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Institutionalization of international university research ventures

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ABSTRACT

International research collaborations are widespread, but few have studied those that reach the scale and scope of what we call international university research ventures (IURVs). In an IURV, a university sets up a formal and organizationally consolidated research relationship in a foreign country. This paper puts forward an institutionalization framework to explain the development of IURVs with different forms. Five case studies are presented of IURVs in the countries with the largest number of IURVs involving US universities: China and Singapore. The five cases are examined relative to the elements of the institutionalization framework: nominal, leadership, administrative support, multi-year funding, research targets, formal researcher-to-researcher exchange, visibility, evaluation, and supporting characteristics. The results show that the emergence of IURVs depends on the specific connections between the role of government and the availability of resources with the realization of mutual benefits, leading to different patterns of institutionalization. This variation is in part a function of the degree of involvement of the government agency or department providing the funding for the IURV, which influences retention of the knowledge produced by the IURV in the region through institutionalized mechanisms as well as the development of scientific and technical human capital in the host country. Institutionalization is not a benefit without limits; nevertheless, an institutionalized structure may be necessary if ambitious research-driven goals are to be achieved.

1. Introduction

The involvement of universities in countries other than their home location is a growing trend (Wildavsky, 2010; Lane, 2011; Kosmützky and Krücken, 2014; University of Oxford, 2015). Such international university initiatives are diverse, ranging from offices abroad to coordinate outreach with alumni to fully-fledged overseas branch campuses with degree programs. Among efforts to classify the international activities of universities, Kinser and Lane (2015) identify 12 different types of foreign higher education bases, based on the functions performed by these campuses, from their database of more than 230 branch campuses (globalhighered.org), one of which is the research/campus or site. Studies have also been undertaken of particular cases. For example, the global partnerships of the Massachusetts Institute of Technology (MIT) have been examined using a typology based on a systems architecture and life cycle framework that presents four architectures: bilateral, networked, institution building, and functional expansion (Pfothenhauer et al., 2016). Each model represents one of the international partnerships negotiated between a foreign government and MIT: the bilateral relationship involved the United Kingdom with

the University of Cambridge and MIT; the networked model is with seven universities and other research institutes in Portugal; institution-building is with Abu Dhabi; and functional expansion is with Singapore.

Within this diversity of internationalized university arrangements, we focus on one type of initiative: the international university research venture (IURV) in which universities formally set up a research relationship in a foreign country (see also Li et al., 2016; Shapira et al., 2016). Even within this category, we will show that there are variations by location, longevity, and research theme, reflecting differences in goals, management and operations. Yet, these variants notwithstanding, IURVs have one feature in common. They involve a university systematically engaged in research in a host nation other than that of the university's home country. The drivers of such relationships include host country desires for scientific, technological, or reputational benefits as host institutions engage with capable and recognized international universities. Typically, the host country or host institution has something to offer the home institution, be it financial resources to pursue high quality research, access to special research opportunities or raw talent, among other possibilities (Guimon, 2016). The realization of these mutual benefits suggests the need for a mechanism that goes

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beyond co-authorships or research projects between individual scientists in different countries. International university ventures that intend to transcend such informal or smaller-scale collaborations require managerial and administrative support of a certain magnitude and longevity. We denote as “institutionalization” the establishment of formal organizational features and support with a level of permanence that extends further than the usual publishing or project cycles.

The choice of the notion of institutionalization for this study requires clarification. The key point is to distinguish “institutions” from “organizations,” as discussed in an extensive body of literature that spans decades (see, for example, [Khalil, 1995](#); [Scott, 2013](#)). The broader social and cultural norms that influence organizational patterns and persist in time belong in the institutional order. This study does not focus exclusively on organizational features in a snapshot of time. Rather, it attempts to explain the outcome of a process that takes a significant amount of time and is subject to such broader conditions of the context. For this reason, it is justified to embed our study in an institutional perspective.

In this paper, we seek to probe what specific features of institutionalization raise a collaboration from an informal international research relationship to an IURV, and what kinds of supportive environments lead to their development. A comparison of US IURVs in Singapore and China highlights the variety of institutionalization paths and outcomes. An institutionalization framework is the mechanism we adopt to explain the emergence of IURVs and the differences in their forms. The framework compares and explains these ventures along three dimensions to gauge how they might realize the desired mutual benefits based on the extent to which they acquire certain characteristics in these dimensions. The three dimensions are, first, the extent to which they meet nominal institutional characteristics such as having a formal name and agreement; second the requirements of a fully institutionalized research venture based on characteristics such as formally designated directors and administrative support; and, third, the role of supporting characteristics such as government funding or intellectual property arrangements. The paper demonstrates various degrees and modalities of institutionalization in four archetypes resulting from whether government is (or is not) involved and the degree of structuring in its governance pattern. As detailed in the paper, the four archetypes are government-directed, government-facilitated, non-government-collegial, and non-government-contingent. Although life cycle concepts might suggest the home country would be in a superordinate position relative to the IURV partners in the host country, our case studies suggest that the relationships are more ones of mutual benefit, with a division of labor and distribution of advantages that also address host country societal challenges.

The next part of the paper considers, in the context of extant literature and international research trends, the background for understanding the development of IURVs. We then put forward our theoretical frame and research design, including justifying the selection of five cases of US IURVs in China and Singapore. After presenting each of the IURV cases, we undertake a cross-case analysis to distill and compare key features. The concluding section discusses our findings on the characteristics and trajectories of IURV institutionalization, and reflects on the implications for research management, university internationalization, and policy.

2. Background

Research has become more internationally collaborative as the exponential growth of science alongside constraints on national resources for research make it impossible for any country to be prominent in any field entirely by itself ([Katz, 1994](#); [Zinman, 1994](#)). The phenomenon, if not the motive itself, can be identified by observing publication trends. The percentage of scholarly publications indexed in Scopus with authors from two or more different countries rose to 19% in 2013 from 13% in 2000 ([National Science Board, 2016](#)). Using another database,

the Science Citation Index, [Wagner et al. \(2015\)](#) demonstrate that the percentage of publications in this index with co-authors from different countries more than doubled from 1990 to 2011. [Van Raan \(1998\)](#) shows that internationally co-authored publications involving Dutch astronomers attract more citations, even after controlling for self-citations. [Georghiou \(1998\)](#) links the growth of international research collaboration to mechanisms such as research exchange, workshops, cooperative networks, and large scale scientific equipment and instruments, and national-level initiatives. The author also notes the importance of indirect drivers of international collaboration such as national economic development considerations. [Shapira and Wang \(2010\)](#) confirm that even when countries have national technology strategies (as in the case of nanotechnology), individual researchers and groups extensively collaborate internationally in co-authoring research papers.

While the rise of informal and project-based international scientific collaboration provides a backdrop for the growth of IURVs, other motivations and factors also come into play. Stimuli for the growth of IURVs include the search for effective mechanisms for international scientific collaboration, as well as national, regional, and institutional motivations. We define an IURV as a research arrangement established by a university in one country to partner with a university or other research organization in another country and which involves research facilities or specialized research offices outside of the home country ([Li et al., 2016](#)). This definition distinguishes IURVs from “brick and mortar” educational campuses in foreign host countries and spotlights IURVs as a focus of study. Although some IURVs are associated with an educational function at an international campus, we also observe a number of IURVs deriving from researcher-to-researcher collaborations or national and regional efforts to advance research capability. IURVs do not carry the financial and educational quality risks associated with transnational educational campuses ([McBurnie and Pollock, 2000](#); [Altbach and Knight, 2007](#); [Olson, 2011](#); [Healey, 2015](#)). Yet tensions can still exist between the IURV host institution and the home university, for instance over intellectual property ownership, research conduct norms, staffing, and health and safety ([Borenstein and Shamoo, 2015](#); [Shams and Huisman, 2012](#); [Feast and Bretag, 2005](#)). [Shams and Huisman \(2016\)](#) and [Klerkx and Guimon \(2017\)](#) use the term “dual embeddedness” to describe these tensions in navigating administrative, educational, and research relationships within and between the requirements of host and home institutions.

IURVs represent an institutionalization of cross-national research collaborations. This aspect of the institutionalization of university research is an important topic because, as [Herbst \(2014, p. 3\)](#) notes, research depends “on the institutional or cultural setup in place to foster science.” The institutionalization of university research can present as an evolutionary, life cycle process. One might conceive of IURVs as being born of individual researcher collaborations in different countries that progressively move toward greater institutionalization over time. Yet other mechanisms are also at work. [Chompalov et al. \(2002\)](#) and [Genuth et al. \(2007\)](#) chart the rise of administrative mechanisms in research collaboration, suggesting that there are more institutional models than the inter-laboratory cooperation or the large-scale particle physics network. Based on interviews of researchers in 53 multi-institutional research organizations, it is argued that multi-organizational research collaborations are born of funding opportunities, emerging research problems, new methods and instruments, and interactions between scholars. Drawing on this interview dataset, [Chompalov \(2014\)](#) found varying degrees of institutionalization in these multi-institutional research cooperatives in physics and allied sciences based on governance modes. Their finding suggests that although some research collaborations are modest in size and informal, others are of the scale and complexity to require institutional mechanisms to support the research.

Studies of institutionalization of university research have further highlighted the role of broader systemic factors. [Bozeman and Rogers](#) highlight the “knowledge value collective” in which researchers

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