
SASE PRESIDENTIAL ADDRESS

New forms of competition in higher education¹

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Abstract

This paper addresses the transformation of competition in higher education. Not only have competition and competitive schemes dramatically developed in the last decades, from competition for students to competition for budgets and competition for professors, but the nature of competition has also evolved, leading to new forms of competition, especially on the segment where this evolution has been the strongest, i.e. research universities. It is argued that competition in higher education is no longer only occurring between individuals and countries, but has become institutional, leading to a multi-level form of competition and transforming universities into competitors. This competition is framed as a competition for quality which has become more organized and equipped, and that increasingly relies on impersonal judgment devices. It is shown that this growing form of competition has spawned new classifications and categories, and that alliances of competitors belonging to the same category (like leagues, guilds or associations) are simultaneously emerging. Consideration will be thus given to how competition and cooperation intersect and combine.

Key words: Competition, Universities, Cooperation, Quality, Rankings, Evaluation

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1. Introduction

Despite the rise of the sharing economy alongside the traditional economic sector and the emergence of new forms of economic exchange disrupting well-established professional industries (like taxis and hotels), more traditional forms of economy remain resilient, and their

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capacity to overtake sectors from which they were previously excluded or quasi absent should not be underestimated. Higher education is a case in point. This article builds on the impressive increase in competition in higher education and analyzes the transformation of the competitive game, specifically focusing on research universities as they directly face this development.

This article considers competition as a form of conflict and rivalry, wherein different parties target the same faculty, the same students and the same funding for their projects, or different parties are voluntarily or involuntarily participating in ranking, rating and evaluation exercises. Following a Simmelian-leaning perspective (Simmel, 1903), the article will look at the forms of competition in higher education and seek to identify how they emerged and how and by whom they are organized. In the same vein, the forms of sociability arising from the competitive game will also be explored.

By focusing on competition, this article departs from the approach of many scholars—starting with Sheila Slaughter and Larry Leslie (Slaughter and Leslie, 1997) who in the late 1990s first spoke of academic capitalism, followed by Sheila Slaughter and Gary Rhoades (Slaughter and Rhoades, 2004) and Richard Münch (Münch, 2014)—who have argued that higher education has experienced a process of increasing marketization (for instance, Jongbloed, 2003), and even ‘McDonaldization’ (for instance Hayes and Wynyard, 2002) of teaching and research. Discussions about whether higher education is a public good and whether students should pay for an immediate benefit (the training program they attend) or for a longer-run benefit (i.e. the job to which they will gain access) have become more and more frequent among policy-makers. Meanwhile, the notion of knowledge economy, which became a buzzword in the 1990s, recast research outcomes as potential goods with economic value and as major drivers of economic development (for instance Vandebussche *et al.*, 2006). This is often described as the commodification or economization² of higher education, since an economic value is attributed to all and everything, including research and teaching (Berman, 2012).

Nevertheless, as argued in a previous publication (Musselin, 2010), greater caution is warranted regarding markets in higher education. Following Max Weber (Weber, 1978 [1922]), as well as Richard Swedberg (Swedberg, 1998) and Pierre François (François, 2008), the term ‘markets’ should only be applied to situations where competition and exchange are simultaneously present. While situations including both competition and exchange can be found in higher education, they are rather rare: cases are limited to some countries, like the USA for instance, to certain disciplines, like management and economics, and to specific issues such as faculty salaries, tuition fees, patents and funds obtained from executive education. Many studies that see marketization in higher education are actually conflating markets and competition and referring to markets when only competition is at play. For example, when a university competes for grants, it is engaged in a competition for resources rather than in a market for grants, because the sum of the obtained grant is not a

2 Elizabeth Popp Berman (2014, p. 399) defines economization as ‘a shift toward thinking in terms of the economy. The process of economization as it plays out in US S&T policy has two components. First, it involves increased political concern with “the economy” and related economic abstractions (e.g., growth, productivity, the balance of trade) as objects of knowledge that government can act upon. [...] Second, it involves coming to see more activities as inputs into this system - inputs that government can potentially manipulate in order to affect the economy.’

function of the match between supply and demand. Neither the quality nor rarity of the project impacts the grant level either. Conversely, if competition can exist without exchange, value may be attributed and negotiated without relying on competitive mechanisms, as stressed by Elizabeth Popp Berman (Berman, 2014). Georg Krücken (Krücken, 2017, p. 13) even remarks that competition may occur without demand and simply result from a confrontation between competitors: there may be competition without a market, and competition should be considered *per se*.

In light of the divide between competition and markets, this article will not focus on the issues of monetary exchange, price and pricing mechanisms in higher education, but will rather primarily address competition, and more specifically competition among research universities. It may seem surprising to only consider competition in a sector where competition has always been present and serves as a motor of sorts for scientific activity. Authors as different as Robert K. Merton (Merton, 1973 [1957]), Pierre Bourdieu (Bourdieu, 1988[1984]) and Bruno Latour (Latour, 1993) have all stressed the competitive nature of science. In fact research has long been organized as a competitive activity. Nevertheless, it is worth exploring this issue again for at least two reasons. First, competition and competitive schemes have dramatically developed in the last decades, starting in the eighties for countries that aimed to attract international students and have them pay tuition (Larsen and Vincent-Lancrin, 2002), and disseminating internationally in the 2000s with international rankings. This evolution had many drivers: the increase in research costs (Altbach, 2015) and the parallel increase in the number of academics; the decrease in public budgets (Tandberg, 2010); the introduction of new steering instruments promoting market-based mechanisms (Broucker and De Wit, 2015); in countries like the USA, the financialization of higher education (Eaton et al., 2016); and more broadly the globalization of higher education and the development of the knowledge economy (Marginson, 2010). As a result, competition between research universities intensified from competition for students to competition for budgets and competition for professors. It is therefore relevant to look at the consequences of this trend. Second, and more interestingly, the nature of competition has evolved, leading to new forms of competition. Although this process is widespread (affecting many parts of higher education) and global (all over the world), the paper focuses on the segment where this evolution has been the strongest, i.e. research universities. It also mostly builds on empirical examples taken from the USA, the UK, Germany and France, primarily because I have studied the higher education systems of these countries. However, the process I describe is international and can be observed in research universities all over the world. Furthermore, research universities are the primary focus because research is often less contextual and national than teaching, and therefore more conducive to international competition, and because research is a more competitive activity than teaching³. Research universities also face stronger competitive pressure as institutions strive to be classified in this category (Paradeise and Thoenig, 2015). While this point will not be further developed in the next pages, it is important to bear in mind that competition involves both pressure on institutions (and individuals) and strategy: institutions and individuals may decide not to enter the game, i.e. not to be published by top-ten journals, not to apply for grants, and not to answer selective calls

3 Being the first to make a discovery is a winner-takes-all activity; this is not the case when one is the first to teach a class on a specific topic. There are also much less competitive arenas for teaching activities than for research.

launched by governments to be awarded as an excellent lab, university or project. Those experiencing competitive pressure are—at least partly—agreeing to subject themselves to it.

The first part of the article will argue that competition in higher education, and especially between research universities, is no longer only occurring between individuals and countries, but has become institutional, i.e. a competition between institutions, leading to a multi-level form of competition across the globe and transforming research universities into competitors. This competition will then be framed as a competition for quality (rather than over price). This is very much in line with what Lucien Karpik (Karpik, 1989) called an economy of quality to describe a situation where competition is about quality rather than price, and where the issue is to assess quality rather than determine a price (Beckert and Musselin, 2014). The article will then show that this competition has become more organized and equipped with formal mechanisms and procedures, and that it increasingly relies on impersonal judgment mechanisms (Karpik, 1989, 2010 [2007]). Finally, it will show that the growing competition has spawned new classifications and categories, and that associations of competitors belonging to the same category (called leagues, guilds or groups) are emerging. Consideration will be given to how competition and cooperation intersect and combine.

2. A multilevel competition

A first major transformation of competition in higher education pertains to the emergence of research universities as competitors. Some years ago only individuals or teams of individuals on the one hand, and countries on the other, were involved in the competitive game. Institutions have now entered the fray and become competitors. The increase in competition therefore also entails a transformation of the actors involved in this competition, with the emergence of universities and university leaders as increasingly influential participants in the contest for quality and status.

2.1 Competition is simultaneously individual, institutional, national and international

In the 19th century, Western universities played an important role in the construction of nations and nation-states. Training, knowledge and research became areas of competition between nations and were seen as crucial to economic development as well as to winning wars. For instance, after their defeat by the Germans in 1870, the French attributed their loss to the low quality of their higher education and research compared to Germany. They sent their best scientists to Germany on visiting scholarships and asked them to write memos on the German situation for the French ministry. These memos informed the 1896 act that sought to transform the French higher education system (Charle, 1994). Similarly, the quest for national strength in higher education led to the development of Russian chemistry, as described by Michael Gordin (Gordin, 2008): after Russia's defeat in Crimea in 1856, young Russian scholars were sent to Germany to improve their practices and knowledge. Some chemists (including Mendeleev) attended Heidelberg University in order to be trained. But they remained quite isolated during their stay because of what they perceived as 'German xenophobia', and they developed a Russian nationalist way of developing chemistry that they brought back to Russia. These are two very specific historical examples, but both illustrate the individual and national levels of competition in science and higher education.

Competition occurred between scientists from different countries and between their countries.

Most of the competition and rules in Europe were regulated by the academic profession and bureaucratic rules set by the state, with higher education institutions playing a secondary role.⁴ The more extreme case was probably France: until 1968, the main pillars of the French university system were discipline-based faculties. Disciplines were the relevant level of regulation of the academic profession, and a discipline-based national body (the CNU, National council of universities), not universities, managed academic careers (Musselin 2004 [2001]). As shown by Terry N. Clark (Clark, 1973), by the beginning of the 20th century, in social sciences the (naturally) male and Parisian ‘patron’ was central to the career and provision of resources for his ‘circle of disciples’, i.e. the numerous fellows waiting for the patron to grant them a position or promotion. In a recent paper, Jérôme Aust and Emmanuelle Picard also described the very active and prominent role that French ‘mandarins’ played at the end of the ‘50s, when project-based funding first developed (Aust and Picard, 2014). France’s extreme case of professor-based regulation of scientific competition—and the related absence of universities—also occurred in other parts of continental Europe, until recently. As stressed by Jürgen Enders and Ulrich Teichler (Enders and Teichler 1995), in the mid-1990s Germany saw strong competition among professors while universities were all considered as equivalent. This was also true for many other European countries, with the exception of the UK, where the higher education landscape has long been stratified.

The European situation is therefore quite different from the trajectory experienced by US higher education institutions. As shown by Burton Clark (Clark, 1987), US higher education institutions were often created through private individual initiatives, and developed strong institutional identities relying on what Burton Clark described as organizational sagas (1972). Unsurprisingly, the first institutional rankings emerged in the USA (Salmi and Saroyan, 2007) by the end of the 19th century with the Commission of the US bureau of education. This was repeated at the beginning of the 20th century by the psychologist James Catell and by the Chicago Tribune in 1957, until US News and World report was published in 1983. At that time the editors of US News, ‘decided to invest in educational rankings, as a way to distinguish themselves from their rivals by offering “news you can use”’ (Espeland, 2015). They have published rankings every year since.

This phenomenon has slowly spread to Europe over the last two decades. A first factor is the reforms implemented by most European countries to transform universities into organizations (Sahlin-Andersson and Brunsson, 2000; Krücken and Meier, 2006), and to increase universities’ managerial autonomy and institutional autonomy (Berdahl, 1971). The development of evaluation and accreditation agencies across Europe (Schwarz and Westerheijden, 2004) further reinforced the idea that training and research were not only individual-based but also institution-based. In the UK, the 1980s saw the introduction of the Research Assessment Exercise to evaluate university departments, allowing for a classification of institutions according to the grades they received. By the late 1990s, Germany’s CHE (center for higher education), a higher education think tank funded by the Bertelsmann foundation, had published the first rankings of German departments and universities, giving

4 This does not mean that it did not happen before, but it was limited to rather specific cases like Oxford and Cambridge in the UK.

lie to the idea that all German institutions were alike. This trend intensified when the Shanghai ranking and other international rankings further emphasized the institutional level in their assessment of institutions. In other words, competition is no longer limited to individuals and nations; it has become multilevel. Competition cannot solely be approached at the individual level but rather must simultaneously be addressed at the individual, national and institutional levels, yielding a complex interplay between these different levels (Lazega and Snijders, 2016).

As competition between research universities intensified, the locus of this competition shifted from the national to the supranational level. Regions and nations are still competitive spaces for most universities, but the most successful institutions are no longer engaged in a national contest: they compete globally. Their teaching no longer aims to solely train nationals, but also ‘citizens of the world’. Their student body and faculty are less and less national, their research addresses international issues rather than purely domestic matters, and they are less dependent on national funding and authorities as they have managed to secure other sources of funding (often from the tuition paid by their international students). Thus, global, national and regional competitive arenas are intertwined (Hüther and Krücken, 2016). Global institutions do not primarily compete for their country but for themselves and against similar institutions. They expand to foreign countries where they develop branches, they recruit staff and students from around the world and they don’t depend on the resources of their national stakeholders as much as other institutions. Just like premier league soccer teams, their main competitors are outside national borders: although the nationality of the most renowned research universities is linked to the territorial location of their headquarters, the nationality of their students and staff depends on the competitive arena in which they operate as institutions, i.e. either the regional, national or global arena.

2.2 Universities as competitors

As Raimund Hasse and Georg Krücken convincingly argue (Hasse and Krücken, 2013; Krücken, 2017), growing institutional competition led university leaders to adopt competitive behaviors and proceed more strategically. While they sometimes criticize rankings, university leaders who want to stay in the competitive game look at them and are generally concerned about their institution’s reputation. In her research on the Shanghai ranking in France, Christine Barats (Barats, 2017) showed that most of the respondents who expressed opinions on this ranking were university presidents, thus confirming Ellen Hazelkorn’s conclusions (Hazelkorn, 2015) on the impact of international rankings on university leaders.

The transformation of universities into competitors is facilitated by policies that most European governments have pursued since the 1980s in a bid to empower university leaders. These policies are widespread across Europe and even in France, where the emergence of national universities is a rather recent phenomenon—as aforementioned, until 1968 faculties, as opposed to universities, were the main pillars of the French system. But in France as in all other European countries, public policies in higher education strengthened university presidents and ushered institutional autonomy. Even institutions without aspirations to enter the top 50 of the Shanghai ranking have embraced the objective of competition, as exemplified in this quote from an interview at a mid-range French university.⁵

5 This interview was conducted in 2011 as part of a study on university governance at three French universities that involved around 100 interviews (Musselin *et al.*, 2012). The study was funded by the

To what extent do you agree with these sentences (answers from faculty staff)	Department	ANOVA ^a	University	ANOVA
I think it is important to mention the name of my on publications	6.09 N=1.306	0.123	5.94 N=1.436)	0.000
I am concerned with what others think of my	5.85 N =1.323	0.282	5.47 N=1.435	0.000
Belonging to this is important to me	5.99 N=1.313	0,297	5.75 N=1.428	0.000

^aWhen compared with answers of the administrative staff.

When X was vice-president for research, policies for excellence were developing [in France], but not all of our research units were ready to adopt this discourse and recognize the need to be part of a culture of evaluation. The research units with a CNRS label were close to being ready, but this was not the case for the others. As a result, we had to accompany and support them in fostering a culture of calls for projects and competition, in a context of considerable resistance. (Vice-President for Research, 2011)

The attention paid to the reputation and results of one's institution is not limited to university leaders. In a survey on university governance conducted with Stéphanie Chatelain, Stéphanie Mignot-Gérard and Samuel Sponem (Chatelain-Ponroy *et al.*, 2012) in 2011 at all French universities,⁶ the answers of academics—and not just university leaders—to questions about their university and department converged and all their positions skewed towards agreement with the provided statements on the importance they attach to their department on the one hand and to their university on the other, demonstrating recognition of the institutional level. Academics indicated their position on the following statements, using a Likert scale ranging from 1 (disagree) to 7 (completely agree), with the neutral position being 4. Assessments of their departments were always higher, but remained very close to assessments of their university:

Ecole Supérieure de l'Éducation Nationale, which trains the top administrators of public high schools and universities in France. Around 30 interviews were conducted at three different French universities (two in the Regions and one in Paris, a general university, one specialized in science and medicine and one in humanities and social sciences, in order to reflect the diversity of the French university system). The interviews were conducted by the students in the masters program in sociology at Sciences Po under the responsibility of Christine Musselin and three doctoral candidates (Julien Barrier, Camille Boubal and Aude Soubiron). They were conducted with a selection of members of the presidential team, members of the university councils, department heads, research unit directors, deans and members of the administration of each university. These interviewees were chosen by the research team. Each interview lasted between one and two hours and addressed decision-making processes (mainly surrounding the allocation of budgets and positions) and the effects of changes introduced by the university governance act of 2007.

- 6 The interview-based research described in footnote 4 was conducted through a survey that was also funded by the ESEN. Questionnaires were sent to all members of presidential teams, members of university councils, department heads, research unit directors, deans and administrative directors of all French universities. A total of 12 633 questionnaires were sent by mail and 2598 responses were received (of which 1817 were from academics) (response rate: 21%). Questions addressed university governance, the use of indicators in decision-making and opinions on recent French reforms.

The same research (which also included in-depth interviews at three French universities) showed that when they undergo the 5-year evaluation conducted by the French national evaluation agency many French university leaders⁷ are very keen to improve their institution's results (those of their research units, of their training programs and of university governance)—a position that was not observed in previous comparable studies (Mignot-Gérard, 2006). They develop strategies in order to do as well as possible. Some organize a pre-evaluation in order to identify potential negative aspects to correct before the evaluation starts. Others develop incentives to improve their rate of 'research active' faculty. Still others review all the self-evaluation reports submitted by their research units in order to better align them with the agency's expectations.

The ongoing transformation is not only about playing the competitive game, but also about shifting the role of university presidents into becoming competitors. In the aforementioned field studies (Musselin et al., 2012; Chatelain-Ponroy et al., 2012), the interviews conducted with members of the presidential teams (president, vice-presidents and registrar and the answers of this subgroup to the questionnaire, compared to those of the other groups, clearly showed a strong concern about the evaluation led by the national agency for the evaluation of research and teaching (called AERES at the time), and about their institution's ability to win competitive grants and participate in the various national calls launched by the French government at the time. While they sometimes engage in gaming, they also want to be positively evaluated in comparison with others and therefore consider it legitimate to make strategic decisions and to set priorities in terms of redeploying positions, allocating budgets and closing units. As they become competitors, they develop a new understanding of their role and become more interventionist. But members of their institution often contest this new role. In order to legitimize their actions, university leaders often point to the outcomes of competition to justify their decisions (Musselin, 2014). The different competitive schemes in which their institutions partake become steering instruments. Competition leads them to be more strategic, but by the same token the results of the competition help them implement and legitimize their strategy.

Competition therefore drives the evolution of universities into organizations.⁸ This process does not only occur through the identification of boundaries, the definition of a hierarchy and an increase in rationality, as stressed by Nils Brunsson and Kerstin Sahlin-Andersson (Brunsson and Sahlin-Andersson, 2000), but also develops through the use of the results of competition as management tools (Musselin, 2013, 2014). University leaders do not just endure competition and bend to it. They also make instrumental use of competition, thus increasing its performance impact (Espeland and Sauder, 2016).

7 It should be added that while this approach was widely shared among university leaders, lay academics displayed a greater variety of positions: some embraced the same perspective while others refused to enter the competitive game.

8 This sentence relates to a question that was largely debated in the 1960s to 1990s (for a summary of the discussion, see Musselin, 2004 [2001], chapter 7) about whether universities are organizations, and if so, what kind of organizations (collegial, political, organized anarchies, resource-dependent, entrepreneurial...), and how specific and incomparable to other organizations they are. Nils Brunsson and Kerstin Sahlin-Andersson (Brunsson and Sahlin-Andersson, 2000) in a way ended the discussion by arguing that public services (including universities) were finally transformed into organizations by public management reforms because their boundaries were better defined, hierarchical relationships were strengthened, and rationality became more important in decision-making.

3. Competition is about quality

The competition between research universities is not only primarily research-driven, but it also touches upon a wide array of issues: competition for students, grants, discoveries, patents, academics, public and private resources, etc. The rules of the game, the stakes in these various arenas, the actors involved and the characteristics are obviously different and would need to be more precisely distinguished. But the goal here is to go beyond this heterogeneity and identify the more general mechanisms at play in the competition between research universities. In this perspective, it is useful to build on the seminal work of Harrison White (1981, 1992) and to examine the relevance of the three strategies he identified for competitors. I will show that competition in higher education is neither a price war nor a signal competition, but rather a competition for quality. What quality is, or means, will not be further defined here as there is no universal and shared definition of what quality in higher education is⁹ (Lamont, 2009; Musselin, 2009 [2005]).

A first potential strategy is mainly based on concern about other competitors. As stressed by Harrison White, in this case prices are central and the principal drivers of competition, as competitors engage in a price war. Competition creates a market as prices shape the competition: for a given product, the winner will be the competitor offering the lower price. This can only work if, as posited in neoclassical economic analysis, all products are the same. However, this is rarely the case for research universities. It may apply to some teaching-based institutions, including private for-profit ones ‘selling certifications’ for standardized and technical training programs often offered online. In most cases though, and especially for research universities, the products are different and hard to compare. Price wars therefore rarely occur among research universities.

In the second potential strategy that White describes, competitors are primarily concerned about their clients. The premise is that a variety of products exist (as stressed in post-Keynesian analysis, Eloire 2010) and that competitors try to assist their clients in their choice by using prices as signals for the quality of the goods—and as a way to sort goods—because the quality is not known before the transaction. Competitors are no longer price-driven as they themselves set the prices of goods. Prices reflect the cost of production and depend on the quality of the raw material, of the technical process or of the manpower used to produce the good. This strategy may appear to be more applicable to higher education, but in fact competition for clients is still rare among research universities for various reasons. Take competition for students, for example. If tuition is considered to be the price for training students, it rarely works as a signal for the quality of teaching programs, even if the scope is limited to research universities (which are supposed to attract the best students). First, training is still free (or almost free) in many countries, where no price signaling strategy therefore exists at all. Second, in situations where tuition fees apply, the link between the level of tuition and quality is loose. The introduction of tuition fees in the UK provides a compelling example. When the UK government first raised the ceiling on tuition fees to £1000, all universities—regardless of the respective quality of their undergraduate programs—raised their tuition to 1000£. This happened again when the government raised the

9 In a study of academic hiring processes that I led at 16 research universities located in France, Germany and the USA, I was struck by the fact that almost all of the approximately 200 interviewees told us that ‘they want to hire the best candidates’ whatever the reputation of the hiring department. I therefore dedicated a whole chapter of the book (Musselin, 2009 [2005]) to showing that the expression ‘the best candidate’ had very different meanings from one department to the next.

ceiling to £3000 a few years later, and once more when the ceiling was raised to £9000 (Dearden, Fitzsimons and Wyness, 2014). It is therefore impossible today for students and their families to assess the quality of a British university on the basis of its tuition fees. This is true even when tuition fees are unregulated (as is the case for overseas students in the UK and private institutions in the USA): John Douglass and David Ward showed that tuition fees at US higher education institutions were somewhat unrelated to their reputation, since top-ranked schools were not more expensive (Ward and Douglass, 2006). The same disconnect between quality and value appeared when I worked on the ‘price’ of academics on the US academic labor market (Musselin 2009 [2005]): the price (salary, starting funds and other conditions¹⁰) offered to assistant professors was not set by the recruiting university on the basis of the hiring committee’s evaluation of the quality of the candidates, but rather in accordance with the price offered to assistant professors of the same discipline at universities that the recruiting institution considered to be its peers. Thus, prices in higher education rarely signal quality, and competition for clients is not the strategy that universities typically pursue.

As a result, quality matters much more than price, and higher education competitors are engaged in a competition for quality, which is the third potential strategy identified by Harrison White. Quality is at stake in two main cases.

The first case applies when (some) people are ready to pay very high prices for what is expected to be high quality. This is what Fabien Eloire (2010), also building on Harrison White’s work, observed in his study of French restaurants in the North of France, where he identified three categories of restaurants. Some engaged in price war to achieve the lowest prices (restaurants primarily competing with other restaurants), others used prices as signals for quality (restaurants primarily focused on customers), and then came gastronomical restaurants, where customers knew they would pay high prices and had no qualms about it since they valued quality above all: quality, rather than price, determined the intersection between supply and demand (Karpik, 1989). Such situations can be observed at research universities when they set very high tuition fees and have a very good reputation. The tuition fees are then hardly an issue: students and families are ready to pay the price (or accept a heavy debt burden) because their primary concern is quality.¹¹

The second case applies to situations where there is no price or when the price is low and fixed. In higher education this happens when tuition fees are nonexistent or low, as well as when fees do not signal quality. Institutions must then compete on quality and persuade families, students, staff, and funders of the quality of their offering. France provides many such examples. When French universities recruit academics, their salaries are determined according to a fixed bureaucratic scale. The attractiveness of French universities therefore depends on the quality of their departments—and primarily on the quality of their scientific activities—as opposed to their capacity to offer high salaries.

In higher education, competition for quality can be assimilated with status competition as quality is difficult to define and assess. In other words status is often used as a ‘proxy’ for quality, and competition in higher education rests on the three premises defined by Joel

10 Advantageous loans to acquire a house, free access to the library of the closest top university.

11 Again what quality is might vary from one student or family to the next. It might be recognition by the job markets of the degrees awarded by the university, the quality of the research, the quality of the supervision of undergraduate students or the rankings of the targeted department.

Podolny (Podolny, 1993, p. 835) as the basis for status competition: quality in higher education is often difficult to assess until it is experienced; an institution's status is a signal that students and families use to make their decisions; the relationships of a university (like dual degrees, exchange programs, etc.) with other reputable institutions result in transfers of the latter's status to the former and signal its quality.

Competition for quality among research universities is therefore a competition for status, as Nils Brunsson and Linda Wedlin (Brunsson and Wedlin, 2016) emphasize. However, contrary to what these two authors argue, so is competition for resources (budget, students and staff). When they compete for the 'best students' or the 'most renowned researcher', research universities are not only competing for resources but also competing for the status attached to these resources and the status they will derive from the resources. In fact, not all resources are associated with the same reputation. It is more prestigious to receive an ERC grant (highly selective grants allocated by the European Research Council, ERC) than to obtain a grant from a national or regional agency, for example. It is more prestigious to recruit an assistant professor who received a 'best paper award' for a publication in a major journal than to recruit someone with no award, etc.

In recent years, as competitive pressures over status increased among research universities, the form of this competition evolved.

4. More organized, more equipped and more visible competition

A further transformation of competition in higher education is attributable to the fact that competition is increasingly equipped with formal mechanisms and procedures and entrusted to organizations—like research councils, evaluation agencies or funding agencies or councils—in charge of managing it. Many of these organizations were recently created, as I will argue in the second part of this section. They also led to a transformation in the development of academic judgment. While reputation and status primarily built on interpersonal assessment references in the past, these references are now supplemented and sometimes even replaced by impersonal assessment references¹² (Karpik, 1989). For example, when I studied hiring committees in France, Germany and the USA at the turn of the 2000s (Musselinn 2009 [2005]), the evaluation of candidates primarily relied on personal networks, a personal assessment of journals and doctoral schools, interpersonal relationships, and also on what François Eymard-Duvernay and Emmanuelle Marchal (Eymard-Duvernay and Marchal, 1997) call 'judgment in interaction' (when candidates are interviewed or give a job talk). Personal is understood here in the sense that the assessment was based on evaluators' personal knowledge or on their individual networks. Today, this information is completed by data such as the H index (in physics for instance), the citation index (usually in economics) and the number of papers

12 This notion of personal and impersonal assessment references is borrowed from Lucien Karpik and his seminal work on the economy of quality. When one does not know about the quality of a wine for instance, one may either rely on personal assessment references, such as one's network of friends, or on impersonal assessment references, i.e. use the Parker guide to choose the wine to purchase. Impersonal does not mean that the assessment is automatic and devoid of individuals: Robert Parker is a person (as are the inspectors providing grades and stars in the Michelin guide), but the confidence in his judgment does not rely on the wine buyer's interpersonal interactions with him.

published in 'FT journals'¹³ multiplied by their impact factor (in business schools in particular). At both the individual and institutional levels, information produced by rankers, bibliometrics and more recently altmetrics has grown, providing more impersonal assessment references to reviewers. They are impersonal to the extent that the peer reviews on which they build are mediated by their transformation into an indicator. Two main trends are driving this process. The first one is the proliferation of indicators and data produced by some private actors involved in the production of bibliometrics. The second is linked to the role of public authorities in promoting the development of more formalized and standardized competitive schemes. Both create new forms of competition whose results are more visible and accessible, thus fueling competition by publicizing rankings, ratings and indicators.

4.1 The role of bibliometrics, 'big data' and the private sector

The first stems from private firms and is linked to the development of scientometrics and bibliometrics. As David Pontille and Didier Torny (Pontille and Torny, 2015) show, this development started quite a long time ago, beginning with US librarians sorting scientific journals in order to identify the best ones and select which ones to buy. A few decades later, Eugene Garfield extended this process with the creation of the Journal impact factor and the Science citation index, thereby fostering a 'citation culture', as Paul Wouters (Wouters, 1998) called it. After Eugene Garfield created his own firm, ISI, dedicated to this activity and to the Web of Science (Pontille and Torny, 2015), the collection of information about paper citations became a commercial activity that remained quasi-monopolistic until 2004 and the creation of Scopus.

With the development of the Internet and growing access to many types of data, firms like Google also developed research search engines. They are freely accessible and not restricted to papers in academic journals (as in the case for Web of science and Scopus¹⁴); books, conferences and all kinds of scientific literature are included.¹⁵ This huge amount of data enabled the calculation and production of new indicators based on alternative algorithms, among which the h-index is probably currently the best known and most publicized. Today, Web of science, Scopus and Google scholar are frequently used to compare individuals, journals and institutions. They are particularly mobilized by organizations that develop international rankings. Indeed, the first of these international rankings was not produced by a firm, but rather resulted from a relatively isolated initiative pursued by a Chinese chemist, Professor Nian Cai Liu, at the University of Jioa-Tang. He led an international ranking of universities based on data available on the websites of these universities.¹⁶ This ranking first aimed to identify the position of Chinese universities on the international scene, but became known worldwide when it was released on the website of his university. However, its success led some private firms like THE (Times Higher Education) and QS (Quacquarelli Symonds), together and then separately, to enter the small circle of private international rankers and, like the Center for World-class universities led by Professor Nian Cai Liu nowadays, to

13 This is a list of journals in management ranked by the Financial Times. <https://www.ft.com/content/3405a512-5cbb-11e1-8f1f-00144feabdc0> (last consulted 13 May 2018).

14 Scopus is a database of academic journals' citations and abstracts that Elsevier launched in 2004 to compete with Web of Science.

15 See Dominique Cardon (Cardon, 2013) to understand how Google develop PageRank and the moral machine involved in this algorithm aiming at ranking the appearance of data on web pages.

16 Since he had very few resources to collect data and therefore focused on easily accessible data.

develop their own services and provide higher education institutions with (paid) analysis of their situation and advice to improve it (Mignot-Gérard and Sarfati, 2015; Lim, 2017). They are simultaneously remunerated ranking counselors and producers of rankings.

All these private actors have their own definition of what ‘the best’ means, and develop their own algorithms to rank institutions, journals and scientists, but they are all comparable to the extent that they all provide impersonal assessment references that can be used to select higher education institutions, just like the Guide Michelin (Karpik, 2000) rates restaurants. Of course, impersonal does not mean ‘neutral’: each reference embraces a particular—and different—conception of an ‘ideal’ paper, journal or institution. But they also all challenge or at least supplement the interpersonal assessment references that previously prevailed.

4.2 The state as competition organizer

Private firms are not the only actors active in the organization and equipment of competition with impersonal assessment references. In recent years (from the 1980s for the pioneering countries to the 2000s for the laggards) public authorities have implemented new public management approaches to higher education institutions (Ferlie *et al.*, 2008). They have also been very active in developing competitive schemes and new instruments, thus implementing government-sponsored competition¹⁷ (Naidoo, 2016). In some countries, a number of these bodies—such as research councils (OECD, 2011)—have long existed, but their roles have dramatically grown in the last decades: they became responsible for the allocation of increasing levels of funds while lump-sum budgets decreased and were transformed into project-based funding that research councils managed. Universities and academics were forced to engage in competitive exercises organized by research councils if they wanted to gain access to additional resources. The more universities depend on such councils to get resources for their research programs, the more powerful these councils become.

Countries without such organizations created them: for example, in France the ANR (National Research Council, *Agence Nationale de la Recherche*) was established in 2005.¹⁸ Many governments also developed new resource allocation mechanisms—all relying on selective processes—and implemented ‘policies for excellence’ to help identify the best research units and clusters (cf. the ‘excellent scientific clusters’ in Germany and the Labex (excellent labs) in France), as well as the best institutions (see for instance the German excellence initiative, the IDEX in the French *Programme d’investissement d’avenir* (Investments for the Future program), the Linnéstöd in Sweden, the ‘international campus of excellence’ in Spain and the 211 and 985 programs in China).

Since the 1980s, evaluation agencies or evaluation procedures have emerged in almost all countries, as confirmed in a book edited by Stefanie Schwarz and Don Westerheijden (Schwarz and Westerheijden, 2004) at the beginning of the 2000s: the different authors describe all the evaluation/accreditation organizations created in Europe on a country-by-country basis. While they come in different forms, they all indirectly increase competitive pressures by providing assessments of training programs, research units and higher education institutions, thus allowing for comparison between people, research units and institutions.

17 Rajani Naidoo also speaks of a ‘competitive state’ (Naidoo, 2008).

18 Although the ANR was first created in 2005, project-based research funding was already developed in France. It started in the late 1950s and developed, but was less visible and less centralized under a single agency; it also received, less funding and the competitive schemes were less formalized.

The organization of competition has thus led to the emergence of procedures and/or organizations that were deliberately created with this mission. The various research councils, accreditation agencies and ad-hoc processes like the REF (Research excellence framework) in the UK exist to develop competitive processes that either select projects or conduct evaluations whose results impact the allocation of resources. As argued by Dietmar Braun (Braun, 1993) and Arie Rip (Rip, 1994), the academic profession always challenges the public authorities' control over these agencies. On the one hand, the agencies are involved in a typical principal-agent relationship, having been created to implement the research priorities of the state. On the other, they receive criticism from the academic profession that they try to take into account. Two dissertations on the recently created French agencies (Gozlan, 2016; Schultz, 2016) reveal that this tension often does not resolve: the ministry tries to reassert control over the agencies when it fears they have become too close to the academic profession, but the agencies resist and seek to avoid criticism from the academic profession.

Caught between the ministries and the academic profession, these agencies are nevertheless very active in organizing competitions and producing impersonal assessment references. They denounce the era when budget allocations were based on interpersonal relationships and ad hoc peer review, and they are creating increasingly formalized and standardized decision-making processes (Gozlan, 2016). In her project on academic grant-writing practices in Germany, Kathia Serrano-Velarde (Serrano-Velarde, 2018) found examples of one-paragraph applications in the first decades of the 20th century—something inconceivable today. Academic competition is equipped with procedures and mechanisms organizing the decision-making process. Research councils and evaluation agencies have developed templates that applicants must use in order to develop their ideas, explain their budget, present the different work packages that will structure the project and describe how it will be steered. The expected deliverables and timetable for their delivery must also be included. The counterparts of the project description templates are those provided to the reviewers. While project templates allow reviewers to more easily compare various projects, the templates used by reviewers contribute to the final decision-making process by producing grades that enable a ranking of projects, and by making reviews more comparable and commensurable through their identical structure.

Beyond the templates and 'proceduralization' of the reviews, the agency's selection of reviewers, the inclusion of international reviewers to guard against clubby decisions by the national community of peers and the attention paid to conflicts of interest when selecting the reviewers and creating the committee that will ultimately examine all the projects—all show that much has been done to reduce particularistic decisions, depersonalize the review process and produce more impersonal assessments. The tacit collaboration between peers involved in the agencies and state reformers leads to a mutual reinforcement of competition. It is a specific kind of competition, at the confluence of governmental objectives and professional logics shared by this part of the academic profession.

Finally, although this process is not steered by the academic profession, but rather results from governmental policies, it is interesting to observe that—in contrast with the private firms providing rankings and ratings—the instruments developed by public actors directly rely on academic peer-review¹⁹ and even organize it. A mix of academics and bureaucrats is

19 One can argue that scientometrics also relies on peer reviews since it develops indicators for papers published by peer-reviewed journals. They nevertheless mediate peer reviews through quantification processes.

always at the helm of the agencies responsible for developing the instruments. This has yielded a growing divide in the academic profession between the academics who participate in defining the norms of today's science and the terms of the competition, and the academics subject to them. A gap has also formed between 'the haves'—those who successfully pass the selections and evaluations, and the 'have nots' who fail. As a result, competition exacerbates but also changes forms of domination within the academic field. The oppositions between those representing the spiritual power (mainly the humanities and sciences) and those with temporal power (medicine and law), and between tenured teachers and those lacking institutional recognition that Pierre Bourdieu (1988 [1984], p. 276) described as the antagonistic forces structuring the academic field, are perhaps less relevant today than oppositions within each discipline between those who benefit from the competition or manage it, and those who endure it. Indeed, the study on which the *Homo academicus* is based was conducted in 1967 on Parisian professors and has never been replicated since, although many reforms and movements (including the 1968 events) have since occurred. Some recent studies indicate that such a study should be conducted again, as it would likely reveal new forces in the field. For example, a recently published paper shows that academics who promote performance are less attached to the 'publicness'²⁰ of universities, and that these academics are most often full professors, university leaders and successful in securing grants (Chatelain-Ponroy *et al.*, 2018).

The intensification and transformation of academic competition also lie in the publicity and visibility given to the outcomes of competition, whether private firms or public authorities are leading the competition. These outcomes are more visible and accessible than ever. Quantitative data and indicators have been developed to compare institutions, people and labs, rank them and follow their activity and contributions. The activity of higher education institutions is more often than ever measured and transformed into numbers, rankings, ratings and grades (Espeland and Sauder, 2009, 2016). This coheres with observations in many other sectors (Bezes *et al.*, 2016), as described by Michael Power (1997), Gwyn Bevan and Christopher Hood (Bevan and Hood, 2006). These markers are also increasingly visible: they are publicized and available to all.

When the French agency for the evaluation of higher education and research was created in 2006 in France, the publication of the grades attributed to the evaluated research units on the agency's website was strongly criticized for making the results public and accessible to all colleagues, students, parents of students and economic and political actors. This was very new in France: research units had long been evaluated and sometimes graded, but the results remained the private knowledge of the reviewing body (national research institutions or divisions of the ministry, depending on the type of research unit considered).

The RAE had a similar experience a few years earlier in the UK. Poorly evaluated departments lost part of their public funding because of their scores, but the HEFCE was not the

20 As defined by Barry Bozeman (1987), the publicness of organizations depends on how much the public context of these organizations affects their behavior. In the paper written with Stéphanie Chatelain-Ponroy *et al.* (2018), three dimensions referred to the adhesion to the publicness of universities: their public ownership, the fact that they depend on public control and rely on public funding (Andrews *et al.*, 2011).

only body informed of their achievement: the publicity around their evaluation on the RAE website led some private actors to withdraw funding as well (Camerati, 2014).

This visibility of the results released by public authorities and by newspapers (in the USA through the ranking of departments by US News) has clearly grown with the multiplication of measures, data, indexes and indicators. They are all just a click away on the web and can be viewed by all. Someone who does not know his/her colleagues can look up their score on scholarometer, calculate their h-index and find their most cited papers. Every academic, every journal, every department and every institution can be found on a ranking or can be attached to any indicator.

Competition has increased because more private and public organizations are organizing competitive schemes and developing procedures, methods and algorithms aimed at replacing interpersonal assessments through impersonal references. It is also increasingly equipped and dependent on impersonal assessment references produced by private firms as well as through higher education public policies. Publication of the results of these competitive evaluations further increases competitive pressures on academics, research units and institutions.

5. Competition, norms and cooperation

Academic competition is no longer a competition between academics and countries. It has become more institutional and more global. This has two main consequences that will be discussed in this last section. First, competition among research universities, like all forms of competition, relies on classifications but has also given rise to new classifications in the form of alliances of research universities considering that they belong to the same category of institutions and should network, share information and develop relationships with one another. Second, these alliances of competitors have yielded new forms of cooperation and common social norms among their members.

With regard to markets, one of the outcomes and prerequisites of competition is classification. Fourcade and Healy (Fourcade and Healy, 2013) powerfully showed that market instruments sort individuals and classify customers. By the same token, competitors for customers are also classified according to their success in attracting their sought clientele. Competition also classifies competitors. In higher education this occurs via various mechanisms. First, competition distinguishes between winners and losers when competitors are vying for a third party. This is the case, for example, when academics apply for grants and some get them while others do not. Academics compete for grants in a bid to secure funding for the development of their research. But competition for grants is also a competition for status. Having one's name associated with a high-status grant (like the European research council grants—ERC—in Europe, or the NSF in the USA) increases one's status as well as the status of one's institution, since ERC grants now are an indicator of academic quality. Second, competition classifies when competitors are rated according to their performance. The classification resulting from this process can be explicit, as is the case for the French evaluation system of research units introduced by the AERES in 2006. The research labs either belong to the group that obtained an A+, the group with an A, the group with a B or the group with a C. Ratings can also lead to more implicit classifications. The *Exzellenzinitiative* in Germany is a case in point. After the first round in the mid-2000s, German universities were no longer equal—as they were supposed to be before (Enders and Teichler, 1995), and could therefore organize into new groups. Some could be labeled

‘Zukunftskonzept’²¹ and identified as excellent universities. A less explicit group—with no label—consisted of universities that went through the process and were positively evaluated, but did not make the final cut for the *Zukunftskonzept* group. They generally performed quite well in terms of running excellent scientific clusters and excellent graduate schools—two other competitive processes launched alongside the *Zukunftskonzept* competition. Most of them received additional support from their *Land* ministry and began implementing part of their project even if they did not win the ‘jackpot’. At the other extreme, some universities did not compete at all²² and in a way excluded themselves from the start: as mentioned at the beginning of this article, individuals and institutions may refuse to partake in competition, or recognize its relevance to them. Thus, four implicit groups emerged from the *Exzellenzinitiative* competition: the winners; the ‘almost winners’ that received support from local authorities; the applicants that clearly failed; and the numerous institutions that did not even try.

Third, international rankings may appear to be distinct from the two former processes (competition for grants and ratings) since they produce an ordinal hierarchy, but they actually build categories as well. For starters, they distinguish the ranked from the unranked. In fact, rankings only cover a very small part of the higher education world. They rank between 2% to 5% of the 16 000–17 000 higher education institutions in the world.²³ A very small category indeed! But even among the ranked institutions, observers usually reconstitute categories, distinguishing the top 10 or the top 50, for example. Beyond a certain number, some rankings no longer provide an ordinal rank and instead regroup institutions into categories: the 101–150, or the 201–250 for instance.

As a result, regardless of the forms it takes, competition in higher education creates new classifications. These classifications challenge the existing ones. As Jelena Brancovic (Brancovic, 2018) has shown, university associations, which first appeared in the late 19th century, greatly strengthened in the last decades. They generally either relied on formal distinctions (such as the divide between universities and *grandes écoles* in France, or the universities and the *Fachhochschulen* in Germany), or on a functional specialization-based distinction such as the separation between research-oriented and teaching-oriented higher education institutions, or between technical and liberal arts universities.²⁴ The increased competition, the growth in competitive processes and their publicity cast aside these traditional classifications and introduced new ones that only partially overlap with the former ones.

- 21 This is the German term that was chosen to designate the universities that were selected through the competitive process. The expression ‘Elite Universität’ that was first used elicited strong resistance and was therefore abandoned in favor of a term that literally means ‘concept of the future’.
- 22 In 2005, in the very first round of the German *Exzellenzinitiative*, 27 universities (around one-fourth of German institutions) sent draft proposals. In the second round, 22 universities sent a draft, but the competition also included the 9 universities that became *Zukunftskonzepte* in 2006.
- 23 The percentage of ranked higher education institutions cannot be rigorously established as the number of universities in the world is not precisely known and the number of universities ranked by the different rankers varies from one ranker to the next (500 for some, 800 for others).
- 24 Jelena Brancovic (Brancovic, 2018) distinguishes between the sectoral associations of liberal arts universities (conference of University presidents), the intra-sectoral, horizontal associations of universities with a specific attribute (Federation of private universities) and the vertical associations of universities with a specific attribute (International Alliance of Research Universities).

The new categories are alliances regrouping institutions that consider themselves alike. Most often, these alliances are not completely isomorphic with the results of the competition schemes.²⁵ Alliances exactly based on a specific competition result are rare²⁶ because many institutions achieve different results depending on the competition schemes: only very few make it into the top 20 of all international rankings every year. Thus, no clear alliance exists among the top 20 institutions of the THE, for example, but alliances develop between universities that are present in all of the most renowned rankings rather than on the basis of only one of them. While no alliance strictly relies on the classifications resulting from various competitions, there is some overlap. An example is the recently created U15 in Germany that brings together 15 German institutions. The website²⁷ of the Freie Universität Berlin, which took the initiative to create this group, explicitly states that ‘their objective is to increase the awareness of the teaching and research performance, the social influence, and the knowledge-creating and economic potential of leading German comprehensive universities among the political and economic leaders and the general public’. Seven of these ‘leading comprehensive universities’²⁸ are *Zukunftskonzepte*,²⁹ and two were *Zukunftskonzepte*³⁰ between 2006 and 2012. The six others all applied for the *Exzellenzinitiative*.

This example shows that emerging elective alliances are not strictly reproducing the results of a particular competition but that they bring together, on the basis of selective affinities, institutions that share characteristics and thus belong to a certain category of institutions, i.e. the ‘leading German comprehensive universities’. This by default suggests that institutions outside of U15 are not ‘leading German comprehensive universities’.

These ‘alliances’ may take very different forms. Whether they are guilds, associations, federations, groups or leagues, they all consist of networks bringing together higher education institutions that consider themselves as belonging to the same category, share the same status and have an interest in making their commonalities visible by becoming part of the same circle (Dent *et al.*, 2017). They are therefore based on self-selection.

Many of them formed recently. Some have existed for a long time (the Ivy league in the USA since the beginning of the 20th century), but many are much newer: the Russell group in the UK was created in 1994, the French CURIF (group of French intensive research universities, *Coordination des Universités de recherche intensive françaises*) only appeared in 2008 and U15 formed in 2016. Jelena Brancovic’s (Brancovic, 2018) statistical accounting of these classical and new associations shows that status-based associations (high-status membership in Brancovic’s typology) are still less common than the two other groups this author identifies (the one based on category membership and the one based on specialized

25 This aligns with the observations of Joel Podolny (2005) on competition for status when he assumes that being accepted as status-equivalent does not only rely on results but also on social affinities.

26 Although it might sometimes happen: in France the three universities that were confirmed as ‘Excellent universities’ created a network with the CNRS and the INSERM in order to share good practices about the leadership of an excellent university.

27 http://www.fu-berlin.de/en/presse/informationen/fup/2012/fup_12_299/index.html

28 They include the Free University of Berlin, Humboldt University and the universities of Bonn, Frankfurt, Freiburg, Göttingen, Hamburg, Heidelberg, Cologne, Leipzig, Mainz, Munich, Münster, Tübingen and Würzburg.

29 The Free University of Berlin, Humboldt-University and the universities of Bonn, Heidelberg, Cologne, Munich and Tübingen.

30 The University of Freiburg and the University of Göttingen.

membership), but that they have strongly developed since the 1980s. While most are national, some also have a regional scope. This is for instance the case of LERU, the league of European Research universities founded in 2002, and of the Association of East Asian Research Universities created in 1994. Some are even global like the International Alliance of research universities.

I had the opportunity to discuss three of them (two recently created and one about to launch; one national, one European and the other probably global) with their developers and read the first documents sent to potential participants. It is interesting to note that all three started at the initiative of one university, mostly its president.³¹ He or she generally writes a first mission statement describing the contour of the category (leading universities of country Y, or research-oriented leading technical universities in the world, etc.) and the main tasks or objectives the alliance would target (most of the time lobbying at the national or regional level, sharing good practices, etc.). Then he or she directly gets in touch with other presidents of universities that he or she considers to belong to the same category as his or her own institution. Those who show interest (i.e. those who believe that they are in the same category and that the alliance could confirm their status and academic specificity) are invited to a first meeting where further association activities may be discussed.

These various forms of alliances among competitors have had two main effects. They produce common social norms and they also increase cooperation among competitors. As a matter of fact, institutional alliances demonstrate the Janus face of competition (Simmel, 1903) competition is conducive to both 'conflicts' and sociability. In a competitive framework, competitors identify their competitors and also observe them, learn about them and imitate them, thus producing some social unity. Furthermore, in order to compete, they must embrace common norms and their attendant social regulations: universities might not agree with these regulations and instruments—even top-ranked institutions criticize rankings—but at least they agree to subject themselves to these norms and to play the game. They even strengthen the game when they create alliances that broadly reflect the results of the competition schemes. These alliances play the same role as that played by what Harrison White (White, 1981) called 'market segments': just like White's producers, higher education competitors belonging to the same association look at what their peers are doing and align their actions accordingly. They thus define common norms and principles that their members embrace and commit to.

These norms are sometimes explicitly stated on the website of elective associations. Consider this extract from the LERU website about a memorandum of understanding signed with the European Commission, whereby LERU members commit to respecting some norms related to careers and scientific activities:

MOU signed between LERU and the European Commission

The League is also an active participant in meetings organised by other stakeholders, mostly at the European level. For example in the Summer of 2012, LERU signed a Memorandum of

31 In these three cases, as in the others, we need more evidence to understand why these presidents suddenly decide to take this course. They probably have diverse and multiple rationales: putting their university on the map by launching this process; feeling that the kind of institution they manage may be endangered by the dominant model of complete world-class universities and wanting to have other models of world-class universities recognized; following what has been done in other countries or other regions; wanting to coordinate in order to be stronger in discussions with public authorities.

Understanding (MoU) together with the European Commission, on the further realisation of the European Research Area (ERA). According to this MoU, LERU will encourage its members to carry out a number of actions, dealing with open recruitment, research careers, gender, mobility, doctoral training open access, knowledge transfer, e-science and scientific cooperation <http://www.leru.org/index.php/public/activities/other-activities/>.

Like the producers in Harrison White's 'market segments' (White, 1981), they also have an interest in not bringing down other members of the segment, so that the segment can remain a recognized group. The focus is on survival as opposed to the elimination of rivals in order to preserve the existence of their segment (alliance) and be recognized as a group. For the U15 group to play a role and be recognized, its member institutions cannot too aggressively go after each other, even though they are competing against one another.

Some of these alliances are going even further: they not only produce common norms but also favor cooperation among competitors.

The issue of cooperation among competitors is highly debated in the literature. In many cases, it is denounced as a form of collusion, with competitors joining efforts to either eliminate another competitor or set higher prices, as Baker and Faulkner (1993) concluded from a study in which they observed that social networks led to illegal price-fixing conspiracies in the US electric equipment industry in the 1950.

But there is also a vast literature arguing that cooperation among competitors is efficient and should be promoted. Following Adam Brandenburger and Barry Nalebuff (Brandenburger and Nalebuff, 1995), some authors call it 'coopetition' and defend the idea that it is a category *per se*. That is, it is neither a form of cooperation nor a form of competition, but rather a third form that it is characterized by actors interacting and partially sharing common objectives and interests, thus playing a non-zero-sum game instead of a zero-sum game (Dagnino et al. 2007). Some more sociological approaches to cooperation among competitors further provide good examples of what non-collusive cooperation brings and how effective it is. According to Paul Ingram and Peter W. Roberts (Ingram and Roberts, 2000), who studied hotels in Sydney 'the networks of competitor friendship [are] more efficacious when they are cohesive' because they close the structural gaps (Burt 1993) faced by customers.³² These authors also look at the conditions that favor such cooperative practices. For Paul Ingram and Peter W. Roberts, friendship is a condition as well as an effect of the development of cooperative relationships between the managers of hotels in Sydney, and it works so because these friendship ties are horizontal, i.e. they link similar organizations that compete with one another (Ingram and Roberts, 2000:389). In his study of restaurants in the North of France, Fabien Eloire (Eloire, 2010) observed that only 'gastronomical' restaurants, i.e. those competing for quality, developed cooperative behavior, but he believed it was the type of competition in which restaurants were engaged that explained the development of cooperation. He observed that restaurants competing on price and over customers were not involved in such relationships. The importance of cooperation among competing universities might therefore be explained by the fact that, as for gastronomical restaurants, they compete for quality, as research universities do.

Whatever the reason for cooperative behavior, the benefits that can be drawn from it are heightened and help explain both why alliances emerge and why they are sustainable. What

32 Customers are no longer the contacts through which a hotel might be connected to another when hotels themselves interact.

does this cooperation involve? Ingram and Roberts first observe that it focuses on problem solving, and this is typically what elective university associations do. For example, the Russell group is highly involved in an effort to moderate the impact of Brexit on UK universities, while the recently created 'The Guild' aims to coordinate and facilitate relationships between its members and Brussels. Second, Ingram and Roberts observe that cooperation is about enforcing common norms and reducing aggressive competitive behaviors: although no formal constraints or sanctions are placed on members of an elective university elective who do not play the game, they feel obliged to observe the norms in order to keep the group together. Finally, the two authors conclude that cooperation is about exchanges of reliable and useful information. Again, this is exactly what elective alliances among 'leading research universities' are about: their members participate in joint sessions where they share their situations, problems and solutions. Thus, national alliances often serve as a forum where information on forthcoming reforms, new regulations and future funding schemes can be circulated and prepared.

However, this cooperation is also about status, a dimension that is not stressed by Paul Ingram and Peter W. Roberts or Fabien Eloire. Institutions involved in these alliances benefit from the status of the higher-status participants (Podolny, 1993, 2005). The ability to place the logo of national or international elective alliances on one's website works like a signal for quality and communicates that the institution belongs to the same category as all the other institutions displaying this logo on their websites. This works at the institutional level and also likely at the individual level. Universities in an alliance probably lean towards recruiting PhD graduates from universities in the same alliance

Finally, this cooperation is only possible because it takes place within a certain social circle (Weber, 1978). Alliances create what Lazega *et al.* (2016, p. 2) call a social niche, i.e. 'a dense subset of structurally equivalent members of a collective among whom resources of all kinds can be exchanged and accessed at a lower cost than outside the niche'. They develop specific activities serving their members (or primarily serving them), like common summer schools or the creation of specific services like LERU's law portal dedicated to open archives in law. It is also highly probable—and further empirical research would be needed to demonstrate this—that co-authorship, co-supervision of doctoral candidates, joint applications for grants, dual degrees and research cooperation is more common among members of the same elective association.

6. Conclusion

While the economization, commodification and marketization of higher education can be observed on some issues, in some sectors, and within some countries, it is still a rather limited phenomenon compared to the generalization and effects of competition among research universities. Competition has dramatically increased in this sector as national governments have developed competitive schemes and private actors have developed bibliometrics or built on bibliometrics to quantify scientific activities, and more broadly academic work. They thus allow comparison and rankings between individual researchers, research units, higher education and research institutions and countries. As a result, academic judgment today increasingly relies on impersonal judgment and references based on assessments derived from algorithms, quantified indicators and standardized processes.

As argued in the second part of the article, the competition at stake between research universities is not a competition for prices or for customers, but rather a competition for

quality. Furthermore, it is no longer limited to individual scientists and their teams, and to countries, but also applies to higher education institutions that adopted competitive strategies and became competitors themselves. In some countries, like the USA, this ‘institution-based’ competition already existed at the national level. This is now the case in all countries and many research universities do not only compete at the national level but also internationally.

Competition has both increased and changed as research universities have become competitors, competitive schemes have become more formalized and the results of competition have become more quantified, visible and easy to compare.

A first consequence of this evolution lies in the transformation of the governance of universities. The reforms aimed to increase university autonomy and introduce management practices developed in private firms, leading universities to behave more strategically and to replace collegial relationships with hierarchical ones—i.e. what Nils Brunsson and Kerstin Sahlin-Andersson (Brunsson and Sahlin-Andersson, 2000) called the transformation of universities into organizations. The increase in competition consolidated these reforms: university leaders have had to become more strategic in order to act as competitors (Hasse and Krücken, 2013). As stressed in Section 2, competition favors managerial behavior from university leaders, and the latter use the results of competition as management tools.

This impacts relationships within research universities as some of the faculty is empowered by competition (the winners and those participating in the definition of the competitive game in funding agencies) and others endure competition. As stressed by Simon Paye in his PhD (Paye, 2013), this has led to a transformation in the management of academic human resources in UK universities, and to a distinction between research-active and non-research-active academics. More research is needed to explore the implications on the power balance between disciplines or within disciplines, and institution-based competition’s effects on the academic field.

Another consequence of these parallel developments concerns the relationships between research universities themselves. Competition leads to the emergence of new categories of higher education institutions and the constitution of ‘alliances’ of institutions that join forces in institutionalized networks (associations, guilds, leagues, etc.)—based on their success in various competitive schemes—because they consider each other to be of equal status. But, as the last part of the article shows, these alliances are more than a formal representation of new categories and more than the locus of production of common norms; they also foster new forms of cooperation among the competing institutions they encompass.

Little is known about these alliances, their role, how they have been formed, their ability to develop innovative cooperative practices and the relationships they entertain with one another. More research should be explore them.

Finally, the transformation of competition between research universities and its consequences raise the question of the interplay between the different levels affected. The interaction between individual, institutional and national levels has received little coverage, but the recent evolution strongly calls for the development of such analysis. It is important to know how the development of competition and of co-competition at the institutional level impacts and interacts with individuals. Emmanuel Lazega and his colleagues (Lazega *et al.*, 2016, Wang *et al.*, 2016) have paved the way in their analysis of interactions between individual networks of oncologists and relationship networks among research units in oncology, and how these affect the individual trajectories of big versus small fish (i.e. renowned versus low-

profile scientists) working in small versus big ponds (low-profile versus renowned research units). The location of research units in competitive versus less competitive universities, and the national and international networks in which these universities are located should be added to the analysis. This could quite significantly renew the study of higher education and research systems.

References

- Altbach, P. (2015) 'The costs and benefits of world-class universities', *International Higher Education*, 33, 5–8.
- Andrews, R., Boyne, G. A. and Walker, R. M. (2011) 'Dimensions of Publicness and Organizational Performance: A Review of the Evidence', *Journal of Public Administration Research and Theory*, 21, 301–319.
- Aust, J. and Picard, E. (2014) 'Gouverner par la Proximité', *Genèses*, 94, 7–31.
- Baker, W. E. and Faulkner, R. R. (1993) 'The Social Organization of Conspiracy: Illegal Networks in the Heavy Electrical Equipment Industry', *American Sociological Review*, 58, 837–860.
- Berdahl, R. O. (1971) *Statewide Coordination of Higher Education*, Washington, American Council on Education.
- Berman, E. P. (2012) *Creating the Market University: How Academic Science Became an Economic Engine*. Princeton, Princeton University Press.
- Berman, E. P. (2014) 'Not Just Neoliberalism: Economization in U.S. Science and Technology Policy', *Science, Technology & Human Values*, 39, 397–431.
- Bevan, G. and Hood, C. (2006) 'What's Measured is what Matters: Targets and Gaming in the English Public Health Care System', *Public Administration*, 84, 517–538.
- Bezes, P., Chiappello, È. and Desmarez, P. (2016) 'Introduction: La Tension Savoirs-Pouvoirs à l'épreuve du Gouvernement par les Indicateurs de Performance', *Sociologie du Travail*, 58, 347–369.
- Bourdieu, P. (1988 [1984]) *Homo Academicus*, Palo Alto, Stanford University Press.
- Bozeman, B. (1987) *All Organizations are Public: Bridging Public and Private Organizational Theories*. San Francisco: Jossey Bass Publishers
- Brancovic, J. (2018) 'How do Meta-Organizations affect Extra-Organizational Boundaries? The Case of University Associations'. In Ringel, L., Hiller, P. and Zietsma, C. (eds) *Towards Permeable Organizational Boundaries? (Book series: Research in the Sociology of Organizations)*, Bingley, Emerald Publishing Limited.
- Brandenburger, A. M. and Nalebuff, B. J. (1995) *The Right Game: Use Game Theory to Shape Strategy*, Harvard Business Review, 76, 57–71.
- Braun, D. (1993) 'Who Governs Intermediary Agencies? Principal-Agent Relations in Research Policy-making', *Journal of Public Policy*, 13, 135–162.
- Broucker, B. and De Wit, K. (2015) 'New Public Management in Higher Education'. In *The Palgrave International Handbook of Higher Education Policy and Governance*. London, Palgrave Macmillan, pp. 57–75.
- Brunsson, N. and Wedlin, L. (2016) Competition for Status: The Example of Universities. Communication at the Competition(s) Workshop at the Copenhagen Business School, for the 'Performances of Value: Competition and Competitions Inside and Outside Markets' project, supported by the Leverhulme Trust and led by David Stark.
- Brunsson, N. and Sahlín-Andersson, K. (2000) 'Constructing Organizations: The Example of Public Sector Reform', *Organization Studies*, 21, 721–746.
- Burt, R. S. (1993) 'The Social Structure of Competition', *Explorations in Economic Sociology*, 65, 103.

- Camerati Morrás, F. (2014) Les universitaires britanniques face aux instruments d'évaluation et de financement de la recherche: les départements de géographie et d'informatique de deux universités face au Research Assessment Exercise et au full Economic Costing en Grande Bretagne (Doctoral dissertation, Paris, Institut d'études politiques).
- Cardon, D. (2013) Dans l'esprit du PageRank. *Réseaux*, 177, 63–95.
- Charle, C. (1994) *La République des Universitaires, 1870-1940*, Paris, Seuil.
- Chatelain-Ponroy, S., Mignot-Gérard, S., Musselin, C. and Sponem, S. (2012) *La Gouvernance des Universités Françaises Pouvoir, Évaluation et Identité*. CSO Monograph, accessed at http://cso.edu/upload/dossiers/Rapport_GouvernanceUniversitesFrance_2012.pdf on June 16, 2017.
- Chatelain-Ponroy, S., Mignot-Gérard, S., Musselin, C. and Sponem, S. (2018) 'Is Commitment to Performance-based Management Compatible with Commitment to University Values in French Universities', *Organization Studies*, doi: 10.1177/0170840617717099 | First Published August 19, 2017.
- Barats, C. (2017) *Co-construction du processus de médiatisation du classement dit 'de Shanghai' ou Comment le classement vint de Shanghai? (Habilitation à diriger des recherches, Créteil, Université Paris Est Créteil)*.
- Clark, B. R. (1972) 'The Organizational Saga in Higher Education', *Administrative Science Quarterly*, 17, 178–184.
- Clark, B. R. (1987) *The Academic Life. Small Worlds, Different Worlds. A Carnegie Foundation Special Report*. Princeton: Princeton University Press.
- Clark, T. N. (1973) *Prophets and Patrons: the French University and the Emergence of the Social Sciences*. Cambridge, MA, Harvard University Press.
- Dagnino, G. B., Le Roy, F. and Yami, S. (2007) 'La Dynamique des Stratégies de Coopétition', *Revue Française de Gestion*, 176, 87–98.
- Dearden, L., Fitzsimons, E. and Wyness, G. (2014) 'Money for Nothing: Estimating the Impact of Student Aid on Participation in Higher Education', *Economics of Education Review*, 43, 66–78.
- Dent, S., Lane, L. and Strike, T. (eds). (2017) *Collaboration, Communities and Competition: International Perspectives from the Academy*. Dordrecht, Springer.
- Eaton, C., Habinek, J., Goldstein, A., Dioun, C., Santibáñez Godoy, D. G. and Osley-Thomas, R. (2016) 'The Financialization of US Higher Education', *Socio-Economic Review*, 14, 507–535.
- Éloire, F. (2010) 'Une Approche Sociologique de la Concurrence sur un Marché le cas', *Revue Française de Sociologie*, 51, 481–517.
- Enders, J. and Teichler, U. (1995) *Der Hochschullehrerberuf im Internationalen Vergleich*. Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie.
- Espeland, W. (2015) 'Narrating Numbers'. In Rottenburg, R., Merry, S.E., Park, S.-J. and Mugler, J. (eds) *The World of Indicators: The Making of Governmental Knowledge through Quantification*, Cambridge, Cambridge University Press, pp. 56–75.
- Espeland, W. N. and Sauder, M. (2016) *Engines of Anxiety: Academic Rankings, Reputation, and Accountability*, New York, Russell Sage Foundation.
- Eymard-Duvernay, F. and Marchal E. (1997) *Façons de Recruter: le Jugement des Compétences sur le Marché du Travail*, Paris, Métailié.
- Ferlie, E., Musselin, C. and Andresani, G. (2008) 'The Steering of Higher Education Systems: A Public Management Perspective', *Higher Education*, 56, 325.
- Fourcade, M. and Healy, K. (2013) 'Classification Situations: Life-Chances in the Neoliberal Era', *Accounting, Organizations and Society*, 38, 559–572.
- François, P. (2008) *Sociologie des Marchés*, Paris, Armand Colin.
- Gordin, M. D. (2008) 'The Heidelberg Circle: German Inflections on the Professionalization of Russian Chemistry in the 1860s', *Osiris*, 23, 23–49.

- Gozlan, C. (2016) *Réinventer le Jugement Scientifique* (Doctoral dissertation, Institut d'Études Politiques de Paris).
- Hasse, R. and Krücken, G. (2013) 'Competition and Actorhood: A Further Expansion of the Neo-Institutional Agenda', *Sociologia Internationalis*, **51**, 181–205.
- Hayes, D. and Wynyard, R. (2002) *The McDonaldisation of Higher Education*, Wesport, Bergin & Garvey.
- Hazelkorn, E. (2015) *Rankings and the Reshaping of Higher Education: The Battle for World-class Excellence*. Dordrecht, Springer.
- Hüther, O. and Krücken, G. (2016) 'Nested Organizational Fields: Isomorphism and Differentiation among European Universities'. In *The University Under Pressure*, Bingley, Emerald Group Publishing Limited, pp. 53–83.
- Ingram, P. and Roberts, P. W. (2000) 'Friendships among Competitors in the Sydney Hotel Industry', *American Journal of Sociology*, **106**, 387–423.
- Jongbloed, B. (2003) 'Marketisation in Higher Education, Clark's Triangle and the Essential Ingredients of Markets', *Higher Education Quarterly*, **57**, 110–135.
- Karpik, L. (1989) 'L'économie de la Qualité', *Revue Française de Sociologie*, **30**, 187–210.
- Karpik, L. (2000) 'Le Guide Rouge Michelin', *Sociologie du Travail*, **42**, 369–389.
- Karpik, L. (2010 [2007]) *Valuing the Unique: The Economics of Singularities*, Princeton, Princeton University Press.
- Krücken, G. (2017) 'Die Transformation von Universitäten in Wettbewerbsakteure', *Beiträge zur Hochschulforschung*, **39**, 10–29.
- Krücken, G. and Meier, F. (2006) 'Turning the University into an Organizational Actor'. In Drori, G., Meyer, J. and Hwang, H. (eds) *Globalization and Organization: World Society and Organizational Change*, Oxford, Oxford University Press, pp. 241–257.
- Lamont, M. (2009) *How Professors Think*. Cambridge, MA, Harvard University Press.
- Larsen, K. and Vincent-Lancrin, S. (2002) 'International Trade in Educational Services', *Higher Education Management and Policy*, **14**, 9–45.
- Latour, B. (1993) *Portrait d'un biologiste en capitaliste sauvage. Petites Leçons de sociologie des sciences*, Paris, éd. La Découverte, 1993, coll. "Points-Sciences".
- Lazega, E. and Snijders, T. A. (2016) 'Introduction'. In Lazega, E., Snijders, T. A. and Tom, A. B. (eds) *Multilevel Network Analysis for the Social Sciences*, Cham, Springer, pp. 1–12.
- Lazega, E., Snijders, T. A. and Tom, A. B. (2016) *Multilevel Network Analysis for the Social Sciences*, Cham, Springer.
- Lim, M. A. (2017) *The Building of Weak Expertise: the Work of Global University Rankers*. Higher Education, **75**, 1–16.
- Marginson, S. (2010) 'Higher Education in the Global Knowledge Economy', *Procedia-Social and Behavioral Sciences*, **2**, 6962–6980.
- Merton, R. K. (1973 [1957]) *The Sociology of Science: Theoretical and Empirical Investigations*, Chicago, University of Chicago Press.
- Mignot-Gérard, S. (2006). *Échanger et Argumenter. Les Dimensions Politiques du Gouvernement des Universités Françaises*. Doctoral thesis. Paris: Institut d'études politiques.
- Mignot-Gérard, S. and Sarfati, F. (2015) 'Dispositif de Jugement sur la Qualité ou Instrument de Construction de la Réputation?', *Terrains & Travaux*, **26**, 167–185.
- Münch, R. (2014) *Academic Capitalism: Universities in the Global Struggle for Excellence*, New York, Routledge.
- Musselin, C. (2004 [2001]) *The Long March of French Universities*. New York, Routledge.
- Musselin, C. (2010) 'Universities and Pricing on Higher Education Markets'. In *Changing Educational Landscapes*. Dordrecht, Springer, pp. 75–90.

- Musselin, C. (2013) 'How Peer Review Empowers the Academic Profession and University Managers: Changes in Relationships between the State, Universities and the Professoriate', *Research Policy*, **42**, 1165–1173.
- Musselin, C. (2014) 'Empowerment of French Universities by Funding and Evaluation Agencies'. In *Organizational Transformation and Scientific Change: The Impact of Institutional Restructuring on Universities and Intellectual Innovation*. Bingley, Emerald Group Publishing Limited, pp. 51–76.
- Musselin, C. (2009 [2005]) *The Market for Academics*. New York, Routledge.
- Musselin, C., Barrier, J., Boubal, C., Soubiron, A., Hexel, O., McAvay, H. and Wulf, M. (2012) Liberté, Responsabilité... et Centralisation des Universités. CSO monograph, accessed at http://cso.edu/upload/dossiers/Rapport_LiberteResponsabiliteCentralisationUniversites_2012.pdf on June 16, 2017.
- Naidoo, R. (2008) 'L'État et le Marché dans la Réforme de L'enseignement Supérieur au Royaume-Uni (1980-2007)', *Critique Internationale*, **39**, 47–65.
- Naidoo, R. (2016). 'The Competition Fetish in Higher Education: Varieties, Animators and Consequences', *British Journal of Sociology of Education*, **37**, 1–10.
- OECD. (2011) Issue Brief: Public Sector Research Funding, OECD Innovation Policy Platform, accessed at <http://www.oecd.org/innovation/policyplatform/48136600.pdf> on May 4, 2018.
- Paradeise, C. and Thoenig, J.-C. (2015) *In Search of Academic Quality*, Dordrecht, Springer.
- Paye, S. (2013) *Différencier les pairs. Mise en gestion du travail universitaire et encastrement organisationnel des carrières académiques (Royaume-Uni, 1970-2010)*, PhD thesis in Sociology, Sciences Po, Paris.
- Podolny, J. M. (1993) 'A Status-based Model of Market Competition', *American Journal of Sociology*, **98**, 829–872.
- Podolny, J. M. (2005) *Status Signals: A Sociological Study of Market Competition*, Princeton, Princeton University Press.
- Pontille, D. and Tornay, D. (2015) 'From Manuscript Evaluation to Article Valuation: the Changing Technologies of Journal Peer Review', *Human Studies*, **38**, 57–79.
- Power, M. (1997) *The Audit Society: Rituals of Verification*, Oxford, OUP.
- Rip, A. (1994) 'The Republic of Science in the 1990s', *Higher Education*, **28**, 3–23.
- Salmi, J. and Saroyan, A. (2007) 'League Tables as Policy Instruments', *Higher Education Management and Policy*, **19**, 1–38.
- Sauder, M. and Espeland, W. N. (2009) 'The Discipline of Rankings: Tight Coupling and Organizational Change', *American Sociological Review*, **74**, 63–82.
- Schultz, E. (2016) *Construire une économie de la recherche sur projets. L'installation de l'Agence Nationale de la Recherche en France et ses conséquences dans les domaines de la génomique végétale et de la chimie durable* (Doctoral dissertation, University Paris Sorbonne).
- Schwarz, S. and Westerheijden, D. F. (2004) 'Accreditation in the Framework of Evaluation Activities: A Comparative Study in the European Higher Education Area', *Higher Education Dynamics*, **5**, 1–42.
- Serrano-Velarde, K. (2018) 'The Way we Ask for Money... The Emergence and Institutionalization of Grant Writing Practices in Academia', *Mimerva* (forthcoming).
- Simmel, G. (1903) 'Soziologie der Konkurrenz', *Neue Deutsche Rundschau*, **14**, 1009–1023.
- Slaughter, S. and Leslie, L. L. (1997) *Academic Capitalism: Politics, Policies, and the Entrepreneurial University*, Baltimore, The Johns Hopkins University Press.
- Slaughter, S. and Rhoades, G. (2004) *Academic Capitalism and the New Economy: Markets, State, and Higher Education*, Baltimore, JHU Press.
- Swedberg, R. (1998) *Max Weber and the Idea of Economic Sociology*, Princeton, Princeton University Press.

- Tandberg, D. A. (2010) 'Politics, Interest Groups and State Funding of Public Higher Education', *Research in Higher Education*, **51**, 416–450.
- Vandenbussche, J., Aghion, P. and Meghir, C. (2006) 'Growth, Distance to Frontier and Composition of Human Capital', *Journal of Economic Growth*, **11**, 97–127.
- Wang, P., Robins, G., Pattison, P. and Lazega, E. (2016) 'Social Selection Models for Multilevel Networks', *Social Networks*, **44**, 346–362.
- Ward, D. and Douglass, J. (2006) 'Higher Education and the Specter of Variable Fees: Public Policy and Institutional Responses in the United States and United Kingdom', *Higher Education Management and Policy*, **18**, 1–28.
- Weber, M. (1978 [1922]) *Economy and Society*, Berkeley, University of California.
- White, H. C. (1981) Where do Markets come from?. *American Journal of Sociology*, **87**, 517–547.
- White, H. C. (1992) *Identity and Control: A Structural Theory of Social Action*, Princeton, NJ, Princeton University Press, pp. 448.
- Wouters, P. (1998) 'The Signs of Science', *Scientometrics*, **41**, 225–241.