

Bertel Ståhle: *Universiteten och forskarna – från stagnation till förnyelse. Universitetsforskare, forskarutbildning och forskarrekrytering i Norden* (Universities and researchers – from stagnation to regeneration. University researchers, their training and recruitment in Nordic countries). Nordiska ministerrådet, Köpenhamn: Nord 1996:39, 581 pp.

The composition, age trends, qualifications, renewability potential, gender distribution and recruitment of university researchers have been standing issues in the science policy debates internationally and in the Nordic countries for several decades. Bertel Ståhle has now tackled these issues. In his monumental research report (581 pp.) Ståhle provides the reader with an excellent whole-length picture, not only of the development of university staff, but also of the development of universities and university policies in the Nordic countries. On the basis of wide statistical data, Ståhle analyses changes in the composition of academic staff, research training, the supply and demand of doctors and university research funding. The comparisons focus mainly on Denmark, Finland, Norway and Sweden. Iceland is introduced in a separate chapter due to the difficulties its smallness would have caused for the statistical comparisons.

Making comparative statistical analysis is always difficult and full of pitfalls. Among other things, it requires wide background knowledge on systemic features, history and policy turns of the compared societies. The differing compilation techniques of statistics and varying statistical definitions in countries under scrutiny set extra challenges. Ståhle, however, with an experience of

almost three decades in comparative science policy analysis in the Nordic countries, has profound knowledge of Nordic societies, their science policy developments and the problems of Nordic statistics.

The temporal focus of the analysis is on the 1980's and 1990's, but in some cases the analysis reaches back even 30-40 years. Ståhle points out that a long temporal horizon is crucial when analysing university staff. For instance, the composition of professorial staff in the uppermost age categories is a reflection of the situation among graduates 30-40 years ago and of the research training and doctorates 20-30 years ago. Thus, for instance, the gender distribution of the current professors reflects the situation among students some 20 to 30 years ago when the gender distribution and career patterns were different from today. The explanation of the current situation would be impossible without reference to the historical circumstances. The statistical comparisons generally cover the period from the beginning of the 1980's to the year 1993, but updatings have been conducted as far as possible to 1995 or 1996. Ståhle's analysis reaches, however, well beyond mere reporting of the latest statistical data, providing the reader with interesting insights into the development of Nordic university research system as a whole.

The widest time span is provided when Ståhle traces the historical roots of the Nordic university system from the Middle Ages onwards. He does this in order to show how the faculty system and the staff structure of the Middle Ages teaching universities and later civil service colleges have left their marks on the structure of the current research univer-

sity. Ståhle points out that the tenured research positions and the organisation of research in separate faculties is characterised more by the historical developments than by the actual needs of research in the current universities. Teaching still seems to be the primary function of the universities. Ståhle's analysis, however, indicates also that an increasing proportion of permanent staff's working time is spent on research even though the number of students has grown fast. This may indicate increasing tension between research and education which, ultimately, may lead to pressures to separate teaching and research from each other in one way or another.

One of the most interesting findings of the study concerns the problem of "blocking age cohorts", or collective aging of university researchers. In several debates it has been claimed that the older generations are "blocking" the career opportunities of younger researchers as the rapid expansion of university system has slowed down. As a consequence "a lost researcher generation" has emerged and the situation may lead to a generation changeover crisis when researchers of "blocking age cohorts" reach retirement age. Ståhle, however, argues that these views should be rejected. On the basis of the analysis of academic staff structure, age composition and production of trained researchers, he is able to show that the correspondence between the researcher's age, scientific qualifications and academic position is relatively weak. It seems that in all Nordic countries the academic staff is evenly distributed across all age groups from the youngest one to the group of 50 years and beyond. However, the age profile of tenured top positions

is dominated by older age groups but this is mainly due to the fact that those who were recruited into tenured positions during the past 10-15 years were older than previously. Ståhle's conclusion is that this is a consequence of increasing formal qualification requirements and toughening scientific competition. For a junior researcher, the report thus promises nothing but hardening competition for tenured posts, particularly since it seems difficult to influence the age profile with traditional science policy tools. Ståhle maintains that a decrease in average age can only be achieved by reducing the recruitment age.

The problem of increasing competition is even more evident when Ståhle discusses the future supply of and demand for trained researchers. The production of doctors has increased in all Nordic countries. Since the mid-1980's, in Denmark, Norway and Finland, and in 1990's also in Sweden, the annual amount of doctor's degrees has increased due to several factors, e.g., increasing scientific competition and goal-oriented policy. The national quantitative targets for doctor's degrees are usually based on forecasts on the need and supply of doctors. Ståhle criticises these forecasts from various perspectives. For instance, one of the most common shortcomings in forecasts has been that they have presupposed the demand of doctors to increase outside research and development (R&D) with the same speed as in R&D. In particular, the demand for doctors and trained researchers in business enterprise sector has been much overestimated. In addition, the scenarios have usually overestimated the growth of GNP.

On the basis of statistical analysis, Ståhle concludes that the amount of trained researchers increases rapidly in all Nordic countries while the demand for trained researchers grows relatively slowly. The analysis raises the question of an over-production of trained researchers in relation to the number of jobs. In addition, there are indications that the doctorate will develop into a form of extension studies in the increasingly competitive labour markets which leads to a gradual “inflation” of doctorate. The most urgent researcher training problem is no longer to increase the annual production of doctorates but instead of that, to pay attention to the utilisation of researchers and the further training of new doctors to professional researchers.

The study shows in several dimensions how the Nordic systems differ from each other. For instance, the professorate in Finland and Norway is several times larger in relation to the number of inhabitants than in Denmark and, to a certain extent, in Sweden. There are also differences in the distribution of professorships across various disciplines. In Finland, Norway and Sweden, there is in each country one discipline in which the number of professorships clearly exceeds, both relatively and absolutely, the other disciplines within the country and in other Nordic countries. These kinds of ‘national specifics’ are social sciences in Finland (28% of the Finnish professorate in 1993), natural sciences in Norway (28%) and medicine in Sweden (32%). In Denmark, the distribution of professorships across disciplines is more even. Thus, interestingly, the figures show that there are great differences between the countries and disciplines in creating

new professorships and career opportunities for university researchers. Some other striking features in the Nordic professorate are Norway’s part-time professors and Sweden’s part-time “extra-professors” (adjungerad professor). The most original professorial policy is applied in Norway. In 1991, Norway initiated a system of “personal competence professorships” (kompetensprofessor). In this system, a tenured researcher may apply promotion to a professor on the basis of achieving scientific qualifications required for the appointment regardless whether there are any vacant posts.

Corresponding differences between the Nordic countries can be found also in university funding. In general, the proportion of external funding has increased in all countries but it is considerably larger in Finland and Sweden than in Denmark and Norway. The external funding has not, however, superseded the general university funds since the amount of direct budget funding has increased concurrently. The balance between basic research, applied research and development work seems to endure – at least so far. Moreover, the effects of increasing external finance are often perceived as positive by the university researchers themselves. There are, however, considerable differences in external funding among the main scientific fields across the countries. In 1993, the biggest proportion of external funding can be found in engineering in Finland and Sweden. At the same time, the proportion of external funding in social sciences in Sweden was considerably bigger than in other countries. In Denmark and Norway, the biggest proportion of external finance was directed to agricul-

ture and forestry.

There are also clear country-specific "disciplinary profiles" in relation to research man years per capita. While the total amount of research man years has increased in every country since the 1980's, the most striking feature is the overwhelming position of engineering in Finnish university research. In 1993, 27% of all research man years in Finland was carried out in engineering. The corresponding figure was 10% in Norway and 16% in Denmark. If public sector research is included the differences are even more striking. In Finland 33%, in Sweden 20%, in Norway 6% and in Denmark 14% of research man years were conducted in engineering. In a country-specific examination medicine stands for the biggest proportion of research man years in Sweden and Denmark, while natural sciences have the largest proportion in Norway. The differences can be partly explained on the basis of differing costs of research man year in various disciplines, partly the differences reflect different policy priorities in the Nordic countries.

The analysis of undergraduate students also shows interesting differences. There are significant differences in the relative number of students in higher education. In 1993, the amount of students per 100 000 inhabitants was 1580 in Denmark, 2080 in Finland, 1810 in Norway, and 1080 in Sweden. There are also clear differences between countries in the distribution of students among disciplines. In 1992/1993, 34% of students in Finland studied natural sciences and engineering while the corresponding figure in Denmark was 28% and in Norway and Sweden 24%. Similarly striking is the proportion of stu-

dents of medicine in Sweden (14%) in relation to other countries' corresponding proportions (e.g. Norway 5% and Finland 7%). There are also clearly less students in humanities in Sweden (14%) than in other countries (e.g. Norway 20%).

A longstanding issue in higher education policy debates has been graduation age. In general, graduation age has been seen as too high in the Nordic countries because it affects the recruitment and career advancement of researchers. There are, however, differences also in this respect. The average graduation age in 1993 in, e.g., Denmark was 29,5 and in Finland 27. Similar differences can be found among disciplines: in social sciences, the lowest average graduation age was in Finland (27) and the highest in Norway (33,1). The same concerns the average completion age of Ph.D. degree. For instance, in Denmark the average completion age in 1993 was 34,9 while in Finland it was 38,0 and in Norway and Sweden 36,5. Variation is even greater across fields of study. For instance, in social sciences the average completion age was in Denmark 36,9 and in Sweden 42,9. Interestingly, Ståhle also points out that women complete their doctorate at a younger age than men in fields which have a low graduation age and a high degree of structured research training (natural sciences, engineering and medicine) while in fields with high graduation age and less-organised research training (humanities, social sciences) women complete their Ph.D. at an older age than men. Thus, there are significant differences among the countries concerning the time spent in research training. Especially Denmark's high graduation age and low completion

age of Ph.D. is striking. Partly this is due to different requirements and norms of postgraduate training. Hence, Ståhle raises a question concerning the extent to which research training and doctoral theses are comparable among the Nordic countries.

On the whole, the study shows interestingly that the Nordic countries, in spite of their obviously similar university and research systems, are quite different. There are, however, also common problems as many development trends seem to be quite alike in several Nordic countries. It is, for instance, evident that the over-production of doctors is a problem faced by all Nordic countries, not to mention the actual and increasing need for post-doctoral career advancement.

In general, the area covered by the book is so large and multifarious that it is only possible to scratch the surface of

the book in a short review. Since the book contains a huge amount of statistical information as well as policy and system descriptions it is an excellent handbook for various comparative and country-specific research or policy purposes. The book is published in Swedish which, unfortunately, excludes the English-speaking readership. Ståhle's analysis would be interesting reading also outside the Nordic countries. For English speaking audience the book, however, contains a relatively extensive English summary.

Mika Nieminen
Research Institute for Social Sciences
Science Studies Unit
University of Tampere
Tampere, Finland