoE to administer the NSFAS. The first state allocation for the NSFAS by the state was made in 1995, as was already mentioned in Section 2.1.10. However, already in 1991, the IDT provided R50 million to TEFSA to be granted as loans to needy students from disadvantaged backgrounds for the 1991 and 1992 academic years. In 1999 the NSFAS was formally established by an Act of Parliament (Act no 56 of 1999). In 2000, TEFSA was reconstituted as the NSFAS - a statutory agency with a board, representing all the major stakeholders in HE in South Africa, appointed by the Minister of Education. The NSFAS is also collecting and allocating donor funding as loans and bursaries for needy students.

The aim of NSFAS is to ensure that all citizens have access to education and training and can afford it. The NSFAS receives allocations from the state but also donations from local and international donors and then provides assistance to disadvantaged students by means of bursaries and loans. The NSFAS functions as an income contingent loan and bursary scheme. This means that loan recipients only start repayments once they are in employment and earning above a threshold level of income. This threshold income level is currently R26 300 per annum. According to CHE (2004: 194), the initial student award is a 100% loan: for 2004 the minimum loan was R2 000 and the maximum loan R25 000. Interest accrues on loans at approximately 2% above inflation ($5\% + 2\% = 7\%$ for 2004). Up to 40% of the loan is converted into a bursary, with the extent of the conversion determined by the student's academic results. Although the bursary portion of the loan does not need to be repaid, the loan component must be paid back and the repayment includes this interest charge of 2% above the inflation rate (based on the previous year's CPI). One of the purposes of the NSFAS is to change the racially skewed composition of the student population in South Africa by providing funds for disadvantaged but deserving students to afford higher education. The need for financial assistance is massive. This can be seen from the fact that in 1996, when the NSFAS was established, 223 000 students applied for loans, but only 70 000 could be assisted.

Since 1996, the TEFSA/NSFAS office has relied on the financial aid offices of the 36 HE institutions to act as local agents in executing the disbursement system. It makes sense because these institutions are in contact with prospective students all over the country.

More specifically, the financial aid offices' tasks are summarised as to:

- administer loans and bursaries granted to students of the institution;
- receive loan and bursary applications forms for students;
- consider and access applications in the light of the criteria (including a prescribed means test) determined by NSFAS for the granting of loans and bursaries;
- grant bursaries and loans if the criteria are met after ascertaining whether or not funds are available;
- enter into a written agreement with a borrower or bursar in accordance with the provisions of the Act and on terms and conditions determined by NSFAS;
- report on the progress made by the borrower at intervals agreed upon by the institution and the NSFAS board; and
- notify the board immediately if the borrower discontinues his/her studies.

According to the NSFAS Act of 1999, any student may apply in writing for financial assistance, but in order to be eligible for a NSFAS loan a student must:

- be a citizen of South Africa;
- be accepted as a registered student at a university or technikon in South Africa when the award was made;
- be studying for a first tertiary qualification; or
- be studying for a second educational qualification provided that this second qualification would enable the student to practice a chosen profession;
- be judged to have the potential to succeed; or
- be regarded as financially needy.

For this process to be successfully undertaken, a means test has to be applied. TEFSA requests HE institutions (as agents) to answer the following fundamental questions:

- Who should be considered responsible for meeting the costs of the applicant's education?
- What sources of income can legitimately be called upon to assist in meeting the applicant's costs?
- Who should be considered to be dependent on the total income of the household of the applicant?
- How much of the available means can be used to help the applicant to meet the legitimate costs of his/her studies?
- What should be considered to be 'legitimate study costs'?

The different HE institutions customised the means test to suit their specific context, but in general it can be summarised in one or more of the following five categories:

- calculations of gross family income with applicants qualifying if their income is below a certain predetermined maximum;

- *per capita* income which takes into account the gross income of the family, but also the number of dependants in that household;
- a points system that takes account of the above, but also takes into consideration if parents are divorced or other dependants in the household are also studying at a HE institution;
- a questionnaire and interview by a skilled interviewer to explore the complexities of the student's background; and
- notional disposable income that takes into account family size, what each member of the household needs to live on and the income available to finance the applicant's studies.

Generally speaking, the decentralised NSFAS scheme is working fairly well although the HE institutions have raised a few concerns. The first was in relation to the distinction between part-time and fulltime students. Normally part-time or distance education students qualify for smaller loans because they can pay for their studies from their own earnings to a larger extent than fulltime students. On average university students received a NSFAS award of R9 596 in 2003, but students studying at Unisa received only R4 604. With technikons, the same difference is experienced. For example, in 2002, technikon students on average received an award to the value of R7 338, but students at Technikon SA only R2 823. All students who previously failed more than once had to enter as part-time students for the purpose of a loan application, while they could still be *de facto* full-time students. This distinction also had implications for distance education students. Some of the distance education students enrolled for more modules/courses than their residential counterparts and the mode of study should thus not be considered when defining a student as part-time or fulltime.

Other problems with the NSFAS are: students with dual citizenship, who try to qualify for NSFAS loans on the basis of their South African citizenship, while there is no guarantee that they will take up employment in South Africa; students who fail to meet the criteria of the screening process (in other words they are not sufficiently needy or poor) frequently challenge and blame the HE institutions for trying to exclude them; communication with students in rural areas (without reliable postal services and no fax machines) is sometimes a difficult process; illiterate parents signing the NSFAS forms on behalf of their minor children are sometimes unaware of the financial implications of the contracts.

To ensure that funds for NSFAS are equitably divided between the different HE institutions the institutional allocations are based on the number of disadvantaged students at the respective HE institutions, as well as the costs of study (according to study programme) at each institution. The average full cost of study (FCS) for all academic programmes at an institution includes both tuition fee and residential fee. The weighted number of disadvantaged students (WDS) at each HE institution is determined by means of the following formula:

$$WDS = (FTE\ enrolled\ Black\ students \times 3) + (FTE\ enrolled\ Coloured\ students \times 2) + (FTE\ enrolled\ Indian\ students \times 1)$$

Finally, the *WDS* and *FCS* measures for each institution are then used to apportion the total NSFAS allocation for a specific financial year between the 36 HE institutions.

In determining the size of the award to qualifying students, because not all students need the maximum loan amount, the HE institutions are supposed to use the following formula (although most HE institutions actually experience that the maximum amount available through the NSFAS scheme is not enough to cover all the costs of a student):

$$NSFAS\ award = costs - bursaries - expected\ family\ contribution$$

The repayment of the NSFAS loans seems to be the most important problem experienced by the scheme. The tracking of debtors between the time when they exit the HE system and their first place of employment has proved to be very time-consuming and this is where most problems are experienced. The situation is even worse for students that fail and drop out of the HE system. Frequently the NSFAS office loses contact with these students. This makes the recovery of outstanding debt a difficult task. These problems are experienced despite the fact that employers are obliged by law to report when they employ NSFAS students.

2.4.2 The effect of NSFAS on higher education in South Africa – In this Section the possible influence of NSFAS on the South African HE system is analysed. The relative size of NSFAS funding in comparison with other institutional funding, as well as the number of awards that have been made to HE institutions are explored. The information used in Tables 2.9-2.12 is compiled from the Department of Education's budget review of August 2003, as well as the financial tables in Appendix C. The Tables in Appendix C are discussed in detail in Section 3. In this analysis the data of all the universities and technikons for the period 1995-2003 were used and the few missing or wrongly reported data points should not influence the general trends that can clearly be observed. The second column of Tables 2.9-2.12 reflects the amount that the state budgeted for NSFAS. In the third column, the amount actually spent is given, in other words, the sum of state allocations, recovered funds and funds received from donors. All percentages in the tables and the average size of awards are calculated by using the actual expenditure (column 3) and not the funds allocated by the state (column 2) as is reported in Appendix C in Tables C.1.22; C.1.23; C.2.17 and C.2.18 as NSFAS income. In this way, the total expenditure on NSFAS is used and not just the budgeted amounts of the state and we are of the opinion that this gives a more accurate picture of the flow of funds via the NSFAS scheme. The Scheme's primary source of funds is still the Department of Education (72%) with a large contribution being made by the European Union.

According to Table 2.9, the amount of NSFAS funds that has been allocated to HAUs by the state increased from just less than R13 million in 1995 to more than R177 million in 2003. If we look at the total amount spent on NSFAS awards the increase is even more remarkable, from about R13 million in 1995 (if we assume donor contributions were very small when the scheme started) to more than R303 million by 2003. Despite this huge increase in expenditure on NSFAS funds it never represented more than 2.8% of the total income and also at most 12.1% of the tuition fee income at these institutions. Although the awards more than doubled during the time period and were on average rather big (compared to the other HE institutions) the amounts per student (headcount) stayed fairly low. Using Table A.1 of Appendix A it can be calculated that only 7.2% of the students at the HAUs did receive NSFAS awards in 2003. In the evaluation of Table 2.9 (and also later Tables 2.10-2.12) it must be remembered that NSFAS awards are not restricted to tuition fees alone, but can also be used for housing and other cost of living purposes. The expenditure on NSFAS awards is also compared to total tuition fee income and to the total income of the HAUs to get some idea about the size of these awards compared to the income of these institutions. One would normally expect the demand for NSFAS awards to increase as tuition fees increase.

Table 2.9: NSFAS allocations at HAUs: 1995-2003 (in Rand)

Year	State budget for NSFAS funds	Total actual expenditure on NSFAS	NSFAS expenditure as % of total income*	NSFAS expenditure as % of tuition fees	NSFAS expenditure per student (head-count)	Number of awards	Average size of award
1995	12 871 000	-	-	-	-	-	-
1996	72 999 000	77 296 000	1.3%	7.6%	286	12 114	6 381
1997	51 654 000	87 468 000	1.4%	7.8%	320	11 476	7 622
1998	69 178 000	89 884 000	1.3%	7.1%	319	12 355	7 275
1999	91 100 000	109 145 000	-	-	364	13 141	8 306
2000	112 245 000	142 351 000	1.9%	9.7%	460	16 031	8 880
2001	122 460 000	184 933 000	2.1%	10.4%	533	19 640	9 416
2002	138 103 000	225 241 000	2.3%	10.7%	609	21 863	10 302
2003	177 011 000	303 782 006	2.8%	12.1%	785	27 783	10 934

*Excluding accommodation income.

The data in Table 2.9 indicate that NSFAS allocations did not help HAUs much in terms of their annual cash flow. It could, however, be accepted that the outstanding student debt at HAUs (discussed in Section 2.3) would have been significantly higher if the NSFAS allocations had not been made. The growing number of NSFAS awards for students at HAUs (they increased by almost 75% during the last 3 years) indicate that more students from previously disadvantaged communities are now studying at these institutions.

The situation at HDUs is somewhat different. In the first couple of years after the NSFAS was introduced, students at these institutions in total received much more funds than those at the HAUs (see Tables 2.9 and 2.10). An interesting observation is that the number of awards for HDUs decreased slowly since 1995 and although the average size of the awards marginally increased the average size of the awards was at least 20% smaller than the average award size at HAUs. This is mainly the result of higher tuition fees and residence fees at HAUs. Over time the number of awards to students at HDUs decreased slightly while the awards to students at HAUs increased by 130% from 1995 to 2003. There seems to be a trend that relatively more students from disadvantaged areas are now studying at HAUs.

Table 2.10: NSFAS allocations at HDUs: 1995-2003 (in Rand)

Year	State budget for NSFAS funds	Total actual expenditure on NSFAS	NSFAS expenditure as % of total income*	NSFAS expenditure as % of tuition fees	NSFAS expenditure per student (headcount)	Number of awards	Average size of award
1995	22 129 000	-	-	-	-	-	-
1996	137 323 000	163 779 000	7.1%	40.9%	1 517	35 558	4 606
1997	88 525 000	165 756 000	7.0%	36.8%	1 616	31 708	5 228
1998	121 247 000	176 845 000	7.7%	41.7%	1 903	31 313	5 648
1999	137 951 000	159 604 000	-	-	1 911	26 707	5 976
2000	141 756 000	167 054 000	8.0%	40.3%	2 170	28 928	5 775
2001	128 850 000	192 549 000	8.5%	40.3%	2 382	29 815	6 458
2002	143 633 000	204 169 000	8.2%	35.2%	2 253	29 819	6 847
2003	128 347 000	219 176 519	8.2%	32.5%	2 171	32 069	6 835

*Excluding accommodation income.

When one examines the percentage of expenditure on NSFAS funds relatively to the total income of the HDUs, and especially as a percentage of tuition fees, the importance of these funds for the HDUs becomes very clear. On average the value of these awards were 7.8% of these institutions' total income and between 35 and 40% of their tuition fees. Using Table A.1 of Appendix A, it is calculated that about 32% of the students at the HDUs did receive NSFAS awards in 2003. It is clear that NSFAS played an important role since 1995 to create more financial stability at HDUs who traditionally served students from disadvantaged communities. The rising trend in the average NSFAS expenditure per student (headcount) indicates that it is an important source of finance for the students at these universities. One of the reasons why the number of awards decreased may be linked

to the fact that the number of students at these institutions decreased since the introduction of the NSFAS scheme.

The first few years after the NSFAS was introduced the amounts that students at the HATs received from the state budget increased quite dramatically, but thereafter the increase was more moderate (see Table 2.11). However, if one looks at the actual expenditure on NSFAS awards the rising trend continued throughout the whole period. The average size of the awards that these students received was initially much smaller than the awards that students at universities received. This may be ascribed to the generally lower tuition fees at technikons relatively to universities. During the last couple of years the average size of the NSFAS awards was very similar to those at HDUs. NSFAS funds were more important to HATs than to HAU. Expenditure on NSFAS awards on average amounted to 5.5% of these institutions' total income. As a percentage of tuition fees it was much larger and for the last couple of years was 25% of these technikons' tuition fee income. This was thus an important source of income for these institutions. Using Table A.1 of Appendix A it is calculated that 15.5% of the students at the HATs did receive NSFAS awards in 2002, but it dropped slightly to 13.4% in 2003. This is a significantly higher percentage than the 7.2% at the HAUs. One contributing factor for this difference is the less stringent admission requirements for technikons. Relatively speaking, more students from previously disadvantaged communities gained entrance at HATs than at HAUs. So, although these awards were more important to HATs than to HAUs, they did not play such a crucial role as they did in the case of the HDUs.

Table 2.11: NSFAS allocations at HATs: 1995-2003 (in Rand)

Year	State budget for NSFAS funds	Total actual expenditure on NSFAS	NSFAS expenditure as % of total income*	NSFAS expenditure as % of tuition fees	NSFAS expenditure per student (headcount)	Number of awards	Average size of award
1995	2 409 000	-	-	-	-	-	-
1996	44 993 000	43 662 000	2.8%	13.4%	275	12 734	3 429
1997	31 858 000	50 783 000	2.8%	11.7%	318	12 867	3 947
1998	58 337 000	70 582 000	4.7%	19.8%	437	16 026	4 404
1999	87 738 000	95 716 000	-	-	613	18 026	5 310
2000	106 643 000	113 979 000	6.1%	23.2%	732	19 405	5 874
2001	112 960 000	153 134 000	6.3%	23.5%	952	24 031	6 372
2002	125 653 000	183 327 000	8.2%	26.1%	1 142	24 815	7 388
2003	130 291 000	199 155 010	7.4%	27.3%	1 175	22 703	8 772

*Excluding accommodation income.

Table 2.12: NSFAS allocations at HDTs: 1995-2003 (in Rand)

Year	State budget for NSFAS funds	Total actual expenditure on NSFAS	NSFAS expenditure as % of total income*	NSFAS expenditure as % of tuition fees	NSFAS expenditure per student (headcount)	Number of awards	Average size of award
1995	2 591 000	-	-	-	-	-	-
1996	44 685 000	48 606 000	7.0%	44.1%	1 207	12 371	3 817
1997	27 963 000	46 989 000	6.4%	35.1%	1 041	14 523	3 652
1998	47 626 000	57 184 000	8.4%	45.9%	1 262	16 070	3 568
1999	68 108 000	76 588 000	-	-	1 671	17 461	4 249
2000	76 756 000	87 417 000	11.9%	54.4%	1 857	18 887	4 505
2001	75 732 000	104 476 000	10.8%	51.1%	2 117	20 046	4 348
2002	81 611 000	120 736 000	12.0%	51.2%	2 229	23 376	4 865
2003	97 351 000	171 558 006	10.5%	31.1%	2 828	29 709	5 775

*Excluding accommodation income.

From Table 2.12 it can be deduced that NSFAS funds (both in terms of the state budget as well as the actual expenditure on NSFAS) at the HDTs increased rather dramatically and the number of awards increased by about 150% since 1996. The average size of the awards that the students at HDTs received was smaller than their counterparts at the HATs – a similar trend as for the university sector. Although the HDTs received about the same number of awards in 2002 than the HATs they only received 40% of the actual expenditure on the NSFAS awards for technikons. Despite these factors, NSFAS played an important financial role within the HDTs. The expenditure on NSFAS awards was on average 9.6% of the total income of these institutions and 44.7% of the tuition fees. The relatively high values of NSFAS expenditure per student (headcount) indicate that many students at these institutions rely on these awards to finance or partly finance their studies. Using Table A.1 of Appendix A it is calculated that 48.9% of the students at HDTs received NSFAS awards in 2003. Without these funds being made available by the state many technikons, especially the HDTs, may have been in serious financial trouble.

There can be no doubt that the NSFAS has played an important role since 1995 to place many HE institutions on a more sound financial footing than would otherwise have been the case. When the State launched the scheme in 1995, a mere R40 million was budgeted for it, but in 2003 the budget increased to R533 million. If the actual amount spent is reviewed (in other words including donor as well as recovered funds), it increased from R40 million (assuming that the scheme started with very little donor funds) to more than R893 million in 2003. Over time, repayment increased as more students started paying back their loans and currently it amounts to approximately 20% of the funds actually spent on NSFAS awards. In 1996, the number of awards made was 72 777 and in 2003 it increased to 112 264.

The biggest advantage of these awards was that thousands of students, who would otherwise not be able to afford HE studies, could enrol or carry on with their studies at HE institutions. In the process it also alleviated the cash flow problems that many institutions, especially HDIs encountered since the early 1990s. One big problem, already highlighted in Section 2.4.1, is the trouble that is experienced with the repayment of NSFAS loans. This is a problem encountered worldwide.

2.4.3 Lessons to be learned from the income-contingent loan scheme of the United Kingdom – The United Kingdom is moving towards an income-contingent loan scheme to be implemented in 2006. This Section is extracted from a paper by Barr (2004), where it is discussed in more detail. Basically, the scheme is a loan granted to a student that is big enough to pay for total tuition and other living costs. The student has to pay a zero real interest rate on this loan, but only starts paying back once his/her income is above a certain minimum level. The payment is made jointly with income tax or pension payments. For a more needy student a grant is given additionally to compensate the student for his/her present unfavourable circumstances.

Some people believe that HE is a basic necessity and should be provided free of charge. However, food is also a basic necessity, but nobody argues that food must be provided free of charge. There is definite proof of the private benefits of higher education (see Section 1.4 for a discussion of this aspect) and in that sense it makes sense for students to bear some of the costs of their higher education. Few students have the ability to finance their education and an income-contingent loan scheme provides those funds to students. The important thing is that it is not the students that are paying for the loan, but the graduates when they earn more than a specified income. If the loan is sufficiently large, education is actually free at the point of use.

According to Barr, the income-contingent loan scheme to be implemented in the UK has three legs. The first is that HE institutions must be free to charge variable prices and that prospective students use these price signals to decide where to undertake their studies. An internationally renowned institution may ask a higher price than an institution that is not regarded so highly in international terms. Variable fees also mean that higher fees are asked for the student that can afford more (note that 'can afford' refers to a person's earnings as a graduate and not to the student's family income while being a student) and is progressive in the sense that it shifts resources from today's best-off (those who lose some of their fee subsidy due to higher fees) to today's worst off (those who have to receive a grant) and tomorrow's worst off (those that due to a low income do not pay their loan back in full). Secondly, the default interest rate should be linked to the cost of the government to borrow to ensure no market distortions. The third aspect is that action should be taken to promote access. Barr stresses the importance to inform prospective students from especially poorer regions about the costs and benefits of HE. In these regions learners frequently underestimate the benefits of HE and simultaneously overestimate the cost of it. They are

thus generally unwilling to take out a loan to finance their HE. Barr argues that income-contingent loans have a built-in insurance against inability to repay and therefore take away the risks that students from poor communities face when taking out a normal loan. The supplying of grants or scholarships to these students to cover the cost of studying at a HE institution will also further help to overcome this problem.

This system has a lot of similarities with the NSFAS scheme. The biggest difference is that only the very poor benefit from NSFAS awards and that the amounts that universities receive are allocated by using a racially based formula (as was explained in Section 2.4.1). When institutions allocate these awards, the only criteria they look at are that the student must be financially needy and show potential to succeed. This however implies that there are less funds available for needy students that are attending historically white institutions. Although this racially based allocation formula had some merit given South Africa's history, the NSFAS and the Ministry of Education should work towards a system where financial need and not race determines the allocations that HE institutions receive. The biggest problem with a system like the UK's described above is to set up seed money to start the scheme. If it is considered to be too expensive at undergraduate level it should by way of a pilot be introduced on postgraduate level. At this level students have already shown some academic excellence and are not likely to drop out. Many post-graduate students also have access to some form of bursary or grant and the financial burden for the loan scheme should not be too big. Much research is still needed in this area to determine the feasibility of such a system for South Africa. This, however, falls outside the scope of this report.

2.5 THE THIRD MONEY STREAM

It has already been alluded to in Section 1 that, worldwide, HE institutions are pressurised to extend their so-called third money stream, i.e. their income excluding allocations by the state for general purposes or by students/households by means of tuition fees. The third money stream universally consists mainly of the following three income sources, namely –

- *philanthropic funding*: donations by alumni or other individuals and endowments by private sector companies;
- *entrepreneurial funding*: selling the institutional knowledge by means of consultancy, contract research and short (not-subsidised) courses, e.g. language teaching courses and continuous education courses, or providing services for payment, e.g. library services and data networks services; and
- *earmarked research allocations*: these allocations are usually made by the state (separate from the HE allocation for general purposes made by the Education Ministry) to fund specific research projects undertaken by selected researchers.

It is of some interest to note that the Higher Education Funding Council (HEFC), responsible for the state funding of universities in England, has developed an additional state funding stream (apart from the general funding for teaching and research) with the

purpose to improve academic-business links. It could also be seen as an attempt to facilitate knowledge transfer between universities and industry. This could eventually stimulate contract research and therefore alleviate the fiscal pressure on HE institutions.

According to Weiler (2000), there are some potential problems when the market becomes the third player (government and the institution being the first and second) in higher education. External funding like contract research being performed for the private sector could compromise institutional priorities. It is important to ensure that direct and indirect costs are covered in these contracts and that the institutions' long-term capabilities, including the training of young researchers, are not eroded.

The three categories of third stream income outlined above are also referred to as external funding, in many publications. These three categories are now discussed in more detail.

2.5.1 Philanthropic funding – In the USA, funding campaigns for philanthropic donations and endowments are a long established and an essential annual activity of all HE institutions, both public and private. According to Russell (1997), the ability to provide quality academic programmes is tied to raising significant amounts of money from private sources. The state provides the base support but private donations are what ensure the margin of excellence. Private support also helps to attract solid educators for HE institutions. Russell also quoted leaders at California-Berkeley, a State university, who believe that there are many prospective donors who have not had the opportunity to participate in previous money raising campaigns. They believe that there is scope for more money to be raised.

According to the European Commission (2003), there is an absence of a philanthropic donation tradition in universities in Europe. The Commission indicates that private donations, particularly via foundations, can represent a substantial source of revenue for universities as in the case of the United States. However, this alternative runs into a series of problems, particularly the low financial appeal of private donations from a taxation point of view and the status of certain universities which still does not allow them to accept private funds.

Most donations to HE institutions are in the form of endowments. An endowment is an investment expected to grow larger, while only a percentage of the interest is spent. Private donors and companies give money to HE institutions, which then invest the funds. Donors can earmark how the funds are to be spent or can allow the institution to use the money as they see necessary. Although difficult to determine the exact extent of earmarked endowments to HE institutions in South Africa, most are probably earmarked. These endowments are therefore not very helpful in cases where institutions experience financial problems.

Philanthropic funding is becoming very important for South African HE institutions. Where alumni were the most important source of this type of funding in the past, industry is presently being targeted to a larger extent. Since 1994 large overseas philanthropic funding was secured by especially the HDIs.

2.5.2 Entrepreneurial funding – According to Lee and Rhoads (2004), higher education students in the USA tend to look to the 1980s and 1990s as a key period in the intensification of entrepreneurial trends. This was mainly the result of an increase in university-industry research alliances and a decrease in federal funding for HE, but especially for academic research. The demand for applied research had also increased during these years. Entrepreneurial activities can produce many benefits, such as enhanced relations with outside bodies, the potential for institutional and individual prestige, the employment and recruitment opportunities for students and graduates, and enhanced scientific and research equipment (Slaughter and Leslie, 1997).

Research into entrepreneurial trends has, however, increased to such an extent that Resnik (1996) warned that basic research may become marginalized in the light of the revenue-generating research with direct application to corporate or industrial use. Entrepreneurial trends has become so embedded within the culture of the academy that academic personnel's success in generating external revenue inevitably raises their status and prestige as well as that of the institution (Slaughter and Leslie, 1997; Stigler, 1993). One major conflict of interest that has received considerable attention in the literature is concerned about whether or not faculty members at especially research universities are able to maintain a commitment to their teaching role while engaging in entrepreneurial activities. Universities can quite easily release entrepreneurial academic personnel of teaching loads and hire less qualified substitute lecturers, doctoral students or part-time instructors and on the surface convey a commitment to the educational mission. But, while departments may save considerable money by these practices and enhance external income, they also may compromise the quality of teaching (Fairweather, 1989). Using 'The 2001 Faculty Survey', Lee and Rhoads (2004) studied responses on teaching commitment (dependent variable) of 20 000 faculty members at 68 public and private research universities in the USA. Apart from demographic independent variables, two other important entrepreneurial indicators were also used as independent variables, namely consulting activity and the use of intra- or extramural funds for research. They concluded that consultancy activities are usually not to the detriment of teaching commitments, but that large research institutions that generate the most funds through research are especially prone to neglect undergraduate teaching.

No public information on the extent of the entrepreneurial activities (especially the offering of short courses and the involvement in contract research) of South African HE institutions, as well as the income generated by these activities is presently available.

2.5.3 Earmarked research allocations – In order to ensure that the necessary research will be undertaken in specific or priority areas that is important for a country, most governments have established funding agencies with the necessary expertise to determine worthwhile research projects at HE institutions. In South Africa government earmarked allocations for research at HE institutions (by means of various budget votes) are then transferred to the respective agencies for dissemination amongst HE institutions. The amounts for research in these budget votes are determined by Treasury with no regard whatsoever as to the research funding already flowing to HE by means of the education budget. Traditionally, the science councils have acted as the agents, and funds were earmarked for basic and strategic research projects or for doctoral studies of promising students at HE institutions. The National Research Foundation (NRF) was established in 1999 and replaced the Foundation for Research Development (FRD) and other agencies associated with the science councils that previously disseminated earmarked research funding. The NRF has already played an important role in the dissemination of project research funding. The scope of earmarked research funding has broadened significantly over the last 10 years. At present the NRF, the Medical Research Council (MRC), as well as the Water Research Commission (WRC) are responsible for earmarked research allocations to HE institutions. These allocations which are a very important part of the third money stream will be discussed and analysed in the next subsection.

2.5.4 Trends in state earmarked research funding to HE institutions (1996-2003)

The NRF funds research at HE institutions in three ways, namely by means of direct NRF allocations for different purposes, by means of the Technology and Human Resources for Industry Programme (THRIP) and from the Innovation Fund.

THRIP allocations

According to the NRF Web site, THRIP (in the 12 years since its establishment) aimed to boost South African Industry by supporting research and technology development, and by enhancing the quality and quantity of appropriately skilled people. The Programme brings together the best of South Africa's researchers, academics and industry players in funding partnerships that enable participants to improve the quality of their products, services and people. Table B.3 of Appendix B gives the THRIP allocations made to HE institutions for 1995-2004. A total amount of R748.2 million was allocated to HE institutions during these years.

Innovation Fund

This fund has set itself a mission to promote the economic competitiveness of South Africa through investments in technological innovation that leads to the establishment of new enterprises, and the expansion of existing industrial sectors, to the benefit of all South Africans (see NRF Web site). The fund is a key instrument in the Research and

Development (R&D) strategy of South Africa. The allocations to HE institutions from this Fund for the years 1998 (first year of allocations) until 2004 are set out in Table B.4 of Appendix B. Innovation Fund allocations are made to consortiums of research entities (which could include one or more HE institutions) for projects with a duration of three years. The annual allocations to institutions indicated in Table B.4 were calculated by distributing the institutional project funding evenly over the 3 years of the respective project duration. A total amount of R125.7 million was allocated to 14 universities and four technikons from the Innovation Fund over the time period 1998 to 2004.

(Other) NRF allocations

Table B.5 in Appendix B shows all NRF allocations (excluding THRIP funding and Innovation Fund allocations) to universities and technikons during the years 1996-2004. These allocations include inter alia Thuthuka grants (developing and advancing excellence in researchers) from 2001 onwards, research funding within the Institutional Research Development Programme (IRD), funding for centres of excellence in 2004, scholarships and fellowships to masters and doctoral students, research grants for specific projects and grants for attending overseas conferences and other research visits. NRF funding (excluding THRIP funding and Innovation Fund allocations) to HE institutions amounted in total to R1506.2 million during the years 1996 to 2004.

As was indicated in Section 2.5.3 two other state agencies, namely, the MRC and the WRC are also involved in the earmarked funding of research.

MRC allocations

The Medical Research Council funds university/technikon-based research programmes of research centres, research units, research groups or self-initiated research projects in the health sciences. Bursaries and training scholarships at universities and technikons are also funded, while financial support for researchers to attend international conferences and for sabbatical leave is also given. The MRC allocations indicated in Table B.6 of Appendix B include, however, only the funding of university/technikon-based research programmes of centres, units, groups or self-initiated research. The retrieval of the allocations for bursaries, scholarships, international conferences and for sabbatical leave according to HE institution is apparently very difficult and therefore not included in Table B.6. Approximately nine per cent of the funding to HE research centres during the years 1996 to 2003 could not be divided among the respective universities involved in the research, and the research allocations are indicated separately in Table B.6. In total R158.7 million was allocated to 17 universities and two technikons by the MRC during the years 1996 to 2003.

WRC allocations

The Water Research Commission annually strategically allocates research project funds between key strategic areas (KSAs). The allocations are made to various research entities according to their expertise in a specific KSA. The WRC has indicated that, although not impossible, it was difficult for them to extract data on research allocations to the individual HE institutions for the period 1996-2004. This is a format not often used by the Commission. They have therefore only provided aggregated information for 2004. This is set out in Table 2.13. The WRC has, however, also indicated that the data allocations to HE institutions are stable and that the total amount allocated for 2004 is representative of annual allocations to HE. Table 2.13 shows that in 2004 the HE sector has secured 55% of the total 274 water research projects accepted for funding by the WRC. These contracts were worth 57% of the total WRC project research allocations of R92.18 million for 2004.

Table 2.13: Project research allocations (in Rand) by WRC in 2004 according to key research area (KSA) and research sector

Research area (KSA)	Research in HE sector		Other research entities	
	Number of projects	Allocation	Number of projects	Allocation
Water resource management	27	12 970 000	21	11 380 000
Water-linked ecosystems	23	11 770 000	15	4 430 000
Water use and waste managem.	81	20 300 000	69	16 810 000
Water utilization in agriculture	20	7 340 000	18	7 190 000
Total	151	52 380 000	123	39 810 000
Percentage	55.1	56.8	44.9	43.2

Source: Water Research Commission, 2005

Aggregation of earmarked research allocations by state agencies

Table B.7 in Appendix B shows the total agency funding (excluding WRC project funding) for 1996-2003 for all HE institutions. The research allocations given in Tables B.3-B.7 of Appendix B also show the totals for the 4 institutional groups of institutions, namely the HAUs, the HDUs, the HATs and the HDTs. On the institutional level the Universities of Cape Town, Stellenbosch, Pretoria, Witwatersrand and Natal secured the most research funding for the period 1996-2003 as far as universities are concerned, while Technikons Pretoria, Port Elizabeth, Free State, Cape and Peninsula fared the best in the technikon sector.

Figure 2.4 is based on the total allocations of Table B.7 and shows the trends in the earmarked research allocations by state agencies to the universities in total, but also for the HAUs and HDUs separately. The most obvious characteristics of the research allocations

in the figure (given in nominal rand) are the huge discrepancy between allocations to HAU's and HDUs. Although there was a small hiccup in total allocations in 2001 the average annual real increase in earmarked research funding for universities for the period 1996-2003 was 6%. It is interesting to note that in 2003, for example, the total earmarked research allocation to the HAU's represented only 2.63% of their total income (see Table C.1.22 of Appendix C).

Similar to Figure 2.4, the trends in the earmarked research allocations by state agencies to the technikons is given in Figure 2.5. The most obvious characteristic of the research allocations in this figure (given in nominal rand) is a sudden decline in research allocations from 1999 to 2001.

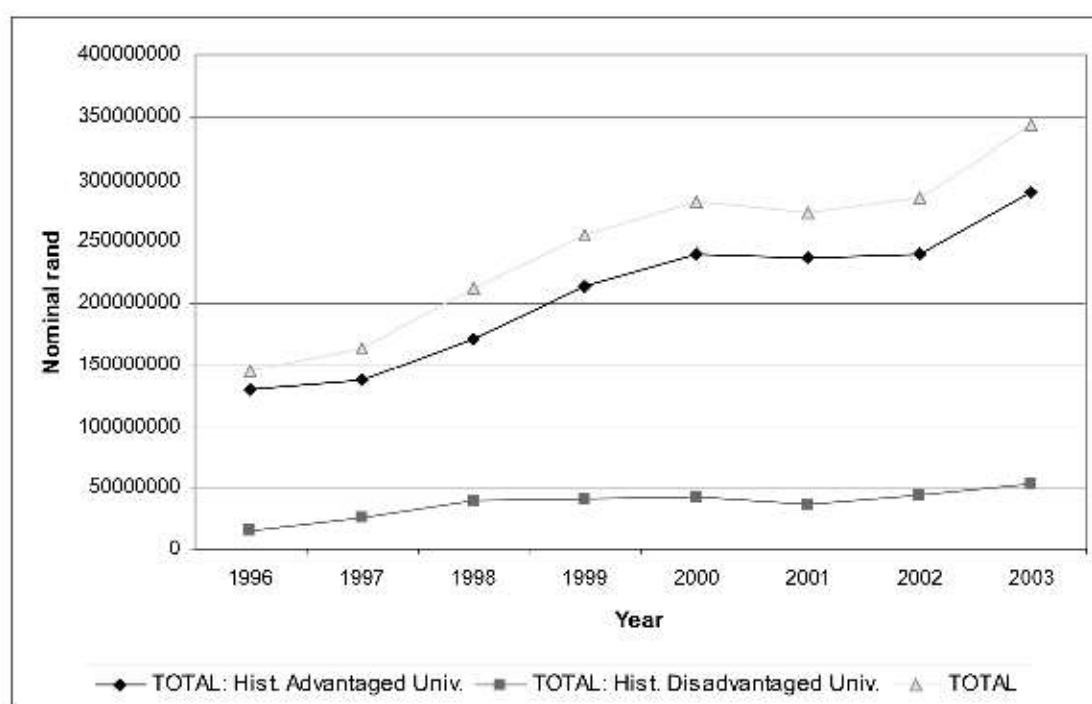


Figure 2.4: Earmarked research allocations (in Rand) by state agencies to universities (excluding WRC allocations) for 1996-2003 according to institutional group

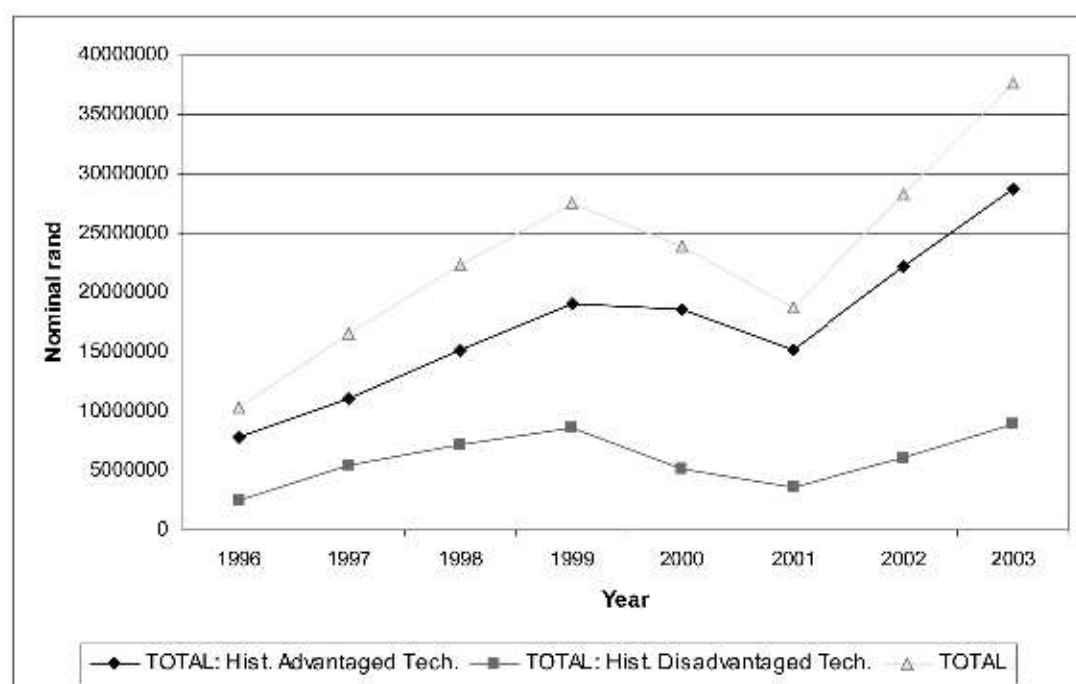


Figure 2.5: Earmarked research allocations (in Rand) by state agencies to technikons (excluding WRC allocations) for 1996-2003 according to institutional group

On average, however, the total earmarked research funding by state agencies for technikons increased annually by 13% in real terms over the period 1996-2003. The difference in the research funding between the advantaged and disadvantaged technikons is not as big as it was between the advantaged and disadvantaged universities. To interpret the relative importance of the earmarked research allocations to technikons, the following is of interest. In 2003, for example, the total earmarked research allocation to the HATs represented only 1.04% of their total income (see Tables C.2.5, C.2.11, C.2.12 and C.2.22 of Appendix C). This figure is much lower than the corresponding figure of 2.63% for the HAU_s.

Another way to look at the research funding by state agencies over time is to view it from the point of view of the researchers in HE. Since the instruction/research personnel (academic personnel), or groups of personnel, at HE institutions are all potential receivers of earmarked research allocations from state funding agencies, it seems obvious to calculate the annual research allocation per FTE instruction/research personnel member for each institution, as well as for the four institutional groups separately. FTE personnel, as an accurate measure of the utilization of person power resources, is discussed (and used) in more detail in Sections 3 and 4. Figures 2.6 and 2.7 express the information represented in Figures 2.4 and 2.5 in real terms per FTE instruction/research personnel member.

The calculations were done by using Table B.7 of Appendix B, Table D.1 of Appendix D and the CPI multiplying factors (see Section 3.3) as reported in, for example, Table C.1.22 of Appendix C.

Figure 2.6 shows that the real research allocation per FTE academic personnel member at universities increased significantly from about R13 000 in 1997 to almost R18 000 in 2000, but has declined since then. The trends for the two institutional groups had the same form, but it is evident that throughout the study period the real per capita allocations for the HDUs was much lower than the allocations for the HAU. There is, however, some move towards equality since 2001.

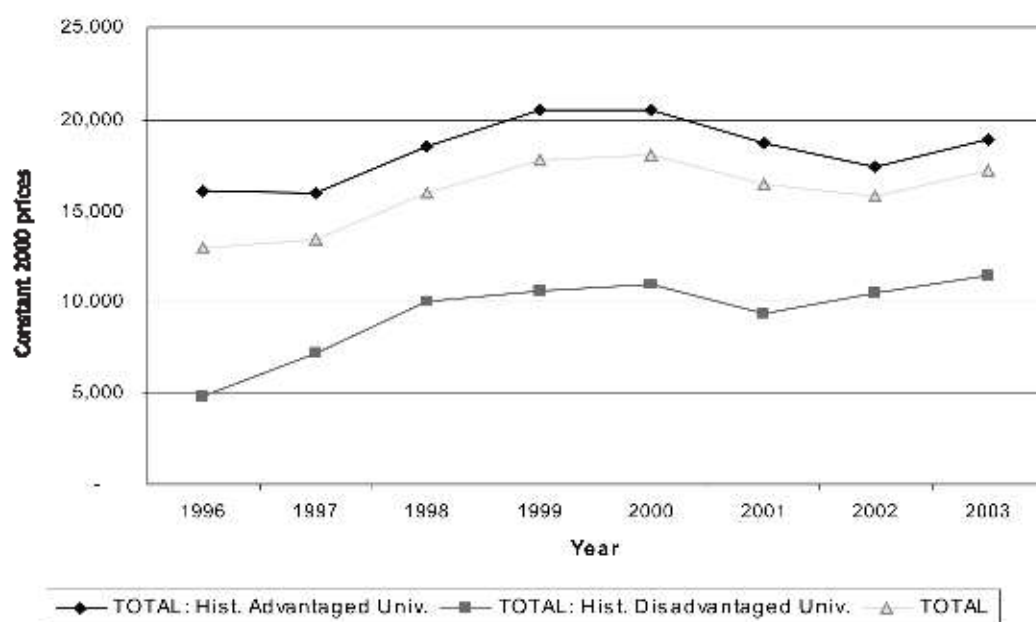


Figure 2.6: Real earmarked research allocations (in Rand) per FTE instruction/research personnel member by state agencies to universities (excluding WRC allocations) for 1996-2003 according to institutional group

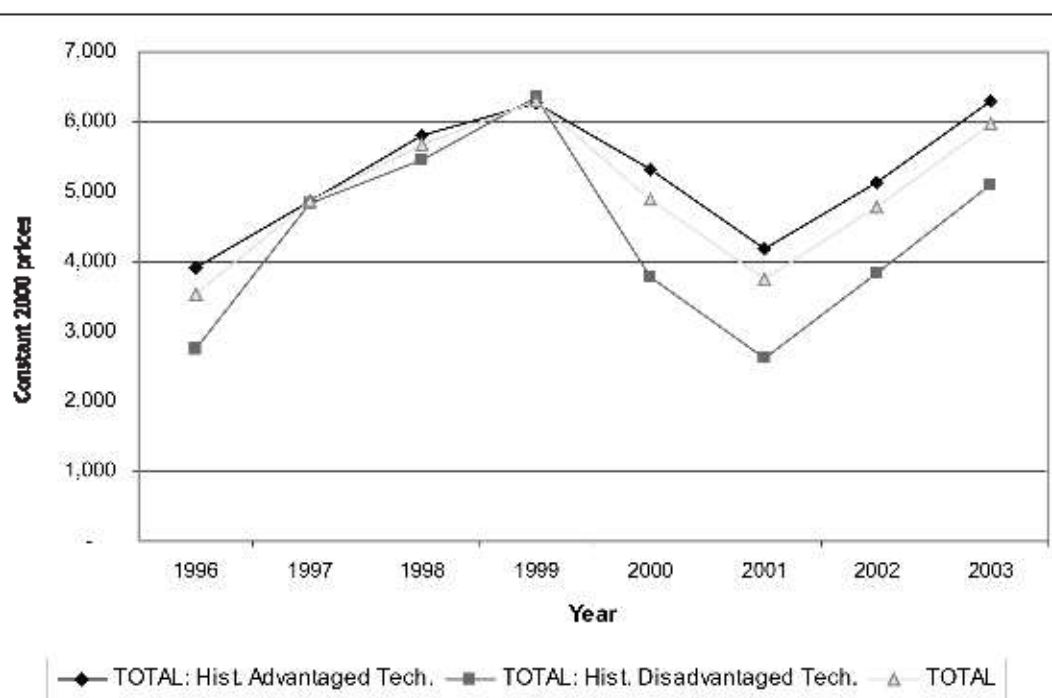


Figure 2.7: Real earmarked research allocations (in Rand) per FTE instruction/research personnel member by state agencies to technikons (excluding WRC allocations) for 1996-2003 according to institutional group

Figure 2.7 shows that the real research allocation per FTE academic personnel member at technikons increased sharply from about R3 500 in 1996 to R6 300 in 1999. A significant decrease followed, but the per capita allocation in 2002 and 2003 improved to almost the levels of 1999. The trends for the two institutional groups had the same form, but a difference in the real per capita allocations between the HATs and the HDTs became evident since 1999. In 2003, the real earmarked research allocation per instruction/research personnel member for universities was almost three times that of technikons.

In conclusion, it can be stated that large amounts are annually awarded for earmarked research at HE institutions. In 2003 a total of R381 million was allocated by means of NRF funding, THRIPP funding, MRC funding (excluding some smaller allocations) and from the Innovation Fund. Over the eight years 1996 to 2003 an amount of R2.146 billion was spent in this way. As indicated earlier these figures exclude allocations from the WRC. Although the research awards are earmarked for specific projects mostly performed by specific persons and are therefore not helping HE institutions to solve possible day to day financial problems, these awards are indispensable for HE institutions (the engine room of research in the country) for maintaining a research infrastructure, as well as increasing their research output to respectable levels.

SECTION 3: THE ANALYSIS OF FINANCIAL STATEMENTS OF HIGHER EDUCATION INSTITUTIONS

3.1 INTRODUCTION

Appendix C contains summarized versions of the financial statements of the 36 HE institutions for the period 1986 to 2003. Tables C.1.1 - C.1.23 of Appendix C apply to the 21 universities and Tables C.1.22 and C.1.23 respectively to the aggregated statements of subsets of the historically advantaged and historically disadvantaged universities. Tables C.2.1 - C.2.15 apply to the financial statements of the 15 technikons and Table C.2.16 to the Durban Institute of Technology established in 2003. Tables C.2.17 and C.2.18 respectively give the aggregated statements for a subset of historically advantaged and historically disadvantaged technikons.

3.1.1 Sources of information

SAPSE financial statements

Data contained in SAPSE Tables 4.2, 4.7, 5.7 and 5.13 were used to compile the financial information for the years 1986-1993. As a result of adjustments to Chapters 4 and 5 of the SAPSE reporting system in 1994, in which Table 4.4 replaced Table 4.7 and Table 5.12 replaced Table 5.13, Tables 4.4 and 5.12 were used to compile the information for 1994 to 1998. Tables 4.2 and 4.7 (4.4) were, according to national policy, audited annually by the external auditors of HE institutions.

Financial Statements for HE institutions prescribed by national policy 2000-2003

After the SAPSE information system was terminated in 1999, the Department of education introduced a new policy for the reporting of financial information in 2000. The standards and requirements for the presentation of annual financial reporting by public HE institutions in a manner that is consistent with accepted international standards were outlined in a Finance Manual for HE institutions in December 2000. These standards were adjusted in 2001 and 2002 until the final regulations for annual reporting by higher education institutions, issued in terms of the Higher Education Act, 1997, (Act No. 101 of 1997) were published in Government Notice 25407 of 29 August 2003.

The following consequences of the adjustment of financial reporting of HE institutions with effect from 2000 are important for the analyses of the financial statements of HE institutions for 2000-2003 used in the rest of this section –

- No complete financial information for HE institutions is available for 1999. Some institutions submitted SAPSE financial statements for 1999, but most did not.
- Since the financial reporting under SAPSE differs in important aspects from the new reporting framework (based on SA Generally Accepted Accounting Practice (SA GAAP)) it is extremely difficult to extract a time series of the different sources of

income, as well as the different types of expenditure of HE institutions for the period 2000-2003 that is consistent and compatible with the period of 1986-1998.

- The problem of the incompatibility of annual information was exacerbated by the fact that the post SAPSE financial reporting formats were adjusted annually in the process of developing a new financial reporting scheme during the years 2000-2003.
- A distinction is made between general income controlled by council and earmarked income for specific purposes. There is, however, uncertainty whether the annual ad hoc and earmarked allocations made by the DoE should be included under 'State appropriations-general purposes (council controlled)' or under 'State appropriations-specific purposes (specifically funded)'. To bypass this problem the official state appropriations (subsidy and ad hoc allocations), appearing in the annual document titled *Information on the State Budget for Higher Education* of the DoE, were used in the income statements of the institutions for 2000-2003.
- Although the regulations of 2003 for the annual financial reporting by HE institutions indicate that NSFAS allocations should not appear in the income or expenditure statements of institutions, inspection showed that it is likely that these allocations, which form part of the annual earmarked ad hoc allocations of the DoE to institutions, were nevertheless mostly included in the income and expenditure statements of institutions during the period 2000-2003. This is not surprising, because NSFAS allocations were included under 'Government appropriations' in Table 4.2 of the SAPSE system since 1995 (when the first NSFAS allocations were made by government). It was therefore assumed in the compilation of the financial information of HE institutions (see Appendix C) that all institutions have included the NSFAS allocations in their annual income and expenditure statements. However, the negative values of the third money stream (calculated as the difference between the total income and the sum of first two money streams) in the case of a few institutions for one or more of the years 2000-2003 could be an indication that this assumption could be incorrect in respect of these specific institutions. See also Section 3.1.4 in this regard.

3.1.2 Incomplete information – The institutions that formed part of the TBVC states prior to 1994 only submitted their financial statements for the first time towards the end of the 1990s. The statements of some of the other institutions are also missing for some years. This is the case regardless of the national policy that required and still requires HE institutions to submit audited statements to the national education department every year. As was mentioned earlier, most institutions did not submit financial statements in 1999. Apart from two sources of institutional income, namely government subsidies and NSFAS allocations, which could be compiled from official documents of the DoE, no other reliable financial data are available for 1999. Information for 1999 is therefore not included in the tables of Appendix C. The data of only 24 of the 36 HE institutions are complete and reliable for the other 17 years. These institutions are:

Historically advantaged Universities (11/11)

University of Cape Town
 University of Natal
 University of the Free State
 University of Port Elizabeth
 Potchefstroom University for CHE
 University of Pretoria
 Rand Afrikaans University
 Rhodes University
 University of South Africa
 Stellenbosch University
 University of the Witwatersrand

Historically disadvantaged Universities (5/10)

University of Durban-Westville
 Fort Hare University
 University of the North
 University of the Western Cape
 Vista University

Historically advantaged Technikons (5/8)

Cape Technikon
 Technikon Free State
 Port Elizabeth Technikon
 Technikon Pretoria
 Technikon SA

Historically disadvantaged Technikons (2/7)

Technikon Northern Gauteng
 Peninsula Technikon

In the case of the historically advantaged institutions, the universities are fully represented, but for the technikons only 63% are represented. The data of only half of the HDUs could be used and HDTs are unfortunately totally under-represented by only two out of seven. Analysing the aggregated information for the two groups of advantaged institutions should therefore be very informative; that for the disadvantaged institutions, less so.

3.1.3 Information on the auxiliary enterprises programme (student and staff accommodation) – HE institutions vary substantially in the provision of student housing. Institutions with five or six thousand students in residences will have substantial income accruing from residence fees and will also have substantial expenditure regarding the housing of students, while non residential institutions will have no or very small income and expenses in this regard. As the Auxiliary Enterprises programme only indirectly supports the line function activities of a HE institution, it was decided, as far as this study is concerned, to exclude income accruing from and expenses relating to this programme from the financial statements of institutions to prevent distorted figures. Student fees which are reported in the institutional financial information statements therefore only refer to fees for tuition.

3.1.4 NSFAS allocations – As NSFAS allocations are essentially loans to students repayable over the longer term it is debatable whether they should be included as part of the government's appropriation to HE. These allocations are, however, important for the bigger picture of HE sources of income. It was therefore decided to isolate these allocations from the rest of the government appropriations (subsidy and other ad hoc allocations) in the tables reflecting institutional financial statements. Therefore, as described above, and for the sake of consistency with the information of 2000-2003, government's appropriations, as reported by the individual institutions in SAPSE Table 4.2, have since 1995 been replaced by the official allocations (excluding NSFAS) appearing in the DoE's documents on the state budget for higher education.

3.1.5 Depreciation and the effect of provisions under GAAP based accounting versus cash based accounting in SAPSE – The full expenditure on the different categories of fixed assets, and not only the depreciation costs, have in the SAPSE era been reported in Table 5.13 (Table 5.12 since 1994) as non-recurrent expenditure. The GAAP based financial reporting system used since 2000 makes provision for the depreciation costs for the different categories of fixed assets. To make the recurrent expenditure of institutions during the period 1986-1998 comparable with the recurrent expenditure of 2000-2003, the annual provisions for depreciation in the financial data of HE institutions for 2000-2003 were excluded from the tables of Appendix C in the calculation of the institutional total recurrent expenditure during these four years.

The movement from cash based accounting under SAPSE, where items were fully expensed when they occurred, to provision based accounting under GAAP will show deviations in the yearly comparison between the two years where the change occurred. The actual figures for 2000 should thus be excluded in the graphs, before interpretations are made. Therefore, the values for 2000 were excluded when Figures 3.11 3.14 were drawn.

3.1.6 Remuneration of personnel – The analysis of personnel remuneration for the years 1986 to 2003 forms a crucial part of the study. For this purpose, a distinction is made between instruction/research (academic) personnel and other personnel. Unfortunately, if

the financial statements of some institutions in Appendix C are studied, it is clear that large year on year fluctuations in the remuneration of these two personnel groups for especially 2000-2003 occurred. It is evident that some institutions annually made adjustments in the classification of their personnel into these two groups. This is a matter of concern since clear definitions of the classification of personnel into different categories are given in the SAPSE information system. The same definitions still apply in the HEMIS personnel information system that was introduced in 2000.

3.1.7 The third money stream – This source of income appears in the financial statements in the tables of Appendix C under the heading 'Other income' and is calculated by the deduction of tuition fees and government (state) appropriation (including NSFAS since 1995) from the total institutional income as reported annually in the income statement. The 'Other income' source includes earmarked government appropriations (agency funding) for research projects, investment income, donations and income accruing from entrepreneurial activities like short courses and contract research (See Section 2.5).

3.1.8 Erroneous financial information – The institutional financial statements as compiled for each of the 36 institutions contain in some cases erroneous values. A few obvious mistakes were corrected by the researchers, the most important being government appropriations during the years 1986-1994, which deviate substantially from the official figures published by the former Department of National Education. These corrections are highlighted (grey background) in the Tables. A few very large figures, as well as negative amounts, are also highlighted but not corrected since information for the possible corrections thereof is not available.

3.2 RELATIVE STATE SPENDING ON HIGHER EDUCATION: SOME MACRO-ECONOMIC INDICATORS

As the State's annual allocation to HE is the outcome of a long negotiation process influenced by economic and political processes, these allocations could vary from year to year. Since the introduction of the Medium Term Expenditure Framework (MTEF) by the government a few years ago, whereby not only the HE allocation for a specific financial year is given, but also probable allocations for the next two financial years, more stability was introduced in HE funding because future allocations became more predictable.

In making comparisons between the annual government allocations to HE meaningful, as well as measure the relative importance of HE compared to other functions of the state, the three measures calculated in Table 3.1 are quite useful. This table shows the actual state allocations made by the Minister of (National) Education to the university and technikon sectors for financial years 1987/88 to 2005/06 (in short 1987 to 2005).

It also expresses these allocations relatively in various ways, namely, as:

- percentages of the total expenditure of the state on education (EE);
- percentages of the total state expenditure (TE); and
- percentages of the Gross Domestic Product (GDP) of the RSA.

Projections for these three measures for 2005/06 are also shown in Table 3.1. The information in Table 3.1 that refers to 1987 to 2000 was taken from Steyn (2002), while the information for the years 2001 to 2003 come from the budget reports published by the Department of Education. For 2004 the GDP as published by the SARB (March 2005) was used and estimates for 2005 come from BER (2004). Figure 3.1 shows the trends in the three expenditure indicators in the case of the total allocation to universities and technikons for the period 1987 to 2005. Although the official state budgets for higher education include the NSFAS allocations since the first allocations were made from this aid scheme in 1995, the NSFAS allocations should, strictly speaking, be excluded from the calculation of the above defined indicators of relative HE state expenditure. In the last column of Table 3.1 the HE expenditure of the state as a percentage of the GDP (probably the most informative of the three indicators) is also calculated when the NSFAS allocations are excluded. Note that the earmarked ad hoc funding for institutional restructuring is excluded from the state allocations for the years 2003-2005. The allocation of these funds will be terminated once the restructuring is completed. Since it is abnormal (earmarked) short term funding by the state to implement a state decision, it must be excluded when comparing HE state funding in 2003-2005 with the pre-2003 period.

The following trends can be deduced from Table 3.1 and Figure 3.1 –

- The joint total state allocations to universities and technikons as a percentage of EE decreased rather rapidly during the late 1980s from 15.43% in 1987 to an all-time low of 11.63% in 1994. Since then this percentage steadily increased to 14.04% in 1999, partly because of the incorporation of the TBVC states (see below), but slumped back annually since then to 12.34% in 2003. The 2005 percentage is 12.65%.
- The universities' share of EE has declined from 12.58% in 1987 to 8.67% in 2003. In contrast to this the technikons' share has steadily increased from 2.55% in 1990 to 4.07% in 1999 with the 2003 percentage on 3.66%. This is the result of a higher growth rate in student numbers, especially during the 1990s, at technikons than at universities. The fact that since 1993 the projection formula for ESS in the revised SAPSE formula for technikons allowed for a higher subsidizable growth than the revised SAPSE formula for universities, also contributed to these inverse relationships.
- The total allocations to universities and technikons as a percentage of TE show some fluctuations in the earlier years, then a sharp increase to 1999 and since then an alarming decline to 2.44% in 2005, i.e. a decline of 20% in 6 years.
- The total allocations to universities and technikons as a percentage of the GDP have fluctuated during the study period, mainly between 0.7 and 0.8. A consistent annual decline from 0.80% in 1999 to 0.68% in 2005 is, however, evident. When the NSFAS allocations are subtracted from the total allocations to the HE sector, this indicator

declined to 0.62% in 2005, i.e. a decline of almost 23% in 6 years.

- The increases in the mid-1990s of the total state allocations to universities and technikons in all three relative measures of spending are partly the result of the transfer of the HE institutions in the so-called TBVC states to the SA system during that time. No relative increases are, however, noted in 2001 and 2002 when the teacher training colleges were incorporated into the HE system, thus concealing a further decline in funding for HE.

Table 3.1: Relative state allocations to universities and technikons: 1987-2005

Year	Sector	State allocation (R million)	% of education budget	% of total Budget	% of GDP	% of GDP Excluding NSFAS
1987/88 ¹⁾	Universities	1 159.730	12.58	2.47	0.700	
	Technikons	263.071	2.85	0.56	0.160	
	Total	1 422.801	15.43	3.03	0.860	
1988/89 ¹⁾	Universities	1 210.187	11.79	2.25	0.590	
	Technikons	272.276	2.65	0.51	0.133	
	Total	1 482.463	14.44	2.76	0.722	
1989/90 ¹⁾	Universities	1 425.777	11.85	2.24	0.593	
	Technikons	334.985	2.79	0.53	0.139	
	Total	1 760.762	14.64	2.77	0.732	
1990/91 ¹⁾	Universities	1 648.529	10.67	2.29	0.608	
	Technikons	394.178	2.55	0.55	0.145	
	Total	2 042.707	13.22	2.84	0.753	
1991/92 ¹⁾	Universities	1 775.260	10.37	2.18	0.640	
	Technikons	478.158	2.79	0.59	0.170	
	Total	2 253.418	13.16	2.77	0.810	
1992/93 ¹⁾	Universities	1 948.650	9.55	1.85	0.582	
	Technikons	564.842	2.77	0.54	0.169	
	Total	2 513.492	12.31	2.39	0.751	
1993/94 ¹⁾	Universities	2 336.518	9.87	1.87	0.550	
	Technikons	692.676	2.93	0.55	0.160	
	Total	3 029.194	12.80	2.42	0.710	
1994/95	Universities	2 768.887	9.03	1.97	0.574	
	Technikons	795.484	2.60	0.57	0.165	
	Total	3 564.371	11.63	2.54	0.739	
1995/96	Universities	3 066.472	9.15	2.03	0.559	0.553
	Technikons	1 006.336	3.00	0.66	0.184	0.183
	Total	4 072.808	12.15	2.69	0.743	0.736
1996/97	Universities	3 850.804	9.22	2.19	0.623	0.589
	Technikons	1 356.458	3.25	0.77	0.220	0.205
	Total	5 207.262	12.46	2.97	0.843	0.794
1997/98	Universities	3 975.855	9.06	2.09	0.580	0.559
	Technikons	1 455.513	3.32	0.77	0.212	0.204
	Total	5 431.368	12.38	2.86	0.792	0.763
1998/99	Universities	4 336.687	9.71	2.15	0.584	0.558
	Technikons	1 663.101	3.73	0.83	0.224	0.210
	Total	5 999.788	13.44	2.98	0.808	0.768
1999/00	Universities	4 648.252	9.97	2.16	0.571	0.543
	Technikons	1 896.873	4.07	0.88	0.233	0.214
	Total	6 545.125	14.04	3.05	0.804	0.757
2000/2001	Universities	5 001.196	9.95	2.13	0.542	0.515
	Technikons	1 976.701	3.93	0.84	0.214	0.194
	Total	6 977.897	13.89	2.97	0.757	0.709
2001/2002 ²⁾	Universities	5 398.837	9.82	2.05	0.529	0.505
	Technikons	2 122.769	3.86	0.81	0.208	0.190
	Total	7 521.606	13.68	2.86	0.737	0.694
2002/2003 ²⁾	Universities	5 707.815	9.22	1.96	0.490	0.466
	Technikons	2 215.857	3.58	0.76	0.190	0.172
	Total	7 923.672	12.80	2.72	0.680	0.638
2003/2004 ²⁾	Universities	6 070.619	8.67	1.85	0.485	0.461
	Technikons	2 563.990	3.66	0.78	0.205	0.187
	Total	8 634.609	12.34	2.63	0.690	0.647

Table 3.1 (Continued)

2004/2005 ²	Total	9 364	12.44	2.53	0.681	0.639
2006/2006 ²	Total	10215	12.65	2.44	0.680	0.623

- 1) Excluding the TBVC states
- 2) Amounts include incorporation of teacher training colleges, but exclude NSFAS administration cost, provision for student fee differences at teacher training colleges, as well as funding for institutional restructuring in 2003-2005.

Sources: Suzyn (2002) for 1987-1993
 Department of Education budgets: 2001-2005
 GDP for 1994-2004: SARB (2005)
 Projection of GDP for 2005: BBR at Stellenbosch University

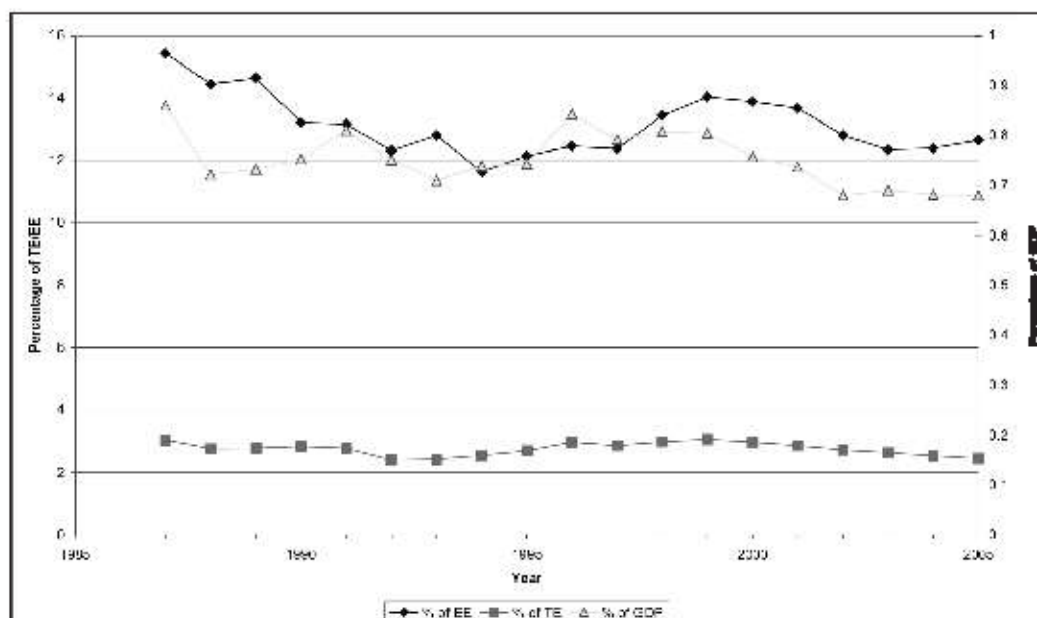


Figure 3.1: Relative expenditure on universities and technikons: 1987-2005

Figure 5.2 of Section 5 shows the real state allocation per weighted FTE student (See Section 1.7.6) for the higher education sector for the years 1987 to 2003. The figure also indicates real per capita allocations for the university and technikon sectors separately. Although the same trend is visible in respect of all three time series during the study period, the per capita allocations to technikons were on average during the period about 22% less than the allocations to universities.

Table 3.2 shows a summary of the total expenditure on higher education institutions and higher educational administration as a percentage of the GDP made by local, regional and national governments for 2001 in respect of 84 countries. The averages for the different continents/groups of countries in Table 3.2 are calculated from Table 11 of UNESCO Institute of Statistics (2004). According to OECD (2003) the average public spending on HE (also as a percentage of the GDP) of 29 OECD countries in 2000 was 0.90.

The RSA expenditure on HE as a percentage of the GDP, namely 0.74 (or 0.70 if the NSFAS allocations are excluded) for 2001 is lower than both the average value for all 84 countries and the average value for 15 countries in Africa. The same is true if the same measure for the RSA for 2000 is compared with the OECD average referred to in the previous paragraph.

The past 11 years (including the budgeted figures for 2004 and 2005 financial years) show a steady increase in the annual allocations to the NSFAS. Many institutions benefit by these increased allocations since they tend to increase the proportion of tuition fees collected annually. The significant increases in NSFAS allocations are, however, eroding the HE block funding since these allocations must usually be afforded inside the very stringent and conservative MTEF of the state. NSFAS allocations can even in some sense be seen as funding for community development or poverty relief.

Table 3.2: Total expenditure on HE by government as a percentage of the GDP for 2001 according to continent/region

Continent/region	Number of countries	% of GDP Average
Africa	15	0.85
North America	13	0.88
South America	6	0.85
Asia	24	0.64
Europe	21	0.95
Oceania	5	0.74
TOTAL	84	0.81

Source: UNESCO Institute of Statistics (2004): *Global Education Digest 2004: Comparing Education Statistics across the World*, Table 11

There is a case to be made that the government grants earmarked for research projects (agency funding) should be added to the Department of Education's allocation for 2001 before the comparison with the averages in Table 3.2 is made. This will add about R293 million to the HE budget. The fact of the matter is, however, that these grants are administered by state departments and agencies independent of the Minister of Education. As with South Africa, many other countries also do not consider earmarked research grants as part of the HE funding.

As was discussed in Section 1.5.1, the United States of America, in comparison with the rest of the world, spend the highest percentage (public and private) of GDP on HE. Also in absolute terms they spend the most per student in HE in the OECD countries. It is

therefore interesting to note that in a recent study by researchers in Shanghai (quoted in Economist 2004a) the list ranking the top 50 universities in the world included only 15 universities outside the USA. In Europe only Oxford and Cambridge obtained places in the top 10 and from outside Europe no other university obtained a place in the top 40. Seeing that private funding of HE is more important in the USA, this study seems to indicate that more private sector involvement in higher education increase efficiency and excellence.

3.3 TRENDS IN THE COMPOSITION OF INSTITUTIONAL INCOME

The actual annual amounts (in rands) associated with the four sources of income for every HE institution during the years 1986 to 2003 are set out in the Table C.1 series (Universities) and the Table C.2 series (Technikons) of Appendix C. These amounts can be analysed per institution in various ways. To assist in such analyses the Consumer Price Indices (CPI), as well as the CPI multiplying factors to convert nominal amounts to real amounts (constant 2000 prices) are also given in each table. Furthermore, a number of income indicators under the heading 'Income Information' are calculated. Some of these indicators express the various sources of income per weighted FTE student (WFTEs) or per FTE personnel member. Before these indicators are discussed, the changes in the composition of the various sources of income are analysed.

Figures 3.2 to 3.5 show the division of income (as percentages) between tuition fees, government appropriations, other income and NSFAS for the 4 groups of HE institutions for the years 1986, 1994 and 2003 (See Section 3.1.2). These figures summarise the trends contained in Tables C.1.22 and C.1.23 for the universities and Tables C.2.17 and C.2.18 for technikons. Some clear trends can be observed.

Historically advantaged universities (HAUs)

The tuition fees as a percentage of total income for this group increased from 13% in 1986 to 23% in 2003. This increase was the result of substantial annual upward adjustments in the tuition fees to compensate for real decreases in state appropriations from year to year (see later analyses). The state appropriations as a percentage of the total income of the group declined from 51% in 1986 to 40% in 2003 (see Figure 3.2). Amidst some annual fluctuation the third money stream was (percentage wise) a constant source of income with an average of about 37%. The NSFAS allocations accounted for a very small percentage of the income of the HAUs. The individual HAUs experienced in general the same trends in the composition of income as described above for the group. In some cases, however, there were some indications of a decrease in the contribution of the 3rd money stream income.

Historically disadvantaged universities (HDUs)

The tuition fees as a percentage of total income increased for this group from 11% in 1986 to 25% in 2003. This increase was also the result of substantial annual upward adjustments in the tuition fees to compensate for real decreases in state appropriations from year to year

(see later analyses). The state appropriations as a percentage of the total income of the group were 66% in 1986 and decreased to 51% in 2003 (see Figure 3.3).

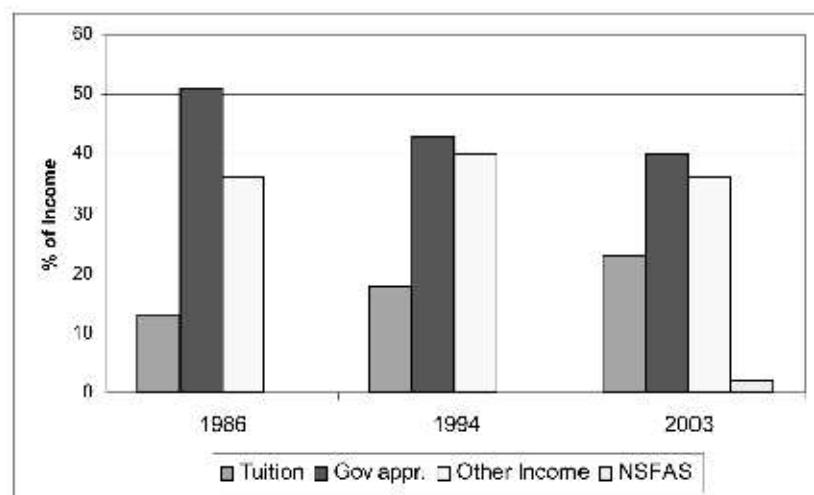


Figure 3.2: Composition of income of historically advantaged universities according to source of income and year

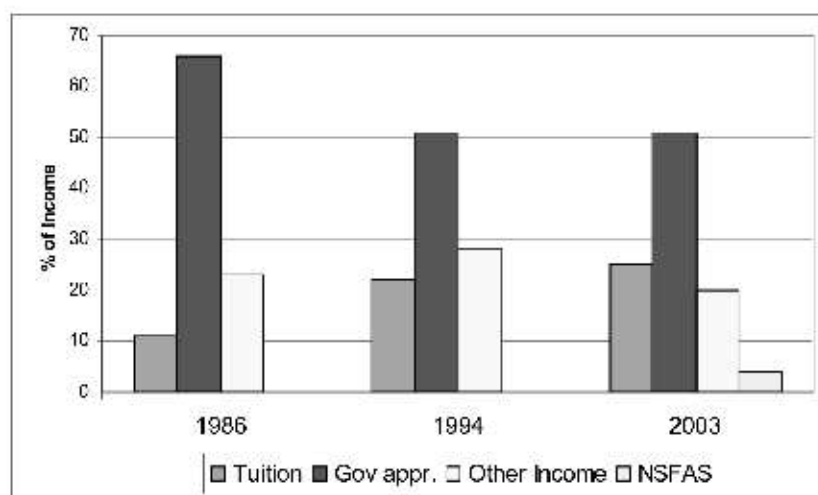


Figure 3.3: Composition of income of historically disadvantaged universities according to source of income and year

Amidst some annual fluctuation between 1986 and 2003, especially since 2000, the third money stream accounted for about 25% of the total income, while the NSFAS (at 4-5% of the total income) was a more substantial source of income for this group than for the HAUs. A study of the income patterns of the individual institutions in the HDUs group show large institutional year on year fluctuations in the composition of the various sources of income. This could be the result of relatively smaller budgets (in comparison with most of the HAUs) for some institutions, the effects of bad student debt and declining student numbers which lead to unstable state appropriations.

Historically advantaged technikons (HATs)

The tuition fees as a percentage of total income increased for this group from 15% in 1986 to 31% in 2003. The contribution of the state's appropriation for this group was initially high at 60%+, but since 1990 it is lower and rather constant at around 50%. The fluctuating third money stream declined over the study period, especially since 1998, while the NSFAS contribution was about 4% per annum since 2000. Looking at the individual institutions in this group we find that for all of them the tuition fees percentages as well as the NSFAS contributions (since 1995) increased over time. The other two sources of income fluctuated largely but a decline in the contribution of the state appropriation was evident for 3 of these institutions.

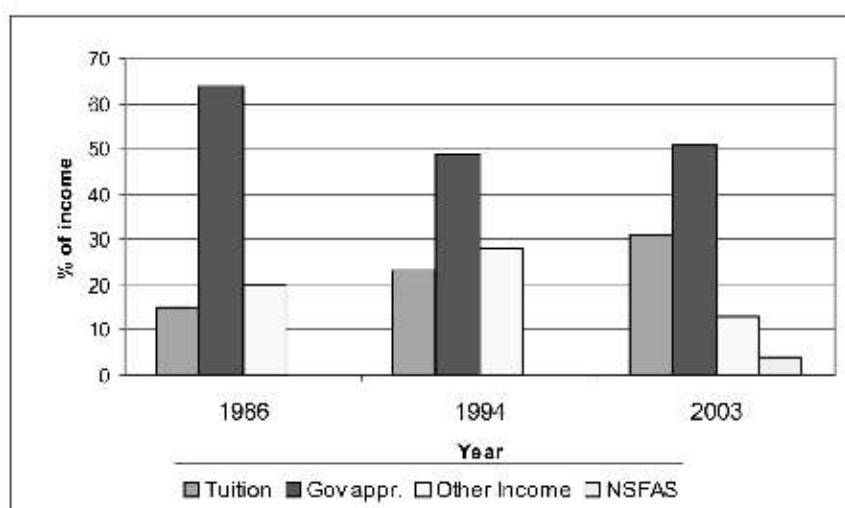


Figure 3.4: Composition of income of historically advantaged technikons according to source of income and year

Historically disadvantaged technikons (HDTs)

Keeping in mind that this group consists only of two institutions and that no financial data are available for these two technikons for 1986, it seems that the same trends that hold for the HATs are also valid for this group, with the exception that the NSFAS contributions are

more significant in the ranges of 6%-8% for the last number of years. Studying the individual HDTs one sees that in the case of some of the HDTs not included in the aggregation as a result of incomplete data the same trends as outlined above are evident for the years where the financial statements are available.

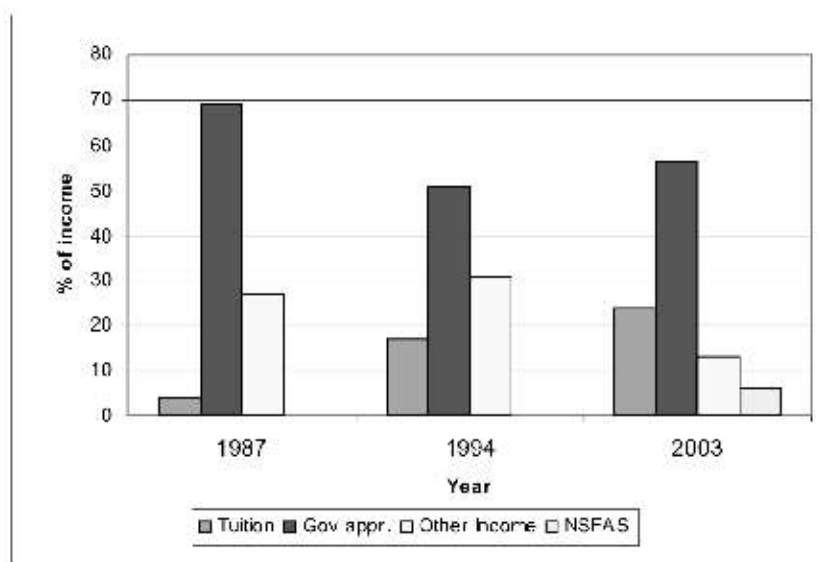


Figure 3.5: Composition of income of historically disadvantaged technikons according to source of income and year

3.4 DIFFERENT INCOME CATEGORIES PER UNIT OF INPUT

As three of the four sources of HE institutional income are mainly determined by FTE students it seems logical to express the annual amounts of these sources of income per FTE student to gain more insight into the underlying factors that caused the significant shifts in the relative importance of the four sources of income as they were highlighted in the previous section. As outlined in Section 2, the SAPSE formulas were based on effective subsidy students (related to WFTEs) while the NFF is essentially also based on a weighting system related to WFTEs, namely the further weighting of WFTEs by instruction cost of four study fields and four study levels. Using a weighted FTE student as a unit cost item has therefore intuitive appeal.

Figure 3.6 indicates the tuition fees per WFTEs, the state appropriation per WFTEs, as well as 'Other income' (third money stream) per WFTEs, all in constant 2000 prices for the HAU group. The information is derived from Table C.1.22 of Appendix C. The corresponding information from Table C.1.23 is shown in Figure 3.7 for the HDUs. Note that the missing data used in the figures for 1999 were estimated as the averages of the corresponding unit values for 1998 and 2000. The two tables and figures confirm the broad

conclusions drawn from the analyses of Section 3.3 but give the following additional useful information –

- For HAUs the real tuition income per WFTES increased from R6 351 in 1986 to R9 527 in 2003, an increase of 50%, while the increase from R4 662 to R6 739 in real tuition income per WFTES for HDUs represents an increase of 45%. The lower per capita tuition fee income at the HDUs is probably mainly the result of relatively fewer students enrolled in Science, Engineering and Technology (which are associated with higher fees as a result of higher teaching costs) at the HDUs than at the HAUs, as well as a higher bad debt ratio at HDUs.
- The real state appropriation per WFTES declined from R24 517 in 1986 to R16 697 in 2003 in the case of the HAUs, a very significant decrease of 32%. The corresponding figures for the HDUs are R28 106 in 1986 to R13 410 in 2003, equivalent to a decrease of 52%. Figure 3.7 shows that the trend of the real state appropriation per WFTES has a 3rd degree polynomial trend for the HDUs. The significant decrease in student numbers at HDUs in the 1990s coupled with the SAPSE subsidy formula's student projection formula is mainly responsible for this polynomial form.

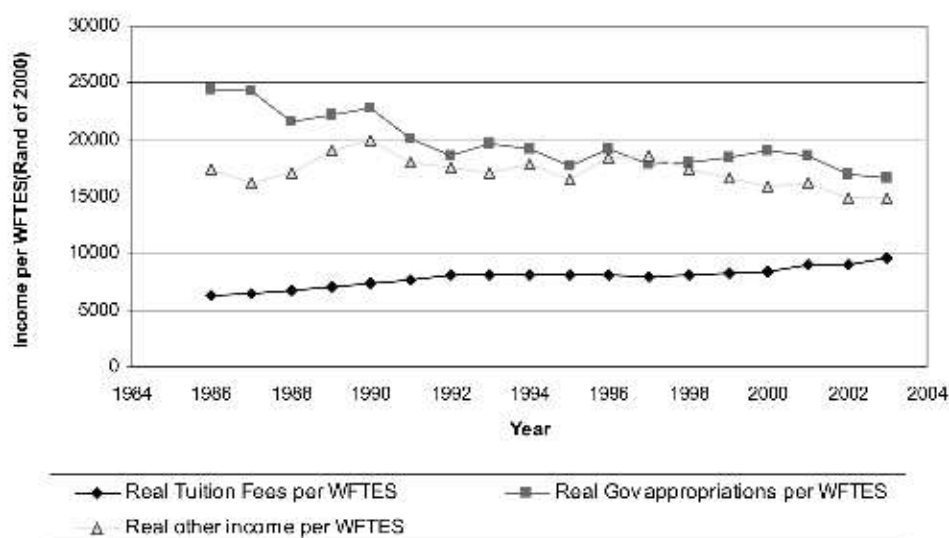


Figure 3.6: Real income per weighted FTE student for historically advantaged universities according to source of income: 1986-2003 (constant 2000 prices)

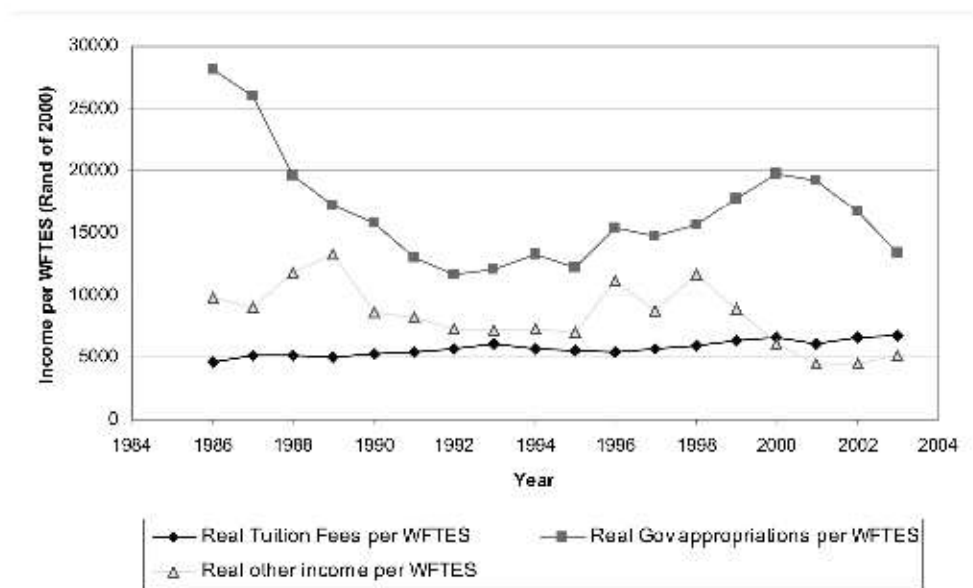


Figure 3.7: Real income per weighted FTE student for historically disadvantaged universities according to source of income: 1986-2003 (constant 2000 prices)

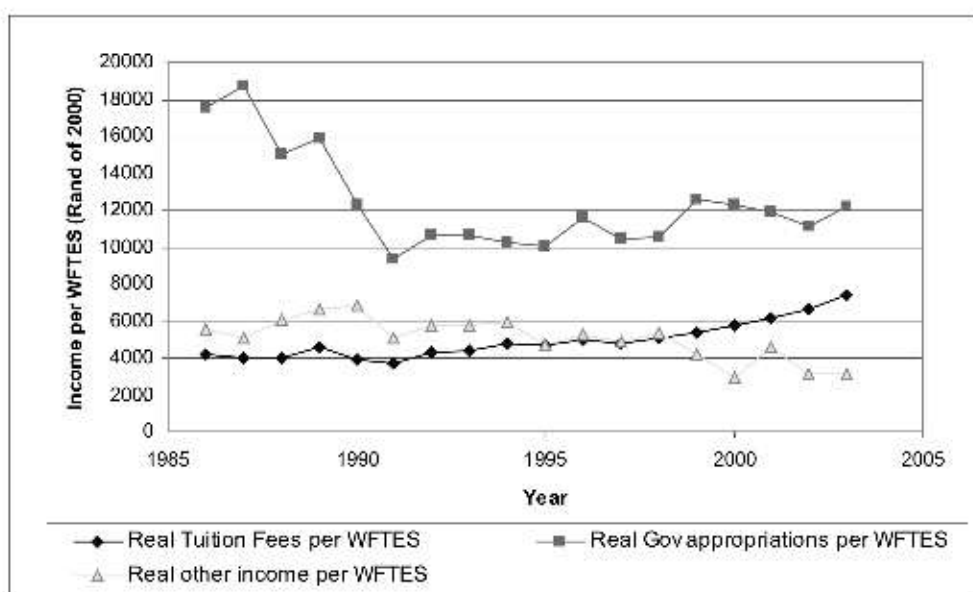


Figure 3.8: Real income per weighted FTE student for historically advantaged technikons according to source of income: 1986-2003 (constant 2000 prices)

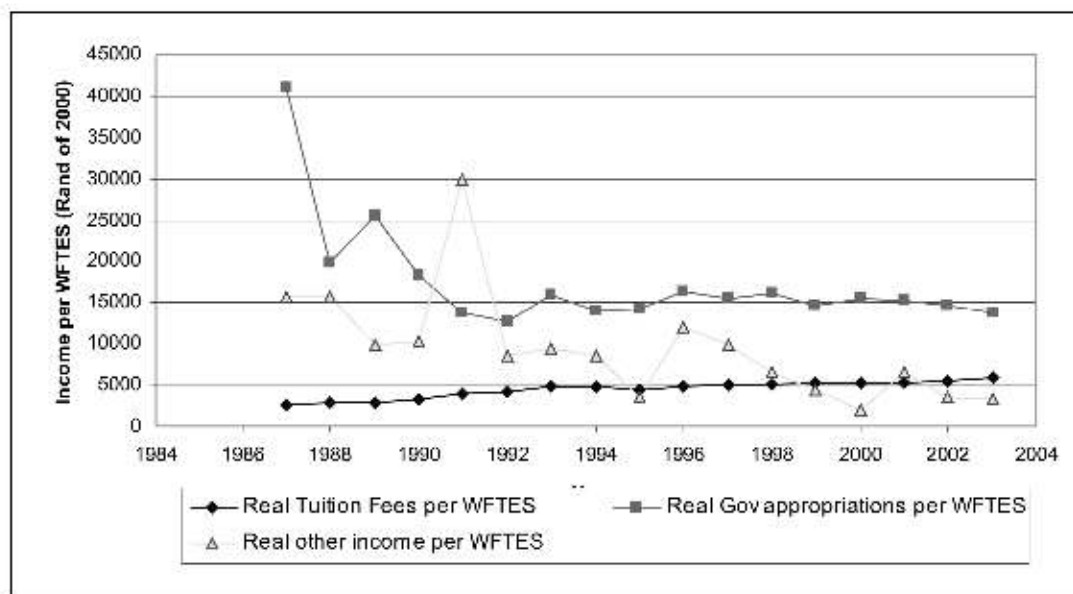


Figure 3.9: Real income per weighted FTE student for historically disadvantaged technikons according to source of income: 1986-2003 (constant 2000 prices)

Figures 3.8 and 3.9 indicate the real income per WFTEs according to the three main sources of income for the two technikon groups. The information comes from Tables C.2.17 and C.2.18 of Appendix C. Note that the missing data used in the two figures for 1999 were estimated as the averages of the corresponding unit values for 1998 and 2000. Although the two tables and figures confirm the broad conclusions drawn from the analyses of Section 3.3, the following additional useful information can be deduced—

- The real tuition income per WFTEs increased from R4 228 in 1986 to R7 393 in 2003 in the case of HATs, an increase of 75%, whilst the increase from R2 590 in 1987 to R5 804 in 2003 for the HDTs represents an increase of 124%. The lower per capita tuition fee income at the HDTs compared to the HATs could probably also partly be ascribed to relatively less students enrolled in Science, Engineering and Technology (with higher fees) at the HDTs than at the HATs, as well as a higher bad debt ratio at HDTs.
- The real government appropriation per WFTEs declined from R17 537 in 1986 to R12 167 in 2003 in the case of the HATs, a significant decrease of 31%. However, note that the real decrease occurred mainly from 1986 to 1991. Since then the per capita state appropriation income fluctuated between R10 000 and R12 000. The corresponding figures for the HDTs show very large initial fluctuation until 1991 and a fairly constant value of about R15 000 since then. Large fluctuation in the real income per WFTEs for the third money stream can also be seen in Figure 3.9.
- The rather constant real state appropriation per WFTEs for the technikon sector since 1992 could be partly the result of the revision in the technikon's SAPSE subsidy

formula with effect from 1993. This revised formula has closed the gap between university and technikon funding somewhat. The higher appropriation of income per WFTEs for the universities compared with that for the technikons, especially for the HAUs, reflects the higher ESS funding for universities in comparison to technikons under the SAPSE formulas. This was the result of a much larger research component per ESS in the university formula (see Section 2).

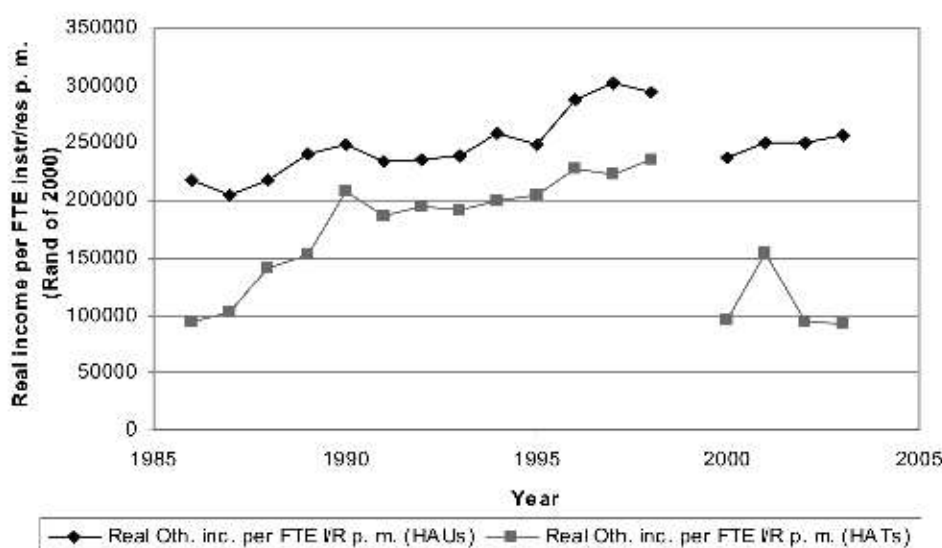


Figure 3.10: Real income from third money stream per FTE instruction/research personnel member for historically advantaged universities and technikons according to group: 1986-2003 (excluding 1999) [constant 2000 prices]

Usually, a large part of the third money stream of HE institutions is generated by the entrepreneurial activities of the personnel of these institutions (mostly contract research and short courses) or by government agencies' earmarked allocations to institutions for performing high level research projects. The key role players in the generation of these funds are obviously the instruction/research personnel of an institution. It is therefore of interest to study the real income from the third money stream per FTE instruction/research personnel member. As the aggregated data for this source of income is more consistent for the historically advantaged institutions than for the other institutions, only the HAUs and the HATs are considered in this regard. The third money stream data in Tables C.1.22 and C.2.17 are summarised in Figure 3.10, but the data for 1999 were not estimated as in previous figures. The figure shows that, amidst some fluctuation, there are indications that universities increased their real annual third money income stream per FTE academic personnel member over the 18-year period, while the technikons' real annual income also shows a steep upward trend until 1998. The sudden decline in the case of technikons since 2000 (and to a lesser extent also for universities) is surprising. This could be related to the new financial reporting system implemented in 2000. Another explanation, especially for technikons, could be that the increasing student-lecturer ratios

for the technikon sector (see Section 4) has eroded academic personnel's time to such an extent that less capacity were left for entrepreneurial activities.

3.5 ANALYSIS OF THE EXPENDITURE OF HE INSTITUTIONS

A number of expenditure indicators under the heading 'Expenditure information' in the Tables C.1 and C.2 series of Appendix C are investigated in this section. The institutions included in this analysis are the same as was the case in the previous section.

As was discussed in Section 1.7, the number of students at both universities and technikons increased substantially over the period of this investigation. From Table 1.2 it can be deduced that the headcount of university students increased by almost 100% (or on average by four per cent per annum) and the headcount of technikon students by almost 400% (or on average by 9.9% per annum) for the period 1986-2003. Over the same period government appropriations per weighted FTE student decreased substantially for the whole HE sector. How did these trends impact on the expenditure of HE institutions? Once again, a distinction is made between universities and technikons, and between historically advantaged and historically disadvantaged institutions. As was explained earlier, financial data for 1999 are not available, but the data of 2000 are sceptical because institutions were unfamiliar with the new HEMIS system of reporting and the data suggest that mistakes were made. Therefore, the analyses in this section do not include either 1999 or 2000. In Figures 3.11-3.14, the dotted lines represent interpolated linear functions between the actual values of 1998 and 2001.

3.5.1 Recurrent expenditure per weighted FTE student – From Figure 3.11 it is clear that the real recurrent expenditure per WFTEs at HAU was relatively stable until the mid 1990s but then increased quite substantially.

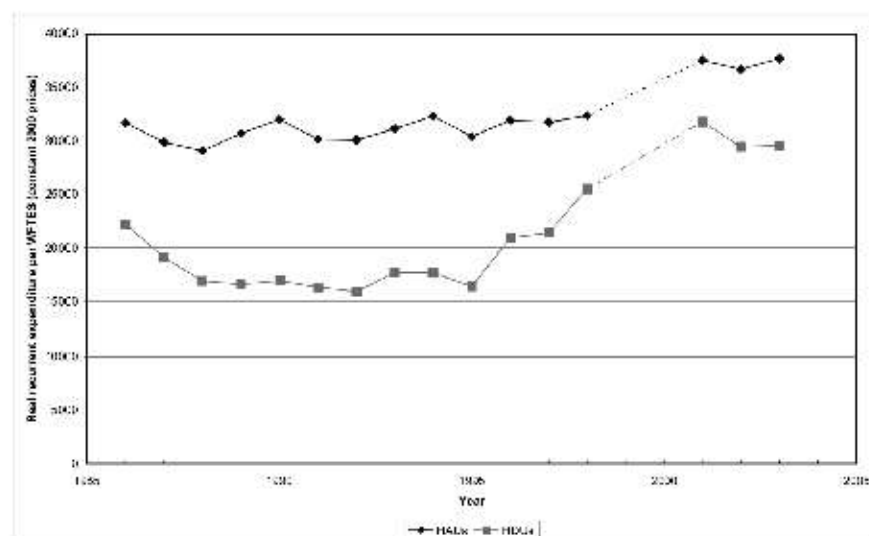


Figure 3.11: Real recurrent expenditure per WFTEs at HAU and HDU: 1987-2003
(Constant 2000 prices)

In 1998, the value of real recurrent expenditure per WFTES at HAUs was R32 341, then increased to R37 536 in 2001, and then remained relatively stable until 2003 (R37 697). With decreasing government appropriations, but increasing expenditure per WFTES, funds had to be collected elsewhere. As discussed in Section 3.4, this was mainly from higher student fees (see also Table C.1.22 of Appendix C). The situation at HDUs followed roughly the same trend over the study period. The real recurrent expenditure per WFTES decreased until the mid 1990s and then increased rather sharply after that. In 1995 the real recurrent expenditure per WFTES at HDUs was R16 395 and increased to R31 775 in 2001 and then decreased slightly to R29 577 in 2003. The real recurrent expenditure per WFTES at HDUs was about 80% of what is spent by the HAUs per WFTES, but it is clear that the gap between the expenditure differences between the two groups of universities is closing.

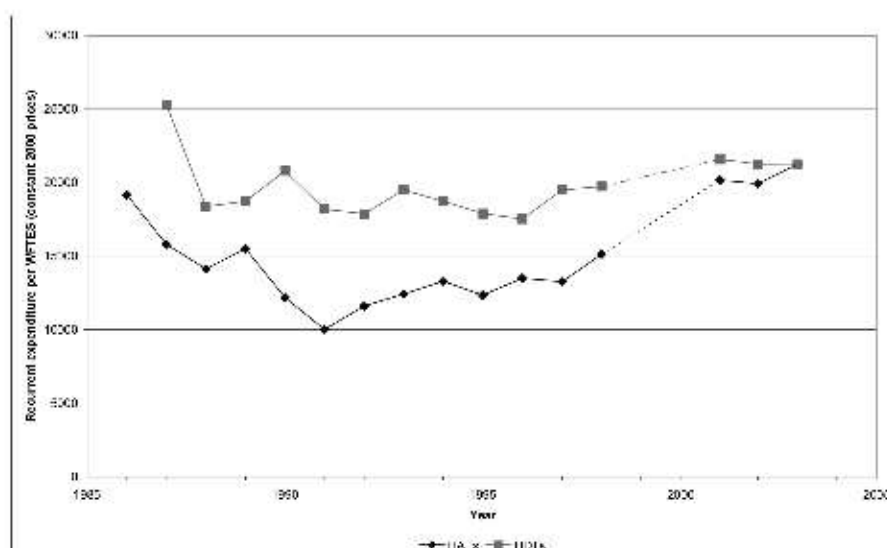


Figure 3.12: Real recurrent expenditure per WFTES at HATs and HDTs: 1987-2003
(Constant 2000 prices)

The situation with the HATs is slightly different. Although the value of real recurrent expenditure per WFTES decreased quite substantially over time from R19 153 in 1986 to R9 999 in 1991, it then started to increase and had a value of R21 251 in 2003. The value in 2003 is also higher than the value in 1986. The contribution of government appropriations and the third money stream decreased over time as a percentage of total income (see Table C.2.17 in Appendix C); and these institutions had to rely on higher student fees to balance their budgets. This placed definite constraints on the ability of these institutions to increase their expenditure per WFTES. With the HDTs, the situation is roughly the same although the trends may not be representative for all the HDTs because the data of so few institutions could be used. According to the available data (represented graphically in

Figure 3.12) the real value of recurrent expenditure per WFTES stayed fairly constant over the whole period under discussion if the high values in 1987 is ignored. Another interesting observation is that the real recurrent expenditure per WFTES of the HDUs was consistently on a higher level than the corresponding values for HATs although it was almost the same in 2003.

The fact that the amounts represented in Figures 3.11 and 3.12 are in constant 2000 prices should be borne in mind. If values remain constant, it means that the nominal values increased at the same rate as the inflation rate (as previously pointed out we used the CPI as an indicator of inflation). In general, there is an increasing trend in real expenditure per WFTES and this implies that the increase in expenditure by HE institutions was faster than the corresponding inflation rates.

To complete this picture, it is interesting to look at the nominal expenditure per WFTES at the different types of institutions. For HAUs, the value in 1986 was R7 819 and it increased to R46 028 in 2003. The corresponding figures for HDUs are R5 477 and R36 114 respectively. For HATs the figure increased from R4 730 in 1986 to R25 948 in 2003 and for HDTs it increased from R7 257 in 1987 to R25 995 in 2003.

3.5.2 Recurrent expenditure per qualification awarded – If we look at the recurrent expenditure per qualification awarded, the real expenditure at HAUs stayed relatively constant over the whole period (see Figure 3.13). It steadily decreased from a real value of R126 204 in 1986 to R105 225 in 1995, but since then it has shown a rising trend. Despite this increase, the cost per qualification is still lower in real terms in 2003 than in 1986. This seems to indicate that over the years HAUs have become fractionally more cost efficient in delivering qualified students.

At HDUs, the real recurrent expenditure per qualification awarded remained relatively constant until the middle 1990s (except 1986), but since then it has increased rather dramatically. In 1986 the real expenditure per qualification was a very high R105 672 and it dropped to R66 131 in 1992. Especially from 1996, the increasing trend in expenditure per qualification awarded picked up momentum and increased to levels not experienced before. This can to some extent be explained by decreasing student numbers at HDUs in these years, which led to smaller student/lecturer ratios and therefore a higher cost structure. This also led to fewer qualifications being awarded, which, in turn, increased the cost per qualification (see Section 4 for a more detailed explanation of this phenomenon). Another contributing factor to the higher cost structure may be the use of more modern technology. However, whether this is a sufficient explanation for the 140% increase in real expenditure since 1995 is doubtful. The other obvious conclusion from this figure is that qualifications awarded at HAUs were initially more expensive to produce (if we use this method of measurement as a yardstick), but the situation changed over time and currently the qualifications at HDUs are more expensive to produce.

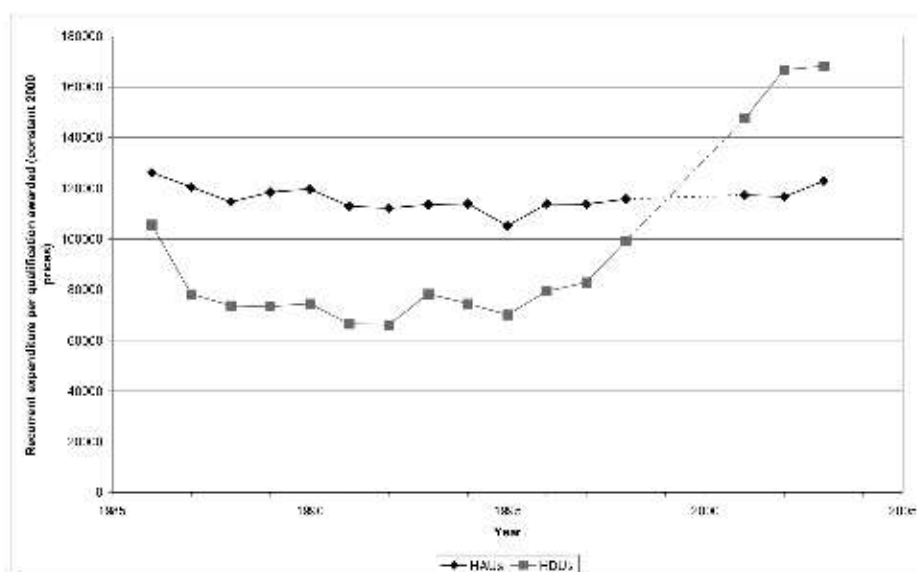


Figure 3.13: Real recurrent expenditure per qualification awarded at HAU's and HDU's: 1987-2003 (constant 2000 prices)

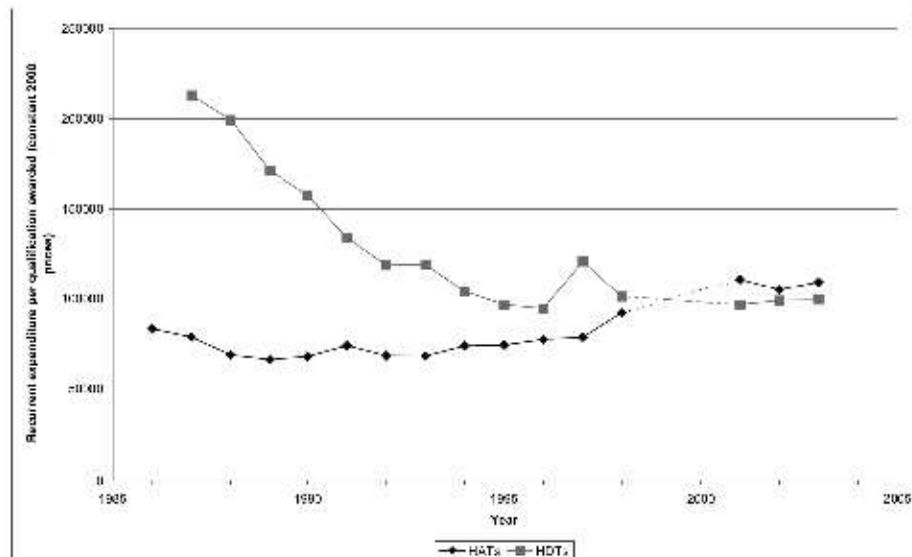


Figure 3.14: Real recurrent expenditure per qualification awarded at HATs and HDTs: 1987-2003 (constant 2000 prices)

If the real recurrent expenditure per qualification awarded at the HATs is looked at, it is clear from Figure 3.14 that it followed a decreasing trend from R83 235 in 1986 to R68 224 in 1993. From then on, it increased almost every year and in 2003 the real expenditure per

qualification awarded was R109 409. For these institutions, the costs to 'deliver' a qualification is currently increasing. The data for HDTs are more volatile and starts with a very high R213 259 in 1987 per qualification awarded. This is almost R100 000 more than for HAU. Bear in mind, however, that both institutions included in the HDTs were young and small institutions with relatively few diplomates in 1987. The cost of running a HE institution is high, even when a small number of qualifications are awarded. Since 1995, there has been a little more consistency in the per qualification cost for this group, although it was still rather volatile from year to year until 2001, after which it seemed to stabilise around R100 000. The data suggest that the costs per qualification awarded were declining in the 1990s.

Once again, the analysis is concluded with the nominal amounts of recurrent expenditure per qualification awarded. For HAU the nominal expenditure in 1986 per qualification awarded was R31 167 which increased to R150 036 in 2003. The corresponding figures for HDUs were R26 096 and R205 486. For HATs, the nominal expenditure per qualification awarded in 1986 was R20 555 which increased to R133 589 in 2003. For HDTs this figure increased from R61 171 in 1987 to R121 347 in 2003. Two clear outliers can be identified from these expenditure series. The first is the very high cost of qualification awarded at HDTs in the beginning of the study period, and the second, the very high cost per qualification awarded at HDUs at the end of the study period.

3.5.3 Bursaries paid by HE institutions – The amounts that HE institutions spent on bursaries in total and per WFTEs are summarised in Table 3.3. This table is deduced from Tables C.1.21, C.1.22, C.2.17 and C.2.18 of Appendix C. From the data series, it seems as though not all institutions treated bursaries in a similar way in their financial statements and that some included NSFAS allocations under institutional bursaries. This is clearly wrong. They should include the bursary part of NSFAS awards, but not the loan part. Owing to the inconsistency in the data series, this is not analysed in as much detail as the other expenditure. Because of the data problems alluded to and the fact that not all institutions are included in this analysis, one should make comparisons between the magnitudes of bursary expenses of the different groups of institutions, as indicated in Table 3.3, with the necessary circumspection.

When the data in Table 3.3 are analysed, it becomes clear that the already dubious data are becoming even more unreliable from 2000 onwards. At HAU, the amount paid on bursaries over the whole period increased 17-fold from almost R43 million to roughly R740 million at a nominal growth rate of 18.3% per annum. Even in real terms, it increased by 7.6% per annum. Also at HDUs, the same tendency can be detected; and bursary expenses increased from a mere R1.3 million in 1986 to more than R132 million in 1998, but then decreased to less than R99 million in 2003. This corresponds to a nominal increase of 28.7% per annum or a real increase of 17.2% per annum for the period 1986 to 2003. From

1986-1998 the increase was 46.5% per annum. Although the magnitude of bursary expenses at these institutions seems to be much less than at the HAUs, there can be no question about the increasing trend in bursary expenses.

Table 3.3: Bursaries (in Rand) paid by HE institutions in South Africa: 1996-2003

Year	Total bursaries at all HAUs	Total bursaries at 5 HDUs	Total bursaries at 5 HATs	Total bursaries at 2 HDTs
1986	42 768 458	1 346 299	97 619	-
1987	48 695 721	2 613 482	211 327	1 497 988
1988	54 825 992	3 919 482	142 076	1 461 002
1989	68 693 773	5 889 535	339 568	1 937 040
1990	67 113 771	5 766 904	446 570	3 281 686
1991	81 391 493	7 650 782	831 780	4 405 232
1992	102 148 489	17 044 081	1 504 581	7 031 324
1993	125 873 726	34 712 008	4 391 257	5 417 419
1994	145 275 664	35 893 434	9 695 252	7 913 471
1995	157 579 198	59 922 049	12 936 021	7 854 096
1996	192 771 877	124 315 223	19 426 768	8 734 722
1997	211 336 687	98 740 920	20 538 894	5 023 430
1998	234 162 549	132 337 795	26 323 832	5 924 507
1999	-	-	-	-
2000	375 388 000	74 445 670	64 998 000	19 661 273
2001	530 371 000	23 559 000	78 984 243	5 356 970
2002	625 550 000	48 903 000	20 120 000	3 943 908
2003	739 395 000	98 985 000	176 940 554	88 704 000

With technikons, expenditure on bursaries was initially very small, because the time period under investigation started shortly after the first technikons were established. The increase in bursaries was remarkable, but one must bear in mind that these increases took place from a very small base. Bursaries at the HATs increased from a mere R97 617 in 1986 to more than R26 million in 1998 and then rather sharply to almost R177 million in 2003. For HDTs, the expenditure on bursaries increased from approximately R1.5 million in 1987 to almost R6 million in 1998. After that the series is very volatile and the figure of R88 million in 2003 does not seem to be correct.

From the above analysis, there can be no question about the seriousness of HE institutions to get more involved in making bursaries available to prospective students. On the one hand, government appropriations decreased, but on the other, the NSFAS scheme was introduced in 1995 to help financially disadvantaged students to finance their education (as was discussed in Section 2.4). Given that a part of a NSFAS allocation may be converted to

a bursary, this may be one of the most important reasons why HE institutions' expenditure on bursaries increased so fast. It is doubtful whether it would be possible for HE institutions to provide so much funding for bursaries from their own funds. The continuing financing of bursaries through the NSFAS scheme may prove decisive in future to ensure equal access to education for everybody, irrespective of their socio-economic background.

3.6 TRENDS IN THE REMUNERATION OF HE PERSONNEL

Person power resources of HE institutions are very expensive and as far as some personnel categories are concerned, e.g. instruction/research personnel and executive management personnel, also scarce resources. The size of the remuneration budget of an institution, as well as the average annual remuneration per personnel member, are both important issues. What can be deduced from the financial statements of the individual institutions and the aggregate statements of the 4 groups of institutions (as set out in Appendix C) as far as personnel expenditure over the study period is concerned? How does HE remuneration compare with other sectors? These are some of the issues that will be discussed in this section.

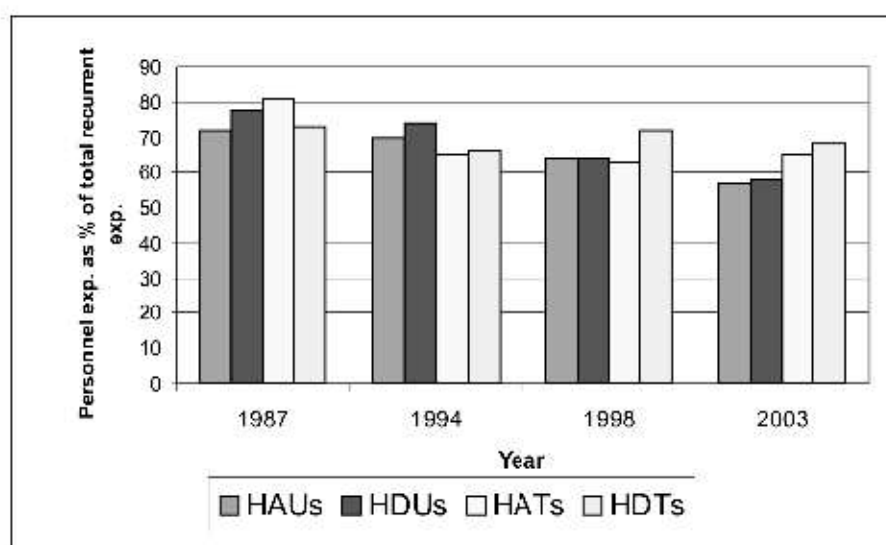


Figure 3.15: Personnel expenditure as percentage of total recurrent expenditure according to HE group: 1987, 1994, 1998 and 2003

Figure 3.15 shows that remuneration as a percentage of the total recurrent expenditure had decreased for all four institutional groupings for 1987, 1994, 1998 and 1998. Except for the HDTs (and the HATs for 2003) the decline in the remuneration percentage was significant. There are many possible reasons for this decline. As is shown in Sections 4 and 6, the increase in FTE academic personnel had not kept pace with the increase in the weighted FTE student numbers. Since the WFTEs is the main driver of institutional income and

expenditure the decreasing relative size of remuneration is not surprising. The space created by the decreasing importance of remuneration in the institutional budgets as far as recurrent expenditure is concerned, is usually taken up by higher spending on bursaries and supplies and services. Advances in technology not only generates the need for more equipment (considered as non-recurrent expenditure in the SAPSE reporting system) over the past two decades but also created a need for more office consumables generated and used by computers and other sophisticated laboratory and administration equipment. Another factor that contributed to the decrease in the remuneration budgets at many institutions is the privatisation of some services, especially cleaning and gardening services. Some remuneration expenses have therefore been converted into expenditure on supplies and services.

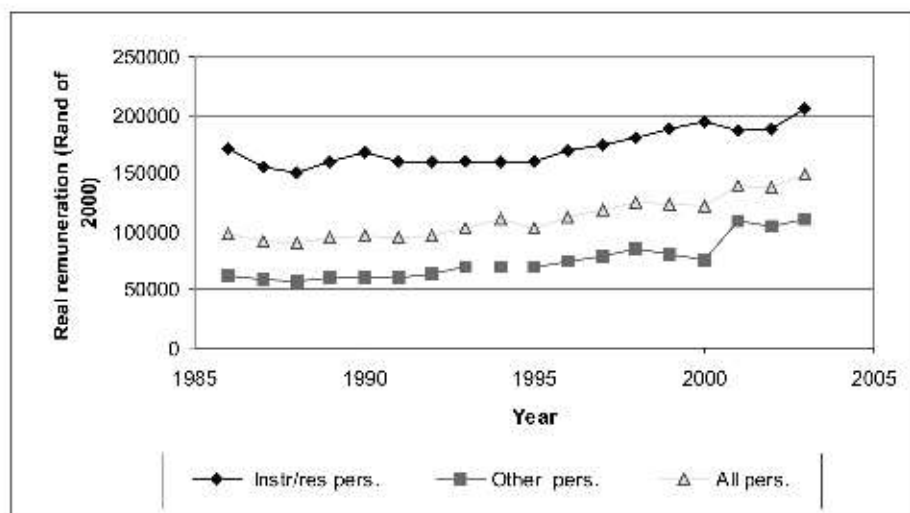


Figure 3.16: Real remuneration per FTE personnel member for the historically advantaged universities according to personnel category: 1986-2003 (constant 2000 prices)

The so-called C1, C2 and C3 cost units in the SAPSE subsidy formulas for universities and technikons, as described in Section 2.1.6, were associated with the total remuneration of instruction/research personnel, administrative/technical personnel and service workers (the last two groups of personnel will for this study be categorised jointly as 'Other personnel'), respectively. Although earlier government subsidy formulas and policies (preceding the SAPSE era) regulated salaries of university personnel, no such regulation was in place during the study period 1986 to 2003. The remuneration of employees by HE institutions was therefore determined by market forces and institutional budgetary constraints. Figures 3.16-3.19 indicate, respectively, the trends in real remuneration per FTE personnel member for the four institutional groups during the study period. In each figure, the real remuneration per FTE instruction/research personnel member, the real

remuneration per FTE other personnel member, as well as the real remuneration per FTE personnel member (total personnel corps) are given. For a more detailed discussion regarding the calculation of FTE personnel, see Section 4.2.

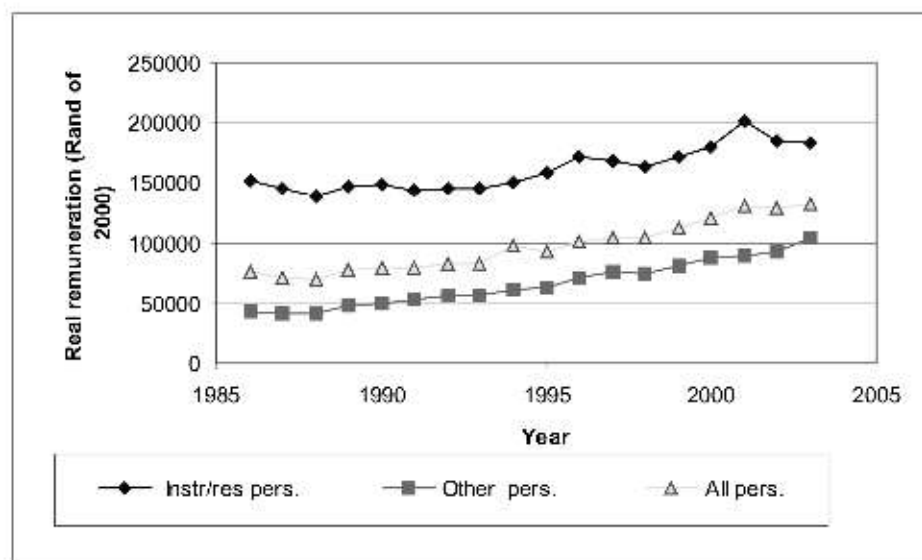


Figure 3.17: Real remuneration per FTE personnel member for the historically disadvantaged universities according to personnel category: 1986-2003 (constant 2000 prices)

The following can be calculated from Tables C.1.22, C.1.23, C.2.17 and C.2.18 of Appendix C –

- In the case of the HAU's, the real increases in per capita remuneration for the 18 years were:
 Instruction/research: 20%
 Other personnel: 77%
 All personnel: 50% (real average annual increase of 2.4%)
- For the HDUs, the real increases in per capita remuneration for the 18 years were:
 Instruction/research: 20%
 Other personnel: 148%
 All personnel: 76% (real average annual increase of 3.4%)
- For the HAT's, the real increases in per capita remuneration for the 18 years were:
 Instruction/research: 45%
 Other personnel: 31%
 All personnel: 33% (real average annual increase of 1.7%).

Figure 3.18 shows some confusing fluctuation for the years 2001 and 2002 that could not be explained.

- In the calculations for the HDTs below, the 2003 information was not taken into account since it is obviously incorrect. A misclassification of personnel at one of the two institutions caused this. The real increases in per capita remuneration for the 17 years up to 2002 was:
 Instruction/research: 42%
 Other personnel: 94%
 All personnel: 60% (average real annual increase of 3.0%)

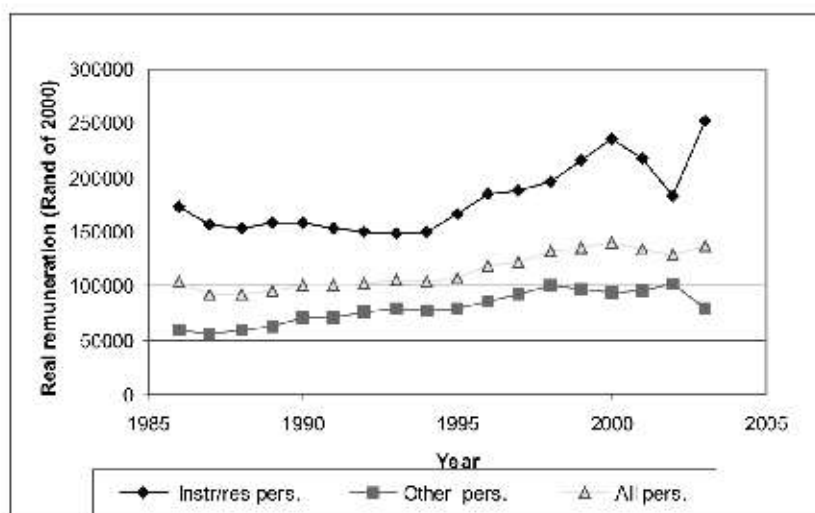


Figure 3.18: Real remuneration per FTE personnel member for the historically advantaged technicians according to personnel category: 1986-2003 (constant 2000 prices)

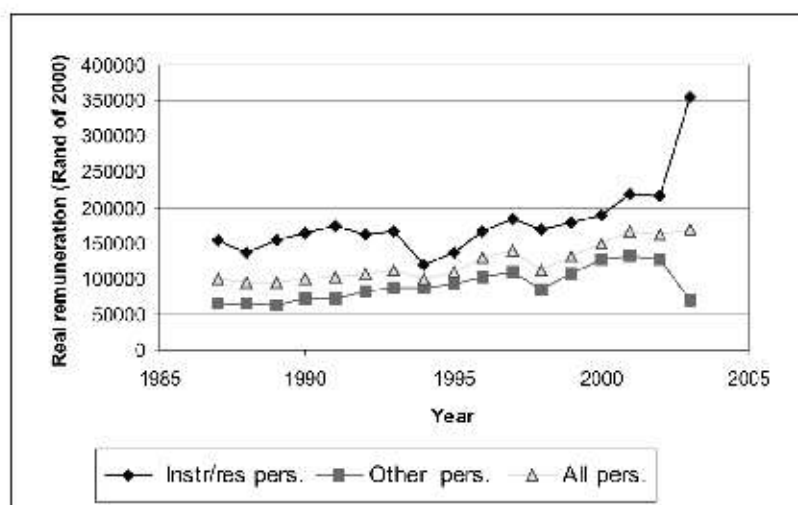


Figure 3.19: Real remuneration per FTE personnel member for the historically disadvantaged technicians according to personnel category: 1986-2003 (constant 2000 prices)

The real increases (and especially the size of the increases) in the per capita remuneration for both personnel categories for all four institutional groups are somewhat surprising, because the general consensus among HE employees is that their remuneration has not kept up with inflation. However, many factors, which have not been analysed here, play a crucial role in the remuneration changes observed in the analysis described above. Some of these factors are:

- *the age distribution of employees:* It is common knowledge that the median age of especially instruction/research personnel at HE institutions is high. At many institutions the median age is increasing from year to year. The reason for this trend is obvious: Academic life does no longer have the same attraction as 10 to 20 years ago, especially to young graduates. It is therefore very difficult to make appointments on the junior lecturer and lecturer ranks. The consequence of this is that the senior academics' high remuneration packages can no longer be balanced by the relatively smaller packages of young personnel. This results in an upward shift in the utilisation of academic ranks and increasingly also to the utilization of retired professors as temporary part-time lecturers. To unpack the crucial role of age on the changes in remuneration of HE personnel (especially academic personnel) a detailed analysis of the age-remuneration profiles of the sector or the individual 4 groups in the sector will have to be made for the two groups of personnel. Information on all employees in HE on both remuneration and age (paired observations) will be needed. This information is not contained in the SAPSE databases. In principle it should, however, be possible to extract this information from the unit records of the HEMIS personnel database.
- *market forces:* Increasingly in the professional disciplines like law and engineering the young and upcoming academics are lured away to the private sector. To counter these market forces these personnel are promoted by HE institutions earlier in their academic career than was the case some years ago.
- *employment equity:* One of the unintended negative consequences of implementing employment equity is the sometimes unrealistic remuneration packages offered in order to attract and appoint personnel from the designated groups. This is the result of severe competition in a market where the supply is low. These higher salaries eventually have a spill over effect to the remuneration of other personnel. This problem is not only restricted to instruction/research personnel but also to senior positions in management and administration.
- *outsourcing:* It was already indicated that the outsourcing of some services is common at many HE institutions. This is one of the reasons for the relatively small growth in HE personnel from 1986 to 2003. Cleaning, gardening and technical services were usually the first services to be contracted out to the private sector. As a result of this policy the services of many service workers and technical personnel (from a remuneration point of view of the lowest paid personnel) were terminated during the last 10 to 15 years. This had undoubtedly significantly increased the average level of remuneration in the 'Other personnel' group in most HE institutions.

The average annual remuneration (in nominal terms) per FTE personnel member over the whole period 1986 to 2003 for the four institutional groups, obtained from Tables C.1.22, C.1.23, C.2.17 and C.2.18, are:

Historically Advantaged Universities:	R82 850
Historically Disadvantaged Universities:	R74 488
Historically Advantaged Technikons:	R98 575
Historically Disadvantaged Technikons:	R103 107

In the above calculations, the remuneration and personnel information for 1999 was estimated for all institutions, while that was also the case for 1986 for the HDTs. Clearly the technikons' remuneration of personnel was better than the universities' remuneration of personnel during 1986 to 2003.

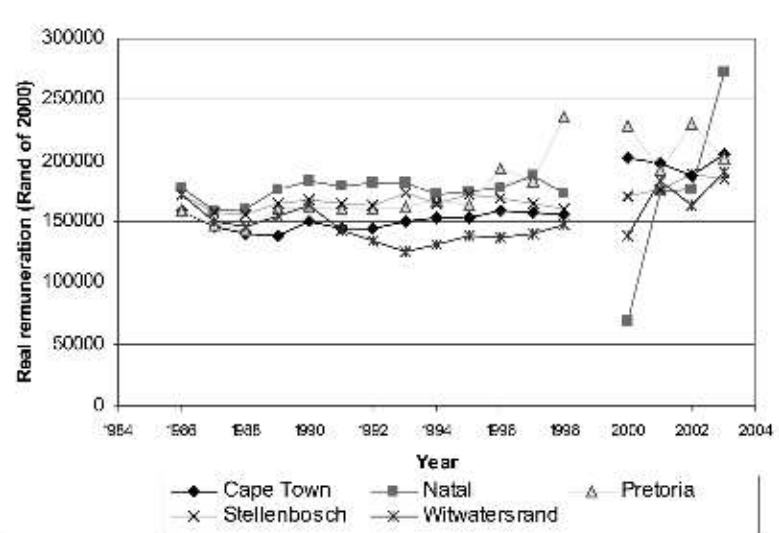


Figure 3.20: Real remuneration per FTE instruction/research personnel member for the five largest research universities: 1986-2003 (constant 2000 prices)

Although the analysis of individual institutions' remuneration of personnel is very important and interesting, it is seriously hampered by the fact that the reporting of remuneration information by many institutions, especially since 2000, is flawed. Figure 3.20 is a good example of these inaccuracies. The real remuneration per FTE instruction/research personnel member for the five largest residential universities is shown in Figure 3.20. These five universities are also known as research universities, as their

research output is, both in absolute and in relative (per academic personnel member) terms, usually the highest annually. In Section 4, it is shown that jointly these five institutions contribute about 60% of all HE research output. These universities are obviously in competition for the best academic personnel and this will influence the per capita remuneration of their academic personnel. The figure shows that the per capita remuneration of three of the five universities became unstable from 2000 onwards. As a result of this, no attempt was made to estimate the remuneration for 1999. The underlying problem is probably that the division of personnel into 'Instruction/research' and 'Other personnel' categories for the annual financial reporting according to the new (post-2000) format was done incorrectly or in an inconsistent way by some institutions. This problem seems to be serious and will also be referred to in Section 4.

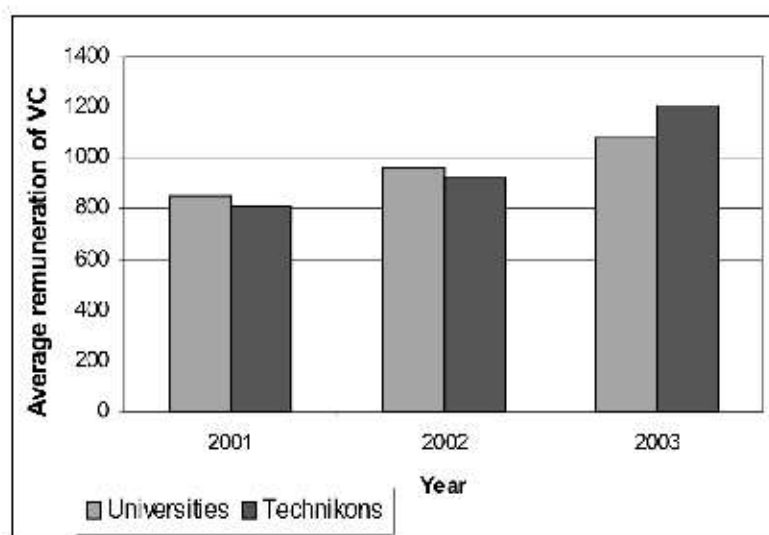


Figure 3.21: Average remuneration of Vice Chancellors according to year and HE sector (R'000)

As part of HE institutions' financial reporting (in correspondence with the regulations for annual reporting – See Section 3.1.1) the gross compensation of executive staff of HE institutions must annually be declared by name in a specific format. The gross remuneration of the Vice Chancellors (VCs) of all the HE institutions for 2001-2003, extracted from the institutional financial reports by the Department of Education and provided to the researchers, is set out in Table C.3.1 in Appendix C. Figure 3.21 shows the average remuneration packages separately for the university and technikon sectors for the 3 years. The following can be derived from Table C.3.1 and Figure 3.210–

- The average annual increases in the remuneration of VCs differ widely between HE institutions. Although there were two negative increases, most were large positive increases. In one year, from 2002 to 2003 the remuneration of the VC at one technikon increased by 173%.
- The real average annual increase in the remuneration of VCs over the period 2001 to 2003 was 4.4% for universities and 13.0% for technikons. Both these increases, but especially the increase in the remuneration of technikon VCs, are significantly higher than the real increases in the respective total personnel remuneration of the two sectors.
- The average remuneration levels of the VCs at universities and technikons was comparable in 2001 and 2002, with the university VCs' remuneration fractionally higher. This changed quite dramatically in 2003. In 2003, technikon VCs' remuneration was 12% higher than their counterparts at universities. This was mainly the result of the excessive increase of one VC already referred to.

A HE institution is a complex organisation and the management of such an institution is a very challenging task. Most of the VCs appointed at HE institutions are academics and do not come from big business. They have chosen an academic career (with a moderate salary) and not a business career with the prospects of a very high income. Although a VC, as the CEO of the HE institution, should therefore earn a salary that is related to the responsibilities of the position, the VC's responsibilities are shared by many other competent supporting managers. The remuneration of some of the VCs could therefore be regarded as unrealistically high.

How does HE remuneration compare to remuneration packages paid by the private sector or by government? This question is frequently asked, especially by instruction/research staff of HE institutions. The Van Wyk de Vries Commission of Enquiry into Universities (1974) concluded in their report that it does not make sense to equate the upper notch of the salary of a professor to that of the salary of a specific post in the civil service. According to the Commission, the remuneration of academic personnel at universities should be determined on its own merit.

It could be argued, however, that HE institutions are statutory organisations and are as far as the utilisation of staff is concerned in many ways rather similar to government departments. Although this applies more to the administrative, technical, management and service positions at a HE institution, highly qualified specialists, similar to academic personnel, also form an important part of government employees.

Following a comprehensive occupational specific investigation into the salaries of the educator family (college/school educators, university educators and technikon educators) by the government in 1981, the salaries of educators were increased on average by 26% that year.

This investigation, set out in two reports by the Department of National Education (1981), led to a government policy of parity between salaries of educators and the rest of the public sector in respect of posts with similar complexities. To uphold this salary parity principle, a number of salary investigations were undertaken by the Department of National Education in the 1980s and early 1990s, all leading to occupational specific adjustments of the salaries of educators. In these investigations, baskets of educator posts, posts in the rest of the public sector, as well as posts in the private sector with the characteristic of similar average complexities (measured according to the Peromnes post evaluation system) were constructed. Salary-age profiles, based on available data coming from salary databases of HE-institutions, governmental salary systems and the HSRC database of graduates, were compiled for each basket of posts. These profiles informed the salary adjustments.

The adjustments of the salaries of university and technikon instruction/research personnel, determined by the outcomes of the above-mentioned investigations, had only influenced the C1 cost unit of the SAPSE subsidy formulas for universities and technikons (See Section 2.1.6). Under the SAPSE funding it was left to the respective institutions to determine the actual remuneration structure of their personnel. It is of some interest to note that the SAPSE information of 1986 had shown that on average the academic personnel at universities were only remunerated at a level of 83% of the so-called ceiling value C1. The last investigation, based on the parity of baskets of post of educators and posts in the rest of the public sector, was conducted in 1991. From then until 2003, when the SAPSE subsidy formulas were terminated, the C1 as well as the C2 and C3 cost units (Section 2.1.6) were annually adjusted for salary inflation in accordance with the broad movement of salaries in the public sector as reported by Statistics SA.

No official information, based on a scientific study, is currently available to make any comparison possible between the remuneration of higher education personnel (especially academic personnel) and their counterparts in government. In the light of this we will in this study only look at the broad movement (in terms of real increases) in the remuneration of higher education personnel and government employees over a period of 11 years.

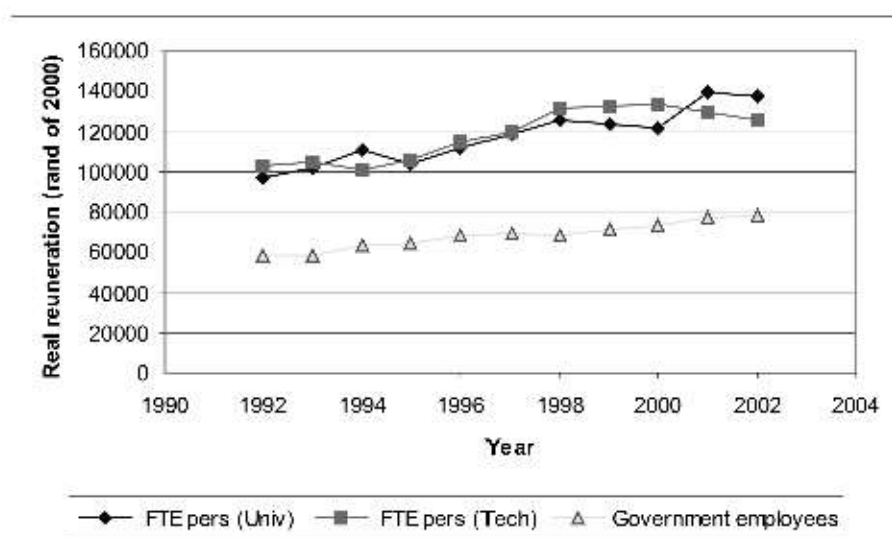


Figure 3.22: Real remuneration per personnel member according to group: 1992-2002 (constant 2000 prices)

Figure 3.22 shows the annual real remuneration per staff member for 1992-2002 for three groups of staff, namely the HAU staff, HAT staff and all government employees. The remuneration data of government employees comes from Statistics SA (2003). The gross average monthly remuneration of government employees as tabulated in the aforementioned document was converted to annual remuneration. The data for the first two staff groups come from Tables C.1.22 and C.2.17 of Appendix C. Although a similar increasing trend in the remuneration of staff can be seen in Figure 3.22 for the three groups, it is clear that, as expected, the remuneration of HE staff (with more highly trained personnel) is much higher than that of government staff. What is of greater importance, is that the respective real average annual increase in remuneration for the period 1992-2002 are comparable, namely,

University staff:	3.6%
Technikon staff:	1.7%
Government staff:	3.0%

From the above result, it is clear that personnel remuneration at HE institutions were, broadly speaking, adjusted annually according to the annual change in the remuneration of government employees as reflected in the annual adjustments of the C1, C2 and C3 cost units in the SAPSE subsidy formulas. The comparison of HE personnel remuneration with the private sector is a very complex exercise and will not be attempted in this rather limited study. This issue falls outside the scope of this report.

3.7 EXPENDITURE ON LIBRARY COLLECTIONS

It was mentioned earlier that the relative amount spent by a HE institution on library collections (books and journals) is a good measure of the academic commitment of such an institution. If the remuneration of HE staff is annually increased by high percentages, but the budget for library collections, and especially journal collections, is decreased every year, questions can be asked about the commitment to academic excellence of such an institution. Since no information on expenditure on library collections is available under the new (post 2000) reporting system, an analysis of this type of expenditure can only be done up until 1998.

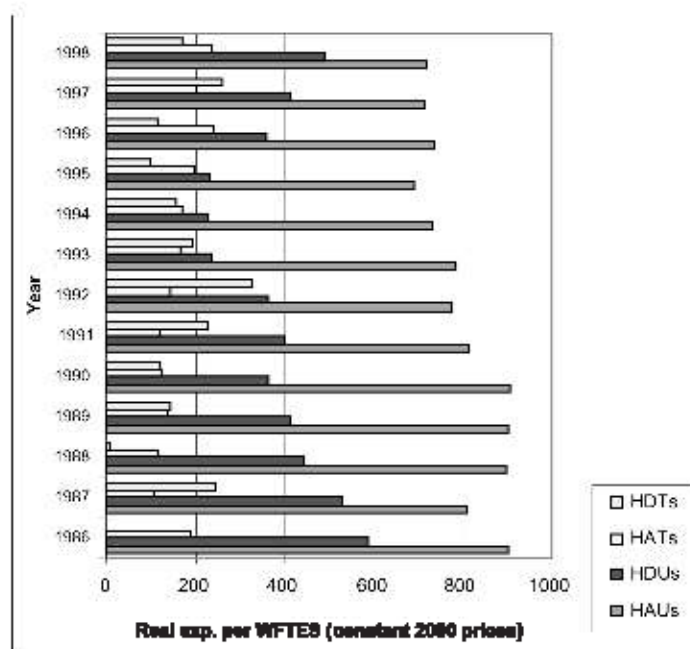


Figure 3.23: Real expenditure on library collections per WFTES according to institutional group: 1986-1998 (constant 2000 prices)

Figure 3.23 shows the real expenditure per weighted FTE student on library collections for the four institutional groups for the period 1986-1998. It is clear that while the HAUUs spent, on average and in real terms (in constant 2000 prices), about R800 per WFTES on library collections, the other three groups, but especially the technikons, spent much less. For example, in 1990 only R120 per WFTES was spent by both technikon groups on library collections. The fact that there was a decrease in the real per WFTES student expenditure on library collections at the HAUUs, is a matter of concern. These institutions are responsible for about 87% of all research output of HE. Maintaining a first rate library should be one of the top priorities, especially in these universities.

3.8 HE INSTITUTIONS EXPERIENCING FINANCIAL PROBLEMS

As a result of the adjustments made to the financial reports for the period 2000-2003 in order to make them compatible with the SAPSE reports (See Section 3.1), the institutional financial statements, as summarised in Appendix C, cannot be used directly to determine which HE institutions are experiencing financial problems. The surplus/deficit (difference between the total income and total expenditure when all activities, including the auxiliary enterprises programme, are taken into account) as reported in the complete financial statements for the last available years, namely 2000-2003 (not included in this report), are indicated in Table C.3.2 of Appendix C.

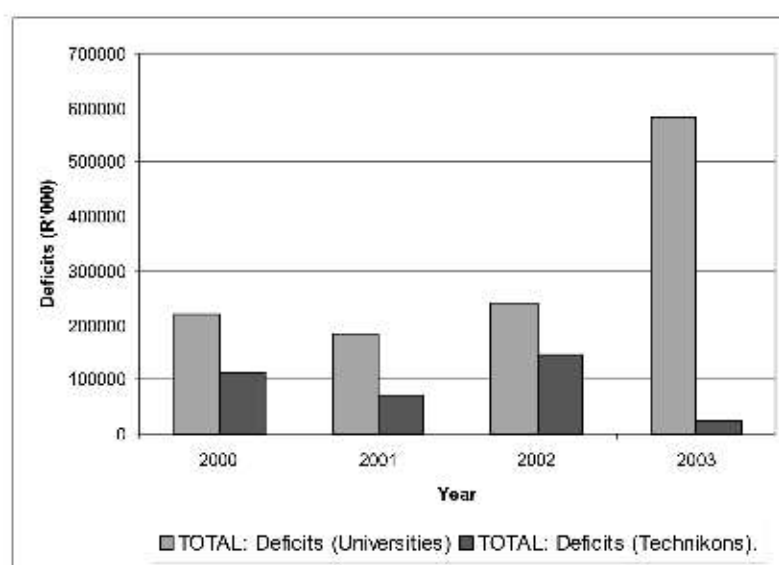


Figure 3.24: Total deficits - all activities (as per income statement) for universities and technikons: 2000-2003 (R'000)

Table C.3.2 shows that respectively eleven, nine, fourteen and twelve HE institutions reported deficits for the 2000, 2001, 2002 and 2003 financial years. The total deficits for each year for both the university sector and the technikon sector are summarised in Figure 3.24. The total university deficit amounted to almost R600 million in 2003. Although more sophisticated analyses are necessary to determine the viability of some institutions, it can in general be stated that the overall financial situation of many institutions looked rather bleak in 2003. The restructuring of HE, and especially allocations from the restructuring fund of government (amounting to R1 618m for the period 2004-2006) will bring some relief to many merging institutions.

SECTION 4: ANALYSIS OF THE TEACHING AND RESEARCH PERFORMANCE OF HIGHER EDUCATION INSTITUTIONS

4.1 PERFORMANCE INDICATORS OF HE INSTITUTIONS

The number of students (headcount) at HE institutions in South Africa increased by 150% during the period 1986-2003. As indicated in Section 3, significant changes also took place over these years in the composition of the different sources of income, as well as the types of expenditure of HE institutions. For example the real state appropriation per weighted FTE student decreased at most institutions since 1986 as well as the remuneration of personnel as a percentage of total recurrent expenditure. All these and other changes are analysed in detail in Section 3. What was the impact of all these changes on the two most important institutional functions, namely teaching and research? Was the impact the same for all institutions or groups of institutions? To answer these questions the quality or effectiveness of the teaching and research functions, as well as changes in the quality of these functions over the past 18 years will have to be investigated for all HE institutions.

A comprehensive range of literature exists on the selection of a set of indicators to monitor HE institutional performance in important activities. Steyn (2004) provides a short list of some 180 possible performance indicators. The list of indicators is wide ranging and includes the most well known internationally accepted indicators, as well as indicators flowing from WP3 and the NPHE. It can be used to monitor all the important institutional functions in HE. The selection of a set of key performance indicators for the monitoring of teaching and research quality and effectiveness at HE institutions depends on a number of factors. Firstly, the chosen indicators should be relatively simple and intuitively acceptable. Secondly, the data for the calculation of these indicators should be reliable and available for all institutions over the whole study period. Finally, every chosen indicator should measure or highlight different facets of the activities concerned, i.e. teaching and research in this case. Bearing these factors or criteria in mind, the following broad types of indicators were selected –

- student-lecturer ratio;
- qualifications awarded per lecturer;
- graduation rates; and
- research output per researcher.

The benchmarking of institutional activities is currently a popular activity. As far as the calculation of performance indicators is concerned, benchmarking translates into the determination of norms for performance indicators. Two important sets of norms, namely, norms for graduation rates for the different types of qualifications and norms for research output, currently form part of the national policy for HE in South Africa. Although externally (international) determined norms are useful for the interpretation of the calculated values of institutional performance indicators, they are mostly either not

available or not completely comparable. Comparisons of calculated indicator values (institutional or system wide) over time or the comparison of indicator values among South African HE institutions (or a few peer institutions) for specific years can also provide valuable information on the quality of teaching and research or about changes in the quality of functions performed by HE institutions.

4.2 STUDENT-LECTURER RATIO

Lecturers (academic personnel), also referred to as instruction/research personnel, within the SAPSE/HEMIS information context, are the most important institutional resource used in teaching. Generally speaking, from an educational point of view, one can say that the more students there are per lecturer the more difficult efficient instruction becomes. Although technological advances and creative modes of instruction could still ensure efficient instruction even in modules with high student-lecturer ratios, the monitoring of changes in the student-lecturer ratio at institutions is believed to provide important information. Since both enrolled students and employed academic personnel can be measured in more than one way, a student-lecturer ratio is by no means uniquely defined. It is therefore of the utmost importance to ensure that comparisons of these ratios at different institutions are valid, i.e. that the ratios have been calculated in exactly the same way.

We define the student-lecturer ratio as:

$$S/L \text{ ratio} = \text{Weighted FTE students per FTE instruction/research personnel member}$$

The calculation of the weighted FTE students (WFTEs) has already been discussed in Section 1.7.6. WFTEs for 1986 to 2003 according to institution appear in Table A.5 of Appendix A.

According to the SAPSE/HEMIS definitions personnel at HE institutions are divided into 7 categories. The first category is the instruction/research personnel responsible for teaching and research (and to a lesser extent for academic support and community service). As was already indicated in Section 3, for the purpose of this study, the other six personnel categories, which include executive managers, administrative and technical personnel, as well as service workers are pooled into a group called 'Other personnel'. An instruction/research personnel member employed full-time for the whole academic year counts as one full-time equivalent (*FTE*) personnel member in that year. Part-time (usually temporary) personnel, or full-time personnel appointed only for a part of an academic year, count less than one *FTE*, the *FTE* value being determined in a pro rata way. Table D.1 of Appendix D shows the *FTE* instruction/research personnel values for 1986-2003 according to institution. The table also includes *FTE* 'Other personnel' values and *FTE* 'Total personnel' values for the respective years. Please note that no *FTE* personnel information is available for 1999 (See Section 1.6.2).

S/L ratios have been calculated for all institutions for the years 1986 to 2003, except for 1999 where no personnel information is available. These indicator values are presented in Table D.2 of Appendix D. Figures 4.1 and 4.2 show the *S/L* ratios for the university and technikon sectors respectively. For both sectors, the ratios of the historically advantaged and historically disadvantaged groups are also shown separately. In order to obtain a continuous trend, the missing ratios for 1999 were estimated by means of the averages of the 1998 and 2000 values. Table D.2, as well as Figures 4.1 and 4.2, indicate significant increases in the *S/L* ratios at most universities and technikons during the period 1986 to 2003. Large fluctuations in the annual *S/L* ratios are, however, also evident at many institutions. This is in many cases the result of annual fluctuations at many institutions in the denominator of the *S/L* ratio. Under normal circumstances *FTE* instruction/research personnel values should form a very stable time series since personnel appointment and attrition are sensitive issues and large changes cannot occur in the short term. However, the practice that part-time temporary appointments are also incorporated in the calculation of the *FTE* values gives rise to instability in these values. The reason for this is that the *FTE* calculations for part-time personnel are often done incorrectly by many institutions. Some institutions also apply the definition of instruction/research personnel in an inconsistent and sometimes incorrect way, especially since 2000. The tampering with the SAPSE information system seems to have had negative effects.

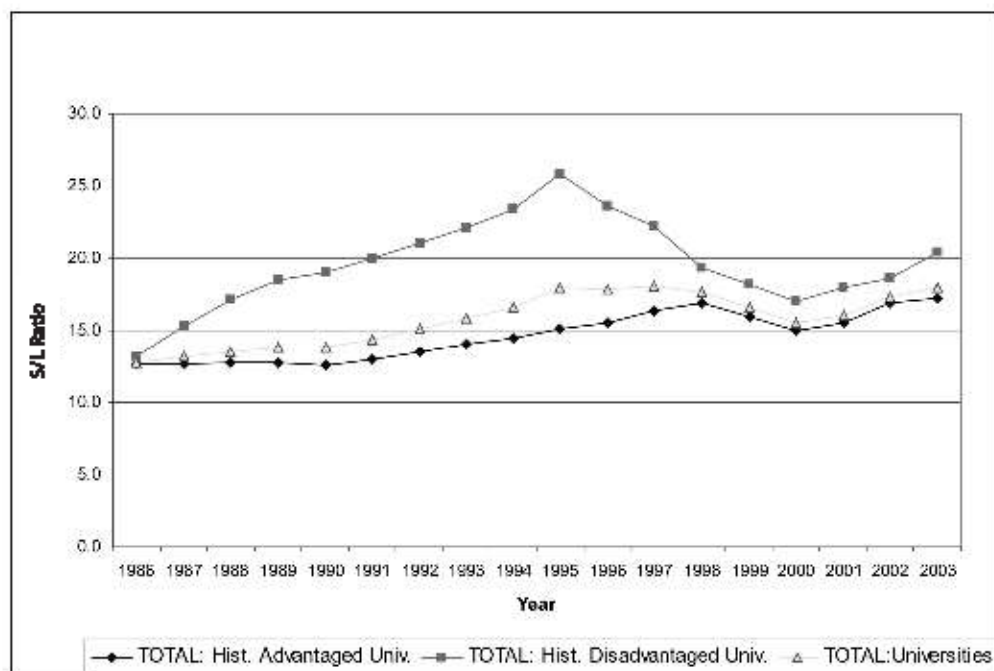


Figure 4.1: WFIES per FTE instruction/research personnel member (*S/L* ratio) for universities: 1986-2003

Amidst the large fluctuations in institutional S/L ratios, Figure 4.1 clearly shows an increasing trend in the S/L ratio of the university sector. The ratio for all universities increased from 12.7 in 1986 to 18.0 in 2003, an increase of 42%. The figure further shows that there are some differences in the trends of the ratios of HAU and HDU. The trends in the three series of ratios depicted in the figure also show some resemblance with the corresponding trends in the weighted FTE students for the three institutional groups during the study period (See Figure 1.6).

Figure 4.2 indicates an even more significant increase in the S/L ratio for the technikon sector. The ratio for all technikons increased from 14.9 in 1986 to 29.0 in 2003, an increase of 95%. In 1997, the HATs' S/L ratio was an all time high of 36.8. As expected, the graphs of the S/L ratios in Figure 4.2 also show some resemblance with the weighted FTE student numbers of the corresponding groups (See Figure 1.7).

It is clear from Figures 4.1 and 4.2 (and Table D.2 of Appendix D) that since 1986 the provision of instruction/research personnel had not kept up with the growth in student numbers. The question that needs to be answered is whether the S/L ratios of 18 and 29, respectively, for universities and technikons in 2003 are still synonymous with quality teaching. Table 4.1 provides some insight.

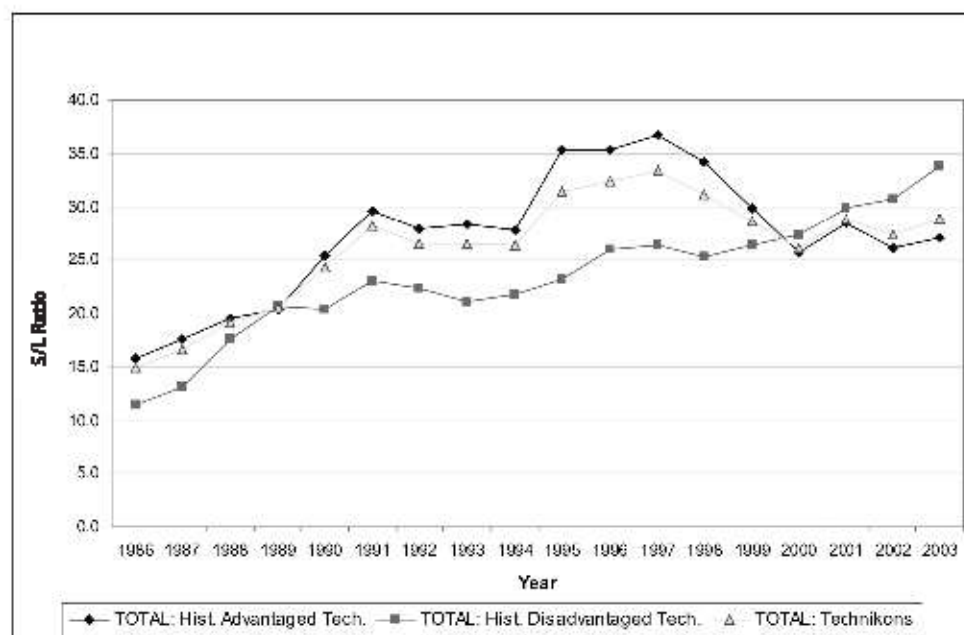


Figure 4.2: WFTES per FTE instruction/research personnel member (S/L ratio) for technikons: 1986-2003

Table 4.1: Ratio of students to teaching staff (FTE) in higher education: 1985-1992, according to country

Country	1985	1986	1987	1988	1989	1990	1991	1992
Australia							9.4	14.3
Austria	15.5	15.8	16.3	16.7	16.6	16.4	16.5	13.8
Czech Rep.								9.7
Denmark	22.5	23.6	24.5	25.3	26.3	27.9	28.9	29.3
France								17.8
Germany	10.7	10.9	10.9	10.8	10.8	11.0		
Ireland	10.7	10.8	12.6	13.1	13.6	14.2	14.3	15.0
Italy	29.2	28.3	25.9	26.8	28.8	29.4	31.7	
Japan					11.8	11.8	12.1	12.2
Netherlands	10.2	10.3	10.4	10.6	10.6	12.0	13.2	
Portugal							11.4	
Spain	22.0	23.7	25.0	24.8	24.1	24.0	23.4	22.6
Turkey	19.0	20.5	20.7	19.4	20.6	21.4	21.8	23.1
UK				10.8	11.4	12.2	12.8	14.0
USA	15.0	14.8	14.7	14.9	15.1	15.4	15.6	15.8
Average	17.5	18.2	19.0	19.0	19.4	19.9	20.1	19.9

Source: National Centre for Education Statistics (NCES) 2000, Table 12.4

In comparing the *S/L* ratios of the countries given in Table 4.1 with the ratios calculated for HE institutions in South Africa, it must be noted that some of the ratios in the Table are in all probability calculated by using headcount enrolments and not *FTE* student enrolments. The NCES document is not very clear about this. Using headcount enrolled students could inflate the ratios somewhat. The USA figures are, however, very informative since these are definitely based on both *FTE* students and *FTE* academic personnel. The university *S/L* ratio of 15.1 in South Africa in 1992 was rather low when compared with the average of 19.9 of the 11 countries in Table 4.1, while the technikon *S/L* ratio of 26.6 in 1992 was well above the international average. Since 1992, the *S/L* ratio of universities and technikons had both increased; universities by 19.2% and technikons by 9.0%. It is unclear how these ratios currently compare in a world context.

4.3 QUALIFICATIONS AWARDED PER LECTURER

As the primary purpose of HE institutions is to provide graduates to society, the number of qualifications (degrees, diplomas and certificates) awarded annually by HE institutions is of great significance to any country. And, as HE is very expensive for both the state and the students, it is important to measure the resources (and especially the human resources (lecturers)) needed to deliver a successful graduate. The annual ratio of qualifications awarded per lecturer gives a useful indicator that sheds some light on possible changes in the cost effectiveness or performance of the teaching process.

The following performance indicator can thus be defined –

$$Q/L \text{ ratio} = \frac{\text{Total number of qualifications awarded per FTE instruction/research personnel member.}}{\text{FTE instruction/research personnel member.}}$$

Two additional indicators, one for universities and one for technikons are also used to give more nuanced teaching performance information for HE institutions:

$$M/L \text{ ratio} = \frac{\text{Total number of masters degrees awarded by a university per FTE instruction/research personnel member.}}{\text{FTE instruction/research personnel member.}}$$

$$3YD/L \text{ ratio} = \frac{\text{Total number of first (three year) national diplomas awarded by a technikon per FTE instruction/research personnel member.}}{\text{FTE instruction/research personnel member.}}$$

Obviously, many other ratios, using other qualification types, could also be used, but the above two were regarded as expedient. Tables D.3 and D.4 in Appendix D indicate the number of qualifications awarded to students at universities and technikons respectively during the years 1986 to 2003. In the case of universities the total number of qualifications, as well as the number of Master's and doctoral qualifications are also shown in Table D.3. The number of doctoral degrees is highly correlated with research activities and is used in Section 4.5 to evaluate the performance of universities as far as research is concerned. Apart from the total number of qualifications awarded by technikons, the number of certificates and the number of first (three year) national diplomas are also shown in Table D.4.

The Q/L ratios and the M/L ratios for the universities for the study period appear in Table D.5 of Appendix D, while the Q/L ratios and the $3YD/L$ ratios for technikons appear in Table D.6 of Appendix D. Figures 4.3 and 4.4 present the trends in the two university ratios, while Figures 4.5 and 4.6 give the trends for the two technikon ratios. In all the figures the ratios for the two institutional groupings are also shown.

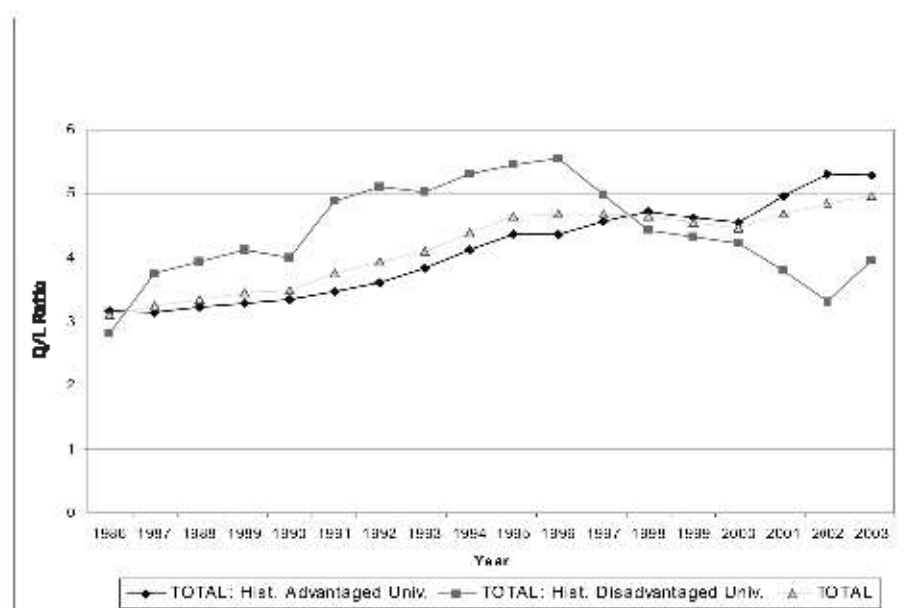


Figure 4.3: Number of qualifications awarded per FTE instruction/research personnel member (Q/L ratio) for universities: 1986-2003

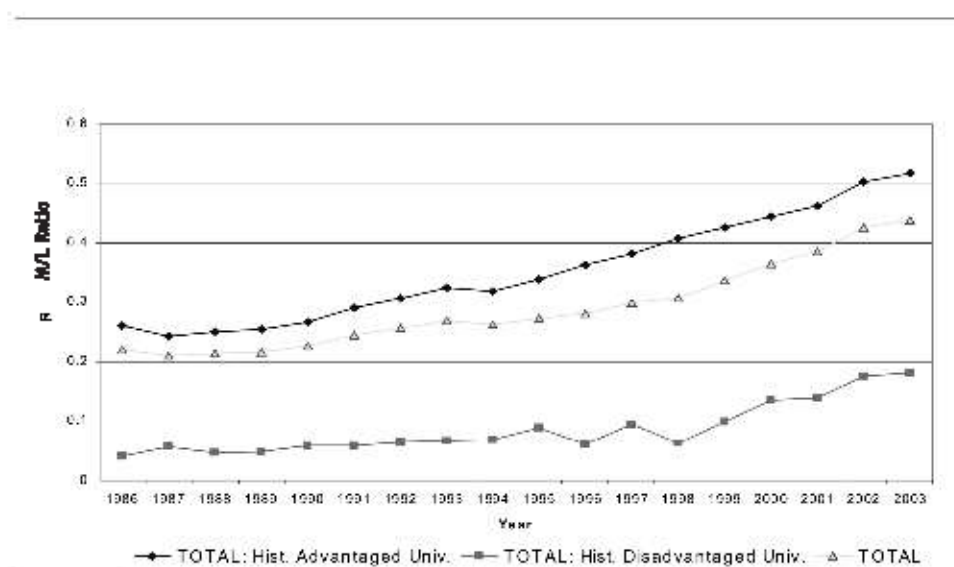


Figure 4.4: Number of masters degrees awarded per FTE instruction/research personnel member (M/L ratio) for universities: 1986-2003

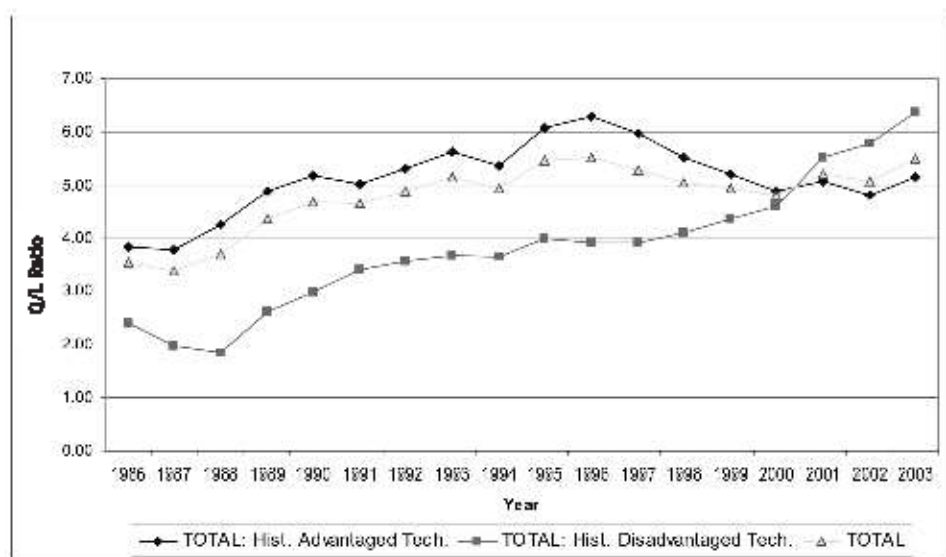


Figure 4.5: Total number of qualifications awarded per FTE instruction/research personnel member (Q/L ratio) at technikons: 1986-2003

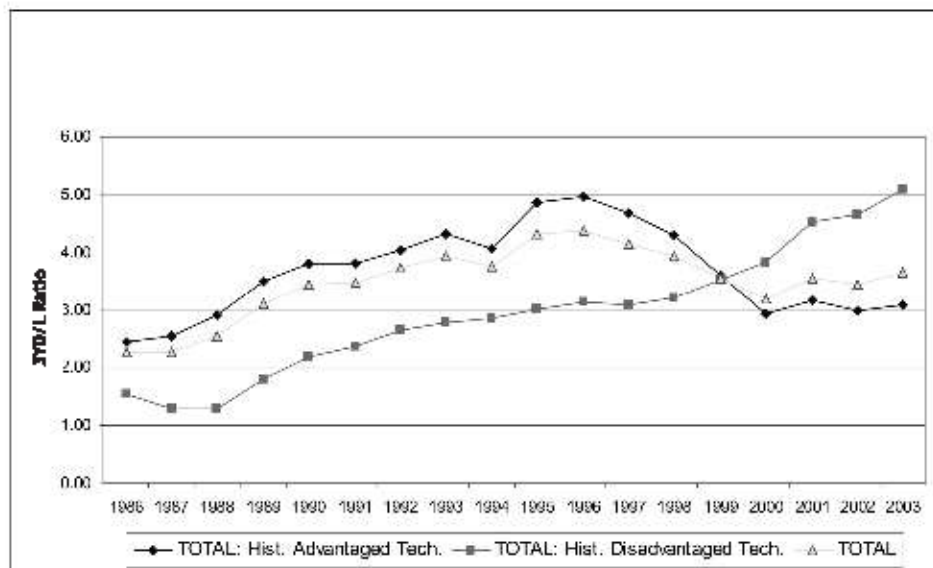


Figure 4.6: Number of National Diplomas (3y) awarded per FTE instruction/ research personnel member (3YD/L ratio) at technikons: 1986-2003

What can be learnt from these tables and figures? The Q/L ratio of universities increased by 60%, from 3.10 in 1986 to 4.97 in 2003. During the same years the technikons' Q/L ratio

increased by 55% from 3.54 to 5.50. These trends show that significantly more 'products' were produced in the HE sector per lecturer in 2003 than in 1986. Figure 4.3 shows some differences in the Q/L ratios for the two groups of universities. Although the ratio for the HDUs initially increased, it started to decrease from 1997 and only increased again in 2003. This can be attributed to the decrease in student numbers at these institutions since 1996. The ratio for HAU's increased throughout the whole period under discussion, with 1999 and 2000 being the only exception. The trends in the ratios for the two groups of technikons, as shown in Figure 4.4, are the opposite of the university situation. This follows from the slump in weighted *FTE* students at historical advantaged technikons in the second half of the 1990s. The positive correlation between student numbers and Q/L ratios was fuelled by the unwillingness of institutions to decrease academic personnel when student numbers plunged. This was the result of the understandable belief that decreasing student numbers was only a temporary phenomenon. This outlook was proven correct, as student numbers started to increase again in 2001.

The increasing Q/L ratios show that the HE sector increased its academic efficiency significantly during the study period (1986-2003). This is specifically evident in the case of the HAU's and the HDUs. It is, however, difficult to say whether the HE system still has the capacity for further efficiency improvements and to what extent some institutions are already suffering from academic overload. Tables D.5 and D.6 show that Q/L ratios as high as 11 were recorded at certain institutions. The question could be asked whether such high Q/L ratios still conform to acceptable academic standards.

The relative output in Master's degrees at universities, as measured by the M/L ratio, has doubled from 0.22 in 1986 to 0.44 in 2003. A continuous increase in this ratio during the whole study period is evident from Figure 4.4 for both groups of universities. Although the ratios for the HDUs are much lower than for the HAU's, the growth rate in the ratio of the HDUs is much higher than for the HAU's.

Finally, Figures 4.5 and 4.6 show that the trend in the $3YD/L$ ratio for technikons is similar to the trend in the Q/L ratio for technikons. This is not surprising since the number of first (three year) national diplomas awarded at technikons had comprised about 65% of all qualifications awarded at technikons during the study period. The $3YD/L$ ratio and the Q/L ratio should therefore be correlated.

4.4 GRADUATION RATES

Although it is customary to calculate graduation rates according to qualification type (e.g. for first (three year) B degrees, professional B degrees, Honours degrees, etc.) a collective, but rather crude, rate based on all the qualifications awarded at HE institutions in a specific year has been chosen. A graduation rate for an institution is a relative figure that provides some insight into the progression of students through the educational system of the institution. The graduation rate in a specific year is defined as the number of qualifications

awarded in the year divided by the total number of students enrolled in that year. Bearing in mind that enrolled students can be expressed in terms of a headcount or in terms of FTEs (or weighted FTEs), two specific rates are defined, namely –

$$GR(Headcount) = \frac{\text{Total number of qualifications awarded}}{\text{Headcount of students}}$$

$$GR(WFTEs) = \frac{\text{Total number of qualifications awarded}}{\text{Weighted FTE students}}$$

The rates defined above are shown, respectively, for universities and technikons in Tables D.7 and D.8 of Appendix D.

A value of $GR(Headcount)$ of 0.25 for a HE institution in a specific year has (with some provisos) the meaning that on average students take four years to complete their qualifications. Obviously, some students are enrolled for a professional degree with a minimum formal time of say four years, while others could be enrolled for an Honours degree with minimum formal time of only one year. Assuming that the enrolment mix according to qualification type does not change significantly from year to year at an individual institution an increase in $GR(Headcount)$ for an institution or a group of institutions indicates an improvement in student flow-through rates and therefore (possibly) in teaching efficiency. It is more difficult to interpret the $GR(WFTEs)$ ratio since it combines a measure in terms of a headcount of students (graduates in numerator) with weighted FTE students. Changes in $GR(WFTEs)$ are, however, also significant. Tables D.7 and D.8 of Appendix D show that the $GR(Headcount)$ and $GR(WFTEs)$ ratios are positively correlated, with the last mentioned rate the higher of the two. The $GR(WFTEs)$ indicator is perhaps a better measure to use in the monitoring of the graduation rates at institutions with a large number of distance tuition students. Summary results of the calculated graduation rates in terms of headcounts are shown in Figures 4.7 and 4.8.

Table D.7 (of Appendix D) shows that the $GR(Headcount)$ for universities in total was rather stable and fluctuated between 0.15 and 0.19 during the study period. No real trend was visible. One should be careful not unambiguously to make the conclusion (as suggested earlier) that on average successful students at universities need between five and seven years to obtain a qualification. The continuous increase in enrolments in the university sector between 1986 and 2003 (enrolments doubled) generally deflates the graduation rates. Furthermore, such a statement also does not take cognizance of drop-out students, who usually never obtain a qualification at the institution at which they initially enrolled for a specific qualification. Figure 4.7 shows that the $GR(Headcount)$ for historically advantaged universities (excluding Unisa) fluctuated between 0.19 and 0.25 while the rate for disadvantaged institutions fluctuated between 0.14 and 0.22. The reason for the exclusion

of Unisa from the group of HAUs is that its headcount enrolment comprise about 50% of all headcount enrolments in the HAUs, while the institution's graduation rate only fluctuates between 0.07 and 0.11, as can be seen in Figure 4.7. Furthermore, the slump in student enrolments at HDUs in the second half of the 1990s had inflated their graduation rates. The *GR (Headcount)* rates for HDUs decreased substantially over the last few years, mainly as the result of the increase of students in the last couple of years after the student numbers at these institutions decreased for some time before that.

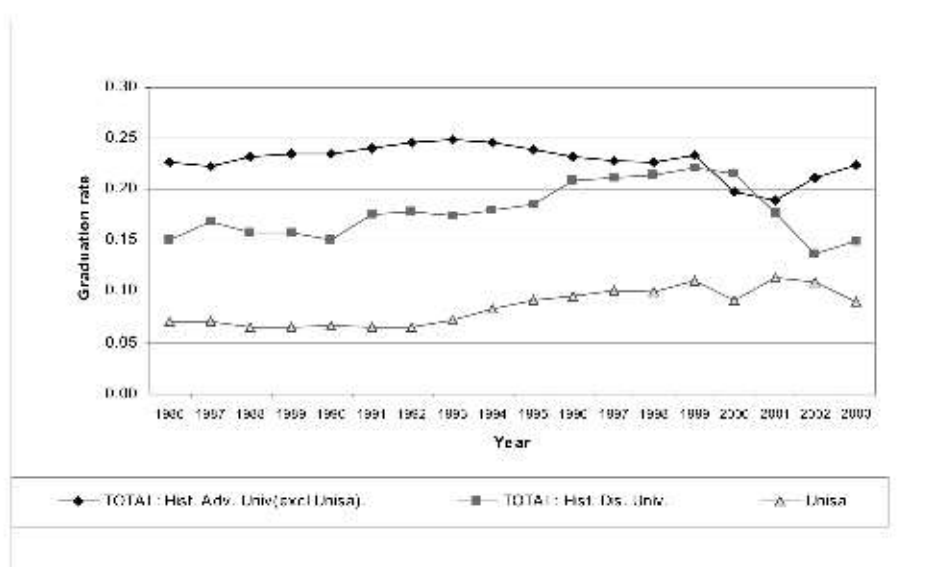


Figure 4.7: Graduation rates (headcount) for universities: 1986-2003

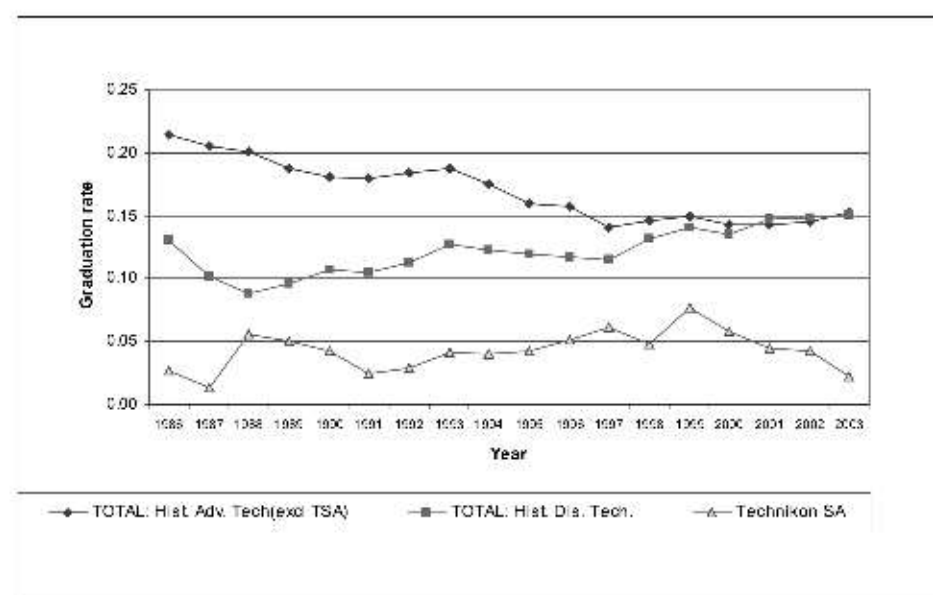


Figure 4.8: Graduation rates (headcount) for technikons: 1986-2003

Table D.8 (of Appendix D) shows that after an initial decrease in the graduation rate for the technikon sector (from 0.16 in 1986 to 0.10 in 1995) there was some improvement in the rate towards 2003. In studying the graduation rates of the two groups of technikons in Figure 4.8, it was decided (in line with the decision about Unisa in Figure 4.7) to exclude Technikon SA from the HATs and present this institution separately since it is the only technikon (apart from Technikon Pretoria on a small scale since 1997) that was involved in distance education. A disturbing decrease in graduation rates from 1986 to 1997 is seen for the HATs (excluding TSA). The HDT group on the other hand shows a steady increase in graduation rate from 0.09 in 1988 to 0.15 in 2003. This is similar to the HATs rate in 2003. Technikon SA shows very low rates fluctuating between 0.01 and 0.08. The teaching model of correspondence education used by Technikon SA was evidently unsuccessful.

Benchmarks for graduation rates form part of the NPHE (See Section 2.3.1 of the NPHE). These rates are broken down into qualification type and mode of instruction (contact and distance). Weighting the respective graduation rates by the headcount enrolments of students (total for universities and technikons) according to qualification type (for both contact and distance tuition) for 2003 as obtained from the HEMIS database, the graduation rate benchmarks in Table 4.2 is calculated for 2003 and can be compared to the $GR(Headcount)$ rates for the different institutions.

Table 4.2: Weighted NPHE graduation benchmarks for 2003 according to mode of instruction

Mode of instruction	Graduation rate for 2003
Contact	0.268
Distance	0.165
Total	0.223

It is clear from studying all the graduation rates in Tables D.7 and D.8 that most universities' rates are stable, although there is no sign of definite improvement. On the other hand, the graduation rates are declining at many technikons. The drive for more efficient (or higher quality) teaching, as formulated in the NPHE and imbedded in the NFF, seems therefore necessary. The graduation rate for the university sector of 0.17 in 2003 and for the technikons sector of 0.12 in 2003 is way below the benchmark of 0.223 for 2003 as calculated from the NPHE and indicated in Table 4.2. Since no progress has been made with the improvement of the graduation rates over the last 18 years under the SAPSE subsidy formula with a very large emphasis on rewarding student success, the prospects of improving the graduation rates in future in HE look rather bleak. The improvement of graduation rates in an environment of increasing S/L ratios (consequently with larger class sizes) will probably be impossible if academic standards are not to be jeopardised.

The NPHE benchmarks for graduation rates are definitely unrealistically high and will have to be scaled down significantly to have any telling effect as target values for the flow-through rates of students. Fortunately, this has already been realised by government as far as HE funding is concerned since the benchmarks used to determine the teaching output development allocations for HE institutions in the NFF represent a significant reduction in the NPHE benchmarks.

4.5 INDICATORS MEASURING RESEARCH OUTPUT

Two well-known indicators are used in this study to monitor the research performance of HE institutions during the study period. Firstly, the number of approved research output units (See Department of Education 1995: Report 014(95/10) – also known as publication units – per instruction/research personnel member, and secondly, the number of doctoral degrees awarded per instruction/research personnel member. The utilisation of *FTE* personnel values rather than permanently appointed personnel headcounts as denominator in the calculation of the two indicators is more accurate since part-time temporary instruction/research personnel could also be involved in the generation of research output. However, as already mentioned, the annual calculation of *FTE* personnel, especially *FTE* instruction/research personnel, by some institutions is often inaccurate. As a result of this, the Department of Education is forced to calculate the relative number of research outputs (consisting of research Master's and doctoral graduates, as well as approved publications) for the purpose of applying the NFF in terms of permanently appointed instruction/research personnel (See Section 2.2.2). The number of permanently appointed academic personnel at all HE institutions for the total study period appears in Table D.9 of Appendix D. In this study, both ways of measuring the number of academic personnel are used as far as publication units are concerned, while the number of doctorates awarded are only expressed in terms of *FTE* instruction/research personnel. Three indicators of research performance are therefore formally defined, namely:

$$PU(\text{Headcount}) \text{ ratio} = \frac{\text{Number of approved publication units per permanently appointed instruction/research personnel member}}{\text{Number of approved publication units per permanently appointed instruction/research personnel member}}$$

$$PU(\text{FTE}) \text{ ratio} = \frac{\text{Number of approved publication units per FTE instruction/research personnel member}}{\text{Number of approved publication units per FTE instruction/research personnel member}}$$

$$D/L \text{ ratio} = \frac{\text{Total number of doctoral degrees awarded per FTE instruction/research personnel member.}}{\text{Total number of doctoral degrees awarded per FTE instruction/research personnel member.}}$$

Table D.10 of Appendix D shows the publication units of HE institutions for the years 1993 to 2003. Projected values of the publication units for year *n* (based on actual approved publication units in years *n*-3 and *n*-2) were used as input parameter to the SAPSE subsidy formula for universities since 1987 (see Section 2.1.6. and 2.1.7). The first research outputs

(publication units) measured for universities were for 1984. Projected values of publication units for technikons were only used from 1992 in the SAPSE subsidy formula for technikons since the earliest measured research output for technikons was for 1989. Unfortunately the actual approved publication units for HE institutions for the period before 1993 are not available and the replacement of these missing values with their projections used in the SAPSE formulas (which are available) will introduce an inherent incompatibility in the publication data series. It was therefore decided to only use the actual approved units for HE institutions as set out in Table D.10 of Appendix D. The two PU ratios are shown in Tables D.11 and D.12 of Appendix D. Since the number of permanently appointed academic personnel is always smaller than the FTE academic personnel, the PU ratio for an institution based on the FTE personnel is always lower than the PU ratio based on the permanently appointed personnel.

A study of Table D.10 reveals that the total number of publication units of universities fluctuated around 5 300 units a year during the period 1993-2003 with an all-time high of 5 606 in 2002. The total number of publication units of technikons increased rather dramatically from only 55 units in 1993 to 230 in 2003. The *PU(Headcount)* ratio for universities shows a horizontal trend with some small fluctuation around 0.5 while the same ratio for technikons has increased from a very low base value of 0.022 in 1993 to 0.061 in 2003. This means that while on average one approved publication every two years is forthcoming from permanently appointed university academics the publication frequency for technikon academics is one in 17 years. As far as the *PU(FTE)* ratios for universities are concerned there was a small decline in the ratio for the 10 reporting years. The reason is obvious. The FTE instruction/research personnel at universities has increased faster than the permanently appointed academics since 1993. The *PU(FTE)* ratio for technikons has as expected increased dramatically.

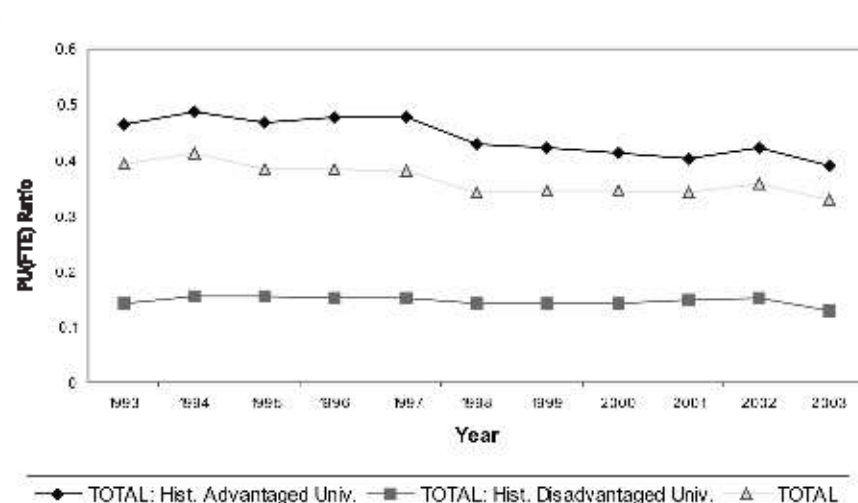


Figure 4.9: Publication units per FTE instruction/research personnel member for universities: 1993-2003

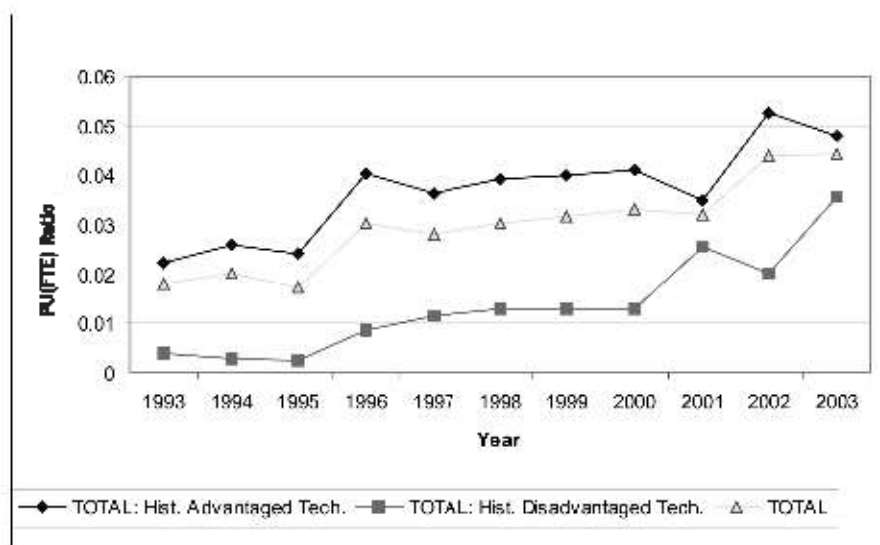


Figure 4.10: Publication units per FTE instruction/research personnel member for technikons: 1993-2003

Figures 4.9 and 4.10 show the PU(FTE) ratios for the two institutional groupings for universities and technikons, respectively. Clearly, the historically advantaged institutions' PU rates are about three times as high as the historically disadvantaged institutions' rates in both the university and technikon sectors. The same type of results is found in the case of the PU(Headcount) ratios, but is not presented graphically.

Table D.10 clearly indicates that the bulk of the high level research output of the HE sector, as measured by approved publication units, is to a large extent generated by a few universities. Although there was significant progress in research (as measured by the publication units) at technikons, especially in the last couple of years, their contribution is still relatively small compared to the research output of most universities.

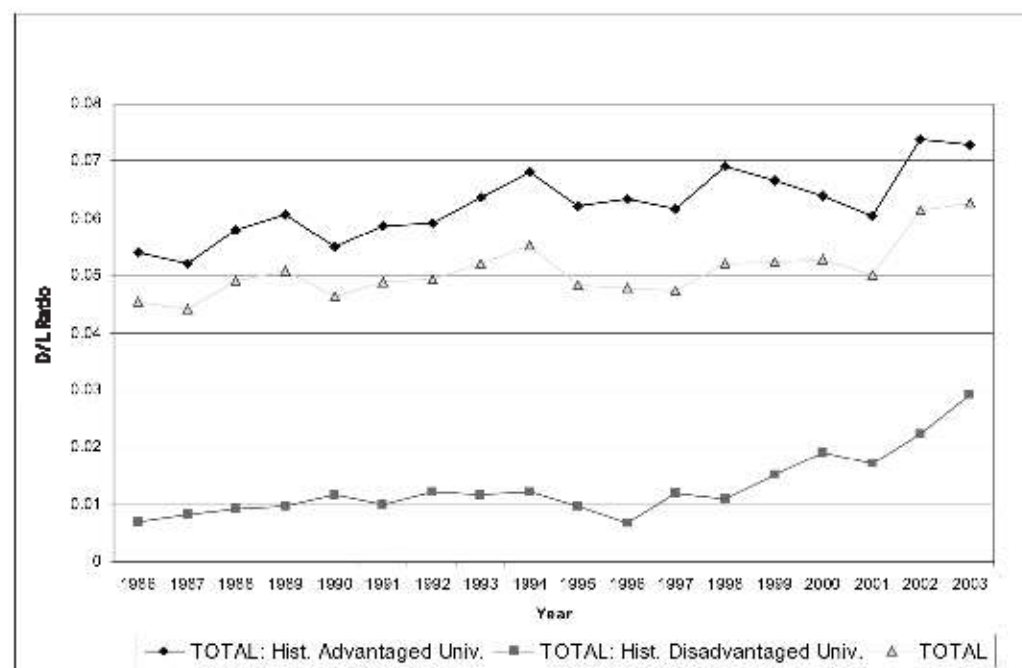


Figure 4.11: Number of doctoral degrees awarded per FTE instruction/research personnel member for universities: 1986-2003

The annual number of doctoral degrees awarded by universities during 1986 to 2003 is indicated in Table D.3 of Appendix D. This number has increased from 534 in 1986 to 1 024 in 2003, an increase of 92%. Table D.5 and Figure 4.11 shows that the D/L ratio had, amidst some fluctuation, increased from 0.045 in 1986 to 0.063 in 2003. The D/L ratio for historically advantaged institutions shows the same trend while the ratio for historically disadvantaged institutions have, although from a very low base, increased dramatically since 1996 to reach a value of 0.029 in 2003.

4.6 HOW DID THE HE INSTITUTIONS PERFORM IN RESPECT OF TEACHING AND RESEARCH DURING 1986 TO 2003?

Although each institution's performance can be scrutinised and interesting and unique conclusions be drawn for each individual institution, the overall picture unfolding from 1986 to 2003 as far as the HE sector as a whole and its main groupings are concerned is as follows –

- The numbers of instruction/research personnel (both in terms of permanent appointments and FTEs), who are performing the teaching and research functions at HE institutions, increased over the study period, but not nearly at the rate of enrolled students. Consequently the overall *S/L* ratio of the university sector increased from 12.7 in 1986 to 18.0 in 2003, while the technikon sector's *S/L* ratio increased from

14.9 in 1986 to a very high 29.0 in 2003. Compared to 'international standards' (the average *S/L* ratio of 11 countries for 1992 was 19.9) the university ratios are acceptable but from 1990 the technikon ratios are too high.

- Amidst increasing *S/L* ratios, the number of qualifications awarded per FTE instruction/research personnel member by universities and technikons increased from year to year since 1986. This shows perseverance by institutions (and especially by the academic personnel) annually to churn out an increasing number of graduates and diplomates with relatively diminishing person power resources.
- The graduation rate of the university sector shows a rather constant trend while the graduation rate of the technikon sector is declining. In the light of increasing *S/L* ratios this is hardly surprising, especially in the case of technikons. It is commonplace that the graduation rates of all HE institutions in respect of the different qualification types are presently far below the respective benchmarks for universities and technikons as specified in the NPHE. It therefore seems very unlikely that even in the longer term the present national norms will be attained by institutions.
- There was very little change in the level of high level research produced by universities as measured in terms of the approved publications per academic staff member. In the light of increasing pressures on academic personnel as far as the teaching function is concerned, it will become more difficult to maintain present research performances in the future. The publication rate of the technikon sector has improved dramatically but is still way below that of universities. To live up to their new name as Universities of Technology these institutions will have to improve their average publication rate of one publication in seventeen years over the short term. With present *S/L* ratios this will be very difficult.
- The five universities with the highest publication numbers (in absolute terms but usually also in terms of PU-rates) are annually responsible for about 60% of the total number of approved publications in the HE sector. It seems important to ensure that at least these universities will not become so pressurised by annually increasing *S/L* ratios or unrealistic graduation rate targets that they lose the edge on their research capacity. There are indications that this is already happening.

The results of many of the performance indicators calculated in sections 4.2 to 4.5 support the proposal in an important report of the Council on Higher Education (2000) that there is a need to differentiate between comprehensive postgraduate and research higher education institutions and other types of higher education institutions.

SECTION 5: FUTURE STATE FUNDING OF HIGHER EDUCATION IN SOUTH AFRICA: SOME SCENARIOS

5.1 INTRODUCTION

The two most influential drivers of the level of state funding of higher education during the next five years are the HE student enrolment during the five year period and the capacity of the state to fund HE institutions accommodating these students at a reasonable level. This capacity will mostly be determined by the macro economic environment of the country as expressed inter alia in terms of future predicted real economic growth percentages.

These two factors, namely, future HE student enrolments and realistic future economic growth, are analysed before some scenarios of future HE funding are presented. Changes in the annual enrolment numbers at higher education institutions are significantly influenced by the annual output of the school system, namely, the total number of Senior Certificates awarded and, perhaps of particular importance, the number of passes with endorsement. Therefore, before any attempt is made to project student numbers in HE, an analysis of the annual output of the school system is necessary.

5.2 SENIOR CERTIFICATE (SC) RESULTS FOR 1996-2003

Table 5.1 shows the national results of the Senior Certificate examination for the years 1996-2003 (Department of Education, 2003). The 18 education departments of the pre-1994 era were transformed into ten new education departments during 1994-1995, one national and nine provincial departments. This transformation was a very disruptive exercise for school education; and the teaching outcomes (including the SC results) were somewhat abnormal during these transformation years. The results of these two years are therefore not considered in the analysis.

Table 5.1: Results of Senior Certificate examination according to type of pass: 1996-2003

Year	Candidates who wrote	Passed without endorsement	Passed with endorsement	Total passes	Population size: 18-20 yrs old
1996	518 225	19 9472	80 015	279 487	2 452 271
1997	559 233	19 4668	70 127	264 795	2 479 031
1998	552 862	20 2632	69 856	272 488	2 587 061
1999	511 474	18 6106	63 725	249 831	2 701 715
2000	489 941	21 4668	68 626	283 294	2 820 237
2001	449 371	20 9499	67 707	277 206	2 877 841
2002	443 821	23 0726	75 048	305 774	2 938 808
2003	440 267	24 0482	82 010	322 492	2 985 894

Using the data of Census 2001, and assuming an annual mortality rate of 0.0025 for the population in the age groups 16 to 25 years, estimates of the population sizes in the age group 18 to 20 years were made for the period under discussion; and these estimates appear in the last column of Table 5.1.

Table 5.2: Comparison between the growth in the population in age bracket 18-20 years and Senior Certificate results: 1996-2003 (Index values with 1996 = 100)

Year	Candidates who wrote	Passed without endorsement	Passed with endorsement	Total passes	Population size: 18-20 yrs old
1996	100.0	100.0	100.0	100.0	100.0
1997	107.9	97.6	87.6	94.7	101.1
1998	106.7	101.6	87.3	97.5	105.5
1999	98.7	93.3	79.6	89.4	110.2
2000	94.5	107.6	85.8	101.4	115.0
2001	86.7	105.0	84.6	99.2	117.4
2002	85.6	115.7	93.8	109.4	119.8
2003	85.0	120.6	102.5	115.4	121.8

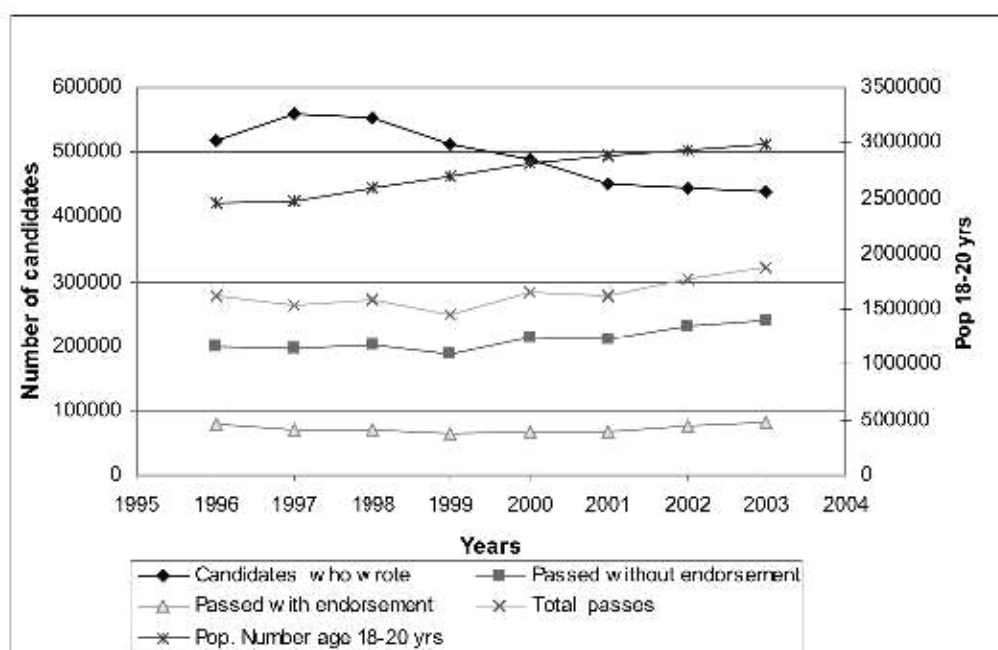


Figure 5.1: Results of Senior Certificate examination: 1996-2003

Figure 5.1 summarises the information contained in Table 5.1, while Table 5.2 transforms Table 5.1 to indices with 1996 as base year. From Figure 5.1 and Table 5.2, the following is evident –

Population size: 18–20 years old

The estimated size of the group of learners from which the successful school leavers are normally forthcoming, namely, the 18 to 20 years old learners, has increased annually at a fairly constant rate. The increase from 1996 to 2003 was about 22%.

Total number of Senior Certificates awarded

The number of successful school leavers decreased until 2000 but have since then shown a steady increase. The increase of 15% in successful learners from 1996 to 2003 is much lower than the growth in the 18 to 20 years old learners during the corresponding period.

Number of school leavers attaining matriculation exemption (passed with endorsement)

This number decreased rather dramatically from 1996 to 1999 but has picked up gradually since then to reach 82 010 in 2003 – a figure only slightly higher than the 1996 total. This result is no doubt a matter of great concern and means that (considering the number of the 18 to 20 years old learners in the population) the school system in 2003 provided only 84% of the passes with endorsement relatively to what it had been providing in 1996. It seems as though the annual growing numbers of extremely good performers under the group of school leavers with matriculation exemption (not indicated in Table 5.1) is not evidence of an increase in the academic potential of learners or of better education in schools, but irrefutable evidence of the lowering of standards in the school system in order to live up to the expectations of the general public. The high drop out rates at universities of first-time entering first year students, who have passed the SC examination with endorsement (even under the group of the top performers of the school system) supports this point of view.

Passes without endorsement

The numbers of passes without endorsement have increased by almost 21% during the study period, only marginally lower than the increase in the estimated number of 18 to 20 years old learners in the corresponding period. As a result of the public perception that many students, who have obtained a pass without endorsement (and even with endorsement), do not have the capacity to cope with the demands of higher education or even with the demands of the workplace if directly employed after school, an investigation into the quality and standard of the SC examination was undertaken by the General and Further Education and Training Quality Assurance Council (Umahusi) in 2004. Umahusi investigated five topics regarding the SC examination over the period 1992–2003, namely the examination papers, the memoranda and marking, the statistical moderation process, the language compensation of 5% for candidates not answering the examination in their first language and the rules and procedures used in the examination. Although the Umahusi report of the findings of the investigation tries to highlight issues where the SC

examination has improved, a variety of very disturbing trends in the SC examination is also reported. According to the report there is an increase in Standard Grade learners relatively to Higher Grade learners (especially in Mathematics, Physical Science, Biology and History), the standards in many subjects have declined (easier papers, reduction in content), a declining level of conceptual challenge in especially Standard Grade papers (but also some Higher Grade papers) and problems with reliable norms in the statistical moderation process. As a result of these worrying factors, Umalusi concluded that follow-up investigations are of crucial importance.

The number of candidates writing the Senior Certificate examination:

Except for 1997 and 1998, there are opposite trends in the estimates of the number of 18 to 20 year old learners and the numbers of candidates sitting for the Senior Certificate examination during the study period. There were about 21% less registrations for the school end examination in 2003 than in 1997. This may be the result of a more stringent assessment system applied by all provincial education departments, especially in Grade 11. While national statistics (Report on Senior Certificate Examination, Department of Education, 10 December 2003) show a flow-through rate of 88.3% of the Grade 11 pupils of 1997 to Grade 12 in 1998, this percentage decreased annually over the following three years to such an extent that the Grade 12s of 2001 represented only 67.4% of the Grade 11s of 2000. In 2002 and 2003 these percentages have increased to 72.5% and 77.1%, respectively. An educational and politically expedient consequence of the decline in the candidates sitting for the SC examination is a substantial rise in pass rates for the Senior Certificate examination. The pass rate has increased significantly from 49% in 1998 to 73% in 2003.

What conclusions can be drawn from the above SC examination analysis? The most important is that while pass rates in the SC examination have increased dramatically the relative output of the school system has declined during the years 1996 to 2003. The results of the SC examination are also becoming more and more dubious, as the investigation of Umalusi highlighted. However, in the light of a new curriculum to be implemented for Grade 10 in 2006 (and in Grade 11 and 12 in respectively 2007 and 2008) and the issuing of the National Senior Certificate (NSC) for the first time in 2008, it is questionable if any significant changes in the SC examination system will be made in the interim. The issuing of the NSC from 2008 onwards will without doubt establish a new pattern of first year enrolments at HE institutions with effect from 2009.

5.3. HOW WILL THE NUMBER OF CANDIDATES COMPLETING SENIOR SECONDARY EDUCATION INFLUENCE HIGHER EDUCATION NUMBERS DURING THE NEXT DECADE?

Taking the age distribution of the South African population as reported in Census 2001 as basis and once again a mortality rate of 0.0025 per annum for the relevant age group, it is estimated that the number of 18 to 20 year old learners will slowly increase from 2 995 000

in 2004 to reach a maximum of about 3 032 000 in the year 2009. From 2010 onwards the number of 18 to 20 year old school goers will decline annually.

The information in Table 5.3 shows that the enrolments of first time entering pre-diplomate/undergraduate students at technikons increased by 12.3% during 2000 to 2003. During the same period the enrolments of first time entering pre-diplomate/undergraduate students at universities increased by 28.9%. For universities and technikons jointly the percentage increase was 21.7%. The majority of first time entering pre-diplomate and undergraduate students exited from the school system the previous year. It is therefore important to compare the growth in first time entering pre-diplomate/undergraduate students with the growth in the output of the school system during the years 1999 to 2002. From Table 5.1, it is calculated that the growth in this period in total passes and in passes with endorsement were respectively 22.4% and 17.8%. The first figure compares well with the growth in the first time entering pre-diplomate and undergraduate students in the HE system. The last percentage suggests, however, that over the past few years the proportion of students with matriculation endorsement enrolling at universities is increasing. If this trend continues the enrolments of first time entering undergraduate students at especially universities could increase even if the school system fails to increase the output of candidates with matriculation exemption.

Table 5.3: Enrolment of first time entering pre-diplomate and undergraduate students at universities and technikons: 2000-2003

Sector	Enrolment of first time entering students				% Increase: 2000-2003
	2000	2001	2002	2003	
Technikons	46 307	44 254	47 686	52 006	12.31
Universities	60 291	68 528	73 827	77 731	28.93
Total	106 598	112 782	121 513	129 737	21.71

The implementation of the new NSC will without doubt have a major influence on the enrolments of first time entering pre-diplomate and undergraduate students at HE institutions in 2009. It is important that the HE sector (institutions, bodies like the HE Association of SA (HESA), as well as other stakeholders) is not only continuously involved in curriculum development and assessment processes of the Grades 10-12 school phase, but also in the standard setting of the NSC examination to ensure that the necessary standards and procedures will be in place to identify the students who qualify for higher education study. Alternatively, the HE sector should start as soon as possible to devise uniform entrance tests to enhance the future NSC examination system to select worthy students for higher education. The *Policy on Minimum Admission Requirements for Higher Certificate, Diploma and Bachelor's Degree Programmes requiring a National Senior Certificate*, promulgated in terms of Section 3 of the Higher Education Act, 1997 (Act No 101 of 1997) by the Minister of Education in August 2005, provides the necessary framework for such tests.

5.4. OTHER FACTORS THAT WILL INFLUENCE HIGHER EDUCATION ENROLMENT NUMBERS IN THE NEXT DECADE

Apart from the number of students attaining the SC many other factors will also have a major influence on the size of the higher education system in the next decade. Some of the most important are:

- the ability of potential students to afford higher education;
- the total annual NSFAS allocations by the government;
- the effect of HIV/AIDS on the age group 18-30 years;
- the unemployment rate in South Africa;
- the trend of especially white school leavers to work abroad for an unpredictable period before returning to enrol in higher education or if already graduated to enrol for post-graduate studies;
- the student throughput rate in HE; and
- growth restrictions imposed by the Minister of Education on subsidised FTE student enrolment in the application of the NFF.

In the UNDP report (2003) poverty statistics show that the income inequality of the South African population is increasing. The Gini coefficient, a measurement of income equality (a value of 0 means complete equality and a value of 1.0 means complete inequality), for South Africa has increased from 0.596 in 1995 to 0.635 in 2001. According to the report, the Gini coefficients of all four racial groups have increased during this period, although not to the same extent for Whites and Indians as for Blacks and 'Coloureds'. Taking into account that the new higher education funding policy is devised inter alia to stimulate especially black and coloured student enrolments, the inability of many of these students to afford higher education will increasingly present problems to government and to HE institutions. Institutions' policies regarding the enrolment of students with unpaid fees as far as the previous year(s) are concerned have a distinct influence on the number of enrolments at HE institutions. Unfortunately, these policies are adjusted from year to year by many institutions. The non-affordability of higher education tuition fees, as well as the increase in NSFAS allocations by the state as a solution to this problem are discussed in more detail in Sections 2 and 3.

According to the Actuarial Society of South Africa (2002), the estimated number of persons with HIV+ infection in the age group 0-19 increased from about 83 000 in 1995 to 483 000 in 2001. The estimated number of HIV+ infected persons in the age group 20 to 29 has increased from 470 000 in 1995 to an estimated 2.013 million in 2001. Although some researchers believe that these figures may perhaps be too high, there is no doubt that the HIV/AIDS pandemic will have a telling effect over the next decade, not only on the

enrolments in higher education, but also on the performance of students already enrolled. Increases in the number of people infected by HIV+ in age groups 30 and older will also erode the financial capacity of providers (mainly parents and other family members) of students in higher education. The estimates of the population size in the age bracket 18 to 20 years for the next few years (See Section 5.3) did not take this increase in the incidence of the HIV+ infection into account.

The results of Census 2001 show that many young whites in the age group 20 to 30 years are temporarily working outside South Africa. More specifically it can be calculated from the census figures that up to 20% of Whites in the age group 22 to 24 years were outside South Africa on Census day 2001. As the enrolment of white students represents a significant part of the total higher education student enrolment (26.2% in 2003), this trend amongst young whites to go abroad for a year or more is already influencing higher education enrolments, both on the undergraduate and post-graduate level. The influence of this trend could even become more enhanced, especially if relatively more youngsters were to go abroad directly after completing school.

According to the October Household Survey (1995) and Labour Force Survey (2002) (as quoted in UNDP 2004), unemployment in South Africa doubled from about four million in 1995 to about eight million in 2002. By contrast to the factors that have been discussed and which all have a dampening effect on higher education enrolment, unemployment could increase enrolments in higher education. Many school-leavers with a SC but unable to secure suitable jobs (or any job at all) may enrol at higher education institutions. The opportunity cost of HE (the income that you could earn if you took on a job instead of studying) decreases in these circumstances. Graduating students, who fail to find suitable employment, usually opt to stay on at HE institutions for further study.

In a cohort analysis based on the first time entering undergraduate students in HE in 2000, the Department of Education (2005) found that 50% of them dropped out during the period 2000-2002. Only 22% graduated in 2002 or 2003, while 28% were still studying in 2003. A change (either an increase or a decrease) in drop-out rates or graduation rates will obviously influence the size of the HE system. In the light of the analyses in Section 4, it seems dubious that the throughput of students in HE will improve in the short term.

As a result of budget restrictions imposed by the Medium Term Expenditure Framework (MTEF) of the Treasury, the DoE has already indicated that the Minister of Education will place restrictions on the growth in the number of FTE students to be subsidised at HE institutions in the next few financial years. In using the 2003 student enrolment data in the calculation of the NFF allocations to institutions for 2005/06, a cap of five per cent was placed on the teaching input units for contact tuition students and a cap of three per cent on the teaching input units of distance tuition students. As was already indicated in Section 2.2.1 a document titled *Student Enrolment Planning in Public Higher Education* of the

Department of Education was released for discussion by the Minister of Education on 29 March 2005. In this document it is proposed that the NFF should for an interim period of three financial years, namely, 2006/07 to 2008/09, be substantially adjusted in order to help curbing the high growth rate experienced in HE since 2001. This entails inter alia differential student growth restrictions (as far as funding is concerned) for HE institutions for the years 2006-2009. As indicated in Section 2.2.2, the Minister of Education released in September 2005 the *Ministerial Statement on Enrolment Planning*. As was already noted in Section 2.2.2 this statement indicates that no direct caps will be placed on FTE student enrolments for the period 2004 to 2006, but the Minister intends to determine funded headcount and FTE student enrolments totals for each HE institution for the period 2007-2009.

The growth caps indicated above for the calculation of the 2005/06 HE allocations and the funding policy for 2006/7 are placed into perspective when they are compared to the total weighted FTE student growth in the higher education system between 2001 to 2002 of 5.6% and between 2002 and 2003 of 7.6%. Obviously, most institutions will not be able or willing to curb their student intake straight away. However, if the proposed restrictions become national policy, or the FTE student growth is still disregarded in subsidy block grant allocations for 2007/8 and later years, most institutions will not (if it is allowed by the Minister) be able to indefinitely fund FTE student growth above the level determined by the Minister of Education from their own funds. This could eventually lead to institutional policies that will restrict enrolments for some or all academic programmes.

It is important to remember that restrictions on subsidisable student growth were a generally accepted feature during 1993 to 2003 of both the SAPSE subsidy formula for universities and the formula for technikons. Apart from different restrictions for universities and for technikons and for residential and non-residential institutions, these SAPSE formula restrictions did not differentiate between institutions as suggested in the student enrolment planning proposals released by the Minister.

It is very difficult, if not impossible, to develop a projection model for student enrolments in higher education for the next number of years. Such a model will have to incorporate at the very least the factors (variables) discussed above. Accurate historical information on all these variables is either not available or not relevant in the present dynamic higher education environment influenced from year-to-year by the implementation of new policies. Two factors flowing from such new policy frameworks that have not been discussed above could also be crucial determinants of enrolment numbers in years to come. These are, firstly, the enrolment patterns associated with the new (merged) higher education landscape and, secondly, the new (draft) structure for academic programmes (See Department of Education, 2004).

Since it is important to draw some conclusions on the capacity of the state to maintain or increase subsidy levels for higher education over the next number of years (say the next five) it would therefore, in the absence of definite student projections, be necessary to analyse different standard growth scenarios. Under some general assumptions, calculations show that the caps on the 2003 teaching input units, referred to above, translate to a subsidisable weighted FTE student enrolment for 2003 of not more (but probably less) than about 431 000. This represents a 4.6% growth on the total weighted FTE student enrolment for 2002. In the light of the analyses of Sections 5.1 to 5.3, as well as the FTE student enrolment caps discussed above, scenarios of annual subsidisable growth in weighted FTE students of 0%, 2%, 4% and 6% for the next 5 years, namely 2005-2010, seem to be reasonable choices for further study.

5.5 THE MACRO ECONOMIC SCENE FOR THE NEXT 5 YEARS

To predict what will happen to the South African economy, and the implications of it for the South African higher education system, is very difficult indeed. For this purpose the researchers will assess the views and forecasts of the BER, the UNDP and the National Treasury.

If one looks at the history of the South African economy, clearly a different picture unfolds in the post-apartheid South Africa than was the case during the apartheid years. During the years 1980-1993, the average annual real economic growth was below 1 per cent far below the population growth and thus leading to negative real per capita growth rates. This means that on average South Africans actually became poorer. Since 1994, the situation improved and during the years 1994-1996 the average real annual growth rate was 3.6% – equivalent to a real per capita annual growth rate of 1.2 %. Thereafter real economic growth slowed down, but still averaged 2.5% per annum during the period 1997-2002 (equal to a real annual per capita growth rate of 0.5%). Compared to the other countries in sub-Saharan Africa, the structural adjustment of the South African economy during the latter part of the 1990s becomes more apparent. During the period 1995-2001 the South African economy grew by 2.7% per annum in real terms, but countries like Botswana, Mauritius, Senegal, Tanzania and Namibia all grew at higher rates (UNDP 2004: 170-171). Although some of these countries grew from a relatively small base, the fact that the simultaneous occurrence of democratisation and globalisation placed the South African economy under severe pressure to adjust to the changing environment cannot be ignored. From the medium term budget policy statement (MTBPS) late in 2004 by Trevor Manuel, the Minister of Finance, it is clear that the government wants to change this situation to lift the economic growth rate to higher levels than were experienced the last couple of years (Bisseker 2004).

Table 5.4: Estimates of certain South African economic indicators: 2003-2007

Rbn	2003	2004	Medium term estimates		
	Actual	Estimate	2005	2006	2007
Total revenue	289.4	328.2	363.0	399.1	440.5
% of GDP	24.3%	24.5%	24.7%	25.0%	25.1%
Total Expenditure	328.7	371.7	413.6	449.7	488.2
% of GDP	26.7%	27.7%	28.2%	28.1%	27.8%
Debt service cost	46.3	49.6	53.2	58.2	63.7
% of GDP	3.8%	3.7%	3.6%	3.6%	3.6%
Deficit(-)	-29.3	-43.5	-50.6	-50.6	-47.7
% of GDP	-2.4%	-3.2%	-3.5%	-3.2%	-2.7%
CPIX	6.8%	4.4%	5.1%	5.0%	5.1%
GDP growth rate	1.9%	2.9%	3.9%	3.7%	4.2%

Source: National Treasury in Bisseker 2004 and Bester 2004

To achieve higher economic growth rates, the government is even willing to sacrifice one of their holy cows, namely a maximum budget deficit of 3% of GDP. This can clearly be seen in row four of Table 5.4. The deficit is, however, again anticipated to be less than three per cent in 2007. Despite recent increases in the oil price, the Minister believes that the pressure on inflation is not something to be too worried about. Since September 2003 the CPIX has been within the inflation target of between three per cent and six per cent. Estimates of the CPIX by the National Treasury are within this range for the whole period of the forecast. This implies that high real interest rates should not place too high a burden on the economy and should thus not play an important role in dampening economic growth. This point of view is supported by the Bureau for Economic Research (2004 & 2005). This is believed to be the case owing to structural rigidities and the high levels of unemployment. It must, however, be stressed that many factors influence the economy and that certain exogenous factors may alter the growth path of the South African economy. An incident like 'September 11, 2001' had a vast influence on a small economy like South Africa's. These types of unknown/unforeseen incidents cannot be modelled into estimates. Therefore, these figures must be treated with care because they are based on predictions that may be proved wrong in future. However, future decisions must be anticipated with the data available at present even though they may be imperfect.

It is expected that the stronger performance by the world economy will give the South African economy more momentum and will lead to a stronger domestic demand that will lead to rising investment. To achieve these higher economic growth rates the capacity constraints of the port and rail network need to be addressed. The government is investing R165bn in Eskom and Transnet over the next five years to increase electricity capacity and to develop port and rail infrastructure, as well as the public transport system (Bisseker,

2004). The importance of this is further stressed by the fact that real exports as a percentage of the GDP increased from an average annual value of 21% during 1982-1993 to 27% for the period 1994-2001 (UNDP 2004). The South African economy must become more export-orientated because that is the outlined economic growth strategy of South Africa's macro economic policy (GEAR). In order to achieve this, an infrastructure that can efficiently deliver these exports is a prerequisite and this explains the reason for the increased investment in the rail and port sectors. The UNDP (2004) also stresses the sub-optimal operation of the rail and port sectors as factors inhibiting economic growth in South Africa.

With its latest economic outlook, the Bureau for Economic Research (2005) made a long term forecast until 2010 of the economic performance of South Africa. In Table 5.5, the actual figures and growth rates of the GDP and its components for 2002-2004 are shown, as well as the estimates for 2005 to 2010. In deriving these growth rates certain assumptions were made. It was assumed that the oil price will drop to about \$37 per barrel for the latter half of the forecast period and that this would stimulate global economic activity. It was also assumed that the US economy will grow at an annual rate of about 3.4%, while the economy of Euroland is expected to grow in the region of 2.2% per annum until 2010. It was assumed that the Japanese economy will continue to grow at an average annual rate of about 2% until 2010. The Chinese economy has been growing strongly for many years and a growth rate of 7-8% per annum for the Chinese economy for the forecast period was assumed (BER 2005).

Looking at the performance of the South African economy, it is encouraging that it has experienced positive economic growth now for 39 consecutive quarters since 1994. However, despite these positive growth rates there was insignificant employment growth and only small increases in foreign direct investment. High enough economic growth rates to enhance economic development were not recorded.

Table 5.5: Expenditure on Gross Domestic Product and its components in South Africa: 2002-2010 (R billion in 1995 prices)

Component	2002	2003	2004	2005	2006	2007
Household consumption	620.159	641.485	680.341	716.677	743.607	764.195
% annual growth ⁴	3.2%	3.4%	6.1%	5.3%	3.8%	2.8%
Government consumption	180.129	191.599	205.458	213.660	221.508	228.146
% annual growth	4.4%	6.4%	7.2%	4.0%	3.7%	3.0%
Fixed capital formation	149.892	163.366	178.664	193.950	209.866	222.990
% annual growth	3.7%	9.0%	9.4%	8.6%	8.2%	6.3%
Inventory investment	6.782	9.152	11.433	10.441	9.027	2.32 ¹
Residual item	2.763	4.612	-2.168	-2.168	-2.168	-2.168
Gross Domestic Expenditure	959.725	1010.214	1073.728	1132.561	1181.840	1215.483
% annual growth	4.8%	5.3%	6.3%	5.5%	4.4%	2.8%
Exports: goods and services	262.920	260.498	268.129	283.109	300.381	313.852
% annual growth	0.5%	-0.9%	2.9%	5.6%	6.1%	4.5%
Imports: goods and services	241.543	262.063	295.770	324.297	349.254	359.821
% annual growth	4.9	8.5%	12.9%	9.6%	7.7%	3.0%
Expenditure on GDP	981.543	1008.649	1046.087	1091.373	1132.966	1169.518
% annual growth	3.6%	2.8%	3.7%	4.3%	3.8%	3.2%

Table 5.5 (continued)

Component	2008	2009	2010	1999-2004	2005-2010
Household consumption	790.999	822.919	858.680		
% annual growth	3.5%	4.0%	4.3%	3.7%	4.0%
Government consumption	234.840	241.459	248.357		
% annual growth	2.9%	2.8%	2.9%	4.1%	3.2%
Fixed capital formation	244.961	270.460	293.663		
% annual growth	9.9%	10.4%	8.6%	3.7%	8.7%
Inventory investment	3.318	7.282	7.859	7.084	6.708
Residual item	-2.168	-2.168	-2.168	1.168	-2.168
Gross Domestic Expenditure	1271.950	1339.951	1406.392		
% annual growth	4.6%	5.3%	8.5%	3.6%	4.6%
Exports: goods and services	332.407	353.793	383.689		
% annual growth	5.9%	6.4%	8.5%	2.3%	6.2%
Imports: goods and services	384.621	418.833	456.750		
% annual growth	6.9%	8.9%	9.1%	3.9%	7.5%
Expenditure on GDP	1219.732	1274.907	1333.339		
% annual growth	4.3%	4.5%	4.6%	3.2%	4.1%

Source: BER 2005: 28

Assumptions about exchange rates are an important variable influencing the performance of the South African economy, because authorities have chosen an economic policy of

export led growth, and exchange rates directly influence the prices of exports and imports. The BER assumes that the Rand will depreciate from its current levels of approximately R6.45 per \$1 to R9.43 = \$1 by 2010, against the Euro from R7.96 = €1 to R11.13 = €1 by 2010 and against the pound from current (August 2005) levels of approximately R11.70 = £1 to R16.02 = £1 by 2010.

From Table 5.5, it is clear that higher investment levels will be necessary for the predicted economic growth rates to be realised. The assumed increase in capital formation of 8.7% per annum for the period 2005-2010 is much higher than the annual growth rate of 3.7% over the years 1999-2004. Although it is assumed that household consumption will also increase quite substantially it is the growth rates of exports and imports that are assumed to more than double during 2005-10 compared to 1999-2004. Although the forecasts for specific years may differ, the average growth rates forecasted by the BER and National Treasury over the forecast period are very similar. The benefit of the forecast of the BER is that it is for 5 years compared to the 3 years of the National Treasury. For further analysis we will use the growth rates calculated by the BER.

5.6 SCENARIOS OF GOVERNMENT FUNDING OF HIGHER EDUCATION

If the forecasts in Tables 5.4 and 5.5 are accepted as being the most reliable available, what are the implications of these forecasts for the financing of higher education? As was pointed out in Section 3, the funds allocated to higher education fluctuated from a high of 15.4% of the educational budget in 1987 to a low of 11.6% in 1994 and in 2005 were 12.7%. As a percentage of the GDP the contribution to higher education fluctuated from a high of 0.86% in 1987 to a low of 0.680% in 2005. These figures must, however, be treated with caution because NSFAS allocations, since their introduction in 1995, formed part of the state's contribution towards HE. This practice can be questioned because a substantial part of the NSFAS awards must be repaid to the state by the recipients once their income exceeds a certain level (See Section 2.4). There is therefore a direct link between the granting of the NSFAS award and the repayment of the required amount. With normal HE state subsidies there is an indirect link between the payment of the subsidy and some repayment in the form of higher taxes due to higher income by those students that were subsidised (although the HE institutions received these subsidies). The part of the NSFAS award that can be treated as a bursary is a direct subsidy towards higher education, but not the amount that must be repaid like a normal loan by the receiver of an award. Although this leads to the reduction of student debt at HE institutions, it does not help these institutions directly to balance their books.

Without getting too technical and trying to avoid the above controversy, one could make the assumption that total public higher education expenditure should at least stay constant as a percentage of GDP. This means that the growth in public HE expenditure should stay

in pace with the growth in the economy. From Table 3.1, it can be deduced that on average HE expenditure in South Africa was 0.752% of GDP for the period 1987-2005. As mentioned above, from 1995 this amount included the NSFAS awards. From 1987-1994 (in other words without NSFAS awards) the public sector's contribution to HE was almost the same, namely on average 0.760% of GDP. The sizes of the NSFAS awards for the period 2000-2005 varied between 0.042% and 0.059% of GDP. In Table 3.2 it was indicated that an international benchmark in 2001 for public HE expenditure based on 84 countries was 0.81% of GDP, with the average for 15 African countries even higher at 0.85%.

5.6.1 Government allocations keep tract with size of GDP –

Scenario 1: International benchmark (0.81% of GDP)

To keep the financing of HE in South Africa on the levels experienced elsewhere in the world, HE expenditure should be 0.75% of GDP if we assume that a further 0.06% (the latest value, namely for 2005/06) will in future be awarded through the NSFAS awards. In this sense we do accept the current practice to include NSFAS awards as part of public financing of higher education in South Africa.

Table 5.6: Public expenditure on higher education: Different scenarios for 2006-2010 using HE expenditure as percentage of GDP as a yardstick (R million)

Year	Estimated nominal GDP ¹⁾	Formula & ad hoc allocations ²⁾	NSFAS awards	Total HE Expenditure
Actual allocations				
2003	1 251 468	8 102	533	8 635
2004	1 374 476	8 786	578	9 364
2005	1 501 478	9 351	864	10 215
MTEF Estimates				
2006		9 927	926	10 853
2007		10 424	1 113	11 537
Scenario 1: Keeping HE expenditure at 0.81% of nominal GDP				
2006	1 647 379	12 355	988	13 344
2007	1 799 787	13 498	1 080	14 578
2008	1 965 952	14 745	1 180	15 924
2009	2 153 653	16 152	1 292	17 445
2010	2 367 954	17 760	1 421	19 180
Scenario 2: Keeping HE expenditure at 0.752% of nominal GDP				
2006	1 647 379	11 400	988	12 388
2007	1 799 787	12 455	1 080	13 534
2008	1 965 952	13 604	1 180	14 784
2009	2 153 653	14 903	1 292	16 195
2010	2 367 954	16 386	1 421	17 807
Scenario 3: Keeping HE expenditure at present 0.68% of nominal GDP				
2006	1 647 379	10 214	988	11 202
2007	1 799 787	11 159	1 080	12 239
2008	1 965 952	12 189	1 180	13 368
2009	2 153 653	13 353	1 292	14 645
2010	2 367 954	14 681	1 421	16 102

1) Values for 2003 and 2004 as published by SARB (2005). For 2005-2010 BER estimates are used.

2) Amounts exclude institutional restructuring (merger) funding

In Table 3.1, it was shown that the state allocation to higher education in 2005 is R10 215 million and should thus increase to R13 344 million in 2006. This amount, as well as the allocations for the years 2007-2010, according to Scenario 1 are shown in Table 5.6. According to this scenario, expenditure on higher education should increase by more than 87% over the six-year period 2005-2010 in nominal terms. This will probably be much higher than what the Treasury is currently budgeting for. According to the MTEF estimate, R10 853 million will be allocated to HE in 2006 and R11 537 in 2007 when restructuring allocations are excluded. This is already almost R2.5 billion less than the 2006 and more than R3 billion less than the 2007 allocations in Scenario 1. It is important to note that restructuring (merger) allocations to HE have been excluded in the actual allocations to HE in 2001 to 2005 as given in Tables 3.1 and 5.6. These allocations are therefore also excluded in the estimated allocations for 2006-2010 in the different scenarios in Table 5.6. (According to the MTEF estimate R600 million will be allocated to this function in 2007.)

Scenario 2: Average for 19 years: 1987-2005 (0.752% of GDP)

This scenario assumes a total HE expenditure (including NSFAS) of 0.752% of GDP for the forecasted period. This is to keep total HE expenditure on the average level that it has been during the last 19 years, namely 1987-2005 (although NSFAS awards have only been added to the total HE expenditure since 1995). The NSFAS allocations are assumed to be the same as in Scenario 1. These calculations are also given in Table 5.6 and this scenario will require a nominal increase of 74% in HE expenditure over the period 2005-2010. The 2006 estimated allocation under this scenario is still R1.5 billion higher than the present MTEF budget estimate of government for 2006/07 and almost R2 billion more than the MTEF budget for 2007/08.

Scenario 3: Continuing the 2005/06 HE allocation (0.680% of GDP)

This scenario assumes that the most recent confirmed (but very unsatisfactory) situation of a state HE allocation of 0.680% of the GDP for the financial year 2005/06 (See Table 3.1) is to be maintained for 2006-2010. This will require a nominal increase of 58% over the period 2005-2010. If the present MTEF figures are used as a yardstick it is rather disturbing that even Scenario 3 shows that the estimated HE allocation for 2007 is R720 million higher than the present MTEF budget estimate of government for 2007/08. The MTEF budget estimate for 2006/07 is estimated to be only 0.659% of GDP. For 2007/08 it is even lower at 0.641% of GDP. Using this GDP measure the 2007/08 HE allocation, if not adjusted, will represent a 5.7% decrease in the funding level of 2005/06. This is a worrying trend in a sector that is plagued by a shortage of resources in its effort to empower enough students with the skills that the economy needs urgently.

5.6.2 Real government allocations keep tract with increases in student numbers

– Another way to look at HE funding is to assume that the state's contribution per weighted FTE student should at least stay constant in real terms. This implies that the expenditure per student should increase with the anticipated inflation rate. Total expenditure on higher education by the state will then be dependent on the assumption about what will happen with the number of students in higher education. Figure 5.2 shows the real state allocation per weighted FTE student for the university and technikon sectors for the years 1987-2003 as given in Table 3.1. There was a steep decline in the per capita allocation from about R30 000 in 1987 to about R20 000 in 1992. Since then, the real per capita allocation fluctuated around R20 000 per annum with the latest amount per WFTEs available for 2003, namely R 19 493. The difference between the real per capita government allocations for the university and technikon sectors, as seen in Figure 5.2, was already discussed (see Section 3.2). In this section, scenarios will be discussed that rely on different changes in expected future student numbers.

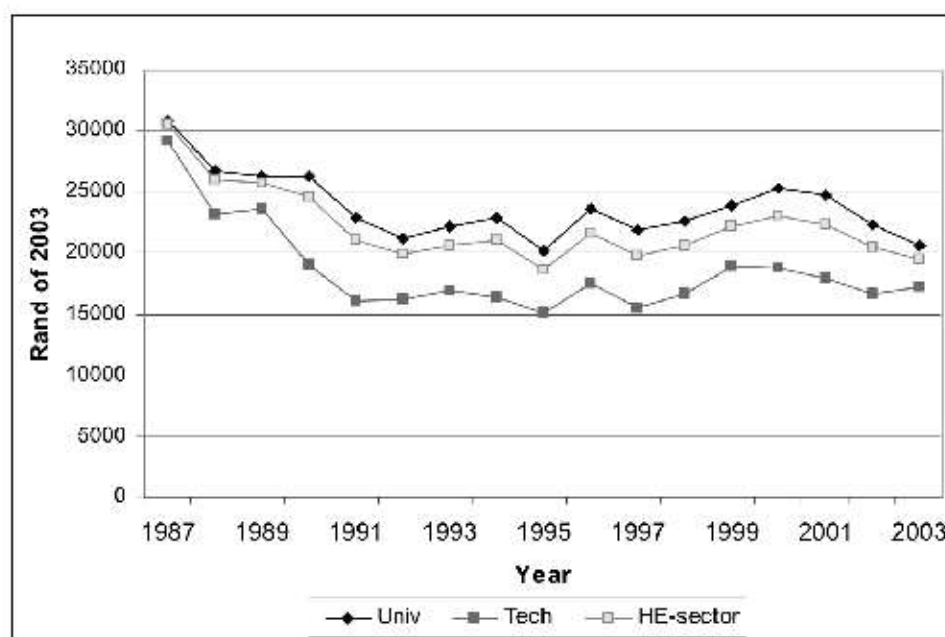


Figure 5.2: State allocation per WFTEs to HE institutions according to year (constant 2003 prices)

Table 5.7: CPI inflation and public HE allocations per WFTES for 2003 and estimated per WFTES allocations for 2004–2010 in order for the allocations to stay constant in real terms

	2003	2004	2005	2006	2007	2008	2009	2010
HeadlineCPI inflation	5.9%	1.6%	4.2%	6.2%	4.9%	2.8%	4.3%	4.4%
Allocations per WFTES	19 493	19 805	20 637	21 917	22 991	23 635	24 651	25 736

In Table 5.7, the predicted inflation rates by the BER are given for the years 2003 to 2010, as well as the nominal HE state allocation per WFTES. These nominal allocations were calculated in order for the relative allocations to stay constant in real terms; in other words expenditure per WFTES must increase with the anticipated inflation rate. This implies that R25 736 must be spent by the state per WFTES in 2010 to have the same buying power as was the case in 2003. This method thus assumes that educational expenditure increase by the same percentage as is the case with the general price level.

In Table 5.8, different WFTES growth rate scenarios are considered and for each scenario the HE allocations are calculated on the assumption that HE allocations per WFTES will stay constant in real terms for 2003–2010. Note that while the HE allocations are already available for 2004 and 2005 the most up to date official WFTES values are for 2003. State HE allocations per WFTES are therefore not available for 2004 and 2005. Table 5.8 therefore treats the state HE allocations for these two years as unknown.

Table 5.8: State HE allocations in nominal and real terms for different growth rates in WFTES on the assumption that the real state HE allocations per WFTES Will stay constant for 2003-2010 (R millions)

Year	State HE allocation (keep tract with only increases in student numbers)	State HE allocation (keep tract with increases in price and student numbers)
<i>Scenario 4: WFTES stay at 2003 level</i>		
2003	8 635	8 635
2004	8 635	8 773
2005	8 635	9 142
2006	8 635	9 708
2007	8 635	10 184
2008	8 635	10 469
2009	8 635	10 919
2010	8 635	11 400
<i>Scenario 5: WFTES increase by 2% per annum</i>		
2003	8 635	8 635
2004	8 808	8 949
2005	8 984	9 511
2006	9 164	10 303
2007	9 347	11 024
2008	9 534	11 559
2009	9 724	12 297
2010	9 919	13 095
<i>Scenario 6: WFTES increase by 4% per annum</i>		
2003	8 635	8 635
2004	8 980	9 124
2005	9 340	9 888
2006	9 713	10 921
2007	10 102	11 914
2008	10 506	12 737
2009	10 926	13 817
2010	11 363	15 002
<i>Scenario 7: WFTES increase by 6% per annum</i>		
2003	8 635	8 635
2004	9 153	9 300
2005	9 702	10 272
2006	10 284	11 563
2007	10 901	12 857
2008	11 556	14 010
2009	12 249	15 489
2010	12 984	17 141
<i>MTEF budget Estimates</i>		
2006		10 853
2007		11 537

Scenario 4: No student growth after 2003

The first scenario in this approach to HE budget estimates is a baseline scenario where the WFTES numbers stay constant at the 2003 level until 2010. The second column of Table 5.8 gives the HE allocations which do not provide for inflation (in other words, constant nominal allocation per WFTES) and are only included for comparative purposes. The more important figures are the HE allocations in the last column which indicate allocations which have the characteristic that the real per WFTES allocations stay constant from 2003 to 2010. The NSFAS allocations are assumed to be the same for the years 2003 to 2010 as given in Table 5.6 and only the total allocations (excluding restructuring/merger funding) are therefore given in Table 5.8. If the HE allocations per WFTES were to stay the same in real terms they should increase by 32% from 2003 to 2010 under scenario 4, and by 25% from 2005 to 2010. As expected the allocations for 2004 and 2005 are much lower than the actual allocations (see Table 5.6) and also lower in 2006 and 2007 than the MTEF budget estimates of R10 853 million and R11 537 million respectively. It must be noted that a scenario with no student growth in the HE sector in South Africa can hardly be seen as realistic.

Scenario 5: Low annual student growth of 2% from 2003-2010

If the number of weighted FTE students increases by 2% per annum it implies that HE allocations must also increase by two per cent per annum to stay constant in nominal terms. In order for per capita HE allocations to stay constant in real terms Table 5.8 shows that HE allocations must increase by 52 % from 2003 to 2010 and by 38% from 2005 to 2010. In this scenario the allocations for 2004 and 2005 are still lower than the actual allocations (See Table 5.6) in these years and also lower in 2006 and 2007 than the MTEF budget estimates.

Scenario 6: Moderate annual student growth of 4% from 2003-2010

If the number of weighted FTE students increase by four per cent per annum it implies that HE expenditure must also increase by four per cent per annum to stay constant in nominal terms. In order for per capita HE allocation to stay constant in real terms, Table 5.8 shows that HE allocations must increase by 74% from 2003 to 2010 and by 52% during 2005-2010. In this scenario, the allocations for 2004 and 2005 are still lower than the actual allocations (See Table 5.6) in these years, but the HE allocation for 2006 is R63 million more than the MTEF budget estimate of R10 853 million for 2006/07 and in 2007 it is R377 million more than the MTEF estimate of R11 537million for 2007/08. This shows how totally unrealistic the MTEF budget estimates are. These estimates should thus seriously be reconsidered, especially in the light of the higher than expected realised economic growth rate in 2004. This led to higher tax collection than was budgeted for.

Scenario 7: High annual student growth of 6% from 2003-2010

This last scenario assumes a rather high annual increase of weighted FTE students of 6% per annum. In the light of the fact that WFTES increased by 7.6% from 2002 to 2003 this scenario is by no means unrealistic. As was the case in the previous three scenarios this

growth rate implies that HE expenditure must also increase by six per cent per annum to stay constant in nominal terms. In order for per capita HE allocation to stay constant in real terms Table 5.8 shows that HE allocations must increase by 99 % from 2003 to 2010 and by 67% from 2005 to 2010. In this scenario the allocations for 2004 are still slightly lower than the actual allocation for 2004, but the 2005 allocation is higher than the actual allocation for 2005 (See Table 5.6). The HE allocation for 2006 is R710 million more than the MTEF budget estimate of R10 853 million for 2006/07 and in 2007 it is R1 320 million more than the MTEF budget estimate of R11 537 million.

As indicated in Section 5.4, the Minister of Education has already introduced restrictions on FTE student growth in determining the block grants for HE institutions for 2005/06. This growth restrictions could be translated to about 4% annual growth in WFTES from 2002 to 2003 (for the 2005/06 HE allocations). As a result of the suspension of the NFF for 2006/07 and possibly also for the years 2007/08 and 2008/09 as far as the teaching input block grants are concerned, no direct FTE growth restrictions will be needed by the state for the years 2004-2006. However, it is unsure if restrictions in annual growth in later years will be lower or higher than the 4% referred to above.

The NFF's primary purpose (see Section 2.2) is to divide the total HE allocation, as determined by the MTEF, between institutions. In this division student numbers and institutional output are utilised. It can therefore be argued that the macro economic factors and trends determining the MTEF allocations for the various functions of the state are of primary importance. This means that any argument to increase HE state funding should preferably rely on macro economic indicators. Linking state HE funding to the size of the GDP and not to student numbers seems to be in line with government thinking. If this is the case, Tables 3.1 and 5.6 clearly show that the HE allocations made by the state during the last 19 years were declining and that the allocation in 2005/06 was at a level of only 0.680% of GDP. This is significantly lower than the UNESCO study (international benchmark of 0.81% of GDP in 2001) and the OECD study (average public spending on HE of 29 OECD countries in 2000 was 0.90% of GDP) referred to in Section 3.2. As an interim measure the Minister of Education should endeavour at least to restore the HE allocation to the average level of the last 19 years, namely of 0.752% of GDP (Scenario 2 in Table 5.6). It is interesting to see that the HE allocations according to this scenario for 2006-2010 are to some extent similar to the HE allocations for these years according to Scenario 7 (6% annual growth in WFTES).

The policy of the introduction of growth caps on subsidised students at institutions where student growth is too high is to the advantage of the total HE sector. Different caps for different institutions will, however, be very controversial if not clearly substantiated. Furthermore, the NPHE clearly advocates an increased gross participation rate for HE and if the HE system is not allowed to grow on average by about 6% per annum, the (gross)

participation rate target will not be reached within the next ten years. This may have the result that many students from disadvantaged societies may perhaps not get the opportunity to undergo higher education after they leave school. Furthermore all indications are that the economic growth rate of South Africa will increase in the short to longer term. More high-level person power will be needed and it will be a sad day if the lack of funds prevents the HEIs to provide these well-educated people.

SECTION 6: CONCLUSIONS AND PROPOSALS

6.1 INTRODUCTION

Although this research project primarily focuses on the possible effects that changes in the sources of HE funding have on institutional activities and performance, many peripheral, but also important, issues came to the fore during the investigation. It is therefore important not only to make conclusions and proposals that relate to the main focus, but also to highlight the other more general matters that were discussed in the report.

Some relevant theoretical results and principles as observed by the researchers in scanning the comprehensive literature on research in HE financing were discussed in Sections 1 and 2, especially. The main thrust of the investigation, however, was of an empirical nature. The comprehensive tables with HE student data, personnel data, research data, financial data and performance indicator values, as set out in Appendices A to D, are evidence of this. Although some of the data sets have some limitations, namely that of missing values, inaccuracy and some incompatibility between the SAPSE and HEMIS databases, there is sufficient information contained in these appendices to make some very interesting and significant conclusions. The four appendices could serve as a convenient data source for future research.

The 18-year study period of 1986 to 2003 covers an eventful and very turbulent era in the South African history. During this period, two totally different and politically opposing governments were in power. Changes in important HE parameters during this era were therefore expected, especially after South Africa became a democracy in 1994. However, the transformation of HE, spelled out in WP3, only really got momentum after the NPHE was published in 2001. With the process of institutional restructuring, which started in 2003, as well as the introduction of the NFF with effect from the 2004/05 financial year, the pre-2003 HE system has been totally transformed in many aspects. During this restructuring process some institutions merged with the result that the HE sector in South Africa has changed completely from the one that was investigated in this report.

With our research we focused on the trends in the HE system as a whole although the data of individual institutions are also included in Appendices A-D. We did, however, make a distinction between the trends in the four well defined groups of institutions, namely the HAUs, HDUs, HATs and the HDTs. Ideally these distinctions should become redundant as soon as possible and the new HE landscape will assist in this regard. Our research shows, however, that differences between these four groups still exist. This should be kept in mind and recognised in managing the new HE landscape.

The very complex, but still relevant, issue of institutional redress, especially as far as the HDUs and HDTs are concerned, is not specifically addressed in this study since this has already been the topic of various other studies that have been undertaken during the last

number of years. Some conclusions on this issue can be drawn from the wealth of information contained in Appendices A to D, especially.

In this section we will first make conclusions relating to the different sources of HE income, followed by conclusions regarding expenditure patterns. Then we will focus on the question of whether the HE system still consists of viable, effective and academically sound institutions. The fiscal needs of the HE sector and some general related issues will be highlighted in the last part of this section.

6.2 CHANGING SOURCES OF FUNDING OF HE INSTITUTIONS

6.2.1 Relative public funding of HE – Table 3.1 clearly shows that amidst some fluctuation in the period 1987 to 1998 the relative government funding of HE has decreased significantly since 1999. As a percentage of the GDP the government allocation to HE decreased from 0.804 in 1999/00 to 0.680 in 2005/06. The HE allocation as a percentage of the total state budget and as a percentage of the state's education budget also shows decreasing trends. (See Table 3.1)

Although the slow abdication of government in the funding of HE is a worldwide phenomenon as described in Sections 1 and 2, the UNESCO study in 2001 conducted in 84 countries, which covers all continents, shows that South Africa's government HE allocation for 2001 as a percentage of GDP, namely 0.75%, was significant lower than the average of 0.81% for the 84 countries. If compared to the average of 0.85% of 15 other African countries, the difference is even more disturbing. Furthermore, according to Barr (2004) the percentage of public spending on HE as percentage of the GDP in 30 OECD countries in 2000 was 0.90%. There are good arguments to exclude the annual allocations to the NSFAS that have to be repaid, in calculating the government allocation to HE (as, for example, New Zealand and the United Kingdom are doing) since these amounts are not available for normal HE expenses. Perhaps the first substantial NSFAS allocation of R300 million in 1999 was partly responsible for public expenditure on HE increasing from 0.743% of GDP in 1995 to 0.843% in 1996 (See Table 3.1), but in later years the NSFAS allocations became part of the normal HE budget and are currently about 0.06% of GDP.

This study shows that there should be great concern amongst all role players in HE (including the Minister of Education) about the present level of government funding of HE. Although there is a worldwide trend to decrease government appropriations to HE, the level of HE funding by the South African government is too low when compared to international standards

6.2.2 The three income streams in HE expressed per weighted FTE student – Given the fact that public funding of HE has decreased annually in real terms, how do the HE institutions cope with this loss in income? In Section 3, the three main sources of income, namely state appropriations, tuition fees and other income (the so-called third

money stream) are analysed in respect of the four institutional groupings. The most serious problems experienced in doing the analysis were that the financial statements of some of the institutions were incomplete (and therefore they had to be excluded from the analyses) and the incompatibility between the pre-1998 SAPSE and post-2000 GAAP financial statements of institutions. The most informative conclusion is that tuition fee income had to increase in order to compensate for the loss of government appropriations to HE institutions. The third money stream income fluctuated over the study period and no significant trends were found.

Table 6.1 shows the real income per weighted FTE student for the first two sources of income for the four groups (see Section 3.1.2 for the institutions included in the respective groups) for three years during the study period. The NSFAS allocations were not included in these figures and conclusions regarding NSFAS allocations will be drawn in Section 6.5.6. Since no information is available for 1986 for the two institutions included in the HDT group, we have chosen 1987 as starting year in Table 6.1.

Table 6.1: Real tuition fees per WFTEs and real state appropriations per WFTEs according to HE group and year (in constant 2000 prices)

Group	Real tuition fee per WFTEs			Real state appropriation per WFTEs		
	1987	1994	2003	1987	1994	2003
All instl. ¹⁾				30 556	21 046	19 494
HAUs	6 462	8 063	9 527	24 276	19 198	16 697
HDUs	5 135	5 644	6 739	25 987	13 227	13 410
HATs	4 024	4 732	7 393	18 751	10 254	12 167
HDTs	2 590	4 701	5 804	41 008	13 922	13 847

1) All institutions - calculated from Table 3.1 and Table A.5 of Appendix A. NSFAS allocations are excluded

It is evident from Table 6.1 that real tuition fees per WFTEs in all groups increased substantially over the study period while simultaneously real state appropriations per WFTEs decreased dramatically (see Sections 3.3 and 3.4 for more detail). In the case of HAUs (the only group with no 'missing' institutions as far as the analyses are concerned) Figure 3.2 shows that while the state allocation contributed 51% of all income to these institutions in 1986 this percentage has decreased to 40% in 2003. During the same period tuition fees had increased from a contribution of 13% of total income to 23%. This substitution of state funding by student fees is also evident for the other 3 groups (See Figures 3.3-3.5).

This study shows beyond doubt that HE institutions are annually increasing tuition fees in real terms to compensate for the loss of state funding. On average (over the study period) HAUs increased their tuition fees annually by 2.4%, HDUs by 2.2%, HATs by 3.3% and HDTs by 4.9% (all in real terms). In view of the priority of government to increase access to HE this trend is of real concern.

It was already indicated that no clear trend has been observed in the contribution of the third money stream's contribution to total income or when expressed per WFTEs. This income source is more and more dependent on entrepreneurial initiatives of institutions and earmarked research funding (see Section 2.5). It is mainly instruction/research personnel that are responsible for generating these two sources of income. Figure 3.10 shows a definite increase in the third money stream per FTE instruction/research personnel member for both the HAUs and the HATs during the study period, although there were some problems in the reporting of this information since 2000 (See Section 3.1.7 in this regard). The fact that academic personnel numbers have not kept pace with the growth in student numbers, as well as with the financial turnover of HE institutions, has definitely obscured the fact that it is becoming increasingly important for academics to earn additional money for HE institutions by means of entrepreneurial activities and research awards.

This study shows clearly that instruction/research personnel are increasingly responsible for earning additional income for HE institutions in order to balance their books. Institutions should be aware of the potential dangers (see e.g. Section 2.5.2) of over emphasising entrepreneurial activities in order to compensate for the loss in income from state appropriations.

6.3 TRENDS IN INSTITUTIONAL EXPENDITURE

The problems encountered with the linking of the recurrent expenditure of HE institutions reported under the SAPSE financial reporting system for 1986-1998 and the recurrent expenditure reported from 2000 by means of GAAP were discussed in Section 3.1.5. Some adjustments were made to the income statements of institutions from 2001 onwards in order to make the two recurrent expenditure series more compatible.

6.3.1 Real recurrent HE expenditure per weighted FTE student and per qualification awarded – The real recurrent expenditure per WFTEs and per qualification awarded of the four groups of institutions for specific years are given in Table 6.2 (see Section 3.5 for a detailed discussion). There was in general an increasing trend in the real recurrent expenditure per WFTEs for all groups of institutions except the two HDTs. It is of some interest to note that the application of the SAPSE subsidy formulas with constant student numbers and constant α values (See Table B.1) in consecutive years has shown in the past that HE inflation usually exceeds CPI inflation. This could have contributed to the increases in real recurrent expenditure per WFTEs at three of the four institutional groups as indicated in Table 6.2. It is also clear that real expenditure per WFTEs in the university sector was much higher than in the technikon sector.

The four groups show different characteristics when we look at the real value of recurrent expenditure per qualification awarded. For HAUs it stayed fairly constant implying maintained cost efficiency in delivering qualifications. For the HDUs the real expenditure

per qualification awarded stayed fairly constant until about 1997 and since then started to increase. The HATs followed almost the identical pattern although the rate of increase was much less than for the HDUs. The series of HDTs is very volatile, but in general expenditure came down from very high levels and has been fairly constant since 1993. Obviously the different student growth patterns of the four institutional groups over the study period played an important role in the unit costs calculated in Table 6.2.

Table 6.2: Real recurrent expenditure per WFTEs and qualification awarded according to HE group and year (in constant 2000 prices)

Group	Real Expenditure per WFTEs			Real Expenditure per qualification awarded		
	1987	1995	2003	1987	1995	2003
HAUs	29 681	30 403	38 010	120 581	105 225	123 924
HDUs	19 070	16 395	29 783	78 263	70 075	169 464
HATs	15 804	12 346	21 579	78 622	74 201	111 096
HDTs	25 299	17 892	20 772	213 259	95 589	96 966

Conclusions on the two measures calculated in Table 6.2 are not clear. In general the real expenditure per WFTEs increased over time and the real cost to deliver a qualification also increased during the last couple of years. The technology drive in HE could have contributed to these trends. The tendency for costs to increase, linked with smaller government appropriations, should be a reason for concern.

6.3.2 Remuneration of HE personnel – Personnel remuneration is a very sensitive issue in HE and the general feeling amongst personnel, especially academic personnel, is that they are increasingly underpaid (and overloaded). Figure 3.15 shows that the expenditure on remuneration of personnel expressed as a percentage of total recurrent expenditure decreased during the study period. This was generally the case for three of the four institutional groups. The relevant tables in Appendix C show that the HAUs spent 74% in 1986 on remuneration of personnel, while this percentage decreased to 57% in 2003. For the HDUs these percentages were respectively 80% and 58% and for the HATs 83% and 65%.

There is reason to conclude that, considering only recurrent expenditure, the relative expenditure on personnel at HE institutions has decreased since 1986.

Table 6.3 gives some insight into why expenditure on remuneration as a percentage of recurrent expenditure decreased over time. It gives the numbers of weighted FTE students, FTE instruction/research personnel and FTE 'other personnel' of the 4 institutional groups for 1986 and 2003. Note that the figures in Table 6.3 include all 36 institutions and are taken from Table A.5 of Appendix A and Table D.1 of Appendix D.

Table 6.3: Weighted FTE enrolled students, FTE instruction/research personnel numbers and FTE 'Other personnel' numbers according to institutional group and year

Group	Weighted FTE students		FTE instruction/ research personnel		FTE other personnel	
	1986	2003	1986	2003	1986	2003
All institutions.	183 604	442 962	14 036	21 510	28 354	34 538
HAUs	121 267	216 213	9 604	12 557	19 238	18 825
HDUs	28 722	77 220	2 177	3 790	5 530	6 792
HATs	27 954	101 238	1 763	3 734	2 828	6 657
HDTs	5 661	48 291	492	1 429	758	2 309

While the total weighted FTE students in the HE system increased by 141% during the period 1986-2003, the total academic personnel increased by only 53% and the 'other personnel' by only 22%. Academic personnel have increased more than the other personnel since many services, e.g. cleaning and gardening services have been contracted out since the early 1990s. Especially, some of the so-called service workers were phased out and the remuneration expenses associated with the retrenched personnel have been transformed into expenditure on supplies and services. Furthermore, the strong increase in student enrolment relative to employed personnel also meant that instruction and academic support consumables, which both primarily depend on student numbers, have increased relative to personnel remuneration.

The calculation of FTE instruction/research personnel, as well as the classification of each personnel member into one of the seven personnel categories according to HEMIS definitions is severely flawed in the annual HEMIS personnel submissions of many institutions. This is incomprehensible since the HEMIS definitions are the same as those used for 16 years under the SAPSE system. In the interpretation of personnel remuneration, conclusions will therefore only be drawn in respect of all personnel (In Section 3.6 some results are given according to personnel category). From 1986-2003 the average real annual increase in remuneration per FTE personnel member was:

- HAUs: 2.4%
- HDUs: 3.4%
- HATs: 1.7%
- HDTs: 3.0%

It was indicated in Section 3.6 that some circumspection is necessary with the interpretation of the above results. Without more sophisticated analyses, like remuneration-age profiles for the different personnel groups and a study of the effect of employment equity on remuneration, it is difficult to determine whether substantial across the board improvement in the remuneration of HE personnel has actually taken place over

the study period. If the productivity of academic staff has been increasing (student/staff ratios increasing), then increases in remuneration above the rate of inflation could be justified.

The average nominal remuneration over the same period for the four groups was:

HAUs: R 82 850
 HDUs: R 74 488
 HATs: R 98 575
 HDTs: R103 107

- i. *The study shows that the average annual increases in the remuneration of HE staff were above the inflation rate during the study period. This is somewhat surprising and more detailed studies are necessary to comprehend this result fully.*
- ii. *There are clear indications that the technikon sector on average paid better salaries than the university sector. Appointing academics from industry to teach at technikons usually leads to additional expenses and could be responsible for this observed discrepancy. The introduction of the professorial rank at technikons over the last number of years could also have contributed to the above trend.*

The high remuneration packages of vice-chancellors of HE institutions have recently attracted some attention. Table C.3.1 of Appendix C summarises the information for the available data of 2001-2003 and is discussed in Section 3.6. The remuneration of VCs at universities and technikons increased on average by respectively 4.4% and 13.0% annually in real terms during 2001 to 2003.

Of more concern is the actual level of VCs remuneration packages. Table 6.4 shows a comparison of the average remuneration of all personnel, as well as the VC's remuneration for 2003 according to institutional group. The remuneration averages is calculated from the four institutional groups' aggregate tables in Appendix C, while the VCs' average remuneration is calculated from Table C.3.1 of Appendix C. The last column in Table 6.3 gives the ratio of average VC remuneration to the average of all personnel remuneration.

Table 6.4: Average remuneration of VCs and all personnel in 2003 according to institutional group

Group	All personnel	Vice-chancellors	Factor VC/All pers.
HAUs	R181 583	R1 197 000	6.6
HDUs	R162 581	R 947 000	5.8
HATs	R160 976	R1 214 000	7.5
HDTs	R206 647	R1 200 000	5.8

Although VCs play a crucial role in the present complex HE environment, the question can be asked whether that alone could justify not only the extreme differences between many institutions' VC remuneration and their personnel's remuneration, but also the phenomenal increases in remuneration packages of most VCs over the last few years. Since accurate and comparable information regarding the remuneration of the rest of the institutional management teams is not available the analysis could not be extended to include them as well.

In comparing the real remuneration and the annual increase in real remuneration per FTE personnel member at universities and technikons with the corresponding remuneration of employees of the broad government sector (See Section 3.6 and specifically Figure 3.22), it was found that HE remuneration has kept up with the remuneration in the broad government sector since 1992. This is probably the result of an indirect linkage between the cost units C1, C2 and C3 in the SAPSE subsidy formulas for universities and technikons and the remuneration of employees in the public sector during the years 1984 to 2003 as described in Section 3.6.

The real average annual increases in the remuneration of personnel employed by universities, technikons and the broad government sector during 1992-2002 were respectively 3.6%, 1.7% and 3.0%. These figures do not take into account possible differences in the complexities of posts in HE and the government sector. It is thus impossible to say whether the level of remuneration of HE employees relative to that in the government sector is realistic, but it can be stated that HE remuneration is not losing field, compared to the government sector.

6.3.3 Financial viability of HE institutions – This study did not try to determine how many HE institutions are in financial trouble because that would be a very complex investigation, even without the financial reporting problems already alluded to in Section 3.1. In this study only one relatively simple measure of financial viability was calculated, namely the size of the annual surplus or deficit (total income minus total expenditure) of all institutions for the years 2000-2003 (See Table C.3.2 of Appendix C). This was calculated from the annual GAAP statements using the income (including auxiliary enterprises programme) and expenditure (recurrent and non-recurrent) of all activities. It was found that 11, 9, 14 and 12 HE institutions reported deficits for respectively the 2000, 2001, 2002 and 2003 financial years. These figures are summarised in Figure 3.24. In 2003, the total university deficit amounted to R584 million and the total technikon deficit was R22 million.

Although more sophisticated analyses are necessary to determine the viability of HE institutions, it could in general be stated that the financial situations of many institutions were all but sound in 2003. The total deficit of R606 million in 2003 at HE institutions represents about 7% of the total public funding of HE in 2003. Using this crude measure it seems as though more universities are experiencing problems than technikons. The funding for the restructuring of HE is currently bringing welcome financial relief to some of the merging institutions with deficits.

6.4 THE PERFORMANCE OF THE HE SYSTEM

From the analyses of the trends in student enrolment, the changes in the different sources of income of HE, as well as changes in the expenditure patterns, it is obvious that the HE system in 2003 differs totally from the system in 1986. Were all these changes to the detriment of the HE system or did some changes have a positive influence on the main tasks of HE institutions, namely teaching and research? The changes in research and teaching activities during 1986-2003 were summarised in Section 4 by means of performance indicators. Some consequences of these findings will be summarized here.

6.4.1 Teaching performance – Tables D.1 and D.9 of Appendix D, as well as Table 6.2 show that the number of instruction/research personnel (both in terms of permanent appointments and FTEs) increased over the study period, but not nearly at the rate of enrolled students. This resulted in the overall student/lecturer (S/L) ratio of the university sector increasing from 12.7 in 1986 to 18.0 in 2003, while the ratio for technikons increased from 14.9 in 1986 to a very high 29.0 in 2003 (See Figures 4.1 and 4.2). The average S/L ratio of 11 countries for 1992 was 19.9 (See Table 4.1).

Compared to 'international standards' the university student/lecturer ratios are acceptable but the technikon ratios are too high, especially from 1990 onwards.

A further related consequence is that the number of qualifications awarded per FTE instruction/research personnel member (the Q/L ratio) has also increased substantially during the study period for all four institutional groups (See Figures 4.3 and 4.4).

Comparisons of the S/L ratios of 2003 and 1986 with the Q/L ratios of 2003 and 1986 for the 4 institutional groups, show that in the case of the HDUs, HATs and the HDTs the percentage increases in Q/L ratios over the study period are smaller than the increases in the S/L ratios. This is an indication that the increasing S/L ratios are negatively influencing the graduate/diplomate output at these institutions.

The graduation rate of HE institutions can be used to measure (in a crude way) the inherent efficiency of the teaching process (See Section 4.3). Figures 4.7 and 4.8 show that the graduation rate of the university sector shows a rather constant trend while the graduation rate of the HATs is declining.

In the light of increasing S/L ratios and Q/L ratios it is hardly surprising that the graduation rates in the HE sector did not live up to expectations. The graduation rates of all HE institutions in respect of the different qualification types are presently far below the respective benchmarks for universities and technikons (as specified in the NPHE of 2001) and it is unlikely that the present national norms will be attained, even in the long term.

6.4.2 Research performance – Two performance indicators relating to high level research at HE institutions, namely the publication units per academic personnel member (both in terms of FTE and permanently appointed staff) and the number of doctoral degrees awarded per FTE academic personnel member were investigated in Section 4.5. The publication units (PU) ratios of HE institutions were only calculated for 1993 to 2003 for reasons outlined in Section 4.5. Figure 4.9 shows some signs of a decreasing PU(FTE) ratio for the university sector, especially for the HAUs, while the PU(Headcount) ratio for universities (See Table D.12 of Appendix D) was more constant during the study period. Figure 4.10 and Table D.12, however, show big increases in both the PU ratios for technikons, but from a relatively small base ratio.

During 1993-2003 the publication rate of universities was about 0.5 publications per permanently appointed instruction/research personnel member. This translates to about one 'approved' publication by a permanent academic staff member every two years. While there are some indications that this rate is under pressure at universities the corresponding technikon's publication rate for 2003 was a low 0.061, but increasing annually. This represents on average a rate of one publication by a permanent academic personnel member every 16.3 years. The technikon rate will have to improve in the new HE landscape where these institutions have either become universities of technology or form part of a comprehensive HE institution.

There was a steady increase in the number of doctoral degrees awarded per FTE academic personnel member (D/L ratio) at both HAUs and HDUs during the years 1986 to 2003. Although the HDU ratios are still much smaller than the HAU ratio, these increases are very positive signs. They clearly show that the capacity to train researchers at universities has been enhanced. The challenge seems to be to convert this enhanced capacity into significant increases in high quality research output.

The five universities with the highest publication numbers (in absolute terms but usually also in terms of PU-ratios) are annually responsible for about 60% of the total number of approved publications in the HE sector. According to Poutis (2003), the HE sector is responsible for 80% of the country's visible research output. These five top research institutions are therefore generating at present almost half of the worthwhile research in South Africa. It is very important that a suitable environment should be created where especially these institutions can perform optimally as far as research is concerned. Fortunately in 2003 the S/L ratios of these top research universities were all lower than the average for all universities or the average of the HAUs.

It seems important to ensure that the top research universities will not become so pressurised by annually increasing S/L ratios or unrealistic graduation rate targets that they lose their edge on research capacity. There are indications that this is already happening.

Figure 3.23 indicates that the real average expenditure per weighted FTE student on library collections for the period 1986 to 1998 was about R880 (in 2000 prices) for the HAUs. The corresponding expenditure for the other three groups was much lower. Both technikons groups spent for example about R120 (in 2000 prices) per WFTEs on library collections in 1990. It has already been indicated that comparable data on the expenditure on fixed assets (including library collections) are not available for the post-2000 period.

If the very low expenditure level on library collections (one of the most important resources for high quality teaching and research) continued, especially in technikons since 1998, the chances for the improvement in graduation rates and research output in technikons are rather slim.

The above conclusions about the performance of HE institutions in their line function activities during the years 1986 to 2003 are reason for great concern. The HE system was still functioning relatively well in 2003 and there were and still are some quality teaching and research endeavours at many HE institutions. However, the capacity of all institutions, but especially the technikons, is stretched to its limit. At many institutions quality is deteriorating as a result of financial pressure.

6.5 SOME OTHER ISSUES RELATED TO FUNDING

6.5.1 HE policy framework –

Higher education institutions have to cope at present with some conflicting policy signals. This puts undue pressure on institutions and the HE system as a whole. Some examples which came to the fore in this research project are discussed below.

Distance education: While distance education is promoted in WP3 the subsidy weighting factor in the public funding formula for HE has been scaled down from 0.67 (in the SAPSE formula) to 0.5 in the NFF (for undergraduate/underdiploma and honours programmes). At the same time in applying the NFF for 2005/06, growth caps of three per cent for distance education FTE students compared to caps of five per cent for contact tuition have been imposed by the Minister of Education.

Participation rate in HE: The NPHE indicates a target (gross) participation rate of 20% of the age group 20-24 in public HE by 2011-2016. Since the gross participation rate was only 16.3% in 2003 it can be calculated that the enrolment numbers in HE should increase by about 300 000 to reach the 20% target in about 2013. This means an average annual growth rate in headcount enrolled students of more than 4% per annum until 2013. The Department of Education's proposed growth restriction for the period 2006-2009 allows only for an average annual student growth (to be funded by means of state allocations) of about 0.6%. Clearly this contradicts the NPHE participation rate target.

NPHE graduation rate benchmark: These benchmarks are unrealistically high in the present educational environment where first time entering undergraduate students come from a school system where the Senior Certificate examination standards are perceived to be dropping and where the S/L ratios at all HE institutions are increasing as a result of decreasing public funding of HE (See Sections 4 and 5). The fact that only R85 million for the 2004/05 financial year and R91 million for 2005/06 financial year have been made available by the state as earmarked funding under the NFF for so-called foundation programmes for under-prepared new students, does little to solve the problem of the worsening throughput rates at many HE institutions. Furthermore, these amounts are top-sliced from the higher education allocation, therefore robbing Peter to pay Paul.

Funding equity between the university and the technikon sectors: By a stroke of a pen total funding equity was attained under the NFF between universities and technikons. The need for better funding of the teaching function at technikons (by means of the teaching input block grant) was illustrated by the very high S/L ratios at these institutions. The implication for universities, however, with the implementation of the NFF was that they have experienced a huge cut in subsidies with the introduction of the NFF in 2004/05. Funding has been shifted from the university to the technikons rather than dealing with the technikon problems directly. The subsidy losses of universities are softened somewhat by the implementation of the NNF by means of a migration strategy.

Co-ordination of state allocations for research: The NPHE makes a plea for better co-ordination between the Minister of Education in the allocation of public funds for research in HE and the Minister of Science and Technology allocating (via state agencies) earmarked funds for research projects, scholarships, etc. at HE institutions. The absence of such co-ordination seems to be a serious problem. No official breakdown according to institution and year of either the (theoretical) 'education allocations' for research or the actual 'science and technology allocations' for research (through agencies) are available. Although the 'education allocations' are presently not earmarked in the way the 'science and technology' funding is, it has already been indicated by the DoE that the research development funding, allocated within the NFF, will be earmarked from 2007/08 onwards. Clearly in a country like South Africa where a relatively low percentage of the GDP (about 0.75% in 2001 according to the Department of Science and Technology, 2004) is expended on research and development (R&D), it is important that the two Ministries should have a common goal for the allocation of research funds. The accuracy and completeness of the earmarked research allocations to HE institutions by state agencies, analysed in Section 2.5.4, is in many ways suspect.

Institutional planning: One of the three pillars of the present integrated government steering of public HE is planning (See Figure 2.2). Three three-year rolling plans (for 1999-2001, for 2000-2002 and for 2004-2006) have been requested from HE institutions since 1998. Apart from these requests the so-called PQM projections (headcount of students, FTE students

and graduates according to CESM category and study level) were also requested in 2001 for the time period 2004-2006. Substantial institutional resources were invested in the drafting of these very comprehensive plans. Unfortunately, because of the different formats of these 4 rolling plans resulting from the different policy goals of the DoE that had to be satisfied by these four plans, they were not very helpful for internal institutional planning. The standardisation of annual three year rolling plans is therefore essential. This will help institutions to integrate the annual drafting of the 3-year rolling plans with institutional planning. Furthermore, most HE institutions have already modelled their student enrolment planning, as well as their financial planning along the lines of the NFF. The adjustment to the NFF for the 2006/07 financial year, as determined in the Ministerial Statement of 2005 (See Section 2.2.2), has invalidated most of the institutional long term plans. Since it is unclear whether the 2006/07 adjustment will become a permanent feature of the NFF, it is at present extremely difficult for institutions to do any multi-year planning.

6.5.2 State provision for new buildings – In Section 2.1.12 the history of the state's policy for the provision of new buildings and land improvements other than buildings was discussed. Apart from one large capital project which was already underway in 1996 no funds for new capital projects have been allocated since 1996. All the policy tools necessary for resuming allocations for capital projects have been put aside by the DoE (the submission of building information by institutions, national space and cost norms and the cost unit balance sheet for new buildings). Inevitably, in the light of the expanding HE system and very large, but unknown, backlogs in buildings at many HE institutions, it will be necessary to reactivate the funding of new buildings. However, according to the NFF no provision is made for such funding.

To ensure quality HE the funding of capital projects at institutions is essential. It is of critical importance that the state formulate its intentions by means of national policy regarding:

- (i) the norms and standards for the erection of new buildings and other land improvements*
- (ii) the funding of new buildings and other land improvements.*

6.5.3 Jongbloed's two dimensional classification of HE funding systems – Figure 2.3 shows that the NFF is far removed from the previous, more market oriented, mechanisms used in the public funding of HE. As emphasised in various policy documents (see Section 2.2.1), government is not prepared to leave the HE system in the hands of uncoordinated institutional decisions on student enrolment and programme offerings. The planning policies of the Minister of Education and the NFF were developed to steer the HE system to respond to the national development agenda in terms of access, redress and human development needs. However, no national human resource model has been constructed to act as basis for HE planning.

- (i) *As could be seen from SAUVCA's official response to the NFF (See Section 2.2.3) there is some concern in the HE sector that HE autonomy is impaired by government's centralised approach in the funding of HE by means of the NFF.*
- (ii) *A further source of concern is that very stringent growth restrictions on student enrolment in HE was proposed in March 2005 by the DoE for future years without any reference to any study performed by government on the human development needs of the country.*

6.5.4 The principle of cost-sharing in HE – Owing to social benefits the state has to be involved in HE, but there is widespread evidence that the private benefit that an individual receives from education is quite substantial (for example, the studies on private rates of return on an investment in education). There is currently a world wide trend that the individual has to pay more for HE since governments are cutting back on their financing of HE. More and more countries are moving to an income-contingent loan scheme where the graduate pays for HE once his/her income rises above a certain level. In this way, the benefit principle is maintained (they who benefit, pay) and indigent students' cash-flow are resolved.

6.5.5 Student debt – Student debt in HE increased substantially over the years, but only data for some institutions for 2000-2003 are available. For those with data available the student debt trends are very clear. From Table 6.5 it can be deduced that student debt increased by 79% over the period 2001-2003 and student debt written off by 102% from 2000-2003. The picture may even be worse because the institutions for which no data are available fall into the institutional groups where large debts could be expected.

Table 6.5: The size of accumulated student debt at 26 HEIs (all HAUs, 6 HDUs, 6 HATs and 3 HDTs) according to year

Year	Student debt (R)	Student debt written off(R)
2000	-	94 218 000
2001	669 031 192	120 383 000
2002	1 161 116 000	116 676 000
2003	1 195 397 712	190 208 306

Despite large annual NSFAS allocations student debt is increasing at a fast rate and is a problem especially at the HDUs and the HDTs.

6.5.6 The impact and working of the NSFAS scheme – The NSFAS scheme was introduced in 1995 to help needy students and although thousands of students have benefited from this scheme the demand for funds outstrips the supply by far. As can clearly be seen in Table 6.6 the state allocation for NSFAS increased substantially over time and

with donor receipts and the repayment of loans the actual expenditure increased by 168% from 1996 to 2003. During the same time the annual number of awards increased by 53%. This scheme played an important role to ensure that certain HE institutions did not run into cash flow problems.

Table 6.6: NSFAS allocations at HE institutions in South Africa

Year	State budget for NSFAS (Rand)	Actual expenditure on NSFAS (Rand)	Number of awards	Average size of award (Rand)
1995	40 000	-	-	-
1996	300 000	333 343 000	73 140	4 558
1997	200 000 000	350 996 000	68 918	5 093
1998	296 388 000	394 495 000	75 720	5 210
1999	384 897 000	441 053 000	75 900	5 811
2000	437 400 000	510 801 000	83 769	6 098
2001	440 002 000	635 092 000	97 517	6 513
2002	489 000 000	733 473 000	101 312	7 240
2003	533 000 000	893 672 471	112 264	7 960

The NSFAS scheme helped thousands of students to afford HE. Due to the history of the country most of the funds are at present allocated to blacks (Africans). Presently the racial breakdown of the students that received NSFAS awards is 90.2% blacks, 4.7% coloureds, 2.5% Indians and 2.6% white. Presently the demand for funds exceeds the supply by far. Ways must be found for increasing the available pool of NSFAS funds. Especially on the post-graduate level an income-contingent loan scheme like the UK scheme must be considered seriously.

6.5.7 Personnel and financial reporting of HE institutions – The main difference between the SAPSE information system and HEMIS is that where SAPSE consisted of a multitude of prescribed fixed tables in which institutional data were aggregated, the HEMIS data consists of individual student and personnel data records (so-called unit records). More or less the same characteristics of students and personnel which were included in SAPSE also form the fields of the unit records of the HEMIS student and personnel database. The HEMIS records can therefore, by using some user friendly software, potentially be aggregated not only to generate all the SAPSE student and personnel data tables but also a myriad of multi-dimensional summary tables regarding the whole HE sector. Unfortunately, six years after implementation of the HEMIS systems for students and personnel, HE institutions can still only access a relatively small set of 'SAPSE' tables generated by the DoE in fixed formats from the HEMIS unit records submitted by institutions to the DoE.

During our study we became painfully aware of the shortcomings in data reporting of many HE institutions. Many institutional tables in the SAPSE database were missing. Although most problems regarding HEMIS student enrolment information are already sorted out, our analysis of personnel data has shown some major problems. Although the HEMIS definitions of the classification of a HE personnel member as belonging to the instruction/research personnel group or not is relatively clear, it is not applied in a consistent and correct way by many institutions. Furthermore, the calculation of FTE personnel values, especially for instruction/research personnel, is suspect.

The replacement of the SAPSE financial statements by new formats according to GAAP was necessary. Unfortunately, there is still no uniformity in the application of the regulations of financial reporting. Issues causing problems are the handling of NSFAS allocations, expenditure on bursaries and the consistent handling of depreciation and non-recurrent expenditure. These problems also influence the compatibility of the financial information contained in the SAPSE system and the GAAP financial reporting system and are therefore jeopardising investigations like this one which take a longer term view of the HE sector.

The termination of institutional reporting on the acquisition of fixed assets and the utilisation of building space in 1998 was an unfortunate decision by the DoE. In the longer run this will accelerate the deterioration of physical facilities, equipment and library collections at HE institutions.

Although good progress has been made with the implementation of the HEMIS system for students and personnel, as well as the new financial reporting system according to GAAP, some relatively serious problems still exist in the institutional reporting in terms of these systems. Some of these problems were outlined above.

6.5.8 Trends in earmarked research funding by the state – The researchers experienced some problems in obtaining data on the research allocations made by state agencies on behalf of the Minister of Science and Technology to the different HE institutions during the study period. It was therefore decided to focus only on the period since 1996. Information had to be obtained separately for THRIP funding, funding from the Innovation Fund, other NRF funding, MRC funding and WRC funding. The collection process was long and arduous and the quality and completeness of some data seems suspect. For example, only aggregate allocations by the WRC for 2004 for key strategic areas (KSAs) were provided and the MRC allocations exclude some types of grants. It seems surprising that no central database for earmarked research funding exists. If established (preferably at the Department of Science and Technology) it would not only enhance the management and administration of earmarked research funding, but would

also ensure better coordination with the Department of Education on the funding of the HE sector. Easy access to such a database would also enable research benchmarking at HE institutions.

Even with incomplete data, it can be concluded from the analyses made in Section 2.5.4 that the HE institutions with the highest research output are also receiving the highest research awards from state agencies. Although there was a deviation in total allocations in 2001 the average annual real increase in earmarked research funding for universities for the period 1996-2003 was six per cent. The corresponding figure for technikons was 13%, although there was also a period of decreasing allocations. Since most of the allocations are driven by research proficiency of the applicant researchers, the allocations for the historically advantaged universities (measured in terms of the real allocations per FTE instruction/research personnel member) are significantly higher than the corresponding allocations for the other three institutional groupings. In 2003, the real earmarked research allocation per instruction/research personnel member for universities was almost 3 times that of technikons.

- i. *There is a definite need for a central governmental database containing all earmarked research allocations according to HE institution or research entities and type of allocation. This database should be accessible to all researchers, institutions, as well as all other stakeholders in research and development.*
- ii. *The earmarked amounts awarded annually by state agencies for research purposes to researchers and postgraduate students at HE institutions are substantial (R381m in 2003) and have increased significantly over the last few years. When expressed in terms of the annual research allocation per FTE academic personnel member, universities secured almost 3 times more funds than technikons in 2003. Using the same measure of research funding it is also clear that the historically advantaged HE groups are receiving more funds than the historically disadvantaged groups.*

6.5.9 Future state funding of HE in South Africa – In Section 5, the possible growth in student enrolment for the next five years, as well as the macro economic prospects for the same period were analysed. Accepting the BER projections regarding future values of the GDP and the CPI, three public funding scenarios of HE were formulated in terms of the percentage of GDP that government would be prepared to spend on HE. Four further funding scenarios, based on different weighted FTE student growth rates and the premise that government would keep the public allocation per WFIES constant in real terms at the 2003 level, were also calculated. In the discussion of the different funding scenarios in Section 5.6 the following conclusions were made –

- i. *The philosophy underlying the NFF suggests that the best way to plan future government allocations to HE is in terms of a specified percentage of the GDP.*
- ii. *As an interim measure the Minister of Education should endeavour at least to restore the HE allocation to the average level of the last 19 years, namely 0.752% of GDP (Scenario 2 in Table 5.6). In the longer term allocations should increase to a more comparable international percentage of about 0.81% of GDP or even higher.*
- iii. *It is interesting to see that the HE allocations according to Scenario 2 for 2006-2010 are very similar to the HE allocations for these years according to Scenario 7 (6% annual growth in WFTES and constant per WFTES spending at the 2003 level).*

SECTION 7: BIBLIOGRAPHY

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