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Abstract

The European Research Training Network "Women in European Universities" investigates women's career opportunities in higher education. In seven European countries (Austria, France, Germany, Poland, Spain, Sweden and the United Kingdom) women's position and career perspectives within the systems of higher education are analysed. Main focus of the project is the "glass ceiling" that women encounter when they strive for top rank positions such as professorships.

This report is a result of the second working phase of the research Training Network in which a secondary statistical analysis of women's position in higher education was conducted. This Training-Paper is concerned with the case of Sweden. The aim of this paper is twofold: Firstly, it will give an overview of the development of women's participation in Swedish higher education. Secondly, it will trace statistical evidence for critical steps on the academic career ladder. This means showing in statistical terms where, on the academic career path, women are dropping out.

It is the contention of this paper that a useful investigation of women's situation in academia needs an analysis of both the leaky pipeline in higher education and the attractiveness that academia has to society and future cohorts. Additionally, a Three-Level-Model is proposed in order to make the Swedish data comparable with data from other systems of higher education.

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Introduction

Swedish higher education has undergone a range of reforms during the last thirty years and with each reform women's position and participation have changed – not only in statistical terms. The interest of upper secondary school-leavers in higher education, the unemployment rate just as the level of salaries inside and outside academia also have a great influence on the gender composition and women's status in higher education.

This paper is concerned with women's participation in Swedish higher education during the last thirty years. The impulse to this paper was given by two observations. The first is the fact that the participation rate for women in the studentship has been higher than 50 per cent already since 1977 while women are surprisingly underrepresented among academic staff, especially professors. It is the concern of this paper to investigate the leaky pipeline in Swedish academia.

The second observation is the fact that occupational areas with a higher feminisation rate usually have lower wages and lower prestige than occupations with a low rate of feminisation. Feminisation and prestige are obviously linked together. In an attempt to elaborate this rather complex relation a little closer the attractiveness of higher education is also discussed in this paper.

The paper will link together an elaboration of the leaky pipeline in Swedish higher education with the attractiveness of academia. It is my contention that this combination is necessary for a careful analysis of women's participation and position in higher education. In order to make the Swedish data comparable a Three-Level-Model is proposed in order to point out the – for women – critical steps on the academic career path.

The first chapter gives an overview of available data concerning higher education in Sweden. In the second chapter important changes on the academic career path together with definitions and concepts, which are used in this paper, are presented. Chapter three, finally, provides the data concerning women's participation and the attractiveness of higher education.

I. The Availability and Quality of Data

International sources in general use data from national sources in their publications and databases. The national data are aggregated in order to make them comparable. But at the same time the high level of aggregation may imply a loss of some sorts of information. National data are mostly not comparable on an international level; instead they are mostly aggregated on a lower level, which makes it easier to trace back the way of data modification. Table 1 shows the main sources, which provide data about higher education in Sweden. In the following, attention is paid to these sources and the data they provide.

Table 1: Data Sources about Higher Education in Sweden

International Sources	
OECD	-Education at a Glance -Education policy
EU	-Key Data on Education in Europe -Key Topics
Nordic Council of Ministers	-Nordisk utbildning i fokus - indikatorer
National Sources	
Statistics Sweden	-Universitet och högskolor. Grundutbildning: Nybörjare, registrerade och examina UF 20 -Universitet och högskolor. Forskarutbildning: Nyantagna, registrerade och examinerade. UF 21 -Universitet och högskolor. Personal vid universitet och högskolor. UF 23
National Agency for Higher Education	-Årsrapport för universitet och högskolor -NU-data base

Organisation for Economic Co-operation and Development - OECD

Within the Organisation for Economic Co-operation and Development the Centre for Educational Research and Innovation (CERI) was formed in 1968. This group initiated in the late 1980's the project Indicators of Education System (INES). This project consists of three networks and a technical group. Network A (Educational Outcomes) is concerned with the results that students reach. Network B (Student Destination) is led by Sweden and focuses on the relation between education and the labour market. Network C (School Features and Processes) works with indicators about decision making processes, teaching and so on.

The technical group, where Sweden is strongly involved, is concerned with the elaboration and improvement of the statistical work in the networks. Members of the National Agency for Higher Education and Statistics Sweden

are working in the technical group. (Ministry for Education and Science 2000: 1)

The main publications of INES are *Education at a Glance* (EAG) and *Education Policy Analysis* (EPA). The former is published since 1992. The latest edition from 2001 presents data from 1998 and focuses on about 30 indicators on education. The EPA is an additional report, which is concerned with certain topics that the OECD sees as relevant for the political debate in the member-states.

European Union – EU

The European network for information about education is called Eurydice. Sweden is a member of this network since 1994. (Ministry for Education and Science 2000: 1) Eurydice provides information on the education systems of the member states of the European Union in several publications and the database Eurybase.

The main publications are *Key Data on Education in Europe* and *Key Topics*. The former combines descriptions of the education systems with quantitative statistic. The data are produced by Eurydice and the statistical office of the European Union Eurostat. *Key Data on Education in Europe* published its fifth edition last year.

Earlier, the *Key Data* were published yearly and contained even a part with a main topic. Now the *Key Data* are published every second year. In the years in-between the *Key Topics* will be published as a developed part of the former "topic-parts" of the *Key Data*. The first two *Key Topics* were concerned with student aid (in autumn 1999) and patterns for financing schools (2001).

Nordic Council of Ministers

The first edition of *Nordisk utbildning i fokus – indikatorer* was published in 1999. The Nordic Council of Ministers decided to provide data on education in the Nordic countries. The data provided in this publication are based on the OECD-data.

In order to make international data on education comparable, the International Standard Classification of Education (ISCED) was developed. This classification is also used in the international publications mentioned above, but until today mostly the older version from 1976 has been used. The data in EAG-2000 are presented according to the new ISCED 97.¹ But some tables are still based on the older classification, in order to present the data in a more comparable way.

¹ ISCED-76 provides ten categories (from level 0 to level 9) to classify all levels of education. ISCED-97 gives a range of 7 categories. Level 0 describes pre-primary education, while level 6 classifies the second stage of tertiary education. See also: UNESCO 1997, 1999.

INES, Eurydice and Eurostat use the data provided by the national statistical offices, in the case of Sweden by Statistics Sweden. The international statistical reports are extensive and the groups working at these reports are concerned with improvements of the quality of data. But still there are "pitfalls" based on problems with common definitions or other difficulties of data comparability. That is why these reports have to be read in a critical way. (Ministry for Education and Science 2000: 2)

Statistics Sweden (SCB)

The key publications on higher education in Sweden provided by Statistics Sweden is the series "Higher education" (*Statistiska Meddelanden*). *Universitet och högskolor*, UF series). Each edition consists of three parts, one with data about undergraduate education (*UF 20*), one about research training (*UF 21*) and one concerned with employees at universities and university colleges (*UF 23*). Similar data are also published in the "Yearbook of education" (*Utbildningsstatistisk Årsbok*). The recent edition provides the data from the last academic year, i.e. from the year 1999.

The data collection served by the SCB is called Higher Education Register (*Högskoleregistret*) and contains information about students, examinations, research training and so on. All institutions of higher education send their data and information directly to the Higher Education Register. Information about the employees is taken from the SLÖR-system. All institutions of higher education send information and data about their staff to this system, which is used for the payment of the salaries. All data is being sent automatically to Statistics Sweden. This happens under the period from the end of the spring-term (30th of June) to the end of September. The SCB controls the data and collects missing data. So the "deadline" for all data about higher education is October. The statistics are published in May the year after. Additionally the Higher Education Statistics co-operates with and uses information and data from subgroups in the SCB (e.g. the group "Borderline education-labour market" or "the Register about people and education"), the Agency for Service in Higher Education (*Verket för högskoleservice*) and the Central Board for Study Support (*Centrala studiestödsnämnden*).

The SCB has no data about the Stockholm School of Economics, because Statistics Sweden works only on public institutions of higher education. The University College in Jönköping and Chalmers University of Technology are also institutions in non-state ownership, but they are included in the national statistics, because these institutions are members of the Swedish Agency for Government Employers (*Arbetsgivarverket*).

In their publications on higher education Statistics Sweden's does not use NUTS categories nor categories according to ISCED 97. The SCB prepares the data from the academic year 1998/99 even in ISCED-terms, but these are still

not a part of their publications. For the earlier years the office provides a manual about the classification of Swedish education according to ISCED 97, so that it is possible to translate the categories in the SCB-publications into ISCED-categories.

Statistics Sweden started to collect data about higher education systematically in 1984. But until 1993 the data about employees at universities and university colleges were not published in the series "Higher education" but in "Backgroundmaterial about higher education" (*Bakgrundsmaterial om högskolan*, BoH series).

The Higher Education Act in 1993 brought some changes for the higher education system in Sweden. Study programmes were re-organised and even the system of academic staff got a new shape. With these changes even the SCB had to use new definitions and working schemes. Since the courses and programmes of higher education were newly structured in 1993, even the SCB presents the data in a new form. Now students are counted per discipline, not per study program (*Linje*) or free course (*Fristående kurs*). The mentioned manual about the classification of Swedish education according to ISCED 97, does not provide a key to translate these categories into ISCED-terms.

While the data about the studentship were gendered from the beginning of the publication, it took some time until gendered data were available on the academic staff. In the earlier statistics about academic staff the number of employees is counted in total numbers. There are no data about the number or percentage of women in academic staff published until 1997.

National Agency for Higher Education

The National Agency for Higher Education (*Högskoleverket - HSV*) is a national body responsible for supervision of universities and university college's activities, evaluation and development of higher education in Sweden. The agency collects data about both students and academic staff, independently from Statistics Sweden. The statistics are published yearly in the *Årsrapport för universitet och högskolor*. The numbers of academic staff provided by the HSV differs from the numbers given by the SCB. This is due to the time of data collection. The given numbers in the SCB-publications refer to the month of October. The HSV gives the numbers of academic staff for the academic year. As already mentioned, the SCB publishes gendered numbers on academic staff since 1997. The HSV started already earlier to publish gendered data. In the annual reports, which are published since 1992, one can find gendered data back to 1990.

The NU-database (*Nationell Uppföljning*) is a database provided by the National Agency for Higher Education. The database collects data about students and employees at universities and university colleges but in a more

limited way than the data from Statistics Sweden.² But the NU-database also includes the Stockholm School of Economics and provides data about heads of departments, which Statistics Sweden does not. The database gives interesting information about all institutions of higher education, academic staff, head of departments and so on. But one of the main problems with this database is the fact, that quite a lot of data are not complete. Recently the HSV started to publish short papers (so called PM's) about actual topics in higher education on the website of the NU-database, which can be used as an additional source.

The national statistical data from the SCB are more detailed compared to the data from OECD and EUROSTAT, which can be seen as an advantage. A disadvantage is the fact, that the national data are hardly comparable in time perspective. In the second phase of the network project it was aimed to provide data from 1970 till today. But as the SCB first started to collect data about higher education in 1984 and as the data from the period before 1993 are hardly comparable with the published data from the last seven years, it is not possible to provide a statistical profile about the last 30 years of higher education in Sweden. Smaller publications like the series "Number on higher education" especially the booklet "Between two reforms" can help to trace certain developments in higher education between 1977 and 1993. But this is more a contribution to the national level of analysis than to the comparative level.

² Employees at universities and university colleges are i.e. just counted as full time equivalents but not as persons itself and the measurement units are rather coarse.

II. Definitions and Concepts

In order to investigate women's career chances in higher education one needs an overview of developments and changes of the academic career ladder. The Higher Education Act of 1993 meant not only a new structure of the career path in Swedish academia, it was also enacted with the hope that the new structure would work in favour of women. This chapter shall serve two functions. Firstly, it will provide an overview of the most important changes of the academic career ladder in Sweden. Secondly, it will introduce the definitions and concepts that are used in this paper.

1. The Career Ladder in Swedish Academia

With the Higher Education Act in 1993 the structure of academic career changed. Before 1993 we find in Sweden two career-paths in academy. One had to decide whether she or he wanted to make a teaching career or a research career. Teaching at universities and university colleges at that time was mostly provided by senior lecturers and lecturers. Senior lecturers had already finished their PhD while it was assumed that lecturers would work on their doctoral thesis beside their teaching commitments.

Precondition for a research career was the doctor title and then a position as research associate. Later one could advance to docent and finally to a professor.

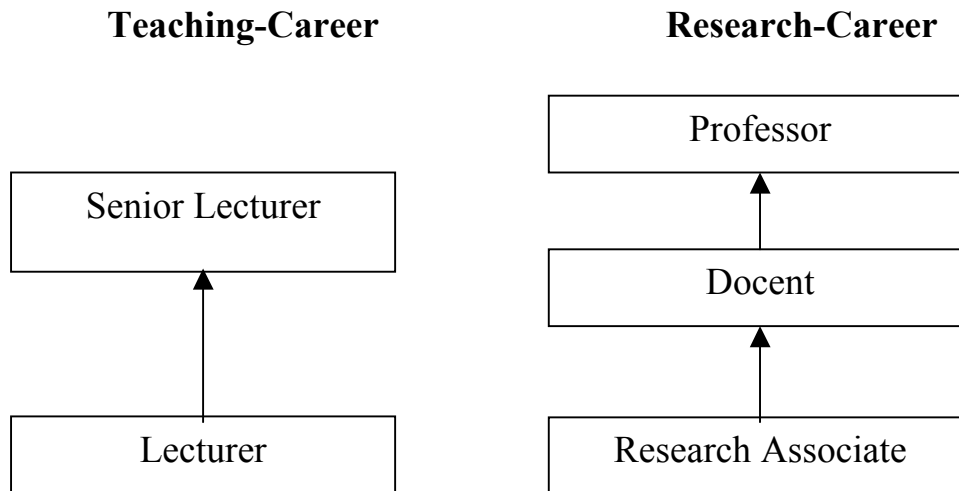
The two career paths were not combinable and a decision for a teaching career – or the need to choose a teaching career because of several barriers – meant both a loss of economic remuneration and social prestige.

Today we find a quite different career structure in the Swedish academy, but the influence of the old structure is obvious. The two career paths were combined and now build one structure. But still there are positions strongly linked to teaching while others are more concerned with research.

The lecturer's post is still a position where no doctoral degree is required. Lecturers are concerned with teaching while it is still assumed that they work on their PhD at the same time. An assumption that is mostly wrong, because working on the dissertation becomes more a kind of leisure time activity, because there is no time for research in this position.

Some doctoral candidates have an employment at an institution of higher education. They also have teaching commitments, but these are not more than 10 per cent of the working time. A post as a lecturer and as a doctoral candidate with an employment requires the same qualification, but the working tasks and the consequences for the further career are quite different. A lecturer is strictly concerned with teaching, while the doctoral candidate has more time for research.

Figure 1: The former Academic Career Path's in Swedish Higher Education



Both the lectureship and the post as a doctoral candidate with employment can be seen as starting positions for an academic career. But a look at the average makes clear, that the lectureship means no real good start. Doctoral candidates are 33 years old in the average. The average-age for lecturers is 47 years. (SULF 2001)

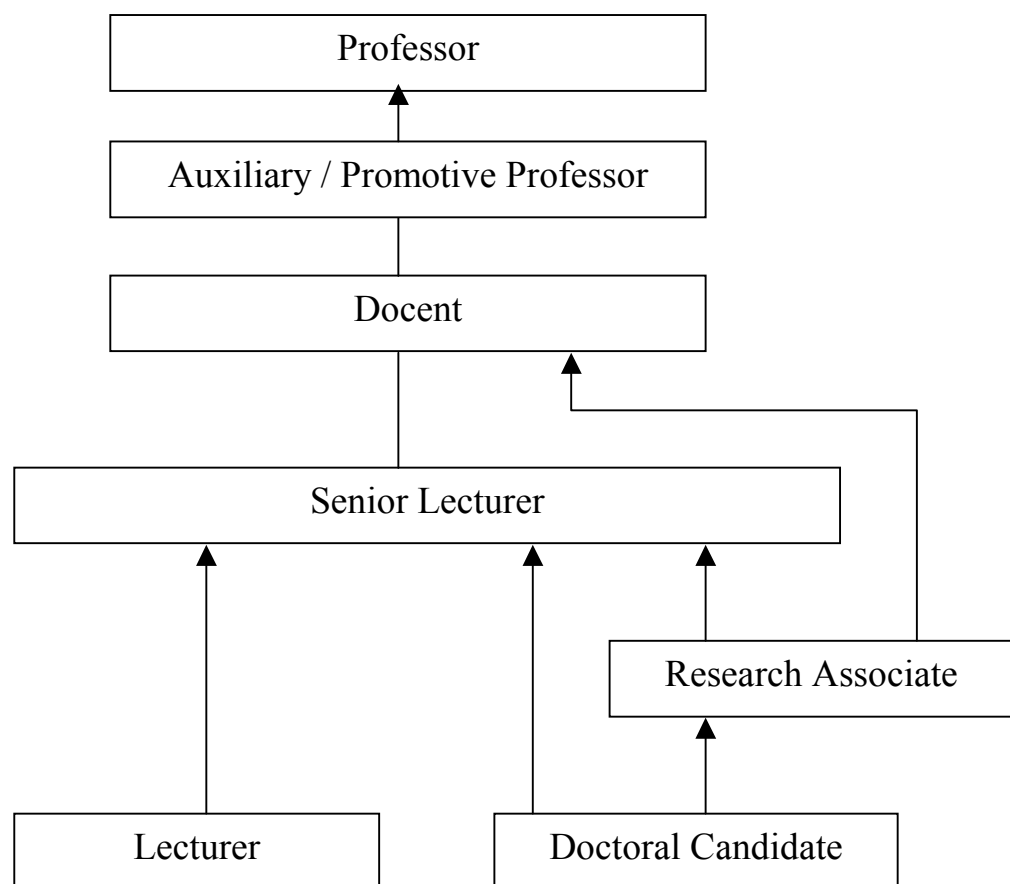
The Swedish career ladder in academia is structured around posts and titles. For a senior lecturer and even for a research associate it is possible to advance to a docent. This is just a title, but it implies, that one can work as a supervisor for doctoral students. Since 1993 it is even possible that a senior lecturer can advance to an auxiliary or promotive professor. Both are just titles without consequences to the working tasks or the payment, it does not even imply the right for supervision – both the auxiliary and the promotive professor are in fact still senior lecturers.

Both posts and titles are important to understand Swedish career patterns in academia. But at the same time we have to be aware that Swedish statistics focus on posts! In the statistics we find the categories of doctoral candidates with employment lecturer, senior lecturer, research associate and professor. Persons with the title docent, auxiliary professor or promotive professor are counted as senior lecturers. The area between senior lecturer and professor on the career ladder is not suitably taken up in the statistics. Even the National Agency for Higher Education criticised in one of its latest reports the fact, that there exists a lack of data about auxiliary and promotive professors (National Agency for Higher Education 2001a). But it is very likely that one could find patterns of discrimination and exclusion of women at that stage on the career ladder. But where are the critical points for women on the career ladder? As it is necessary to visualise the career patterns in the higher education systems that will be investigated, it is also necessary to point out where the critical points are

on the career ladder. Or in other words: where are women deviating from a career plan in academia?

As already mentioned, the Swedish system is structured around posts and titles. Certainly influenced by the idea of the "folkhem" Swedish statistics and investigations about higher education are blind to questions of titles. The Doctoral Candidate with employment, the docent, and the auxiliary and promotive professor are important positions on the career ladder but they are not separately shown in the national statistics. The lack of data is particularly criticised in recent reports of the National Agency for Higher Education. (National Agency for Higher Education 2001a)

Figure 2: The New Academic Career Path in Swedish Higher Education



Important for the start of an academic career is the question if one becomes a lecturer or a doctoral candidate with employment. While the lecturer has exclusively teaching commitments, the doctoral candidate with employment has teaching commitments only 10 per cent of the working time. From both the lecturer and the doctoral candidate it is expected that she or he will write a doctoral thesis. But for a lecturer the PhD-thesis is more or less a kind of leisure time activity, while a doctoral candidate has time to do research, to publish and

to present her or his own work on conferences. As a consequence the preconditions for a successful career in academia are unequal.

But there remains the question, what influences are important for one to become a lecturer or a doctorate with employment?

2. Definitions and the Three-Level-Model

In order to make the data comparable it is important to use clear definitions. The following definitions will be used in this paper: **Institutions of higher education** are all institutions which 1. Enable students to enter doctoral courses / programmes, 2. Award doctoral degrees and 3. Offer post-doctoral posts / research posts. **Students** are all students who are enrolled at higher education institutions as we defined them above. **Doctoral Candidate** is the first step on the academic career ladder. The candidate usually takes part in a training or research programme. **Lecturer** even this is a first step on the academic career ladder. A lectureship implies mostly teaching commitments, but it is expected that a lecturer works on her or his PhD. **Research Associate** Time-limited academic post with only research commitments. A doctorate is required. This post is defined as the second step on the academic career ladder. **Senior Lecturer** even this is defined as a second step on the career ladder. Post with both teaching and research commitments. Doctorate is required. **Professor** is the top rank position in the system of higher education. It is a post that mainly is concerned with research.

As the earlier part of this chapter showed, is it not possible to understand the Swedish academic career ladder as one-dimensional. It has to be assumed that this is the case in other systems of higher education as well. One finds several types of posts, but not every post corresponds to a step on the career ladder. To advance on the academic career ladder (to reach the next step) means to obtain a position that leads to new formal qualifications (like the doctorate), that implies a new "quality" of working conditions and new competencies or that give the possibility to gain new merits and develop a stronger profile.

Keeping this in mind, we can construct a three-level-model that helps to describe and analyse the academic career ladder (see table 2): **The First Level** shapes the precondition for an academic career. At this level first experiences in research and teaching are made and usually the first postgraduate title is awarded. **The Second Level** is a phase of shaping a stronger profile. In some countries this step leads to the habilitation. But even in countries without a habilitation, this is a step with moments of selection. In Sweden several merits can be awarded, like the competence to supervise a doctoral candidate. **The Third Level** is the level of the top rank position that means the professorship.

Table 2: The Three-Level-Model - Levels and Posts on the Swedish Academic Career Ladder

LEVELS ON THE ACADEMIC CAREER LADDER	
First Level	Doctoral Candidate, Lecturer
Second Level	Research Associate, Senior Lecturer
Third / Final Level	Professor

This model is seen as an analytical tool that enables to point out the critical steps for women on the academic career ladder instead of describing women's problems in certain occupational positions in higher education. In a national context this model might be less necessary but it will be useful for a comparison of different systems of higher education. The model makes it possible to attach the varying academic positions in different countries – according to their function – to one of the levels.

As we can see for the Swedish case (see table 2) the lectureship and the position of a doctoral candidate belong to the first level. The research associate and the senior lectureship are attached to the second level. The final level contains out of the professorship.

According to Statistics Sweden the country has today 52 institutions of higher education. Our definition of institutions of higher education (see above) limits the number to 21 higher education institutions, as we are only interested in institutions with research resources. These institutions are the eleven universities in Uppsala, Lund, Göteborg, Stockholm, Umeå, Linköping, Karlstad, Växjö, Örebro, the Luleå University of Technology, the Swedish University of Agricultural Sciences plus the Karolinska Institute and the Royal Institute of Technology as specialised institutions of higher education. Beside these public institutions we find the Stockholm School of Economics as a major private institution and Chalmers University of Technology and the Jönköping University College as institutions in non-state ownership, that are run in form of foundations. Finally there are five university colleges which are permitted to offer postgraduate degrees in certain disciplines. These colleges are the Blekinge Institute of Technology (offers the master of arts and the doctoral degree in techniques), the Malmö University College (offers the master of arts and the doctoral degree in medicine), the Kalmar University College (offers the master of arts and the doctoral degree in natural sciences), the Mid Sweden University College (natural sciences) and Mälardalens University College (techniques).

Some of these institutions are quite young, but most of them have a longer history. They grew from smaller institutions that provided education in just one or two disciplines. When there were several of these institutions in one region, they joined together and became finally a university college or university. Institutions of higher education are situated all over the country, but the density

of higher education institutions is higher in Stockholm and the south of Sweden. Thinking about the universities locations, the Swedish University of Agricultural Sciences is a special case as this university has four main campuses located in quite different regions. Most of the level 6 institutions in Sweden have an Equal Opportunity Committee and also a group for Gender studies.

3. Attractiveness of Higher Education

The Swedish higher education system – like most of the European systems - underwent a range of changes concerning under- and post-graduate education, the career patterns in academia or the distribution of finances. When new institutions of higher education like university colleges emerged, the role of the universities changed and new cohorts received access to higher education in general.

During the last thirty years not only the structure and organisation of the higher education system changed, additionally also women's participation in higher education and academia increased. Today 59 per cent of all students, 43 per cent of the doctoral students and 13 per cent of the professors are women. That is why we can talk about a feminisation in Swedish academia.

But feminisation means more than only the increase of women's participation. As we know from other occupational areas feminisation means also a decreasing prestige of the feminised area, which mostly is shown by lower wages. It is not clear if feminisation is the result of a decreasing prestige or if the weakening of the prestige is a result of feminisation. Nevertheless, if we keep the developments in Swedish academia and the impact of feminisation in mind one has to ask how attractive Swedish academia is today? This paper is partly focusing on this question. In order to give a sufficient answer, the question has to be divided into several parts by focusing on different forms of attractiveness. We simply have to ask: Attractive to whom? The term "attractiveness" can be used on three different levels.

Firstly, attractiveness can refer to academia as a whole and to the prestige and image that the academic system has in society and for political forces. Attractiveness at that level will be measured in this paper by the amount of money spent by several financial sources. Main attention is paid on academia's attractiveness to the Swedish State.

The second level on which the term "attractiveness" is used is related to academia's ability to attract future cohorts. This paper is mainly concerned with the attractiveness to future cohorts for the studentship. Here we have to look at the ratio between people who begin higher education and the cohort, which is the number of people who left secondary education. Additionally also the ratio

between the new entrants in higher education and the number of study-places has to be taken into account.

Strongly related to the attractiveness to future cohorts is the third level on which the term “attractiveness” is used. The third level implies the attractiveness of academia to people who already work in higher education. This implies to focus on salaries, opportunities for promotion or even chances on the labour market outside the academy.

As this report is concerned with women’s situation in academia, the idea of attractiveness is used as one possible concept to analyse women’s status and career situation. But as women’s career perspectives are depending on more factors other influences will also be elaborated. Cohorts play an important role for the development in higher education as they influence the possible number of future students and academic staff. But when it comes to vertical gender segregation, cohorts give rather limited explanations. They tell about possible developments, but to assume that an increasing number of women on a lower level of the academic career ladder would automatically lead to an increasing number of women on the next higher level means to neglect the impact of gender and discrimination.

III. The Swedish System of Higher Education in Numbers

This chapter will give a statistical overview of the changes in women's participation in Swedish higher education and academia's attractiveness to financial sources, future cohorts and to people working in academia.

1. Attractiveness to Financial Sources

In a first step special attention is given to academia's attractiveness to financial sources. As education and research are mainly financed directly by the Swedish government or by public research foundations, this means that attention is given to academia's attractiveness to the Swedish State. By looking at the amount of money that is spent on higher education and research and how it is distributed among different fields, it is possible to give an impression of how strong higher education such as research and development are prioritised.

OECD-data show that Sweden takes a top-position when it comes to the expenditure on education, research and development. In 1997 Sweden spent 6,9 per cent of the GNP for education on all levels. With this amount Sweden spent a greater share of the GNP on education than Austria (6,5 per cent), France (6,3 per cent), Poland (5,8 per cent) or Spain and Germany (both 5,7 per cent). For the higher education sector Sweden spent 1,7 per cent of the GNP compared to 1,5 per cent in Austria, 1,2 per cent in France and Spain, 1,1 per cent in Germany and 1,0 per cent in the United Kingdom. (Statistics Sweden 2001a and OECD 2000)

A look at the development of the expenditure on research and development over time shows that Sweden continuously increased the share of GNP spent on research. (See table 3) For the year 2001 not less than 21.516 Million SEK are set up for research and development. Compared to the year 2000 this means an increase of 3.328 Million SEK. These numbers are referring to both the money distributed by the Swedish government and by the public research foundations. The public research foundations finance about 11 per cent of research and development in Sweden and had a budget of 2.375 Million SEK in 2001. (Statistics Sweden 2001b: 4)

The higher education sector receives half of the amount that is set up for research and development in the budget bill. Table 4 shows more in detail how the money is distributed among the biggest areas of research and development.

As will be shown later more in detail, the Swedish system of higher education underwent a period of enlargement during the 1990's that still continues. During the last decade the number of students nearly doubled, the number of PhD-students increased by 30 per cent, the doctorates awarded by 60 per cent and the academic teaching staff by 30 per cent and the total number of

academic staff increased by 35 per cent. (Kim 2000: 36 and own calculations, see also tables in the appendix) The enlargement of the higher education system was and is a clearly expressed political goal of the Swedish government and the total expenditure spend on higher education grew with nearly 68 per cent during the last decade. (see table 5) But still, the amount of money spent on higher education does not really respond to the developments in higher education.

Table 3: Expenditure on Research and Development (R&D) by sector. Million SEK, current prices.

YEAR	BUSINESS SECTOR	PUBLIC SECTOR	PRIVATE NON-PROFIT SECTOR	HIGHER EDUCATION SECTOR	TOTAL R&D EXPENDITURE OF GROSS DOMESTIC PRODUCT
1979	6.002	735	4	1.870	1,86 %
1981	8.479	812	34	3.995	2,32 %
1983	11.733	920	40	5.496	2,58 %
1985	17.001	1.100	44	6.844	2,90 %
1987	20.401	1.290	41	8.821	2,98 %
1989	23.731	1.401	36	11.104	2,94 %
1991	28.598	1.695	35	11.432	2,88 %
1993	33.457	4.163	330	12.589	3,39 %
1995	44.029	4.300	93	13.004	3,60 %
1997	50.151	2.372	50	14.346	3,71 %

Source: Statistics Sweden 2001

Table 4: Government Budget Appropriation or Outlays for R&D in 2001. Current prices, MSEK and per cent.

	MILLION SEK	PERCENTAGE
Education / Research at Universities	9724	51 %
Defence	2847	15 %
Economy / Industry	1663	9 %
Agriculture / Forestry	1143	6 %
International Aid	984	5 %
The 5 biggest Areas of Expenditure	16361	85 %
Others	2780	15 %
All Areas of Expenditure	19141	100 %

Source: Statistics Sweden 2001b: 6

Table 5: Total Expenditure for the Higher Education Sector, in MSEK

FISCAL-YEAR	TOTAL EXPENDITURE
1991/92	24.900
1992/93	27.700
1993/94	29.600
1994/95	31.500
1996	35.269
1997	37.605
1998	39.245
1998	41.742

Source: Statistics Sweden 1996a, 2001a

Especially the higher education reform of 1993 put more responsibility on the institutions of higher education. A new resource allocation system based on tasks and achievements was introduced. Additionally, universities and university colleges now have to rely more on external funding. This development challenges the institutions of higher education to provide good quality in education and research in a demanding financial situation.

2. Institutions of Higher Education

A higher education reform in 1977 introduced common entry requirements for students and common staffing conditions for all institutions of higher education. Besides, it expressed the political will to enlarge the Swedish system of higher education as a whole.

A first look at the total number of institutions of higher education (Table 6) might be misleading: in 1995 we find 73 institutions of higher education, 2000 this number has declined to 50 institutions. Is it then still correct to speak about a time of enlargement? Yes, it is: During the 1990's most of the university colleges for health related sciences were incorporated into either the greater universities or other university colleges. But at the same time new university colleges were founded.

The reform of 1977 took time until its first results were shown. The number of institutions of higher education, which provide post-graduate education, did only slowly increase. The reform of 1977 gained no momentum before the late 1990's. In 1999 three university colleges advanced to universities and three university colleges were allowed to award postgraduate training in certain disciplines. The former three are the universities in Karlstad, Växjö and Örebro. The latter three are the Blekinge Institute of Technology, which can award master of arts and doctoral degrees in Techniques, the university college in

Malmö which can award master of arts and doctoral degrees in medicine and the university college in Kalmar which can award master of arts and doctoral degrees in natural sciences. Since the year 2000 the Mid Sweden University and the University College of Mälardalen also have to be classified as institutions with research resources.

Table 6: Number of Institutions of Higher Education 1995-1999

YEAR	NUMBER OF INSTITUTIONS (LEVEL 5 AND 6)		
	Non-Public	Public	Total
1995	12	61	73
1996	13	56	69
1997	13	56	69
1998	13	56	69
1999	12	40	52
2000	12	38	50

Source: National Agency for Higher Education 1996, 1997, 1998, 1999, 2000, 2001a

Usually it is claimed that the reform of 1977 incorporated the two types of institutions of higher education – universities and university colleges - into one single system and the fact that there are common entry requirements for students and common staffing conditions may support this statement. But in fact the term of a "hidden binary system" is in use to describe Swedish higher education. This refers to the fact that universities are the institutions, which are concerned with research, while university colleges mainly respond to undergraduate education.³

The clear division of tasks between universities and university colleges makes universities more interesting, in terms of academic career, for different reasons: First because professors are rarely appointed at university colleges and a professorship at a university college is not as prestigious as a professorship at a university would be. Second, university colleges are hardly connected to ongoing research. Third, it is more difficult to start post graduate education at a university with a degree from a university college. Usually the candidates have to attend certain preparatory courses in order to be qualified for postgraduate education. For all these reasons the institutions of higher education with research resources are more interesting and more important for our project, especially as they educate the "real" cohorts for future academic careers. That is why the number of higher education institutions will be limited to the 21 institutions with research resources, which are listed in table 7.⁴

³ See also Schenk 2001

⁴ A list of all higher education institutions is shown in the appendix.

Table 7: Institutions of Higher Education with Research Resources

INSTITUTION OF HIGHER EDUCATION	DATE OF FOUNDATION⁵	POST-GRADUATE EDUCATION SINCE	PRIVATE (PR) / PUBLIC (PU)
Uppsala University	1477 ⁶	1477	PU
Lund University	1666	1668	PU
Göteborg University	1891 / 1954		PU
Stockholm University	1879 / 1960		PU
Umeå University	1965	<1971	PU
Linköping University	1969 /1975	1969	PU
Karolinska Institute	1810	1906	PU
Royal Institute of Technology	1827		PU
Luleå University of Technology	1971 / 1997		PU
Swedish University of Agricultural Sciences	1977		PU
Karlstad University	1977 / 1999	1999	PU
Växjö University		1999	PU
Örebro University		1999	PU
University College of Kalmar	1977		PU
Blekinge Institute of Technology	1989	1999	PU
Malmö University	1996	1999	PU
Mid Sweden University		2000	PU
University College of Mälardalen	1977	2000	PU
Chalmers University of Technology	1829 / 1937		PR
Stockholm School of Economics	1909	1946	PR
University College of Jönköping	1977	1999	PR

Source: Information-centres of the institutions, Nordstedts Uppslagsbok 2000

Even though the focus of this paper is limited to 21 institutions of higher education, the investigation can be seen as representative as these institutions provide education for 87 per cent of all Swedish students and employ 97 per cent of Sweden's 3254 professors.⁷

From the reform of 1977 until today ten new institutions of higher education have been added to the list of institutions with research resources. (See table 7) This means that the number of institutions, which offer postgraduate education and respond for research has doubled since the late

⁵ In some cases two dates of foundation are given, these are the cases where university colleges were transformed into universities. Then the first date refers to the foundation of the institution, while the second date gives the year when the institution became a university.

⁶ From 1516 until 1593 the education at the Uppsala University was discontinued.

⁷ The numbers refer to the year 2000.

1970's. The new institutions challenge the established institutions when it comes to competition over students, academic staff and research resources. As the increasing number of institutions also opens new possibilities for academic careers it is interesting to see how strong women are represented among the studentship and academic staff at the old and the new institutions.

Today 59 per cent of the 319.091 Swedish students are women. When it comes to the institutions with research resources the representation of women is slightly lower – 58 per cent of all students enrolled at the 21 institutions listed above are women.

In the following the 21 institutions with research resources will be divided into two groups. As the reform of 1977 implied an increase of the number of institutions of higher education, this year is set up as a borderline between the group of "old institutions" and the group of "new institutions". The latter received their research resources after 1977.

This distinction suggests itself, but is not conclusive. Even among the old institutions one could distinguish between "old" and "new", with the institutions founded before 1950 on the one side and institutions founded after 1950 on the other. This categorisation would assume that the institutions founded after 1950 are influenced by new social movements, political values and a different gender culture than the old institutions. Still in this paper it is assumed that the influence of the reform of 1977 on women's career chances has to be regarded as more important.

If we compare the percentages of female students at the old and the new institutions, the new institutions seem to be more women-friendly. In the average 61 per cent of the students at the new institutions are women. The average of the old institutions is clearly below the national average, only 56 % per cent of the students at the older institutions are women. (See also table 8)

A comparison between the public institutions and the institutions in non-state ownership in our list shows that the public institutions seem to attract more women students. In non-state ownership institutions in the average 37 per cent of the students are women, while 59 per cent of the students at the public institutions are women.

A look at women's representation among the professors shows a similar picture. The national average of women's share within the professorship is at 13 per cent. The average for the 21 institutions with research resources is 12 per cent. On the level of professorships we find a clear difference between old and new institutions. On the average 12 per cent of the professors at the old institutions are women. In contrast the average for the new institutions is at 16 per cent. (See table 9)

Table 8: Percentage of Female Students in Old and New Institutions of Higher Education in 2000

OLD INSTITUTIONS (FOUNDED BEFORE 1977)		NEW INSTITUTIONS (FOUNDED AFTER 1977)	
Uppsala University	60 %	Swedish University of Agricultural Sciences	59 %
Lund University	54 %	Karlstad University	61 %
Göteborg University	65 %	Växjö University	61 %
Stockholm University	62 %	Örebro University	64 %
Umeå University	61 %	University College of Kalmar	62 %
Linköping University	55 %	Blekinge Institute of Technology	49 %
Karolinska Institute	78 %	Malmö University	67 %
Royal Institute of Technology	28 %	Mid Sweden University	59 %
Luleå University of Technology	51 %	University College of Mälardalen	60 %
Chalmers University of Technology	25 %	University College of Jönköping	57 %
Stockholm School of Economics	32 %		
Average	56 %	Average	61 %

Source: Statistics Sweden 2001c

Table 9: Percentage of Female Professors in Old and New Institutions of Higher Education in 2000

OLD INSTITUTIONS (FOUNDED BEFORE 1977)		NEW INSTITUTIONS (FOUNDED AFTER 1977)	
Uppsala University	11,5 %	Swedish University of Agricultural Sciences	16,9 %
Lund University	10,4 %	Karlstad University	13,3 %
Göteborg University	17,0 %	Växjö University	15,6 %
Stockholm University	19,0 %	Örebro University	14,3 %
Umeå University	12,8 %	University College of Kalmar	14,3 %
Linköping University	10,4 %	Blekinge Institute of Technology	35,3 %
Karolinska Institute	13,3 %	Malmö University	19,2 %
Royal Institute of Technology	5,2 %	Mid Sweden University	26,7 %
Luleå University of Technology	2,5 %	University College of Mälardalen	10,0 %
Chalmers University of Technology	6,0 %	University College of Jönköping	0 %
Stockholm School of Economics	0 %		
Average	12 %	Average	16 %

Source: Statistics Sweden 2001e

A comparison between the public institutions and the institutions in non-state ownership shows that we find a more women-friendly atmosphere at the public institutions. In the average 13 per cent of the professors employed at a public university or university college are women. Only 4 per cent of the professors employed at the non-public institutions are women.

The data lead to the conclusion that the public institutions of higher education attract more women in the studentship and seem to have a more women-friendly policy when it comes to the employment of professors. Also the new institutions seem to provide a better environment for women than the old institutions.

A deeper investigation of women's position in Swedish higher education would probably show a more complex picture. Firstly, because even the old universities can be distinguished according to the year of foundation. The universities in Göteborg, Stockholm, Umeå, Linköping and Luleå are founded during the 1960's and 1970's and show a higher percentage of women than the institutions founded earlier. Even though no official ranking between institutions of higher education exists in Sweden, the institutions founded earlier than the 1960's have a higher status than the others do.

Secondly, because there are only three institutions of higher education in non-state ownership – Chalmers University of Technology, Stockholm School of Economics and University College of Jönköping. These institutions are specialised in fields which by tradition are dominated by men, which explains the low percentage of women in the studentship and particularly the absence of women professors. But in contrast there are new public institutions of higher education - like Blekinge Institute of Technology or the Swedish University of Agricultural Sciences - which show a higher percentage of female professors even though they are specialised in male-dominated fields. This indicates a strong regulatory influence of the Swedish State, especially if one keeps in mind that the government in a few of its latest bills pronounced the importance of raising women's share in the field of technology.

3. Students and Doctoral Students

In line with the enlargement of the Swedish system of higher education the number of students nearly doubled during the last ten years. This development also restructured the participation rates of women and men in the studentship such as the horizontal segregation. In the following special attention is given to the students and doctoral students such as the development of total numbers and women's share.

3.1. Attractiveness to Future Student Cohorts

As this paper is also concerned with the question how attractive Swedish academia is, it is also interesting to see how attractive higher education is for possible future cohorts. This implies the question if a higher education is desirable for upper secondary school leavers. In fact cohorts with a university degree are less vulnerable in terms of risk for unemployment in times of weak business cycle. Especially in the early 1990's it turned out, that the higher the level of education, the bigger the chances to find an employment on the labour market. (See Socialstyrelsen 1997:49, Statistics Sweden 2000c) In the beginning of the 1990's about 50 per cent of all upper secondary school-leavers were employed shortly after they left school. In 1993 only 20 per cent of the school-leavers from upper secondary school had an employment shortly after leaving school. This situation improved until now. In 1998 the percentage of upper secondary school leavers who found an employment shortly after they left school increased up to 40 per cent. (Statistics Sweden 2000c)

Table 10: Number of Applications for Higher Education

YEAR	TOTAL NUMBER OF APPLICANTS	PERCENTAGE OF WOMEN	APPLICANTS NOT EARLIER ENROLLED	PERCENTAGE OF WOMEN
1995	248.351	59	105.551	60
1996	273.990	61	112.768	60
1997	290.949	61	123.515	60
1998	287.691	61	119.393	60
1999	289.321	62	120.983	60
2000	283.331	63	109.986	60

Source: Statistics Sweden 1995b, 1996b, 1997a, 1998a, 1999b, 2000a, own calculations

In times of high unemployment-rates it is not surprising that the periods of education are increasing. Firstly, people may decide to choose a longer education to increase their chances on the labour market and to avoid unemployment. Secondly, even the state has an interest in keeping people in education in order to keep the unemployment rate low. This could mean that the increased numbers of students has to be seen as a consequence of times with higher unemployment rates. In consequence, the interest in higher education would decline as soon as the situation on the labour market is improving. As the Swedish unemployment rate was declining during the end of the 1990's we might expect a lower interest in higher education among younger cohorts. Table 10 shows the development of the total number of applicants and the number of

first time applicants. Both numbers have increased during the second half of the 1990's and show a slightly declining tendency in the end of the 1990' and 2000.

The numbers in table 11 are more interesting, as they show that the increased number of applicants is not due to applicants younger than 25. That means that the interest of the real future cohorts was rather stable through the years, in some years even decreasing. These numbers lead to the conclusion that rather older cohorts caused the increase of number of students, not the upper secondary school-leavers.

Table 11: Change in Number of Applicants not earlier enrolled

YEAR	CHANGE IN NUMBER OF APPLICANTS NOT EARLIER ENROLLED	CHANGE IN NUMBER OF APPLICANTS NOT EARLIER ENROLLED, AGE < 25
1995	15 %	-2 %
1996	7 %	0 %
1997	10 %	0 %
1998	-3 %	1 %
1999	1 %	-3 %
2000	-9 %	0 %

Source: Statistics Sweden 1995b, 1996a, 1997a, 1998a, 1999b, 2000a

Table 12: Number of New Enrolled Students

YEAR	TOTAL NUMBER OF NEW ENROLLED STUDENTS	PERCENTAGE OF WOMEN	FIRST TIME ENROLLED STUDENTS	PERCENTAGE OF WOMEN
1995	147.311	57	54.150	55
1996	156.092	58	50.501	56
1997	150.165	59	47.738	56
1998	155.785	60	49.235	56
1999	167.108	61	55.244	57
2000	181.562	62	57.643	58

Source: Statistics Sweden, 1995b, 1996b, 1997a, 1998a, 1999b, 2000a own calculations

The trend that rather older cohorts stand for the enlargement of the studentship has to be seen as critical. Sweden's higher education policy aims at an enlargement of the system – partly in order to provide highly educated people for the labour market, but also as a part of unemployment-policy. As it seems today, the enlargement policy serves mainly the latter aim. The cohort of upper secondary school leavers seems not to have an increasing interest in higher

education. In fact the number of first time applicants is declining while the number of study places is increasing.

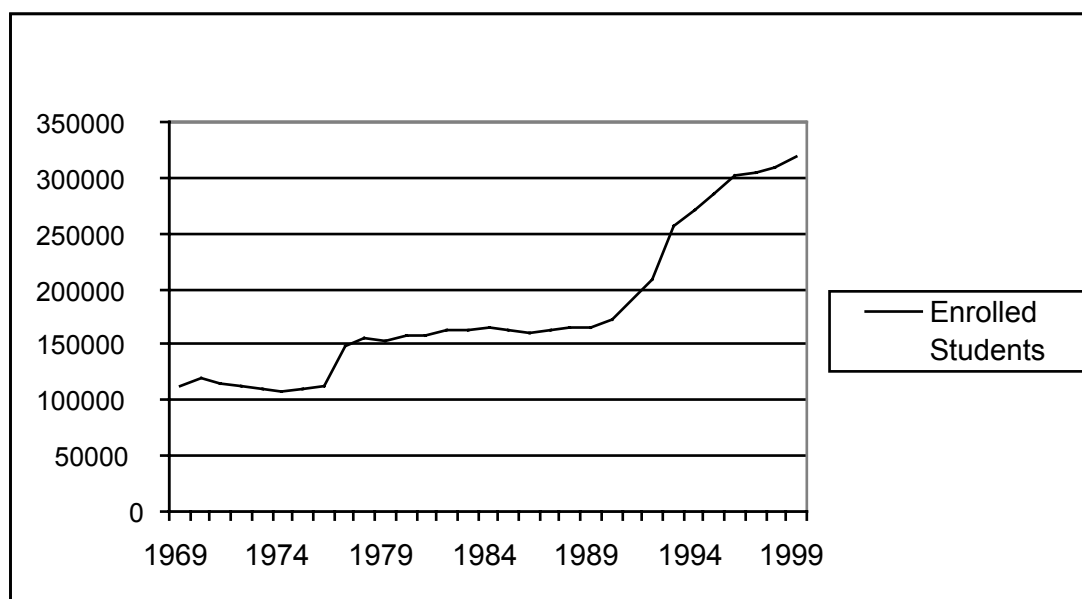
Another – rather critical - trend in Swedish higher education is that people stay longer in education than they did ten years ago. Table 12 shows this, with the difference between new enrolled students and first time enrolled students. Another indicator for a longer time of higher education is the fact that the establishing-age increased during the 1990's. In 1987 the establishing-age for men and women was at 21. Ten years later the establishing age had increased to 27 for men and up to 30 for women. (Statistics Sweden 2000b:9f.)

These tendencies will provide several problems for the Swedish State. Firstly, it has to be questioned how the financial situation of higher education will develop. When more people are enrolled as students but spend more time in education, the degree gets more and more expensive for the state. Secondly, it will have consequences for Swedish social policy. If women establish later on the labour market, their active working period will be shortened, which will have consequences for the social security.

3.2. Students

The Swedish system of higher education expanded during the last years - as the increasing number of higher education institutions with research resources shows. A development that still continues and also affects the structure of the studentship.

Figure 3: Total Number of Enrolled Students 1969-1999



Source: Statistics Sweden 1978 - 2001

Figure 3 shows the development of numbers of students during the last thirty years. It shows that the total number of students trebled during a period of thirty years. The reasons for the increasing number are quite different. The growing interest in higher education that caused the increase was particularly political will. But even statistical reasons have to be taken into consideration when explaining the increase.

The reform of 1977 caused a first increase of the number of students. The total number increased between 1976 to 1977 with 35.000. But this can hardly be seen as an indicator for an intensified interest in higher education. The reason for this increase was the higher education reform itself: In 1977 the education for nurses and work-therapists became a part of higher education, which lead to higher numbers of students.

In fact the period after the reform of 1977 is the period with the slowest increase of enrolled students, compared to the periods before and after. (See table 13) The data of the studentship confirm the finding of the previous chapter: Even though the political will to enlarge the system of higher education was already expressed in 1977, the real enlargement did not gain momentum until the 90's.

Table 13: Changes of Number of Enrolled Students

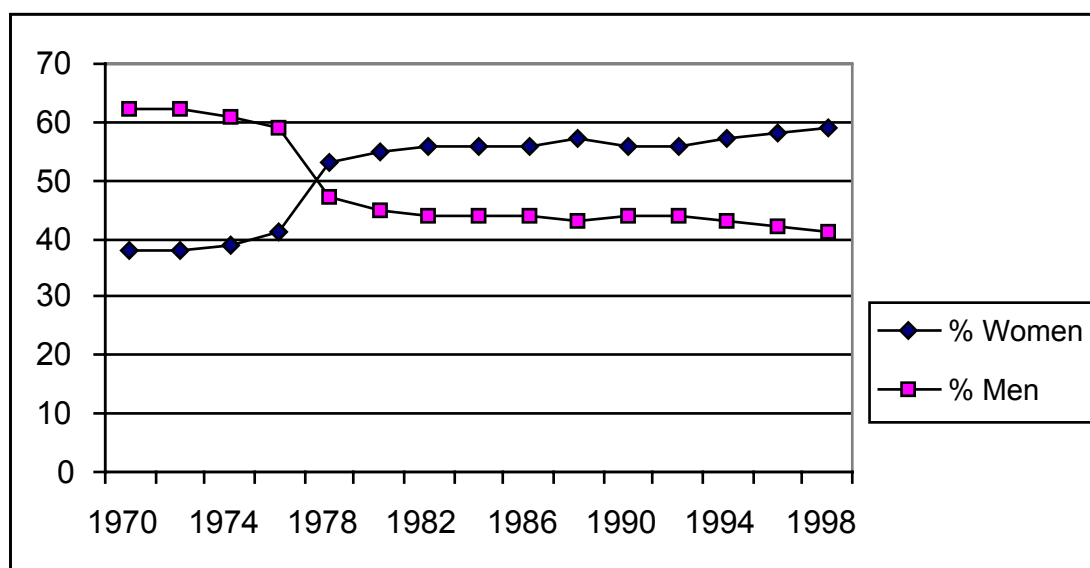
PERIOD	CHANGE
1965 - 1970	71,7 %
1970 - 1979	28,2 %
1980 - 1989	4,2 %
1990 - 1999	64,8 %
1965 - 2000	329,4 %
Before and after the reform of 1977	
1965 - 1976	70,2 %
1977 - 2000	91,7 %

Source: Alexandersson (2001)

During the last thirty years even the structure of the studentship underwent changes. It is interesting to see how the proportion of women and men within the studentship changed. In 1970 undergraduate education was clearly dominated by men with a participation rate of 60 per cent. Thirty years later this turned to the opposite – today nearly 60 per cent of all students are women. (See figure 4) This development might have an influence on the career patterns in the future academy. If 60 per cent of all students are women, the cohort for future female academics is much larger as it was in the 1970's. We might assume that the more feminised the studentship is, the more feminised will also the professorship be.

This hypothesis can be built upon two assumptions. Firstly, as already mentioned above, a higher percentage of women among the students means a larger cohort for future female professors. Expecting a higher percentage of female professors would mean to assume that women are less numerous in academic top rank positions because they entered the academic world later than men did. Following this assumption would mean to expect a causal relationship between women's participation in the studentship and women's share among the professorship. But it is shown that this expectation is not true⁸, especially as it excludes discrimination and career obstacles as explanatory factors.

Figure 4: Share of Women and Men within the Studentship



Source: Statistics Sweden 1978-2001, 1981a

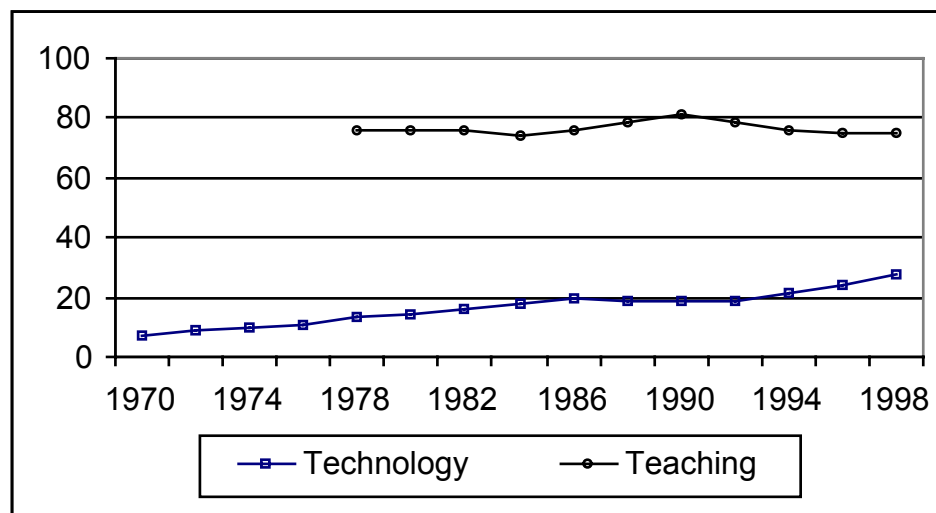
Secondly, it is possible to see it the other way around and assume that women attract women. As more and more female professors are working at Swedish universities and university colleges, they motivate younger generations to start higher education, to begin post-graduate education and to plan an academic career. The data presented in this paper give no information why women started a higher education or why they decided to begin an academic career. But the data show how the growth of women's participation in the studentship is related to the growth of women's share in different academic positions.

In order to investigate women's position in higher education not only vertical segregation has to be analysed but also horizontal segregation. During a long period highly prestigious subjects like economics or technology were dominated by men, a pattern which only slowly is breaking up. But as women's participation in the studentship grew up to 60 per cent, women also entered these male dominated subjects. At the same time another development can be

⁸ See also ETAN 2000:15

observed. Women's share in fields of study which traditionally are dominated by women decreases – even though slightly.

Figure 5: Development of Women's Share in the Fields of Technology and Teaching⁹



Own calculations based on: Statistics Sweden 1978 - 2001

Figure 5 shows the development of women's share in the fields of technology and teacher training. Technology is a subject traditionally dominated by men. The percentage of female students in this field still is rather low – only 24 per cent – but the increase during the last thirty years is remarkable. The teaching profession is by tradition a field dominated by women. Figure 5 shows that women's participation increased until 1990 in contrast to this did the share of female students decrease during the last ten years. This development might point to a process of horizontal restructuring.

Even though the increased numbers of students during the last years is mainly due to women's entering in higher education, this is no explanation for the tendencies shown in figure 5. Horizontal segregation is not breaking up simply because of a higher share of women in the studentship. The reasons for the development shown above are more of political nature. The Swedish government a long period of time pronounced the importance of equal participation of women and men in all societal areas. Several governmental investigations (*Statens offentliga utredningar*) were conducted in order to evaluate women's participation in higher education. These investigations give not only input to political decision making processes, they also put a certain

⁹ From 1970-1976 Technology implies all students listed by SCB under the categories "Teknisk Högskola" and "Tekn. Mag. Utbildning". From 1977-1993 all subjects related to natural sciences or agricultural sciences are excluded. From 1994-1999 the "Apotekareexamen" and the "Receptarieexamen" are excluded. In both fields (Technology and Teaching) the "Påbyggnadskurser" were not counted.

pressure on the institutions of higher education to improve women's situation. That is why a range of programmes and measures were started in order to attract more women into fields like technology. As examples the following measures have to be mentioned: the introduction of a basic-year in technology, teaching in learning groups, support of mentors or teaching methods that are based on teamwork. The basic-year in technology at the Linköping University showed good results as the participation of the two sexes are nearly equal and more women participate in the education in technology. (Statens Offentliga Utredningar 2001:94)

Interesting is also another development to restructure horizontal segregation. New study-programmes in technology are created which contain more "soft" components, as an example the engineer with specialisation in biology or energy has to be mentioned. The trend to create gender-suitable study-programs is also quite popular in fields like teacher education. (Statens Offentliga Utredningar 2001:94f.) In order to attract more men new study-programs in child- or youth-pedagogic are created, which contain focal points in natural sciences or techniques. In result, new programs are created which shall meet the assumed needs of women and men.

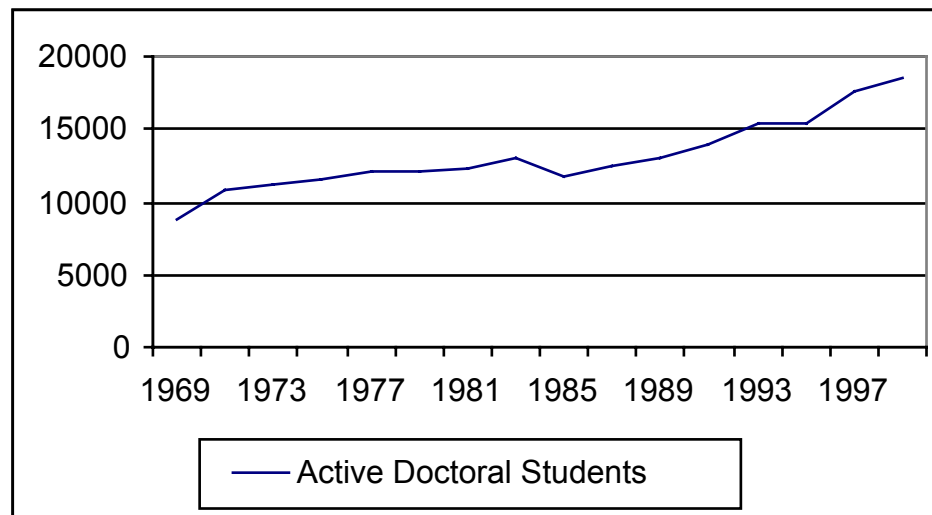
But what are the results of these gender suitable programmes? First results show that it is more difficult to keep men in women-dominated fields, than to keep women in men dominated fields. (Statens Offentliga Utredningar 2001:95) One reason might be that feminised fields still have low status, which makes them less attractive for men. Another reason might be, that the newly created programmes in pedagogic do not fit the needs on the labour market, which gives women with a traditional education better chances than men with a new created education. No matter what the reasons are it is striking that it is assumed that women and men are different and have different needs in education. Women need "soft" education, men need more natural sciences and techniques in their education. The fact that there are fields with more prestige than others and that work and achievements are valued in a different way depending on gender is not questioned in this policy. It might be questioned if the strategy of creating and labelling study programmes really increases gender equality and women's status in higher education.

3.3. Doctoral Students

The enlargement of the system of higher education in Sweden also implied an increasing number of doctoral students. A larger number of students also means a bigger cohort for post-graduate education and at the same time more places for post-graduate education were established. The number of active doctoral students grew from 8.800 in 1969 up to 185.00 in 1999. The increase of the number of doctoral students was accompanied by a restructuring of women's

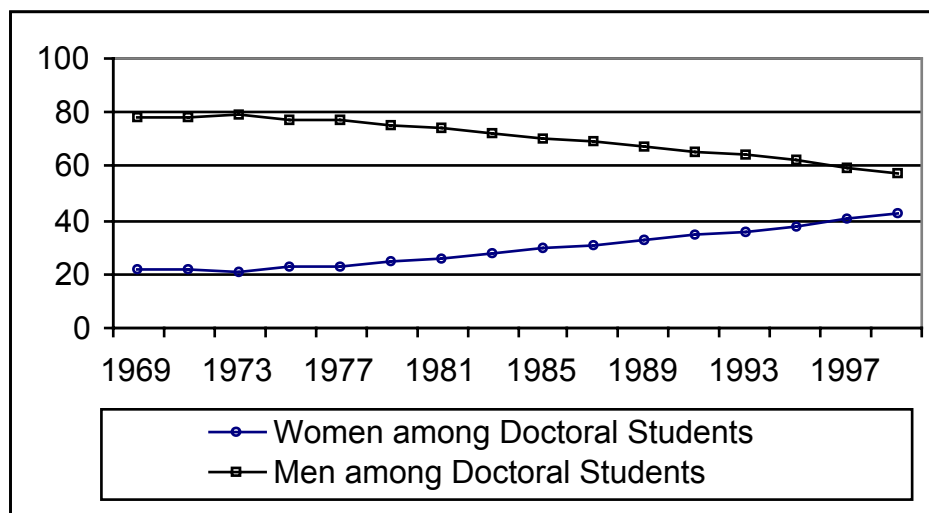
and men's share among the doctoral students. The percentage of women among doctoral students was not higher than 22 per cent in 1969. Thirty years later it had risen to 43 per cent. (See figure 7)

Figure 6: Total Number of active Doctoral Students 1969-1999



Source: Statistics Sweden 2001d

Figure 7: Percentages of Women and Men among Doctoral Students 1969-1999



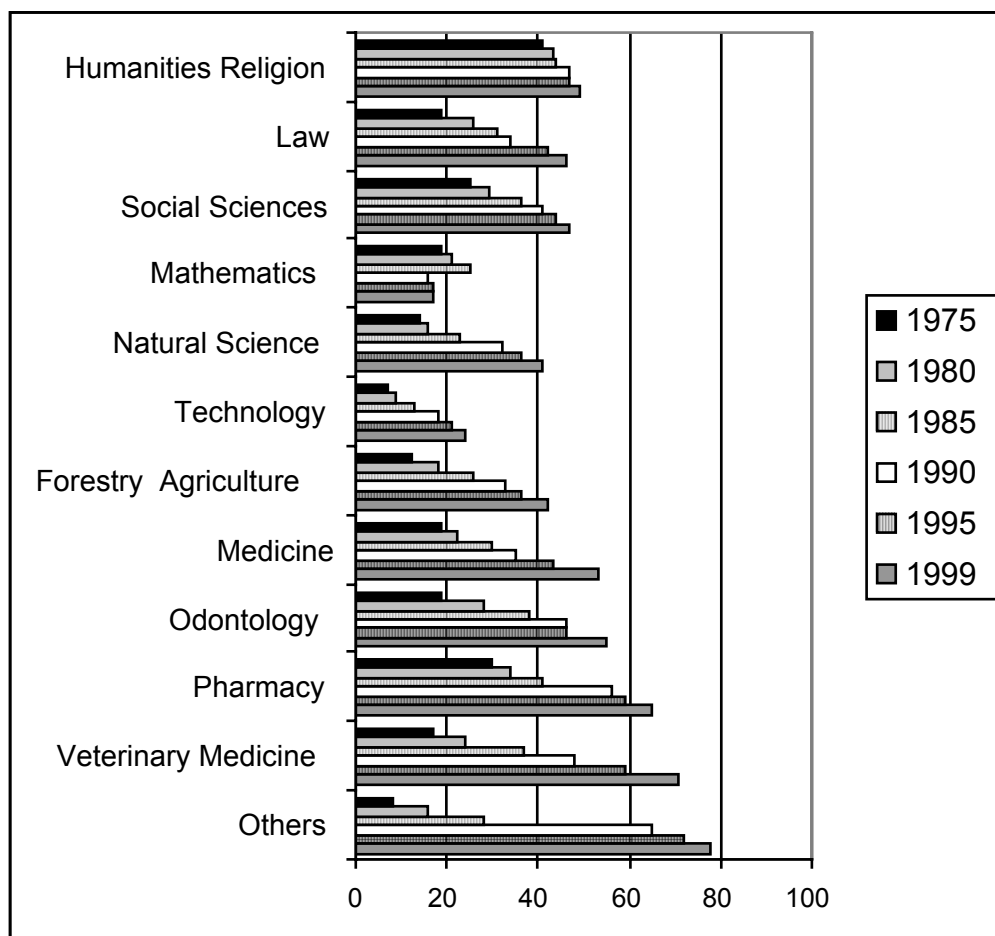
Source: Statistics Sweden 2001d

Looking back at the number of students and women's share (see figure 4) we can see that the point of equal share of men and women within the studentship was reached in 1978. Today women's share of the studentship is 59 per cent while women's representation among the doctoral students is 43 per cent. Even though men represent the smaller part of the studentship, they make the bigger part of the doctoral students. One explanation could be that women in contrast to

men do not choose to start post-graduate education. Another explanation could be that men have higher success rates than women. The question of vertical segregation will be raised at a later point in this paper.

In order to investigate women's position in higher education it is also important to take a look at the horizontal segregation. To see that women's share among doctoral students raises over time may point to an improving situation for women, but it is just as important to ask if there are certain fields where women are over- or underrepresented. Figure 8 gives an overview of the development of women's share in several fields of study.

Figure 8: Percentage of Female Doctoral Students according to Discipline 1975-1999



Source: Statistics Sweden 1995a, 2001d

The distribution of men and women in several fields seems to be rather classic than surprising, but still there are a few interesting moments. In the 1970's women were strongly represented in the humanities, social sciences and pharmacy. During the 1980's women's participation in other fields like veterinary medicine, natural sciences, odontology and medicine grew stronger.

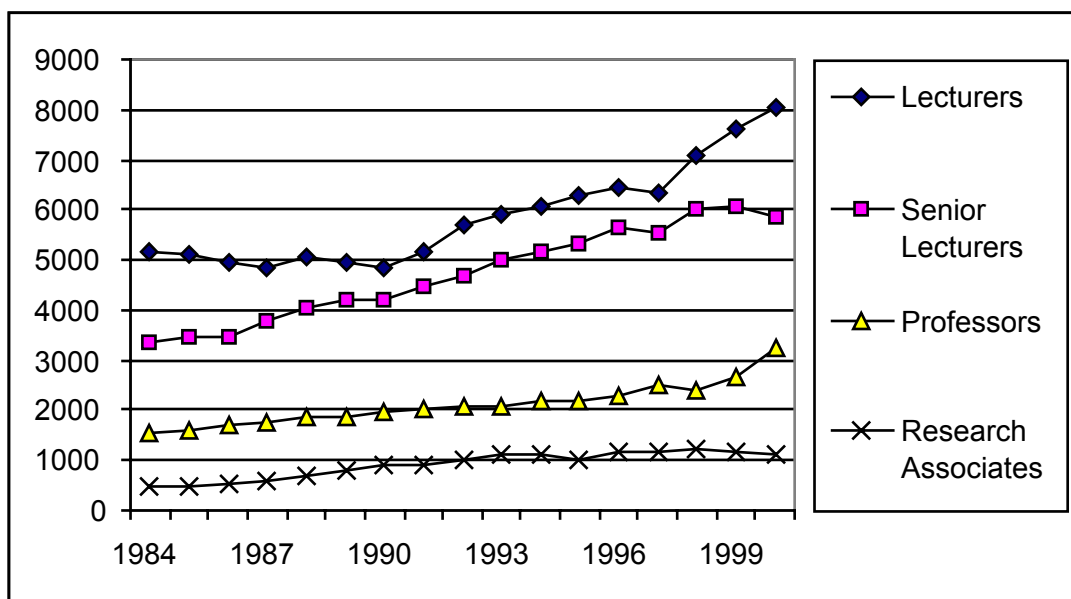
Mathematics and technology seem to be fields where women's share remains low.

As we already have seen at the student level, women's participation in the fields of technology is constantly increasing. In 1975 women's share among the doctoral students in technology was not higher than 7 per cent. In 1999 almost 24 per cent of all PhD-students in technology were women.

4. Academic Staff

The enlargement of the Swedish system of higher education also meant an increasing number of lectureships, research associates, senior lectureships and professorships. Figure 9 shows the increased numbers of academic staff from 1984 to 2000. During this period of time the number of professors and research associates doubled, while the number of lecturers and senior lecturers grew by a factor of 1.5 respectively 1.7.

Figure 9: Total Numbers of Academic Staff 1984-2000



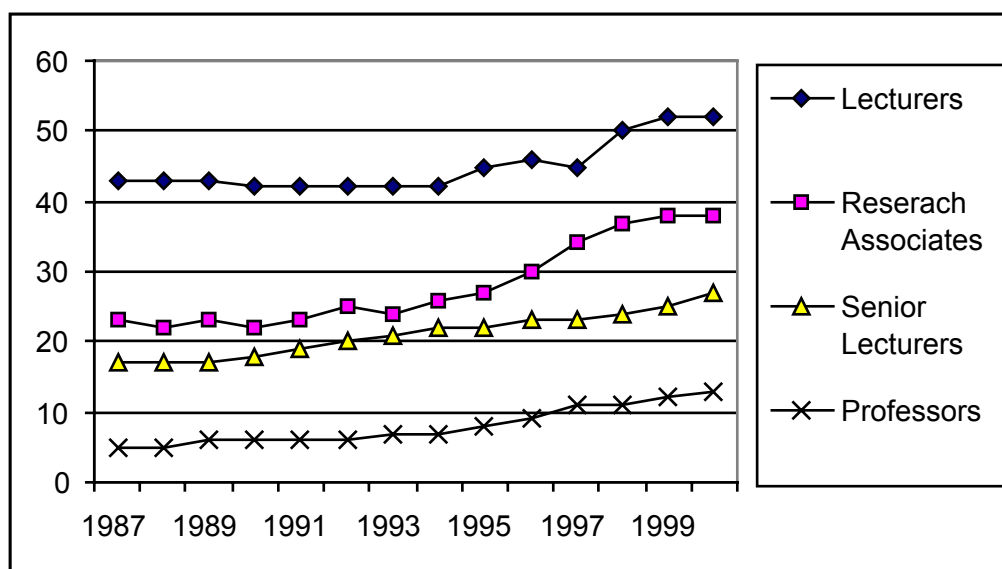
Source: Statistics Sweden 2001e

The number of research associates increased less during this period. This position can be crucial in an academic career since it is a post-doc position that enables to earn qualifications needed for a future academic advancement. The post-doctoral phase has to be seen as a bottleneck in career patterns in Swedish higher education. There are too few posts for research associates to respond to the increasing number of doctorates. At the same time the actual number of research associates is not big enough to provide a sufficient cohort for future senior lectureships. (Kim 2000: 46) Swedish academia might face a cohort

problem in future when it comes to the appointment of new senior lecturers and professors.

Figure 10 shows the women's share among academic staff from 1987 to 2000. The figure shows clearly that women are stronger represented among lecturers and research associates than among senior lecturers and professors. If all academic staff is counted as one group then women's participation increased during the last ten years from 28 per cent up to 37 per cent. But a closer look at each academic position shows that women's share differs depending on the position. Today the representation of women and men among lecturers is rather equal, 52 per cent of all lecturers are women. The higher positions on the academic career ladder are in contrast dominated by men. About 73 per cent of all senior lecturers and 87 per cent of all professors are men. (Statistics Sweden 2001e)

Figure 10: Percentages of Women among Academics Staff 1987-2000



Source: Statistics Sweden 2001e

During the last ten years women's share of the professorship increased from 6 up to 13 per cent. The 13 per cent women professors in 2000 mean an increase with one per cent compared to 1999. Sweden does not rank its institutions of higher education according to prestige, but one might assume that institutions with research resources might be more prestigious than institutions without research resources. Keeping this in mind, it is interesting to notice that the share of women professors at university colleges¹⁰ amount to 18 per cent. (Statistics Sweden 2001e) It seems to be easier for women to reach top rank positions at institutions without or with only limited research resources – this means at institutions with lower prestige.

¹⁰ This includes even the university colleges with research resources.

The lecturers' position shows the highest participation of women among all academic positions. For lectureship no doctorate is needed and the position can be both time-limited and tenured. But no matter if this position is time-limited or tenured, it has to be seen as a rather insecure start for an academic career. The doctorate is still the precondition for an academic career and only 27 per cent of the lecturers are enrolled in any kind of post-graduate education (*Forskarutbildning*). (SULF 2001a:6) A new study about the working conditions of tenured lecturers shows that lecturers hardly have time for competence-development¹¹ and that the amounts of money spend on lecturers by the institutions is decreasing. (Rådahl 2001:4 f.) Some institutions even lack a plan for competence development.¹² Under such circumstances it is rather difficult to work on a doctoral thesis, which is the entrance-ticket to an academic career. A lectureship can easily turn out as a dead end street. Keeping this in mind, the high (and still increasing) percentage of women has to be taken rather sceptical.

We can conclude the existence of a vertical segregation. This means firstly, that the percentage of women is lower the higher the position is situated on the academic career ladder. Secondly, we can even see that women's share among tenured positions (like senior lectureships and professorships) is lower than in non-tenured positions. Even though we can not easily count the lectureship as a non-tenured position, it is still a rather insecure position in terms of academic advancement.

4.1. A New Promotion System – New Chances for Women?

In 1999 a promotion reform introduced changes in the career patterns of Swedish academia. The former two career paths were combined into one in order to revalue teaching compared to research. The idea was that both merits in research and pedagogical skills should be taken into account when it comes to the appointment of academic staff. Further, a system of (self-) promotion was introduced. This system implies that people with appropriate qualifications can apply to advance on the academic career ladder. A lecturer can apply that her or his post will be changed into the post of a senior lecturer. A senior lecturer can also apply – provided that she or he has the needed qualifications - that the lectureship will be transformed into a professorship. It was assumed that a reserve of research talent would exist within the academic staff and that people

¹¹ The study was mainly concerned with the Uppsala University but also contained data from the universities in Stockholm, Lund, Göteborg, Linköping, Umeå, Luleå and Karlstad as well as the Mid Sweden University College, Chalmers University of Technology and the Karolinska Institute.

¹² Usually 10 per cent of the working time of academic staff should be spend in competence-development. But according to the law the institutions are free to set up plans that ensure even more time.

would take advantage of the new promotion-system, because they could use their talent in a better way through the title of professor.

Until now it is not clear what impact this reform had for the promotion of lecturers to senior lecturers. In spring 2002 the National Agency for Higher Education (*Högskoleverket*) will publish its first report concerning this question. But preliminary experiences from the institutions of higher education indicate that pedagogical skills are not valued in the same way as scientific merits like the doctorate or the master of art or science (*Licentiate*). (See also SULF 2001a:6f.)

Concerning the promotion of senior lecturers to professors preliminary results are published in a study of the National Agency for Higher Education (2001a). When the reform of 1999 came into force it was also assumed that the new promotion system would increase women's representation among senior lecturers and professors. Early results have shown that the percentage of women professors has increased from 12 per cent in 1999 to 13 per cent in 2000. But this increase is due to both promotion and recruitment.

In the beginning of 1999 2.129 professors were employed at Swedish institutions of higher education. Twelve months later the number had increased to 2.726 professors.¹³ The number of professors who were appointed by the recruitment path – 147 – is rather modest compared to the 504 professors advanced by the promotion path. (See table 14) In the average, both ways of advancement - recruitment and promotion - seem to have the same outcome for women. 20 per cent of the newly recruited as well as 20 per cent of the promoted professors are women.

If one takes a closer look at the different fields it becomes clear that the two ways of advancement give different results for women. In fields like humanities and religion, law or social sciences the recruitment path seems to be the more successful path for women. In fields like natural sciences, agriculture and medical sciences the promotion path gives better result for women. When it comes to technology the recruitment path is only slightly more successful for women than the promotion path.

The status of the promoted professors was and is still hotly debated. The promotion system was seen as risky for the high scientific standard within the Swedish professorship. As a first investigation shows, people who apply for promotion meet higher demands when it comes to academic and pedagogical qualifications than people who are appointed by the recruitment path. (National Agency for Higher Education 2001) In terms of academic qualification there is no reason to speak about promoted professors as second-class. But in contrast, promoted professors have more teaching commitments than their recruited

¹³ Due to different measurement times and procedures the number of professors given by the National Agency for Higher Education is not the number given by Statistics Sweden.

colleagues do, which limits their possibility to spend time on research. (Taawo 2001)

Table 14: New appointed Professors in 1999

DISCIPLINE	PROMOTION		RECRUITMENT		TOTAL	WOMEN
	Total	Women	Total	Women		
Humanities / Religion	72	32 %	23	39 %	95	34 %
Law	3	0 %	3	33 %	6	17 %
Social Sciences	93	19 %	29	38 %	122	24 %
Mathematics	20	5 %	4	0 %	24	4 %
Natural Science	90	16 %	11	9 %	101	15 %
Technology	75	8 %	56	11 %	131	9 %
Agriculture	17	24 %	3	0 %	20	20 %
Medicine	115	21 %	12	9 %	127	20 %
Odontology	11	27 %	3	0 %	14	21 %
Pharmacy	-	-	2	0 %	2	0
Veterinary medicine	-	-	-	-	-	-
Others	8	75 %	1	100 %	9	78 %
Total	504	20 %	147	20 %	651	20 %

Source: National Agency for Higher Education 2001: 46

Another question is the financial status of the promoted professors. Here another picture becomes visible. In 1997 the promotion reform was decided, based on a government bill. This government bill contained 50 million SEK in order to finance the new reform. But the Swedish parliament decided to use this amount for other purposes. Additional changes in the budget bills of 1999 and 2000 concerning the salaries (löneomräkningar) reduced the budget for salaries at the institutions of higher education. In 1999 this meant an amount of 300 million SEK less. (Blomqvist 2001) The difficult economic situation for the universities and university colleges also influences the economic situation of promoted professors. A recruited professor can expect a salary that is 15 up to 20 per cent higher than the salary of a senior lecturer. As the case of Lund University shows, promoted professors hardly receive the same salary as their recruited colleagues. The promoted professors can expect a salary 1500 SEK higher than their salary as a senior lecturer. (Taawo 2001) This means an increase of 4,9 per cent.

It becomes clear, that women have better chances to become professors today than they had thirty years ago. The number of women professors increases year by year. But still they remain in a less prestigious position:

Firstly, women's participation within the professorship is lower at the old institutions and higher at the new institutions and university colleges. Even though Sweden does not rank its higher education institutions according to prestige, it can be assumed that the old institutions have more prestige, they have had research resources for a longer time and have shown their scientific credibility during the years. The new institutions have to prove their quality.

Secondly, there are new ways for women to advance on the academic career ladder. The promotion system was enforced in order to bring more women in top rank positions. But since a promoted professor has more teaching commitments and a lower salary than the recruited colleague, the promotion reform has to be seen rather as a cosmetic reform. More (female) academic staff is labelled "professor" but without having the same status.

4.2. Attractiveness to People inside Academia

Academia's attractiveness to people who already work inside the academy can be measured in different ways: By the level of autonomy and self-fulfilment, by the level of flexibility of working time or by the level of the salaries. Since the former two points could be better investigated by a questionnaire, the following part will mainly focus on the salaries partly in relation to the situation on other sectors on the labour market.

In general the situation on the labour market is rather good for postgraduates. 70 per cent of all doctorates find an employment within three months after their graduation. After three years 90 per cent of all postgraduates are employed in a permanent position. 45 per cent of all doctorates on the labour market are working in the higher education sector, 29 per cent are employed in the private sector and 26 per cent are working in the public sector. On the average, postgraduates receive a 45 per cent higher salary than undergraduates do. (Kim 2000: 45)¹⁴ To earn a postgraduate degree means to improve the chances on the labour market. That is why, from a general career perspective, a doctorate seems desirable. Another question is how desirable is an academic career?

In an international perspective it turns out, that Swedish doctoral candidates receive a rather good payment. (See table 15) A look at the salary distribution within Swedish higher education and comparable occupational groups gives a more differentiated picture. (See table 16) From 1992 to 1999 the doctoral candidates are the group with the lowest average salary increase in the higher

¹⁴ The numbers refer to the year 1999.

education sector, also in comparison with other occupational groups. (Increase by 21 per cent) Professors and research associates had the highest increase of average salaries in higher education during the same period. (Increase by 30 and 33 per cent)

Table 15: Salaries of PhD-candidates

COUNTRY	EARNINGS (STARTING MONTHLY SALARIES IN EURO)
Netherlands	1.079
Germany	Dependent on Position
Sweden	2.040
United Kingdom	882 (research grant)
Finland	1.500 (graduate school) 1.500-2.000 (employed by university)
Flanders	1.923 (research assistant) 2.382 (doctoral assistant)

Source: Huisman / Bartelse 2000: 91

Table 16: Average monthly Salary (SEK) of Academic Professional Groups and comparable Occupational Groups in State Sector 1992 and 1999

OCCUPATION	1992	1999	DIFFERENCE (99-92)
Academic professionals:			
Professors	30.000	39.000	+30 %
Senior lecturers	23.000	29.000	+26 %
Junior lecturers	19.000	23.000	+23 %
Research assistants	18.000	24.000	+33 %
Doctoral scholarship holders	14.000	17.000	+21 %
Government professionals:			
Of high rank	28.000	40.000	+41 %
Of lower / middle rank	18-22.000	24-31.000	+37 %
Legal professionals:			
Of high rank (magistrate)	27.000	38.000	+44 %
Of lower rank (clerk)	13.000	17.000	+29 %
All state sector	15.000	21.000	+38 %

Source: Kim 2000: 47

Again the question occurs if the level of salaries differs depending on the institution. If we compare the average salaries of academic staff that the old institutions with the staff of the new institutions, we have to admit that the differences are rather small. The level of the salary seems not to depend on the

age of the institution, but rather on its field of specialisation. Institutions like the Royal Institute of Technology and Blekinge Institute of Technology show higher levels of salaries compared with other institutions. (See also tables in the appendix.)

A comparison of the average salaries of top rank positions in academia with comparable occupational positions shows that the salaries for professors today are on the same level as high rank government professionals and legal professionals. But the increase of average salaries was higher in the latter two groups than for the professors. We might conclude a decreasing attractiveness of top rank positions in the higher education sector – at least in terms of salaries.

When it comes to the question of how attractive an academic career is to women, a closer look at the pay gap between women and men is necessary. A comparison between higher education and the private sector is difficult because the level of comparability between the available data is rather low. But based on the data available it is possible to see that the pay gap between women and men is smaller in the higher education sector than in the private sector. (See table 17)

Table 17: Average monthly Salary (SEK) of Employees holding Postgraduate Degree in Higher Education compared to Private Sector 1998

SUBJECT AREA OF DEGREE	PRIVATE SECTOR		HIGHER EDUCATION INSTITUTIONS	
	Men	Women	Men	Women
Humanities, arts	27.300	25.800
Social sciences, administration, law	29.000	26.300
Natural sciences, engineering	35.000	28.400	28.900	25.100
Medical sciences	..	34.000	31.600	25.800
Agriculture, forestry	44.100	..	29.600	24.500
Other			28.700	26.300
All areas	36.100	29.100	29.100	25.700

Source: Kim 2000: 48

From a general career perspective the private sector is more attractive in terms of salaries than the public sector of higher education. But at the same time the “protected environment” of the public higher education sector guarantees a more equal level of salaries for women and men.

4.3. The Leaky Pipeline

In the earlier parts of this paper the development of women’s participation within the studentship, the doctoral students and the academic staff was

elaborated. Even though women's participation is increasing with each year it has been shown that women's participation is decreasing the higher the academic position is. (See table 18) Somehow the system loses women along the academic career path. In order to describe the gradual loss of women from academia throughout the different levels on the career path, the term "leaky pipeline" is used. The scissors diagram (figure 11) shows what the leaky pipeline looked like in 1989 and in 1999. In 1999 the scissors is more closed compared to 1989. The studentship and the lectureship are exceptions here, but only in a minor way. In general one can conclude that women's participation in higher education have become more equal during this period.

Table 18: Women's Participation at Different Academic Levels 1988-2000

YEAR	STUDENTS	DOCTORAL STUDENTS	SENIOR LECTURERS	PROFESSORS
1988	57	32	17	5
1990	56	34	18	6
1992	56	35	20	6
1994	57	37	22	7
1996	58	39	23	9
1998	58	42	24	11
2000	59	43	27	13

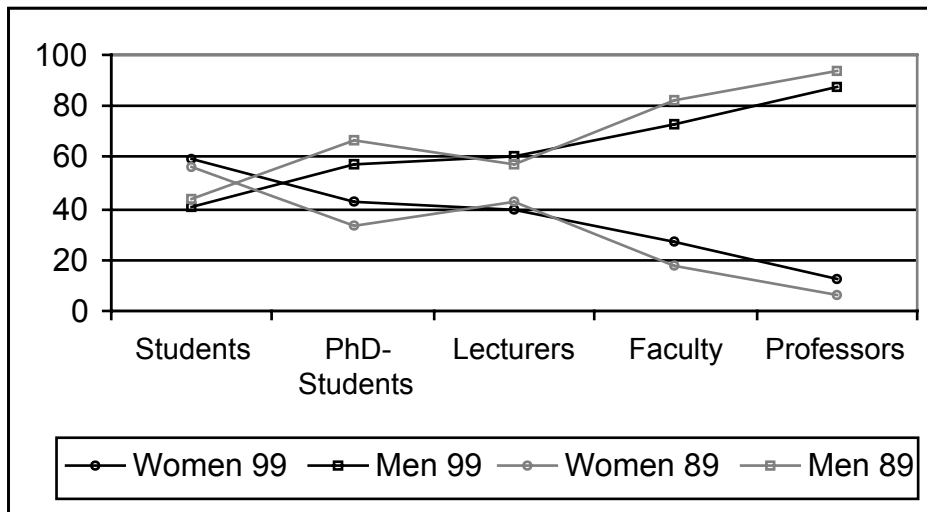
Source: Statistics Sweden UF 23 SM 0101

Figure 11 is interesting because it shows were on the academic career ladder the proportion between men and women changes in favour of men. Women are over-represented among students; they make 56 per cent of the studentship in 1989 and 59 per cent in 1999. Men, in contrast, are over-represented among PhD-students (67 per cent in 1989 and 57 per cent in 1999) and the other academic positions.

One possible explanation for this change in proportions would be the "hidden binary system" of Swedish higher education. The fact that Swedish universities respond for research and Swedish university colleges do not, has consequences for women's possibilities on the academic career ladder. The binary structure has consequences for both students' contact with research during their education and the academic career at these two types of higher education institutions. Institutions without research resources have a higher share of women students because they often are specialised in fields dominated by women. Women's share among the studentship is about 68 per cent in institutions without research resources - compared to 58 per cent in institutions with research resources (own calculations). This means that a larger cohort is more or less excluded from an academic career. Students at university colleges

do not have the same contact with research and researchers as students at universities, and in fact there is no way to start postgraduate education at a university college. The hidden binary structure in combination with the low mobility rate among Swedish academics has to be seen as one possible explanation for the lower participation of women at the level of PhD-students.

Figure 11: Women and Men in Academia in Sweden (in Percentages) 1989 and 1999



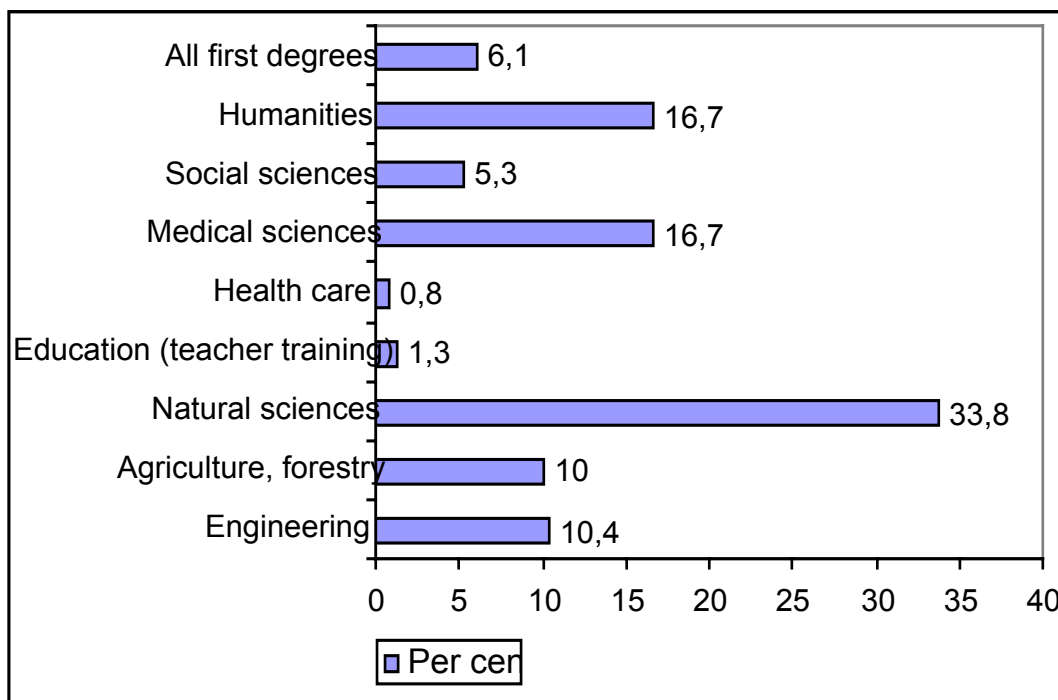
Own calculations based on: Statistics Sweden 2001c, 2001e

Another explanation is given in the transition rate from undergraduate to postgraduate studies. The overall transition rate was around 7 per cent in 1999/2000. (Kim 2000: 39) A look at the transition from undergraduate to postgraduate studies broken down by disciplines shows that the rate is much lower in disciplines dominated by women. The transition rate in health care, education and social sciences is clearly below the average. (See figure 12)

The binary structure in Swedish higher education may be one reason for the patterns in transition rates. But another possible explanation has to be taken into account: In 1998 a reform was enacted that demanded that applicants for postgraduate education must have guaranteed funding – post or grant – to be admitted. As a result problems for the “poor” disciplines¹⁵ like humanities and social sciences occurred. The number of new entrants in these fields is declining. As a consequence the situation today is rather paradox: In areas like technology and natural sciences, there are not enough applicants to fill the vacant places in postgraduate education. In the women-dominated fields like humanities or social sciences the competition to postgraduate education is hard. (Kim 2000: 39)

¹⁵ “Poor” refers here to the rather limited possibilities to attract external financial sources in fields like humanities or social sciences.

Figure 12: Percentage of First Degree Students 1989/90 – 1993/94 enrolled in Postgraduate Education (within 3-4 years after graduation) by Discipline



Source: Kim 2000: 40

In result, the demand that every PhD-student needs a guaranteed funding can be seen as an obstacle that changes the overall proportion of women and men among PhD-students in favour of men. But on the other hand it can also be seen as a possibility for women in male-dominated disciplines. Since fields like technology have bigger capacities, vacant places and as the number of postgraduates educated at a certain institution also mean prestige, women could fill in the “missing” PhD-students. This could lead to a stronger feminisation in fields, which today are male-dominated.

Nevertheless, not only the representation of women and men is unequal in Swedish higher education, so is also the level of qualification. A look at the percentage of women and men with a doctoral degree among the teaching staff shows a higher percentage among male teaching staff than among female teaching staff. Even though the percentage varies from 33 to 92 per cent for the male staff with a doctoral degree depending on the institution, the responding numbers for women are clearly lower – 16 to 85 per cent. (See also tables VI and VII in appendix.) In result we have to state that women are not only underrepresented but also lack academic qualifications. As it is hard to believe that women simply have no ambitions to advance on the academic career ladder the explanation of women’s under-representation and lack of qualification has to be found with a different approach. A statistical overview can elaborate overall developments and give a picture of the status of institutions and the women

within them. Questions concerning the study- and working conditions, systems of support and motivation just as women's and men's perception of their academic environment would be helpful to explain the formation of the leaky pipeline. But this can not be answered in this paper since a survey or a rather qualitative approach are more useful in this case.

Summary

One of the main purposes of this paper was – from a statistical point of view – to try to find the points on the Swedish academic career ladder that are critical for women. Critical in the sense that women seem to drop out at these points, that academia presents obstacles for women on their way up on the career ladder. In order to simplify the Swedish career path and to make it comparable with other career ladders a three-level-model was suggested in the second chapter. The data presented in this paper showed mainly the following things:

- 1.) The first critical step for women is to reach the first level on the academic career ladder. The participation rate of women and men is changing from the students' level to the level of PhD-students in favour of men. As possible reasons the "hidden binary structure" of Swedish higher education, the low transition rate in women-dominated fields and the demand of guaranteed funding for PhD-students were pointed out.
- 2.) The lectureship was characterised as a feminised but also as a rather insecure starting point for an academic career. This position does not offer the same opportunities to get involved in research as the position of a doctoral candidate does.
- 3.) In general a "lack of a postdoctoral career" (Kim 2000:36) was found. The number of positions of research associates did not grow at the same pace as the numbers of PhD-students or senior lecturers. Even though the second level of the suggested model – namely the position of research associates – turn out to be a bottleneck, women do rather well on that level. Women's participation rate among research associates increased strikingly during the second half of the 1990's.
- 4.) The third or final level seems to be improving for women. The participation rate of women has increased during the last years and the average success rate for women applying for professorships (20 per cent) is higher than the recent participation rate (13 per cent). This will certainly promise an increasing share of women professors even in the future. In contrast the paper showed also the need for a further investigation of this rather promising picture, because there are first signs that the promotion reform of 1999 could lead towards two classes of professorships. Depending on the academic field the impact of these two classes might be gendered.

A second purpose of the training paper was to elaborate the attractiveness of Swedish academia. Attractiveness was here understood in three ways: Firstly, as attractiveness to financial sources, measured by Sweden's expenditure in higher education. Secondly, as attractiveness to future cohorts, which mainly means upper secondary school leavers. Thirdly, as attractiveness to people within academia. Here the main focus was put on salaries, as it was assumed that

possible opportunities for earning money influence the decision to seek an academic career.

The data provided show that Swedish higher education policy and the institutions of higher education are in a challenging situation. Even though the enlargement of the higher education system is an expressed political aim, the expenditure on higher education could not grow at the same pace as the numbers of students or academic staff. Additionally, people – and especially women – tend to stay longer in education plus that the school leavers' interest in higher education was not increasing during the end of the 1990's – rather the opposite was true. In result, a larger number of (older) students is staying longer in higher education while the state is not able to finance the whole enlargement of the system. This will probably enforce market tendencies, as higher education institutions have to find external financial sources to keep their academic standard high. A development in which certain fields – possibly even higher education institutions – may loose because they have difficulties to attract financial sources. These fields may be the humanities, health related sciences or social sciences – fields traditionally dominated by women.

The data concerning salaries show a rather ambiguous picture. In terms of attractiveness of salaries the private sector seems to be more desirable compared to the public higher education sector, because the salaries are remarkable higher. Even comparable occupations in the public sector are on the way to overtake leading salary levels in higher education. In terms of gender equality concerning salaries the higher education sector seems to be more desirable as the pay gap between men and women is much smaller than in the public sector.

Thinking about the concept of best practise it becomes obvious that a pure statistical approach can not provide a satisfying answer concerning women's status in higher education. To look exclusively on the participation and success rates of women professors may give a misleading picture, because such a perspective is blind to the context, which means to the possible development of a two-class system for professors. To measure academia's attractiveness to people starting an academic career only by salary means to exclude the status of the academic position itself or personal motivations of scientific interest and ambition.

In general a concept of best practise has to include three levels which complete each other. A statistical approach that provides data to place women in the system of higher education. An analysis of the context (political developments and aims, ideologies and so on) that gives more needed information for a sufficient interpretation of the statistical data. A focus on the personal (micro) level that allows asking for ambitions, values and a private context. A combination of these three levels – this means a mix of different methods - will lead to more detailed analysis of women's participation and situation in academia.

Glossary

Doctoral Candidate

The doctoral candidate is the first step on the academic career ladder. The candidate usually takes part in a post-graduate training or research programme.

Gender Equality

Gender equality refers to a situation in which all human beings are free to develop their personal abilities and make choices without limitations set by strict gender roles. The different behaviour, aspirations and needs of women and men are equally valued and favoured. (European Commission 2001:53)

Gender Impact

There are substantial differences in the lives of women and men in most fields. These differences may cause apparently neutral policies to impact differently on women and men and reinforce existing inequalities. This is known as gender impact. (European Commission 2001: 53)

Horizontal Gender Segregation

Horizontal segregation refers to concentration rates in certain occupational sectors or disciplines. (European Commission 2001:54)

Institutions of Higher Education

Institutions of higher education are all institutions which 1. Enable students to enter doctoral courses or post-graduate programmes, 2. Award doctoral degrees and 3. Offer post-graduate posts such as research positions.

Leaky Pipeline

The term used to describe the gradual loss of women from science throughout the career path, even though women and men go into higher education in equal numbers. (European Commission 2001:54)

Lecturer

The lectureship can also be seen as a first step on the academic career ladder, it is the only academic position that does not require a doctorate. A lectureship implies mostly teaching commitments, but can also enable the lecturer to work on a PhD-thesis.

Professor

A professorship is defined as the top rank position in the system of higher education. It is a position mostly concerned with research.

Research Associate

Time limited academic position with solely research commitments. A doctorate is required. This post is defined as a second step on the academic career ladder.

Senior Lecturer

The senior-lectureship can also be defined as a second step on the academic career ladder. It is a position with both teaching and research commitments. A doctorate is required.

Students

Students are all persons who are enrolled as students at institutions of higher education.

Vertical Gender Segregation

Vertical segregation concerns the position of women and men within the hierarchies of science. (European Commission 2001:54)

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Appendix

I. Universities and University Colleges in Sweden 2000

Institutions of Higher Education with Research Resources

State

Uppsala University
Lund University
Göteborg University
Stockholm University
Umeå University
Linköping University
Karolinska Institute
Royal Institute of Technology
Luleå University of Technology
The Swedish University of Agricultural Sciences
Karlstad University
Växjö University
Örebro University
Kalmar University College
Blekinge Institute of Technology
Malmö University College
Mid Sweden University College
Mälardalen University College

Private sector

Chalmers University of Technology
Stockholm School of Economics
Jönköping University College

University Colleges

State

Borås University College
Dalarna University College
Gotland University College
Gävle University College
Halmstad University College
Kristianstad University College
Skövde University College
Stockholm University College of Physical Education and Sports
Stockholm Institute of Education
Södertörn University College
Trollhättan / Uddevalla University College

Private sector

Erica Foundation
Ersta Sköndal University College
Gammelkroppa School of Forestry
Johannelund Theological Institute
Stockholm School of Theology
Örebro Theological Seminary

University Colleges of Arts*State*

University College of Dance
University College of Film, Radio, Television and Theatre
University College of Arts, Craft and Design
Royal University College of Fine Arts
Royal University College of Music in Stockholm
Stockholm University College of Opera
Stockholm University College of Acting

Regional Authority

Ingesund College of Music

Private sector

University College of Music Education in Stockholm

University Colleges for Health Sciences*Regional Authority*

Jönköping University College of Health Sciences

Private sector

The Swedish Red Cross University College of Nursing and Health
Sophiahemmet College of Health Sciences

Source: National Agency for Higher Education 2001a

II. Enrolled Students 1969 – 2000

YEAR	TOTAL NUMBER	PERCENTAGE OF WOMEN
1969	113.600	39
1970	120.100	38
1971	115.900	37
1972	113.600	38
1973	110.000	38
1974	108.522	39
1975	110.012	40
1976	113.046	41
1977	148.386	52
1978	156.711	53
1979	154.541	54
1980	158.280	55
1981	158.379	55
1982	163.114	56
1983	163.685	-
1984	164.601	56
1985	162.859	-
1986	161.366	56
1987	163.075	-
1988	166.230	57
1989	164.935	56
1990 ¹⁶	203.185	57
1991	221.933	57
1992	241.855	57
1993	256.297	56
1994	269.667	57
1995	285.753	57
1996	300.948	58
1997	305.348	58
1998	310.250	59
1999	319.076	59
2000	330.156	60

Source: Statistics Sweden 1978, 1981, 1981a, 1983, 1985, 1987, 1989, 1991, 1992; Homepage of Statistics Sweden

¹⁶ From 1969 until 1989 the data refer to the autumn-term. From 1990 the data refer to the academic year.

III. Active Doctoral Students 1969 - 1999

AUTUMN SEMESTER	TOTAL NUMBER	PERCENTAGE OF WOMEN
1969 ¹⁷	8.800	22
1970 ¹⁸	9.800	21
1971 ¹⁹	10.800	22
1972	10.900	21
1973	11.200	21
1974	11.200	22
1975	11.600	23
1976	11.800	23
1977	12.100	23
1978	12.100	24
1979	12.100	25
1980	12.000	25
1981	12.300	26
1982	12.600	27
1983	13.000	28
1984	13.100	29
1985 ²⁰	11.800	30
1986	12.100	30
1987	12.400	31
1988	12.900	32
1989	13.100	33
1990	13.200	34
1991	14.000	35
1992	14.300	35
1993	15.400	36
1994	15.500	37
1995	15.500	38
1996	16.600	39
1997	17.700	41
1998	18.600	42
1999	18.500	43

Source: Statistics Sweden 2001d

¹⁷ In 1969 Psykology is not included.

¹⁸ In 1970 Psykology is not included.

¹⁹ From 1971 on all numbers are net amounts.

²⁰ The numbers of 1985 refer only to the autumn-term.

IV. Academic Staff 1984 - 2000

YEAR	LECTURERS		RESEARCH ASSOCIATES		SENIOR LECTURERS		PROFESSORS	
	Total	Women	Total	Women	Total	Women	Total	Women
1984	5.152	-	501	-	3.379	-	1.571	-
1985	5.105	-	497	-	3.462	-	1.608	-
1986	4.937	-	535	-	3.460	-	1.679	-
1987	4.866	2.102	578	131	3.769	636	1.742	84
1988	5.077	2.173	702	156	4.059	686	1.843	97
1989	4.962	2.130	824	188	4.224	709	1.890	107
1990	4.838	2042	913	197	4.201	762	1.985	129
1991	5.148	2.161	910	208	1.163	850	2.025	128
1992	5.685	2.385	1.017	251	4.700	925	2.061	130
1993	5.912	2.474	1.119	271	4.980	1.055	2.094	145
1994	6.089	2.585	1.141	295	5.170	1.126	2.187	160
1995	6.282	2.838	1.030	278	5.325	1.167	2.177	172
1996	6465	2.946	1.177	349	5.629	1.302	2.264	193
1997	6.333	2.880	1.167	396	5.515	1.271	2.529	272
1998	7.059	3.535	1.226	451	6.042	1.460	2.390	261
1999	7.634	3.943	1.170	443	6.058	1.536	2.671	319
2000	8.029	4.205	1.102	442	5.837	1.576	3.251	414

Source: Statistics Sweden 2001e

V.Salaries at different stages at the academic career ladder in 2000²¹**Salaries for Doctoral Candidates in SEK**

OLD INSTITUTIONS (FOUNDED BEFORE 1977)			NEW INSTITUTIONS (FOUNDED AFTER 1977)		
Institution	Average Salary in SEK	Average Age	Institution	Average Salary in SEK	Average Age
Uppsala University	17.009	32	Swedish University of Agricultural Sciences	17.804	33
Lund University	17.872	32	Karlstad University	18.263	31
Göteborg University	18.230	34	Växjö University	17.528	35
Stockholm University	17.448	34	Örebro University	17.197	33
Umeå University	17.185	34	University College of Kalmar	18.300	34
Linköping University	19.102	31	Blekinge Institute of Technology	20.321	35
Karolinska Institute	18.752	36	Malmö University	18.609	40
Royal Institute of Technology	19.630	31	Mid Swed University	18.352	34
Luleå University of Technology	19.485	31	University College of Mälardalen	18.082	33
Chalmers University of Technology	18.944	30	University College of Jönköping	17.829	32
Stockholm School of Economics					
Average	18.366	32,5	Average	18.229	34

Source: SULF 2001, own calculations

²¹ Some of the institutions of higher education received their research resources in 2000, this explains why there are no data about research associates or professors.

Salaries for Lecturers in SEK

OLD INSTITUTIONS (FOUNDED BEFORE 1977)			NEW INSTITUTIONS (FOUNDED AFTER 1977)		
Institution	Average Salary in SEK	Average Age	Institution	Average Salary in SEK	Average Age
Uppsala University	24.035	49	Swedish University of Agricultural Sciences	24.163	44
Lund University	24.024	48	Karlstad University	22.975	47
Göteborg University	23.990	50	Växjö University	22.958	47
Stockholm University	22.181	49	Örebro University	23.239	48
Umeå University	22.155	45	University College of Kalmar	23.182	46
Linköping University	23.355	47	Blekinge Institute of Technology	24.550	45
Karolinska Institute	23.142	50	Malmö University	25.103	48
Royal Institute of Technology	27.362	50	Mid Swed University	23.730	47
Luleå University of Technology	23.911	46	University College of Mälardalen	24.837	48
Chalmers University of Technology	24.650	49	University College of Jönköping	24.255	49
Stockholm School of Economics					
Average	23.881	48,3	Average	23.899	46,9

Source: SULF 2001, own calculations

Salaries for Research Associates in SEK

OLD INSTITUTIONS (FOUNDED BEFORE 1977)			NEW INSTITUTIONS (FOUNDED AFTER 1977)		
Institution	Average Salary in SEK	Average Age	Institution	Average Salary in SEK	Average Age
Uppsala University	25.614	41	Swedish University of Agricultural Sciences	25.790	40
Lund University	24.124	39	Karlstad University		
Göteborg University	26.093	42	Växjö University		
Stockholm University	23.846	41	Örebro University		
Umeå University	24.045	40	University College of Kalmar		
Linköping University	25.844	39	Blekinge Institute of Technology		
Karolinska Institute	25.963	41	Malmö University		
Royal Institute of Technology	28.384	38	Mid Swed University		
Luleå University of Technology	27.611	41	University College of Mälardalen		
Chalmers University of Technology	27.054	36	University College of Jönköping		
Stockholm School of Economics					
Average	25.858	39,8	Average	25.790	40

Source: SULF 2001, own calculations

Salaries for Senior Lecturers in SEK

OLD INSTITUTIONS (FOUNDED BEFORE 1977)			NEW INSTITUTIONS (FOUNDED AFTER 1977)		
Institution	Average Salary in SEK	Average Age	Institution	Average Salary in SEK	Average Age
Uppsala University	29.325	50	Swedish University of Agricultural Sciences	30.811	49
Lund University	30.234	50	Karlstad University	28.861	50
Göteborg University	29.547	52	Växjö University	29.512	50
Stockholm University	27.278	51	Örebro University	29.306	50
Umeå University	28.008	49	University College of Kalmar	28.466	48
Linköping University	30.175	48	Blekinge Institute of Technology	32.278	47
Karolinska Institute	32.825	51	Malmö University	29.825	48
Royal Institute of Technology	33.578	50	Mid Swed University	30.340	48
Luleå University of Technology	31.118	48	University College of Mälardalen	30.119	51
Chalmers University of Technology	31.080	48	University College of Jönköping	30.413	52
Stockholm School of Economics					
Average	30.347	49,7	Average	29.993	49,3

Source: SULF 2001, own calculations

Salaries for Professors in SEK

OLD INSTITUTIONS (FOUNDED BEFORE 1977)			NEW INSTITUTIONS (FOUNDED AFTER 1977)		
Institution	Average Salary in SEK	Average Age	Institution	Average Salary in SEK	Average Age
Uppsala University	41.961	55	Swedish University of Agricultural Sciences	37.679	53
Lund University	38.488	54	Karlstad University	39.075	51
Göteborg University	39.271	54	Växjö University	40.915	53
Stockholm University	36.949	54	Örebro University	42.790	52
Umeå University	38.123	53	University College of Kalmar		
Linköping University	40.958	54	Blekinge Institute of Technology	43.230	51
Karolinska Institute	42.631	54	Malmö University		
Royal Institute of Technology	46.155	53	Mid Swed University		
Luleå University of Technology	42.680	52	University College of Mälardalen		
Chalmers University of Technology	43.651	53	University College of Jönköping	42.185	58
Stockholm School of Economics					
Average	41.087	53,6	Average	40.979	53

Source: SULF 2001, own calculations

VI. Women and Men in Swedish Institutions of Higher Education (Old Institutions, founded before 1977)

INSTITUTION OF HIGHER EDUCATION	NUMBER OF STUDENTS		NUMBER OF TEACHING STAFF		PERCENTAGE OF TEACHING STAFF WITH DOCTORAL DEGREE		NUMBER OF PROFESSORS	
	Women	Men	Women	Men	Women	Men	Women	Men
Uppsala University	12.745	8.190	439	990	49	75	51	378
Lund University	13.206	11.643	513	1.296	57	81	44	400
Göteborg University	16.505	8.747	540	857	40	70	62	282
Stockholm University	14.746	8.842	319	673	65	80	54	232
Umeå University	10.609	6.563	470	805	46	69	27	190
Linköping University	9.164	7.887	483	648	36	76	25	184
Karolinska Institute	4.227	1.225	350	385	46	92	37	215
Royal Institute of Technology	3.302	8.262	91	610	53	65	11	172
Luleå University of Technology	4472	4011	160	380	24	57	2	60
Chalmers University of Technology	2.105	5.966	77	536	85	80	11	175
Stockholm School of Economics	475	926	10	91	71	86	1	40

Source: National Agency for Higher Education 2001b

VII. Women and Men in Swedish Institutions of Higher Education (New Institutions, founded after 1977)

INSTITUTION OF HIGHER EDUCATION	NUMBER OF STUDENTS		NUMBER OF TEACHING STAFF		PERCENTAGE OF TEACHING STAFF WITH DOCTORAL DEGREE		NUMBER OF PROFESSORS	
	Women	Men	Women	Men	Women	Men	Women	Men
Swedish University of Agricultural Sciences	2.372	1.578	137	363	70	80	32	154
Karlstad University	5.465	3.299	160	252	25	46	5	25
Växjö University	4.692	3.091	96	198	28	42	5	20
Örebro University	5.966	3.207	147	200	24	44	3	19
University College of Kalmar	3.408	2.341	99	177	23	33	2	7
Blekinge Institute of Technology	1.659	1.930	57	107	31	52	6	17
Malmö University	6.473	3.101	219	213	30	43	5	18
Mid Sweden University	6.380	4.388	170	289	16	37	2	12
University College of Mälardalen	5.366	3.504	163	236	21	37	2	17
University College of Jönköping	2.991	2.322	50	117	22	42	4	19

Source: National Agency for Higher Education 2001b