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# Universities as strategic actors: limitations and variations

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## Introduction

Recent changes in the funding and governance of universities and research organizations in a number of countries have led many to imitate the formal structures and planning procedures of business corporations. These changes have been especially marked in the public higher-education systems of continental Europe and Japan, where many states have decentralized some administrative and financial authority to universities as separately accountable organizations [1–3]. These shifts in university governance have often been accompanied by an increasing emphasis on the commercialization of academic research in some countries and some sciences, most notably in the biomedical fields in the U.S.A. [4–6], and on the university becoming the central agent in managing such commercialization processes. Many universities have established technology licensing or transfer departments, and become actively engaged in commercializing research results. Such changes have encouraged the view that universities are becoming more like firms in developing distinct entrepreneurial capabilities and some strategic autonomy [7–9].

However, the extent to which universities and similar organizations dedicated to the production of publicly certified knowledge could become strategic actors in a similar sense to firms in competitive markets is limited by inherent characteristics of public scientific knowledge production and dissemination. It also varies between differently organized public science systems, as well as being affected by broader features of political economies such as the nature and role of the state and the dominant institutions governing labour markets [10, 11].

Such limitations and variations raise questions about what kinds of strategic actors universities could become in different societies, and how they could develop distinctive organizational capabilities in research and teaching. As a contribution to dealing with these questions, in this chapter I outline the major factors that limit universities' ability to function as independent strategic actors with unique organizational capabilities, and then explore how we can understand the key factors affecting their varying autonomy and 'organizational actorhood' [12] in different societies within these limiting conditions. First, I summarize the major reasons why universities competing for intellectual prestige are unlikely to develop organization-specific competences in managing their core activities. Next, I contrast four ideal types of universities as distinct organizations, and finally consider the major factors that are likely to affect the extent to which universities develop

distinctive strategic capabilities and autonomy from both states and scientific elites in different societies.

Essentially, I argue that universities competing for prestige and resources on the basis of academics' contributions to public knowledge are highly restricted in their ability to develop organization-specific competences that could enable them to act strategically and confer competitive advantages. At most, they could function like investment banks, allocating and managing resources amongst competing project teams. Their development of strategic autonomy depends greatly on state policies and the availability of resources from a variety of different agencies and activities, including commercialization revenues. However, the more that they seek to gain such independence by raising revenue from their intellectual property, the more they risk losing their charitable status and public support, including privileged access to research materials.

## The limited strategic actorhood of universities

When considering how universities could become particular kinds of strategic actors, it is obviously important to clarify what is meant by this term and how we could decide in what respects they are indeed similar to organizational actors in competitive markets. Broadly speaking, firms become strategic actors in market economies on the basis of their ability to generate distinctive services from human and material resources [13]. It is the development of collective capabilities through the authoritative co-ordination and steering of economic activities, and generation of joint problem-solving routines by mobilizing employee commitment, that are crucial for firms to be able to compete effectively as separate strategic actors [14,15]. This implies that legally constituted companies may not actually function as distinct strategic actors in this sense if they lack collective capabilities that are both specific to the firm and embedded in organizational processes and understandings.

For universities to become strategic actors with distinctive organizational capabilities and knowledge, then they would have to develop two sets of collective capabilities. First, to exercise discretionary authority over the acquisition, use and disposal of human and material resources; and secondly to generate particular kinds of problem-solving routines and knowledge that are organization-specific. Creating such enterprise-specific capabilities would require researchers to share their intellectual goals, resources and knowledge in the joint pursuit of organizational purposes, as distinct from those of individual research groups and scientific fields.

The limited ability of universities to generate such collective capabilities is exemplified by private research universities in the U.S.A., which are some of the most autonomous and administratively integrated of public research organizations. Academics are employees whose conditions of service are largely decided by each university and, in theory, the organization of departments and faculties is a matter for each institution to determine on its own. These powers have enabled many universities in the U.S.A. to establish organization-specific procedures for reporting inventions, evaluating research and teaching performance and implementing other accountability mechanisms [16]. Such autonomy allows them



to make discretionary investments in particular fields, establish different kinds of departments and faculties and promote novel kinds of interdisciplinary co-operation. They are also able to engage in different kinds of activities so that they are much less standardized and homogenous in their teaching programmes and research specializations than their equivalents in more state-dominated systems [17].

However, these kinds of strategic choices are more similar to those of holding companies and investment portfolio managers than entrepreneurial decision-making in more authoritatively integrated and directed work organizations. In particular, they rarely, if ever, systematically plan, co-ordinate, continuously monitor and improve research and teaching activities to achieve collective goals by combining specialist skills and knowledge in particular ways. They therefore do not develop organization-specific problem-solving skills and knowledge to carry out their core activities more effectively than their competitors.

The very limited co-ordination and direction of research activities by universities stems from the inherent uncertainty of public scientific research and the prevalent, if not dominant, role of scientific communities composed of researchers around the world in establishing research priorities and evaluating the merits of different research results [18,19]. While the extent of such international reputational control of research goals and evaluation standards varies between fields and over time [20], universities competing for scientific renown on the basis of their employees' intellectual contributions have to accept the collective judgements of competent researchers throughout the world concerning the nature of important problems and the significance of outputs.

As employers, then, universities have limited discretion over the kinds of skills and knowledge they recruit when they seek to contribute to particular scientific fields, and over the intellectual priorities to be pursued by research groups. Equally, they are usually only able to assess the performance of employees second-hand and have to rely on the collective judgements of external researchers as evidenced through citations, scholarly association prizes and other indicators in assessing the worth of researchers' achievements. The ability of research organizations to: (i) determine collective objectives; (ii) organize the division of scientific labour; (iii) ensure collaboration and integration of work activities to achieve organizational goals; and (iv) evaluate work performance, is therefore highly constrained in the public sciences. As a result, they are unable to develop distinctive organizational capabilities on the basis of such collective co-ordination and direction.

This dependence of universities on the verdicts of specialist scientific communities is, of course, partly generated by the pervasive uncertainty of scientific research. Since knowledge claims in the public sciences have to be innovative to become published and accepted as valid contributions, organizations devoted to the generation of scientific knowledge are incapable of planning research projects to produce specified results beforehand. Such uncertainty about outcomes is intensified by the highly tacit and often weakly standardized nature of most research technologies. Materials and equipment have to be actively constructed as standard entities that can be expected to behave in the same way in different laboratories, as in the case of monoclonal antibodies [21].

Such pervasive uncertainty about both cause–effect relationships in knowledge production and uncertainty about the meaning and significance of results, which often extends over considerable periods of time as they are re-interpreted and re-evaluated in changing contexts, greatly restricts the ability of university administrators to co-ordinate and direct research activities in the public sciences. Since researchers themselves often do not know how their work 'succeeds' or 'fails', and typically are unsure what outcomes will eventuate in any precise sense that could enable them to be integrated across projects and groups in a reasonably reliable and predictable manner, systematic planning of research activities to achieve collective organizational goals would seem quite quixotic in most fields.

These limitations on the ability of universities as employers to organize and direct particular divisions of scientific labour and integrate resulting outputs around specific organizational purposes mean that they are rarely able to develop distinctive capabilities in carrying out their core activities. As putative strategic actors, then, they may develop some organization-specific problem-solving routines in managing resources, attracting high-quality staff and students, and raising funds through the employment of managerial professionals to carry out these tasks [22], but these competences rarely extend to the management of research and teaching activities. In most sciences and in most research universities, effective research skills and knowledge about how to select and conceptualize problems, develop appropriate research strategies and techniques, and organize project teams remains firmly located at the specialist and small group level, and employers are restricted to facilitating such groups' activities rather than systematically organizing them.

Insofar as organizational actorhood is understood to imply unified central authority over the design of work processes, the co-ordination of their outputs and the development of collective capabilities for dealing with problems, adapting to change and seizing entrepreneurial opportunities through mobilizing the commitment of skilled staff, it is unlikely to be achieved in most research universities in the OECD (Organisation for Economic Co-operation and Development) economies. Rather, as they develop greater autonomy from the state, they could become more similar to portfolio managers who decide to make strategic investments in particular project teams and scientific specialities. However, their authority over such teams and their ability to evaluate performance are typically much less than in most investment companies.

## Variations in the strategic actorhood of universities

Within these limitations on universities developing distinctive organization-wide competences, there remain major differences in the extent to which, and ways in which, universities exercise authority over resource acquisition, use and disposal in different countries. These variations continue to affect how they respond to recent changes in their environments and become particular kinds of organizational actors [12,19]. Despite the general tendency of states coping with the effects of mass higher education and diversification of institutional goals to reduce direct



state control over university operations, significant national differences in the cohesion and autonomy of universities remain [2,23] and continue to affect their ability to act strategically.

The major differences in the kinds of universities that are developing as separate organizational entities in different nation states can be explored through the comparison of four ideal types. These vary in their ability to exercise authority over inputs and outputs, as well as internal processes, independently from state agencies, on the one hand, and scientific elites, on the other hand. A particularly important difference concerns their role as employers of academic staff and in establishing organizationally specific employment policies and practices. The key characteristics of these ideal types are summarized in Table 1 and will now be further discussed.

Beginning with the two variants of 'hollow organizations', these have little or no discretionary control over resources, employment policies and internal academic structures. Most of their financial and administrative decisions are made by state agencies, whereas academic matters are usually decided by the professors in charge of faculties and institutes. Such universities have limited freedom to shift resources between activities, subject areas and services, let alone to establish new areas of research and teaching or to close existing ones. Since academics are state employees, as often are most other staff, universities are unable to vary employment practices and sometimes cannot decide who should be appointed or whether they should be promoted.

The main difference between the two kinds of such hollow organizational types identified here concerns their relative independence from the state and the ability of scientific elites to exercise independent and collective influence over intellectual reputations, research goals and employment decisions. The first type, 'fragmented' universities, are simply arms of the state, with little or no discretion over teaching programmes, student selection, resource acquisition, staff recruitment, allocation or mobility, and the management of facilities.

An example of a higher-education system that shares many of these characteristics is that of post-war Japan [3]. In his account of Japanese science, Coleman has suggested that:

> *"national university faculties in Japan find themselves in the lower ranks of a chain of command under the Ministry of Education. Various academic self-governance mechanisms obscure the relationship, but at its core are the Ministry's power of financial decision making and its assignment of administrative staff to each national university"* ([24], p. 122).

In the second, bifurcated variant of hollow organizational types, such state dominance over academic curricula and resources is counter-balanced by greater academic influence, especially over appointments, promotions and educational programmes. Here the university remains weak, both as a source of collective identity and commitment and as a decision-making entity, and does not directly employ its academic staff.

Decisions in these kinds of higher-education systems are taken either by national or regional government Ministries or by academic elites, reflecting

**Table 1**

| | Hollow organizations | | Employment organizations | |
|---|---|---|---|---|
| | Fragmented | Bifurcated | State-chartered | Market-based |
| Discretion over resource allocation | Very low | Limited | Some | Considerable |
| Discretion over employment decisions and policies | Very low | Limited | Some, within state framework | Considerable |
| Dependence on state funding | High | Considerable | Considerable | Varies |
| Discretion over student selection, degree programmes and assessment | Low | Limited | Considerable | High |
| Discretion over organizational structures, establishing and closing departments | Low | Limited | Considerable, within state framework | High |
| Dependence on scientific elites in establishing research priorities and performance standards | Considerable, but shared with state agencies | Considerable | High | High |

**Characteristics of four ideal types of research universities as strategic actors**



collective scientific judgements, but rarely by university administrators who are squeezed between these groups. Budget setting, administrative routines and resource allocation processes are usually determined by the state without much, if any, scope for university variation, and disciplinary identities, reputations and elites largely determine scientific careers, goals and rewards. Whereas some such universities may have a more distinct organizational identity and elaborate administrative apparatus than fragmented ones, as Musselin [25] suggests was the case for German universities in comparison with French ones, their capacity for independent strategic action remains severely constrained [26].

Next, considering higher-education systems in which universities and similar organizations are able to employ academics directly, states often grant them some discretion over resource allocation, curricula development, student selection, assessment and academic structures as well. However, there are considerable differences in how much autonomy universities have from state agencies and other external groups such as funding bodies, on the one hand, and from scientific elites and internal faculty leaders, on the other hand.

For analytical purposes in distinguishing degrees and types of strategic independence and action, we can identify two ideal types of universities as employment organizations: 'state-chartered' and 'market-based'. While both are able to hire academic staff and determine their own promotion and other reward policies, as well as having some discretion over their internal structures and procedures, they vary in their capacity to control inputs and outputs independently of state agencies, including entering and exiting particular 'markets' such as those for medical and law experts, set tuition fee levels and determine financial policies, and to develop and implement different academic strategies in different ways.

State-chartered universities are authorized by the state for particular purposes and under certain conditions. In these kinds of higher-education systems, the state effectively decides which organizations shall be entitled to function as universities, their resources, powers and responsibilities, as well as establishing mechanisms of academic and financial accountability. While being formally separate organizations, with their own governance structures and powers to award degrees, hire staff, organize activities and manage facilities as they see fit, universities nonetheless have to do so within the general framework of the state higher-education system and conform to its standards and policies. Their charters have to be approved by the state, as do any changes to these, and *in extremis*, they could be withdrawn.

Such state supervision is usually reinforced by the dominant role of state funding, which enables governments to influence curricula and accounting procedures directly and insist on standard mechanisms for evaluating quality and achieving national goals. Additionally, through the growing use of project-based funding of research at the expense of block grants, state agencies are also able to affect intellectual priorities and criteria for judging research performance, especially since the establishment of research evaluation systems in many countries [27].

Market-based universities, in contrast, are much more independent of state tutelage and state licensing. In principle, though by no means always in practice [6,28], market entry and exit are unrestrained by state ministries, so that tertiary education and published research can be provided by any organization wishing to

do so without being required to obtain formal state approval. Many market-based universities are free to employ whom they like on whatever terms they wish, and their managers have the same powers to organize and direct research and teaching activities as those in charge of profit-seeking private companies. Indeed, for-profit universities can be, and sometimes are, established in such societies, although these are usually focused on large-scale teaching of relatively low-cost subjects with clear practical benefits for their graduates.

In terms of being able to determine their own destinies with their own resources in a competitive environment, such market-based universities are clearly able to act strategically and potentially develop distinctive organizational routines and capabilities in diverse ways. In the late 20th Century U.S.A., for example, some ambitious universities that lacked the resources and prestige of the top research universities differentiated themselves from the traditional discipline-based model by pursuing interdisciplinary strategies for 'creating the future' [17]. This kind of higher-education system tends, then, to contain a much more heterogeneous and varied set of organizations than that found in the other three types discussed here [29].

However, this freedom of strategic action for research universities is constrained by scientific elites, on the one hand, and by funding agencies, on the other hand. Both state-chartered and market-based universities competing for intellectual prestige through the contributions of their staff to scientific goals have to share authority over their primary activities with national and international scientific communities that collectively and over time decide what is worth studying, what the competences required for doing so effectively are, and what the significance and worth of research results is.

Indeed, Geiger [30] suggests that the growth of research universities in the U.S.A in the early 20th Century involved the delegation of much decision-making authority to departments who increasingly relied on the judgements of large disciplinary communities in making appointments and promotions. Intellectually ambitious university presidents came to rely more and more on scientific reputations when allocating resources, and so helped to establish a national academic labour market in which specialized departments competed for the most renowned scientists in their particular disciplines.

In this most 'market-like' university system, then, considerable local autonomy and hierarchical control, which had characterized many 19th Century colleges and universities, became substantially replaced by more collegiate and discipline-based authority relations, in which strategic choices focused on how to compete for the best researchers and obtain the funding to provide them with the best facilities. Such competition for scientific prestige also led to greater standardization of graduate training and certificates, as many universities sought to emulate the leading organizations [28,30].

Consequently, although both state-chartered and market-based types of universities have more autonomy from the state in obtaining and allocating resources than their more hollow counterparts, they are equally constrained by disciplinary judgements. They are also limited in their ability to generate organization-specific capabilities through the systematic co-ordination of work activities by their pursuit of scientific prestige in diverse specialisms. As long as they rely on national and international reputational systems for establishing research priorities and evaluating performance, the ability of employment organizations to develop high levels of employee commitment to the development and improvement of organization-specific competences remains lower than that of most private companies.



Such constraints do not, of course, apply to nearly the same extent to staff recruited to undertake more university-specific goals such as improving student support services and fund-raising. The employment of such managerial professionals by universities has expanded considerably in the U.S.A. and some other countries in recent decades [22], and, in principle, allows them to develop similarly organization-specific capabilities and problem-solving routines as those generated by professional service companies.

## Societal influences on the strategic actorhood of universities

The extent to which research universities in a society come to resemble any of these four ideal types depends on a number of features of their environment; notably, of course, the structure and policies of the state and the organization of the public science system [10,31]. In most industrialized societies, the state controls the formal status of universities and specifies the conditions under which they can award qualifications, recruit students and offer programmes of study. States also provide the bulk of the funding for teaching and research activities, and establish particular procedures for allocating such resources and evaluating their use. The extent to, and ways in, which they delegate control over activities and funds to variously constituted university administrators and scientific elites vary considerably between nation states, resulting in major differences in how universities are managed and research is co-ordinated.

These variations often reflect broader patterns of state structures and policies, especially how political and bureaucratic elites have steered social and economic development during and after industrialization, as well as the nature of labour markets for skilled professionals. The key aspects of the state's role in managing socio-economic change and of the organization of public science systems that affect the strategic autonomy and capabilities of universities are listed in Table 2 together with their likely influence, and will now be further discussed.

Beginning with the general pattern of state–society relations in market economies, we would expect 20th Century states that are highly proactive in managing social and economic development processes to view universities as important resources for socio-economic development that can, and should, be integrated into the state apparatus and controlled by it. This is especially probable when state elites adopt a 'dominant developmental' approach, in which it dominates society and discourages the formation of independent intermediary organizations between individual families and the nation state. As organizations dedicated to producing knowledge and educating members of the elite, universities are unlikely to be granted substantive autonomy, let alone freedom of market entry and exit, in such societies.

**Table 2**

| Institutional Influences | Extent of University Discretion over: | | |
|---|---|---|---|
| | Resource acquision and use | Co-ordination and direction of core activities | Development of organizational capabilities |
| Role of the State | | | |
| Dominant developmental | – | Varies | – |
| Regulatory | + | Varies | + |
| Control over elite labour markets | – | Varies | – |
| Public Science System | | | |
| State funds allocated *en bloc* | + | Varies | + |
| Reliance on peer review | Varies | – | – |
| Diversity of funding sources for science | + | Depends on peer review | + |
| Availability of non-hypothecated resources | + | + | + |
| Competitiveness of market for resources and prestige | + | Depends on peer review | + |

**Institutional influences on university strategic autonomy and capabilities**



In contrast, more 'regulatory' states seem likely to permit universities to become more autonomous organizations within the state-established framework, which can develop their own idiosyncratic ways of contributing to societal purposes. Here, formal regulation of relatively independent organizations is more widespread than substantive steering of priorities and procedures. As such states allow universities to determine their own use of resources to a greater extent than do promotional states, they also encourage them to develop distinctive organizational routines for managing resources and making strategic investment decisions.

Secondly, the autonomy of universities is also affected by their role in the selection, training and assessment of social, political and economic elites in different societies. In many higher-education systems, a central role of universities and similar elite schools has been to develop future members of the bureaucratic and political elites and the major professions. As a result, they have tended to be seen as state institutions, or at least as bodies fulfilling state functions, and so governed by state rules and employment policies. Overall, the more that states licence elite professionals and rely on universities to train and examine entrants to such occupations as agents of the state, the less they are likely to perceive them to be independent autonomous corporations with their own separate interests and capabilities.

In contrast, where states usually delegate more control over professional labour markets and competence standards to professional elites, and the role of universities in selecting future leaders of the state is more informal, if not indeed quite tenuous, they may well permit greater university independence and separation from the state. Such decentralization of authority is more probable in regulatory states than in dominant developmental states. Overall, then, university autonomy from the state and discretion over resource allocation, employment policies and educational programmes seem likely to be greatest in societies where the state has traditionally been more regulatory than developmental, elite professionals have been semi-detached from the state, and universities are not primarily and directly concerned with selecting and training future state officials.

Turning now to consider how more specific features of public science systems are likely to affect university autonomy and capabilities, these are primarily concerned with the sources and allocation mechanisms of resources. In general, the more varied are the sources of funding for research and teaching, and, in particular, the more diverse are the objectives and procedures of funding agencies, the more universities are likely to become independent from the state and able to determine their own patterns of resource use and purposes. To become powerful strategic actors in the struggle for research stars, facilities and prestige, many universities have sought additional funds beyond tuition fees and public support that they could control as strategic managers.

A further feature of higher-education funding systems that affects university autonomy is, of course, the means through which resources are distributed, especially those from the state [32,33]. Where this is done on a block grant basis, universities are more able to exercise some discretion over resource allocation internally and, in principle, can cross-subsidise new developments and make strategic investment decisions.

A central characteristic of the resource allocation process that affects university discretion over strategic priorities and the direction of activities internally is the degree to which states and other governing bodies rely on the judgements of disciplinary elites in making appointments, especially to senior posts in universities, as opposed to political–bureaucratic patronage or local elite selection. This is crucial to the establishment of reputational communities as distinct intellectual organizations controlling the direction of research in particular fields.

By making employment and promotion decisions based on scientific merit as determined by researchers' collective evaluations, states and universities effectively delegate much control over knowledge production to national and international communities, as distinct from local employers, and so greatly limit the ability of universities to co-ordinate and guide a key activity of their staff. While the extent of such network governance of research varies between scientific fields and higher-education systems, reflecting, in part, the degree of concentration of elite control over key resources such as research facilities, journal space and access to funds [20], it clearly restricts the ability of universities to develop idiosyncratic and organization-specific research goals and contributions.

The delegation of research direction and evaluation to extra-university intellectual communities is reinforced by the growth of project-based research funding allocated by peer review. As external funding of research, especially by state research councils and foundations, has expanded since the end of the Second World War, and has been largely awarded on the basis of relative intellectual significance and competence as determined by colleague–competitors, the autonomy of researchers from their local employers has increased, particularly where research grants include a substantial contribution to university overheads. These often became a significant source of university funding as well as allowing researchers to buy themselves out of university obligations, especially teaching.

The search for non-hypothecated resources, i.e. those that are not tied to specific purposes, has led universities in many countries to try to exploit their ownership of intellectual property rights, including encouraging the formation of new firms around research-based technologies and licensing of patents. Investment in technology licensing and transfer offices has often been facilitated by changes in patent legislation following the apparent, but limited, success of the Bayh–Dole act in the U.S.A. [6,34,35]. According to Jason Owen-Smith [36], the success of some U.S. universities' licensing policies has enabled them to improve their intellectual prestige considerably by generating discretionary funds that could support investment in high-quality research. This is leading to what he sees as a hybrid system of public and private science, in which the commercial profitability and reputational prestige of elite universities becomes mutually reinforcing rather than functioning as largely separate activities and environments.

Whether this claim is justified, and it does depend considerably on the openness of competition for resources and prestige in national higher-education systems [29], his study emphasises the potential importance of successful commercialization of intellectual property for university actorhood. This is especially so for resources that can be used at the discretion of the university as a whole, rather than being controlled by individuals and departments. If commercialization of research results and external funding of projects remain specific to specialist activities and the resources gained are primarily under the control of research groups, as they sometimes are in the case of the formation of new firms, the university as a whole may not benefit greatly, but could become more fragmented into separate specialist subunits, each controlling its own income streams. In general, then, the greater the proportion of university income and other resources that can be used for broad, unspecified purposes to be decided by university managers, the more potential strategic autonomy they have.



## Concluding remarks

This discussion has highlighted four main points about the changing nature of universities in many societies and their capacity for strategic action. First, there are very strong, if not overwhelming, barriers to research universities developing distinctive organizational competences on the basis of their authoritative co-ordination and control of work activities. As long as they compete for prestige and resources on the basis of researchers' contributions to scientific knowledge in different fields, they will be highly constrained in their ability to integrate specialized research and teaching activities for the achievement of distinctive organizational purposes.

Insofar as they are able to exercise some discretion over resource acquisition and use, they may come to resemble project-based organizations that provide common facilities and services for a wide variety of specialist project teams operating quite independently of each other [37], in a manner similar to Thompson's [38] notion of pooled interdependence. It is largely, if not almost entirely, at the research team level of organization and co-ordination that distinctive capabilities are developed for the pursuit of particular goals, rather than in much larger organizational units.

Secondly, the emergence of universities as particular kinds of strategic actors depends critically on the structure and policies of nation states, especially their role in steering social and economic development. Higher-education systems remain highly nationally distinct, and universities continue to operate in different environments, despite their general diffusion throughout the world [39]. Their organizational identities, powers and responsibilities are determined by state agencies, albeit to varying degrees, and most of their financial resources are provided by the state, both directly and indirectly. How much strategic autonomy and capability they develop is still largely decided by nation states, as is the variety of different kinds of universities with different kinds of resources, roles and powers.

Thirdly, the ability of universities to innovate and develop divergent organizational strategies within national frameworks is highly dependent on the availability of funds and other resources from diverse agencies and groups. The more dependent they are on a single or very small number of state agencies for research funds and facilities, the less likely they will feel able to adopt novel research goals and styles, since the risks of failure will be too great. This tendency will be exacerbated by budget cuts that intensify competition for increasingly limited resources, as observed in Australia [18].

Fourthly, the effects of increasing commercialization of research results and business funding of projects on university actorhood depend on the degree to which resources are earmarked for specific projects and activities, and critical skills and knowledge remain controlled by researchers and their project teams. The more that these teams can indeed function as quasi-firms, independently of university constraints and resource control, the more fragmented and weakened will universities become.

On the other hand, where the university is able to reap the benefits from such commercialization and has some discretion over how the funds will be used, it obviously becomes capable of more strategic investment decisions and is able to support particular areas of research more substantially. However, the pursuit of discretionary resources could encourage organizational control over research materials and the subservience of intellectual goals to managerial ones, leading ultimately to the institutionalization of universities as commercial organizations owning intellectual property rights in a similar way to private companies, as seems to be implied in a 2002 U.S.A. court case [40]. This may increase university actorhood, but at the expense of severely weakening their claims to special privileges and freedom from the responsibilities of companies, as well as making corporate researchers unwilling to share results and material with academics and generating considerable conflicts of interest [5,34].

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