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CENTRE FOR GLOBAL HIGHER EDUCATION

Centre for Global Higher Education working paper series

Performance assessment in science and academia: effects of the RAE/REF on academic life

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Working paper no. 7
September 2016

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND hefce

Published by the Centre for Global Higher Education,
UCL Institute of Education, London WC1H 0AL

www.researchcghe.org

ISSN 2398-564X

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CGHE is funded by the Economic and Social Research Council (ESRC) and the Higher Education Funding Council of England (HEFCE), and is a partnership led by the UCL Institute of Education with Lancaster University, the University of Sheffield and international universities Australian National University (Australia), Dublin Institute of Technology (Ireland), Hiroshima University (Japan), Leiden University (Netherlands), Lingnan University (Hong Kong), Shanghai Jiao Tong University (China), the University of Cape Town (South Africa) and the University of Michigan (US).

The support of the Economic and Social Research Council (ESRC) and the Higher Education Funding Council of England (HEFCE) is gratefully acknowledged.

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Research Assessment Exercise (RAE)
Research Excellence Framework (REF)

Performance assessment in science and academia: effects of the RAE/REF on academic life

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Abstract

This working paper extends Burton R. Clark's notion of academic life and applies, in the first step, theories of higher educational alterations on performance assessment in science and academia. There are six different functions of performance assessment in science and academia. First, there is a belief in numbers. Second, there is reactivity due to indicators and judgement criteria. Third, there are market models effecting performance assessment in science and academia. Fourth, there is business control of scientific and academic entities. Fifth, there is discipline and control of universities. Sixth, these functions go hand in hand with global quality seals.

In the second step, functional and conflict-theoretical models are developed to explain performance assessment in science and academia. The first model explains the production of knowledge in universities as a stratification of meritocratic performance entities, such as performance, quality, talent and achievement on the basis of equality of opportunity. The second model explains the production of knowledge as being stratified by power, capital and status hierarchies on the basis of inequality of opportunity. These two theoretical models are combined to explain performance assessment in science and academia in the UK.

In the next step, the paper analyses the effect of the Research Assessment Exercise (RAE) and Research Excellence Framework (REF) on academic life. Research results show that the RAE/REF affects a) research performance; b) inequality; c) diversity; d) academic freedom; e) the relationship between teaching and research; f) recruitment policies; g) research motivation; and i) power. One of the main research results reveals that it is not clear whether the performance of UK science and

academia has grown in the wake of the mechanisms of the RAE/REF. The RAE/REF increases inequality in the treatment of staff, gender and minorities due to its rules and implementation practices in the university sector. Nevertheless, there are initiatives to counteract this rising inequality. Research diversity looks set to be reduced due to a lesser likelihood of change in fundamental research tracks. The RAE/REF is likely to inhibit diversity in research topics due to scientists and academics conforming to the RAE/REF time cycle. Academic freedom in terms of contribution to the academic and scientific community is likely to be reduced, and the choice of research topics is limited in view of the strong emphasis on high impact journals and the introduction of impact as a measure of economic and social benefits in the real world. Both the recruitment process and the academic choice of research topics are affected as the impact agenda favours short-term relationships over long-term relationships alongside speculative, creative, innovative, risky and blue sky research. Research intensive universities show a decrease in their motivation to produce advanced, globally leading research due to the pressure exerted by the RAE/REF to yield ongoing research results within a certain time frame. The lower ranked institutions are under pressure and control due to universities' quality management aimed at performing better in the RAE/REF. There is a wide use of performance reviews, computer models and information systems to raise RAE/REF scores in the long run. Scientists, academics and the micro-management are putting more emphasis on the way in which they can gain more effective case studies. There is also evidence that performance assessment in science and academia is based on power relationships in the context of the RAE/REF.

1. Introduction

This working paper is designed to provide an introduction of the subject matter and will present my research questions. I will then offer an insight into my theoretical framework and explain my theoretical hypotheses for the qualitative study. Finally, I will introduce my empirical procedure, referring to sample procedures and assessment methods, and will present my empirical research results. At the end of the paper I will give a summary and an outlook to further research.

We are currently experiencing a global research competition for an increase in scientific performance and the recruitment of research stars (cf. Münch 2011; Schäfer 2012; Münch 2014; Münch and Schäfer 2014; Wieczorek and Schäfer 2016). This development is accompanied by a search for institutional models designed to raise research performance (cf. Münch 2014) as well as by reforms to enhance economy, efficiency and effectiveness of higher education systems (cf. B. Clark 1998:2). This competition is rooted in the redefinition of the academic field into markets on both a national and global level (cf. Marginson 2006). This leads to a stratification of universities (cf. Marginson and Wende 2007; Hazelkorn 2008, 2009; Hazelkorn and Ryan 2013; Hazelkorn 2014; Münch 2011, 2014) as a result of the audit culture (cf. Strathern 1997; Power 1999) and shows a concentration of research resources in the top institutions (cf. Henkel 1999; Marginson, Murphy, and Peters 2010:157).

The instruments used to increase scientific and academic performance in the UK are the Research Assessment Exercise (RAE) and Research Excellence Framework (REF). These have an impact on academic life in the UK. Nicholas Stern recently undertook a review of the Research Excellence Framework (REF) and there is currently much debate in the academic, media and political sphere as to the effects of the RAE/REF on academic life (cf. Matthews 2015a, 2015b, 2016a, 2016b, 2016c, 2016d; Oancea 2016; Bentley 2016; Cuthbertson 2016; Locke 2016).

With this context in mind, I analyse the effects of the Research Assessment Exercise (RAE) and Research Excellence Framework (REF) on academic life, since there is clearly a lack of knowledge about the mechanisms underlying these effects. Hence, my research questions concern the RAE's effects a) on research performance; b) on inequality; c) on diversity; d) on academic freedom; e) on research and teaching; f) on recruitment policies; g) on motivation; and h) on power. I will start by clarifying 1) the notion of academic life, because I assume that the RAE/REF has an impact on academic life. 2) I will present a literature review on the identified dimensions of academic life. 3) I will develop a model of higher educational alterations affecting performance assessment in science and academia and the RAE/REF. 4) I will develop a functional and conflict-theoretical model of performance assessment in science and academia and will derive corresponding hypotheses. 5) I will present my empirical procedure and will analyse the effects of the RAE/REF on the relevant dimensions of academic life. To answer these questions I refer to a set of theories

ranging from *reactivity* by Espeland and Sauder (cf. Espeland and Sauder 2007), *ruling by numbers* by Theodore M. Porter (cf. Porter 1996), *audit society* by Michael Power (cf. Power 1999), *surveillance and governmentality* by Michel Foucault (cf. Foucault 1976, 2000), *entrepreneurial university* by Burton R. Clark (cf. B. R. Clark 1998), *academic capitalism* by Sheila Slaughter, Gary Rhoades and Richard Münch (Rhoades and Slaughter 1997; Münch 2011, 2014) and the *Matthew effect in science* by Robert K. Merton (cf. Merton 1968, 1988), to the *functionalist model of science and academia* by Robert K. Merton and Davis and Moore (cf. Davis and Moore 1945; Merton 1995:17) and the *conflict theoretical model of science and academia* by Pierre Bourdieu (Bourdieu 1979, 1980, 1983, 1987, 1992a, 1992b, 1996, 1998, 2006). To analyse the hypothesis I conducted a qualitative study at three different universities and in three disciplines in the UK. I also carried out interviews with policy advisers from a funding body, a higher education agency, a leading adviser to the government and two research experts in the field of the effects of the RAE/REF.

2. Theoretical framework

2.1 Academic life

Burton R. Clark understands academic life as academic community, disciplinary differentiation and academic freedom, with its goals being the increase in quality of research and teaching (cf. Clark 1989). This model will be extended with the theoretical framework of Richard Münch (cf. Münch 2007, 2011, 2014) and my own considerations. First, I will distinguish between research performance vs. research power, equality vs. inequality, diversity and uniformity, academic freedom and unfreedom, research and teaching vs. research and recruitment policies. The first dimension refers to the measurement of daily academic and scientific research with regard to publication output in quantitative terms while, in qualitative terms, it focuses on the advancement of knowledge, and leads to new ideas, theories and methods. We can therefore distinguish between groundbreaking, long-term, speculative research, which is innovative and creative, and normal science.

Research performance is purely based on the performance of individual, organisational and macrological actors. It takes into account their merits in the school systems and is further rewarded in the higher education system right through to their research careers. Research power means that actors refer to certain power networks: institutional communication procedures to establish their research ideas in an institutional context and in the wider academic and scientific community. It stretches to the political and media sphere and is based mainly on social interactions between relevant influential individuals, organisations and macrological spheres.

The next dimension is equality vs. inequality. This assumes that there are certain policies which increase or decrease inequality and equality. Such policies are intended to neutralise the effects of an individual's social background. The

discussions reveal positive and negative discrimination, and exclusion from the possibility of equal performance. Another aspect of inequality involves research allocation mechanisms and the distribution of funds. In theoretical terms inequality can be understood as access to different social resources and positions – such as access to social networks – and in empirical terms as the unequal or equal distribution of grants, publications, citation rates and personal factors.

The next dimension is diversity vs. uniformity. We can distinguish diversity in research topics, gender and ethnic diversity. Diversity in the former enables a wide variety of research topics, methods and theories, research questions, problems and academic interests. Diversity in gender and minorities refers to the social fact that there are merit-based proportions of gender and minorities in the academic and scientific system.

The next dimension refers to academic freedom and academic unfreedom. Academic freedom means that there is an absence of censorship in daily academic practices and the freedom to undertake and choose research methods and theories freely. An academic has the ability to work on the issues he/she wants to research and to question the issues he/she would like to answer. It further relates to freedom of speech, writing and autonomy. There are no constraints that limit one's behaviour. It is purely the research interest which fuels the discovery of new theories and methods in the field of the academic and scientific sphere.

The dimension of research and teaching vs. research refers to the dimension of practices related to the practice of undertaking research and teaching. This includes, for instance, the chance to publish research, write papers, attend conferences, the teaching curriculum and so on. It is closely connected with the crucial skill of distributing knowledge among generations of students. Whereas the former is based on a strong connection between research and teaching, the latter rests on a concentration on research.

The final aspects are recruitment policies, the way academics are appointed and what criteria are relevant in this decision-making process. The dimension of recruitment policies considers the manner in which scientists are appointed and what criteria are crucial for initiating an appointment. These above mentioned dimensions are stratified by individual, organisational and institutional actors. There is, of course, a difference in these dimensions between individual, organisational and macrological actors (See Fig. 1).

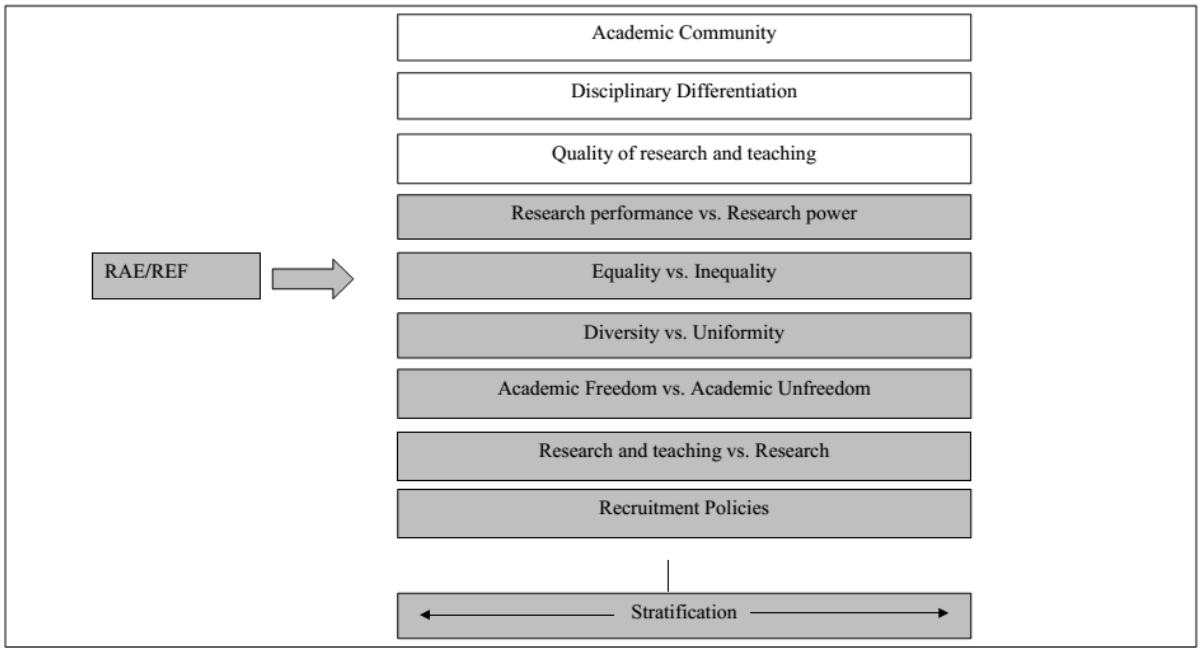

Figure 1: RAE/REF and academic life

2.2 State of research

The RAE/REF's goal is to increase research performance and research quality and it is used as an efficient allocation of research grants to 'excellent' universities (cf. Frølich 2008:5): 'Hand in hand with the rise of the New Public Management and expanding global techno-economic competition, an increasing prominence has been given to the idea that university systems employing output incentives and competition mechanisms are more efficient and productive than systems in which such incentives and mechanisms are employed less or not at all.' (cf. Auranen and Nieminen 2010:822). While citation rates are rising (cf. King 2004; Adams 2011; Bornmann and Leydesdorff 2013), the proportion of papers in the Web of Science is decreasing (cf. Adams 2011:7; Münch 2014:112). UK science is having a decreasing impact (cf. King 2004; Adams 1998:615) and a decreasing efficiency in an international comparison (cf. Auranen und Nieminen 2010:830) and on the disciplinary level (cf. Münch 2014:227–228; 242).

One goal of the RAE/REF is to identify excellence in research and to selectively support high performers in the scientific and academic world (cf. Science and Technology Committee 2002a, 2002b, 2004a, 2004b). But inequality is rising in a whole series of STJU indicators (cf. Münch und Schäfer 2014:64). There is inequality in the field of staff as a result of the administrative workload for teachers and limits on research freedom for researchers. Inequality also occurs in terms of publications in top journals (cf. Harley 2000:565) and funding of established institutions instead of new universities (cf. Orr 2003:45–46). Finally, there is an enforcement of gaming strategies of informed institutions (cf. Harley 2000:555).

As regards diversity, short-term publication work is encouraged by the RAE/REF, while innovative and interdisciplinary contributions are inhibited (cf. McNay 1997:70; Oancea 2010a:260, 2014:91). In the field of economics, there is a list of economic core journals determining recruitment decisions and driving scientific and academic behaviour towards the hierarchy of high impact journals (cf. Harley and Lee 1997:1431; Lee, Pham, and Gu 2013); in addition, research topics must meet the preferences of panel members. McNay and Talib argue that speculative and long-term scientific work is inhibited (cf. McNay 1997; Talib 2002:264). The literature points to decreasing academic freedom as a result of an increase of managerial control. But there is also increasing managerial autonomy (cf. Melo, Sarrico, and Radnor 2010:251; Teelken 2012:282). UK academics feel free (cf. Pritchard 2005:445), yet the RAE/REF generates an administrative burden so that academics would prefer to spend more time on research than they are currently able (cf. Pritchard 2005:445).

Furthermore, contributions to a vital academic community are inhibited (cf. Talib 2002:359). All in all, the entrepreneurial university might reduce academic freedom. (cf. Palfreyman 2006:17–19): ‘Again, it can be seen that the content of autonomy is all important. Universities are increasing their autonomy and academics are increasing their freedom, but in market economic terms.’ (Marginson 1997:366). Also, a division of the UK university landscape into research and teaching institutions is observable (cf. Meier and Schimank 2009:55). With regards to teaching, a drop in teaching quality becomes obvious (cf. Jenkins 1995). The knowledge transfer between research and teaching is decreasing (cf. Broadhead and Howard 1998a:10) and the status of lecturers is also decreasing (cf. Pritchard 2005:447). In addition, there is discrimination against new universities (cf. Kreckel 2008:186–87). With reference to recruitment policies, there is a recruitment of scientists who publish in top journals and a recruitment of scientists with a vast research potential: research has gained considerable weight over teaching (cf. McNay 1997:65–67).

2.3 Higher educational alterations

Starting from theories of general educational alterations in the higher education system, six elements describing performance assessment in science and academia can be identified. First, there is a belief in numbers. Second, we come across reactivity in the form of a change of behaviour towards the goal structure of RAE/REF indicators. Third, we can identify a sort of commercialisation underlining the new relations between university and students in terms of a market model placing students as customers, and universities as suppliers. Fourth, the scope of economic control of research through university management is highlighted. Fifth, we establish control and discipline in the context of the RAE/REF indicators. Sixth, there is evidence reinforcing the assumption of an audit culture in universities: we identify the function of a global quality seal.

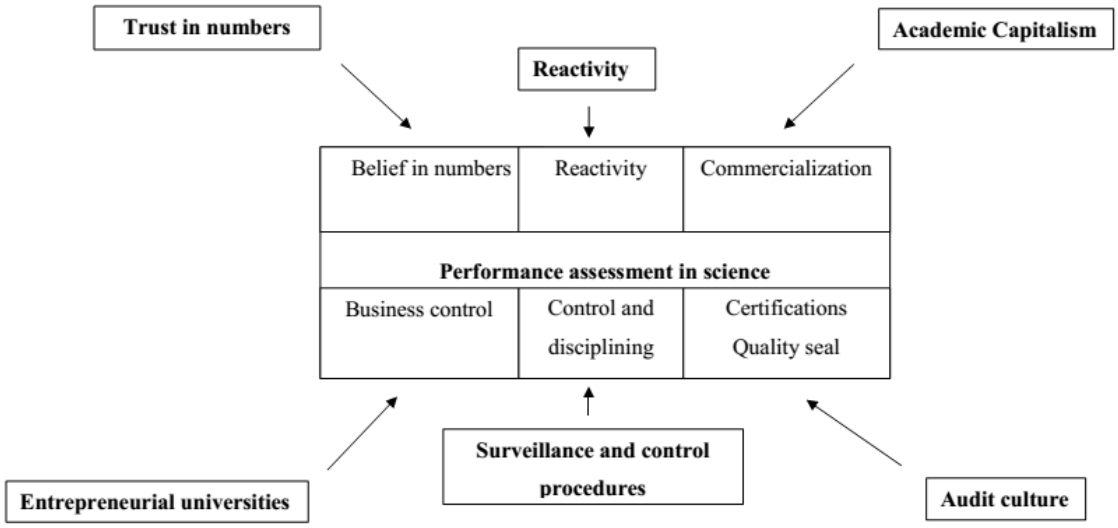

Figure 2: Higher educational alterations

We can understand the RAE/REF's effects on academic life when we differentiate and connect it to general alterations in the higher educational landscape. Numbers, like efficency indicators (publication and citation rates), are increasingly used in the political sphere to measure the output of higher education systems in reports of reviews and for the House of Commons. As Porter describes it, there is a use of numbers in the political and bureaucratic state machinery. This leads to an enforcement of economic criteria, and a management of research proposals is observable. We might say that there is impersonal measurement of scientists through indicators, leading to an authority of numerical values and a belief in numbers.

Experts play a crucial role in this context, because it is their construction and interpretation of performance that matters. Nevertheless, it is a process of *construction* and *interpretation* (cf. Porter 1996). Furthermore, one can identify a behaviour of reactivity. We can observe a behavioural change in the direction of numerical values and an optimising academic and scientific behaviour towards numerical values. These are automated procedures that can be described as governance through numerical models. This enables a career through impact factors (cf. Espeland und Sauder 2007).

From the literature of academic capitalism we know that increased financing takes place through tuition fees alongside the privatisation and commercialisation of universities. This development is accompanied by managerialism of resource allocation. In addition, profit and rationalisation techniques are implemented and monopoly positions and increasing inequality is observed. The result is a competition among students for academic products (cf. Rhoades und Slaughter 1997; Münch 2011, 2014). Burton R. Clark's study of the entrepreneurial university draws the focus onto the business control of university entities that are increasingly regulated

by central management. The result is a global economic and symbolic competition, while, at the same time, cooperation with industry is increasing. Economic entities are implemented in the university system and appointment structures bring about a global competition for research ‘stars’. There is a disentanglement from governmental income resources and a pressure to meet investors' expectations (cf. B. R. Clark 1998).

The effects of the RAE/REF become further understandable when we survey and control research performance through indicators. There is a huge data collection and input into mathematical functions available. Political actors build material and performance-related classification systems and allocate resources to functional sections. We can speak of a power of mathematical regularity and a data template of individual performances (cf. Foucault 1976, 2000). In addition to these higher educational alterations there is an implementation of economic, efficient and effective structures. Quality assurance and internal control procedures are used and motivational structures and conformity with the procedures are created. Formal inspections define the standards of the auditors, and the auditors themselves can be understood as judgemental entities that have an impact on university management. Governmental audits are increasingly being replaced by private audits. This trend is accompanied by an evidence-based interpretation of audit seals. They are interwoven in political processes and are exploited for political programmes and in brand management (cf. Power 1999).

The theoretical elements – a belief in numbers, reactivity, business control, disciplining and quality seals – are core elements in understanding the effects of performance assessment in science and academia and in understanding academia and science in general. We see an increasing belief in statistical models, rankings and league tables. The actors internalise vertical ranking values and integrate them into their judgement criteria. Hence, there are also life course and generation effects.

In methodological terms, we can combine life course analysis with event history analysis and multilevel approaches over time. The individual judgement criteria are stratified by the institutional hierarchy of the universities. Scientific and academic actors choose and predict their future on the basis of university ranking positions. This restricts academic freedom in the sense that research interest is combined with strategic behaviour. Therefore, science and academia are based more and more on statistical evidence. In this context, creative and innovative elements of scientific and academic life are less likely. The element of reactivity changes the behaviour of scientists and academics so that they anticipate changes in indicators and consequently modify their behaviour to conform with the changing definitions of ranking systems. They hypothesise about certain indicators and start to change their behaviour in these directions. As a result, there is a shift from academic and scientific interests towards strategic interests.

The element of business control means that management structures are very important in the implementation and interpretation of ranking structures in

universities. They are increasingly used to improve the individual performance of scientists and academics. This development is accompanied by peer review processes designed to stimulate the improvement of scores. The disciplining element changes the behaviour of individual and organisational actors, whose actions are influenced by the perceived judgement criteria of peers and ranking systems. They tailor their research to certain topics to fit with the criteria of certain journals. This process starts right from the selection of the title of the publication and stretches to the choice of sources and so on. It is closely entwined with processes of economic rationality of scientists and academics. The element of the quality seal means that the overall ranking judgement over a certain university – for example, for an individual working at a certain university – is a seal for both the academic and the scientific audience. It affects recruitment decisions and career chances.

It will be interesting to see how far national quality insurance systems like the RAE/REF have a global charisma in science and academia. At the moment they are still not popular and comparable enough to have a stronger effect than media rankings of universities. This points further to the ways in which the academic and scientific, economic, cultural, and media fields are interrelated. At the core is the individual, with emotional and rational procedures and mind and body. Furthermore, the fields are connected via network positions that are vertically stratified to individual, organisational and macrological spheres. The networks are labeled as performance and power-related networks with high ability and strong power connections. Hence, the field is divided in elite power performance-related power structures and a non-elite segment.

Against this backdrop, I have developed a theoretical model designed to explain the effects of the RAE/REF's performance assessment on science and academia in the UK. Using this model, I differentiate between functionalist and conflict theoretical explanation strategies. In functionalist terms, the constitution of performance assessment in science and academia is functional for the entire university system, because it allows a selection of knowledge and researchers according to performance, achievement, qualifications and talents. The conflict theoretical model of performance assessment in science and academia argues that there are institutions possessing a high number of material and symbolic resources that are reinforced by central actors holding monopolies in the distribution of material and symbolic resources.

2.4 Functional model of performance assessment in science and academia

It is possible to distinguish two theoretical models as explanation strategies. On the one hand, there is the functional model of performance assessment and, on the other hand, there is the conflict theoretical model. In the first case, UK performance assessment can be understood as a measure to strengthen the top performers in the

UK university system. In the second case, historical structures determine capital accumulation of UK performance assessment.

In accordance with the functional model of performance assessment (see Fig. 3) society consists of functional entities. These entities are in a positive relationship to the entire organism and there are specific behavioural patterns, which are essential for the system to survive. It is assumed that the RAE/REF system – perceived as a functional system – ensures the functionality of the UK university system. There is a selective distribution of resources to the high performers of the university system. This enables the recruitment of talent, excellent students and star researchers. This selection process has a positive impact on knowledge evolution and can be understood as producing inequality on the basis of merit (Fig. 3).

However, there are also dysfunctional effects. For example, there are informal relationships that infiltrate the academic system and capital concentration around the high performers. Increasing inequality is used as a tool to increase productivity (cf. Davis und Moore 1945; Merton 1968, 1988). From this starting point, Tumin argues that elite circles reduce the survival probability and selection of talent. An accumulation of advantages takes place for more privileged children through monetary funds, and elite circles gain psychological rewards with positive effects on self-realisation and leisure behaviour. It is assumed that the RAE/REF strengthens extrinsic work motivation and creates positive self-images for elite universities and negative self-images for the wider mass of universities. This leads to decreasing creativity and integrative power in science (cf. Tumin 1953). In this context, Marginson argues that performance data entries in league tables are limited in identifying the actual university performance (cf. Marginson 2015).

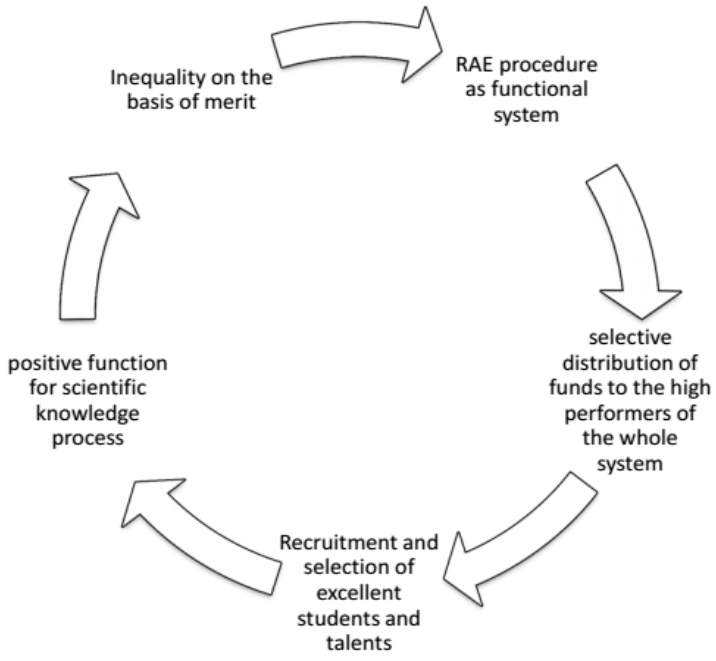

Figure 3: Functional model of performance assessment in science and academia

2.5 Conflict theoretical model of performance assessment in science and academia

In accordance with the conflict-theoretical model of performance assessment in science and academia there is a concentration of attention on elite universities. This goes hand in hand with the definition of performance criteria through monopoly positions. The scientific and academic discussions and publications are restricted to lighthouses: there is a concentration of attention to well-funded universities. Social exchange takes place between elite institutions in the same way as the accumulation of capital and the establishment of ranking positions. Profit interests determine knowledge acquisition and scientific and academic action. One can speak of a screening of the science system with indicators, and an implementation of an elite habitus.

The RAE/REF rates actors due to capital distribution and there is an accumulation of economic and symbolic capital at top institutions. Scientists and academics with high values of symbolic capital are recruited. This leads to the assignment of an elite habitus to institutions, scientists and academics. Inequality can be understood on the basis of the unequal distribution of capital, power and status (Fig. 4). This is in accordance with Pierre Bourdieu's field and capital theory (cf. Bourdieu 1979, 1980, 1983, 1987, 1992a, 1992b, 1996, 1998, 2006). He refers to an elite habitus and classifications and assessments of actors based on excellence criteria in a social space. The field is comparable to an elitist game: the cards in the game correspond to capital, whereby competitions are held and social positions are taken. The field's boundaries are determined through entrance rules and standards and the state bundles resources and exercises power over fields. Actors try to accumulate state capital to strengthen their power positions. The habitus of the actors is a disposition system, and concentrates on experiences and historical conditions. The academic elites transmit material chances to the next generation.

Inequality is thus maintained throughout generations and enables career paths. Elitist language is loaded with symbolic power and linguistic entities are recognised. The RAE/REF's evaluation activities favour top publishers and exercise symbolic power. Power structures are obscured and negated by symbolic violence and are legitimised by the state (cf. Bourdieu 1979, 1980, 1983, 1987, 1992a, 1992b, 1996, 1998, 2006). In this context, Marginson argues there is a stratification by status and achievement (cf. Marginson 2011).

It is very likely that the functional and conflict-theoretical models of performance assessment in science and academia are both relevant to explaining effects in the university sector. There are reproductive elements of power, capital and status and also performance-driven aspects such as individual, organisational and macrological abilities to perform.

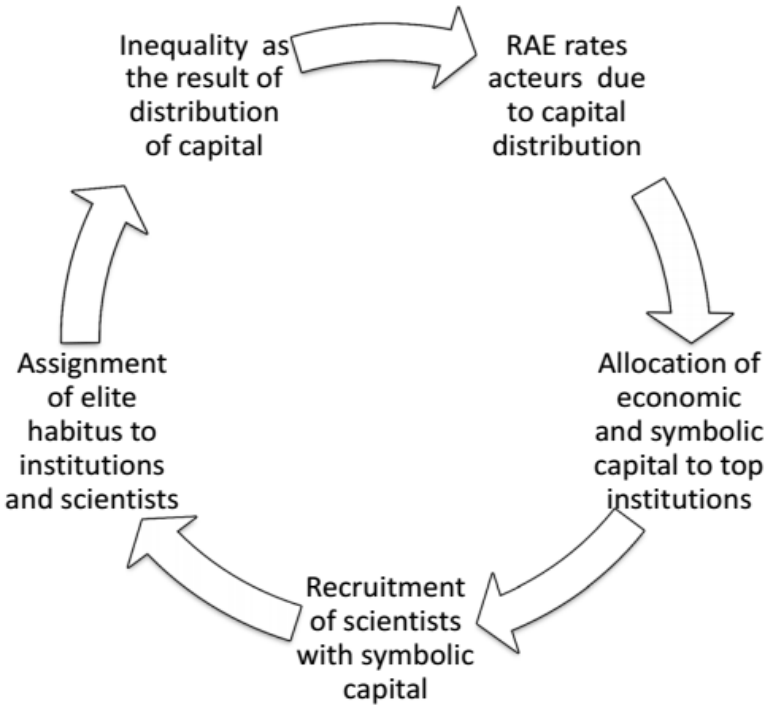

Figure 4: Conflict-theoretical model of performance assessment in science and academia

2.6 Hypotheses

Several methods are very well suited to developing hypotheses for this study. I will consider 1) the state of research, 2) higher educational alterations, and 3) the performance and power-based model of performance assessment in science and academia. Furthermore, I have gathered information during my qualitative interviews enabling me to develop hypotheses in an iterative way.

In regards to the state of research I will formulate hypotheses 1 a) – f).

Hypothesis 1a) assumes that the research performance is increasing or decreasing due to a concentration of resources. This can be accompanied by a higher or lower probability for elite institutions to publish in high impact journals. The concentration of resources can be understood as Gini coefficients in financial, personal, citation and publication resources.

Hypothesis 1b) assumes an increase or decrease of inequality. This inequality can be measured through different indicators and in qualitative terms with the dimensions of gender, the promotion of early career researchers and the progression and status of different positions.

Hypothesis 1c) assumes that there are different dimensions of diversity. Diversity can be enhanced by political procedures or can be reduced due to administrative

workload and an orientation towards panel members' preferences for certain research topics and the expectations of leading journals. Furthermore, it is assumed that there are certain favourable output types in the RAE/REF process. Another crucial feature is that the RAE/REF does not enable scientists and academics to change their research track fundamentally, and they must conform to the RAE/REF time cycle.

Hypothesis 1d) assumes that academic freedom is reduced due to an orientation towards impact measures, high impact culture, administrative burden, quality management and time pressures. This orientation is increased through managerial autonomy and resource competition.

Hypothesis 1e) assumes that there is a separation of research and teaching or a stronger connection between the two. It is assumed that the latter involves an administrative burden for researchers marked as ‘non research active’ and who therefore experience a low level of recognition in the academic field. It also implies that teaching is undervalued compared to research and there is a loss of knowledge transfer between student generations or a transmission of certain research knowledge.

Hypothesis 1f) assumes that there are selective criteria in the appointment practices or general criteria. The effect on recruitment policies means that we will witness a visible change of recruitment criteria in favour of mainstream research and an emphasis on symbolic, instead of functional, values.

In relation to higher educational alterations I hypothesise that 2a) numbers are gaining more and more significance in academic processes. They stimulate academic and scientific behaviour and are relevant as regards different institutional ranks and disciplines. For example, an orientation towards impact factors and strategies to raise ranking positions are indicative of the impact which the belief in numbers has on daily academic practices.

2b) I assume that there is a behavioural change towards reactivity to the performance indicators. It is possible that academics and scientists are more strongly focused on certain output types and general quantitative indicators.

2c) I assume that there is a shift towards a commercialisation of academic practices.

2d) I assume that business control plays an ever more important role in academic practices.

2e) I expect that control and discipline are relevant and are differentiated towards certain institutional ranks. For example, lower and middle ranked institutions are more strongly controlled by management practices than higher academic and scientific ranked institutions.

2f) I suspect that quality seals are relevant in the process of scientific and academic discovery.

3) I assume that the functional and conflict-theoretical model of performance assessment in science and academia is essential.

In the following empirical inquiry I will try to corroborate some of the hypotheses with qualitative data material. Not all hypotheses are analysable with qualitative data. Hence, we still have to refer to quantitative data and discussion analysis. These analyses will form part of my dissertation and will be used at further conferences and in presentations of my work.

3. Empirical procedure

3.1 Qualitative interviews and sample structures

The study is ethically confirmed by the Federal Ministry of Education and Research in Germany and its main funding line 'performance assessment in science' as well as by the University of Bamberg and its related research project 'unintended effects of performance assessment in science and academia' headed by Professor Münch. The interview data is handled strictly confidentially and the interview responses were carried out anonymously due to the sensitive nature of this research project. In the first step I established a random sample of interviewees: I contacted a number of scientists and academics, selected according to their discipline and their institutional affiliation. The crucial point was for academics and scientists to be employed at the university and to hold a position as head, reader, lecturer or professor. The response rate was 10 per cent. Next, I arranged an interview appointment, a time and a location. The interviews were structured by a questionnaire I had prepared beforehand. To start with, I undertook a pretest with three different scientists and academics from three different disciplines to find out whether my questionnaire was accurate enough to provide the answers required for my research project. This was crucial in order to obtain information with regard to problems arising over the understanding of the questions and possible duplication of the knowledge content. In the second step I constituted a sample of the universities in accordance with their institutional affiliation and their 2008 RAE ranking. This decision was made to control changes in the RAE/REF criteria, to ensure stability and to open up the possibility of interviewing academic and scientific staff who are climbing the scientific and academic ladder. I interviewed scientists and academics from three different institutions (low, middle and high ranked) and three different disciplines (chemistry, sociology and history).

As you can see (Tab. 1), it was problematic to get three interviewees from research intensive universities for all disciplines. It also proved difficult to get three sociologists from the lower ranked institutions. Over the next few months I will try to conduct some more interviews via Skype; however, this possibility is restricted by limited staff

numbers and a lacking readiness to participate in the study. One possibility would be to reduce the sample size to two scientists and academics per discipline and institution. However, this would involve a reduction of potential information.

The next step is designed to deepen understanding of the academic, scientific and political discussions and debates. In the discourse structure, certain institutions can be identified as main actors. To comprehend positions and strategies of the main actors in political, scientific and academic discourse, I will conduct interviews with representatives of central institutions. The interviewees will be selected on the basis of their hierarchical level within the institution, their relevance within the institution, and because of previous findings they have gathered with regard to the discourse. This procedure will supply a deep insight into the effects of the performance assessments perceived by the scientists and academics themselves in their role as professors, heads, lecturers and readers in chemistry, sociology and history. Furthermore, valuable insights will come from the scientific, academic and political actors in the mediated sphere to the political field.

	Institution			
Discipline	1	2	3	Total
1	3	3	3	9
2	2	3	1	6
3	2	3	3	8
Total	7	9	7	23

Table 1: Sample 1

In the second step I tried to contact central actors in the field of science and academic policy. The process of getting in touch with funding bodies, higher education agencies and the government is not an easy one. I was able to conduct five interviews with policy advisers from a funding body, one interview with a policy analyst and adviser from a higher education agency. Also, I interviewed a leading scientific adviser to the government. Furthermore, I carried out interviews with two leading scholars in the field of the RAE/REF. Members of Parliament were not available for an interview due to time restrictions.

Institution	Position	Number
Funding Body	Policy Adviser	5
Higher Education Agency	Policy Analyst	1
Research experts	Leading researcher in the field of the RAE/REF	2
Scientist	Leading adviser to the government	1
Σ		9

Table 2: Sample 2

3.2 Questionnaires

First of all, I introduce the questionnaire with a general question concerning the interviewees' work experiences. Next, I ask them about general changes in the university landscape in the wake of the RAE/REF. I then enquire about the RAE's performance goals and the perceptions of the interviewees as to whether these goals have been achieved. In the RAE's functionalist view, it is supposed to have a positive impact on research efficiency and on performance measured in terms of publication and citation rates. In a conflict-theoretical argumentation mode, it is perceived as a symbolic struggle for recognition which could lead to a drop in research efficiency.

The following set of questions relates to the effect the RAE has on inequality. In this context, I am interested in a process of increasing or decreasing inequality and its effects on the perceptions of the interviewees. The subsequent questions are related to the effects of the RAE/REF on diversity. To deepen the understanding of diversity, there will be a question as to the understanding of the term and the effects it has on everyday scientific and academic work. Furthermore, I tried to address the diversity issue with questions relating to its conformity to the RAE/REF's time cycle and the change of research focus.

The following group of questions is related to academic freedom. I would like to find out whether academic freedom is promoted by the RAE/REF and whether the interviewees have the opportunity to choose research themes freely. It starts with a question concerning the interviewees' understanding of the term 'academic freedom'. I am especially interested in the RAE/REF's effect on freedom of research, teaching freedom, learning freedom and contibution to the academic community. The following questions are related to the RAE/REF's effect on research and teaching. In this context, I am interested in finding out whether the interviewee is involved in teaching and how much of his/her workload is allocated to teaching activities. I am also interested in the teaching load of the entire department and the university.

Next, I focus on the functionalism of research and teaching. I will conclude this group of questions with a look at the division of labour in an attempt to discover whether a concentration of the best qualified brains in either teaching or research is desirable. Subsequently, I address the subject of recruitment policies. In this context, I am interested in identifying the crucial criteria in the recruitment process of scientists. The change of recruitment criteria in the wake of the RAE/REF is of special relevance here. I will then have a look at the RAE/REF's effects on research motivation and power. In the following step, I will focus on the institutional effect and ranking position of the academic institution.

The final questions refer to standardisation: the influence of the university management and quality management in the context of the RAE/REF. First, I am going to consider the effects the RAE/REF has on standardisation. Second, I am interested in the way the university management affects decisions of academics and

scientists. Third, I would like to consider the effect of quality management of academic life in the context of the RAE/REF. Ultimately, I am referring to power relationships in science and academia to test the conflict-theoretical model of performance assessment in science and academia.

3.3 Analytical strategy

This analysis is a first interpretation of the data on the basis of my notes taken during the interviews. I will analyse the transcripts of the interviews. In this paper I will concentrate on the similarities rather than the institutional and disciplinary differences. Nevertheless, I will take institutional and disciplinary effects into account whenever this is possible. First, I will have a close look at the effects on a) research performance, b) inequality, c) diversity, d) academic freedom, e) relationship of teaching and research, and f) on recruitment policies, g) research motivation, and h) power.

It should be mentioned that the RAE/REF's effects are embedded in a frame of specific actors and historical changes (Fig. 5). This is grounded on a research result identified by, for example, Oancea: ‘The influences of RAE 2008 were not perceived by the respondents as homogenous, but as multi-directional and depending on a range of factors.’ (Oancea 2010b:8). So even if I asked the interviewees about the effects of the RAE/REF on academic life, it is still possible that the interviewees were relating their knowledge to processes other than the RAE/REF. This means, for example, that when an interviewee described the RAE/REF as encouraging a high impact journal culture, this could reflect a worldwide trend in the scientific and academic sphere. A further example is that university management interprets the rules of the RAE/REF, and, furthermore, implements decisions in their own way. Another example is panel judgement. Sometimes interviewees said that the panel judges performance in a biased way. However, they have no knowledge about certain practices within the panels, not being panel members themselves. So even if the interviewees responded to the best of their knowledge, it is still possible that truth is distorted in their messages. We have to keep in mind that both the researcher and the interviewees did their best to ask and respond to the questions in an objective way. But it is nevertheless a process of constructing the social world within which we live. To take this into account I have enriched my analysis with quantitative measurable data.

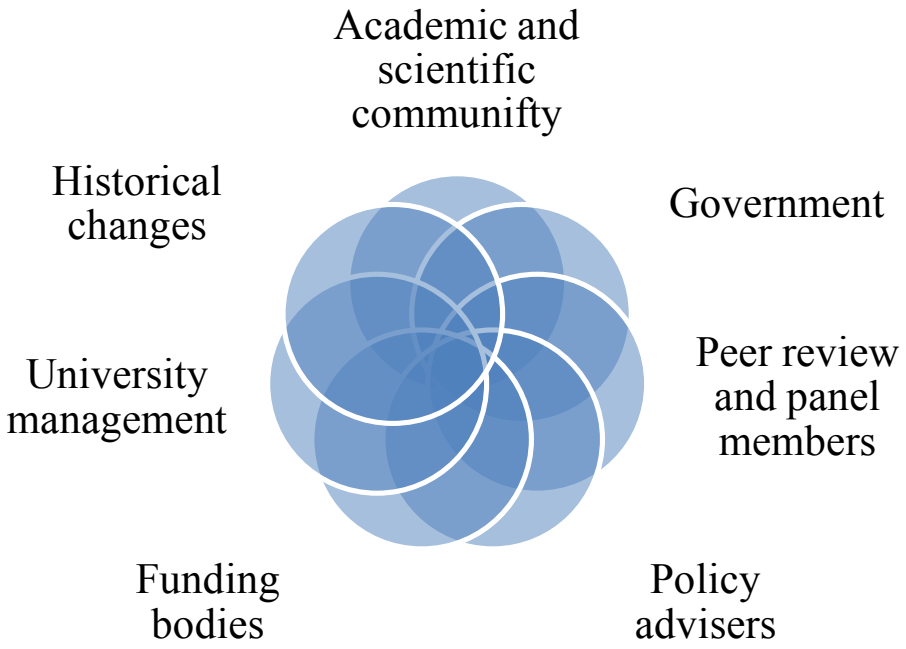

Figure 5: The effects of the RAE/REF in context

4. Empirical results

4.1 The academic and scientific sphere

4.1.1 Research performance

What effects does the RAE/REF have on research performance? 20 of the interviewees said that UK science and academia are doing well in the world (01_01; 01_02; 01_03; 01_04; 01_05; 01_06; 02_01; 02_03; 02_04; 02_05; 02_06; 02_08; 02_09; 03_01; 03_02; 03_03; 03_04; 03_05; 03_06; 03_07). UK science and academia are placed second in the world and are leading worldwide in research in terms of publication and citation rates. This finding corroborates Oancea's hypothesis that the RAE/REF is perceived as increasing the quality of publications (cf. Oancea 2014:89).

This underlines the theoretical assumption that numbers are increasingly crucial for decision-making processes and that there is a belief that performance in science and academia has increased. This, in turn, underlines hypothesis 2a) claiming that numbers are increasingly influencing the decision-making process. Furthermore, it underlines the functional model of performance assessment in science and academia, which assumes that science and academia are perceived as functional in terms of the performance of individual, organisational and macrorelevant indicators. One interviewee said that if one accounts for the investment of GDP, which is below average, the UK does even better than the US (03_05). The analysis shows that

people are looking more and more at league tables when they refer to the worldwide leading position of the UK's science and academia.

To further deepen the question, I required the interviewees to refer to the RAE/REF's effect on their academic and scientific performance. First of all, there is concern about the long-term perspective of the RAE/REF. 10 academics and scientists said that it inhibits long-term speculative and risky research due to its short-termism (01_02; 01_03; 01_04; 02_05; 02_07; 02_09; 03_02; 03_03; 03_05; 03_06). Interviewees indicated that there is an advancement of English speaking countries (01_05; 02_02; 02_07). As regards the effect on academic performance, the interviewees said that impact reduces academic freedom and there is a drive towards high impact journals. Yet only four interviewees stated that the RAE/REF encourages the researchers to plan and organise their research (01_01; 02_2; 02_03; 02_04). 18 scientists and academics did not mention the effect at all. This research result supports hypothesis 1a) as it observes a belief in performance increase and also a performance decrease due to a focus on short-term publication strategies.

4.1.2 Inequality

Five interviewees said that the main funding goes to the leading, established universities (01_04; 01_05; 02_01; 03_02; 03_03). There are head hunting strategies to recruit the best researchers (01_05). One interviewee claimed that it is easier to get Research Council grants with very high RAE/REF scores (02_01). There is also concern about the devaluing of theoretical work (02_06). But still, there is a chance for new universities to climb up the academic ladder. They use the RAE/REF's research funding income to compete with the Russell Group and other institutional actors.

In terms of gender inequality, the interviewees reported a dominance of white middle-class men who protect their elitist position. There is concern about the relative academic chances of women (02_02; 02_03; 02_05; 02_06; 02_07; 02_08) who often take career breaks due to child caring responsibilities, which proves to be a real concern for their RAE/REF research profile. One interviewee said that women are less likely to be nominated for the REF cycle. Furthermore, women are likely to be assigned administrative tasks rather than actively engaging in research to boost their research profile (03_03). The following literature provides more insight and ideas with regard to the gender and minority issue (cf. Bagilhole 1993; Blake and La Valle 2000; Knights and Richards 2003; Probert 2005; Barbezat and Hughes 2005; Doherty and Manfredi 2006; Ackers 2007; Hey et al. 2011; Shepherd 2011; Grove 2015).

One interviewee mentioned that theoretical work is devalued in the sense that empirical work gets better RAE scores (02_06). Furthermore, there are concerns about the chances of early career researchers who are overloaded with work and

need REF-able results for career progression (01_03; 01_04; 01_06; 02_02; 02_03; 02_05; 02_06; 02_07; 02_08; 03_05; 03_06; 03_07). This is supported by the research results of Oancea (cf. Oancea 2010b:6–7, 2014:99). See furthermore (cf. Manfredi and Vickers 2009). These research results indicate that the RAE/REF has created a level of inequality, particularly in the fields of resources, gender, minority, and early career progression and promotion. Oancea also identifies perceived effects of the RAE/REF on promotion prospects (cf. Oancea 2014:89). These research results are in line with the argument that the wake of the RAE/REF and its implementation in universities has resulted in an increase in inequality. The RAE/REF fuels inequality in gender, early career promotion and progression, and confirms hypothesis 1b).

4.1.3 Diversity

Overall, the interviewees understand diversity and inequality as synonyms. So there are diversity issues relating to the chances of women, minorities and diversity in research topics. For further research results see (cf. Oancea 2010b:7). With regard to diversity, one interviewee said that it changes people's behaviour towards thinking about where to publish as opposed to changing the topics they are researching. To deepen this analysis one has to take into account the responses regarding the change of research focus (see below).

Change of research focus

22 interviewees said that they did not change their research focus as a result of the RAE/REF (01_01; 01_02; 01_03; 01_04; 01_05; 01_06; 02_01; 02_02; 02_03; 02_04; 02_05; 02_06; 02_07; 02_08; 02_09; 03_01; 03_02; 03_04; 03_05; 03_06; 03_07). This can be interpreted in three ways. First, it can be assumed that the RAE/REF did not make it necessary for researchers to change their research focus, and it is still therefore the researcher's choice to focus on specific topics. The second interpretation is that the RAE/REF does not enable people to undertake a big shift in their research focus. Some interviews suggest that both interpretations are very likely. So the RAE/REF inhibits a major shift in the research focus and research career of the scientists and academics. But it is also true that the academics and scientists are not forced to change their research focus due to the RAE/REF.
If you consider this topic in more detail you will see that 11 interviewees identified conformity with the RAE/REF time cycle (01_04; 01_05; 02_06; 02_07; 02_08; 02_09; 03_01; 03_03; 03_04; 03_06; 03_07). This conformity could lead to a lesser likelihood of a researcher taking a fundamentally new research path and trying to find new directions in a research area. A third interpretation is purely academic and scientific: academics and scientists are in this way driven by research interest and success in their research field. They don’t change their focus because they have research interest in the topics they are researching. This supports hypothesis 1c) claiming that the RAE/REF does not enable the scientists and academics to change their research track fundamentally.

4.1.4 Academic freedom

Choice of research themes

My first question in relation to academic freedom asked the interviewees what kind of effect the RAE/REF has on their choice of research themes. Eight interviewees replied that the RAE/REF had affected their choice of research themes (01_02; 02_01; 02_04; 02_08; 02_09; 03_01; 03_05; 03_06). The aspects mentioned included impact (01_02; 01_04; 02_02; 02_03; 02_05; 02_06; 02_08; 02_09; 02_09; 03_01; 03_02; 03_04; 03_06), time problems (02_01) and creating high impact journal research (01_04; 02_01; 02_02; 02_03; 02_04; 02_06; 02_08; 03_04; 03_05; 03_07).

During the interviews it became more and more obvious that the academics and scientists have a very strong interest in their research work. Hence, we cannot conclude that the RAE/REF influences and more or less prescribes research topics. But there is serious concern on the part of academics and scientists that the introduction of measuring impact might drive them to focus on more practically orientated topics (01_02; 01_04; 02_02; 02_03; 02_05; 02_06; 02_08; 02_09; 02_09; 03_01; 03_02; 03_04; 03_06). Furthermore, the time cycle of the RAE/REF inhibits long-term and risky research and encourages short-term knowledge production (01_02; 01_03; 01_04; 02_05; 02_07; 02_09; 03_02; 03_03; 03_05; 03_06). In this context, an effect on academic freedom is observable because academics and scientists are not free to study every topic in which they have a research interest.

The interviewees also said that there is a bias towards the ‘trendy’ and ‘glamorous’ research topics often featured in high impact journals. From this perspective, a drive towards metrics will limit the academic freedom of scientists and academics through a concentration on high impact journals (Fig. 6). Some interviewees indicated that they were now striving to get into these journals because they are valued more highly in the RAE/REF panels. The academics and scientists would not normally have published in these journals but it is increasingly an implicit norm of how the panel members are judging their quality of work. Whether or not it is true that panel members favour high impact journals, academics believe that they do and are thus changing their research behaviour accordingly. This supports hypothesis 2b) which assumes that there is a change of behaviour towards measured aspects of the scientific and academic world such as the high impact factor of publications. There is a clear shift in research topics due to the perceived judgment criteria of the RAE/REF (Fig. 6).

With all these findings in mind, the question arises as to how we should handle this social fact? A drive towards more metrics (a more governmental approach of regulating science and academia) would encourage a rush towards high impact journals and restrict academic freedom to publish in the journals where a type of research best fits. Furthermore, most of the interviewees said that the RAE/REF had

little or no effects on their teaching freedom (01_01; 01_02; 01_03; 01_06; 02_02; 02_03; 02_04; 02_05; 02_06; 02_07; 02_09; 03_01; 03_02; 03_03; 03_04).

In relation to freedom of learning there are only small effects (01_02; 01_06; 02_01; 02_06; 02_08; 02_09; 03_02; 03_04). The curricula appear not to be affected, but there could be an indirect effect due to the emphasis on research. Some interviewees indicated that there are restrictions to student learning, and time pressures on research and recruitment processes to fit with REF-able criteria. It is really important to point out that it is not clear whether the drive towards high impact journals is favoured by the RAE/REF. Policy advisers claimed that high impact journals are *not* a judgement criterion of the panel members (04_01). One policy adviser from a funding body said that impact only accounts for 10 per cent (04_01). This underlines hypothesis 1d) suggesting that the choice of research themes is limited due to an orientation towards high impact journal culture and impact measures in the RAE/REF and also allows space for the opposite theory. See further (cf. McNay 1997:66).

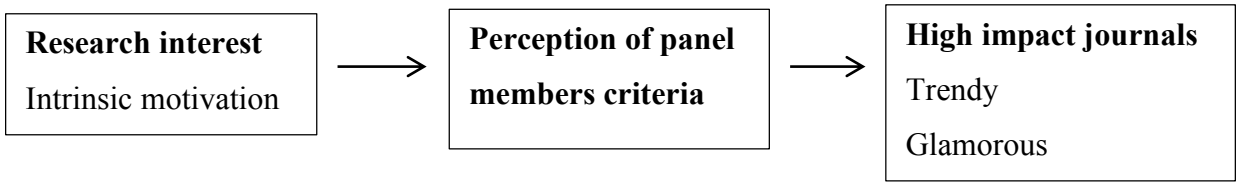

Figure 6: Research interest, panel criteria and academic freedom

Contributions to the academic community

As regards the RAE/REF's effect on the extent to which academics contribute to the academic community, six interviewees said that editorial board, reviewer functions and subject associations are more likely to be disadvantaged by the RAE/REF (01_03; 02_05; 02_09; 03_01; 03_03; 03_06). On the other hand, some interviewees stated that it encouraged collaborations (01_02; 01_04; 02_08; 03_01).

4.1.5 The relationship between teaching and research

I will explore what kind of effects the RAE/REF has on the dimension of teaching and research. Overall, it can be said that it strengthens the connection towards research. Most of the interviewees said that teaching is now more research driven (01_01; 01_02; 01_03; 01_04; 02_02; 02_03; 02_08: 03_03; 03_06) and students are interested in their research. On the other hand, this implies that the chance to discuss new topics which are unrelated to that research is more difficult to develop. When your teaching is closely connected to your research this means that all restrictions of the RAE/REF are focused more directly on the students' academic lives. One interviewee claimed that the RAE/REF had an impact on teaching as he/she had less time to focus on research. So he/she had to work on weekends to get publications out (09_02). This effect supports hypothesis 1e), which suggests

that there is a stronger connection between teaching and research, with research-based teaching being an exception here. It is possible that certain knowledge will be transmitted to student generations.

4.1.6 Recruitment policies

In this section I will analyse the RAE/REF's effects on recruitment policies. Overall this has been perceived as a major effect. An increasing number of strategies are used to increase and improve RAE/REF scores. This creates an instrumental strategic mode to look at different rankings to further stimulate research collaborations at the lower ranked universities. This is a huge shift in the dimension of research collaboration. Whereas prior to RAE/REF, research ideas prospered due to research interests, there are now strategic motives to establish research collaborations with highly ranked researchers. But this development is not only a result of the RAE/REF. It is accompanied by historical shifts in the way the science and academia system develops. There is a global trend for rankings and assessment of science and academia systems.

We can therefore develop a model of research interest which includes a further dimension, such as instrumental decision-making (Fig. 7). Furthermore, evidence suggests that top researchers are recruited by means of REF-able criteria to boost REF scores (01_02; 01_03; 01_04; 01_05; 02_02; 02_03; 02_04; 02_08; 02_09; 03_01; 03_02; 03_03; 03_05; 03_07). Oancea also identifies an effect of REF inclusion on the possibility of being recruited (cf. Oancea 2014:90). Recruitment happens just before the REF cycle ends to boost RAE/REF results. This is a serious concern because it undermines long-term relationships. As a result, the star researchers might feel instrumentalised and be less integrated in the scientific and academic community.

It also has an impact on academic quality, because star researchers are inhibited in their contributions to the academic and scientific community. Furthermore, in recruitment an increasing number of bibliometric tools are used to judge the quality of the new researcher. The recruitment process attempts to ascertain in which area the researcher is working and how well he/she performs with regard to bibliometric indicators (02_01). One interviewee indicated that there are few jobs available after the REF, and the main job offers happen before the REF to ensure good scores through the recruitment of bright people during the assessment period (01_04).

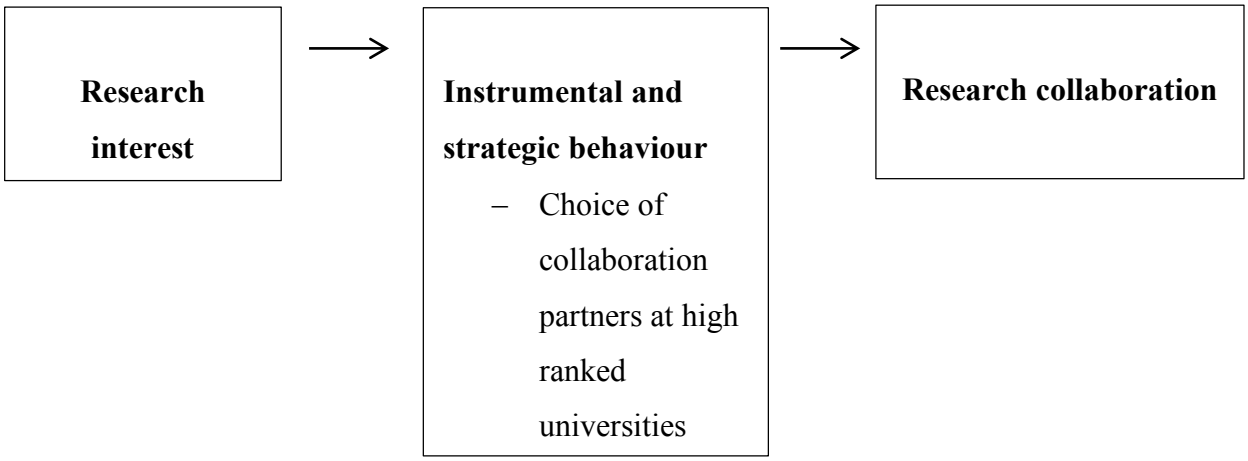

Figure 7: Strategic decisions triggered by the RAE/REF

Employees are increasingly looking for a researcher with a highly REF-able research profile to boost institutional REF scores. Summarising the effects, one can say that a second mode of working in science and academia starts to develop. In addition to the orientation towards knowledge development and the creation of new ideas, and innovative, creative methods and theories, an increasing amount of time is spent on instrumental and strategic behaviour, managerial and departmental peer review processes before and after the RAE/REF to improve research results (01_04; 01_06; 02_03; 02_04; 02_06; 02_09; 03_05; 03_07) and orientation towards metrics in ranking systems (01_05; 01_06; 02_04; 03_01).

This implies a huge change in academic behaviour. Whereas formerly academics and scientists were mainly focused on the search for truth, the RAE/REF academic/scientist is focused on thinking about what criteria will be applied in the next RAE/REF cycle. Huge efforts are made to predict the expected results. To this end computer models are more frequently used to ‘catch the cash cow’. The playing field has changed completely in the wake of the RAE/REF as an instrument to implement rules, regulate behaviour and improve research quality. This playing field now demands specific competences both on an individual and an institutional level to improve the RAE/REF ranking position. This supports hypotheses 2c), 2d) and 2f) which assume that there is commercialisation and managerial control of academics and scientists. The relevant performance processes provide information for a global quality seal.

On an individual and an institutional level the academics and scientists have to meet the REF-able criteria to gain better scientific and academic scores of excellence (01_04; 01_05; 02_06; 02_08; 02_09; 03_05; 03_07). One interviewee indicated that there is concern about inequality of income and that there is much gaming about salaries (01_05). This subject matter could be further explored to discover new issues related to salaries. Oancea's empirical results identify a very low impact on earnings (cf. Oancea 2014:89). These research results support hypothesis 1f)

claiming that more and more selective REF-able criteria are being used in recruitment processes. Those scientists and academics who are performing well in the RAE/REF are more likely to get employed.

4.1.7 Research motivation and pressure

In this section I will analyse the effects of the RAE/REF on motivation and pressure. Some interviewees do not feel affected (01_03; 02_05; 02_08; 03_01; 03_04). For some it is more like an extra motivation (02_03; 02_04; 02_07). For others it feels depressing (01_01); it feels pressuring (01_04; 03_07); it leads to burn out (01_05); it does not help much (02_01); it creates stress (02_02; 03_06); and it demotivates (03_03; 03_05). Further analysis shows that it creates pressure on academics and scientists (01_01; 01_02; 01_04; 02_01; 02_02; 02_04; 02_05; 02_07; 02_09; 03_01; 03_03; 03_05; 03_06; 03_07). This has important implications for the quality of the academic work produced. In this context it is likely for the RAE/REF to increase pressure, which in turn decreases motivation for quality academic research (Fig. 8). The fact that the RAE/REF affects the perceptions of pressure has also been identified by Oancea (cf. Oancea 2014:97–98) and McNay (cf. McNay 1997:65, 67). Oancea discovered an effect of decreasing motivation for non-submitted staff (cf. Oancea 2014:91). In terms of institutional differentiation, four interviewees from a research intensive university indicated that pressure has a decreasing effect on their research motivation (01_01; 01_02; 01_04; 01_05). Chemistry as a discipline seems to be under particularly high pressure (01_01; 01_02; 02_01; 02_04; 03_01; 03_05)

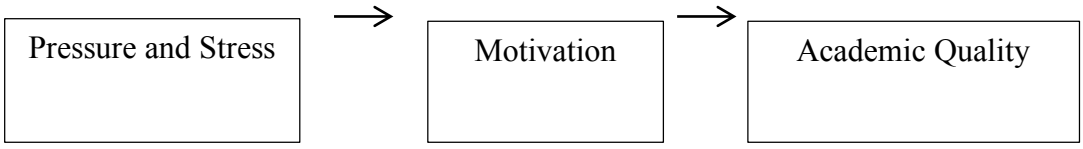

Figure 8: Motivational effects of the RAE/REF

4.1.8 Power in performance assessment in science and academia

As regards power structures affecting performance assessment in science and academia many interviewees replied that they have evidence of power relationships influencing performance assessment in science and academia (01_01; 01_02; 01_06; 02_01; 02_02; 02_03; 02_05; 02_06; 02_08; 02_09; 03_01; 03_02; 03_04; 03_05; 03_06; 03_07). To go into more detail, the respondents said that there is power of important areas (01_01); competitive politics to lead a brand (01_02); managerialism and power of the vice chancellor and academic senate (01_06); people favouring their own agenda (02_01); top-down power (02_03); management in the departments for better RAE/REF outcomes (02_05); power of who is on the panel, senior roles, gatekeepers to the REF and personal experience (02_06); pressure which drives people (02_08); gender bias (02_09; 03_07); more prestigious universities (03_02); and group and society commitments and influencing

mechanisms in panels (03_04; 03_05). This further supports hypothesis 3) which assumes that the power-based model of performance assessment in science and academia is crucial to understanding academic processes related to performance measurement.

4.2 Connections between the academic, scientific and political sphere

In this section I carried out interviews with five policy advisers from a funding body, one policy adviser from a higher education agency, a leading adviser to the government and two research experts in the field of the effects of the RAE/REF.

4.2.1 Research performance

Policy advisers from the funding body and a higher education agency said that performance in the UK has increased as a result of the latest REF (04_02; 04_03; 04_05). It exerts pressure on academics to raise quality and it is a bureaucratic and costly procedure (04_01; 04_02; 04_05). It goes hand in hand with increased managerialism within universities (04_01; 04_02; 04_03; 04_04). Therefore, the effects are due to increased management of the RAE/REF rather than being a direct result of the RAE/REF procedure. It is a selective system of resource distribution. It leads to a concentration of funding (04_01; 04_02; 04_04). The drive for bibliometrics comes from the government (04_01; 04_02) and the latter also stimulated the introduction of impact (04_01). The major problems are the decreasing level of GDP and the need to maintain the resource level for universities (04_01; 04_02; 04_03; 04_05).

In regards to the effects on academic performance, the interviewees said that it is an incentive to produce high quality research by peers (04_01; 04_02; 04_03; 04_04; 04_05) and to broaden interdisciplinary research and collaboration (04_01). An expert in the field of the RAE/REF stated that there is a dual perception of the effects on research performance. It is a more legitimate activity. There are knock-on effects such as more micro-management, more support and more strategic behaviour (04_06). Furthermore, one of the experts said that there is a drive towards a strategy of gaming. It encourages a short-term approach. It encourages a drive towards the norm of mean panel requirements. A reduction and control of quality becomes visible. Money is a driving force for decisions (04_07).

4.2.2 Inequality

Concerning the RAE/REF's effect on inequality, we establish gender imbalances in the staff selected. This is completely in line with the arguments I identified in the interviews with scientists and academics. To balance it out there are codes of practice and the possibility of reducing the number of publications that need to be submitted to the RAE/REF (04_01). It is possible to reduce the number of

publications under special circumstances (such as periods of maternity leave, certain life events, illness and disability) (04_01; 04_03; 04_04). One research expert said that there are gender effects, and effects on the stages of careers for part-time workers. There is also implicit and potential pressure on disclosure, in such a way that researchers fear being perceived as less productive and a 'half peer' (04_06). One expert also said that there is inequality in the attendance of conferences, in direct funding, and in time and emotional support. There is a drive towards a 'research control' culture (04_07). A former leading adviser to the government explained that this depends on the principles of the RAE/REF. If the RAE/REF makes it possible to put more money into the universities that did not previously obtain funding, then this is a good thing (04_08).

4.2.3 Diversity

The diversity issue is handled in a similar way to the inequality issue (04_01). It is assumed that short-term work is encouraged rather than long-term, 'risky' research (04_03). Interdisciplinary research is discouraged (04_04). One research expert said that there is an effect on multidisciplinary research and humanities research. One research expert stated that the boundaries of what is acceptable are set by the panels. Efforts are increased for people who are producing less than four outputs because of special circumstances. There is a lack of female staff and professors of minorities (04_07).

4.2.4 Academic freedom

Choice of research themes
As mentioned above, the results suggest that short-term work is encouraged rather than long-term, risky research (04_03). Interdisciplinary research is discouraged (04_04) and impact influences topics (04_01; 04_04). The panel structure is likely to inhibit interdisciplinary research (04_02). Nevertheless, another interviewee said that interdisciplinary research scored as highly as other research. It encourages all types of outputs and areas, but there is conservatism in the sector, which might prevent some output types and areas (04_03). Citations are not used as criteria in the REF process (04_05). One research expert claimed that there is not a massive effect, but that this is rather more symptomatic. Another research expert said, in contrast, that there is a significant effect. It is a highly managed context, and the devising of a submission strategy is observable (04_07).

Research freedom
An interviewee from a funding body said that the judgement criteria of the panels are broad (04_01). It is more the measurement regime which limits research freedom to invest in mainstream, rather than unusual, research (04_02). But the direction is not predetermined. It is a process of quality selection by peers from the academic and scientific community (04_03; 04_04; 04_05). There is an effect on the institutional, system and central senior level, as one research expert said. There are filters of freedom (04_07). A former leading adviser to the government said that he hoped

people were doing what they want to do and that he believes the RAE/REF does not affect research freedom (04_08).

Teaching freedom
Interviewees said that the pressure to publish keeps them from teaching (04_01; 04_02; 04_03; 04_04). But other countries are also driven by research. It is likely that the RAE/REF accentuates a problem which is rooted in the academic and scientific system (04_05). One research expert said that there is a positive nexus with teaching. It is scholarly research informed. But teaching is also affected by the workload management for junior staff and the individual work balance (04_06). Another research expert claimed that no effect can be felt on teaching freedom (04_07).

Learning freedom
The policy adviser from the funding body explained that the possibility of discovering a new area could be limited due to time reductions because there is a drive towards the ongoing production of publications. Radical changes in research are less likely (04_03; 04_04). One research expert said that there is no effect at all (04_06). Another research expert stated that there might be an effect on in-depth reading due to reasons of time (04_07). A former leading adviser to the government said that he suspects there are few effects on learning freedom (04_08).

Contributions to the academic community
The interviewees argued that there are incentives to contribute to the academic community due to certain indicators such as esteem and environment in the RAE/REF process to stimulate community behaviour (04_01). Furthermore, the nomination for the RAE/REF could have a knock-on effect on the people who are not selected. Their willingness to contribute could be reduced (04_02). Further interviewees said that there are no limitations to collaboration (04_03; 04_05). One research expert claimed that there are different types of esteem indicators used to recognise the contributions of the academic community (04_06). Another research expert replied that the RAE/REF procedure reduces the willingness to contribute to the academic community because researchers are more interested in highlighting their own work: it therefore encourages a less collegial and more selfish environment (04_07).

4.2.5 The relationship between teaching and research

There is an emphasis on research rather than teaching, but this will change with the introduction of the Teaching Excellence Framework (TEF) (04_02; 04_05). One research expert refers to the effects on teaching freedom (04_06). Another research expert claims that the research intensive universities have a research-led teaching culture which ignores what students need and what employers expect (04_07).

4.2.6 Recruitment policies

As regards the RAE/REF's effect on recruitment policies, the policy advisers perceive this as a major effect. It creates a transfer market (04_01; 04_02; 04_03). A rise in staff movement can be observed by the census date (04_03). Certain characteristics are required, such as a strong publication record, by recruiters. These characteristics promise better jobs and better salaries (04_01). There is continued poaching and enticement of research stars (04_02), and it discourages international researchers (04_02). Fixed dates and timing of recruitment are relevant (04_04). Early career researchers are struggling in the assessment cycle (04_04). It enables greater mobility of researchers, and encourages hiring the best people (04_05). One research expert said that it creates a transfer market (04_06) while another research expert claimed that it depends on where you are in the system (04_07). A former leading adviser to the government said he hoped that it has no effects (04_08).

4.2.7 Research motivation and pressure

Concerning the effect of the RAE/REF on motivation, one interviewee stated that the RAE/REF does not have an effect on this. Rather, it is the way the management and performance assessment is implemented in universities (04_01). One interviewee from a higher education agency said that you have to differentiate between the people whose work is submitted to the RAE/REF and those whose work is not selected. For the first group, it means a confirmation of success and underlines the fact that they are highly employable. Those who are not selected will experience a loss of morale (04_02). This situation might also change the way academics and scientists select their research topics. They will have the highest research motivations for areas which will promise them the best outcome. There is further motivation for promotion (04_03). The RAE/REF rewards excellence and there is a strong motivation to produce good quality work. The scientists and academics are motivated to produce major breakthroughs that are visible to everyone (04_05). One research expert said that there is a dual structure of effects (04_06). Another research expert argued there is a more demotivating effect (04_07).

4.2.8 Power

In regards to the power relationships influencing performance assessment in science and academia, the policy advisers see wide evidence for this (04_01; 04_02; 04_03; 04_04). There is a growing need to justify public investments in the spending review and to provide evidence for the Treasury (04_01). The peer review is a further vehicle of power structures. People know each other very well; there are good and bad relationships between the assessors and the assessed, and institutional affiliation plays a role as people care about the name of the universities. They use their power to achieve better outcomes in the RAE/REF (04_02). Furthermore, the institution is seen as a driving power (04_03), on the level of the individual, the institution, the panel and researcher (04_04), the government (04_04), lobby groups, society, and scientific communities and academic unions (04_01). One research

expert said that there are power relationships affecting performance assessment in science and academia (04_06) while another research expert went into more detail by describing evidence of management power, cliques of experts, hegemonial definitions and hierarchies of esteem in the disciplines (04_07).

5. Summary

The academic life theory was extended and dimensions of research performance vs. research power, equality vs. inequality, diversity vs. uniformity, academic freedom vs. academic unfreedom, research and teaching vs. research and recruitment policies were added. These dimensions are vertically stratified by individual, organisational and macrological actors. Six theories of higher educational alterations were applied, which include elements for explaining science and academia in general, and, in the case of performance assessment in science and academia, in the UK. First, there is a belief in numbers. Second, there is reactivity due to indicators and judgement criteria. Third, there are market models affecting performance assessment in science and academia. Fourth, there is business control of scientific and academic entities. Fifth, there is discipline and control of universities. Sixth, this is accompanied by quality seals.

In a second step, functional and conflict-theoretical models were developed for the explanation of science and academia. They were applied for performance assessment in science and academia to identify the RAE/REF's effects in the UK. The first model explains the production of knowledge in universities as a stratification of meritocratic performance entities like performance, quality, talent, achievement on the basis of equality of opportunity. The second model explains the production of knowledge as being stratified by power, capital and status on the basis of inequality of opportunity. These are two theoretical models that were combined to explain performance assessment in science and academia in the UK. The empirical results support the application of both theories for the understanding of science and academia in general, and for considering the effects of performance assessment in science and academia in the UK.

Empirical results

Scientists and academics

First, I will summarise the research results of the academics and scientists from three different institutional ranks and three disciplines. The main results in reference to research performance show that the UK is a leading country worldwide in science and academia. It is not yet clear whether this is attributable to the RAE/REF. Scientists and academics believe in the increased performance of UK science and academia in terms of publication and citation rates. The RAE/REF and its interpretation at universities by management, departments and staff leads to unequal

treatment in early career developments, progression and promotion, and promotes gender inequality.

Furthermore, the RAE/REF is likely to inhibit diversity in research topics due to scientists and academics conforming to the RAE/REF time cycle. Also, the RAE/REF does not enable scientists and academics to change their research tracks fundamentally, even though it does not force academics and scientists to take up research on specific areas only. It is likely to reduce academic freedom in the choice of research themes due to the introduction of impact and an orientation towards high impact journal culture.

There are few effects on freedom of teaching and learning. It is likely to inhibit the possibility to contribute to the academic and scientific community in terms of the commitment of research stars, non-submitted scientists and academics, and activities other than the four publications in the context of the RAE/REF. It enables a teaching culture directed towards research-led teaching and affects recruitment policies of scientists and academics in such a way that short-term rather than long-term relationships are favoured. A kind of transfer market is created. It is likely to reduce long-term, innovative research.

Due to managerialism and quality management procedures in the university it encourages a strategic shift in academia and science to maintain a position on or climb up the ranking ladder. Lower ranked institutions are increasing their efforts to strategically establish research collaborations with research stars at excellenct universities and invest resources by using computer models and information systems to increase their institutional ranks. The RAE/REF is likely to reduce motivation for the production of knowledge and creates pressure for scientists and academics. Research intensive universities are coming under strong pressure to publish worldwide leading research. This might go hand in hand with a decrease of academic quality due to pressure and stress. Furthermore, there is evidence of power relationships in performance assessment of science and academia.

Connections between scientists, academics and politics

Second, I will provide insights into the perception of the effects of the RAE/REF from the viewpoint of policy advisers, research experts in the field and a leading adviser to the government. The performance of UK science and academia has improved. But the RAE/REF is a bureaucratic mechanism that generates costs and adds pressure to academics to increase their quality of work. Increasing managerialism that leads to a concentration of funding in the university system is observable. We witness a drive for metrics, which emanates from the government. Major problems include the decreasing level of GDP and the need to maintain the financial level of the university sector.

There is a dual perception of the RAE/REF's effects on academic life. It is increasingly regarded as a legitimate activity. But there are knock-on effects, such as micro-management and more strategic behaviour. There is a tendency to produce research results to meet the mean of the panel structure. Inequality has an effect on gender and the staff who are selected. To balance this out codes of practice have been developed. Special circumstances can allow the amount of publications required to be reduced. Short-term work instead of long-term work is increased. Interdisplinary research could be inhibited. But there is also an expectation that it should score as highly as other research. The conservatism in the sector is the reason for the prevention of some output types. The judgement criteria are broad and there is a measurement regime that restricts unusual research ideas.

Teaching and research are in a positive nexus in as much as teaching is research informed. But teaching is affected by workload management. The RAE/REF means academics are less likley to switch research directions and fundamentally change their research track. Different types of esteem indicators favour certain contributions to the academic community. The Teaching Excellence Framework (TEF) will be implemented to compensate for the negative effects of the REF. The effect on recruitment policies is particularly noteworthy. We frequently come across poaching and enticement of star researchers. The timing of recruitment is relevant. The RAE/REF has no effect on motivation. The latter is instead affected by the way the management operates at universities. Motivation generates groundbreaking research ideas. Power structures affect performance assessment in science and academia.

Research results in the light of the state of research

This study refers to certain studies related to the state of research. The results can be connected to theoretical expectations raised by Münch (cf. Münch 2007, 2011, 2014) and Marginson (cf. Marginson 1997, 2007a, 2007b) in as far as academic freedom, autonomy and academic independence are concerned. Whereas academic autonomy is likely to persist, there is serious concern about the RAE/REF’s effect on academic independence, since changing established research tracks, radical breaks and critical thinking seem less likely as a result of performance assessment in science and academia (cf. Marginson 1997, 2007a, 2007b). There is evidence that inequality in the treatment of scientists and academics is rising in the wake of the RAE/REF mechanism.

These results confirm the results with regard to career promotion and progression identified by Oancea (cf. Oancea 2010b). Some indications show that the hypotheses claiming that established institutions are gaining more resources are partly true (cf. Orr 2003:45–46). However, there are also more and more new universities gaining more resources. The study confirms the hypothesis of increased gaming strategies and a better scoring of informed institutions (cf. Harley 2000:555). It supports the short-term hypothesis that long-term speculative, creative, innovative, risky and blue sky research is inhibited (cf. McNay 1997:70; Talib 2002; Oancea

2010a). This confirms the short-term hypothesis of McNay, Oancea and Talib (cf. McNay 1997; Oancea 2010b; Talib 2002).

Research results also confirm the short-term recruitment hypothesis of McNay (cf. McNay 2016:7) and McNay's transfer market hypothesis (cf. McNay 2016). The decreasing academic freedom hypothesis in relation to managerial control can be confirmed and differentiated for middle and lower ranked institutions (cf. Marginson 1997:366; Palfreyman 2006:17–19; Melo et al. 2010:251; Teelken 2012:282). Evidence shows that the workload hypothesis for teachers and reseachers is true (cf. Harley 2000:565), but it requires further analysis. At higher ranked institutions there are a huge number of practices working against a lowering of academic freedom due to university administration and quality management. There is some evidence that vital academic community contributions are inhibited (cf. Talib 2002:359). The hypothesis suggesting a separation of research and teaching (cf. Meier and Schimank 2009:55) cannot be confirmed. It is more likely that the teaching style is differentiated in terms of a research-led teaching culture and the new universities play an ever increasing role in the research battle. But the hypothesis has to be analysed in more detail. In quantitative terms there are indications that new universities are gaining more research income in absolute numbers and experience a reduction in the relative proportion of research income of total income. Additionally Schmid shows that the ex-polytechnics are systematically dropping out of the RAE/REF process in the disciplines chemistry and sociology. Furthermore, the ex-polytechnics are predominantly financed through teaching income instead of research income according to statistical data of HESA. But the universities founded before 1992 also have a great amount of teaching income (cf. Schmid 2016).

The interviewees placed strong emphasis on teaching and research across all university ranks, which could lead to a decrease in teaching quality (cf. Jenkins 1995). Furthermore, it is likely that the emphasis on a research-led teaching strategy leads to an exclusion of other important aspects of teaching (cf. Broadhead and Howard 1998a:10).

There are effects on the teaching research nexus that need to be analysed with regard to different functions of teaching and research (cf. Marginson 2014). The decreasing status of lecturer hypothesis could not be corroborated: there is a need for further analysis (cf. Pritchard 2005:447). The findings suggest that the bureaucracy hypothesis (cf. Pritchard 2005:445) is true, especially for the middle and lower ranked institutions. The discrimination against new universities hypothesis (cf. Kreckel 2008:186–87) has to be differentiated. There are more and more new universities that are playing the RAE/REF game and have thus entered the national competition for resources. Being a part of the RAE/REF community lowers the discrimination rate of new universities. But there might still be a significant amount of discrimination in the RAE/REF system. One has to clearly differentiate in further analyses between new universities and ex polytechnics. Furthermore it could be useful to develop questionnaires for departments that dropped out of the RAE/REF process. This could give insights into processes of inclusion and exclusion in the

academic and scientific sphere. The hypothesis of research potential (cf. McNay 1997:65–67) as a relevant criterion in the recruitment process can be extended to REF-able criteria, which includes research publications, but also other relevant indicators and definitions of scientific and academic excellence. The research results can be connected with further research in the area of the RAE/REF (cf. Broadhead and Howard 1998b; Williams 1998; Elton 2000; Bence and Oppenheim 2005; Barker 2007; Bridges 2009a, 2009b; Leisyte 2007; Martin 2011; Tourish 2011; Bridges 2011; Shattock 2012; Enders 2014; Enders and Westerheijden 2014; Locke 2014; Pettigrew, Cornuel, and Hommel 2014; Bleiklie, Enders, and Lepori 2015; Derrick and Samuel 2015; Enders, Kehm, and Schimank 2015; McKenna 2015; Samuel and Derrick 2015; Seeber et al. 2015; Shattock 2015; Souto-Otero and Enders 2015; Wooding et al. 2015; Hamann 2016).

Future research

In my study I considered scientists and academics from three different university ranks and three different disciplines, four policy advisers from a funding body, one policy adviser from a higher education agency, two research experts in the field of the RAE/REF and one leading adviser to the government. With a total of 31 in-depth interviews concerning the effects of the RAE/REF on academic life I covered a broad range of the perceptions of the effects exerted by the RAE/REF. Nevertheless, further research still needs to be done. Interested researchers should broaden their samples and add quantifiable material in their questions. Furthermore, I will look at certain differentiations by institutional rank, discipline, age and position of scientists and academics. Future studies could investigate the impact of the RAE/REF on non-research active staff who are widely disadvantaged in the performance assessment process in science and academia. A first introduction of the effects on non-submitted staff is supplied by the following literature (cf. Oancea 2014). It is also possible to carry out research on international comparisons (cf. McNay 2015b, 2015a) and different disciplines (cf. Broadbent 2010).

It should be mentioned in this context that I am myself a researcher and part of the academic and scientific community. I carried out my research in an as objective and neutral way as possible. The present text is a working paper where I tried to address the relevant literature in this field. Due to the complexity of the subject matter, I would be most grateful for recommendations of relevant literature and empirical results that I should take into account. Email: len-ole.schaefer@uni-bamberg.de

Thank you very much for your time.

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