

Subsidy and Competitive Grants in U.S. State Universities: Faculty Perspectives

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I Introduction

Faculty in the United States face significant and escalating challenges in obtaining sufficient grant funding to support their research. American faculty are currently facing cuts to federal agencies that have resulted in hiring freezes at major research universities (National Public Radio, 2025). These challenges are accentuated at U.S. state universities that are particularly reliant on federal and state funding as part of their educational and research efforts. When viewed from a Taiwanese perspective, the challenges faced by faculty at U.S. state universities offer multiple lessons for Taiwanese faculty aiming to increase their grant funding and overall research competitiveness. This article offers a commentary on the research question of what factors influence faculty perspectives and decisions to apply to subsidy and competitive grants in U.S. state universities. Specifically, this article first begins with a description of the theoretical frameworks that underlie grant funding of faculty and higher education in the U.S. This article then explains the differences between subsidy grants versus internal competitive versus external competitive grants. By describing faculty perspectives on the different types of available grants in U.S. state universities, this article illustrates lessons from the U.S. grant system for Taiwanese faculty and the Taiwanese higher education system.

II Background on U.S. State Universities and Grants

The U. S. has approximately 6,000 Title IV higher education institutions (NECS, 2024); Title IV institutions encompass a wide range of colleges and universities, and can legally provide and administer federal aid programs. Of these institutions, approximately one-third are public colleges and universities. Many public colleges and universities feature tuition rates that are lower than those of private four-year universities, so as to provide quality and affordable higher education to their own in-state residents. The academic programs within these state universities typically combine the three major academic domains of teaching, research, and service (NCES, 2024; American Council on Education, 2025). These state universities offer a wide variety of degree programs at the undergraduate and graduate level, and enroll large numbers of students from domestic as well as international backgrounds. Well-known

public state universities in the United States include the University of California, Berkeley; the University of Michigan, Ann Arbor; the University of Texas, Austin; and the Pennsylvania State University.

The availability of subsidy and competitive grants across U.S. state universities is heavily dependent on the research activity at individual institutions. The Carnegie Classification of Institutions of Higher Education (2023) classifies universities based on their research into three major categories: R1, R2, and teaching-focused institutions (American Council on Education, 2025). Of these categories, R1 universities require the highest level of research activity and offer multiple doctoral programs in graduate fields of study. For example, the University of Michigan reported total research expenditures of \$1.86 billion in 2023, including \$1 billion from federally sponsored research and \$603 million from internally sponsored projects (University of Michigan, 2023). Likewise, the Pennsylvania State University has included \$1.337 billion in research expenditures in 2023-2024, and has increased this to \$1.44 billion in 2024-2025 (Penn State University, 2024; Penn State University, 2025). Briefly, R2 institutions feature fewer research and doctoral programs, while teaching-focused institutions are focused primarily on teaching.

III Theoretical Frameworks for Grant Funding of Faculty and Research in the U.S.

Multiple theoretical frameworks have been developed for explaining how universities allocate limited resources to faculty. From the perspective of faculty in academic departments, Hackman (1984) describes a framework of education resource allocation theory to explain how individual units within colleges and universities can obtain resources. Specifically, Hackman defines two types of power that explain specific variances in university budget allocations: environmental power (the ability of a unit to use external resources from the environment outside of a given institution) and institutional power (the ability of a unit to obtain resources within an institution). The power of individual units to obtain resources depends on the centrality of a unit to the institutional mission alongside the unit's environmental power and institutional power.

In contrast to the unit-based framework described in education resource allocation theory, economic agency theory focuses on the institutional perspective by which how resources are diverted from an institution due to the self-interest of individual faculty or units (Massy, 1996). This theory considers the diversity of professional backgrounds and interests of faculty within research universities, and also describes the importance of discussing the differences between the priorities identified

by an institution versus the priorities of individual faculty. Massy also proposes a concept of value theory that focuses on the productivity offered by faculty in research versus teaching and service.

In particular, research productivity is a key metric by which grant funding is awarded to faculty: McGill and Settle (2012) define research productivity as being centered on the quantity and quality of the products of faculty scholarship, and describe the dissatisfaction of faculty at their institution with limited institutional resources and funding. Grant funding from organizations outside a given university is also heavily contingent on productivity and value theory. Ali et al. (2016) state that scholarly productivity (in the form of publications) and the reputation of a faculty's home institution are major factors in successfully obtaining research grants from external organizations.

On a more fundamental level, there also exist several theoretical frameworks to explain how grant support for faculty in U.S. state universities developed. Becker (1993) articulates a framework known as human capital theory, in which higher education overall represents an investment yielding returns for both individuals (ex. tuition-paying students) as well as for society at large (the economic return for funding education). In contrast, cost-sharing theory (Johnstone, 2004) articulates how despite the benefits of higher education, governments are increasingly relying on private funding and tuition to share the costs of higher education expenditures. The arguable culmination of this trend is in the recent public-private good debate (Marginson, 2011), in which higher education is increasingly seen as a private benefit rather than a public service to be provided primarily by government support and funding. Taken together, these theories underpin an overall trend towards an increasingly fragmented funding landscape for faculty to navigate.

IV Subsidy, Internal Competitive, and External Competitive Grants

This article analyzes the use of subsidy versus competitive grants in U.S. state universities via education resource allocation theory, economic agency theory, and value theory, with particular focus on research productivity as a key metric. This article also draws upon human capital theory and cost-sharing theory as a foundational basis for the current private-public good debate that has shaped the U.S. grant funding landscape described below. Using this theoretical framework, three major types of grants exist at most state universities: subsidy grants, internal competitive grants, and external competitive grants. Based on the framework identified in education resource allocation theory (Hackman, 1984), these grants can be divided into those that rely on institutional power (subsidy grants, internal competitive grants) versus environmental

power (external competitive grants). From the standpoint of economic agency theory, subsidy grants and internal competitive grants allow institutions to reward faculty whose productivity (“value”) align with institutional priorities. There now follows an explanation with relevant examples of each of these types of grants, as well as their roles within the U.S. higher education landscape based on human capital theory and cost-sharing theory.

Subsidy grants are typically awarded to support smaller pilot projects as well as ongoing academic programs, faculty promotion, teaching initiatives, and student engagement. Subsidy grants are often used as a stepping stone to develop the potential of projects to be competitive for larger and more extensive grants. From a human capital theory perspective, these grants allow individual universities to directly invest in their faculty for long-term gain for individual faculty members as well as for the society (in this case, the university) as a whole. However, because of the institution-specific and often topic-based nature of the funding, subsidy grants tend to be less flexible and more sponsor- or institution-directed. At the same time, these grants remain crucial for faculty to sustain and enhance their professional development and support early-career research. An example of a subsidy grant is illustrated by a collaborative regional grant of two campuses at the Pennsylvania State University for funding associate professors to reach full-rank promotion. This grant provides \$1,500 for faculty members in the process of evaluation for promotion to full rank in a restricted professional development account, with specific uses limited to professional travel, student support, or scholarly activities; this grant specifically cannot be used for salary or supplemental pay (Office of the Chancellor, Penn State Harrisburg, personal communication, October 16, 2025).

The second type of grant is commonly referred to as a seed grant; in this article, we will refer to these grants as internal competitive grants, as there are some seed grants that can be funded by external sources. These internal competitive grants also offer a means for institutions to invest in their own faculty from a human capital theory perspective. Internal competitive grants are offered by an institution to the faculty of said institution, but are by their nature competitive: faculty members are required to submit proposals to compete for funding based on a formal review and evaluation process. Internal competitive grants are primarily established to encourage faculty to continue active involvement in research alongside maintaining ongoing grant-writing to facilitate the pursuit of external competitive grants. An example of an internal competitive grant is the Core Seed Funding Program at the Center for Information Technology Research (CITRIS) at the University of California, Berkeley. This funding program was established to support interdisciplinary research teams

addressing major unsolved challenges in information technology for societal benefit in industry and the public sector across domains ranging from aerospace to climate resilience (CITRIS and the Banatao Institute, n.d.). A similar example is offered by the Consortium on Moral Decision-Making at the Pennsylvania State University, which awarded nine seed grants to support interdisciplinary research on human morality and ethical decision-making (Penn State University, 2025).

The third type of grant is the external competitive grant. These grants are offered by institutions external to the university, in government, industry, healthcare, and other large external organizations. Due to the larger pool of applicants from other institutions as well as recent funding constraints for government institutions as part of the ongoing public-private good debate in higher education, these grants have become progressively more challenging to obtain. At the same time, from the lens of human capital theory, these grants are a means of allowing large organizations to invest in the societal and individual capital of producing research breakthroughs and an educated populace. However, the selective nature of these grant awards makes them prestigious, as does the substantial funding that these grants bring to the faculty member's home institution. Therefore, faculty at R1 universities are highly encouraged to pursue external competitive grants. Institutions that offer competitive external grants include the National Institutes of Health (NIH), National Science Foundation (NSF), and Department of Energy (DOE). The federal government is the largest source of U.S. research funding: for the 2026 fiscal year, the U.S. allocated \$181.5 billion dollars for research and development, with 92% of this funding allocated to five federal agencies including the NIH, NSF, and DOE, with the remaining two agencies consisting of the Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) (Congress, 2025). These institutions offer multiple types of grants tailored to specific stages in faculty careers including postdoctoral grants, early-career faculty, and mid-career faculty across a wide spectrum of research disciplines. As an example of an external grant, a \$6.75 million NIH grant was awarded to the University of Michigan in 2024 for reversing health disparities (University of Michigan, 2024). Similarly, the University of Texas at Austin received a \$1 million NIH grant to evaluate risk and protective factors among Black youth (Weill Cornell Medicine & University of Texas at Austin, 2024).

V Faculty Perspectives in the U.S. State Universities

To understand faculty perspectives regarding the different types of available grants, it is important to describe the workload of faculty at R1 state universities. At most public state universities, faculty members are divided into tenure and non-

tenure line professors; an increasing proportion of faculty are also non-tenure line research professors at many R1 state universities. Typically, tenure line faculty members' teaching load (the number of courses taught per semester) ranges from 2 to 3 courses per semester, with summer teaching remaining optional. In contrast, non-tenure line faculty members have a higher teaching load including at least 4 courses per semester. The difference in teaching load between tenure line versus non-tenure line faculty is compensated by the increased research requirement expected of tenure-line faculty, although many non-tenure line and research professors also focus primarily on research. Research productivity for tenure-line faculty is assessed based on publications in peer-reviewed journals, presentations at conferences, and obtaining internal grants as well as external competitive grants for funding research. In addition to teaching and research, tenure-line faculty also are often required to engage in services at the institutional level such as serving on committees for faculty affairs (tenure and promotion) as well as to the community at large.

Empiric evidence at the level of faculty experiences via national surveys exists to demonstrate the pressure of higher education finance on faculty. A survey by the American Association of University Professors (AAUP) revealed that 62% of faculty at public universities report moderate to severe stress regarding funding instability and their overall workload (AAUP, 2022). The daily professional realities of academic faculty are heavily dependent on tuition and grants, with tenure track faculty often adjusting their research priorities to align with funding agency priorities, as opposed to their individual interests in their discipline of choice (Kezar & Maxey, 2014).

The multiple demands of teaching, research, and service on a tenure-line faculty member therefore heavily influence the decision to pursue different types of grant activities. In particular, time constraints represent a major factor that underlies the specific grant activities pursued by faculty. Sehlaoui, Gross, and Ruengawatthakeein (2021) found that time is the most significant obstacle for faculty to engage in grant activities. Faculty will often prioritize grants that offer a high return (a high likelihood of being funded) on the investment of time, energy, and effort that could be devoted to other priorities including teaching, service, and time with family. McGill and Settle (2013) likewise identify widespread dissatisfaction of faculty with their level of institutional support alongside support requirements in finding additional staff, having time released from teaching/other obligations, and funding to attend conferences.

Faculty members will closely scrutinize the type of grant when evaluating grants for potential application. For a subsidy grant, the involved faculty members are directed to work on a funded project with a specific aim, budget, and timeline.

Often, the funding amounts in subsidy grants are low enough that an involved faculty member may not be able to replace class time to waive some proportion of their teaching load. Additionally, once a faculty member is involved in any such subsidy grant, they must spend time guiding assistants in the grant, planning how to allocate funding, and participating in the stipulated activities of the grant. These activities all can take time away from teaching, service obligations, and the faculty member's obligations to family: Chen et al. (2022) identify numerous job-related stressors due to the limited physical, psychological, social, and organizational resources that faculty face. In the face of these competing stressors, subsidy grants offer a low return on investment, meaning that the time and effort spent to obtain and maintain funding are not compensated by the low amounts of funding provided by these grants. Despite this low return on investment, subsidy grants are popular with faculty because they are relatively easy to obtain from a standpoint of competitiveness and because they can contribute to a faculty member's visibility and reputation within an institution. For junior faculty, subsidy grants also offer funding pipelines to support their ongoing early-career academic programs, preparations for tenure and promotion, and initiatives that can be built into programs that are competitive for larger grants.

Both internal and external competitive grants have specific advantages and disadvantages for the prospective faculty applicant. Yaun et al. (2020) describe how competitive grant systems increase research productivity, but at the same time can increase stress for faculty and inequity based on research productivity between faculty. For faculty, the application process for competitive grants is often more involved, and can include detailed requirements, deadlines, and the writing and formulation of a workable proposal. Internal and external competitive grants both prominently involve a rigorous review and evaluation process; however, external competitive grants entail a much larger pool of applicants as they are not limited to a single institution. Additionally, applications to external competitive grants are evaluated by external experts or experts within the awarding organization. Lastly, internal competitive grants are awarded in smaller dollar amounts and support a shorter period of research, in comparison to external competitive grants that can often support a faculty member's research program for several years. External competitive grants can require a larger degree of institutional endorsement and support, including coordination with multiple administrative departments. As a result, the process of applying for external competitive grants is highly intense and challenging for faculty members.

Surveys of faculty experiences and practices describe some of the challenges faculty face with competitive grants. Lanford (2020) specifically comments on these challenges in a year-long ethnographic study of performance funding in U.S. higher

education. By surveying faculty in the context of initiatives such as competitive performance funding, Lanford identifies how these competitive initiatives can hinder the ability of faculty to explore research questions and drive innovation. Lanford also notes that competitive funding metrics can decrease faculty control over teaching content due to the need to align with university priorities and a decline in faculty roles in university governance. The need for research productivity specifically drives this pressure as well for faculty: in a survey of faculty in 104 management departments in research-oriented U.S. business schools, Miller et al. (2011) identify how the pressure to publish can increase stress while sidelining teaching and narrowing research questions to those which can be more easily published.

Despite the multiple barriers to applying for competitive grants, these grants provide multiple benefits for faculty members. Winning a competitive grant can significantly advance a faculty member's professional reputation and raise career advancement, as most R1 institutions' reputations are founded in their research funding and achievements. In particular, faculty in the sciences often require external competitive grant funding to support their research, including graduate students and laboratory equipment. Being awarded competitive grants reflects favorably on faculty candidates, and often leads to improved tenure and promotion results (Keane, 2024; Sehlaoui, Gross, & Ruengwatthakee, 2021).

VI Considerations from the U.S. Grant System for Taiwanese Higher Education

The characteristics of the U.S. grant system and how faculty navigate attaining funding and support offer multiple parallels and considerations for Taiwanese higher education. The Taiwanese higher education system has recently pivoted its funding strategy towards a funding-for-all paradigm which provides baseline funding to each higher education institution, but then offers performance-based grants as a supplement atop baseline funding. This grant structure aims to distribute funds more equitably among research institutions in Taiwan to reduce the concentration of research funding in "elite" universities (Wang & Chang, 2025). At the same time, Taiwanese funding of research has often focused on direct partnerships between universities and industry to prioritize applied research with commercial applications. This approach stands in contrast to the U.S. prioritization of basic science research with grant funding (Reynolds, 2025).

The Taiwanese Ministry of Education has also emphasized performance-based allocation of resources in the Higher Education Sprout Project. The Higher Education Sprout Project distributes funding through individual university-specific programs

via internal competitive grants. An example of this type of grant is the Academic Research Career Development Project at National Taiwan University (National Taiwan University Office of Research and Development, 2025). Similarly, the 2023-2024 Annual Report of the National Sun-Yat-Sen University for the Higher Education Sprout Project specifically describes the achievements of their research groups (for example, the Biomimicry Research Group) in terms of journal articles, industry projects, and patents (National Sun-Yat-Sen University, 2024). Additionally, in order to attract international researchers to Taiwan, government initiatives such as the Yushan Project (funded via the Higher Education Sprout Project) offer external competitive grant funding for distinguished researchers who have worked at international research institutions or international companies (Yushan Fellow Program, 2019).

VII Discussion and Conclusion

Of the numerous universities in the United States, R1 public state universities occupy a unique niche as publicly funded universities that serve a wide range of undergraduate and graduate students from domestic and international backgrounds. The theoretical basis for grant funding in U.S. state universities centers around the challenges of allocating sufficient resources to fulfill the many missions of a research university. In order to fulfill these missions, faculty at R1 public state universities need to obtain grant funding from multiple sources to deliver effective teaching, research, and service. Faculty at R1 public state universities are commonly expected to obtain grant funding, and can choose from subsidy grants, internal competitive grants, and external competitive grants. While subsidy grants are less competitive and easier to obtain, their low funding amounts and specific grant focus can make these less appealing to faculty not in the early stages of their careers. In contrast, internal and external competitive grants feature higher funding amounts, but are also more competitive and require lengthy proposals and applications that can deter early-career faculty. Faculty members also have to consider time constraints based on their teaching, research, and return on overall investment. The U.S. grant funding system and how faculty function within it offer multiple lessons for Taiwanese higher education and research funding, particularly as research budgets continue to tighten and given the increased focus of Taiwanese higher education on performance-based allocation of grants based on research productivity.

Based on educational resource allocation theory, faculty can be encouraged to apply for external grants by increasing their environmental power; this can be accomplished through dedicated grant-writers suited to specific funding agencies as well as increased support staff for preparing proposals. Additionally, in the lens

of value theory, faculty productivity can be increased by redefining productivity to include incremental research accomplishments such as internal milestones in a project in addition to publications and presentations. Additionally, from the standpoint of human capital theory, grant funding of faculty enables universities and organizations to invest in promising researchers and educators to contribute to societal well-being. However, in the lens of cost-sharing theory and the private-public good debate, increasing funding pressure and decreasing resources for grants are making the grant landscape more complicated for faculty. Future research questions can emphasize how to increase faculty environmental and institutional power, particularly given the shrinking role of government institutional funding in external competitive grants. Additionally, future research questions can consider how faculty productivity based on value theory varies with the type of grants that faculty use to fund their research (subsidy grants versus internal and external competitive grants). Finally, a systematic meta-analysis should be conducted, focusing on the short-term and long-term advantages and disadvantages when faculty engage with subsidy grants compared to internal and external competitive grants.

The U.S. grant funding system has been a key component in the U.S. primacy in research and higher education. Taiwan can adapt elements of the U.S. system including increased funding of research, dedicated funding for early-stage faculty, and increased focus on meaningful metrics of productivity including publications and patents. In particular, seed grants (internal competitive grants) have proven to be effective and important as a “middle ground” between subsidy grants and external grants for early- and mid-career faculty; Taiwan can increase the implementation of internal competitive (seed) grants such as in the Higher Education Sprout Project. Overall, the U.S. grant funding system offers multiple lessons for educators in Taiwan and around the world in terms of increasing research productivity while also considering the needs and challenges faced by faculty operating within academic institutions.

Table 1. Faculty Perspectives Toward Different Types of Grants in the U.S. System

Type of Grant	Advantages	Disadvantages
Subsidy Grants	<ul style="list-style-type: none"> ·Can support a broad spectrum of programs: <ul style="list-style-type: none"> ○ongoing academic programs ○faculty promotion ○teaching initiatives ○student engagement ○smaller pilot programs ·Crucial for early-career professional development ·Easier to obtain ·Increases visibility, reputation 	<ul style="list-style-type: none"> ·Specific aims, budget, and timeline can be constraining ·Funding amounts are low, and may not allow class buyouts ·Time spent guiding assistants, planning funding distribution ·Reduces time for teaching and service ·Low return on investment due to low funding amounts
Internal Competitive Grants	<ul style="list-style-type: none"> ·Larger funding amounts compared to subsidy grants ·More prestigious than subsidy grants ·Broader scope of funding than subsidy grants ·Less competitive than external competitive grants 	<ul style="list-style-type: none"> ·Significant time burden developing proposal to align objectives and budgets with internal constraints ·Competitiveness can be a barrier for early-career faculty ·Time constraint is a major obstacle
External Competitive Grants	<ul style="list-style-type: none"> ·Most prestigious grants ·Highest funding amounts ·Transferable across institutions ·Needed for establishing research labs 	<ul style="list-style-type: none"> ·Most competitive process for application ·Dependent on external organizations ·Time-consuming application process, requiring a large amount of resources

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