OECD THEMATIC REVIEW OF TERTIARY EDUCATION

COUNTRY BACKGROUND REPORT FOR SWEDEN

Research overview
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Overview of research regarding tertiary education in Sweden – final version 2005-10-24

Preface

Sweden is one of the countries participating in the OECD project entitled "Thematic Review on Tertiary Education." The Swedish country background report to the project has been prepared by the National Agency for Higher Education on behalf of the Swedish Government. The OECD states in its guidelines for the project that research regarding tertiary education should be included in the preparation of the background reports. In order to meet this request, and thus to supplement the Swedish background report, the National Agency for Higher Education has contracted Dr. Susan Marton, Karlstad University, to prepare a brief overview of important research questions and results during the last decade. The overview is therefore not a complete review of all the research in the area, nor does it constitute an endorsement of the specific research mentioned in the text. The author herself is solely responsible for the selection and depiction of the researchers and publications cited in this overview, as well as for its other content. The views and opinions cited or expressed in the document are not necessarily those of the National Agency for Higher Education, or of the Swedish Government.

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The author's background notes to this Overview of the Research

The following report has been completed by Susan Marton, Associate Professor, Political Science Department, Karlstad University, Sweden. The task has been to present a short overview of some of the most recent research regarding issues facing the higher education system of Sweden. It is important to note that the research field of higher education is not an especially large field in Sweden and today it is rather diffuse in its organizational setting (compared to twenty years ago when the Swedish Council for Studies in Higher Education was a major financier for research programs). Lately the situation has improved somewhat with the creation of an independent research institute, the Swedish Institute for Studies in Education and Research in the year 2000. Given the broad nature of the field, various materials and sources have been collected for this review, including not only established research publications, but also research reports and working papers from diverse research centres and public authorities. The main guidelines for selecting materials have been: a) a publication date generally within the last ten years, b) publications in English when possible, and, c) a listing in the LIBRIS (The National Library of Sweden) card catalogue when possible for easier reference location by interested readers.

The overview presented here has been conducted during a 30 day time-frame. Therefore, this report should not be viewed as an evaluation of the research presented, nor does it claim to be a complete review of all Swedish research on these topics. It is quite possible that other research reports exist which present a contrary position to some of the research reviewed here. Thus it is important to keep in mind that this "Overview of the Research" does not attempt to endorse or refute the results of the research presented here. The presentation has a tone of generality rather than intensive depth given the framework for the task. Emphasis has been placed on higher education and research, thus continuing education programs and advanced vocational education have received limited coverage. One should also be aware that the bibliography only contains works referred to in this text. It is therefore not to be viewed as some type of literature list for the field in general.

This overview is prepared on the basis of the chapters outlined in the OECD guidelines for the preparation of the country background reports. It begins with a section on tertiary education and the labour market, corresponding to section 3 in the guidelines. Sections 1 (Introduction) and Section 2 (Overall Description of the Tertiary Education System) have been omitted since they are of a more descriptive character. . The terminology used in this overview attempts to follow that used in the Högskoleverket report, thus universities and university colleges will be referred to as "HEIs", meaning "Higher Education Institutions". The overview is concluded by some reflections by the author on what she identifies as the main challenges for the future.

3. The Tertiary Education System and the Labour Market

3.1 Demand and Supply Issues Regarding Tertiary Graduates

There are various ways to approach the study of the supply of and demand for tertiary education in relation to the labour market. However the research briefly reviewed here takes primarily a national economic perspective, focusing on incentives to acquire an education.

Stenberg and Wikström (2000) analyze the effect of education (attaining an academic degree) on employment for Swedish males between the ages of 21-45. The background to their study is previous research which finds that well-educated individuals are less-likely to be unemployed than those who are unskilled. Thus education has been seen as a good bet against unemployment risks and investments to acquire an education are viewed as beneficial from the individual perspective. However, Stenberg and Wikström argue that the evidence at the macro level is more ambiguous, thus the motivation for their study of the Swedish macro-level situation in two time frames 1984-90 (during an economic boom) and 1991-96 (during a recession). The authors find that educational attainment has a positive effect on employment rates, and furthermore, that this effect is more important during periods of recession. This leads to policy conclusions that education as a short-term measure to increase employment during recessions could be beneficial. However, the data does not allow for an interpretation of the long-run consequences.

Another way of studying the supply and demand issue is to analyze the match between individuals' competency levels and those required by employers on the job market. Based on data from 1974 to 2000, le Grand et al. (2002 and 2004) conclude that the expansion of education in Sweden has resulted in an increase in the supply of well-educated workers which has not been equally met by an increase in employers' demand for these skills. Le Grand et al. also argue that when analysing this matching process between individual competencies and the job market requirements it is also important to study the "type of education" required instead of focusing on the more typical "length of education". With such an analysis, researchers can find out whether the matching process should be interpreted as being "miss-directed", rather than just an "over-supply" of well-educated persons. Le Grand et al. find however that three-fourths of educated persons with high competency jobs in Sweden are correctly matched in regards to the type of education the job requires. Thus they reject the assumption that the growing share of "overeducated" persons is based primarily on an increase in "miss-qualifications". Yet, other researchers warn of the difficulties involved in calculating the supply and demand factors of an educated work force without taking into consideration the effects of miss-matching on the ways in which employers recruit workers, on the ways in which individuals make their educational choices and on the ways in which education is supplied (Ds.2002:47, p.129). These researchers also point out that the knowledge and competence which individuals acquire through education according to their own interests can provide a stimulus in society, contributing to the creation of new jobs and the need for new competencies on the job market (Ds. 2002:47, p.131).

Henrekson and Rosenberg (2000) have identified two problems in the demand and supply mechanism in the labour market for higher education: 1) the lack of incentives for students to study at high levels in the system and, 2) the lack of incentives for HEIs to make curriculum changes to match employers' needs. Citing an OECD study from 2000, Henrekson and Rosenberg point out that Sweden had the lowest "university salary premium" (i.e. return on investment for university studies) of the 19 countries studied. As for the topic of curriculum changes, Henrekson and Rosenberg cite an international comparative study (Etzkowitz, Asplund and Nordman, 2000) which has documented, through an interview study, the difficulties in quickly changing course content and/or introducing a new knowledge field into the traditional Swedish universities.

Lindahl and Regnér (forthcoming) also address the incentives issue by looking at the relationship between choice of HEI and subsequent earnings upon graduation. Their findings show that earnings vary significantly depending on what type of HEI the student chooses to graduate from. The "earnings

differential" has been in favour of the older, traditional universities. However, when the data is analyzed from the point of view of how many teachers at the HEI have doctoral degrees, the effect of the older, traditional universities is no longer statistically significant. The explanation for this remains unclear, but one possibility may be that a link to general quality levels may exist. Furthermore, the study finds large differences between earnings for men and women (even if they went to the same HEI), but the results only hint at possible explanations, such as different job networking arrangements, employer discrimination and differences in earnings between occupations. Thus, Lindahl and Regnér conclude that although the choice of HEI affects future earnings, further research is required to understand the mechanisms behind these results.

Researchers have also been interested in the issue of when it is most economically profitable for the individual to undertake a long-term investment in education. In a static, unchanging world, it is certainly best to complete an education as soon as possible, in order to reap the economic rewards for many years after. However, in a dynamic, quickly-changing world, it is possible that knowledge becomes out-dated, and another type of economic calculation is necessary. In this situation, it can be economically advantageous to return to the education system after having gained work experience (Ds.2002:47, p.89). Öckert (2001) reaches such a conclusion after studying adults returning to higher education after more than four years of working experience. The adult group of students had a higher chance of receiving a job afterwards in comparison to other student groups and they also had higher future incomes (cited in Ds.2002:47, p.88).

Other issues at the national level are the low mobility rates of graduates. A study from 2002 found that at twelve HEIs, more than 60% of the graduated students lived in the same county as where the HEI was located (Regnér and Gartell, 2002). There are many possible explanations for why students consider the costs to move away as too high – family, friends, housing situation, public transportation problems, etc. but further research is needed to pinpoint these exactly.

3.2 Lifelong Learning

Askling and Foss-Fridlizius (2000) trace the national policy background of adult education in Sweden from the 1930's to today. During the 1970s, it was a well accepted idea that periods of work and study should be interchangeable. In addition, at this time there was a trust in the capacity of the system to manage the educational needs and to forecast the needs of the labour market. By making structural adjustments in both, the government could try to accomplish full employment and equality. Askling and Foss-Fridlizius find that with the arrival of the 1977 reform of higher education, many traits of adult education were present in policy documents, even if they were not labelled so. During the early 1990's, faith in the Swedish welfare-state model began to waiver, and the strategic role of education became much more important as a tool for meeting unforeseen demands in the labour market (see also Bladh, 1999). The focus was now to be on individual competences, economic growth and competitiveness in international markets.

After outlining these changes, Askling and Foss-Fridlizius ask the question of whether the current organizational structures are the most appropriate for today's needs for lifelong education. The analysis showed that since the 1960's, support has existed for lifelong learning policy (the policy-making has gone through various cycles, such as "adult education" and "recurring education" to the ideas of "lifelong education" today.) Regardless of these various policy cycles, Askling and Foss-Fridlizius conclude that there is a general consensus on the political, economic and social goals of the policies even today. Yet, two problems for the future of lifelong learning are outlined. First, citing Sohlman (1999), Askling and Foss-Fridlizius state that it is questionable to what extent the original ideas regarding economic and social equality are still in place since the ideological context of higher education in general has changed. Second, there is a much greater degree of institutional autonomy today for Swedish HEIs and whether this will be used to promote lifelong learning programmes is uncertain. Along with the growing dependency of HEIs on market-like conditions for attracting students and contract research, there are now many new actors making claims and trying to set the HEI's agenda. Whether the individual learner will be put first in this process remains to be seen.

3.3 Advanced Vocational Education (AVE)

(Note: This section is in addition to the discussion of AVE already in the HSV document.)

Lindell and Johansson (2003) have found the AVE to be quite successful given that about 80% of the graduates found work within the field of their education and training. It appears that the strategy of AVE, including the decentralization of the design and implementation of the program to the local actors and a curriculum which allows for training from a variety of educational bodies, has had a positive effect on how graduates are met on the labour market. However, Lindell and Johansson's survey data showed that only 53.1% of the students felt that AVE had helped them achieve a salary increase. The authors conclude that this is an issue for concern given that students had to finance their education with financial aid and loans. According to Lindell and Johansson, further research should focus on the terms and forms of employment for graduates of AVE.

3.4 International Labour Market

According to the Swedish Confederation of Professional Associations (SACO), 1.5% of graduates in the class of 1990 moved abroad directly after receiving their undergraduate degree. Ten years later, the number had increased to 5% of the graduating class of 1990 lived abroad (including those who had already moved directly). Recent trends show that the number of graduating students moving abroad is on the rise (2.4% for those graduating in 1994). Given the expectations that international contacts will increase in the future, it is predicted that the number of graduates moving abroad will continue to rise (Regnér & Gartell, 2002:40-41).

4. The Regional Role of Tertiary Education

The quite profound expansion of regional HEIs in the 1990's has been a source for debate. In reviewing this debate, Sörlin and Törnqvist (2000) claim to have found unclear arguments motivating the construction of new regional university colleges during the 1990's. They state that, on the one hand, the expansion was motivated by the desire for a type of "national economic justice", in order to provide economic compensation for the closure of factories and state-owned companies or for problems related to difficult social issues. On the other hand, the authors argue that there are comprehensive economic arguments from a societal point of view which did not come to the forefront of this debate. In addition, because the development of the university colleges in the regions included the dispersion of more research funds, the debate arose regarding whether a "critical mass" was needed in order to produce high quality research. Depending on who is asked and what interests they have, the answers regarding issues of expansion have varied in the debate. This has also led to a discussion on the internal organization and quality of the university and its research environments. Furthermore, according to Sörlin and the "Humboldt Ian traditional" university role began to be questioned as the "entrepreneurial" university, with societal and commercial goals, became more popular with the stakeholders in higher education (the state, the businesses, the regions and the taxpayers).

Westlund (2003) also reviews the national higher education and regional policies and finds some important conflicts in the goals. The author states that there is a desire to embrace the benefits of academic freedom and the need for research on the highest international levels, while at the same time, HEIs are required to cooperate with the surrounding society, something which has traditionally been seen as causing value conflicts and which can discredit the academic value of research.

Not withstanding the debate outlined above, many researchers studying regions and HEIs emphasize four recent developments which the HEIs are responding to and which have significantly contributed to the recent importance of the regional role of the HEI's. These are: the new and expanding

relationships with Europe, the increased globalization of markets, the increasing amount of R&D in production, and the Swedish state's partial withdrawal of responsibility for the regions' economic development.

4.1 Increasing Access to HEIs and Raising Education Levels in the Regions

In looking at various aspects of regional development and the role of higher education, Wikhall (2001) argues that one of the most important factors in recruitment to higher education is access to an HEI. In addition, as access to higher education increases, there is an increase in recruitment density over time. Thus, Wikhall finds the region's social structure to be a very important explanation, even more important than geographic closeness to an HEI. The idea that those from non-academic families and who live far away from HEIs face more barriers to higher education than other groups receives only little empirical support in Wikhall's study (see Eliasson, 2001 for a similar finding).

The Wikhall study, presented in Sörlin and Törnqvist (2000) and in Wikhall's doctoral dissertation from 2001, reviews where students are born and where they lived one year before being accepted to higher education. Wikhall's main research question asks which factors influence the recruitment of students. A multiple regression analysis of socio-economic variables and regional conditions is used to analyze how students are influenced over three time periods (73/74, 83/84, 93/94). According to the study, the most important variable is the educational tradition in the regional environment. In environments with already high levels of academic attendance there is a higher tendency to continue, and these trends hold in all time periods. Checking against social class background and income level, Wikhall concludes that the data shows that educational tradition outweighs the other factors.

In addition, Wikhall claims that the students' current situation on the job market explains partly their decision to attend higher education (see also Eliasson, 2001 for a similar finding). When the job market is good, fewer students attend HEIs, when the job market is weak, more students are registered. The study also finds that the level of urbanization in the region is no longer an explanatory factor. Students from sparsely populated areas were more likely to attend an HEI than those from urbanized areas (for the 1980 and 1990 data). Lastly, the availability of HE in ones' own region (given the expansion of HE), is no longer influencing the recruitment patterns as strongly as before. The average for the country is 48% of students at an HEI have come from the region where the HEI is located. But the difference between HEIs across the country is very large, for example Stockholm and Göteborg, being the largest cities in the country, have students coming primarily from these cities (for example Stockholm University received 84% of students from the region). For schools that are not in big city regions, like Uppsala with 27%, Linköping with 29%, and Umeå with 33%, the recruitment area is much wider.

The next question asked in the study is whether these recruitments are possible because of the HEIs' attractiveness. The authors admit that there are many methodological problems with this type of analysis when trying to do a ranking of universities. Yet, it is possible that some young adults can judge the quality difference in the educational program. Given that the research has shown that a variety of social factors influence whether or not a student enters HE, it is also likely that these factors also influence which HEI the student chooses. Given the quite significant differences in climate in Sweden, the study states that the possibility of this factor influencing choice should also be seriously considered. (At the present time, there is no data to help answer such a question).

Wikhall also finds that in regions with previously remote access to HEIs, the share of individuals now getting more education has increased. In addition, one and a half years after their degrees were awarded, about half the students choose to stay in the region where they were educated, and the other half moved on. Yet there was wide variation in the results depending on how large the region was. For example, in Stockholm, most graduates could remain in the region (and Stockholm also needed to import students from other regions to meet labour market demands). Other regions where students could remain and find jobs were Malmö/Lund, Göteborg, Linköping, Karlstad, Sundsvall and Umeå.

4.2 HEIs and regional growth and innovation

As government policy makers have become increasingly interested in the "new production of knowledge" and the "knowledge economy", the "triple helix" concept has played an increasingly important role in research on regional development. Given the belief that innovation is carried out in networks of actors, the "triple helix concept" helps to identify the actors involved in the innovation process, i.e. industry, university and government.

Maskell and Törnqvist (2003) investigate whether the university can create "a greater degree of dynamism in a region" in terms of economic development and entrepreneurial activities (p.132). Many studies have been carried out by various researchers, but so far no clear, dominating evidence of synergy effects between HEIs and entrepreneurial businesses have been found. The connections are usually few between, given that the two institutions live in separate worlds. For example, no effect has been found in the work by Persson and Regnér (2004) where in a statistically based analysis, data from Swedish employers and employees is used to analyze the impact of a new HEI on the local economy. There were no significant effects on employment growth or the survival rate of companies. However, the time frame used in the study is limited (1987 to 1995) and the authors themselves admit that such effects may take more than 20 years to materialize. (Data for such an expansive time frame for this type of statistical analysis is not yet available.)

Yet by focusing on learning processes, Maskell and Törnqvist hope to understand more about the indirect effects which HEIs play in the regional economy. From a case-study investigation of the Öresund region, the authors did not find support for the idea of a causality chain in innovative processes (from universities to research to innovations to spin-offs). Rather, their research indicates that more data is needed on how new ideas are picked up by entrepreneurs and transformed into the economy.

Asheim and Coenen (2005) present research on learning processes in a comparative study of Regional Innovation Systems (RIS). The idea behind their research is that learning processes are shaped differently in the triple helixes of different regional innovation systems. Thus, Asheim and Coenen argue that the focus should be on "localized learning" in order to understand economic development. This would imply the need for changing roles for the different actors in the regional innovation system. The authors ask whether such processes are shaped differently. One of the systems in focus is a RIS "under construction" from the Vinnova "Vinnväxt" program in the province of Skåne in Sweden. The authors have found that "organizational innovations" within each sphere of the triple helix are just as important as the institutional arrangements between the spheres of the triple helix. Their policy advice is that one should reconsider the balance between heavily "top-down" innovation systems and those that are "bottom-up".

In regards to new company establishments and the role of the regional HEIs, Sörlin and Törnqvist find that the "HEI variable" (i.e., having an HEI in the region) could not explain the establishment of new companies in the regions (based on Lundquist's statistical model, see also Lundquist,1996). The "HEI variable" could however help explain the level of knowledge in the new company. Thus Sörlin and Törnqvist conclude that the most important factor behind regional differences in the rate of newly established companies has to do with a variety of factors, including small company traditions and specialization in the area, access to potential entrepreneurs, the size of the markets and the markets growth and the distribution of state support to companies.

Westlund (2003) has studied economic effects such as employment and consumption effects, company localization decisions and the establishment of "spin-off" companies. Westlund finds that the expansion of the regional HEIs has brought new employment into some regions, as well as increased consumption in the local economy. In a case study of Borås, for each new employee at the HEI, one

additional job was created. The role of HEIs as localisation magnets for other companies has also been reviewed, with case studies showing that Uleåborg and Karlskrona were rather successful in this regard. Findings regarding the establishment of "spin-off" companies show that most of the companies were part-time firms, where the employment possibilities were limited. Thus Westlund (2003) concludes that the political expectations and visions regarding this effect do not match the current development. The same has been found to be true for companies in "science parks", where a study from Andersen (1993) evidences only limited contact between the "science park" and the research which is conducted by the HEI.

Certainly, the discussion regarding the economic growth effects of regional HEI investments is a crucial component for a better understanding of the triple helix and its role in innovation processes. However, the question should be asked as to how areas of the HEIs which are not related to technology and natural sciences play a factor in regional development. Marton (2005c) has studied the responses of a humanities faculty and a social science faculty to pressures to engage in "triple-helix" behaviour. Although the gains to the economy are not measured statistically in this study, new forms of cooperation (and learning) with the community were evident. In addition, the case study provided some evidence that "triple-helix" behaviour is easier for some faculties than others. The social science faculty acted quickly in the time period studied 1997-2002, and developed new cooperation with such entities as the leading newspaper publisher and with the municipal government, while the humanities faculty was slow to start, but later developed some new cooperation with the media and the local school system.

4.3 Cultural Aspects of Regional Development

Despite many studies, it has not been possible to show a clear relationship between higher education and economic growth. However, the need for the HEIs to cooperate with their surrounding communities is not limited to the economic field only, but also includes cooperation with society as a whole. Cederlund (2004) investigates the relationship between HEIs and cultural life (availability of books, art, music, theatre and film) in thirty municipalities with HEIs. The study concludes that there is a relationship between culture, higher education and research. Only in regard to movie theatres was there an even distribution across the municipalities. The three largest municipalities (Stockholm, Göteborg and Malmö) as well as the university cities of Lund and Uppsala have many more cultural activities per inhabitant than others. In many cases, the amount is more than half that of the total supply over the country. Cederlund concludes that one can question whether the political goal to spread culture across the country so that it can be available for all is just a mere utopian idea. Cederlund argues that one must accept the fact that communities with HEIs are more culturally rich than others. An explanation could be that the role of critical mass is most likely at play, keeping a pluralistic and varied cultural life possible. Studies have also shown the connection between education levels and visits to museums, with Cederlund (citing Nilsson, 1999) pointing out that it is six times more common for academics to make such visits than it is for people who have pre-high school education only. Nonetheless, the research does identify exceptional cases, where the supply of cultural activities exceeds that expected based on population statistics (examples can be found in such places as Gotland and Örebro).

4.4 Issues for Regional Development in the Future

Sörlin and Törnqvist (2000) emphasize the difficulties in trying to explain differences in regional development with simple measuring techniques. Instead, they discuss the "social fabric" of a community (see also, Brulin, 1998 for a similar discussion of "the horizontal development dynamic"), where developmental success can be related to the levels of communication systems, the openness of the society, the levels of trust between citizens and their elected representatives and the types of cooperation between different groups and interests in the region. Thus, current research is highlighting the importance of socio-cultural variables in regional development. Wikhall's (2001) work, discussed earlier, has already shown how regional HEIs can contribute to the "educational

tradition" in the region, and Cederlund (2004) as well emphasizes the regional HEI's socio-cultural role in the community. As Westlund (2003) also points out, towns with universities and colleges are attractive to young adults on the move, and are basically the only types of town that are able to compete with the big cities in regards to arts, culture and leisure activities. Going forward, Westlund warns that there could be a lack of a shared value base between the HEIs, the businesses and the politicians, and as a result, the social capital effects are not fully gained. Yet research on this topic is insufficient, and Westlund concludes that much more research is needed in the future.

Sörlin and Törnqvist ask the question, "Is there a relationship between the social fabric of the community and the regional effect of investments in HEIs?" In addressing this question, they refer to the in-depth case study of Umeå University written by Olsson and Wiberg (2003). Olssson and Wiberg explain the positive effects from the university on the regional development of Umeå as a "positive spiral" of long-term synergy effects (p.195). They see traditional industry areas as possibly being in a risk zone, given the low appreciation of education in the community and the low capacity of businesses and public authorities to welcome those with higher education. Using the Umeå case study, Sörlin and Törnqvist (2000) further point out that Umeå's development also provides evidence of the importance of a well-functioning cultural life (which has expanded in tack with the expansion of the university). These results are in line with Cederlund's findings (2004) and thus she warns against the view of the university as some type of "consulting company" for the needs of the business world, with the university being transformed to a "utility-maximizing" institution. Cederlund argues that the cultural heritage of higher education institutions must also be protected in order to maintain the creativeness and attractiveness of knowledge environments.

In concluding their book, Sörlin and Törnqvist discuss some of the current conflicts in the goals of regional development policy (in regards to higher education and research) established by the national level policy actors. First, they return to the debate on the regional distribution of research and education. There are tensions in the policies between the national economic return on research and development investments and the issues of equality and regional development. In trying to find a medium point in this debate, Sörlin and Törnqvist launch the idea of creating "regional capital cities" to "provide both a complement and a counterbalance" to Stockholm (p.264). The author's also discuss the historical build-up of the higher education system and its internal logic. Two problems are found to be particularly crucial for the future: first, the low mobility among academics, and second, the difficulties of having a national resource distribution system which is not clearly related to the actual achievement of goals regarding the tasks of teaching, research and cooperation with business and society. Sörlin and Törnqvist advocate a system which would allow for more differentiation among the HEIs to meet the various societal needs. This would imply that not every HEI would try to do everything. In this regard, the authors discuss the system of tertiary education in California, where various HEIs play different roles in the system (p.248-249).

5. The Role of Tertiary Education in Research and Innovation

5.1 Changes in the Financing of Research at the HEIs

The financing of research at HEIs during the past ten years has undergone a significant change given the role of external financing. Sandström (2002) refers to this change as having created a new "research landscape". In reviewing the macro-level financing statistics from 1994 to 2000, Hällsten and Sandström (2002) analyze the total financing picture with a goal of answering the question of what impact the increases in external funds have had in terms of researchers' own ability to steer research. Their research approach includes a review of the actors making decisions regarding the allocation of research funds. To answer this question, the authors analyze two categories of funding: first, "*researcher-steered funding*" which is decided upon directly by academics and includes funding such as the direct state appropriations to the universities and funding provided by the national research councils; and second, "*non-researcher steered funding*" which is decided upon outside of the university, including funds from the "sector"-funding agencies, the newly created research

foundations, the traditional private foundations, and businesses. The authors conclude that "*researcher-steered funding*" has decreased from 68% in 1994 to 55% in 2000. This is primarily related to cut-backs in financing from the research councils. In addition, the authors draw the conclusion that the increase in external funding has increased competition in the system, which from a researcher point of view raises the level of uncertainty for research activities, plus that the relatively constant level of state appropriations over the time frame studied has meant that the expansion of research is only possible with access to external funds. External funds have been available; in absolute numbers Sörlin mentions that the total amount of funding in the higher education system for research has doubled since the beginning of the 1990's (Sörlin, 2005a; prices non-adjusted for inflation). This increase has meant that external funds comprised approximately 55% of the total amount of funds available for research at the start of the new millennium (Sandström, 2003).

Schilling (2005) has studied national research policy developments during the period 1980 to 2000 to analyze whether the mode of knowledge production has changed to a Mode-2 form as outlined by Gibbons et al. (1994). Schilling's conclusion is that the system has not transformed entirely to a Mode-2 form, but rather that a two-track system has developed with research in one track and innovation in the other. This leads Schilling to critique the Gibbons et al. model in that it does not properly consider the role of basic research. The "interconnectivity" which the model hypothesizes is not found in the Swedish case. Rather, Schilling traces the development of the innovation track back to issues of the university-industry relations and the "sector research" demands. Thus, it is not a completely new track, but a re-organization. (For the historical description of sector policy research and changes therein, see Persson, 2001). Schilling concludes that for the time period he has studied, innovation policy in Sweden was separate from research policy, not integrated in it. Thus, Sweden, in comparison to England and Finland, is moving slowly towards a development where research is seen as a "strategic possibility".

In a review of interdisciplinary research policy in Sweden, Sandström and Harding (2002), question where the financing for this type of research will come from in the future (after having reviewed approximately thirty years of policy-making on the topic). Given the past disciplinary emphasis of the national science councils, the authors are somewhat hesitant to these councils' potential for this type of investment, even if a new umbrella organization (VR, The Swedish Research Council) now combines many of the previously separate councils. Sandström and Harding also mention the start-up of the new research foundations which were to primarily have an interdisciplinary emphasis. Given political turmoil in the early 1990's and the change in governments, a new goal of cooperation with society was also placed on the new research foundations (for details of this development, see Benner, 2001).

Two recent publications have analyzed the role of the new research foundations in contributing to interdisciplinary research. In a dissertation focusing on the MISTRA foundation, Mobjörk (2004) studies how the activities of MISTRA were organized and what type of knowledge production was preferred. MISTRA functioned as an interesting case study given its emphasis on creating inter-disciplinary research groups and on involving user groups in the research. Mobjörk develops a thesis regarding types of ambivalence in relation to science, the production of knowledge and the roll and function of research. Schild and Sörlin (2005) studied the way in which four HEIs structured themselves in the face of requirements for inter-disciplinary research, using the MISTRA foundation as a focal point. They conclude that the organization of research in Swedish HEIs is starting to change, primarily due to increased competition for research funds. The HEIs develop in a variety of ways, given the variety in their past histories. However, Schild and Sörlin found a problem in the way in which university-level goals for interdisciplinary research were met at the faculty and department levels, especially in regards to recruitment and promotion of academics.

Marton (2005a and b) has focused on the universities' and academics' response to these financing changes from interviews with fifteen rectors from the large HEIs in Sweden as well as with fifty academics representing six disciplines in the humanities and social sciences. Using theories regarding entrepreneurial universities and academic capitalism, Marton found that many of the changes taking place in the HEIs today are seen more as a development forced upon the institutions due to economic

circumstances than as a development in new forms of knowledge production. Thus, Marton's results confirm Bennich-Björkman's (2004) earlier results regarding the way in which academics and HEI leaders perceive threats to academic freedom in the current financing system. According to both Marton and Bennich-Björkman, the constant need to adapt research to the needs of a market is putting strains on both the academics and the HEI leadership, with many pondering what is the main task for the HEI in today's higher education system.

5.2 Issues Regarding the Evaluation of Research

Given the increased emphasis on cooperation between the HEIs on social and economic conditions with surrounding society, Harding (2002) discusses some of the consequences regarding the evaluation of research. For example, the traditional academic "peer review" system has been criticized for its lack of ability to include other judgement criteria (particularly social and economic relevance). Nonetheless, Harding finds that not even the "modified" peer review system – with a broader composition of reviewers – has gained popularity in Sweden. Instead, the most common response has been to include more international experts, usually from the same discipline. An additional potential problem is seen in the new demands from the government on the researchers' ability to communicate research results to the business world and to the society at large. Traditional academic research education emphasizes the need to communicate research results to one's senior colleagues (based again on the "peer review" system). According to Harding, one can question whether the current organizational arrangements can meet the requirements which this new emphasis on communication of research results to society entails.

5.3 The Changing Role of the HEI in the Knowledge and Innovation System

In section 4.3 of this report, many aspects of the HEIs role in regional innovation systems were discussed. In the review of research presented here, the focus will now be on the changing conditions for knowledge production at the universities and the relationship between HEIs and the conditions set at the macro-economic level.

Benner (2003) discusses the conditions for scientific research at the HEIs given the new financing situation and finds a clear trend in that the importance of the individual researcher and research group for the direction of research has increased. The increased dependence on external financing has brought about sharper tensions between the winners and the losers in the research financing competition, and has also led to more intense discussions of priorities and selection/ evaluation techniques. Benner also identifies different characteristics of scientific production from a typology of four research environments.

Sörlin (2005b) reviews the transformation which researchers are experiencing as funds for basic research are less available and external funds are the only source for research growth. New conditions are placed on the researcher to meet the goals of the external actor, rather than allowing the researcher's own curiosity or the international research front-line to provide the stimulus for the research direction. In addition, researchers are facing increased demands to meet deadlines and establish routines for steering with "new public management" techniques which nearly match the environment in the business world, but researchers receive lower salaries and have less job security. Sörlin raises the issue that it might not take too much time before the research career becomes a less attractive career option. Eventually, the research system could be forced into internal specialization, with some academics becoming prominent teachers and others becoming prominent researchers. According to the author, the current system seems unsustainable with increasing numbers of researchers but without matching increases in research funds.

Cooperation with Business and Industry/ Knowledge Transfer

Many authors studying regional economic growth mention the "Swedish paradox" – that there have been quite high investments in research and education, but that problems with economic growth, entrepreneurialism, employment and growth in high-tech firms remain nonetheless (see also Edquist and McKelvey, 1998; Sörlin, 1996; and Deiaco and Broström, 2005).

Researchers are concerned about the reduction in Swedish relative incomes since the 1970's, and pose the question of what is the relationship between investment in research and the returns on that investment. When one looks at Swedish research production, with data such as publications in the world's leading scientific journals, Sweden has produced very well in relation to the size of its national economy (in 1995, Sweden was in second place after Israel, (Henrekson and Rosenberg, 2000:27). Thus these researchers want to investigate why there is a weak link in the chain from scientific knowledge production to commercialization. Plausible answers may have to do with the fact that most Swedish basic research is conducted at the universities, and that the diffusion of this knowledge is poor (see also Jacobsson, forthcoming). Given previous research, it is known that applied research (and research development) is dominated by large international companies, operating in Sweden, but with much of the commercialization of knowledge taking place outside of the country (citing Braunerhjelm, 1998). There is also previous research on how Swedish companies are often licensing new technology to companies in other countries.

In trying to identify the "weak link", Henrekson and Rosenberg (2000) look at the most important aspects of cooperation between universities and industries which lead to economic growth. Their analysis shows that there are major problems in the incentive structure in Sweden in comparison to other countries (particularly in comparison to the US). The following problems in the incentive structure were identified:

a) low incentives to invest in better supply of human capital by improving the intensity and type of courses offered in HE,
b) relatively low return on investment for academics to switch from being a salaried employee of the state to being an entrepreneur,
c) low incentives to expand existing business activities,
d) poor incentive structure inside the university in a variety of areas, such as: 1) better arrangements for researchers to cooperate with business, 2) changing course content to meet business needs, 3) the distribution of research funds to meet changing situations and 4) incentives to move out of the university into the entrepreneurial world.

At the macro-economic level, Henrekson and Rosenberg refer to documented evidence of small companies having difficulties in expanding due to high tax on entrepreneurial incomes, low incentives for the accumulation of private capital (including problems with venture capital), and a rigid system of regulations regarding wage negotiations and hiring conditions. The authors recognize that many reform measures have already been taken by the political decision-makers during the 1990's. They conclude that in order to spread and encourage academic entrepreneurialism in Sweden, more changes should be enacted.

Recently, some positive developments are being reported from the micro-firm level. Lööf and Broström (2005), in reviewing approximately 200 firms' collaboration with HEIs on innovation projects, found that collaborating firms tend to apply for more patents than non-collaborating firms and in addition, income from new product sales was considerably higher for collaborating firms compared to non-collaborating firms. In another study on the role of networks for knowledge intensive industries, Rogberg (2002) identifies the SMIL program in Linköping as particularly successful. Started in 1984 with just a few IT companies, the network today engages over 150 companies in various branches. According to Roberg, one of the most important keys to the network's success is its cooperation with Linköping University's "Centre for Innovation and Entrepreneurship".

Sörlin (2004) reviewed some of the structural and system issues facing the entire Swedish research system and found that: a) the state's role as financier in innovation and industrial policy should be made more clear, b) there is a need to increase mobility of intellectual capital between HEIs, businesses and applied research institutes, and c) there is uncertainty at the HEIs regarding their role as entrepreneurs and conductors of needs-oriented research. Sörlin concludes that new stimulus and incentives should be encouraged and suggests that pluralism and differentiation in the system should be increased strongly by allocating more financing to specialized research institutes that conduct needs-oriented (applied) research.

Intellectual Property Rights

The Swedish tradition of "lärarundantaget" – where the individual academic has full property rights to her/his research results is currently under policy discussion by the government. Henrekson and Rosenberg (2000) explain that one would think that such a system would almost automatically encourage commercialization of research, yet the authors have found other difficulties in the system which have hindered such a development. Because the property right was owned solely by the academic, the universities did not need to get involved. Etzkowitz et al. (2000) have also confirmed this finding. The rigid system of state-employees' salary levels has contributed to difficulties where the university would not want to "lose" talented researchers to the business world. In addition, difficult regulation regarding leave of absences has hampered such exchanges. Most research on such exchanges in Sweden has shown that they are often individually based (i.e. the researcher herself/himself has a personal network of contacts) and that these take place in collaboration with large companies (not small and medium-sized companies).

6. Achieving Equity in and through Tertiary Education

6.1 Selection Procedures

Using the reform of selection procedures from 1977 as background, Kim (1998) studies the process of choice and recruitment to higher education from the individuals' perspective, with the underlying national policy-making decisions in interplay with the individual. The study finds that although the admission rules were uniform in design and had a strong impact on individuals' choice, the rules produced different effects for different groups of applicants. The study also found that the admission process and its effects are strongly cumulative over time, especially up to the 1990's when admission capacity remained relatively unchanged.

Wolming (2000) discusses the validity of the admission system from a theoretical starting point of the relationship between justice and fairness. The study traces the academic performance of three different admissions groups (admitted under different categories) over a period of three years after admission. The study shows that students admitted under the Swedish Scholastic Assessment Test and the work experience credits were less successful than other admission categories. Wolming concludes that views on validity change according to the principles underlying the admission system, such as the principles for distribution.

In 2005, Löfgren reported on some of the major findings from the extensive VALUTA-project (2001-2004) which included thirteen researchers studying the various components of the system for admission to HEIs in Sweden. It is not possible to review all of the VALUTA findings here, but some of the most important findings will be outlined. First, in regards to selection instruments, the researchers found: a) that the items on the Swedish Scholastic Assessment Test do not play out differently for various social groups to any large extent, b) the annual high school GPA (grade point average) has increased since 1997 and onwards, but there has been no corresponding increase in the test scores for that period, and c) high schools which are focused on the more theoretically based programmes are tougher in grading than those with practical programmes. In regards to the selection instruments and their value for predicting study success for students in HEIs, the VALUTA findings are in line with those reported above by Wolming (2000): students admitted to an HEI on the basis of

their high school GPA achieve more higher education credit points per term than students admitted based on their Swedish Scholastic Assessment Test scores. The VALUTA group has however, noted a substantial increase in the number of high school students who are improving their GPA before applying to an HEI by taking supplementary courses provided by the municipality, and the topic of removing this option has been discussed by the research group. Furthermore, the VALUTA research group has studied the effects of repeatedly taking the test, and has found that a gain of 0.1 normed score points can be achieved from the first taking to the second. Within the VALUTA project, these research results have led to a consideration of whether it would be better to use the mean of the last two test scores instead.

Ekström (2003) studied changes in the secondary education system and the related effects on admission to higher education. Specifically, Ekström looked at the 1991 school reform, which added an extra year of education for those in the upper secondary vocational education programs (from 2 to 3 years). One of the ideas behind the reform was to encourage these students to also apply for acceptance in HEIs and the statistical results show positive effects on university enrolment.

6.2 Distance Education

Connecting to the discussion on life-long learning and regional access to education, Dahllöf (2003) studies the relationship between distance-learning centres (i.e., study-centres under the responsibility of the municipalities, and which are detached physically from the HEIs campus,) and the propensity to attend an HEI, and Roos (2003) focuses on presenting a background description of who these students are, and how their family commitments and career objectives are combined, and whether they have had good or bad experiences of distance learning. The findings show that many would not have been able to study without the distance-learning centre, this was especially relevant for women and for students coming from non-academic homes. (For an evaluation of the Consortium for National Distance Education established between five HEIs, see Holmberg et al. 1996. For studies on the practical and pedagogical challenges of working as a distance teacher, see Gisselberg, 2002).

6.3 Women in higher education

Berner (2002) tries to explain why women's HE degrees appear to be undervalued on the job market compared to men's, even though there is an official "equality ideology" and a quite broad "equality policy" in Sweden. Berner finds that women have educated themselves in areas which are traditionally dominated by women and where the salaries are low and the working conditions are poor. This is related to the building up of the welfare state in the 1960's where, since men were already employed in predominantly the private production sector, women took the newly available jobs in the public sector. Recently, women have invested in education in previously male dominated careers, which is beginning to pay off. However, Berner concludes that this does not mean the situation for women is acceptable. There are still problems related to statistical discrimination and male networks which prevent women from acquiring the full economic benefits from their higher education.

Abdallah (2002) has focused on the challenges and difficulties facing female academics while establishing their academic careers, especially in regards to securing research financing. After reviewing the available research, Abdallah finds that women have a lower "success rate" (i.e. the amount of accepted applications in comparison to the total number of applicants) in comparison to men. The explanation lies in the lack of female applicants from high levels of academic positions in comparison to men (see also Nyberg 1993), and thus two further questions are generated: 1) "Why do women apply less than men?" and 2) "How can working conditions/incentives for female academics improve?" Abdallah suggests that part of the answer may be found in the appointment process to higher positions, however there is no conclusive evidence available yet to substantiate this hypothesis. Another explanation may lie in the need for women to break into the established, informal networks with researchers who already have influence and responsibility (see also Sonnert and Holton, 1995). And certainly, the debate on the effect of family responsibilities on female academics' careers can not be ignored, yet studies on this topic vary in their conclusions. Thus Abdallah concludes that

quantitative studies on "success rates" must be combined with further studies on the "informal barriers" that may hinder female academics. (For a somewhat more dated description of the differences between women and men and the conditions they face in planning and carrying out their academic careers, see also Johnsson, 1997).

Much of the recent research discusses ways in which to improve women's educational experiences and career opportunities upon graduation, especially in fields that were previously male dominated. Udén (2000) has used feminist theories related to technology and empirical data from interviews and thesis essays, to create an understanding of technology and civil engineering from a female's perspective. A similar study by Salminen-Karlsson (1999) looks at the curriculum in computer engineering in order to make the educational programme more appealing to women. The study shows that implementing new curriculum reforms was not easy in an environment dominated by the norms of the traditional male high school graduate. Efforts to improve the environment for female academics were analyzed by Lindgren (2000) in a dissertation regarding a mentorship program for twelve female Ph.D. students. The results showed positive effects in that all participants claimed to have increased their confidence and to have gained self esteem. (For a descriptive presentation of differences between men and women in civil engineering at Chalmers Technical University, see Göransson, 1991.)

7. Resourcing the Tertiary Education System

The research on resourcing the tertiary system identified for this report primarily deals with academic staffing and career issues, and the new funding method for undergraduate education and the quality issues therewith raised. Although not a direct topic for the OECD thematic review, the author of this overview considers that one should include issues of academic identity and culture in discussions of issues relating to academic staff. We have already seen indications of how identity and academic freedom issues came to light in the discussion of research and innovation in Section 5 of this report. Further research on these topics is presented in Lundgren's (ed.) (2002) ethnological study of three different research environments in Sweden. The aim of the Lundgren study is to provide a basis for reflection upon the cultural conditions of knowledge production at HEIs.

7.1 Academic Staffing and Career Issues

One of the most comprehensive reviews of these issues to date is Kim's (2000) report on academic careers. The report is a descriptive case study of the changes in Sweden from the 1980's to 2000 covering topics such as recruitment, financing, career structure, mobility and attractiveness of the academic profession. Citing Askling (2001a), there are two main background factors which affect Swedish academic staff today: 1) the quite radical deregulation in the 1990's and the strong increase in student numbers during that time, and 2) the major reform (in 1999) of the legal framework for academic appointments, working requirements and promotion procedures. Askling concludes that these factors have brought more variation to the working environment and working patterns of academics regarding areas such as working conditions and duties, incentive systems and career patterns.

Furthermore, Kim (2000) states that mobility among academics is very low, reflecting trends in general for Swedish society. Of those continuing to doctoral education, 85% continued at the same institution where they received their undergraduate degree. For the transition from doctoral education to joining a faculty, Kim reports that about 66% of professors and 80-85% of other teaching staff have been awarded their Ph.D. at the same faculty. Kim concludes that the disadvantages of such a system are obvious, but recent policy actions at the HEIs and the research councils to change these attitudes and behaviours are encouraging for the future.

The attractiveness of academic careers is certainly under pressure given changes in the higher education system from the 1990s according to Kim (2000). The situation has not been helped by a general reduction in administrative support staff, also at a time when student numbers increased

significantly. Time for research activities is diminished by other responsibilities even though teachers claim they work on average 49 hours a week. Some of these negative trends may be causing increasing sick leave statistics and feelings of lack of control. Kim has also compared salary levels for academics with the private-sector and other government professionals and comparable occupational groups and finds that on average, most academic salaries were lower.

One recent Ph.D. dissertation on the issue of academic leadership and managing departments used a discourse analysis method of interview data with heads of departments and staff (Haake, 2004). The starting point for the study was the view that leadership in higher education is socially constructed. Discourses from the two groups were studied over a period of four years allowing for a study of identity development. The study concludes with statements regarding the "gender segregation process" and the different ways in which academic leadership expresses itself in male-dominated versus female-dominated positions.

Issues regarding doctoral education

Kim (2000) reviews recent reforms of doctoral education which focused on reducing the student's time to complete the program. The government has established that the normal time for achieving a doctoral degree should be four years (this meaning net study time, not gross). During the 1990's, this net time goal was rarely achieved. The problem of long completion-time drew attention on the advisor's role in the dissertation process (especially after survey data in 1998 showed that 37% of doctoral students complained about a lack of support from their advisor) (Kim, 2000, p.43). Recent data shows that the situation has improved, with the average net time to completion in 2004 being 4.5 years, with medicine having the best results at 3.5 years, followed by engineering and the natural sciences with 4.5 years and the humanities and social sciences taking 5 years (Högskoleverkets årsrapport 2005 and Statistics Sweden, 2005).

Given that the data above shows that students in the humanities and social sciences take more time to complete the Ph.D. than others, Schoug's (2003) interview study at the micro-level is an important contribution to the discussion. The study includes interviews with 68 doctoral students and newly graduated Ph.D.'s in the disciplines of ethnology, literature, sociology and political science. Given the new time-frame requirements, many doctoral students were worried about variations in quality level in comparison to previous Ph.D. graduates who did not face the same time pressures. Schoug describes this situation as one where ideas and norms from the outside have forced their way into a protected environment. This creates tensions in the relationships between the new doctoral students and the advisors, who are familiar with the previous "order". Schoug finds that rather than questioning the political system which created the reform, the doctoral students place the cause of the problem in the lack of organization of research education, the diffuse "rules of the game" and the informal structures which exist in academic departments. Different views on the way in which researchers should be "socialized into the environment" also cause tensions, as doctoral students want to feel that they are progressing through their four years, while their advisors want to encourage them to have an independent search for knowledge and problem formulation for the doctoral thesis. Schoug concludes that if the reform is going to succeed for doctoral students in the humanities and social sciences, then the forms for research education must change.

Issues regarding the doctoral student–advisor relationship are also addressed in a recent work by Salminen-Karlsson and Wallgren (2005). However, their study focuses on Ph.D.'s being trained in industrial research schools (a "triple-helix" initiative). The authors point out that the type of knowledge transfer taking place in these industrial research schools is special in that it is a transfer from basic to applied research. Yet the authors want to emphasize that the process is also focused on people; the student and the advisor. The study has identified two types of advisors, the "researcher advisor", mainly focused on the production of research and the "entrepreneur" advisor, mainly focused on producing Ph.D.'s. (The term "entrepreneurial advisor" is a reference to Slaughter and Leslie's (1997) book on academic capitalism.) Salminen-Karlsson and Wallgren conclude that two different types of socialization processes are at work and they question whether abandoning traditional academic knowledge production processes is the best way to develop knowledge in a "Mode-2" form.

7.2 Funding Methods and Corresponding Quality Issues

As described in the "Overall Description of the Tertiary Education System" part of the country background report prepared by the National Agency for Higher Education, the state's financing of undergraduate education is based on an output performance system. The funding mechanism calculates the number of full-time equivalent (FTE) students and their study progress in terms of acquiring course credits. A ceiling limit is established by the government as to how many FTEs it is willing to pay for.

The implementation of this performance-based funding mechanism was a political victory for the conservative coalition government in 1993. The political process bringing about this change and the contents and implementation of the 1993 reform in its entirety have been thoroughly analyzed in Bauer et al. (1999) and Marton (2000). The reform was titled "Freedom for Quality" and the politicians placed heavy emphasis on creating competition in the "higher education marketplace". The studies find that the academic response to this new funding mechanism was quite mixed, as interpretations of the reforms' impact on quality varied. On the one hand, it was believed that the new mechanism would undermine quality since passing the students through the system would provide more funds. On the other hand, many interpreted the focus on student achievement as a pedagogical challenge and an opportunity to give more attention to the students. The debate among academics regarding the possible financial and quality impacts of this new funding mechanism flourished, and at the time, it was the most frequently mentioned source of change in the data set of 108 interviews used in the study.

Bauer et al. (1999) found that in implementing the reform, the new resource allocation system was intricately connected to the new freedoms which the HEIs acquired in designing courses and programs to match student needs. There was a flurry of activity in developing these courses and a renewed interest in issues surrounding teaching, learning and examination. Problems did arise however. In particular, according to the interviewees, there were originally misjudgements in the correct "price-tag" for different subject areas, and adjustments were later made. Bauer et al. also found that the HEIs began to practice "over-enrolment" of students in order to hedge their luck on how many students would pass, in an effort to bring home the full "ceiling-amount" allocated by the government. This has led to many extra hours of work for academics, work which could be characterized as "unpaid".

8. Planning, Governing and Regulating the System

Most of the recent research relating to planning, governing and regulating the system can be classified into two main topic areas, issues regarding institutional autonomy and governance, and issues regarding the future of collegial steering.

8.1 Institutional Autonomy and Governance

Marton (2000) studies thirty years of policy-making on higher education and issues of institutional autonomy from a policy-network perspective. The aim of the dissertation is to explain the changing policy outcomes from 1968-1998. By creating a model of four types of state governance and the ideas upon which they are based, Marton shows that levels of institutional autonomy vary between them.[1] The changes in policy-making over the years can, according to Marton, be explained by how coalitions of policy actors align (or not) around the ideas represented in the model. This model has

1 Marton's model of the relationship between state governance models and institutional autonomy was first published in a journal article, see Askling, Berit, Marianne Bauer, and Susan Marton. 1999. Swedish Universities towards Self-Regulation: A New Look at Institutional Autonomy. Tertiary Education and Management 5 (2):175-195.

also been used in Bauer et al. (1999) in a study of all three levels of the higher education system (macro, policy making; meso, the HEIs; and micro, the academics) in examining the impact and implications of the 1993 reform. Shifts from the state, in both the authority given to the HEI and the purpose of the tasks it should be accomplishing, placed heavy demands on the HEIs for internal self-regulation and governance at the end of the 1990's. In addition, the new dependence on market forces required that the HEIs become strategic actors on this market and this situation has been even further stressed by the developments in research funding in later years (see Section 3 on research and innovation). A dissertation studying these later developments and focusing on the HEI's response is currently underway (Melander 2005).

8.2 Collegial Steering at the Institution and Department Level

Askling has studied the internal devolution of authority at the institutional level (see Askling 2001a and b; Bauer et al, 1999; and Askling et al, 1999). In analyzing the Swedish case, Askling concludes that the rector's role is changing from the traditional *primus inter pares* towards a more executive leadership role, but that there are many situations of ambiguity, uncertainty, and conflict. The situation has been further complicated by the fact that the rector is no longer the chairman of the board of the university. One possible explanation for the recent uncertainty, according to Askling, could be that the traditional norms have been broken down, but the new norms have not yet been identified, or are borrowed from the business world. Thus, Askling argues that there is an increasing need to acquire competent leadership and these positions must be made more attractive in order to improve recruitment. From a case study of academic leadership in Sweden and Norway, Askling and Stensaker (2002) conclude, "When faced with the new public management rhetoric emphasising 'strong' leadership in academe, expectations may exceed the real capacity of many current leaders." Many forms of leadership training are already underway, so improvements could be made in the future. Portfelt (2002) is currently working on a study which may shed some light on this topic. The focus will be on HEIs "adaptability" capabilities by studying organizational structures and organizational culture at the institutional level.

Bjuremark (1995) aims to study the nature of the relationship between the manager (head of department) and the managed (professors) using case studies from a faculty of technology and a faculty of social science. The starting point for the study is the need to reconcile new demands in the higher education system for "hands-on management" with the academic tradition to be a "leader among colleagues". The study concludes that the managers from the different faculties behave quite differently, with "hands-on management" represented at the technology faculty and "academic collegiality" represented at the social science faculty.

Bjuremark's (2002) dissertation is a case study of collegial leadership at Lund University at the end of the 1990's (focusing on an entity called the "Dean's Council"). Using methodology inspired by Foucault, the exercise of governance at the university today is placed in relation to historical preconceptions of the university, to the political reforms at the time, and to the national debate. The aim is to study how power and governance are practised in the Dean's Council, and how identities about themselves and others are related to forces of power both within and outside the university. Bjuremark finds that the "Dean's Council", a self-governing body within the university's governance policy, is understood by the actors to represent a movement towards increased autonomy. However, Bjuremark finds that this autonomy can be questioned as pressures from above (i.e. the state) are transforming the activities of the university to meet future manpower needs, particularly in the technological and medical fields, as well as to adopt a quality control system based on economic administrative thinking.

9. Assuring and Improving the Quality of Tertiary Education

The "freedom for quality" reform in many ways placed a new emphasis on quality at the departmental and institutional level. Bauer et al. (1999) investigated changes in quality processes resulting from the

1993 reform at both these levels. At the departmental level, Bauer et al. found that there was a great degree of uncertainty regarding the issue of what was quality in teaching and research (see also Giertz, 2000). Many members of the faculty found this difficult to express quickly, but often the connection of teaching to the research world was a ready answer (an answer which, according to Bauer et al., may well reflect the historical background of dividing Swedish academics into two staffing categories, one for teaching and one for research). In addition, quality at the micro level was viewed in terms of problem-solving and/or critical thinking abilities. The study also found that issues of pedagogy and pedagogical training where rarely mentioned in terms of quality of teaching. As for measures needed to uphold quality, most academics responded at the time that upholding quality was considered to be a natural part of the academic activities. Bauer et al. conclude that this can be interpreted as part of the tension between externally formulated quality policies and the everyday praxis and understandings among the academics.

In the mid-1990s, at the institutional level, there were various changes and successions in the state organizational entities having responsibility for the quality policy-implementation sphere (such as the National Secretariat, the Chancellor's Office and the National Agency). These changes are interpreted by Bauer et al. as reflecting the difficulties of finding the balancing point between governmental control and institutional autonomy. Furthermore, Bauer et al. see these changes as reflecting some ambiguity in a system which was both trying to function as a quality "supportive" entity as well as a quality "controlling" entity at the same time.

Research on achieving quality in higher education has been conducted by Askling et al. (2004) and Bowden and Marton, F. (1998). Bowden and Marton combine research on learning processes with research on institutional management in an effort to create a theory of learning for higher education. The theory combines ideas regarding teaching, research and community service (all taking place on the individual level and local level) with ideas on learning at the collective level (the production of new knowledge). Bowden and Marton argue for a quality system which is based on more appropriate definitions of learning outcomes, and where accountability is a consequence of the system, rather than the focus of it. In a similar light, Askling et al. (2004) emphasize that quality assurance programs, in order to be successful, must be based on the HEIs having an understanding of the rationale behind the system. Internal evaluation and annual reports should, according to Askling, be regarded as important tools in a quality system that is not just forced from "above", but rather which permeates throughout the institution to meet strategic goals.

Harding (2002) discusses the new forms of evaluation which have appeared in the late 1990's, such as the National Agency's evaluation of HEIs. Certainly the focus of these evaluations has been on the educational aspects, but they have also included a review of the HEIs ability to carryout the "third task". Other forms of quality evaluation of the HEIs include requirements for reports regarding multi-disciplinary research, gender research, and contact with the surrounding society. If changes need to be made in the quite dominate "peer review" system (see Section 5.2 in this report) in order to meet the increasing demands for the universities to cooperate with society, Harding then suggests that the forms of evaluation must be flexible enough to adapt to a research environment where different demands for research results exist. Thus, although the peer review system may be best qualified for judging quality within the academy, Harding argues that it is possible that other arrangements are best for other parts of the research landscape (such as those involved in innovation systems, see Edquist 2002). In concluding, Harding hints that the real challenge which lies ahead is that which occurs when the increasingly important need for academic achievement comes in conflict with achievement of the "third tasks".

Gröjer's (2004) dissertation uses a historical institutionalist approach in order to describe, analyze and explain the development of evaluation policies in Swedish higher education between 1964 and 1995. Using this approach, not only are political events important, but also the timing and the sequence of events are crucial to the analysis, given that a different "path" of events could have resulted in different outcomes. The dissertation concludes that the "critical juncture" in evaluation policies was

the end of the 1960's to the beginning of the 1970's when the Office of the University Chancellor began publishing evaluation reports. The institutionalization process continued thereafter.

10. Internationalization

There appears to be relatively little research on internationalization processes in higher education when compared to the other OECD thematic topics. However, one of the largest contributions to the field is Cederlund's (1999) work on research networks and how the HEI acts as a strategic link in these worldwide networks. Using cultural geographic methods, Cederlund tracks the development of scientific networks, and studies bilateral agreements between HEIs, the mobility of students internationally, and the geographic spheres related to international contacts. Cederlund concludes that much of the HEIs prestige is connected to internationalization, referring to the quite high "symbol value" in the signing of bilateral contracts. However, Cederlund also points out that much international cooperation also takes place through informal and unregulated networks based on common research interests. Thus, Cederlund (citing Nybom, 1997) raises the possibility of a conflict in loyalties, where the highly connected international academic may not feel strongly attached to the local, home institution.

Melin (2004) focuses on the internationalization of post-docs, i.e. Ph.D. graduates who spend a significant period of time abroad. Using survey data from 284 former Swedish post-docs, Melin investigated what country the post-docs lived in, and what type of scientific connections were made. Melin concludes that the internationalization patterns were focused on traditionally strong science-producing countries. Very few Ph.D.'s travelled to countries which could be classified as "research undeveloped" or "recently developed" in terms of research. The study also shows that the initial contacts were guided by doctoral supervisors and other colleagues, so that the international network is "inherited" by the post-doc. Contacts made during the post-doc period are maintained later on, often resulting in research collaborations and co-publications.

Concluding Remarks by the author of the overview: Challenges for the Future

After reviewing some of the current research regarding the seven themes outlined by the OECD, the author of this research overview would like to identify some common, overlapping challenges for the future. These challenges can be associated with the tensions arising from the different values underpinning a Humboldtian role for the university in society versus a utility-maximizing role. Three main challenges for the future of Swedish higher education are rooted in these tensions: 1) the need for a clearer differentiation of tasks among the HEIs, 2) the maintenance of an appropriate level of research autonomy, and 3) a clearer understanding of the role of the HEI in contributing to wealth creation and innovation.

The first challenge (and most likely the most difficult challenge) regards the need for a clearer differentiation of tasks for the HEIs, and stems from the difficulties of managing a HE system "where everyone is trying to do everything". In the past fifteen years, the system has undergone a very rapid expansion – both in terms of student numbers and geographic locations. But national policy appears to be ambiguous at times in regards to the correlation between the distribution of funds and the evaluation of quality / accomplishment of tasks. This ambiguity at the national level leads to further ambiguity at the HEI level, resulting in academic management problems. The main question for the day seems to be, "What should academics be doing?" With such a variety of tasks being placed on the HEIs and the academics within them, many conflicts arise in evaluating success. As a result, the next question is, "What makes for a successful academic career?" The traditional answer of quality in teaching and research now must be joined with accomplishments such as bringing in external contacts and contracts, and cooperating with the surrounding society. How this will affect academic staff and recruitment tendencies in the future is very hard to predict. The main challenge for the future is whether the relatively uniform higher education system is sustainable in the face of such various tasks and the pressures to accomplish them all.

Given the changes to the "research financing landscape" described in sections above, the second main challenge entails protecting the autonomy of research. As dependence on external research funds has increased significantly during the past ten years, many academics are worried about their ability to carryout what they perceive as one of the core tasks of an HEI, mainly the independent pursuit of knowledge. Issues regarding the protection of academic freedom in the face of increasing demands for society-relevant research will need to be resolved. It appears that a proper balance has yet to be attained.

Lastly, the author wants to emphasise that challenges are evident in the relationship between HEIs and the business community as the role of HEIs as factors in the creation of economic prosperity grows in importance. In this regard, clearer policies on intellectual property rights are needed. In addition, if HEIs are to contribute strongly in innovative learning and innovative processes, the internal organization and incentive structure within the HEIs may need to be re-evaluated in order to be more in line with other external actors and organizations.

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