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MEASURING AND REWARDING EXCELLENCE OF ACADEMIC CAREERS

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MEASURING AND REWARDING EXCELLENCE

Introduction

This report considers the issue, how excellence and output is measured in the different academic systems and to which extent gender differences exist. In the main we refer to the reports that were the result of the MOBISC-Project where five EU-countries took part (Great Britain, Italy, Austria, Greece, Portugal). This project relates to the mobility of researchers and to gender differences in academic careers.

The reports we refer to are from Lousie Ackers, Andrew Sockanathan and Elisabeth Oliver (UK), Sonia Morano-Foadi (Italy), Doris Kapeller and Monika Kastner (Austria), Maria Karamessini (Greece) and Heloisa Perista and Alexandra Silva (Portugal). To give detailed examples we quote interviews that were conducted with 50 natural scientists in context of the MOBISC-Project in each of these countries.

The report opens with a description of the access to higher education, because the access to universities is a pre-condition for an academic career. To understand the differences of the system, we will give an overview of the relation between private and public universities in each country and how applying to University in the different countries, if the access to Universities is limited by numerus clausus and tuition fees. The next section will detail the various positions that professional scientists can work within the higher education sector. It will look at access to the various positions and will highlight issues that may affect an individual's career progression in the different countries. The individual career is influenced by the government and society in the fields of job possibilities, public support of research and social recognition. Section three moves on to consider how excellence of scientists is measured, what kind of differences exist in the countries concerning career positions and which informal criteria of qualification are requested to advance in scientific career. A special view is taken to career prospects of women and informal barriers of female career progression.

1. The Access to University

This section considers the access to Higher Education as important first step for an academic career. Austria, Italy, Greece, Portugal and the UK have different conditions for young people, who want to start studying.

Concerning the minimum duration of undergraduate studies all five countries are very similar (about 4 to 6 years). In Great Britain it is still very common to do a three year bachelor, but the offer of master studies tend to increase. In Austria Undergraduate Studies usually last about 8 to 10 semesters (4-6 years) whereas the Doctoral Degree can be completed after two years. 2003 a new way of Higher Education with international currence, the "Bachelor" was established, which has the minimum duration of 6 to 8 semesters (3-4 years) and can be continued to a "Master". In Italy the normal minimum age for an undergraduate to start a course is 18 or 19 years old and the average age for getting a first degree is 26,5 years¹.

Higher education in Portugal is composed by bacharelato courses, which last 3 years (short-term higher education courses) and by licenciatura courses which are 4 to 6 year courses

¹ See web site MIUR <http://www.miur.it>

(long-term higher education courses). Because the labour market value of the licenciatura has decreased it is possible to do a taught course (duration usually 1 up to 2 years) afterwards in order to get the Mestrado (Master's degree). Students also can directly go from the licenciatura to the doutoramento (Doctorate) after having shown good performance.

The doctorate degree can be obtained as follows: "Portuguese students who wish to pursue a PhD degree can do it in two different ways depending on their graduation marks: a) take a PhD programme (these are not very common in Portugal, though), which consists of 1 year of specific courses in their research area usually the same as for a Master's degree) plus 4 years for the development of an original work and writing their final dissertation; b) those with higher marks (16 or over) are from the beginning exclusively engaged in the practical development of their work/thesis, which ought to be completed within 4 years. In practice, most students take 5 to 6 years to complete their PhD" (Perista/Silva 2004). In the early 90's the PhD average age was 38 years old (Duarte 1996) and should be decreased until now in account of new funding rules that have been implemented since 1993.

In Greece, Master level courses first appeared at universities in the 1970s. Until the beginning of the 1990s they were under-developed in comparison to advanced EU countries. The duration of undergraduate studies is 4-6 years at universities and 3-4 years at Technological Education Institutes. Universities provide general scientific knowledge in several disciplines as well as interdisciplinary studies, while the technological education institutes are geared to technical knowledge of applied character and studies have a more clear-cut vocational orientation. Post-graduate studies are organized only by universities. Apart from academics, in Greece a great number of senior and junior researchers, research assistants and PhD students are involved in research carried out by universities. The research personnel is mostly working on service contracts or on limited duration contracts and is paid from the funds of the project they participate in.

1.1. The UK

The UK system is generally based on achievement (output) and excellence. It is arguably one of the more elitist systems in Europe with entrance to Higher Education still based primarily on examination performance at 18, although schemes aimed at widening participation are contributing to massification (in common with other countries).

Progression onto higher levels is essentially meritocratic, relatively transparent and highly regulated at least within universities. The UK is perhaps unique in having implemented a system for the 'measurement' of output and rewarding of excellence (the Research Assessment Exercise) which many other countries are now following. Universities in the UK differ in size and the mix of subjects that are offered. Universities are autonomous institutions and can determine their own admission procedures such as what kind of courses and degrees they offer.

There is a distinction concerning the mission and subject mix often referred to as 'new' or 'post-1992' universities² - that placed greater emphasis on the practical application of knowledge - and the 'old' or 'pre-1992' universities that generally provide academic courses rather than professional training (Roberts 2002). The 'Golden Triangle' of Oxford and London Universities (such as University of Oxford, Cambridge, University College London and Imperial College) dominates ratings and research funding allocation.

Where an individual is planning to go on to study a subject at a research-intensive university, the traditional post compulsory route would lead into the General Certificate of Education Advanced-Level qualifications (A-levels). The "Roberts Review of the Supply of People With

² Referring to the Implementation of the Further and Higher Education Act 1992; including the CMU - Coalition of Modern Universities

Science, Technology, Engineering and Mathematics Skills” found that compared to those studying A-levels, the number of pupils studying for vocational qualifications that might lead on to higher education courses in science and engineering, is relatively small.

Although there are recognised alternative routes into science courses in higher education institutions, the use of which are becoming more popular, A-levels – that are single subject examinations - may be studied in any combination and remain the most common option for those who wish to study science (Roberts 2002, 45-46). The courses, which usually last for two years, can be taken in schools or further education institutions and most students take the examinations at the age of 18 years. In order to broaden the curriculum, GCE Advanced Subsidiary Qualifications (AS qualifications) have been introduced. Students are encouraged to study up to five subjects in their first year and on successful completion are awarded AS qualifications. AS exams require the same academic standard as A-levels but include half of the content. Pupils commonly go on to study three of their subjects at A-level in the second year. Another possibility for mature students who may lack formal qualifications is to do an access course.

Students do not apply directly to the university but apply through a centralised admissions service known as UCAS (Universities and Colleges Admissions Service) to the university of their choice. After having passed the access to university students in England and Wales are required to pay tuition fees if the family income is over £20,970 a year. The maximum fees by a family income of over £31,231 (€45,000) are £1,125 (€630) per year. Students from low-income-families don't have to pay tuition fees. There is no entitlement to centrally funded support at post-graduate level. PhD Students have to pay tuition fees yearly that are determined by the university according to the recommendation of the maximum tuition fee by the government. The Doctoral training grants are awarded to universities what means that students are not directly supported for their mainstream research. Students are advised to secure funding before applying officially to the university. Grants are predominantly funded by the Research Councils ³(that are established under Royal Charter).

1.2. Austria

The Austrian research scene is characterized by the dominant position of public universities on the one hand and by small and medium-sized structure of enterprises carrying out researches on the other which are highly heterogeneous with regard to their special fields and at most funded by the state. There are 22 universities maintained by the state and 6 very small Private Universities.

Since the year 2000 a new law has been implemented providing full autonomy to the universities. Austrian universities are changed in 2003 by legalisation. This reform organises the universities as legal entities independent of the Federal Government. The government wants to save money, so they decided this structural and organizational change – the so-called “Autonomie der Universitäten”.

The number of students has grown in the last ten years, but the financial base of the universities stayed the same.

In 1994, Fachhochschule programmes (technical colleges of higher education) were established to supplement university education. They are professionally oriented and have a shorter duration of studies. “Fachhochschulen” can be visited after the successful completion of an entrance examination. There is a great demand for these programmes: 60 study programmes have already been approved in the fields of tourism, business studies, technology, information technology and multimedia.

³ For further information see <http://www.rcuk.ac.uk>

Since 2001 the government has determined tuition fees for public universities in amount of €363,36 per semester in order to stop over-crowding and to minimize the high drop-out rate in order to secure a quick completion of studies⁴.

Students have to complete the secondary education level by the national level examination called “Matura” that gives them the allowance to study. Individuals who don’t have it are instructed to do the “Studienberechtigungsprüfung”, an exam at the universities to be entitled to study. Required for this is a minimum age of 22 or 20 when having a vocational training for about 4 years⁵. Students apply personally at the universities by showing their certificate of “Matura” or “Studienberechtigungsprüfung” to choose their subject they want to study. In general universities are open, that means there is no numerus clausus.

Grants are provided to students of families with lower income and with good performance and are between €180 and €7.800 per annum (payed in 12 monthly instalments)⁶.

Depending on the subject studies are divided in 2 or three parts of each 2 or 4 semester in regards of the content, the so-called *Studienabschnitt*, after that students have to submit their reports. If a *Studienabschnitt* lasts one semester longer than the minimum duration students lose their scholarships until they reach the next *Studienabschnitt*.

1.3. Italy

Higher education in Italy is provided by various institutions like State Universities, private Universities (*università libere*), Politecnics (Politecnici) Academies (accademie) and Conservatories (Conservatori). 64 public universities (containing 3 universities for technology and 3 scuole superiore) and 26 private institutions, containing 16 Universities and 10 Colleges of Physical Education do exist (Berning 2002).

Recently, a new law has introduced the possibility of public and private universities to offer degrees by distance learning⁷.

The biggest public research entity is the National Research Council (CNR), mainly funded by the Government. It is divided into several institutes and centres located on the whole national territory which have a political and strategic autonomy, but without the potential to interact with industry and universities.

All potential graduates apply to the university of their choice directly to the institution.

The *numero chiuso*, that means the limited access to university, is in general politically unacceptable, in Italy with very few exceptions (e.g. dentistry).

Therefore, all students holding a *Diploma di Maturità*⁸ are entitled to enter any degree. However, in recent years, there has been a growing tendency to introduce "entrance tests" and other devices to reduce the number of entrants to a more manageable figure.⁹

In the year 2000 two elements led to an Higher Education Reform, the so-called “Zecchino” Reform¹⁰: the dropout rate and the excessive length of university studies.

It seems to have reduced the problem of massification at universities, certainly through the introduction of new modules and curricula and the increment of novel degrees.

⁴ see http://www.bmbwk.gv.at/universitaeten/studieren/Informationen_zum_Studie3819.xml

⁵ see http://www.bmbwk.gv.at/universitaeten/studieren/Aufnahme_an_oesterreichi3497.xml

⁶ see <http://www.bmbwk.gv.at/universitaeten/soziales/stip/studbei.xml>

⁷ article: Ecco come ottenere la laurea con internet dal ministero le regole per studiare a distanza, 3 luglio 2003, La Stampa, Varie – Redazione.

⁸ There are several A levels (*diploma di maturità*) in Italy ranging from Classical, Scientific and Artistic Lyceum to other technical and professional schools. Best performances of students from Lyceum (55% get a degree) and then Teaching Institutes (37%). Data ISTAT, see web-site Italian National Statistic Institute <http://www.istat.it>

⁹ From 1993/94 there has been a drastic drop of enrolment for the introduction of the entrance test in medicine: Data ISTAT see footnote no. 6

¹⁰ See Law DM 4 August 2000 published in the Official Journal (G.U. no.245, 19th October 2000)

In fact, the university training system has been revised and changes have been introduced in terms of autonomy of the management and didactic organisation.

Although, it is too early to be able to evaluate the new system, industries have welcomed the reform. Their main interest is to have young graduates with no specific training, at least at their first employment experience. On the contrary, most academics generally disagree with the higher education reform. They think the system is producing low quality graduates and the Italian tradition to produce top quality people, who are typically competitive at high levels abroad, is becoming only a memory of the past.

During the last years tuition fees have increased in all faculties. Fees are fixed by the family income and progressive criteria of study. For example the highest amount of fees required to study at the University of Pisa is 1125 Euro per annum (plus 98 Euro for a regional tax).

Good grades in the *diploma di maturita* (examinations at the end of Upper Secondary Schools) give students the advantage of not paying the first year fees. Also a good average at the exams taken at the end of the courses lead to fees exemption. Moreover there are specific discounts or exemption for low-income families¹¹ and disabled students.

1.4. Portugal

Portugal has known for the last 30 years (the Revolution of the 25th April 1974 representing at this level - as well as at many others – a major benchmark) a trend to the democratisation of the educational system and, in particular, to a significant increase in the access to higher education.

However, nowadays Portugal is still facing a serious problem in terms of human resources qualification. Early drop-out from school, even before the accomplishment of compulsory education, is a common feature and the proportion of the total population with some level of higher education is rather low (men: 10.8% - 9.9%, women: 11.7%).¹²

Taking the EUROSTAT – *Labour Force Survey* indicator of the supply of advanced skills,¹³ we reach the same conclusion: the figure for Portugal does not exceed 9,4%, compared to 21,5% for the EU15 average¹⁴ (DG Enterprise, 2003).

Therefore, the promotion of human resources qualification has been presented as a major political goal, aiming at a growing convergence with the average situation in the EU, in particular regarding post-graduate training. Priority has thus been given to the stimulus to PhD and post-doctorate studies as a means to increase academic qualification as well as to enlarge the research field, given that the number of researchers per thousand active population is still one of the lowest in the EU – 3.27, which represents 62% of the EU average (even if showing a growth rate between 1995-1999 of 7,61%, compared to 2,89% for the EU average) (DG Research 2001).

Internationalisation of advanced training is a parallel goal to the improvement of the qualification and the number of researchers. On the one hand it is carried out by the granting of support to the prosecution of doctoral and post-doctoral studies abroad (especially in the EU) but, in the last couple of years, it has also meant a growing presence of foreign post-graduate students, among grant holders in Portugal.

¹¹ See Opera universitaria web site <http://www.operauni.tn.it>.

¹² see INE 2001 Population Census.

¹³ Number of persons with some form of post-secondary education in percentage of the reference population aged between 25 and 64 years inclusive.

¹⁴ Although, given the national variations in this domain, and as stated in the reference document, we are well aware of the difficulties in making international comparisons regarding educational levels.

Because R&D activities are largely under-developed in the business enterprise sector the third major political goal, in the science field, has been to increase them. A science career in the industry sector, for men and especially for women researchers, is thus not a common situation in Portugal.

To apply at an university students have to pass a national level examination at the end of the 12th grade. In Portugal the system of numerus clausus has been introduced, that means, it depends on the students' marks and on the number of places available if they may be admitted. The marks are calculated on the basis of the examinations marks and the average marks from secondary education.

Access to higher education can also be gained through special contests (for which very few places are usually available), addressed to individuals aged over 25 years who have not completed a secondary course, individuals who already hold a medium or higher course, or candidates who have been previously enrolled in higher education institutes in a foreign country. Special regimes are also foreseen, for example, to diplomatic personnel and their accompanying relatives or to Portuguese citizens who are grant holders in a foreign country and their accompanying relatives.

Since 2003 students are supposed to pay tuition fees. The amount of the fees depends on the quality of the courses and is defined by each institution autonomously, according to the nature of the courses and their quality, with a minimum value corresponding to the national minimum wage. For example the costs for a master's degree may vary between €900 and €5000.

Higher education students are, in principle, covered by an educational social action system, guaranteed by the State (although this is usually criticised for being clearly insufficient and poorly funded). Exceptions are made for disabled or economically disadvantaged students or students with an exceptional school performance by providing studies grants (by government or private institutions) depending on the economic situation of the student's household.

Following this recent legislation, the value of fees has very much increased in many universities, which gave motif to large students' demonstrations and other contestation initiatives against fees all over the country.

1.5. Greece

The Greek higher education system is made up of two distinctive types of institutions, universities and technological education institutes.

There are 21 universities and 14 technological education institutes in Greece.

Universities provide general scientific knowledge in several disciplines as well as interdisciplinary studies, while the technological education institutes are geared to technical knowledge of applied character and studies have a more clear-cut vocational orientation. Post-graduate studies are organized only by universities. Scientific research and technological development is done in different types of institutions of the public and private sector. Whereas the public sector includes the higher education research and the government research institutions and technology centres and institutes, the private sector provides R&D activities in private firms and non-profit research institutes.

On account of the dominance of the public sector only a small percentage of 15,1% of all researchers are employed in the business sector. There is also dominance within the public sector relating to the R&D expenditure from that is 49% absorbed by higher education institutions. The low qualifications of the teaching staff at technological education institutes and the monopoly of the universities concerning the organisation of PhD courses cause a leadership of the universities in carrying out research.

Research in universities takes place into the numerous university research centres, institutes and laboratories out of which only 19 possess a separate legal status as well as managerial and

financial autonomy from their respective universities. University research units compete with the government and private research institutions in the open market for publicly and privately funded projects of basic and applied research.

Students are admitted to university after their successful performance at national level examinations taking place at the last two grades of the upper secondary schools.

Higher education is free of charge for most Greek students because many master programmes do not charge tuition fees to their students. But of those who have to pay tuition fees are only a few who get scholarships. Additionally, students are admitted to the Hellenic Open University upon the completion of the 22 year of age by drawing lots.

Masters programmes increased rapidly during the 1990s; their number passed from 51 in 1993 to 233 in 2002. Indeed, only a minority of post-graduate students in Greek universities enjoy a scholarship. The beneficiaries will receive a monthly allowance of 450 € for a period of 12 to 24 months in case of Master level studies or for a period of 12 to 36 months in case of doctoral studies (600 € per month). Recently scholarships for doctoral studies have recently been extended. Since 2003 there have started several governmental projects supporting the participation of PhD students and post-doctoral researchers at research projects (such as the Heraklitos or Pythagoras Programme). It can be sustained that opening up employment opportunities in research mostly favours young post-doc researchers. This is what is expected from the recent IRON programme of the General Secretariat of Research and Development (Ministry of Development), which subsidizes the employment of new researchers and technicians for 18 to 36 months in research projects of the business sector.

2. Measuring and Rewarding Excellence

The following chapter tries to describe what is expected of scientists and academics from universities and society. When is research output signed as “excellent”? What basic conditions must be given to do excellent scientific work? What are the circumstances of mobility? Measuring excellence takes place at different levels. At the institutional level universities and institutes are evaluated concerning their research output. The individual level includes examinations contests and requirements at different stages of an individual’s academic career. A third chapter will describe informal criteria that are expected in the CV of a scientist defined to be “excellent”.

To introduce to the topic we would like to show the general situation of academic research careers with a view of female participation in science careers in Great Britain, Austria, Italy, Greece and Portugal.

2.1. General Situation of Science Careers

Academic Career prospects after the doctorate differ a lot between the countries within our research group. The academic system in Great Britain probably offers the best possibilities to start an academic career. The strong funding of Science in the UK compared to other EU countries and the more flexible and transparent forms of recruitment result in a significant number of opportunities at post-doctoral level. The post-doc-system in the UK shows us advantages both for new doctorates and their employers. The project based nature of contract research leads to a better direction of staff resources towards topics that are identified as current relevant by the research councils and other funders. In addition to this the system is important in providing staffing flexibly in the university system. Furthermore, national and

international mobility is encouraged which leads to a development of innovative approaches and team working skills (Roberts 2002, 146).

If pursuing a scientific career it will be most useful to have a graduate qualification from a university with good reputation. Therefore it is more important where you get your degree than to get a degree.

Other countries such as Portugal and Greece lack of qualified positions. Especially Portugal shows an under-developed research system which forces young scientists to go abroad.

In Portugal most doctoral students and young researchers remain as grant holders for a very long time due the lack of employment opportunities. That means they have to go from one grant to another. Apart from academics, in Greece a great number of senior and junior researchers, research assistants and PhD students are involved in research carried out by universities. The Greek research personnel is mostly working on service contracts or on limited duration labour contracts and is paid from the funds of the project they participate in.

In all countries it is more or less common for PhD students and young researchers to live on grants therefore they often do not have the state of employees. Concerning this, a British Physicist, living in Portugal now for five years, draws an insecure picture of an Academic Career in Portugal:

“The scientific career involves you spending a large number of years on grants and short term contracts, not knowing when the next one is coming, until you reach a point when either you get a permanent job, or you have to leave science”. (Interview 126)

Such tendencies can be pointed out in all five countries. That leads us to the assumption that there are also disadvantages of the post-doc-system in Great Britain. As Rothwell either says, people with post-doc-contracts are those ‘who move from one short-term to another, sometimes into middle age, with little or no security (Rothwell 2002, 74).

Generally the number of insecure limited-contract positions in academia has a tendency to rise in all five countries.

To take a look at the Quality of Research and Higher Education Portugal’s percentage of individuals with ‘advanced skills’¹⁵ is among the lowest of the EU-15. On account of the great lack of human resources – the percentage of individuals with ‘advanced skills’ is about 9,4% compared with the EU-average of 21,5 % - the government has started the promotion of higher education (DG Enterprise 2003). That is why priority lies on the PhD programmes to enlarge research fields and to improve the academic qualification. Further political goals are the internationalisation of advanced training and the increase of R&D activities in the industry sector.

Another criterion to understand the importance of Research and Science in a country is the amount of Research & Development activities. Viewing the Gross domestic expenditure on Research & Development (Table 1.) we can see that Greece does have the lowest rate in the EU-15 with 0,67 of GDP, followed by Portugal with 0,76 and Italy with 1,04. Austria and Great Britain invest the most in R&D with 1,83 and 1,85.

¹⁵ Number of persons with some form of post-secondary education in percentage of the reference population aged between 25 and 64 years inclusive.

Table 1. **Gross domestic expenditure on R&D as a percentage of GDP (1999)**

US	2.66	Spain	0.88	Finland	3.22	Latvia	0.40
Japan	2.94	France	2.18	Sweden	3.78	Poland	0.75
EU-15	1.93	Ireland	1.21	United Kingdom	1.85	Romania	0.40
ACC*	0.83	Italy	1.04	Cyprus	0.25	Slovenia	1.51
Belgium	1.96	Luxembourg	1.36**	Czech Republic	1.24	Slovak Republic	0.66
Denmark	2.09	Netherlands	2.02	Estonia	0.75	Turkey	0.60
Germany	2.44	Austria	1.83	Hungary	0.69	Iceland	2.32
Greece	0.67	Portugal	0.76	Lithuania	0.52	Norway	1.65

* Acceding countries. ** Data for 2000.

Source: Eurostat - Structural Indicators.

To upgrade investments in research some states of the EU-15 enjoy funding of the European Union. For example 24,7% of Research and Development in Greece is funded by the EU, also 19,9% of Austria's R&D, Great Britain gets support for 17,3% of R&D, Italy for 6,2% and Portugal 5,3% (Eurostat; Structural Indicators). This may explain why jobs in Science and Research have such a bad reputation in Portugal. Neither the state nor the European Union invest in Research and Development in Portugal to a large extent. A concrete example for the low reputation of science in Portugal comes from a researcher from abroad who tells us about two job advertisements for research at a institution in Coimbra:

"[...] in Coimbra there were only three applicants – two positions and three applicants. It's unbelievable! Even professors who were tired of teaching could have applied and didn't. And why? Because the research career had such a poor reputation, it had such a poor reputation – people considered it to be degrading, the opposite of a promotion."(Interview 103)

Most applications for academic posts are made after an open call in which requirements differ according to country and position. Only Italy has implemented the concorso which is a countrywide contest for scientific programmes such as doctoral programmes and grants. In Italy academic career progression is very meritocratic with the regard to the practise of public competition (concorsi). On the one hand the system seems to be transparent through this practice, on the other hand the reality at universities is full of corruption.

Referring to the situation of women in Science Careers the situation in the five countries differs only partly. In general, women are more represented in lower positions than in higher ones. In Great Britain women are more likely to study part-time and less likely to study full-time for their doctorate than men. Although the female percentage is growing in PhD programmes women are more likely to complete them in social work than in natural sciences. Women in the UK are also more represented in fixed term contracts than in permanent ones. As in most other countries in the EU the percentage of women in higher positions – (such as full-time-lecturers, Senior Lecturers and Professors) is much lower than that of men. Furthermore the percentage of women decreases with seniority. Despite the large number of initiatives in Great Britain female scientists feel still isolated. Therefore the Greenfield Report (2002) suggests that initiatives should be networked together to provide a higher effectiveness.

In Austria the same two tendencies concerning gender can be pointed out: firstly the gender-specific choices of subjects and secondly the under-representation of women in doctoral studies. Noticeable is the under-representation of women in technical sciences and in coal and steel industrial sciences and as well the over-representation of female students in human and

natural sciences, especially in philosophical, philological and cultural subjects. 63% of the medicine students and 79% of the veterinary medicine students are female (Bundesministerium für Bildung, Wissenschaft und Kultur 2003). Men are more likely to begin a doctoral study and they also seem to be more likely to complete a doctoral study successfully. This must be considered as a major problem in increasing the amount of female scientists at universities because the doctoral degree is an absolute precondition for a career at a university or a scientific career. Women show interruptions of employment during their biography (due to child care) and are very often found in atypical employments. That can be described as “typically female working patterns” (Kapeller et al. 1999) which cause dependency on male partners or spouses. These factors collide with or cause the problems of reconciling employment and family work/child care. In the above mentioned publication there are some new data about part-time working personnel at Austrian universities (Buchinger et al. 2002). Women show the highest proportion of part-time employees at universities in general and the highest proportion at the lowest level which is the post of an assistant with a contract of limited duration (“Vertragsassistentin”, “Vertragsassistent”). In total there are 1.156 assistants with a contract of limited duration and 966 of them work part-time which is a quota of 84% and the female quota is 43,4% (Buchinger et al. 2002, 56). Except for this group of university personnel, the part-time proportion of Austrian university teachers is extremely low.

Although the number of women in Italy working in academia has increased rapidly (of 20,6% compared to 9,2% of men)) there is still a clear unbalance between the sexes (EC 2003, 46). In almost all disciplines the feminisation rate is below 50%. The number of women also decreases passing from a lower to a higher academic position. One reason for this could be the complicated structure of the Italian Academia. Because of evaluation-based procedures of the concorsi academic progression is a very slow and complicated process. While women represent the majority of the administrative staff and about 40% of the researchers (ISTAT 2001), among professors (full and associate) women represent a minority (Facchini 1997). Reasons for this development could be the incompatible requirements of research with family and children and the invisible rules preventing women to take part in higher positions, the so-called crystal-ceiling (or glass-ceiling). A further reason could be “childbearing” during the years of career building and the lack of mobility therefore.

In Portugal women represented 64,3% of all graduates from higher education in the year 2001/02 (Observatorio da Ciencia e do Ensino Superior in: *CIDM 2004*). This follows a trend to a generally higher feminisation rate in almost every Member States of the EU while in studies of science and technology the feminisation rate of the graduates is very low (10,3% women to 31,3% of men in Portugal) (EUROSTAT 2003). In the academic year 1999/2000 the female percentage of students enrolled their Master’s degrees was 54% (*Estatísticas da Educacao 1999/2000*, feminisation rate, in *CIDM 2004*). Recently specific grants aiming at the promotion of the participation of young female post-docs in life sciences have been created (2003) – the so-called L’Oreal Grants for Women in Science.

Concerning the female participation Greece is among the leading EU-countries. Though the percentage of women in academic careers is steadily increasing, the participation of women in higher positions is still very low (full professors: 13,2%). Nevertheless they play an important role in the lower ranks such as lecturers (2001/02: 39,1%) and assistant professors (32,4%).

Although women complete their Master studies at an earlier age than men the opposite happens according to the completion of the PhD. Also women risk more not to finish their doctoral studies. To show the conditions for Greek women entering a scientific career the following facts can be pointed out: At first, discrimination against women appears in relation to the assignment and composition of tasks and promotion. Secondly, the proportion of male researchers occupying posts entailing responsibility and initiative is twice the respective proportion of women. Women are also less involved in the organisation of scientific activities

and reduced participation in administration boards and scientific committees. Another point is that family and child care responsibilities are serious obstacles to the career progression of women (Teperoglou et al. 2002).

2.2. Measuring institutional Excellence

Measuring research output of institutes and academic departments seems to be a phenomenon that has been established by Great Britain. Evaluation of Research Quality and therefore the dependence between the result of evaluation and governmental funding are criteria that only the best universities with the highest reputation award high amount of funding. Nowadays, more and more other countries are following this system.

It is not very clear what constitutes the key to progression in Italy. Recently, newspaper articles and associations have called for the development of a system that is as transparent and objective as possible as the basis for encouraging and rewarding excellence. Some universities have implemented procedures to measure and value research output (both qualitatively and quantitatively). This is a sporadic and isolated initiative of single universities. For example the University of Padua has introduced the impact factor, the section index and an ex-post evaluation of projects to allow only successful research teams and groups to have access to funding.¹⁶ Furthermore a system of assessment has been implemented for medicine and medical studies based on the impact factor of all publications in the previous three years. Although formally some excellence mechanisms might have been implemented, in practice to progress researchers have to work hard and sustain their protector, *barone*, who is a very powerful professor. This is confirmed by one of the MOBEX key informants:

“I have been member of several promotion committees and I had the impression I could decide exactly what I wanted. Unless I had made a mistake in the writing up of a minute or something similar that could be contested before the Court, I could have exercised choices being completely free by liability. Academic choices need to be determined on the basis of merit only. Universities have to compete for excellence and if they do not produce the required standard they should close down. In Italy such a system has been debated and it seems not consensually accepted. Competition can be violent in some cases but it is the price to pay if we want to achieve excellence”. (London 15/11/2002)

Also in Portugal an Assessment of Research Centres has been implemented by the government to spread funding. Assessing departments often has negative consequences for research, as a Portuguese Physicist claims:

“All the departments are constantly evaluated and, if that’s not giving anything or if there is something more important to do, they have no scruples in closing one thing, sacking people and open something else somewhere else.” (Interview 130)

In Austria Evaluation of Teaching at Universities occurs by making inquiries with students containing questions about the quality of the courses.

Indeed, in all countries of our research group except the UK research assessment exists only in particular fields or steps of an individual’s career. In comparison to them the UK research assessment should be commended for its transparency in the following: To ensure an international high standard of scientific output the UK’s government has implemented the Research Assessment Exercise (RAE) since the mid 1980’s.

The RAE is an instrument for measuring research excellence and evaluating research quality at the academic departments of Higher Education Institutions in order to arrange the distribution of governmental and non-governmental funding. So institutions with the most

¹⁶ Interview with one of the MOBEX project Key informants, 15/11/2002 11,30 – 13,00, University of Padua.

prestigious reputation and highest levels of international standing receive the highest amount of funds.

The process operates through a system of expert peer review that covers all disciplines. The peer review is conducted by a panel of experts who allocate the results of the assessment to a 'Unit of Assessment' which is discipline-based (i.e. the unit 'Biological Sciences'; 'Politics and International Studies' etc.). There are two levels where competition takes place. At first, all publicly funded Universities and Higher Education Colleges are invited to submit information regarding their research activities for assessment on a voluntary basis.

Because of the fact that departments with low research activities would get less amount of funding some departments get under pressure to improve their research qualities.

Secondly, members of staff can be selectively chosen for submission to secure funding for the institution. That leads to a competition between the research active staff which could impact negatively to the social environment of the departments (Chandler/Barry/Clark 2002). Virtually all of the government funding for research is linked to the quality and volume of research (HEFCE 2001). In order to enable the funding bodies to distribute research funding, research quality is assessed every 4-5 years through the Research Assessment Exercise (RAE). An individual's ability to contribute to the RAE is therefore intrinsic to their career. As part of the assessment process higher education institutions are invited to submit information about their research activity for assessment. The submission forms ask for details of in the fields of staff, research outputs, research students and studentships, external research income and structure & plans and additional observations.

For the individual working in higher education it is important to be aware that although the reforms proposed for the RAE recommend a variety of excellence indicators, the quality of the publications submitted the RAE Panel are likely to be very important in assessing their rating. Because of the link between the quality of research output and the way that excellence is measured in the RAE, that academic researchers publish books and articles in peer reviewed journals¹⁷ is considered most important to a researcher's career.

2.3. Measuring and rewarding individual excellence

This section highlights the issue about the individual academic career in the single countries. The greatest aim in a scientist's career is a permanent position. There is a significant connection between measurement criteria containing examinations or hearings on the one hand and requirements according to the academic position on the other hand. It is a difference whether you apply for a post after an open call or have to pass examinations such as in Italy (during the concorso) to get the position. Furthermore this has an impact on when an applicant is considered to get a permanent position or even whether it is ever likely to get a permanent contract during an academic career.

In the following section we will have a look at the requirements a young researcher has to fulfil to start an academic career and what the conditions are to get a permanent position in each country.

2.3.1. The UK

It is very common for scientists working in higher education to have doctoral qualifications and to have worked as a post-doctoral researcher before becoming a permanent member of

¹⁷ Briefing Note 4 for the RAE 2001 on Research Outputs states "When assessing the research quality of a research output panels may take into consideration evidence that the item has already been reviewed or refereed by peers as one measure of quality. However the absence of such review may not, in itself, be taken to imply lower quality" (<http://www.hero.ac.uk/rae/Pubs/briefing/note4.htm>)

staff (Roberts 2002, 144). The extent to which a post-doc period is necessary varies between disciplines. In natural sciences it is expected to have at least one post-doc position whereas in social sciences it is common to move directly from the PhD to a junior lectureship.

Within a research group post-docs typically work under a principal investigator, giving a level of informal support to PhD students and conducting research on a specific topic. Many post-docs also work in teaching capacity and get paid for this on top of their salary.

The following quotes are some examples of how indicators of scientific excellence have been perceived by the MOBEX respondents. First of all it is very common for scientists working in higher education to have worked as a post-doctoral researcher before becoming a permanent member of staff. To find a permanent job, it's judged very difficult and competitive:

"In England there's this culture where you have fellowships so you get money for 5 years rather than for 1 or 2 years and it's a very good intermediate between trying to go for a lectureship and being a post-doc. It gives you time to develop your research and establish your name so not many countries have that." (Interview 02)

Though the British Post-Doc system is seen very positively, nevertheless there are still disadvantages of this system. As Rothwell says, people with post-doc-contracts are those 'who move from one short-term to another, sometimes into middle age, with little or no security (Rothwell 2002, 74). A Physician supports this opinion as followed in an interview:

"Britain it's very easy to get in but hard to get a permanent job." (Interview 021)

"It's not so much the temporary contract in itself, it's the career progression as post-doc you have the feeling that yes it's fine to do a post-doc for 2 years, yes it's fine to do a post-doc for 4 years but 6 years that's a bit off. The older you become a. more experienced, b. more expensive and it's difficult for an employer to employ you and it's difficult for yourself to develop if you want to develop as a scientist so this is the biggest problem." (Interview 068)

Otherwise the post-doc-system in the UK shows us advantages both for new doctorates and their employers. The project based nature of contract research leads to a better direction of staff resources towards topics that are identified as current relevant by the research councils and other funders. In addition to this the system is important in providing staffing flexibly in the university system. Furthermore, national and international mobility is encouraged which leads to a development of innovative approaches and team working skills (Roberts 2002, 146).

The selection of applicants for a junior lectureship – which is the lowest rank - is done by members of department observing the vocational presentation of the applicants – to assess their knowledge or ability to speak publicly.

In most cases a new junior lecturer (Level A) has to complete a programme of teaching and training successfully during the first year of probation to get the "Postgraduate Certificate in Learning and Teaching in Higher Education" (PGLCT) by the "Institute for Learning and Teaching in Higher Education" (ILTHE). Expectations of a junior lecturer are teaching, administrative contribution, management of resources, initiating proposals for research projects and obtaining funding. Capacity has to be shown in directing research projects and recording sustainable research output. Level B contents regulations to higher annual salary. Promotion to level B is not competitive but based on the individual performance. For the next rank of Senior Lectureship the candidate has to submit description and evaluation of their activities in teaching, research, management and administration by self-application. For a Readership the applicant needs to show outstanding achievement in scholarship, original research and/or innovative application. Candidates must have some experiences in supervising, gaining research grants and awards, speaking at international meetings etc..

The highest rank, the title of ‘professor’ can be an institutional position or be awarded to individuals. High requirements in administration, teaching (and supervision) and research at an international level have to be fulfilled. In practise research outputs (publications and income generation) are prioritised. There are lower requirements in teaching as for junior lecturers but more in management (i.e. developing courses, participation at committees, propose budget arrangements for research). In addition to this the candidate must have international reputation and a significant experience in industrial collaboration.

2.3.2. Austria

Research career staff is recruited through public invitation to tender. Persons, who holding a PhD degree can send their CV and have to present their curriculum and their scientific work. Candidates must show experience in research, administration and teaching. Because of this, mostly people who are on the institute win the competition.

Though the accent of a post-doctoral position lies on research the person has to fulfil administrative and teaching duties (see interview 306).

According to the university career ladder of the old system the lowest rank after the doctorate was a lecturer with a teaching contract of 1 semester. The next rank was “assistant of contract” which could last between 1 and 4 years. Then it was possible to become 4-year contract for a University assistant which could be renewed after that time up to 12 years. Then one was able to become an Associate Professor and after that a Full Professor.

To become a full Professor it was necessary to do the “Habilitation” and to get offered a ‘chair’ for professorship (that means vocation for professor). An exception could be made to get full professor without a “Habilitation” but with the same accomplishments.

The New Employment Law that has been implemented in 2003 and is still in discussion and permanent revision, wanted to make the University System more flexible by establishing more research contracts.

After the completion of the doctorate programme it is possible to become a scientific Employee in training (“Wissenschaftliche/r Mitarbeiter/in in Ausbildung”) for 4 years.

At the base of the academic pyramid there are now the so called “Vertragsassistent/innen”, who have a contract of limited duration. The second position, which is usually and very often the beginning of a university career, is the position of a university assistant (“Universitätsassistent/in”). The precondition of “Habilitation” to become a university professor at Austrian universities is no longer required. The only permanent position is that of the “Full Professor” whereas all the other levels only have limited duration contracts (usually for about 4 years). To reach the next level depends on a new application and the demand for your work. But with all the reforms permanent positions – that are always the aim of academics – have become rare (see Interview 224).

For female scientists the new reform with its force to mobility could have negative consequences relating to women’s reconciliation of work and family.

The career possibilities at the universities are seen negative by our interviewees, that’s why – as an interviewee said - the situation could give natural scientists a reason to leave the academic area.

The same interviewee – a scientist – complains:

“The new conditions are very unattractive: especially getting a job of unlimited duration should not be a question of money but a question of scientific excellence.”
(Interview 302).

2.3.3. Italy

The Italian university system could be described as a feudal-like system, where a *barone* professor sets up his/her research group in a highly structured way, where only seniority and nepotism matter, while researchers' merits are left behind.

If the barone is not very powerful or leaves his/her proteges behind, or even if he dies, the young researcher will not be promoted –regardless of his/her performance (Alberoni 2003). The *baronato* system is at the core of the career progression and therefore disadvantages mainly women who are generally outside the logic of networking.

Permanent research positions are scarce and the admission to them is by a *concorso*, which includes two written examinations and an oral one. The exam papers can cover any areas of a subject, for instance the whole of Physics or of Chemistry. If the candidate is for example a theoretical physicist, he/she could nonetheless be asked questions on applied physics. Some distorted mechanisms of the system are considered in the following sections.

In many cases persons talked about the problems to win the *concorso*:

“Well to get a job in the university in Italy is not like here (the UK) if you apply for the job, you get an interview and it's either yes or no. You have to go through an exam. So first there is an announcement is published on a formal journal - every month or 3 months - the concorso. For the whole of Italy. Then you apply, you send your application in and nearly after 1 year they call you for an exam and then you have to sit this exam. There is a written exam and then if you pass the written part you go for the oral examination. That's all levels then (...) There may be a few things that changed recently but as far as I know this is how the system works even if you are a professor.”
(Interview 73)

Having negotiated this intricate process, the selected young scientist becomes a researcher: the first step on the academic ladder and the principle route into job security and progression in the Italian academic system. Researchers are generally offered a permanent contract beginning with a period of probation, called “*conferma*” which lasts 3 years.

The problem is that there are specific rules on how to recruit associate and full professors. The new legislation about the university budget autonomy has contributed to these anomalies. The rules are the following: in every *concorso*, two suitable candidates should be selected. Therefore it is more economically advantageous for a faculty to progress internal candidates, both for full-professorships or associate ones. The cost for a new full-professor or a new associate professor is therefore inferior, if the job is given to an internal candidate, being only due the increment between the previous-level salary and the future one.

Jappelli (2002) reported in his article on the academic recruitment system that according to the National Evaluation Committee of the University System in 90% of all public competition, the outcome is known in advance. This does not mean that the selected academics do not deserve to be promoted, but it sheds some lights on the fact that national commissions are a ‘smoke screen’ to hide an internal decision made by a single faculty. The problem is that members of the selection panels have to be paid and they spend days and days evaluating publications, attending meetings and other administrative duties. In the same article Jappelli commented that the cost of the selection process is of about 100,000 Euros per year. 72 millions of euros are spent each year for chairs appointments equal to the annual salary of 720 full-professors. There are other expenses to be added such as the overheads (the actual cost of an office dealing with recruitment procedures) plus the panel's member expenses equal to 2,000 Euros for a total amount of 25 millions of euros. In 2001 the Ministry for Education and Scientific Research has allocated 125 millions of euros for public competitions. Considering the high costs involved in such procedures, the Government has blocked the academic *concorsi* for the years 2003 and 2004 (Bompard 2002). This recruiting

system is being slowly replaced by the system of limited contracts, which may cause more insecurity and low research output (Bryson 1998).

The interviews with scientists back-up the findings above, which indicated that the concorso is not fair and transparent, much more important is networking:

“The Italian system is very, how to say, it’s not set that if you have the right characteristics you will get the fellow. Because you need to belong to a certain group of people. Because there isn’t much money, so before each distribution, official distribution, there is an unofficial distribution.” (Interview 448)

“There’s no precise rule about that (progression). If you do this and this, or this number of publication, or this money further raised, or experiments, then you are eligible for career progression. More I say, more really random. And it also depends on personal relationships. If you are really good, but nobody understand you, you will not progress. And if you are average, but you are very nice to everybody, and everybody likes you, then you progress, it’s an insurance.” (Interview 428)

The usual career of an academic researcher in Italy is described as followed:

“I think it’s very bad the situation in Italy, that you study at one institute (...) and afterwards, you get a scholarship with one of the bosses there, and work there, start to do research there. And then you become researcher at one point at the same university, after that, you become professor at the same university.” (Interview 445)

To understand the progress of an academic career in Italy we want to give a description of the career stages. The academic career is supposed to start with the Assegni di ricerca, a post-doctoral position at the duration of 3-5 years. A post-doc is often not more than a data-gatherer with very low autonomy that means without having the opportunity to shape projects or develop own ones. Otherwise there is no real difference between their work and the work of permanent researchers (Brandi 2000). An important characteristic of the post-doctoral status is that they are grant holders. Therefore they don’t get the same guarantees as employees get.

The following position of the ricercatore (Permanent Researcher) is very rare spread. After having passed two written examinations and an oral one the chosen candidate gets a permanent contract of three years (after a period of probation). To gain the position of Associate Professor – which is the next level - the candidate has to fulfill a number of quality expectations in teaching, administration and research at an academic panel of internal and external advisors. Great importance is given to the publication record. A full-professor (called ‘chair’) is responsible for determining the policies of the department. Officially all three dimensions of teaching, research and administration are asked while in practise the priority lies on research output and making policies. For both positions, the associate or full professorship, two candidates should be selected in every concorso while it is economically more advantageous for the faculty to take an internal candidate (because of lower salary level).

2.3.4. Portugal

The main problems concerning Portuguese PhD students, post-docs and other young researchers currently identified by ABIC are: poor research infrastructures; poor career perspectives, both in the private sector (no innovation tradition and no investment in R&D) and in the public sector (very few vacant places in state laboratories and universities); poor social security benefits.

On the other hand, most researchers remain as grant holders for a very long period of time, due to lack of opportunities of getting a permanent job in a scientific career. Finding a scientific job in Portugal even shows a difficult task for experienced researchers who decide to return after having spent a shorter or longer period abroad, either in Europe or in the USA. Research career staff may be recruited through documental application, transfer or permute. They can also be requested (through *requisição*) or detached (through *destacamento*).

Concerning early career stages, Perista and Silva mention:

“As an exception (and also as specially assigned research staff) research activities can also be developed by *assistente de investigação* (assistant researcher) or by *estagiário de investigação* (research trainee). These categories were formerly defined in a time where there were few Portuguese doctorates; they are no longer compatible with the basic requirement, now imposed, of the holding of a PhD degree for the entry into the scientific career” (Perista/Silva 2004, 22). Trainee and assistant researchers are appointed for 1 year, renewable for two 2 year- periods. In Portugal teaching Staff is also expected to develop scientific research.

Candidates with PhD have to present their curriculum and scientific work in order to become Investigador auxiliary (auxiliary researcher) at university. After 3 years of experience and having approved in *habilitacao or agregacao public proofs* they can apply for a post as Investigador principal (principal researcher). For that application their curriculum, scientific work and a report of their activities will be considered for evaluation. The next stage of Investigador coordenador (co-ordinating researcher) requires a minimum of experience as principal researcher and the successful evaluation of scientific work. Their curriculum and scientific work will also be considered for evaluation.

Documental applications for these categories are dependent on the existence of vacant places in each of them. Usually the recruitment of staff for the categories of research trainee or assistant researcher is done by documental application, complemented through interview, among the candidates who hold a *licenciatura* (with the minimum classification of Good) or a Master’s degree, respectively.

Evaluation criteria to be considered are the quality of the scientific and technical work of the candidates; their professional experience; their professional training; their contribution in terms of scientific supervision, participation in management bodies and service to the community.

Auxiliary, principal and co-ordinating researchers are appointed with a definitive title. However, each three years, they have to present a curricular report to the scientific board.

Evaluation criteria to be considered for these positions are the quality of the scientific and technical work, the professional experience and training and their contribution in terms of scientific supervision, and their participation in management bodies and service to the community. When you have reached a permanent job in Portugal, the freedom what you are doing, is high:

“In Portugal a lot is wrong, but there is an enormous freedom at the universities for people to pursue the work they choose to do. Despite the fact that certain structures are hierarchic, the structures of power, in terms of research everyone can do what they wish.” (Interview 103)

At least it must be said that Career progression in Portugal needs patience, as a Portuguese invited professor at the ITQB (Institute of Chemical and Biological Technology) mentions:

“Our situation is not that bad, it takes work and patience, and those who endure achieve something.” (Interview 135)

2.3.5. Greece

The career of an academic can start at any rank of hierarchy, since many academics have a prior professional experience in research centres or institutes. However, most academics start their career as lecturers and many of the latter as temporary lecturers on limited duration contracts, renewable up to 3 years of total cumulative duration. Holding a PhD is a minimum requirement for the recruitment of temporary teaching staff in universities and, since recently, in technological higher education institutes.

Although recruitment to all regular academic posts is open to competition, starting as a temporary lecturer is seen by individuals as an opportunity to obtain more credits than other candidates of equivalent qualifications for election at a regular post of lecturer. It is also one of the rare opportunities to gain teaching experience, which is one of the qualifications required for the regular posts of the teaching staff.

The PhD degree is a common pre-requisite to start an academic career. Nevertheless there are some positions where the PhD degree is not necessary, such as assistant lecturers or external collaborators.

Assistant lecturers without PhD are a declining category including people who fall under of the old system before the higher education reform at 1982. Most have acquired the new qualifications since 1982. Concerning the teaching staff at technological education institutes, most have no PhD and a great number in the lowest ranks (such as the 'applications Professor, instead of the lecturer at universities) don't even have a Master's degree. Therefore, technological education is lower level than university education.

After an open call for a post academics are elected by a group of eleven internal and external academic members of the department where the post is offered.

Before becoming a lecturer very common stages are working as a research assistant at university. Another way is to be a regular researcher in government research centres or get a post-doctoral contract at university although post-doc-positions are still very limited in Greece. The second level is in general to get a limited duration contract as a temporary lecturer, renewable up to three years. Most start in the position of lecturer, many as temporary lecturers with a limited duration contract.

Regular Lecturers are elected for a seven year term.

The minimum qualifications for lectureship are set by law (Act 1268/82). Requirements are the PhD dissertation in scientific field of the post, at least two-year teaching experience in a university or two-year experience in research centres or recognized professional experience in a scientific field related to the post. In addition to this applicants have to show the experience of at least two publications in scientific journals and have to have ability for independent teaching and research.

After three years it is possible to initiate the promotion i.e. the publication for an open call of assistant professor. If another applicant gets the post they are obliged to quit. Regular lectureships provide job security for seven years maximum.

Requirements for a lectureship are the PhD dissertation, at least two publications in scientific journals and a two-year experience either in a research centre or in teaching at university. Assistant professors are elected for a three year term. Lecturers and assistant professors work very long hours to be able to cope with teaching, research and administrative duties.

At the expiration of their term they have both a right and an obligation to apply for tenure. If their CV is not deemed as appropriate for tenure, their term is automatically ended.

After obtaining tenure assistant professor (by application after the three years) they have the right to apply for a post of associate professor by initiating their promotion. If another candidate is elected for the post their term is automatically ended. In this case, they have the right to ask for an opportunity of a transfer to a vacant post of a public research centre.

Their duties include administrative jobs, teaching and research. Publications are very important.

After the three year term of being Associate professor it is possible to initiate the promotion i.e. publication for the post of a full professor. Being not elected it is possible to initiate the promotion procedure a second time.

Full Professors enjoy tenure. To become a full professor it is necessary to hold at least two courses of the subject matter, teaching in post-graduate programmes, international recognition of contribution in science etc. Additional criteria for progression to the rank of professor are the contribution to the formation and teaching of the subject matter of at least two courses, the teaching in post-graduate programmes, international recognition for contribution in the progress of science etc. The strictness in the application of the criteria differs from department to department, from university to university and from discipline to discipline.

To get a permanent position depends on a combination of many things as useful scientific knowledge, the job opening from the ministry, the contact to people and the age of the applicant.

One fellow expressed frustration at less opportunities, even when you have a permanent job:

“The state, the Greek government, pays you essentially a salary and gives you a desk where you can put your pencil. If you would like to bring your pillow as well, you can sleep there. Nobody controls you. [...] If the state has given that to you, you are free to do research. That’s not truly enough though. You must support the researchers with funding in order to enable them to do their job.” (Interview 215)

Also funding depends on collaboration with other universities:

“It is the structure in an old fashioned way, where the money is colonized in the pockets of some groups. These groups are between some specifications, given mainly by political parties or relations. [...] The government should study better the mentality of funding basic research in Europe. They should not copy models 5 to 10 years old that the other western European countries found out and decided to leave them apart.” (Interview 215)

For career progression funding is very important, because of no support of basic research in Greece:

“If you have some funding you’re progressing faster. If you are progressing faster, you are producing more papers. If you are producing more papers, you have a better C. V.. If you have a better C.V. you are going for better money or better collaborations. This is the chain.” (Interview 234)

2.4. The informal consequences of formal criteria of measuring excellence

Beneath formal criteria that are requested of researchers to advance in their career there exist informal ways to push or prevent one’s career. Significant examples such as mobility and networking are pointed out in the following chapter and are related to the countries.

The chapter closes with a part about women and excellence in order to show what kind of obstacles women are confronted with when steering an academic career.

2.4.1. Mobility

According to European scientists’ mobility a Europe-wide problem still exists: More and more scientists migrate to USA because of better working conditions and better income, actually there are 400.000 European researchers working in the USA. The so called brain-drain forces the EU to expend their supportive measures and funds for financial support to raise the attractiveness of European working places for scientists.

For example there exist the Marie Curie Intra-European Fellowships which are open to EU and associated State researchers of all age with at least four years' professional experience or a doctorate degree. "The purpose is to give the financial means to undertake advanced training through research or to acquire complementary skills at a European organisation most suited to their professional needs".¹⁸ As the empirical findings show, such programs are extraordinary important for countries with under-funding research. For example Greek scientists often point out its necessity:

"Here in Greek I think that we're not very well developed in research. So, we must have contact with other countries, with expertise personnel, with programs of the European Union." (Interview 217)

Most of the interviewees tend to say that mobility is important, firstly for their personal and scientific career. Mobility leads to personal maturity and professional advancement. If you are not mobile, they say, you are not on the crest of the wave anymore in terms of scientific work. On the other hand there is a big range according to their opinions whether mobility leads to success or not. According to mobility expectations the UK system seems to be an exception: The mobility expectation seems less in the UK, where the availability of research grants within the UK acted as a deterrent to mobility, because it is possible to obtain finance for postgraduate and postdoctoral research in the UK.

The advantages through mobility abroad are that you get to know other research centres, new research methods, scientists and new ideas. One Greek scientist pointed out the importance of getting to know people who are into publications so to have the chance to discuss and exchange knowledge. It also makes a big difference, he added, whether you read a publication or see how other people work.

A Dutch Interviewee refers, that studying abroad (in the UK) will give a great impact on the academic career:

"You can start applying for permanent positions but it's very, very hard to get a permanent position, if you have been only in one place." (Interview 002)

Nevertheless, the importance of mobility varies between countries and by discipline and is linked to both the size and the perceived quality of the science labour market in the country of origin, as well as measures to encourage mobility (such as return grants).

People from countries with bad science labour market conditions, for example Portugal and Greece, take mobility abroad as springboard or chance to get established in the foreign country. They do not intend to come back to their home country anymore. This situation deeply depends on the academic system, as a Greek researcher told:

"People who come from other countries should know that if they come back to their home country, there will be a job for them. Because this is more healthy, at least in my opinion. So, there should be programs to motivate people to come back." (Interview 203)

So the pressure to move abroad corresponds to the general lack of opportunities in the home state and the search for a better future elsewhere. A Greek female professor for example advises to her students:

"What I suggest them is to look especially around Europe for work. In Greece they are unemployed. So they should think seriously to go and work in another European country. The conditions elsewhere are good, the salaries are good and they will improve their scientific skills. If they stay here they might end up as high school teachers in remote islands." (Interview 239)

¹⁸ For further information see http://europa.eu.int/comm/research/fp6/mariecurie-actions/action/fellow_en.html.

On the other hand there also exists the opinion, that staying abroad for a long time leads to the loss of social contacts to the origin university, and with it to the loss of chances to get a post in your home country. The following comment confirms a general tendency:

„I have some colleagues during my PhD that, who are afraid to go in post docs, they are afraid, that they will lose competition for permanent positions in their country.” (Interview 432)

Especially in Italy mobility seems to have negative consequences for scientific careers:

“In Italy, until few years ago, when I was a PhD student there wasn’t much expectation of mobility; it was o.k. to work with the same people for ten or fifteen years until they finally bless you with a permanent position. I’m not even talking of moving abroad, you didn’t even move within Italy, you stay in the same group where you did your undergraduate project, then your’ re PhD, then you’re contract and you stay and stay and stay.” (Interview 426)

Or another comment from an Italian female scientist, who explains the minor significance of mobility within the Italian academic system:

„So if somebody wanted to give you a permanent position, it’s definitely a plus to have been abroad. But having been abroad, doesn’t tell you, that you will have a permanent position.” (interview 428)

The statements above show that university systems still are closed systems with traditions and practices from its patriarchal origin. There still exists something like academic initiations, practices of the reproduction of the own “guilt”. (Bourdieu 1988, 45f). Academic careers often correspond with the extension of dependence and authority which takes time, time which often gets manipulated by the mentors or professors. If you stay in your home university the control system seems to work better, on the other side mobility develops into a kind of threat of the common order.

In Austria mobility got more and more important within the past few years, now it is regarded as a supplement qualification. Mobility often seems to be a precondition to get a permanent job like an Austrian Interviewee explained:

„Well, usually the problem is, if you are not already having a permanent position and if you are applying for something and if it one point of the job description or your qualifications that you have been staying abroad for some time, then of course you don’t get the position.” (Interview 309)

One of the consequences is that there is a small group of students and university staff which is very mobile and there is a bigger group of immobile persons. The idea is to “train mobility” at the level of students. Nevertheless Austrians tend to ambivalent attitudes, for the majority mobility seems to be something strange, unknown, whereas Portuguese and Greek scientists claim that mobility abroad is essential.

Furthermore some of the Interviewees give an account of the unequal ratio between time and output, which, in some cases, may lead to lacks of scientific progression. A Greek researcher told us:

“Every time that you move you loose a lot of time because the working environment is different. So you loose around 6 month at the begging to understand what people are doing around you, how they work and the way they want you to work. So someone who has never left his place has never lost any time [...] so he has more time to work. For me that was a big problem. Because if

you change place every 3 years, 4 years of course you automatically change the subject of work.”(Interview 210)

Moreover the age and position of scientists in combination with mobility are important factors. Whereas staying abroad for young scientists often marks the crossing point from study to scientific career, long during migration for older scientists, who already have begun their university career sometimes are counterproductive for their individual progression. The Greenfield Report (2002) stresses for the UK the importance of mobility to research training however notes that later on in career and indeed an individual’s life course, mobility can become problematic. It seems the same situation for all the countries.

Some interviewees also criticize the limited amounts for foreign scientists. A German female scientist describes her experiences abroad:

„The mobility works if you are doing a post-doc and then it does not work anymore, because every country tries to get people with their own language and the people with the language skills end with the fact that the mentality of the country and the mentality of research people.” (Interview 449)

The empirical findings presented above emphasise the importance of international experience to progression in science careers for young researcher. Older scientists are confronted with the situation that the longer they stay in foreign countries the harder it is to get a permanent post at the home university. This often might degenerate into a big problem because the longing to a “well-ordered” life in many cases grows with the years as for example a Greek male scientist explains:

“I have seen people who have become 40 and 45 [years old], are always moving around and hold temporary positions. This is not something I want to do. They don’t have a family. They are jobless at the end. They become very upset.” (Interview 204)

2.4.2. Publications

The interviews with scientists indicate the importance of publications in all countries, as the following comments describe:

“The whole system of evaluation is only based on the publication. It means that being here itself is nothing. Being here and working and publishing and being in France and publishing, that’s practically the same thing. The only important thing is publication.” (Interview 01))

“Publications were an important factor to evaluate your experience.” (Interview 443)

“I suppose there are a lot of people trying to apply for the same jobs and there’s a pressure about publishing papers at the end doesn’t mean that you get very good papers, it means you get lots of papers. I know people who said they did one experiment and instead of publishing one paper they did three and in each one, they tell just a bit of the study.” (Interview 006)

Especially at the beginning of the career the pressure to publish is high:

„So there’s still the pressure and in order to find a job, you have to publish so you have to work very hard, basically it’s not 80 hours a week but most of the weekend I still spend at least one Saturday afternoon and one Sunday afternoon.“ (Interview 005)

Some of the informants complain that in some cases publications are prevented because the research output is regarded as property or secret. Such control systems generally apply to private research organisations. At universities you usually don't have to ask for permission. But many interviewees refer to the problem that at universities the ranking of the authors or publishers on books is essential. So in many cases professors take the right to be named first in spite of the accomplishment done from others:

„When you write papers, it is expected to put their names on it.” (Interview 009)

“You have written the paper and you have made all the jobs and their name is on the end of the list of the authors, so yes I' am really disappointed.” (Interview 008)

Concerning the empirical results the importance of the quantity of publications for career progression is not clear. Exact information about the number of publications respectively about criteria of quality is rarely given. Standardizations for publications as measuring excellence seem to be valid the most likely for the UK. The following comments point it out:

„For a lectureship you must be around 12 or 15.“ (Interview 072)

“Even at the end of this period I've only got enough [...] well I have one publication and one patent but that's not enough, that's not enough if you would like to get a position in the CNR, you need a lot of publications. If you go to post-doc you can make maybe three maximum so at the end of this post-doc I would have four and that's not enough, so I decide that I've still got this position in the National Research Agency because there is a lot of competition and you can compete with these people if you've made during your PhD maybe more than one, maybe two, three, four sometimes publications if you are in a good group and that you can make four again in post-doc so at the end you have eight publications. At the end I had just one, you can expect one or two during the post-doc and you can't compete three against eight you know so I decided to completely forget this because I don't want to start again, too hard so I choose the industry way and this post-doc position was a very good one for me.” (Interview 008)

The importance of publications varies between the countries. Whereas publications in the UK, in Austria and Portugal are high ranked, they don't play such an important part in Greece.

If you like to start a career at Austrian universities publications are something like a precondition. In natural sciences for example both the number and the renowned journal play an important part. To obtain a “Habilitation” - which is the precondition for a permanent post – has either to be published a monograph in addition to publications or the “Habilitation” consists in a collection of publications.

Publications are also very significant in Portugal, the number of papers and citations are very important to the progress of a scientific career. Scientists who want to be successful have to publish in English, when publishing only in Portugal only a few people could read it.

The necessity of publications was mentioned very seldom in Greece. One Greek scientist pointed out the importance of collaborating with foreign researchers:

“Actually most of my publications are not with Greek colleagues, but with colleagues from England, the United States, etc. So 90 percent of my work is mainly done with foreign colleagues.” (Interview 239)

In Italy the opinion about the necessity of publications varies between the Interviewees. Many were arguing that publications are not very important. Much more important is to wait for a perfect opportunity and to know the right people. For example an Italian female scientist explains how unimportant it is to her career to publish:

„I have done a fair amount of work in teaching as well so I think it's fair enough that I should get a conferma. I think that in another country I would have been having a harder time because I didn't publish anything yet from my work. The research is still ongoing but there is no publication at the moment, so in another country I would have been in a more difficult position, here I'm getting permanent.”
(Interview 426)

Another Italian male researcher however points out the importance of publishing in comparison with mobility:

„I think a candidate who has moved around and working in many places but hasn't produced a great curriculum, would certainly not have the advantage of someone that had better publications. The publications, I thought, remains the most important single criteria in career development, but mobility can definitely be a plus.”
(Interview 425)

2.4.3. Conferences, congresses and networking

The Interviewees of all countries consider conferences as important. There are many reasons for it: conferences and meetings open the possibility to get in contact with other researchers, to see new research methods, to set up new collaborations and to present the own research results. So it isn't the participation itself which makes conferences attractive and important for scientific careers.

„But today I know that it's very very good opportunities to exchange, to contact with people, which is much better than the contact that you have with through a paper. You learn a lot from direct discussion, with conversation with someone than reading paper.” (Interview 423)

“Being sent to conferences is quite important but that is a matter of money so Germany has a lot more money for things like that and here it's always writing applications to get money. Now of course we have grants and that's okay but for younger people and very often don't have enough money to send them; one conference a year at the most. For a young person it's very important to show up and to be known.” (Interview 015)

The meaning of the social networks for scientists is also shown (Atkinson/Delamont 1990) in a number of studies. The visit of congresses and conferences is important for the career as, besides the communication of specialized knowledge, professional networks are built up and resources, such as the knowledge around vacancies, get accessible. Women use this opportunity much less than her male colleagues (Mesletzky 1996, 67). It isn't only dependent on the personal motivation to go to congresses and conferences but also on the fact how far the visit of such events loads the private life. Official exemptions often are the precondition to keep private load – that is to sacrifice days of holiday – low. According to an analysis from Mesletzky (Mesletzky 1996, 69) about the private and professional situation of female doctors, women are exempted only in exceptions or not at all.

According to the financial support for the participation in conferences there are big differences between the countries. Financing conferences and meetings seems to work best in England and Austria.

Especially in Greece there is a big lack of financial support. So it is very hard to get the chance to go to conferences.

“No funding from the university, is null, zero. There is no such kind of procedure to ask for money to go abroad or to go to a meeting. We have some congresses that we have to attend, for example the European meetings every two years, or the world meeting every four years. We cannot find the money to go there.” (Interview 235)

Another Greek researcher gave the following calculation:

“In the department in which I’m working, there are about 100 staff members. The whole department has 3000 euros per year for travels and conferences. It’s like each of us getting 30 euros to go to conferences. So this is the level of funding that Greece gives to basic research.” (Interview 239)

These bad circumstances often lead to the fact that researchers have to pay the expenses for their own if they like to participate in meetings:

“If you do not have the findings you do not have the possibility to attend these conferences. Unless you pay your own way. Which many scientists, if they do not have the funding they try to go to some conferences, national or international. Because they gain as far getting informed is concerned for the scientific issues that they are interested in.” (Interview 246)

In Italy and Portugal there exists a financial basic for conferences within the universities, but, the Interviewees told, it is too low. So the only possibility to attend conferences is to try to get research funding from the state or the EU.

Nevertheless, as mentioned above conferences and meetings play an important role for networking which may lead to better financial situations:

“So if you belong to a club or you have good friends, the chance of getting funding is much higher. Higher than in any other case when you are isolated or your working group has not good relationships or links to people [...].” (Interview 215)

The following statement furthermore takes the importance of political power into account:

“I don’t say it for sure, but I think that the money is distributed to certain parties. You must have connections.” (Interview 249)

2.4.4. Women and measuring excellence

There are many facts which make the working conditions more difficult for women: the access to posts, to financial support, to chances for publications, the right of indemnity and experiences with research support. These aspects which influence the scientific and academic career show a preferential treatment of men in high quality professions within the university.

With that neither an open preferential treatment of men nor an openly discriminatory behaviour against women is thought. It would get substantially too short to look for the reasons for the under-representative of women in the science only in open discrimination.

It isn't absolutely that way, that opinions about the lower suitability of women for top positions have disappeared completely, but the production of remarks about the inability of women for a university career has become rare and apparently got unacceptable. However, prejudices and resentments come to the expression in other form.

The most male interviewed think that women aren't put at a disadvantage in scientific careers:

“Science is neutral. [...] Absolutely, I am convinced about that.” (Interview 423)

In the following we want to describe the subtler forms of the dissimilar treatment between men and women. Moreover we will explain which selection criteria besides the formal qualification become effective and whether they affect men and women differently.

The professional getting-in represents an important and sensitive phase for the working-life, it has an essential influence on the further position both in his direction expelling function and as a basis of a stable career (Blossfeld 1985). But furthermore there exist structural discriminations against women at academic start-positions. Women are strongly lower represented at the level of university assistants. This means a profession with career character and usually is a prerequisite for the further scientific career. But they are higher represented in half-day occupations, the category with the clearly lowest professional image, the shortest average use duration and a hardly available career expectation.

At the support of the scientific young professionals not alone formal factors are decisive. Essential is the fundamentally inclusion into the scientific discourse, the interest for the work and performances which has an effect on motivation. As an element of successful support for the scientific young professionals Geenen (1994, 62) stresses the possibility to learn how to get out from scientific isolation and to get the appreciation of the own performance.

“It is really necessary [to be mobile] because no matter the more beautiful work you wrote, but colleagues don’t easily see it if you are not going to their conferences and workshops, presenting it, confronting it with what other people are doing.”
(Interview 109)

Besides the basic factors on professional qualification, scientific careers are based on the fact that persons who already are in prominent posts, place young university graduates into the social network of the scientific community. The mentor - in the rarest cases it is a woman - has the function of the “gate keeper”, of the experienced adviser and helper. A Greek male scientist for example explains the necessity of a mentor for his own career progression:

“I approached a professor, who helped me a lot in fact. At that time [when he came back from going abroad] he wanted to write a book about cosmetology. So I was a bit useful to him.” (Interview 249)

Women often see themselves towards to male mentors who cannot be a model for them for what they want or be able to become. At university there is a big lack of female models. While the normal case, the support of men by men (“[...] and of course there are male professors which prefer men as compared to women [...]” (interview 449)), isn't analyzed within the scientific system, the underlying motivation of promotion and support is often picked out as a central theme by women (Brothun 1988, 319).

Schmerl/Buck/Braszeit (1983, 174) find out, that female students with corresponding performances and self-initiatives can find mentors, the situation, however, forms itself according to completion of the doctorate more complicatedly and gets overlapped by pressure of competition. For many scientists the admission into the professional situation represents as a turning point, most with conflicts around legitimate claims of further scientific qualification and corresponding posts.

The academic training is characterized by long during periods without external feedback and without directly measurable success in form of publications or certifications. That is why informal critics, recognition and appreciation are much more important to stabilize the working process and the working capability. Such confirmations seldom are given to women that is why female biographies are more instable, corresponding with a lack of assurance regarding to the own abilities and a lower crisis strength in the mode of doing science. (Geenen 1994, 72)

As most career relevant decisions, like the suggestions on posts, the “Habilitation” commissions and the vocation suggestions are worked out by male dominated committees,

social networks are of special importance. On the one hand gender-specific differences arise because women never form the majority in these groups.

“But in the past, I certainly have thought that I have been discriminated being a woman, because of the social issue, you know, when I went to a conference, I was a young woman, and there were like 120 older men, so who was I supposed to say hello to. You know, it was very, very hard, and I didn’t like it.” (Interview 430)

On the other hand they are built up strongly to men federations this one makes the entrance easier for the men (Brothun 1988, 328). As men in addition usually are freed of reproduction duties, they fully and completely can concentrate on their scientific activities and social career beneficial activities. Women in the science who also want to be mothers pay through her double load with losses at social sphere, these, having repercussions on the career in turn (Nowotny 1986, 24).

“And the problem was when you have a [baby] break of three years in your career it is difficult to get a new position.” (Interview 445)

Scientific work largely is deprived of an external control and gets its recognition in the context of an inner-scientific-reputation-system. This inner-scientific-reputation-system is arranged over the scientific scholar community which is maintained by group formations and contact nets and usually doesn't integrate women.

The scientific reputation isn't only dependent on the quality of the performances but also on the quantity. Studies showed that women on the average publish less than men, that the number of the publications, however, is not in any connection with the family obligations (Cole/Zuckerman 1985, Mesletzky 1996, 70).

“Actually for women, it’s even worse, because of they need publications. I mean, unfortunately, career progression is measured by the number of publications you have done.” (Interview 430)

The little number of publications can be interpreted as specific female problem concerning their own bad opinion about their work. On the other hand it is a further indication for their aggravated working conditions within the university. The scientific reward system is based on the appreciation of subject colleagues and shows the trend, the more famous a person is, the more recognition is granted to him. This inequality, described as the "Matthew's effect" by Robert Merton (1985, 147f), within the scientific reward system is based on the fact that in unjustified ways well-known scientists are preferred while unknown scientists are put at a disadvantage.

The evaluation of performances is carried out after explicit and implicit criteria which fix what is regarded as a performance to be sanctioned positively and how she is to assess in an organization. Forms of performances which don't fit in this scheme are thus not or hardly visible. Skilful career management could consist in shifting many of the own activities if possible in such areas which are visible and are judged positively. Apparently women handle differently their career management. Studies showed that women have a more ambivalent attitude towards career management and are orientated more strongly by specialized contents than men. Men however pursue their career more determined. (Wagner 1986, 248.) Scientific careers require transparency and announcement of performance.

Visibility of the scientific performances is one of the most important criteria to obtain the attention of the mentor on the one hand and on the other hand also to get hold of a place in the science system. Ways to attain this visibility matter in the visit of profession qualifying events, in the number and in the kind of publications and in the number of lectures.

The social networks steer the publicity, further recommendations, publication and performance offers, research money and other resources in the science business.

“If you have some funding, you’re progressing faster. If you are progressing faster, you are producing more papers. If you are producing more papers, you have a better CV. If you have a better C.V. you are going for better money or better collaborations. This is a chain.” (Interview 237)

These ropes and communication networks are decisive for the career support and the scientific reputation. Typical forms of the ropes of scientists are based either on professional organizations or on scientific schools within the respective disciplines. They extend their publicity by common publications and quoting cartels (Stahr 1991, 165).

Central areas of responsibility of the university employees are education, research and administration. Depending on discipline the time distribution between these areas is extremely different. The conditions for the scientific career must be seen in connection with this, because according to the “Habilitation” and publications it is essential how much time is available for the research activity.

“When you are in your home university, you have to do other stuff as well, in addition to research [...] It’s the education which takes much time. [...] Moreover we have routine administrative work. So we have to share the time of the day among all that.” (Interview 235)

The job as assistant is characterized by short different activities succeeding one another. The work is broadly calculated and substantially determined by the superior. The advancement criteria for the non-professorial teaching staff are strongly different from the main activities of the professional field. The distribution of the activities such as research, education and administration is as far defining for the career as the research success or rather the doctorate and “Habilitation” are the only decisive criterion for the further whereabouts at university. Under the present conditions the career interests should lead to reduce the time expenditure for the education and to invest time in the research as much as possible for this. Lins/Müller (1987, 35) come in her analysis on the academic staff to the findings that the activity areas research and education represent complementary: Who particularly concentrates on the research puts the education back. The strong concentration on the education, as it is traditional for women, means at the same time an obstacle for their careers (Schultz 1991, 73).

Many young female scientists are pushed beside into routine works so that they are not able to finish their qualification within the fixed period of time.

Moreover the scientific working conditions are not prepared for persons with familiar commitments.

The choice of the field of work is another important aspect for the personal scientific career: Topics are subject to a prestige hierarchy within the scientific community in which so-called women topics are on lower level (Brothun 1988, 328).

Another important criterion for the scientific career is the entry to material resources. Meant is the area of the working conditions which contains materials, laboratories, equipment, financial support as well as support on the part of the office. As these aspects just create special conditions for the research, they are decisive for the scientific progress and the professional success. The experience from a Greek female researcher below show the enormous engagement which is necessary to get further with the work when financial basis is missed:

“For example I should have a power point projector in the library to teach my students the way I want, the way that I have to. I can’t draw the structure of a protein on the board, it’s complicated. So, I have to buy the projector by myself! [Equipment] isn’t funded. [...] The situation is dramatic.” (Interview 229)

Studies (Geenen 1994, 122) show on the one hand, that rather material intensive work is assigned to men and the entry to these resources on the other hand is refused to women also more easily. If women don't fight against the prejudice that they're not able to work constructively with technical equipment and these pieces of equipment isn't made available to women, then a qualification deficit arises through this for women in the science business. The doubt about the technical competence of women can also lead to an uncertainty. See the Mathew's effect again (Merton 1985, 170): Respected researchers or research centres get higher research support than those who or which just must make a name.

As mentioned already women who enter on a scientific career are subject to a male oriented time structures with age limits for the different career steps within the university. Because the university refers to male life connections, women are forced to adapt to this one-sided oriented career planning. This problem will particularly get striking between doctorate and "Habilitation", in the life phase in which women have to take the decision whether they put her child wish into effect. The impossibility to arrange family work and scientific career for a long time women are forced to the decision against a partnership. The high number of unmarried female scientists refers to this difficult arrangement. (Hollensteiner 1990, 34).

A scientific career is no longer absolutely connected to the renunciation of children for women today (Schultz 1991, 242). While the family foundation doesn't have any broader negative consequences for the male career in the sciences, women see themselves, today still exposed to great arrangement problems. Two variants of the agreement of labour work and reproduction work are available for women who have decided in favour of a university career: Either they decide in favour of the renunciation of children or they connect her professional role with the family work however without considerable interruptions (Schultz 1991, 191). The successful connection by profession and family is less dependent on the needs of the children than of the adjustment of the partner (Schultz 1991, 203). For male professors there isn't dependence between the own career planning, the family planning and the professional career of the partner.

"[...] they said to me I won't be so efficient in working things, I was going to have a baby, so they don't want to have the problem at the end renewing, at the end I wouldn't be so, what do you say, efficient research or doing publications or anything. So they preferred not to give me the renewal after my pregnancy." (Interview 428)

The structures of many higher positions in the science area require a person who concentrates fully on the reproduction work and releases therefore the partner of all obligations. According to the gender specific job sharing women take on the role of the reproduction worker mostly; married men in the university area, whose family don't raise any demands on their time planning, are privileged.

Moreover there is another aspect of importance: the gender specific division of labour within the scientific area is dependent on the help and support of the partner. Studies (Schultz 1991, 245) showed that men get two thirds of support of her partners while women can count on the support of her partners in much lower measure.

3. Discussion

As we have seen in the former chapters Scientific Excellence depends on various factors. Measuring Institutional Excellence as an strategy to spread funding to universities being signed as "excellent" relating to their research output – as in Great Britain and now following countries – has an impact on the access to universities and to academic careers. In Great Britain for example the most important impact for a future career is which university an

individual chooses for studying. When universities or research centres with low quality have to be closed in account of the lack of funding this has consequences for students as future researchers and the academic staff.

Concerning the access to higher education countries differ relating to their conditions. Most countries request tuition fees from their students. Except in Greece there are only singular courses where fees are demanded. The numerus clausus which means determined access according to entrance tests and excellent record is only implemented in Portugal and in some cases in Italy.

In recent years a tendency to autonomy of universities during uncoupling from the state has been recognized in almost all countries. That leads to autonomous financial administration of the universities which caused for example in Austria a decline of research investment and therefore a lack of research quality. That can lead to poor career prospects for researchers and to poor quality in higher education.

To understand how academic careers are measured as “excellent” we had to take a look at the conditions of career prospects in general and the stages of career progression in particular.

Finding a permanent job which is the highest aim of most researchers not only depends on individual performance but on the labour market situation and the research reputation in each country. As we saw in chapter 2.1. there are big differences concerning the research investment in the five countries.

In Great Britain there are several universities with high reputation that have a large offer of post-doc-positions and give young researcher the opportunity to work in a research group with a contract of limited duration. Though permanent positions have become rare this Post-Doc-System offers graduated people a good chance to get integrated in the academic scene without losing time. In other countries young researchers have to wait a long time until they get a permanent contract, either. In Italy, the procedure of concorsi leads to a very slow and difficult career progress for this reason the tendency is now going to limited contracts. Austria, Greece and Portugal have also concentrated on limited contracts. Positive aspects are that young researchers are supposed to be flexible and mobile as in Great Britain because mobility within the country is encouraged negative facets are that they are partly forced to go abroad such as in Portugal or Greece because they seek better research conditions abroad.

Another problem for gaining scientific excellence is that we assume that age and career prospects interconnect. That means that the age of a Post-Doc can influence his career. Concerning this it must be said that in Portugal students got their PhD Degree at the average age of 38 years whereas in Italy the average age of the Master is 26,5 years. When moving to another country where a younger age is requested it might be difficult to compete. We assume that the real duration of studies depends on the tightness of the education system.

When talking about measuring excellence we have to view the criteria for a researcher to be signed as “excellent”. On the one hand requested experience has to be proved in the application and sometimes in examinations as it is in Italy during the Concorso. On the other hand job duties have to be fulfilled.

Application forms in most countries are required to be documental, sometimes a interview is made with the applicant (except Italy with its examinations). A common condition for starting an academic career is the Doctoral Degree, which is not required only in Greece at the position as “assistant lecturer”. Post-Docs in Great Britain work in research groups with certain responsibility for the working progress and the supervision of PhD students whereas in Italy Post-Docs are very dependent on their “Professor” being more “data-gatherer” than researcher. In Portugal teaching staff is also expected to do scientific work and the other way around. The advantage in Portugal is that researchers – mainly in permanent positions – can choose their research topic freely on their own. In Greece and Austria teaching generally is an important part of an academic career, either. The hierarchy of career steps seems to be very

similar in most countries: after several years as auxiliary researcher and associate professor (or something suitable) a full professorship can be gained.

Mobility seems to be an important factor to push the own academic career in all countries. We assume that there is a connection between the structure and opportunities of the academic system in a country and mobility. Our interviewees located in Austria, Portugal and Greece and partly Italy mention that better job opportunities abroad play an important role for scientific careers. Although mobility seems to be a “plus” for careers, it does not always give secureness that you get a permanent job in the home country. The UK is the only country where mobility is not necessary because researchers get enough support and funding to stay. Mobility does not always have positive consequences as we can see from the statements of the interviewees above. It restrains the productivity of researchers in forcing them to change their subjects therefore it can rather be seen as very useful for young people as being a crossing point between their doctorate and a scientific career than for experienced researchers.

In general it must be said that mobility depends on numerous factors such as the situation at the labour market, age and position of researchers, the availability of taking part at exchange programs and funding.

Another important criterion for excellence of scientists – probably more than mobility in some countries - is the amount and ranking of publications. In many cases the ranking of authors or publishers in books plays an important role for the reputation of scientists. Clear information about the amount of publications requested in each career position is only given in Great Britain. In many cases the interviewees complained about the priority to name professors on publications instead of those who wrote it. Publications often seem to be a pre-condition to advance in academia such as in Austria and Portugal whereas publishing according to the statements of our interviewees, in Italy and Greece is no necessity. Not only the number but also the way papers are published – as monographs or in journals differ from country to country.

To advance in a scientific career it is necessary to hold contact with the scientific community. This is possible by joining conferences, congresses and meetings in order to build up social networks between scientists. Most interviewees mentioned the importance to present the own work just as to discuss currently recorded publications of colleagues.

Financial support to join conferences differs from country to country, the best is given in Austria and the UK, the worst in Greece which often forces scientists to pay of their own.

Concerning informal obstacles especially women are faced informal criteria that can prevent their advance in career. Female under-representation in higher academic positions exists in all countries, although Greece has the best women’s proportion compared to the other countries of our research group. Women are higher represented in half-day occupations which don’t progress their careers. Furthermore it leads to a lack of networking which causes isolation from the scientific community and more breaks in their biographies than in male careers.

They often lack of self-confidence concerning their scientific work and publications. Such factors are more or less distinctive in the five countries and lead to lower chances for qualification and excellence of women.

To come to a conclusion we have drawn a picture of the different systems of research and higher education in different countries to show how deeply measuring and rewarding excellence is rooted in institutional and societal requirements.

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Italy:

Ministero dell' Istruzione, dell' universita e della ricerca: <http://www.miur.it>

Istat - Istituto Nazionale di Statistica - <http://www.istat.it>

Opera Universitaria <http://www.operauni.tn.it>

Austria:

Information about tuition fees, conditions of access to university and grants:

http://www.bmbwk.gv.at/universitaeten/studieren/Informationen_zum_Studie3819.xml

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