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Universities as Hybrid Organizations
Trends, Drivers, and Challenges for the European University

Abstract: Today’s public universities are increasingly becoming like enterprising nonprofits. Partly because of financial reasons, they are turning to the private sector to boost or replace their traditional—predominantly public—sources of funding. University-industry alliances in research and development (R&D) are the result of deliberate strategies implemented by national and international (e.g., EU) governing bodies, as well as the university leadership itself, to promote a more direct involvement of universities in research-based innovation and economic development. This multiplication of stakeholders is leading to new organizational—more hybrid—models of governance that help the university cope with the increased complexity of networks and linkages with which it is involved. This article addresses some of the drivers and manifestations of universities as hybrid organizations, as well as examples of (public-private partnership) models of knowledge linkages between university and industry, such as the ones currently promoted across Europe. The article concludes by highlighting some of the challenges of the increased hybridization of universities, including challenges for research on university governance.

University cooperation with the business sector is nowadays the rule rather than the exception. In many OECD (Organisation for Economic Cooperation and Development) countries, it has become more common for universities, next to engaging in teaching and fundamental research, to

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provide consultancy services to industry and government and contribute to national and regional economic and social development. Governments increasingly regard universities, colleges, and public research laboratories as institutions that have to play a part in “creating wealth from knowledge” (Metcalfe 2010). In addition to their two missions of teaching and research, publicly funded universities have been charged by their governments with a “third mission” (Laredo 2007): to contribute to socioeconomic development. Some governments in Western Europe, for example, in the United Kingdom and the Netherlands, are even providing specific public funding to encourage universities in this third mission.

This third mission of the university is often interpreted mainly in the dimension of technology transfer and situated in the discourse about the entrepreneurial university (Rothaermel, Agung, and Jiang 2007). In this discourse, the emphasis is placed heavily on the economic and technology support function of the university, with the university contributing to knowledge-based innovations that are facilitated by technology transfer offices, and securing technology licensing arrangements with private businesses, setting up science parks, the formation of spin-off companies, and other “valorization” programs (Jongbloed and Zomer 2012). Thus, the entrepreneurial university in particular is generating tangible, monetary returns from its knowledge business. This trend specifically manifests itself in more intense university-industry-government relations.

Academic research on the university has addressed this shifting balance of university-business relationships and the trend toward the “entrepreneurial university” (Etzkowitz and Leydesdorff 1997; Slaughter and Leslie 1997; Rothaermel, Agung, and Jiang 2007). Multiple stakeholders become involved in the organization, management, and leadership of the university (Jongbloed, Enders, and Salerno 2008). This trend goes hand-in-hand with profound variations in how stakeholders view the purpose of the university in terms of their expectations, preferences, and assumptions and results in an increasing complexity of governance structures and processes. In essence, the university is increasingly becoming a type of hybrid organization (Anheier 2011).

The research questions guiding this study are: What have been the conditional factors triggering the hybridization of the university? How has this hybridization been characterized? What challenges and tensions has it produced? The main focus is on public universities in Western Europe.

In the following article, we identify the external and internal factors that affect universities and transform them into enterprising, nonprofit organizations that exhibit a hybrid character. In the context of this discussion, we explore the interaction between universities and the business sector, some manifestations of this interaction, and the efforts of policymakers to encourage such interactions. In particular, we focus on research collaborations between universities and the private sector. We conclude by highlighting
some of the challenges of the increased hybridization of universities, including challenges for research on university governance.

**External factors affecting the university**

Cooperation between the higher education sector and the private sector has focused on the European Union agenda for some time now. In its recent communication on the modernization of Europe’s higher education systems (EC 2011a), the European Commission (EC) has indicated a wish to strengthen the interaction between universities and the business world, thus stressing the role of universities as drivers of innovation. Such interaction is regarded as crucial in establishing a competitive economy in Europe. In particular, *technological* innovation is regarded as a key ingredient for economic and social development, and, thus, universities can assist in strengthening economic activities worldwide. This interplay may also contribute to tackling the grand challenges that the world is facing, such as environmental and energy problems. Another reason for strengthening innovation is that the global technical system is undergoing a profound transformation, based on information and other new technologies, such as biotechnology and nanotechnology. This transformation is changing our world and our societies.

Innovation has often been conceived of as a linear model, a “pipeline” in which fundamental, university-based research is applied through businesses and translated into new products (Bush 1945). Here Bush famously states that innovations “are founded on new principles and new conceptions, which in turn are painstakingly developed by research in the purest realms of science” (16). However, in today’s view, innovation is a much more uncertain and interactive process (Kline and Rosenberg 1986; Utterback and Abernathy 1975) where innovators draw on a wide range of knowledge sources and collaborators. Instrumental in this is knowledge exchange between different actors and new forms of organizations, known as “Mode 2” (Gibbons et al. 1994) or “triple helix” organizations (Etzkowitz and Leydesdorff 2000).

In this interactive view, the academic system is regarded as a part of an innovation system (Lundvall 1985), implying that universities are part of the larger *ecology* of knowledge-using and knowledge-creating organizations that interact in creating value. The idea of the innovation system stresses networks and the flow of technology and information between universities, enterprises, institutions, and people, which leads to a knowledge economy. There are regional, national, and international innovation systems, depending on the set of actors included. Gibbons et al. (1994) claim that the traditional mode (Mode 1) of knowledge production is gradually being complemented by a different mode (Mode 2) in which research problems are approached by a wider set of stakeholders and disciplines with frequent interaction between
users, producers, and brokers of knowledge. This interaction may have an impact on the research agenda of the university (Zomer, Jongbloed, and Enders 2010).

Policymakers who are concerned with the research university have targeted their policies and incentive schemes at knowledge diffusion in public-private partnerships in order to encourage the university to become more entrepreneurial and to interact more closely with the outside world. This action has increased the number of stakeholders that place a claim on the university and has challenged the university to respond to a wider set of expectations. Even if the government may still be the dominant stakeholder for public research-based universities, it has urged the university to become sensitive to additional stakeholders (Jongbloed et al. 2008).

In their efforts to support knowledge-based economic growth, the European policymakers have stressed a closer collaboration between universities and business organizations. The recent EU2020 strategy (Europe 2020 Flagship Initiative —Innovation Union) is a clear example (EC 2010). Across Europe, several grant schemes exist, on the one hand, to stimulate universities to valorize their knowledge and, on the other, to stimulate companies to make use of academic knowledge (Temple 2012). Thereby, governments try to stimulate academia and industry in bridging the gap between them and, thus, enhance innovation. They provide funding streams for universities to encourage their third stream (innovation-oriented-, commercialization-, and engagement-) activities.

The U.S. government introduced policies to foster the transfer of technology between universities and firms many years ago. The Patent and Trademark Law Amendments Act of 1980, commonly referred to as the Bayh-Dole act, allowed universities to retain the intellectual property from the federally funded research they perform. The Bayh-Dole act was promoted by the OECD as a recipe for the commercialization of university research, and the act was imitated by a number of national governments (Leydesdorff and Meyer 2010). The argument was that the act provided an incentive that did not exist previously for universities to seek private partners to invest in the development and commercialization of promising technologies emerging from academic research.

The common perception of European academic research is that it is lagging behind the United States in terms of contributions to technological advancement (Dosi, Llerena, and Sylos-Labini 2006). European universities are much less likely than their U.S. counterparts to own the patents on their scientists’ inventions, either because of lower incentives to patent or because of less control over their scientists’ activities. Looking at the statistics on university-owned patents might lead one to conclude that European academic scientists do not contribute effectively to the inventive activity taking place in their countries. To address this perceived problem, many European countries have introduced legislative changes and policy initiatives aimed
at pushing universities toward patenting. In combination with the tendency of business research and development (R&D) taking place more in networks and partnerships, these policies produce an institutional environment for universities that stresses their role in national, international, and regional innovation systems.

**Internal drivers and features affecting the university**

Having emphasized the role of external drivers (government policies, laws, private R&D trends) in shaping the role of universities, we now turn to some of the internal factors pushing universities to become more like hybrid organizations. Having to face these external and internal challenges, a hybrid organizational model emerges. One of its features is a closer interaction with business and other organizations in the private sector. We start by looking at the internal drivers and motivations for business-university interaction.

The motivation to engage more closely with the business sector does not just lie in external demands placed on the universities. Evidently, universities and businesses only collaborate when it is in their mutual interest. For the knowledge-intensive businesses, the major reasons for entering into collaborative agreements with universities are access to state-of-the-art knowledge and information, to university facilities, and to academic staff, as well as access to students as potential employees. Collaborating with universities enables such firms to reduce the transaction costs relative to pure market-based transactions. On the part of the firm, the transfer of knowledge from academia requires the absorptive capacity to do so. Hi-tech firms and firms with R&D departments are, therefore, more likely to collaborate with universities than firms that are less knowledge-intensive.

From the perspective of the university, the reasons to build partnerships with industry relate to the following (Jongbloed and Venniker 2001; Prigge 2005):

1. access to a source of complementary expertise and equipment—for staff as well as students;
2. access to sources of interesting and relevant new research problems;
3. a channel to provide students with experience in private research and to create a network for student job placement; and
4. access to a source of revenues.

Thus, interaction with businesses may contribute to a more effective achievement of the university’s objectives of teaching, research, and knowledge transfer and, in addition, has the potential to generate additional revenues. This last motivation is getting increasingly important because many governments in the current economic climate are reducing public funds allocated to the university sector.
In most higher education systems, the revenues that universities receive through contract research for clients from industry and the private nonprofit sector have increased rapidly in recent years, while the core funding that they receive from the public authorities for their recurrent expenses has decreased (CHEPS 2010a). In 2008, income from third party funds (i.e., all funding apart from core funds and student fees), on average, represented 21 percent of university incomes in Europe’s national higher education systems. This increase is up from 15 percent in 1995. It also partly reflects the universities’ success in seeking funds that have been made available through special public budgets aimed at encouraging universities to interact more with business and industry.

Today, most of the top performing research universities have a clear commitment to research commercialization and explicit valorization strategies. Often, royalties and other commercialization revenues are shared between the university, the research department, and the inventors. Depending on how the knowledge is valorized—by starting a new venture or by licensing the technology—the inventor may be rewarded by receiving part of the stocks of the new venture or a share in the profits of the license fee. In many cases, a part (often a third) of the net earnings is distributed to a patent fund, a part (another third) goes to the research institute or faculty, while the inventor receives the remaining part.

Universities as hybrid organizations

The more intense collaboration between universities and the business sector and the decreased funds per student in the higher education sector have meant that universities nowadays earn a substantial part of their revenues in the market, where they face an increased number of clients and other stakeholders. At the same time, universities experience a wider variation in terms of expectations, preferences, and performance criteria. They, therefore, have become hybrid organizations (Mouwen 2000; Anheier 2011), driven by two steering paradigms: governmental regulation and market forces.

In hybrid organizations, a governmental body (‘principal’) provides a budget for a number of well-defined tasks, which the organization (‘agent’) – in this case, the university – then executes. This steering mechanism is often referred to as “task steering”. At the same time, the university is being confronted by a market with clients that buy some of the university’s services for a particular price. The resulting revenues provide the university with “extra” income but also imply that the university is being confronted with the preferences of external clients. This process is frequently denoted as “market steering.” The university, thus, has two dominant but different steering mechanisms: task steering, through governmental regulations, and market steering, through prices charged to clients.
A hybrid university has to combine the two steering mechanisms and balance its objectives of teaching, research, and service to society. This poses challenges to universities in terms of their objective function. In terms of the condition that Anheier applies to hybrids (Anheier 2011), the goals of the university may not collapse into a dominant directive of preferences. The university may be driven by different logics of private as well as collective actions. In a for-profit organization, it is quite clear what the key variable—or objective—in the strategy should be: profits, that is, revenues minus costs. Defining a similar objective in the case of the not-for-profit university has given many economists food for thought. Is the objective prestige (Garvin 1980), endowment (Hoxby 1997), faculty satisfaction (James 1990), or something else?

Building on insights from the nonprofit sector, Massy (2009) conceptualizes that universities aim to balance their objectives with their resources. Universities try to maximize their task-related objectives, such as excellence in teaching activities or the creation of knowledge, while being constrained by financial resources as determined by the market—tuition fees, available government funding, and industry funding. Consequently, he claims that universities have to be simultaneously "mission-centered" and "market-smart" (Massy 2009). Without being market-smart, a university would not have resources to pay attention to its main objectives.

This hybridity is particularly evident in the area of university finances and the degree of decentralization the university allows for its schools and faculties in financing issues. Decentralization is highest if the university’s central administration is devolving the generation of revenues and the determination of expenditures to its constituent schools and departments. Such a market-oriented approach may be adopted in order to encourage the university’s schools and departments to generate additional revenue and to spend it in the way these units see as most effective. In this approach, the central administration enables its academic units to act in an entrepreneurial way. Obviously, the degree of decentralization granted to schools and faculties depends on the overall (i.e., national) legislative framework for universities, particularly when this relates to issues of autonomy in the areas of financing, human resources, and academic matters (CHEPS 2010b).

In order to observe, on the one hand, the university’s objective in terms of teaching and basic research and, on the other, encourage the university to generate external revenues and meet the expectations of its nongovernmental stakeholders, a hybrid steering approach is necessary. Massy (1996) has sketched one such hybrid governance approach, where most expenditure decisions (but not necessarily all) are decentralized, and some revenue streams are devolved. The revenue streams that are not devolved focus on the core activities of the university as a task organization in terms of undergraduate teaching. The devolved revenues derive from master-level and other postgraduate teaching, as well as contract teaching, contract research
for industry, research council grants, licensing income, and other work for industry. This hybrid approach encourages entrepreneurship but in a controlled way. The universities portrayed by Burton Clarke (1998) in his book on the entrepreneurial universities seem to exhibit such a hybrid character, combined with high degrees of entrepreneurship and, indeed, intrapreneurship.

In regard to the objective function of the university, we conclude that cooperation with industry can enter the equation on either side: as an objective or as a constraint. It is an objective if innovation-oriented research and commercialization of research are seen as part of the core mission of a university and the university is willing to invest its resources, if needed, into developing this area. Cooperation with industry can enter the objective funding on the constraint side if it is a way to gain additional resources that could be reinvested into core activities, such as more fundamental academic research or teaching excellence. Following the framework suggested by Massy, cooperation with industry is taken equally serious in both cases, as it works for the same goal. Thus, one university may define its mission by linking up with businesses and commercialization activities. Another university may see commercialization rather as a means to build a strong academic research base. The two universities then probably will make use of different approaches to govern their university-business interactions. In the first case, a more decentralized approach may be in place, while in the second, there is probably a stronger strategic core in the university’s center. So far, there is no evidence available to suggest that either of the approaches is dominant.

**Consequences: Knowledge transfer and university-industry interactions**

The degree to which one can observe a more or less intense interaction between universities and industry partners in different countries and universities depends on the extent to which government pushes this task, on the one hand, and, on the other, the market pulls for greater interaction with the university. Before looking more closely at the public-private partnerships that result from this push-and-pull dynamics, we first take a look at the types and channels through which these interactions and partnerships manifest themselves.

Universities of all types (ranging from comprehensive research universities to specialized institutions and teaching-oriented universities of applied sciences) are engaging in various types of partnerships and different forms of knowledge exchange with businesses, communities, and other stakeholders. We present here some examples of university-business interactions in order to better understand what is at stake in the various relationships.

Efforts undertaken by universities to transfer their knowledge and technology to the private sector where it can be put to work is often referred to as “technology transfer” (TT). Traditionally, TT is primarily concerned with
the management of intellectual property (IP) produced by universities. TT includes identifying, protecting, exploiting, and defending intellectual property (OECD 2004). Universities often operate technology transfer offices (TTOs), which are units that liaise with industry and assist academics in the commercialization of research results. TTOs provide services in terms of assessing inventions, patenting, licensing IP, developing and funding spin-offs and other start-ups, and approaching firms for contract-based arrangements.

TT is less broad than knowledge transfer, as the latter refers to the process by which the knowledge, expertise, and intellectually linked assets of higher education institutions are made available beyond higher education for the wider benefit of the economy and society. Knowledge transfer takes place through two-way interactions with businesses, the public sector, and cultural and community partners (Holi, Wickramasinghe, and van Leeuwen 2008). Knowledge transfer (or knowledge exchange) also includes forms of transfer other than those requiring strong IP protection. The mechanisms and manifestations of knowledge transfer between universities and private actors include networking, continuous professional development, consultancy, collaborative research, contract research, licensing, spin-outs, as well as ordinary teaching activities (cf. Holi et al. 2008). These activities demonstrate that multiple channels and interactions are at work between the three sectors of the “triple helix” comprising universities, business, and government (Etzkowitz and Leydesdorff 2000). Along these channels and networks, higher education institutions develop relations with a variety of potential stakeholders and clients, such as entrepreneurs, consumers, policymakers, regional actors, and so forth.

One of the results connected to knowledge transfer is the creation of spin-off companies—a phenomenon that has received considerable attention from policymakers in the past 15–20 years (Rothwell and Dodgson 1992; Bozeman 2000; Zomer et al. 2010). Spin-off creation is a prominent strategy of many research universities. For the implementation of this strategy, universities have science parks, incubator units, TTOs, small business development centers, and on-site commercial research institutes. Out of 200 European universities recently surveyed, 86 percent had a TTO, and more than a third had created ten or more spin-off companies.

The channels for knowledge exchange between universities and other actors include four main interaction forms:

1. texts (scientific, professional, and popular texts);
2. people (including students and researchers);
3. artifacts (including equipment, protocols, software, new materials, modified organisms, artistic performances, films, and exhibition catalogues); and
4. money.
In combination, these interactions cover a broad spectrum of activities, some having significant financial objectives and drivers, others less so. Knowledge transfer through people often takes place through networks, continuous professional development (CPD) training courses, and research contracts.

Money flows are an important channel, next to texts and people. Money is a way of valuing the knowledge transferred through contract research, consultancies, and IP commercialization. In their study for the European Commission, De Dominicis, Pérez, and Fernandez-Zubieta (2010) show budget data for a sample of the 200 most research-active universities in 33 European countries. They reveal that, on average, 56 percent of the total university budget derives from the national government in the shape of recurrent (i.e., core) funding. Government, thus, is the main source of funding for European universities. Another 13 percent is from national public competitive sources, such as research councils. Industry and nonprofit organizations, respectively, contribute 6 percent and 3 percent of the budget, and approximately 2 percent originates from abroad. The remaining 20 percent derives from a large mix of sources, including student fees and fees for services and public contracts. Interestingly, the study illustrates that universities with a high degree of autonomy have the most diversified budget. Most of the institutions with a highly diversified budget are located in the United Kingdom (EC 2011b).

Highly autonomous universities are able to emphasize the degree to which—and the channels through which—they choose to interact with industry. If forces (regulations, market forces) are at work that make universities more responsive to the needs of industry, it may be expected that:

1. a higher share of the university’s publications is aimed at a professional—instead of a more academic—audience;
2. that they have more academics that collaborate closely with industry (and maybe have, or have had, a part-time job in industry);
3. that there are more artifacts (in the shape of research-based materials and services) being produced; and
4. that they generate a higher share of their financial revenues from the business sector.

Consequences: The proliferation of public-private partnerships

The numbers on university-industry engagement show that, compared to other regions such as the United States, the European Union has a lower level of direct commercialization of scientific output by its universities. This has led the European Commission (EC) to call for strengthening knowledge transfer in public-private partnerships, including R&D collaborations between public universities and private companies. The strengthening of such partnerships is believed to be vital both for the output of the universities’
academic research and for continued innovation. University-industry research partnerships are an example of a public-private partnership (PPP) where both partners are mutually committed to reaching a common R&D goal by pooling resources and/or coordinating activities (PCAST 2008). Examples in Europe are the Joint Technology Initiatives and the Framework Programs of the EC. Individual EU member states have promoted cooperation with industry as a key dimension of the third mission of universities in support of research-based innovations. In many countries, policymakers have pointed out public-private partnerships between universities and businesses as a key research and innovation policy issue for a decade at least.

Among other contributions, PPPs produce new knowledge, partly published in texts and articles and partly embodied in people and new technologies (including protocols, prototypes, and other artifacts). PPPs are networks that may be characterized by their membership and the boundaries they span, the geographical proximity of the partners, and the level of formality of the collaboration. An important feature of these networks is the capital, personnel, and funding resources acquired and/or exchanged by participants. Such partnerships have a variety of forms, not all of them very firmly institutionalized. Some industries and academic environments (and their disciplines) have, for a long time, had very close ties, whereas interaction is infrequent in other areas. Traditions for interaction in different sectors often reflect national and/or regional specializations.

PPPs are working across a large variety of scientific and technical fields. This variety has an impact on what these PPPs do, how they do it, and, ultimately, what they produce in terms of outputs and their overall contribution to the potential of the national innovation system. After all, promoting PPPs is expected to contribute to the increased impact of science on society.

An interesting example of a PPP is found in the Netherlands. Here, leading technological institutes (in Dutch: Technologische Top Instituten)—or LTIs—were launched in 1997. These are PPPs created to stimulate research cooperation and innovation in areas that have a strong counterpart in the Netherlands’ manufacturing base. The LTIs are cofunded by government and industry. Universities and semipublic research institutes cooperate with private companies in such LTIs. Four such institutes have been in operation since 1998 and another four were added later on. The first four LTIs were evaluated in 2002, and the findings suggested that LTIs constituted a successful model that should be continued in the years ahead. The public subsidies to LTIs, therefore, were continued after the first ten-year period, and funding for additional LTIs was made available from a number of ministries.

In an OECD report, the LTI model was presented as a best practice that might be considered by other countries (OECD 2004). However, critics have suggested that the LTIs are based on an outdated model and are operating
in a rather closed (inward-looking) fashion, leaving little room for small- and medium-sized companies to cooperate. They would need to be more client-driven, instead of technology-driven (Berkhout and Sistermans 2006; van Beynum 2006). The idea of creating additional LTIs that were oriented more toward the intersection between social sciences/humanities/law research and user groups in society (including government departments) was promoted by the Innovation Platform, an advisory body for the cabinet. For this, the concept of societal top institutes (Maatschappelijke Top Institu- ten) was launched; the name suggests that this type of institute is oriented toward social themes and social innovation, instead of solely toward technological innovation. In 2005, the minister of education made funds available to support three societal top institutes in the fields of pensions/aging, urban innovation, and international law.

The latter discussion touches on the effects that the proliferation of PPPs may have on the frequencies of hybridity and varieties of its organizational forms in the higher education system. More intense interactions between universities and private enterprises may lead to a blurring of established sector boundaries in terms of responsibilities, oversight, behaviors, and outcomes, not least by pointing to the increasing connections between a view on technological and social innovation.

Looking at PPPs from the perspective of industry, we see large multinational companies utilizing research partnerships with universities to help drive innovation, either by directly funding research or by collocating research centers on or near university campuses. For example, Intel has established university research centers at Carnegie Mellon University; the University of California, Berkeley; and the University of Washington Seattle; while the Microsoft Research Laboratory has established satellite facilities globally in China, the United Kingdom, and India. This trend goes hand-in-hand with many industries shifting away from research or outsourcing their R&D (e.g., Bell Labs and XEROX), with some eliminating their core research and laboratory facilities and relying more on an “open innovation” type of R&D model (Chesbrough 2003) that allows them to tap into the worldwide pool of potential researchers and problem solvers who can identify innovative solutions to emerging problems.

These findings point to a complex division of labor in the production and use of knowledge. The innovation system (innovation ecology) consists, on the one hand, of universities, publicly funded research organizations, and research laboratories that play a central role, particularly in relation to the generation and dissemination of fundamental scientific knowledge. On the other hand, there is a variety of more applied public sector institutes and laboratories, as well as a wide range of privately funded laboratories, ranging from those concerned with fundamental research (e.g., the Max Planck Institutes system in Germany) to private, science and technology consultancy
firms that are an integral part of the knowledge-intensive private services sector. In addition, there are the complementary activities of firms with R&D facilities and the laboratories of other knowledge generating organizations, such as research hospitals (David and Metcalfe 2007).

There are approximately 4,000 higher education institutions across the EU, and at least 600 other public research laboratories whose activities are divided between applied and basic research. In the past three decades, Europe has seen quite a few new universities and research laboratories being established, while large changes in the composition and mission of public research organizations also have taken place. Many universities have experienced increasing financial pressures and have gone through governance reforms that have distanced them from the government and forced them to rethink their strategic purpose carefully. This move has put some universities in a difficult position—particularly now that their funders expect them to play a more effective role in the country’s innovation system.

At the same time, we can witness a decline of corporate fundamental R&D labs and the emergence of new areas of science with potentially strong commercial potential (e.g., biosciences, material sciences, nanotechnology). These developments, along with the increased internationalization of the R&D activity of large multinational firms, provide opportunities for universities to engage more intensely with the business sector and to gain a strong position in the innovation system. This position may bring universities interesting new revenue streams and underline their role in the innovation ecology.

What is clear is that in today’s knowledge economy, the innovation system is undergoing a rapid reconfiguration, with new connections and new system components (e.g., PPPs) being shaped, and the roles of traditional ones (e.g., research foundations) being redefined. With the dominant themes being networks, interaction, and connectivity, the boundaries between the public and the private spheres are becoming increasingly blurred—sometimes as a result of deliberate government policies, and sometimes as a result of spontaneous market processes.

Discussion: Organizational and institutional barriers and tensions

While knowledge transfer and university-business connections are high on most university agendas, barriers to strengthening such knowledge interactions still exist. An important barrier is connected to the prevailing systems of performance evaluation and rewards in academia. An academician’s chances of getting a salary increase or tenure is often dependent on his/her research production in terms of refereed publications or the volume of competitive grants brought in from research councils. Academics accordingly may feel that research commercialization is not a part of their job. In addition,
many scientists may be unaware of the commercial potential of their research findings, while others lack the required entrepreneurial skills and attitudes to develop their concepts and ideas further into products or prototypes.

In contrast, increased university-industry interactions, as well as the overall increase of innovation-oriented project funds, have led to a situation where universities are increasingly responding to demands originating in society. External clients nowadays drive part of the university’s research agenda. In addition, the research assessments taking place, for example in British and Dutch universities, pay more attention to the societal impact and economic relevance of academic research.

One of the barriers to interaction between universities and industry results from different views on the sharing of research as well as on the research agenda. A tension exists between a focus on open dissemination of knowledge in universities and the desire for the protection of know-how in industry (Dasgupta and David 1994). Protection—which includes delays in publication, partial dissemination of research results, or strict conditions on access to research materials and technology by other researchers—helps industry safeguard the commercial value of the products and processes eventually resulting from research-based inventions. Academic researchers, however, are hesitant to accept requests to keep research results partly or temporarily secret. Such practices often run counter to the scientific norm of free disclosure, a norm that has contributed to research quality, to the dissemination of knowledge, and to the prevention of wasteful duplicative research.

A second tension between universities and industry concerns the research agenda. Profit-oriented firms may favor applied research over fundamental research because the benefits of the former are easier to appropriate. When universities substitute short-term applied industrial research for fundamental research because of close ties with industry, it may hamper their long-term research productivity, diminish spillovers from academic research, and, eventually, even harm long-term national innovativeness.

Zucker and Darby (1998), however, suggest that closer ties to industry do not necessarily deter basic research carried out by academic researchers. In fact, commercial activities of top researchers may even increase their scientific productivity. They find evidence of this mechanism for top researchers in the field of biotechnology. Top university researchers who perform research and collaborate in articles with employees in firms in their region produce significantly more articles. A study by Zomer et al. (2010) also confirms that the interaction between universities and their spin-offs is generally not detrimental to the academic freedom of researchers.

Concerns over distortion of the academic research agenda and the disclosure of research have been studied in academic fields such as medicine and life sciences (Blumenthal et al. 1997; Thursby and Thursby 2007). Some indications were found that withholding of research results and publication
delays were, indeed, significantly associated with participation in academic-industry research relationships. The evidence is still indecisive on where the increased public-private interactions and the emerging hybridity will take academia, and whether (and, if so, how) barriers to such partnerships should be removed.

Concluding remarks

In this article, we shed some light on the trends and drivers of the university’s transformation to a hybrid organization. We have pointed first at some of the external factors triggering hybridization. Based on evidence from Europe, we have seen that, partly because of financial need and government policies aimed at encouraging public-private research collaborations, academia is getting increasingly interwoven with a multitude of stakeholders. These external factors have led to a more intense interaction between universities and their external partners—notably industry. Next to these external forces, internal forces, such as access to complementary expertise and resources, are driving academicians themselves to engage in knowledge exchange with businesses and other parties. Despite a number of barriers standing in the way of these public-private interactions, this combination of external and internal demands is contributing to an increased hybridization of the university. It implies that the university is facing persistent multiple stakeholder constellations with interests of nearly equal weight but potentially divergent directions. For the university, this may result in tensions and difficulties as it implies having to deal with multiple objectives. The challenge is to balance different missions and deal with seemingly incompatible demands in terms of responding to government and market forces.

The explanatory potential of this study of hybridity in universities is limited by the fact that it is based on theoretical considerations and secondary data. Targeted efforts are needed to test empirically its conceptual and practical conclusions further; some potential research questions are highlighted in the following.

Governance arrangements in the higher education sector will have to be adjusted as a result of hybridization. Understanding the effects of the emerging network governance arrangements triggered by public-private partnerships (PPPs) and the increased business orientation among universities will most probably be a rich area for research in higher education. How shall governments deal with hybridity developments in higher education? What governance arrangements and policy styles are emerging at the macrolevel? What leadership challenges does hybridity pose to the university at the meso- and microlevels? How can the university find a good fit to its environment and become accountable to multiple stakeholders in different legal frameworks, including in PPPs?
In addition to advancing the theory on hybridity and the specific governance issues involved, such investigations are relevant for enhancing practical conclusions. For academicians, hybridization produces a tension between open science and optimizing the commercial potential of science. For governments increasingly interested in improving the competitive position of their economy (or of the EU area as a whole), the concern is about stimulating connectivity and facilitating bridges between universities and firms. These questions challenge governance issues in terms of dealing with multiple stakeholders strategically, building coalitions, and settling contracts and demands for accountability. The increased interaction between the university and its many stakeholders has raised both concerns and expectations. The evidence on the advantages and disadvantages of research commercialization and PPPs is still indecisive. Studying the drivers and effects of increased hybridity in higher education will be highly relevant, particularly now that the third mission of the university is becoming more important with entrepreneurship incentives and the introduction of PPPs into academia.

This article has tried to illustrate that the relationship between the university and its external stakeholders is not a simple one-way process of universities serving customers and putting their academic research into practice – for instance, with industry exploiting academic knowledge. Instead, the relationship is a two-way process in which some of the inspiration for the groundbreaking fundamental research taking place in the university is derived from practice – in a kind of exploration activity. Thus, exploitation and exploration pathways may exist alongside each other. The challenge for the hybrid university is to shape opportunities that allow this exploitation and exploration to build upon each other by drawing from a richer body of cognitive distance (Nooteboom and Stam 2008, 358).

While hybrids have typically more complex governance problems, hybridization induces new management styles and new ways of accountability toward multiple stakeholders. It also opens new opportunities for organizational innovation and may alter the organization’s position in the innovation ecology. Whether innovations in these fields ultimately prove beneficial for the overall performance and impact of universities remains to be explored.

References


