Higher education in Sweden

IHEM Country report

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The CHEPS International Higher Education Monitor

The CHEPS International Higher Education Monitor (IHEM) is an ongoing research project, commissioned by the Dutch Ministry of Education, Culture and Science. The project aims to provide higher education policy makers with relevant and up-to-date information on national higher education systems and policy changes. This information is presented through in-depth country reports, comparative thematic reports, annual update reports, statistical bulletins and a statistical data-base. The core countries for which this information is collected and presented include Australia, Austria, Finland, Flanders (Belgium), France, Germany, the Netherlands, Portugal, Sweden and the United Kingdom.

Country reports

Increasingly, governments take international trends into account when developing national higher education policies. Continuing European integration, the increasing mobility of people within the European Union, as well as supra-national initiatives deployed at the European level with respect to higher education (e.g. the Leonardo and Socrates programs) necessitate such an orientation. Policy makers therefore need to have access to adequate information on higher education structures, trends and issues in Europe as well as other countries. New technologies have opened access for everyone to vast amounts of facts and figures on higher education in almost every country. Although these data are indispensable for higher education policy makers and analysts, they often do not provide much in the way of usable information. What is lacking is a frame of reference to properly interpret the data.

Such a framework is offered by the CHEPS International Higher Education Monitor country reports. These reports have a clear structure, describing the higher education infrastructure and the research infrastructure. In addition to an in-depth description of the institutional fabric of the higher education system, the reports address issues of finance, governance and quality in higher education. The country reports provide the frame of reference for the interpretation of policy initiatives, trend-analyses and cross-country comparisons.

A wide scope of sources are used for these country reports including national statistics, (inter)national journals and magazines, national policy documents, research papers, and international documents and databases.

To keep track of the latest (policy) changes in higher education annual update reports are published.
These publications and other information on the IHEM can be found on:

http://www.utwente.nl/cheps/higher_education_monitor

1. INTRODUCTION

1.1 Country characteristics

Sweden enjoys a rich history and a firm standing among the world's leading countries. Sweden was placed fifth in the 2006 United Nations Human Development Index (United Nations Development Programme 2006) and it's welfare state is often seen as an example in other countries. Located in northern Europe between Norway and Finland, the country's approximately 9 million inhabitants are largely concentrated in the southern part of the country and along the Baltic and North Sea coasts. Sweden's foreign policy is one of neutrality, and has resulted in Sweden acting as mediators in conflicts around the world. Its neutrality and openness to other cultures can further be seen in the fact that approximately 12% of the population was foreign born in 2004 (Integrationsverket 2006).

Sweden is an export oriented market economy featuring a modern distribution system, excellent internal and external communications, and a skilled labour force. Sweden has a healthy economy, with a GDP growth of 4,4% in 2006 and a projected growth of 3 % for 2007. Operating a mixed system of high tech capitalism and extensive welfare benefits."(CIA 2007), over 70% of GDP is generated by the service sector. Engineering products gave the highest contribution to exports of goods. Sweden is a member of the EU since 1995 but is outside the Eurozone; in 2003 a referendum by the public made the decision to keep its own currency, the Swedish Krona.

In terms of educated nations, Sweden consistently ranks above average when compared to other OECD nations in most education categories. For example, as of 2003 more than four of every five adults had at least a secondary-level education. That Sweden's population is highly educated can be explained, in part, to the country's relatively strong commitment to funding all levels of education. Practically all pupils attend schools that are publicly funded schools. For the higher education sector 64.2 per cent of the funding comes directly from the state, while in total 87 per cent of the finance for the activities of the higher education institutions comes from public funds (Högskoleverket 2005).

1.2 Educational infrastructure

Public education in Sweden is generally sub-divided into 7 sectors:

- Pre-school (ages 1 to 5)
- Pre-school class (age 6)
- Primary and lower-secondary education (ages 7 to 16) (*grundskola*)
- Upper-secondary education (ages 16 to 18-19) (*gymnasieskola*)
- Special education
- Further education
- Higher education (*högskola*)

Sweden's education system has historically been dominated by public providers. Private schools at the compulsory and post-compulsory levels are rare and there are only 3 private higher education institutions. Education is offered on the principle of equal access for all and is free at compulsory, upper secondary and higher education levels.

1.2.1 Pre-school and pre-school class

Pre-school education is conducted in family day-care centers and pre-schools. Pre-schools are open to children from one to five years of age. Municipalities have an obligation to provide pre schooling for children whose parents work or study. Children whose parents are unemployed or on parental leave are entitled to at least 15 hours of pre-school per week.
Almost all children attend pre school class at the age of six, to prepare them for compulsory education. This is usually three hours a day and is free of charge (Eurydice 2006; Swedish Institute 2007).

1.2.2 Primary and lower-secondary education

Children are obliged to enroll for nine years of compulsory schooling (*grundskolan*), generally between the ages of 7 and 16, which is divided between primary and lower secondary school. In practice, most children receive ten years of compulsory education, because they attend the pre-school class at the age of six.

Reform of the Curriculum (1993)
Grades are awarded in the 8th year and the fall term of the 9th year in one of three categories: pass (*godkänd*, or G), merit (*väl godkänd*, or VG), and distinction (*mycket väl godkänd*, or MVG). A compulsory school-leaving certificate (*Avgångsbetyg*) qualifies pupils to apply for upper-secondary school, irrespective of the optional subjects taken in the final year of compulsory school. At the same time though, students are also required to have passing grades in three particular subjects: Swedish, English and mathematics. (Swedish Institute 2007)

1.2.3 Upper-secondary education[1]

Over 98% of compulsory school leavers apply for upper-secondary school (*gymnasieskolan*), and nearly all are accepted. Most upper-secondary schools are run by the local municipalities though certain areas of study, including agriculture, forestry, horticulture and certain caring occupations, are run by county councils. Like compulsory education, all publicly-funded upper secondary schooling is provided free of charge. Private upper-secondary providers approved by the National Agency for Education are also entitled to public funding though usually at a lower funding levels than publics.

Students can enroll in one of 17 national programs, 14 of which are vocationally oriented and require 15% of the time to be spent in a workplace environment while the remainder prepare students for university study. In some instances, municipalities have the authority to further tailor these programs to meet local needs and conditions. The remaining three programmes prepare for university entry. All programs are three years in length. Students do have the option of following what are called "specially designed programs" if their interests fall outside what is offered in the national programs and may also pursue "individual programs." The latter, however, tend to be in place to rectify deficiencies from compulsory school so the student may eventually enroll in a national program. A school-leaving certificate (*Avgångsbetyg*, formally called ***studentexamen***) is awarded upon completion of a program.

Reform of upper-secondary education (1993)

In addition to enhancing flexibility, the new 3-year structure was adopted so that, in principle, all programs would now qualify students for access to higher education.[2]

The education reforms of 1993-95 also gave municipalities greater flexibility to determine the organization of upper-secondary education. While national goals for each program are defined by the National Agency for Education (*Skolverket*), municipalities have the authority to determine the ***structure*** of the programs.[3] In addition, municipalities now receive one lump sum grant from the government to cover funding for pre-schools, compulsory and upper secondary schools rather than earmarked funds for each sector. Finally, municipalities or regions are now also free to establish their own upper-secondary programs to meet local needs (Zanotti 1995).

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[1] Source: Swedish Institute (2000). Fact sheet on Sweden: Upper-secondary and adult education in Sweden.

[2] The notion of "in principle" stems from the fact that after 1993, all university-level programmes were also granted the freedom to determine their own entrance requirements.

[3] For example, the National Agency for Education determines the minimum number of course hours to be taken in the three-year programmes, but the municipalities decide exactly how these hours will be used (for example teaching may be done in concentrated blocks).

1.2.4 Further Education

Like compulsory and upper-secondary education, the responsibility for providing further or adult education rests with the local municipalities. The public sector includes municipal adult education, Swedish for immigrants, Advanced vocational education and training and adult education for the intellectually disabled. Alongside this sector exist Liberal adult education (folkbildnung) which is mainly provided within "study circles" (*studiecirklar*) and "folk high schools." Finally, individuals can also take courses through the "national schools for adults" (i.e. distance education).

In 1982 an official *Komvux* curriculum was issued by the Ministry of Education. Adult education courses would be regarded as equivalent to that in upper-secondary schools and would be divided into forms 7 to 9 and 10 to 12. By 1992 every municipality was legally bound to provide basic adult education (1st to 9th forms) for all residents who would desire it. The Purpose of basic adult education is to help adults acquire the knowledge and skills they need to take part in society and working life. It also aims to prepare adults for further study. Municipalities are required to offer basic adult education to all adults who lack skills normally acquired in the compulsory school system.

History of further education development and reforms

From 1996 to 2001 a pilot project on advanced vocational education (*Kvalificerad Yrkesutbildning* – KY or AVE in English) was carried out. Categorized as "post secondary" education, the courses were organized through close cooperation with upper-secondary, higher education, adult education, and private companies. The purpose was to provide a vocational track where one-third of the time would be spent in the work place "in the advanced application of theoretical knowledge" (http://www.ky.se/engelskainfo.html). The success of the pilot program pushed legislators, from 2002 onwards, to include KY in the regular education system in Sweden and regulate it through a newly developed Swedish Agency for Advanced Vocational Education.

Municipal adult education (*komvux*) now comes under the Education Act and the Municipal Adult Education Ordinance, the latter came into force in January 2003. Municipal Adult Education (MAE) and upper secondary schools share the same curriculum. The goals of the national syllabuses are also the same, although they may differ in terms of content. In addition, it is possible within MAE to establish locally initiated course based on local or regional needs and individual courses are also possible. The content of the MAE is to be based on the needs and abilities of the individual. Support for adult learning may take the form of teaching, supervision, study guidance, or assessments of goal attainment or knowledge. (Ministry of Education and Research 2007).

2. HIGHER EDUCATION

2.1 Introduction

Higher education is provided in five institution types: universities (*universitet*), university colleges (*högskola met vetenskapomrade*), other colleges (*overiga hogskolor*), art colleges (*konstnarliga hogskolor*) and other higher education institutions. There are 14 state universities and two private universities in Sweden. University colleges are marked by a wide variation in size and programmatic offerings, some conduct research and provide advanced training whereas others are limited to only a few, professional programs like teaching, education, and business administration. Oftentimes a university college's specializations are strongly linked to the local industry. There are five university colleges (one of which is private), 11 other colleges, 9 art colleges (including two private ones) and 20 'other' higher education institutions. The latter are mainly single subject institutions (mainly psychotherapy) and their size, in terms of enrolment is limited.

Participation in higher education has increased dramatically over the course of the past 60 years. In the 1940s approximately 2% of the Swedish population had some form of higher education. By 2000 that figure had risen to nearly 29%. In the 2005-2006 academic year over 98 700 persons without previous higher education studies applied for programmes at universities and institutions of higher education and the overall undergraduate population reached 389 100 students. (Statistics Sweden 2006; Statistics Sweden 2006)

To meet growing enrollments the existing infrastructure continues to expand as well. For example, the government permits university colleges to apply for full university status and also has granted some "special status" to grant post-graduate degrees in select fields.[4] As of now, four university colleges were infused with additional funding and upgraded to university status in order to stimulate scientific achievement outside the traditional university sector.

Today, Sweden is continuing on the path of what can be called "aggressive expansion" as demand for many programmatic offerings is perennially greater then what is currently being supplied. Economically, it sees further development of the higher education sector as the key catalyst driving regional economic development in the years to come. In principle, the *riksdag* (parliament) strongly believes greater access to higher education is necessary for fostering ethnic and cultural diversity as well as gender equity.

[4] The University College of Kalmar, for example, has the right to grant post-graduate degrees in the area of natural sciences while the University College of Karlskrona/Ronneby offers post-graduate degrees in the area of technology.

2.2 History of Policy Reforms

Prior to the reforms of 1977, Swedish higher education was divided into four sectors: universities, university colleges (UC), institutes, and vocational schools (including the colleges of health). The universities were characterized by their diverse range of academic programs, permanent research budgets, and postgraduate research training. A similar structure could be found in the UCs as they were often founded as university satellites in smaller cities. Like their parent institutions, they too offered a broad range of academic programs, though they were not authorized to grant post-graduate degrees nor did they receive permanent funding for research.[5] The institutes, on the other hand, were almost polar opposites to the UCs in that they performed considerable amounts of research (especially at the Royal Institute of Technology or the Karolinska Institute of Medicine) but only offered limited academic study programs. Vocational schools offered narrow, specialized curricula and did not perform academic research.

Sweden's higher education system underwent considerable reform with the passage of the Higher Education Act of 1977. The most visible change involved assimilating the four distinct sectors into a unified single system, the *högskola*.[6] As a result, all higher education institutions were now to be administered centrally by the Ministry of Education and Science (*Utbildningsdepartementet*).[7] In addition, all aspects of curriculum planning would now be overseen by one central body, the National Swedish Board of Universities and Colleges (*Universitets – och högskoleämbetet – UHÄ*). Through these reforms the government hoped to create more equality between different kinds of education and to initiate an era of greater co-operation between the old sectors. In addition, it anticipated that a unified system would give students from a diversity of social backgrounds equal access to higher education, and thus, another significant change in 1977 was to also incorporate a strong vocational slant into most undergraduate programs in order to provide students with the practical skills necessary for entry into the workforce.

Pragmatic changes were also introduced during this time. New university colleges not offering research and postgraduate education were established. Moreover, students and non-academic staff would now also be included in decision-making bodies at every level, often at the expense

[5] University colleges did attract sporadic research funding linked to local industry.

[6] The term "university" however, continued to be used after the reforms: the institutes were subsequently referred to as *universitet* and *högskolan*

[7] In several instances, institutions did remain outside the Ministry of Education and Science's control. A quarter of the small institutes, many related to the health sciences, continued to remain under regional or local control. Similarly, the institutes for forestry, veterinary medicine, and agriculture remained under the Ministry of Agriculture (*Jordbruksdepartementet*) and consolidated into the Swedish University of Agricultural Sciences.

of academic staff. Detailed admissions requirements and *numerus clausus* for undergraduate education were both adopted. Finally, regional boards with a majority of lay representatives were established to strengthen ties between higher education and local regions.

The establishment of a non-social democratic coalition government in 1991 brought about the January 1992 *Memorandum on independence of universities and university colleges.* This document would lay the groundwork for a new round of sweeping higher education reforms in 1993.

When the Higher Education Act of 1993 was enacted on July 1st that year it represented a broad-based effort to create a system of autonomous higher education institutions each having considerable oversight over their own resources, organizational design, and management. At the outset, it abolished the UHÄ and established the National Agency for Higher Education (*Verket för högskoleservice*), the Office of the University Chancellor (*Kanslersämbetet*), and a Board of Appeal for Higher Education (*Överklagandenämnden för högskolan*). In doing so, universities gained new freedom to design their own programs while at the same time allowing students greater program choice.

Evidence for greater operating autonomy could also be seen in the financing of institutions. A new formula-based funding process was implemented that took into account the enrollment levels as well as various achievement indicators, rather than on the basis of demand forecasts (see section 4.2 of this report). Finally, the reforms decentralized the admissions process by giving individual institutions the right to establish their own admissions criteria.

January 2002 saw the introduction of a new master's degree structure designed to give universities and university colleges greater flexibility to provide continuation courses. The new master's courses are open to people having degrees comprising at least 120 credits (three years). In a move designed to foster greater international mobility, the Swedish Institute[8] has been directed to establish a consultative body that will co-ordinate information and market Sweden to other countries as a destination for higher education study. A program will be established targeting developing countries and a Diploma Supplement will be introduced in 2003. The hallmark of the program is that students from outside the EU will not be charged tuition fees.

The Bill (2004/05:162) New World – New University created a number of important reforms that will be implemented for the 2007/2008 academic year. In order to retain their value on the international market and to be more in line with the Bologna Mandate, the structure of education programmes and degrees will change from a two-cycle to a three-cycle system. In addition, a new credit system, "*högskolepoäng*" (higher education credits), will be

[8] The Swedish Institute is a public agency tasked with disseminating knowledge about the country to external (i.e. international) constituents.

implemented starting from the 2007 academic year. This new system is compatible with the European Credit Transfer System.

2.3 Structure

In 1993 the system of national study programs was abolished, and replaced by a new degree system. Institutions and not government would now determine the organization and range of their program offerings. The duration and extent of programs and courses would be measured in "points" such that one week's full-time study equated to one point and one academic year of full-time study to 40 points (Öhrström 1994).

Today undergraduate students can pursue either a general or a professional first degree:

General degrees:

Diploma (*högskoleexamen*): is awarded after completion of at least 80 points (two years). Diplomas are offered by all universities, university colleges and colleges of Health Sciences. Each institution determines the contents of a program leading to a Diploma.

1. Bachelor's degree (*kandidatexamen*): is awarded after completion of at least 120 points (three years) of which 60 points must be in a major subject and 10 points in a thesis. This degree is offered by all universities and university colleges, except for the colleges of arts.
2. Master's degree (*magisterexamen*): is awarded after completion of at least 160 points (four years), including 80 points in a major subject and either 20 points in one thesis, or two theses consisting of 10 points each. This degree is offered by universities and some university colleges. In Sweden it is regarded as an undergraduate degree and should not be confused with the licentiate degree (see postdoctoral education section). Students also have the option of taking a professional master's degree (*Magisterexamen med ämnesbredd*). It is awarded to students already having a bachelor's degree and who have taken 40 additional study points within a particular area decided by the institution.

Under the new Swedish system, one academic year of full-time studies is equivalent to 60 higher education credits. Forty old Swedish credit points equal 60 new higher education credits (and 60 ECTS).

Professional degrees

Professional degrees (*yrkesexamen*) are awarded upon completion of programs of varying length (two to five and a half years) that lead to work in specific professions including, but not limited to: medicine, dentistry, teacher training, and various engineering programs.

Table 1: Type of degrees offered and program lengths

Type of undergraduate degree	Program length	Program length (in higher education credits
Diploma	2 years (80 points)	2 years (120 points)
Bachelor's	3 years (120 points)	3 years (180 points)
Master's	4 years (160 points)	4 years (240 points)
Professional degrees	1-5.5 years (40-220 points)	1-5.5 years (90-300 points)

2.4 Access

In 1993 the government decentralized admissions decisions. For the first time, individual institutions were free to determine their own selection criteria, or to coordinate their efforts with other institutions through a central agency. At the same time, they were also granted the authority to determine the number of students they would enroll as well. While indirectly limited by the use of formula-based, enrollment-driven forecasts, institutions were still free to accept more students than the number financed provided they could guarantee quality.

The 1990s witnessed growing numbers of applicants to higher education programs and a less than commensurate growth in the physical capacity to accommodate them. The effects of such changes would prove to be significant. In the early 1990s approximately half of all applicants were offered places in higher education programs. However, by 1998 that ratio dropped considerably, to slightly more than 40%. In 2006, the percentage of accepted applicants was back up to 55%.

In 2001 Parliament passed an "open higher education" bill that addresses a broad array of policy issues including: access, lifelong learning, vocation-oriented programs and degrees, ICT in higher education and steering and governance. (Ministry of Education and Science 2001) The primary thrust of the bill is to broaden recruitment and open new paths to higher education. Targets have been established to have 50% of each age cohort embarking in university-level studies by the age of 25. To broaden recruitment, the Higher Education Act was amended to establish a recruitment commission whose primary task would be to stimulate recruitment activities at universities and university colleges. Institutions will now be requested to draw up local action plans for broadening recruitment and develop preparatory courses for incoming students not meeting admissions criteria for specific university programs. A final provision in the bill provides institutions the flexibility to develop and implement new admissions processes (for up to 10% of new entrants).

One of the more salient concerns associated with these figures is the age distribution of new entrants. In the last several years, the government has been actively trying to increase the number of new entrants to higher education coming directly from secondary schools. Currently, around 30% of upper-secondary graduates are entering higher education before the

age of 25. Competition for study places has increased such that the growing numbers of "mature" students enrolled in the system has come at the expense of younger applicants. As such, the government has set a target of increasing the number of upper-secondary graduates enrolling before 25 to 50%.

General requirements

Today, admission to any undergraduate higher education program or single-subject course requires matriculating students to have either: 1) completed one of several forms of secondary school,[9] or 2) reached the age of 25 and have at least 4 years of work experience on at least a half time basis (the 25/4 rule). In addition, all students are required to have achieved proficiency in both Swedish and English at the level of the second-year upper secondary school student.

For admission to many programmes further admission requirements are specified, the specific admission requirements. Generally these specific requirements refer to the knowledge attained in one or several courses in the upper-secondary school or to corresponding proficiency. The specific admission requirements are organised in a system referred to as "standardised admission requirements". The Swedish National Agency for Higher Education lays down the standardised admission requirements for programmes that lead to the award of a professional qualification, with the exception of programmes in the fine arts. The higher education institutions determine the standardised admission requirements for courses and programmes in which no professional qualifications are awarded.

Specific requirements[10]

In nearly all cases students must also meet specific requirements for admission. Generally these specific requirements refer to the knowledge attained in one or several courses in the upper-secondary school or to corresponding proficiency. The specific admission requirements are organised in a system referred to as "standardised admission requirements". For professional degrees there are standardized requirements in place, determined by the National Agency for Higher Education. The higher education institutions determine the standardised admission requirements for courses and programmes in which no professional qualifications are awarded. As individual universities and university colleges each employ their own unique admission criteria, no set requirements can be identified. Criteria may include students' grades from upper-secondary schools, prior coursework completed, writing samples, interviews and specially-designed admissions tests. A standard aptitude test (see next section) is also frequently used for Swedish students.

For single-subject courses, students apply directly to the institution they would like to attend. For most undergraduate programs, applications go through the National Admissions Office for

[9] Includes upper, adult, and foreign secondary school or folk high school.

[10] Source: www.hsv.se accessed 13-05-2007

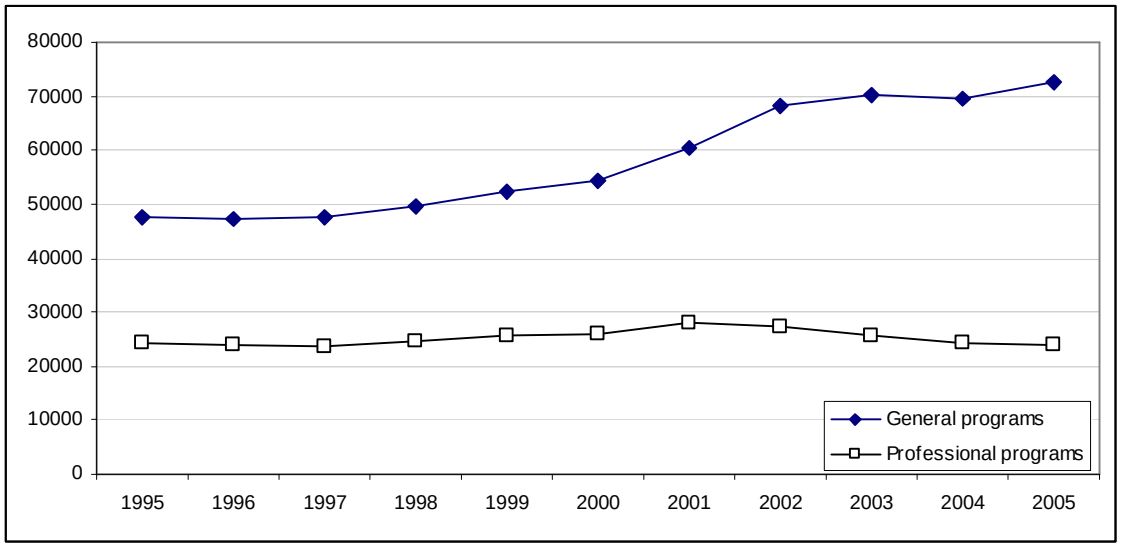
Higher Education (*Verket för högskolservice*).

The Swedish Scholastic Aptitude Test[11]

In addition to upper-secondary final examination marks (or the equivalent), another form of qualification for higher education exists in the form of a Swedish Scholastic Aptitude Test (*Högskoleprov*) which was modeled on the more widely known Scholastic Aptitude Test (SAT) used in the US. First administered in 1977, this non-mandatory examination was originally developed in order to assess applicants who had not received an upper-secondary degree yet qualified for admission under the "25/4" rule. Since 1991-92 however, it has become widely used, in conjunction with students' upper-secondary school grade point averages, to determine eligibility for higher education.

The test also plays an important role in the national regulations governing admissions when the number of qualified applicants exceed the number of available places. In such instances, regulations state that one-third of applicants must be admitted on the basis of their school grades and another third according to the results of their Scholastic Aptitude Test scores . Its incorporation into national regulations was primarily driven by the governments desire, discussed earlier, to increase the proportion of upper-secondary graduates matriculating in higher education.

Figure 2-1: Number of new entrants in undergraduate programs



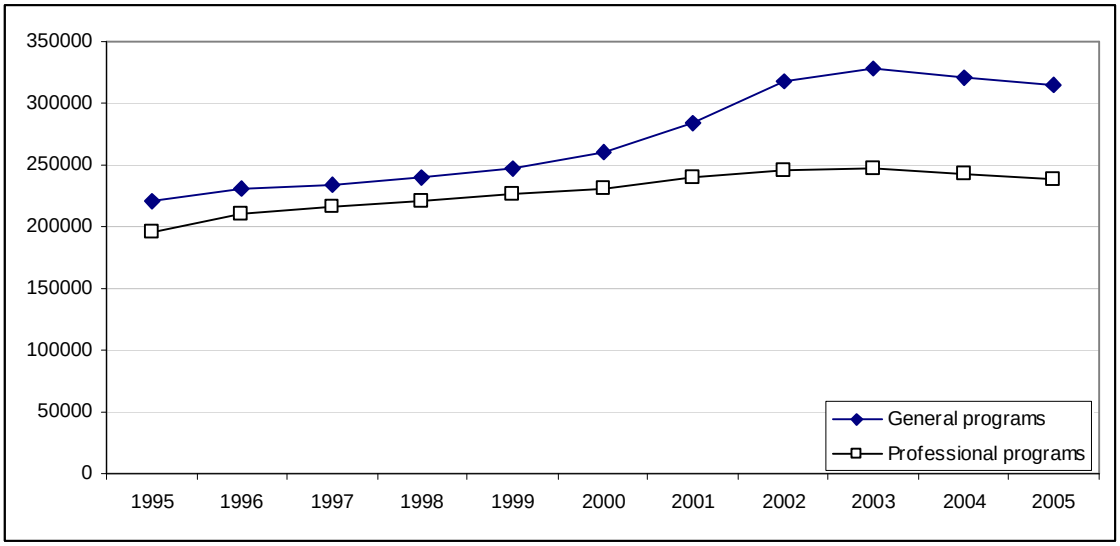
Source: IHEM 2007

[11] Source: www.hsv.se accessed 13-05-2007

2.5 Participation

Figure 2-2 shows that enrolment in undergraduate programmes has grown continuously till 2004. That year, enrollments leveled off and started to decrease. General programme enrolments in natural sciences, technical sciences and health are the least affected by the decrease, whereas humanities and economics (the largest disciplines) show a sharp decline. Professional programmes in health and social sciences/services show a steady increase, whereas natural sciences and technical sciences are here the big losers (see also table 8-2).

Figure 2-2: Enrollments in undergraduate programs



Source IHEM 2007

Adult participation in higher education

Special admissions regulations for people 25 and older with work experience were first introduced in 1970. They were designed to increase educational opportunities for the generations of students that had not been able to profit from the expansion of the upper secondary school system. By establishing the "25/4" rule and fixing a percentage of study places to adult applications, legislators were able to maintain inclusiveness in higher education even in the face of significant structural changes to the overall system.

The result was a remarkable increase in the higher education population of adult students with varying degrees of life and vocational experience. However, the aggregate number of students in the overall higher education system did not rise. The impending result was that admission to higher education became increasingly competitive for younger people. Concerns over the growing imbalance resulted in adjusting admissions requirements to also promote the growth

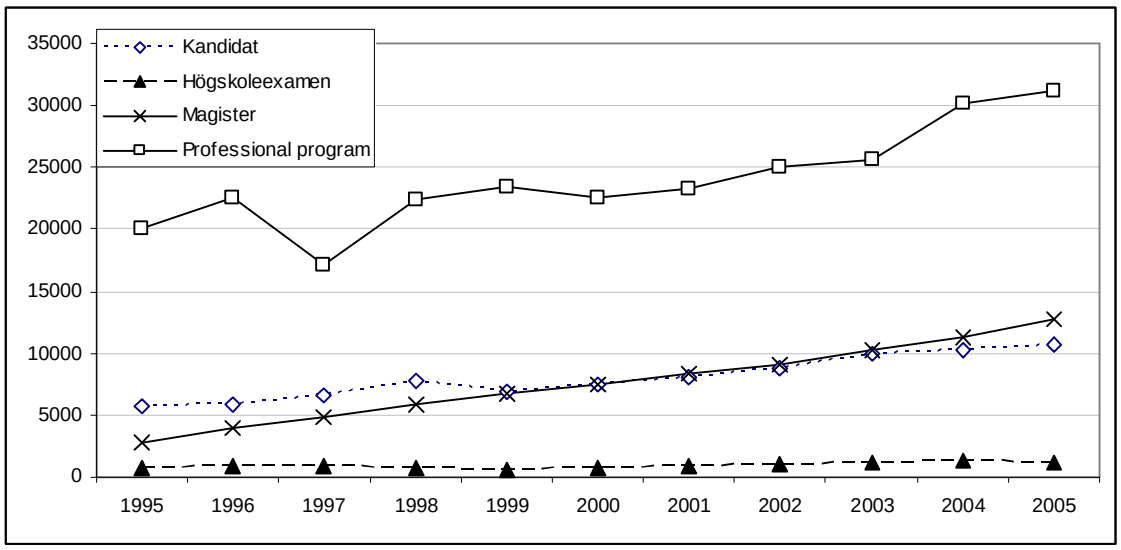
of new entrants directly from upper-secondary schools. Work experience as a criteria would receive less weight and now upper-secondary students would also be allowed to take the Swedish Scholastic Aptitude Test. As a result, the numbers of new entrants to higher education older than 25 continued to grow throughout the 1990s, though at a much slower rate and mainly through an increase in the number of females between the ages of 25 and 35 (Statistics Sweden 2001).

While the percentage of new entrants to higher education come increasingly from upper-secondary education, today Sweden still enrolls a relatively high proportion of adult students. In terms of new entrants one of every three new students in higher education is at least 25 years old and 18% at least 30 years old. This fluctuated during the 1995-2005 slightly (at the turn of the century the percentages were slightly higher: 35% and 22%). In terms of enrolment the percentages are much higher. In 2005 56% of all students was at least 25 years old and 34% at least 30. In 1995 these percentages were lower (50% and 29%) and have grown steadily since.

2.6 Outflow

The number of graduates from undergraduate programmes has grown steadily during the 1995-2005 decade. Growth was strongest in the *magister*-programmes, that surpassed the *kandidat* programmes as major general programme.
In the *Kandidat* programme the number of graduates in social sciences (the largest discipline), humanities and technical sciences was highest, whereas graduation in natural sciences did not grow.
Most graduates of the *magister* programme come from economics and social sciences. These two disciplines have grown strongest. Remarkable is that graduation in natural sciences has leveled off in 2004 and that graduation in social sciences has shot up after 2003. Social sciences are the strongest growing discipline in *Hogskoleexamen*. The main disciplines in professional programmes are social sciences, technical sciences and health. Graduation in social sciences decreased in the late 1990s but it went up strongly after the turn of the century. Graduation in technical sciences has remained more or less stable since 2000 (see also table 8-3).

Figure 2-3: Graduates in undergraduate programmes



Source: IHEM 2007

2.7 Post-graduate education

A variety of higher education institutions today have obtained the right to grant postgraduate degrees. First of all, all the universities are entitled to award post-graduate degrees. This is what sets the universities apart from the university colleges, who do not have this right in general. New regulations have been implemented recently to further increase the number of institutions offering postgraduate degrees. University colleges, for example, may now undergo assessment and evaluation in order to be upgraded to full university (i.e. permission to award graduate degrees) status. In addition, the government may grant certain university colleges the right to engage in particular "research areas." Under such circumstances, university colleges are also afforded the right to grant postgraduate degrees in the research area as well.

2.7.1 Degree structure

Students can elect to pursue one of two degree types:

1. Licentiate: approximately two years in length, obtaining the degree requires students to complete 80 study points, 30-40 of which are in coursework while the remainder is research culminating in a thesis. Degree holders may continue their studies through a doctoral program.
2. Doctorate: four years in principle, obtaining the degree requires the successful completion of 160 study points, of which approximately 40 to 80 consist of coursework while the remainder come in the form of research culminating in a dissertation.

While in principle a doctoral degree takes four years to complete, the average length of study tends to be between 6 and 7 years. Students in fields like science, medicine, and agriculture

tend to finish in approximately 6 years whereas in the humanities and social sciences the average completion time is around 10 years.

The licentiate and doctorate programs both consist of coursework and seminars. Students and their advisors decide upon a study plan and a topic for the thesis or dissertation during the first year of the program that must be approved by the student's home department. Normally the first half of both types of programs involve coursework followed by thesis and dissertation research. The licentiate degree was not awarded between 1971 and 1981 after reforms introduced in 1969 merged all postgraduate study in the hopes of creating an academic degree equivalent to an American PhD. After 1980, universities were again given permission to reintroduce the licentiate as a "step" degree, which could be awarded when half of the doctoral requirements had been completed.

2.7.2 Access

Admissions decisions, including the numbers enrolled and the degree of selectivity, are made at the department level. In general though, individuals wishing to enroll in postgraduate programs are required to hold an undergraduate degree of at least 120 undergraduate study points in the same subject area as their intended graduate study. Depending on the academic discipline and particular institutions, different faculty boards may impose additional requirements as well.

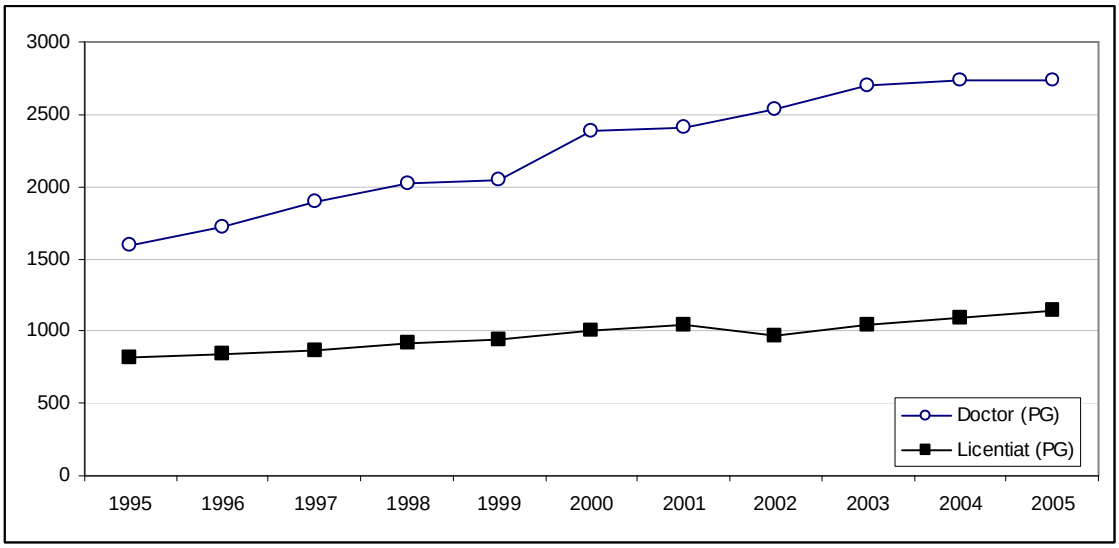
It is difficult to put exact figures on the number of postgraduate students enrolled at any one time as many students frequently stop out of their programs and then restart again at a later date. The most recent estimates suggest there are approximately 18,000 students: those reporting at least 10% of their time is devoted to postgraduate studies. In this regard, it is a simpler to instead consider two other indicators: 1) annual new enrollments and 2) degrees granted.

New enrollments in postgraduate programs continue to decline after a peak in 2002/2003. This figure, even during the peak in 2002/2003 is markedly lower than enrollments prior to 1998. That year the government imposed regulations requiring graduate students secure funding for their studies *prior to* enrolling. As a result, while the number of new entrants reached record levels in 1997-98 (almost 4,000), within one year that number was reduced by almost 25%.

For many years there has been a rise in the number of PhD's awarded. In just over a decade this number has doubled, but now the increase is beginning to level out. The reduction in the number of new enrolments to postgraduate programmes in recent years will result in a decline in the number of PhD's awarded over the next few years.

A total of 2,700 PhD's were awarded in 2005. In addition just over 1,100 licentiate degrees were awarded. This means that the output of individuals with research qualifications amounts to about 3,000 each year (as some of those awarded PhD's had already received licentiate degrees). The number of those awarded research qualifications corresponds to about three per cent of an age cohort, which places Sweden at the head internationally in terms of the volume of postgraduate programmes in relation to population size (Högskoleverket 2006).

Figure 2-4: Graduates in post-graduate education



Source: IHEM, 2007

While the gap between male and females in terms of new enrollments still persists, much of the overall enrollment growth during the 1990s can be attributed to increasing numbers of women entering postgraduate study. In 1990-91, two-thirds (66%) of new entrants were men. In 2001 that ratio was reduced considerably to just less than 55% and in 2005 the balance was even. And while participation rates based on gender vary across fields, only in engineering, where 71% of all graduates are male, is there a distinct imbalance. In every other instance, neither gender commands more than a 60% share of all enrollments. Even in medicine, where women outnumber men the most, they command less than 60% of all new medical enrollments (Högskoleverket 2006).

Efforts have also been undertaken to enhance access to postgraduate study by establishing a group of graduate schools. The purpose of these graduate schools is to encourage new recruitment, further the development of postgraduate education, promote interaction between different higher education institutions, and strengthen the higher education sector's capacity to produce research. Each school focuses on a particular field and responsibilities are divided between a host university and a number of partnering institutions. The Government has established 16 such graduate schools and there are also a number of other graduate schools that receive alternative funding. Graduate schools exist in a number of different subjects.

2.8 Personnel

Academic staff in Swedish higher education can be divided into the following categories:

- *Professor* (professor including visiting professor);
- *Lektor* (senior lecturer, including visiting senior lecturer);
- *Adjunkt* (lecturer, including visiting lecturer);
- *Forskarassistent* (research assistant/postdoctoral fellow);
- *Timlärare* (part-time teacher) and
- *Gästlärare* (guest teacher).

Furthermore, in 2001, the position of *Biträdande lektor* (associate senior lecturer) was introduced. A
final staff category is "other teaching and research staff" (including, for example, temporary research
posts), and technical and administrative staff whose duties mainly involve research. Frequently doctoral students also have some teaching duties. (Swedish National Agency for Higher Education 2006)

Titles of associate and assistant professor were introduced in 1993 as positions between full professors and lecturers. While professors have both teaching and research responsibilities, they frequently spend a considerable portion of their time engaged in research or in overseeing their postgraduate students. Senior lectures, on the other hand have a more balanced teaching/research portfolio and research assistants only engage in research. Only professors, senior lecturers, and research assistants are required to have doctorate degrees. The remaining positions are largely teaching-based and generally require no more than demonstrated competency in teaching and a bachelor's degree. All academic staff positions are appointed to either one-year or three-year contracts (with the exception of postdoctoral fellows). Postgraduate students are technically supposed to focus first on their studies, but may engage in various assistant positions. All assistant positions are limited to no more than 50% of a students work time (Ministry of Education and Science 1992).

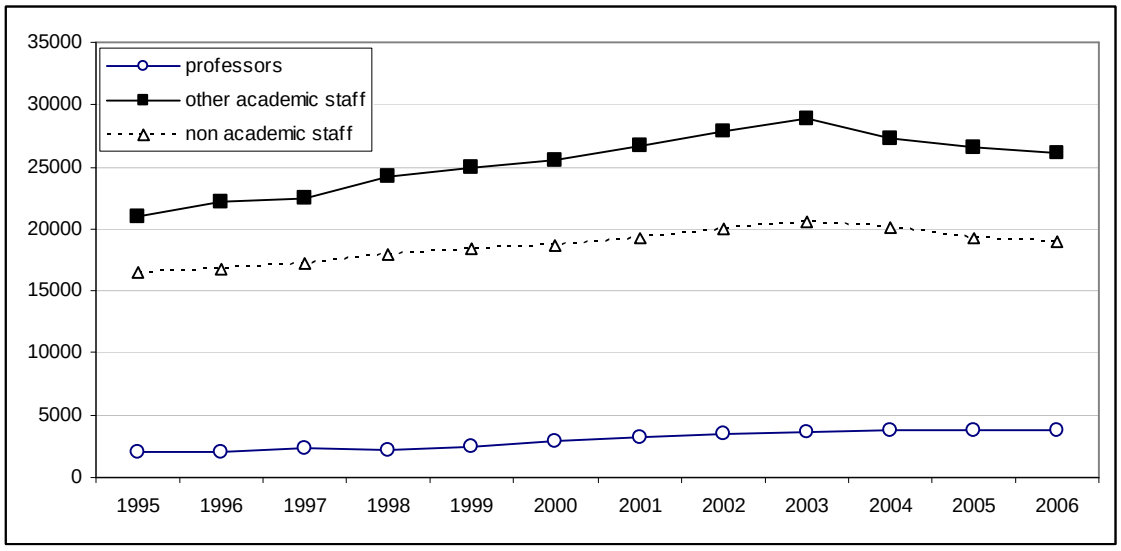
Institutions have also the authority to create new tenured and non-tenured professorships. As a result, many new professorships, permanent and short-term, have been created in areas like engineering, natural science, and medicine. Funding for these positions varies, with some money coming from institutional budgets and others through external sources.

New rules have come into effect concerning the employment, recruitment and promotion of teaching staff. In particular, gender preferences have been formalized into the Higher Education Ordinance in order to recruit more females into academic positions. In addition, new promotion rules are now in place that give greater weight to teaching skills in the promotion process. Moreover, other newly enacted rules mandate that certain academic staff, particularly senior lecturers, that satisfy the employment requirements of a professor should be appointed as professors (Ministry of Education and Science 1992). Furthermore an increasing emphasis has been placed on the teaching skills of HE teachers in hiring and promotion. In

2001 the Government decided that all junior and senior lecturers holding permanent positions must have basic pedagogical training. Such training also became mandatory for doctoral students (Swedish National Agency for Higher Education 2006).

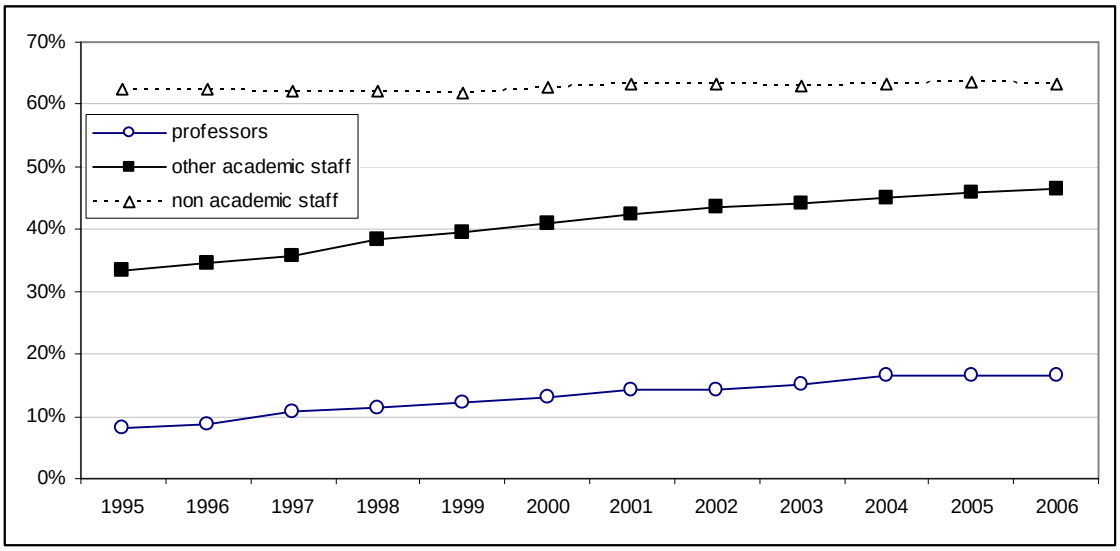
What is most evident in figure 2-5 is that the annual rise in total FTE is largely attributable to growth in academic, as opposed to non-academic, staff.
During 2005 and 2006 the reduction in the numbers employed in higher education that had begun during 2004 continued. The previous year's reduction in staff was the first since 1990 and compared to 2003 numbers have gone down by 4.5 per cent. During 2005 there have been reductions in most categories of staff, guest teachers and part time teachers had the greatest reductions. Professors are one exception, as this group has risen by 2 per cent calculated in terms of full-time posts and remained constant in 2006 (Högskoleverket 2006).

Figure 2-5: Staff in Swedish higher education; fte



Source: IHEM 2007

Figure 2-6: Female staff in Swedish higher education as a percentage of total staff



Source: IHEM 2007

What figure 2-5 does not show is that growth in student numbers has continuously outpaced growth in teachers, hence the student/teacher ratio continues to rise. Between 1994-95 and 2001, growth in FTE student numbers has been almost double that of teachers. This is important for two reasons. First, the proportion of teachers and researchers set to retire in the coming years is rapidly increasing. Second, the impending expansion of the younger age-cohorts, together with the policy goal that 50% of each cohort should begin higher education studies by the age of 25, will require an increase in the number of teachers. What concerns Swedish legislators and higher education policymakers is that the number of new enrollments in postgraduate education are not expected to experience such gains which may result in critical teaching shortages in the coming years (Högskoleverket 2002). This problem seems to be less stressing because according to analyses in 2003 there will be no risk of large across-the-board shortages of academic staff. (Swedish National Agency for Higher Education 2006).

There are still more male academic staff members than female ones. This is very much so for female professors: only one out of six professors is a woman. The situation did improve, although is the latest years the situation stabilizes. Among the other academic staff the situation is much more balanced and is still improving. Traditionally, female participation among non-academic staff is higher than the male one. This situation has not changed in the ten years period reviewed.

3. FINANCIAL ASPECTS

3.1 *Introduction*

The total revenues of the higher education institutions in Sweden amounted to SEK 44.8 billion in 2005. The vast majority of these revenues came from direct state allocations and other public funds. This is particularly noticeable in the case of undergraduate programmes, where direct state funding accounts for 87 per cent of the finance and another 8 per cent comes from other public funding sources. The costs of the operations of the higher education institutions in 2005 totalled SEK 44.6 billion, which is 1.67 per cent of Sweden's GDP. As the GDP is rising although there has been no growth in the higher education sector, the proportion accounted for by these costs has declined for the third year in succession and is now at the same level as in 2001. From a longer perspective, however, the share of the GDP devoted to the higher education sector has risen.

The total expenditure on the higher education sector also includes the costs for financial aid for the students and the operations of a number of central agencies. The cost of financial study assistance amounted in 2005 to SEK 11 billion and for the central agencies SEK 680 million. This means that total expenditure on the higher education sector amounted to SEK 56.3 billion (Högskoleverket 2006).

Under the current funding scheme, the government commands little in the way of direct oversight over individual institutions' internal allocation of government resources. Funding is largely distributed based on enrolment driven funding formulas and appropriations for basic research. Government control, or steering, then exists only to the extent that it sets particular research priorities and controls the aggregate amount of R&D funding to faculties. In short, institutional funding mechanisms have changed considerably since the 1970s. An increasingly decentralized structure has given local authorities much of the responsibility for allocating public funding and shifted the central government's role from planning to evaluation.

3.2 Institutional finance

Historically, higher education finance in Sweden was heavily centralized. Funding came down from the central government to institutions through line-item budget appropriations based on input-oriented goals and detailed planning efforts. Reform efforts in 1987 and 1988 largely decentralized much financial decision-making in the higher education sector. Since that time, institutions have been generally free to determine their own internal allocation systems.

Another important change was a shift from "supply-side" to "demand-driven" funding. Before 1993, across the system programs and numbers of students accepted were determined in advance (i.e. the use of *numerus clausus*), hence so was funding. With the reforms, minimum enrolment and degree guidelines were established as well as maximum funding allowances per full-time equivalent student. This would, in principle, now link funding to the successful

graduation of students and to the extent to which their programs could draw in enrolments (i.e. making courses popular for students).

Today higher education institutions receive funding (referred to as their "educational assignment") on a triennial basis. Allocated funding is a function of both input- and performance-based measures. Minimum numbers of degrees across disciplines are mandated and particular objectives, like increasing/decreasing the numbers of students in given fields, may also be specified. The incremental funding tariffs per full-time-equivalent (FTE) student and for performance measures are determined by the national government annually and specified in their yearly budget.

Funding for research and postgraduate study (as well as for capital maintenance) comes from special grants and is determined on an institution-by-institution basis. Rather than directly fund the particular faculties, government funding is instead allocated to each institution across four general areas of research: 1) humanities/social science, 2) medicine, 3) natural science, and 4) technology. In general institutions have considerable latitude to internally distribute these funds though some broad stipulations are attached, including a minimum percentage of the funding that must be used for postgraduate study.

Taken together, the funding in these three broad areas (undergraduate education, graduate education, and basic research) constitutes approximately 60% of each institution's total resources. The remaining resources come mostly for research through the various research councils, local authorities, and the private sector.

Clearly the brief outlined presented here does little justice to the complexity with which funding is in fact distributed. The next section considers in greater detail the actual mechanism employed to fund undergraduate higher education. More detailed discussion of funding for research and postgraduate training is addressed in the research infrastructure section of this report.

Funding for undergraduate education

The teaching grant is calculated on the basis of two factors. The first concerns the number of students registered, hence the overall award can vary considerably from institution to institution. The second is based on the number of study credits achieved by the students (and therefore corresponds to the number of active students at a particular institution). These two components are approximately weighted 40% and 60% respectively.

Differences between the cost of teaching different subjects are also taken into account in the funding formula. These can be seen in Table 12. The first column of figures shows the enrolment-based funding tariffs and the second, the performance tariffs. The former is calculated based on both overhead and direct teaching costs.

Table 12: Enrollment and performance tariffs for different academic fields (€) 2002

Academic field	Payment per FTE student	Payment for annual performance equivalent	Weight
Humanities etc.	17.217	16.958	1,0
Science, Technology	43.431	37.421	2,4
Pharmacy/Pharmacology	43.431	37.421	2,4
Odontology	48.241	41.783	2,6
Medicine	39.893	46.471	2,5
Nursing	53.908	65.572	3,5
Education	31.490	37.086	2,0
Other	36.441	29.602	1,9
Design	128.583	78.342	6,1
Art	182.547	78.372	7,6
Music	110.932	70.141	5,3
Opera	264.364	158.146	12,4
Theatre	255.635	127.329	11,2
Media	260.874	208.971	13,7
Dance	179.788	99.343	8,2
Physical education and sports	93.688	43.356	4,0

(Deen 2005)

3.3 Student support and tuition fees

3.3.1 Undergraduate student support[12]

The current "study allowance" scheme consists of a study grant and a student loan for both full-time and part-time students. While the total amount awarded does not consider parental or spousal income, it may be reduced based on a student's own income if they earn more than the franchise amount.

The franchise amount varies depending on how many weeks you receive student aid during the calendar half-year. The more weeks you receive student aid, the lower the franchise amount, and vice versa. You are permitted to have a higher income if you apply for fewer weeks with student aid.

The total amount students can receive, the sum of the grant and loan, is SEK 1,841 (€197[13])

[12] The information from this section comes from http://www.csn.se/

[13] Based on the exchange rate of 9.34 SEK for 1€ (http://www.x-rates.com/d/SEK/EUR/graph120.html

per week in 2006 for full-time studies. The student aid consists of a tax-free grant and a loan that is to be repaid with interest.

Two types of study grants are available to students: a base-level grant and a higher-level grant for special priority students. The base-level grant has been raised from 27.8% of the total allowance in the old system to 34.5%. The higher-level grant is primarily intended for students over the age of 25 that are studying at the compulsory or upper-secondary school level. Unlike the base-level grant, nearly 82% of the study allowance is higher-level grant monies. Moreover, under certain circumstances, students over 25 may be eligible to receive a supplementary study loan of SEK 398 (€42) per week for up to 120 weeks of full-time study. Additional loan funding may also be awarded for other incurred costs including study abroad or the need to purchase expensive study materials (e.g. musical instruments).

Under regular circumstances, repayment of study loans begins six months after study allowance payments cease. However because repayments are scheduled to begin at the beginning of each calendar year, students who receive their last study allowance in an autumn term may receive up to a one-year grace period. Repayments take the form of annuities and the maximum repayment period is either 25 years, or until one's 60th birthday, though small loan amounts may be repaid sooner. Each calendar year the government evaluates and may choose to reset loan interest rates.

The current loan system also permits income-contingent repayment schemes. It is possible to reduce the annual repayment to 5% of the debtor's annual income, though the rate increases to 7% for borrowers over 50 and the latter's rate is also based on capital gains or alternate forms of personal income. Finally, in the event that students stop out of a program and begin at a later date, the option is available for repayments to be deferred during the study period.

Students taking up loans under both the pre-2001 and current systems have the option of repaying the loans separately or transferring the old loans to the new annuity system and making a fixed repayment schedule for the total debt. If a reduction in repayments is granted, the percentage repayment amount will be applied proportionally to the debts in the old and the new system respectively (Högskoleverket 2000; CSN 2001).

Students studying abroad are also eligible for the same study allowance scheme as those students enrolled at institutions in Sweden. During the academic year of 2004/05, a total of almost 27,000 Swedish students were receiving study assistance for studies in undergraduate programmes in other countries. This was one per cent less than the previous year (Högskoleverket 2006).

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accessed on 06-06-07)

3.3.2 Postgraduate student support

Students enrolled in postgraduate courses are not eligible for the study allowance scheme described above. Instead, postgraduate student support comes in the form of special posts or fellowships, funded through research funds allocated to each faculty. The decision to allocate funding for postgraduate studies or for fellowships, usually as four year grants, is made by the individual faculty boards. As the former are relatively expensive, most faculty funding for postgraduate training is usually spent on fellowships, which may even be divided to fund two graduate students.

A student who succeeds in obtaining a post is not permitted to pursue external employment and must concentrate on their research and related work, though the latter may include teaching responsibilities. Fellowship recipients may supplement studies with work on externally funded research projects (usually sponsored by various research councils) or may take part-time positions as teaching or administrative assistants. This has become an increasingly used tool for financing postgraduate studies. Since 1998, students studying for a PhD are required to first obtain financial support either through a post or fellowship (Högskoleverket 1999).

3.3.3 Tuition fees

Sweden does not charge tuition fees for higher education programs.

4. RESEARCH INFRASTRUCTURE

4.1 Introduction

Research and development (R&D) is an important facet of the Swedish economy with nearly SEK 104 billion (€ 11.1 billion) in total expenditures during 2005. Sweden's GDP attributable to R&D has grown from approximately 3.17% in 1993 to 3.89% by 2005, although it is declining since 2001 when it topped at 4.2%. In Sweden, the business sector accounts for the largest share of R&D expenditure, with close to 74% of the total expenditure. Measured as a share of GDP, enterprises' R&D amounted to 2.9% in 2005 (Sweden 2007).

An overwhelming proportion of Swedish R&D is conducted in either industry or higher education with the latter performing most government sponsored research. As such, universities and university colleges play a pivotal role in the overall research infrastructure. It is no surprise then that the government and higher education institutions maintain a close relationship and, as this section shows, there has been no shortage throughout the 1990s of efforts to initiate and implement policies designed to strengthening higher education's role in the national research infrastructure.

4.2 Performers

A quick glance at R&D expenditures across OECD countries suggests that in many countries, private industry conducts the majority of research and development. In this regard Sweden is no different. In 2005 private industry accounted for just over 74% of all R&D expenditures. Looking over time one sees that industry's share of R&D in Sweden has in fact grown from about 70% in 1991. Of the other performers, 21% of R&D expenditures were in higher education ranking it a very distant, but nonetheless second. Beyond that 4.6% was expended by the government and 0.4% by the private non-profit sector. (Swedish National Agency for Higher Education 2006).

Within higher education, nearly all research is performed in universities though some is conducted in other higher education institutions as well. Where the two sectors primarily differ is that universities generally receive dedicated government funding for basic research activities while other institutions must often rely on funding for localized and often contract-based research activities. This has however slowly begun to change. Today significant capital and intellectual investments by university colleges coupled with government policies designed to expand postgraduate/research programs is fostering an increasingly diverse sector of higher education institutions performing research.

4.3 Sources and uses of funding

The main provider of R&D resources is private industry (68%) followed by state government (22%). Foreign sources of R&D amounted in 2005 up to nearly 8% of total R&D resources.

Funding for higher education research comes from a variety of sources. These can be seen in Figure 1, a pie chart showing the percentage shares of the SEK 23.9 billion (€ 2.55 billion) in financial resources for R&D given to higher education institutions. As the chart clearly shows, a significant majority of research funding (38%) is provided through grants from the national budget. This figure, however, has been on the decline. In the early 1980s, nearly 66% of all funding came from general and specific grants out of the national budget.(Högskoleverket 2002) The next largest providers of funding are the local and county councils (17%), whom generally provide funding for health- and medically-related research.

State research funds are allocated both by means of direct appropriations to higher education institutions and by means of appropriations to research councils and sectoral research agencies. Research resources thus consist of a fixed portion in the form of appropriations to each scientific field in the higher education system and a flexible portion in the form of funds sought by competing researchers from the research councils, sectoral agencies and research foundations (Swedish Institute 2004).

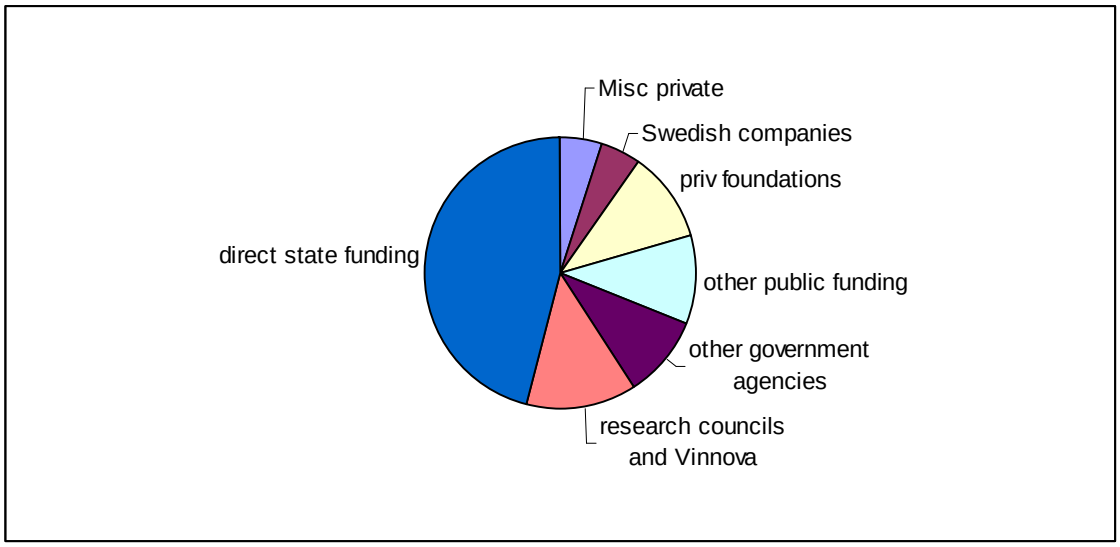
There are many research councils or foundations providing public research monies for many different kinds of research (combined 13%).[14] Primarily established by the government as intermediary funding organizations, their purpose is to channel funding into particular scientific areas. Of course, the levels of funding allocated to the different councils varies considerably. For example, the Swedish Research Council[15] and the Swedish Agency for Innovation Systems had at their disposal SEK 2.5 billion and SEK 1.1 billion respectively (€ 268 million and € 118 million respectively) while others, like the Swedish Foundation for Health Care Sciences and Allergy Research received only SEK 60 million (€ 6.4 million).

The boards of the various councils consist of representatives from the research community and government appointees, with the former being the majority on all councils. All funds are distributed on a competitive basis. Researchers may submit research proposals for funding and the councils may submit requests for proposals for particular areas of interest.

[14] More info can be found online at http://www.vr.se/download/18.aad30e310abcb9735780007237/Swedish+Research.pdf

[15] The Swedish Research Council (*Vetenskapsrådet*) was established in 2001 and consolidated the activities of several other councils including the: Swedish Council for Planning and Co-ordination of Research (FRN), Swedish Council for Research in the Humanities and Social Sciences (HSFR), Swedish Medical Research Council (MFR), Swedish Natural Science Research Council (NFR) and Swedish Research Council for Engineering Sciences (TFR).

Figure 4-1: R&D resources for higher education institutions, broken down by source, 2005



Source: (Högskoleverket 2006)

Besides channeling public funding for research through various councils and foundations, the government also provides direct funding to higher education institutions in the form of grants. These block grants are provided to higher education institutions to jointly fund research and postgraduate studies. Funding is divided into four broad thematic areas:
1) humanities and social sciences,
2) science,
3) medicine, and
4) natural sciences and engineering.
In addition each institution is generally required to spend some particular portion of the grant on postgraduate study. While these grants have historically gone only to institutions granting postgraduate degrees (i.e. universities), since 1997 all universities and university colleges receive some level of what is called “permanent research funding” either through basic grants, special grants, or in support of particular research activities. However, not every institution receives funding for each of the four areas. In many cases, particularly at the university colleges, an institution may only have one designated research area (e.g. physical sciences) eligible to receive this type of block funding.

Over half of the higher education institutions' R&D resources go to the subject areas of medicine and technology. These are followed in descending order of magnitude by the natural sciences with 19%, social sciences with 11%, and the humanities and religious studies with 7%. Other areas of research only account for one or two % of the R&D resources at the higher education institutions. (Statistics Sweden 2006)

4.4 Policy/developments

Sweden continues to improve its countries research and research infrastructure. Evidence of this can be found in the Swedish Research Council's Guide to Infrastructure, which is Sweden's first long-term plan for research infrastructure, with a perspective of 10–20 years. The report was published in 2006 and will be revised annually: the 2007 version, is to be used in the Research Council's documentation for the next Government Research Policy Bill. The plan covers everything from planning, development, and operation of research infrastructure to its phase-out and disposal. It gives an overview of the current infrastructure, involved identification of needs and opportunities for new or improved infrastructure of great potential for future groundbreaking research.

5. GOVERNANCE STRUCTURES

If one was required to attach a "theme" to the subsection on governance structures in Swedish higher education it would have to be decentralization. Throughout recent history, this issue has repeatedly been stressed through major reforms, particularly in 1977, 1984, and 1993. Examining the extent to which this is the case though requires more detailed examination of several levels, or layers, of higher education governance. As this section describes, efforts at decentralization have had a profound influence on the current structures of higher education governance, from the federal level all the way down to the individual institutions themselves.

5.1 Federal governance structure

Today, responsibility for the managing and administration of higher education at the national level falls to several government ministries and a host of national agencies. For obvious reasons, the Ministry of Education and Science has the greatest role, particularly in fiscal and financial matters. Ministry responsibilities are divided into six divisions, including one for higher education, one for research policy, and one for study support and admissions. These divisions, in turn, have at their disposal a collection of the 12 national agencies also sharing oversight responsibility for Swedish education. In general, four of these agencies focus specifically on higher education:

1. The National Agency for Higher Education
2. The National Admissions Office for Higher Education
3. The National Board of Student Aid
4. The Agency for Sweden's Internet University

The National Agency for Higher Education (*Högskoleverket*) has jurisdiction over all higher education institutions in terms of evaluation, accreditation, and issues related to quality and pedagogy. It also is responsible for evaluating aspects of foreign education and monitors the recognition of their education programs. The National Admissions Office operates as a service office designed to assist universities and university colleges with student admissions issues. The National Board of Student Aid is responsible for overseeing the allocation of student aid as well as its repayment. In addition it also serves in a quasi-research capacity by internally evaluating and studying different methods of financing study programs. Finally there is the Agency for Sweden's Internet University (SIU). In operation since March of 2002, SIU is a gateway coordinating the registered distance education courses and programs provided by various universities and university colleges. The Agency's responsibility is to promote the development of distance education courses through the Internet and provide information about its offerings.

5.2 Intermediary organizations

The original mission of the Council for the Renewal of Higher Education (CRHE)[16],

[16] Source: the Council for the Renewal of Higher Education website,

established in 1990, was to aid the development of undergraduate education as well as to stimulate experimentation in teaching. Originally called the Council for the Renewal of Undergraduate Education, in 1999 its mission was expanded to include post-graduate studies and subsequently gave rise to the CRHE title. More generally, the Council acts as an intermediary funding organization with broad authority to pursue the following objectives:[17]

http://hgur.hsv.se/general_info/ordinance.htm

[17] Further information about CRHE can be found at their website, http://hgur.hsv.se/

1. Award grants to development activities concerning quality and pedagogical innovation in undergraduate and post-graduate education.
2. Collect and disseminate information on planned, current and completed development activities of a fundamental and innovative nature concerning undergraduate education in Sweden and abroad.
3. Evaluate such development activities that the Council has funded.
4. Support the integration of environmental perspectives in Swedish undergraduate education.
5. Support changes in curricula and pedagogy in Engineering and Natural Science programs in order to recruit more female student to these programs.
6. Support the use of IT in teacher training.

5.3 Institutional governance

The passage of a second round of major higher education reforms in 1993 continued to drive Swedish higher education down the path of decentralization. For example, for the first time, institutions were given the authority to determine their own admissions criteria. In addition, vice chancellors and deans were granted more extended powers to the point that some researchers suggest individuals in these roles have become a mixture of business manager, fund-raiser, and politician (Streiffert 1992). Research and education may be jointly administered, and the links between undergraduate and postgraduate education have been strengthened. Only in the case of external representation on all boards below the governing board level did greater decentralization not occur. Academic staff now form the majority on all boards below the governing board level. Higher education institutions have the right to determine their own governance structures (at the institutional and departmental levels).

Nonetheless, while diversity in governance styles is possible, a typical pattern continues to persist. All state universities and university colleges have a board of governors whose members are usually government-appointed officials serving three year terms. The chairman is also appointed by the government, though (s)he must not be affiliated with the institution. A vice chancellor (or rector) who, prior to 1998, also served as chairman of the board of governors, serves as the link between board and institution. Like board members, the vice-chancellor is government-appointed, for up to a six year term, based on recommendations by the governing board. Below the vice-chancellor are various faculties, each headed by a dean and respective faculty board. In some instances the faculty board may only be responsible for overseeing research functions and postgraduate education while in other institutions they may be jointly responsible for undergraduate education as well. Since 1999, all university colleges engaged in any research areas must by law have at least one faculty board. The members of the faculty board (except for the student members) are appointed by members of the faculty. Below the faculty lie the traditional departments. These are headed by a prefect (an academic) who is also the chairman of a departmental board. Members of the departmental board tend to be drawn from departmental professors, students and support staff.

5.4 Recent developments

The Association of Swedish Higher Education, which represents Sweden's 42 institutions of higher education, published a manifesto in June 2006 asking the national government for greater autonomy. As mentioned above, decentralization is an important issue in Sweden. In latter years, as the demands on the HEI's have grown, central political authorities have increased reporting requirements and extended the legislation governing the institutions. The increasing reporting requirements have been criticised by HEI's. From their point of view, a transition to a greater degree of detailed control is undesirable. Also, many institutions would like to see a better match of goals and requirements to the individual institutions, rather than today's more general assignments.

6. QUALITY ASSURANCE[18]

6.1 History

In 1995 quality assessment functions were taken over by the National Agency for Higher Education (*Högskoleverket*). The Agency's primary task was to conduct quality audits (i.e. accredit) of all higher education institutions on a triennial basis. Each institution would be judged according to broad goals and guidelines established in the government's Degree Ordinance. During its first "quality program" (from 1995-98) all higher education institutions were audited: external teams of reviewers were assembled, visits conducted, reports prepared, and finally detailed discussions undertaken with the respective institutions. A second phase of the "quality program" began in 1998 under a modified set of rules. Rather than replicate the extensive auditing procedure in the first phase, the focus shifted to a follow-up approach. The reason for this was to not necessarily measure the absolute level of institutional quality but to instead determine the extent to which quality changes had occurred.

6.2 Current procedure and most recent quality audit findings

January 2001 saw the implementation of the most recent quality assessment framework, which notably includes several changes. Most significant is that the unit of analysis has shifted from the institutional level to that of the programs or subjects. In addition, evaluations will occur on a six year basis and include graduate as well as undergraduate programs. Student influence in the assessment process is also enhanced by being formally recognized in the Higher Education Act. In terms of the accreditation concerns lodged on behalf of the university colleges, the new system goes to a much greater extent in defining the link between notions of quality and the right to award academic degrees. In the event that revoking a degree is being considered, the institution can expect to be notified in advance and given a year to redress any perceived deficiencies. Only if those deficiencies remain after a year's time will degree rights be revoked. (Högskoleverket 2001)

By and large, most universities and university colleges assessed during the 2005 Quality Audits and Evaluations showed that out of the 214 appraisals carried out in 2005, only in 17 cases has the
evaluation led to questions about entitlement to award degrees. Furthermore, it was shown that the evaluations have had manifest impact by the first follow-up evaluations three years after the original evaluation.

The quality evaluation system was replaced in 2007 with a the new quality evaluation system, for several reasons. The evaluation undertaken by the National Agency revealed that the system worked well, but even so there are reasons for making changes. Experiences from Sweden as well as from other countries show that new rounds of quality evaluations that are conducted in the same way as previously do not lead to equally valuable outcomes as their

[18] This section is derived primarily from Högskoleverket (2001). From quality audit to quality assessment, The new evaluation approach for Swedish higher education. Stockholm, Högskoleverket.

predecessors. The additional information provided is often restricted and it can at times be difficult to summon up the same commitment for self-evaluations as during the first round.

Another reason for making changes was linked to a potential shift of emphasis where responsibility for quality assurance is concerned. As a result of the large number of national subject and programme evaluations that have been made, the higher education institutions are now much better equipped then they were to assume the responsibility for their own quality assurance and quality development. Increasing responsibility for the higher education institutions themselves also coincides with international developments.
Greater responsibility for the higher education institutions means that the National Agency's evaluations of the quality of subjects and programmes need not be as extensive. At the same time the state must be able to guarantee that reasonable minimum standards are being maintained in all higher education. This can be achieved by undertaking a smaller number of in-depth evaluations of subjects and programmes after an assessment of "the risk of failure to maintain good standards" based on key statistics, monitoring and simplified self-evaluations.
There is also a greater need for international participation in the evaluations. It is important to broaden perspectives and compare Swedish quality evaluations with those conducted in other countries. This means that certain evaluations should be carried out using English as the working language.
There are also grounds for focusing greater attention than before on activities that maintain very high standards. The National Agency therefore wants to test the possibility of providing greater stimulation of local quality procedures by distinguishing centres of educational excellence.
Yet another reason for introducing changes is the possibility of making the evaluations simpler, less time-consuming and more cost-effective – both for the higher education institutions and for the National Agency for Higher Education.

The points of departure of the new system were:
- Greater emphasis on the quality procedures of the higher education institutions themselves.
- External quality appraisal based on risk assessment.
- Greater degree of international participation in the evaluations.
- Distinction of centre of educational excellence.
- Reasonable work loads for the higher education institutions and the National Agency.
- Support for and acceptance of the entire system.

The new quality evaluation system comprises five elements:
- Audits of the institutions' own quality assurance and quality development systems:
  The National Agency will audit and asses how the quality procedures function at a higher education institution. It is especially important to ensure that these procedures are focused and that evaluations cover every level in the institution.
- A smaller number of subject and programme evaluations determined on the basis of data from monitoring:

One way of linking monitoring and evaluations is to use data from monitoring to determine what to evaluate but other criteria could be used as well.

- Thematic evaluations:
  In the new system greater weight will be given to thematic studies which aim to acquire in-depth knowledge about different circumstances and phenomena that are significant for the quality of higher education. Potential themes for evaluation are cooperation between the higher education institutions and the supportive measures offered by the institutions to their students.
- Appraisal of “particularly eminent educational settings” (centers of educational excellence):
  This new feature uses a special application and nomination procedure that designates a “particularly eminent educational setting.
- Appraisal of applications for entitlement to award degrees.
  Appraisals of these applications will continue. For these appraisals and the above it is currently being determined which aspects are to be appraised and on which criteria the appraisals will be based.

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8. APPENDICES

Table 8-1: Number of new entrants by type of programme and discipline

General programs	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Medicine	580	600	710	790	740	640	850	1090	1150	1170	1120
Social Sciences	20800	20000	20000	20800	23000	24400	27220	29410	29120	28420	28840
Natural Science	6400	6600	7180	7310	7370	6830	7290	7850	8210	8750	9720
Technical Science	2900	3100	3500	4050	3640	4150	4730	6730	7310	8170	9570
Humanities	14400	14400	13500	13800	14600	15500	17110	18590	19720	20100	20190
Arts	650	720	820	930	1060	1160	1480	1910	2000	1890	2190
Other	380	480	580	690	660	660	810	960	1040	970	850
Health	1500	1200	1310	1400	1220	1170	1070	1510	1580	0	0
total	47610	47100	47600	49770	52290	54510	60560	68050	70130	69470	72480

Professional programs	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Medicine	530	500	520	490	510	520	610	650	620	630	600
Social Sciences	8100	7700	7260	7460	8010	8710	10420	10570	9930	9390	9540
Agriculture	420	250	270	300	290	350	310	360	360	400	410
Natural Science	0	0	180	200	200	260	280	290	420	420	370
Technical Science	10100	10800	10800	11440	11400	10900	10460	9280	8480	7710	7740
Humanities	170	190	180	220	200	190	160	150	150	170	160
Arts	370	340	310	330	320	380	410	470	420	370	330
Health	4500	4300	4080	4130	4630	4720	5450	5730	5231	5110	4840
Total	24190	24080	23600	24570	25560	26030	28100	27500	25611	24200	23990

Source: CHEPS International Higher Education Monitor, 2007

Table 8-2: Enrolment in undergraduate programmes by discipline

General program	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Economics	45843	45843	45208	46145	49449	51005	54890	58622	59639	57403	55553
Medicine	3266	3313	4979	5665	5223	5417	5683	6651	7149	7098	7145
Social Sciences	31923	34877	36100	38261	41348	45369	48587	54589	54400	53636	53572
Agriculture	172	344	677	868	917	1048	1194	1174	1282	1134	653
Nat. Science	27010	29874	31747	33040	33203	32929	35449	37901	38312	38116	38650
Law	18019	18204	17405	16744	17695	18872	22010	24261	25334	24068	23298
Techn. Science	12057	14044	15175	16161	17125	19539	22207	29291	31912	33413	33330
Humanities	63175	65296	61065	59898	61023	64065	71597	78947	83104	80083	76582
Arts	3087	3230	3780	4159	4771	5309	7286	8990	9083	8915	9527
Other	2664	3047	3120	3738	3429	3801	4020	4988	5669	5047	4515
Health	12690	12522	14700	14629	13401	12449	10777	11509	11584	12115	12054
total	219906	230594	233956	239308	247584	259803	283700	316923	327468	321028	314879

Professional program	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Economics	6733	7949	8289	9063	9046	9347	9784	10104	7862	7301	6962
Medicine	9203	9960	10126	10810	12379	12743	16255	19979	22442	23462	23982
Social Sciences	39919	42391	41836	41967	43410	46032	52262	54649	56952	57779	59052
Agriculture	444	574	570	698	780	696	656	743	824	1035	392
Natural Science	41171	44768	46617	47475	48280	48252	46824	45677	45601	42354	40748
Law	8331	8974	9201	9070	9195	9193	9908	10234	10447	10690	10512
Technical Science	38361	42513	45052	47805	48570	48627	48077	45839	44248	42766	40910
Humanities	22114	22387	23285	24438	24407	23802	23313	24409	23846	21698	19890
Arts	6907	7042	6804	6619	6649	7031	7359	7147	6607	6521	6763
Other	5292	5947	5668	4818	5145	5134	3601	2355	1830	1730	1368
Health	17055	17970	18257	17918	18818	19406	22078	24703	26475	27183	27038
total	195530	210475	215705	220681	226679	230263	240117	245839	247134	242519	237617

Source: CHEPS International Higher Education Monitor, 2007

Table 8-3: Graduates by type of programme and discipline; undergraduate level

Kandidat	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Economics	2113	2005	2035	1855	1903	1953	2110	2368	2694	2870	2843
Medicine	48	52	99	1308	51	60	78	74	64	102	153
Social Sciences	1360	1394	1817	1849	2163	2425	2592	2937	3302	3371	3742
Agriculture	0	0	0	0	4	0	9	1	8	6	3
Natural Science	386	370	317	396	386	404	385	476	445	403	503
Law	38	48	54	69	66	59	75	95	115	119	148
Technical Science	650	773	860	949	901	1051	1285	1192	1438	1472	1297
Humanities	1141	1186	1305	1343	1369	1385	1424	1488	1660	1709	1775
Arts	22	29	29	23	75	89	113	133	178	225	246
Other	4	1	2	10	13	12	9	13	24	33	25
	5762	5858	6518	7802	6931	7438	8080	8777	9928	10310	10735

Högskoleexamen	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Economics	126	113	96	99	60	126	143	170	167	223	215
Medicine	1	1	13	5	5	1	1	2	1	2	12
Social Sciences	119	161	263	247	227	204	264	300	364	445	388
Agriculture	0	0	0	0	0	0	0	1	0	3	0
Natural Science	23	20	17	22	28	38	39	40	55	45	35
Law	9	7	15	16	13	19	24	28	23	27	46
Technical Science	118	114	107	115	77	125	121	140	155	177	211
Humanities	104	128	132	160	149	171	190	248	207	233	199
Arts	45	83	74	70	59	73	64	64	96	78	65
Other	20	9	2	16	0	1	3	2	5	4	3
Health	134	186	136	20	25	8	17	92	56	49	62
	699	822	855	770	643	766	866	1087	1129	1286	1236

Magister	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Economics	880	1350	1849	2052	2407	2527	2723	2916	3529	3725	3785
Medicine	27	25	34	57	102	97	166	171	199	232	364
Social Sciences	540	733	820	1079	1332	1530	1765	1812	1973	2341	3001
Agriculture	0	0	1	7	5	46	49	65	66	63	35
Natural Science	697	901	979	1201	1357	1503	1557	1727	1771	1698	1745
Law	24	47	95	132	125	178	163	180	202	256	222
Technical Science	26	84	95	176	238	315	473	675	922	1093	1465
Humanities	371	602	754	872	854	980	978	971	1082	1214	1444
Arts	34	48	54	61	72	65	160	173	145	175	200
Other	0	5	1	6	8	8	12	15	17	25	29
Health	123	169	204	197	245	225	366	349	415	457	515
	2722	3964	4886	5840	6745	7474	8412	9054	10321	11279	12805

Professional program	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Medicine	1035	1227	1101	1242	1089	1006	1014	1124	1131	1342	1412
Social Sciences	6695	8982	8604	8491	8341	7508	8326	9011	9190	11072	12642
Agriculture	359	395	320	240	455	330	233	348	334	365	385
Natural Science	332	300	334	208	199	306	200	396	312	359	482
Law	1795	946	964	944	1067	1243	935	974	952	949	0
Technical Science	5447	5535	5427	6101	6970	7005	7360	7538	7809	7531	7506
Humanities	148	198	159	164	192	155	139	135	127	141	144
Arts	299	391	290	345	291	232	208	230	268	268	345
Health	3987	4615	0	4662	4894	4707	4843	5231	5462	8164	8314
	20097	22589	17199	22397	23498	22492	23258	24987	25585	30191	31230

Source: CHEPS International Higher Education Monitor, 2007

Table 8-4: Graduates by type of programme and discipline; post graduate level

Doctor (PG)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Medicine	538	564	557	648	703	818	757	790	821	808	884
Social Sciences	165	198	308	260	242	323	314	343	384	361	320
Agriculture	39	51	54	60	60	54	68	47	48	60	63
Natural Science	359	392	420	403	406	468	472	511	533	551	519
Law	11	17	15	16	17	18	18	15	17	25	21
Technical Science	330	357	351	407	418	435	472	537	571	629	642
Humanities	136	125	167	185	172	227	264	251	281	256	239
Other	21	21	21	37	26	45	46	41	46	51	49
	1599	1725	1893	2016	2044	2388	2411	2535	2701	2741	2737

Licentiat (PG)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Medicine	65	94	68	78	118	113	128	99	109	130	142
Social Sciences	135	104	116	123	95	89	89	78	90	104	118
Agriculture	16	16	12	19	12	10	26	5	11	11	5
Natural Science	174	185	190	203	207	220	247	244	240	221	218
Law	4	0	4	2	1	2	1	1	0	1	4
Technical Science	392	389	427	430	459	515	492	489	536	584	592
Humanities	31	52	39	52	47	51	51	43	49	38	40
Other	4	5	5	4	4	4	9	5	12	7	18
	821	845	861	911	943	1004	1043	964	1047	1096	1137

Source: CHEPS International Higher Education Monitor, 2007

Table 8-5: Staff in Swedish higher education

fte	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Academic	22991	24167	24724	26379	27445	28520	29986	31424	32582	31143	30356	29993
of which prof	*1990*	*2047*	*2285*	*2163*	*2442*	*2982*	*3268*	*3503*	*3659*	*3841*	*3842*	*3843*
Non academic	16477	16814	17249	17949	18306	18668	19247	20004	20520	20064	19291	18935
total	39468	40981	41972	44328	45751	47188	49233	51428	53103	52304	50635	50517

fte female staff	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Academic	7164	7832	8249	9499	10190	10853	11789	12632	13339	12904	12781	12795
of which prof	*160*	*175*	*246*	*244*	*301*	*390*	*462*	*503*	*551*	*631*	*632*	*633*
Non academic	10268	10486	10711	11132	11328	11707	12161	12680	12954	12683	12243	11991
total	17432	18318	18960	20631	21518	22560	23950	25312	26293	26100	25483	25566

Source: CHEPS International Higher Education Monitor, 2007