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Hybrid Business Models and the Public Science-Private Industry Interface

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Abstract:

We draw on recent research in business models and hybrid organizations to propose a novel model for bridging the logics that often conflict as science-based technologies are commercialized. The key insight from this model is adopting a broader conceptualization of value creation may enhance technology commercialization efforts and outcomes.

Introduction

Despite the clear benefits from commercializing science-based innovations for numerous stakeholders, past research indicates it can be challenging to transition scientific discoveries to marketable products (Markman et al., 2004). At the heart of this difficulty is the commercialization of such discoveries is an inherently complex process often involving organizations with differing, missions, incentives, and “logics” more generally (Sauermaann & Stephan, 2013). Past research

features numerous efforts to help cross this divide, such as technology transfer offices (Siegel, et al., 2003), university-generated spinoffs (Lockett, et al., 2005) and policy changes (such as the “Bayh-Dole” act in the US) (Mowery, et al., 2001); however, these have all met with limited success (Markman et al., 2004). The literature on technology commercialization and university entrepreneurship offers widespread recognition that this “Valley of Death” phenomenon leaves many potentially value-creating scientific discoveries trapped in

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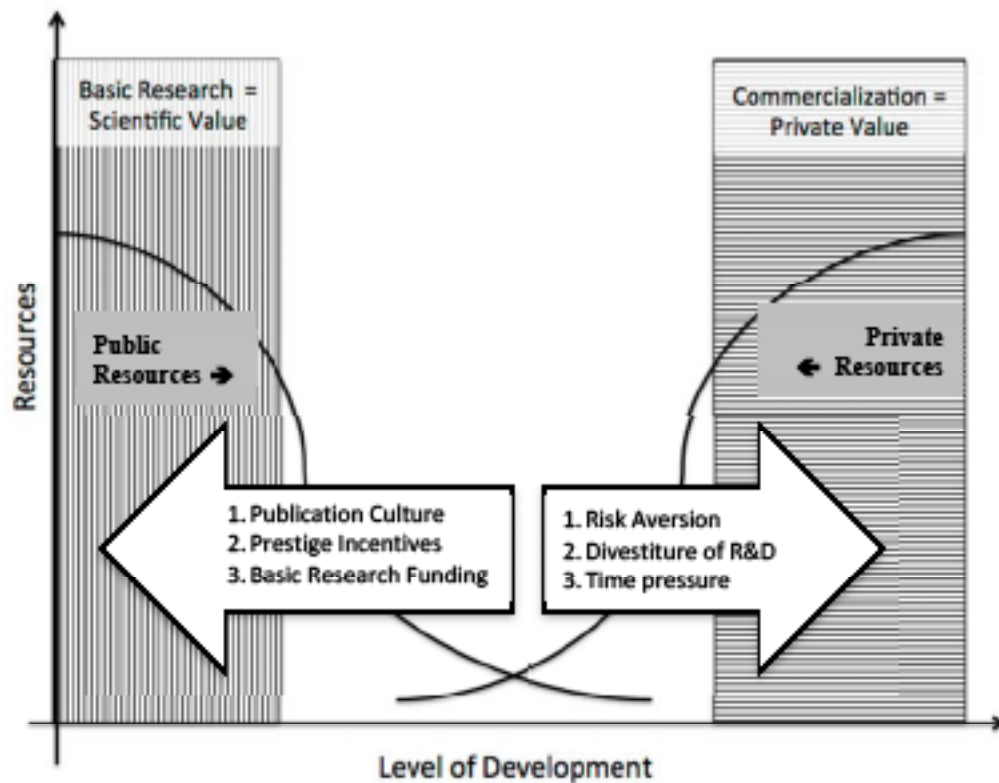


Figure 1: The Valley of Death in Technology Commercialization (Adapted from Barr et al., 2009)

universities (and other basic research focused organizations) worldwide (Figure 1) (Auerswald & Branscomb, 2003). This recognition of the limited success of current models, paired with renewed urgency for introducing and scaling new technologies in areas such as carbon-free energy, has motivated calls for updated models for technology commercialization (Bozeman et al., 2015)

Approach

As a complement to calls for funding “translational” research and changing universities to be more entrepreneurial (Etzkowitz, et al., 2000; Butler, 2008), we propose that organizations with hybrid business models (i.e., organizations that combine the value creation processes of science and industry) may also aid in the commercialization of scientific discoveries. Specifically, our model suggests that hybrids may more effectively interface with both universities and firms than these organizations will with one another, because hybrid organizations are *specifically designed* to cope with (and integrate) the very sorts of conflicting logics that

bedevil technology commercialization (Markman et al., 2004; Pache & Santos, 2013). Furthermore, we propose that the multifaceted mission of hybrid organizations will help increase *inventor involvement* in the commercialization process, something that past research has shown to be a strong predictor of successful commercialization (Thursby et al., 2001). This portion of our model draws on the sociology of science literature (e.g. Merton, 1973) to help address a fundamental paradox at the science – industry interface, namely that the very financial incentives featured in many prescriptions for commercialization are not particularly well aligned with values common amongst scientists (Colyvas et al., 2002) and can even be *detrimental* to fostering entrepreneurial activity (Markman et al., 2004).

Hybrid organizing refers to the activities, structures, processes, and meanings by which organizations make sense of and combine aspects of multiple organizational forms (Battilana & Lee, 2014). Our model builds on hybrids capabilities to combine multiple institutional logics, which manifest in both an organization’s *material means*, such as practices, governance

arrangements, and organizational forms, as well as its *symbolic elements*, such as shared beliefs, interests, preferences, and goals (Thornton & Ocasio, 2008). In the technology commercialization process, organizations that are built on hybrid logics of science and industry combine the traditional 'science' logic of academic discovery and scientific value creation and the traditional 'industry' logic of commerce and financial value creation (Gulbrandsen, 2011). Similarly, hybridization of commerce and social welfare logics in "social enterprise" models are designed for both social impact and financial sustainability, for examples in microfinance (Battilana & Dorado, 2010) and wind energy (York et al., 2016).

Key Insights

Recent research has shown that the logic of science includes not only *scientific value creation* (value through publications, conferences, and other knowledge artifacts) but also increasingly *public value creation* (value through implementation and positive social/environmental outcomes) (Bozeman et al., 2015). In parallel, a broader conceptualization of value is a promising, yet an under-investigated, area of business model research (Nielson et al., 2018; see Seelos & Mair, 2005 for a notable exception). As a result, we propose that hybrid organizations may be uniquely suited to developing business models that provide value to scientists based on their explicit social objectives (aligned with traditional scientific values) and to firms based on their embrace of commercial objectives (aligned with traditional firm values). Furthermore, our analysis suggests that hybrid organizations capabilities to manage, balance, and perhaps even leverage, tensions at the science-industry interface through strategic partnerships with universities and firms, may contribute to their own financial sustainability.

Past research has identified a wide variety of hybrid organizations (Battilana & Lee, 2014), but we focus on "born-hybrids" in particular that are "inherently driven by dual commercial and social logics" (Newth & Woods 2014). This is an important distinction as other approaches to technology commercialization may also be hybrid organizations, but they are much closer the "header-modifier" type of hybrids in which

one logic dominates the other (Gulbrandsen, 2011; Wry, et al. 2014). For example, technology commercialization offices are designed to bridge science and commercial logics; however, the vast majority of these organizations are not self-sustaining being financially subsidized by, and reporting directly to, their associated university (Thursby, et al., 2001). In contrast, in a born-hybrid model, "the hybrid logic of [an] innovation will be less foreign; therefore, resistance to it will be limited to its anticipated *ability* to achieve [its hybrid goals], not the *legitimacy* of trying to do both simultaneously" (Newth & Woods, 2014). A further implication of a born-hybrid model is that individual organizations are likely more suited to combine logics than are multi-organization partnerships in this context. Specifically, these partnerships, however tightly conceived and structured, necessarily have conflicting logics from their component organizations. For example, in their examination of public-private research centers in Scandinavia, Gulbrandsen and colleagues (2015) found that "the centres, despite stakeholder boards and demands for harmonization of agendas and activities, are still made up of people whose main activities are found in their 'home' organizations with other incentives and obligations" (376).

By integrating the notion of a born-hybrid model with the Valley of Death, we present a stylized model of technology commercialization where hybrids act as bridges between organizations engaged in basic scientific research and those engaged in commercialization (Figure 2). The immediate consequences of this model are that both types of organizations extend resources further into the Valley of Death. The motivation for universities to do this is rather than licensing technologies to firm interested in strictly private-value creation they can help fulfill their public-value creation missions. We do not propose universities will underwrite these hybrids, only that engaging with such organizations will both better fit with their mission and engender less resistance from their stakeholders (e.g. that they are "giving away" publicly-funded technologies to private firms). Additionally, private firms will have stronger incentives to develop a given technology earlier on because of the increased certainty created by the university's continued involvement in a technology's development. Furthermore, the inventors of technologies would have stronger incentives to assist in

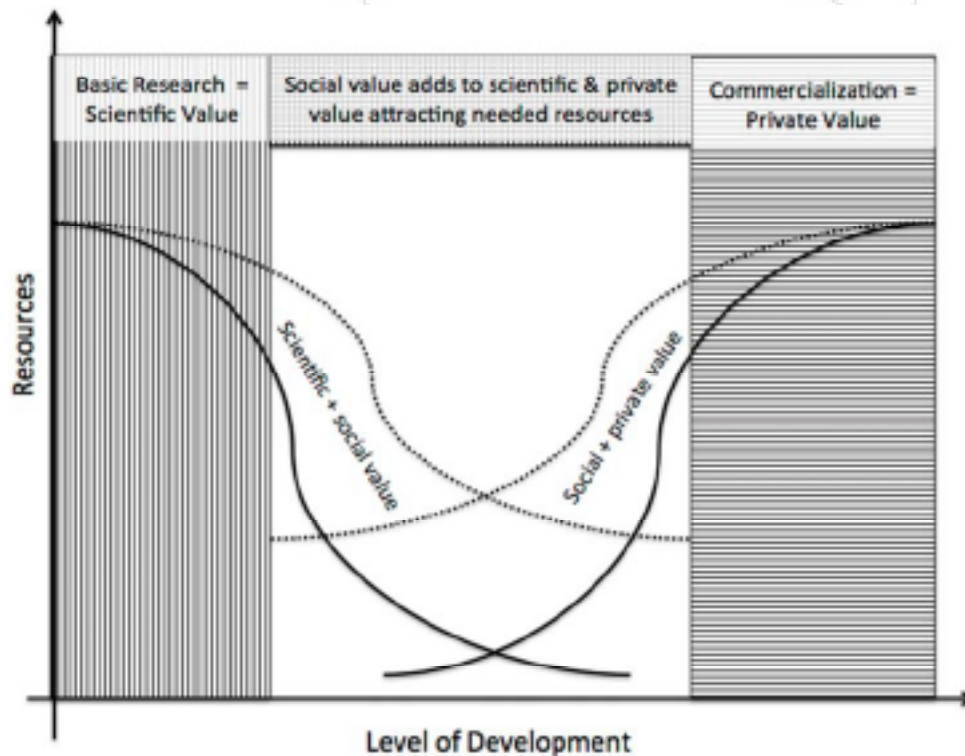


Figure 2: Valley of Death with Hybrid Organization as Bridge

this development since the dual logic of hybrid organizations can accommodate the desire to create public value common among scientists, as well as the private value creation of traditional commercialization vehicles such as licensing agreements and startup companies.

Using born-hybrid organizations to help bridge this gap also allows for additional flexibility as technologies are developed. For example, a hybrid organization could focus on public value creation (both scientific and social) early in this process and then later switch to focusing on private value creation as technologies are further developed. Alternatively, it could develop specific applications of a given technology that feature strong social, but marginal private, value creation profiles (e.g. a cure for an “orphan disease” where its rarity makes for too small of a market for traditional firms to invest in seeking a cure), while licensing the technology for use in applications with stronger private value creation profiles to traditional firms. This arrangement would allow for specialization as well as the application of a new business model (with related specialized human capital) explicitly designed with the flexibility needed to create value for *all stakeholders* in the process of technology commercialization.

Discussion and Conclusions

We view this model as having two main contributions. First, we developed a novel solution to one of the core problems identified in past technology commercialization research – integrating the conflicting logics of public value creation of science with private value creation of firms. Although we applaud efforts to provide translational research funding, increase entrepreneurial training for scientists, and otherwise integrate scientific and commercial logics, we show the possibility of using business model design as a complementary approach to help bridge the technological Valley of Death. This design approach is unique in that it does not require radical changes to the culture, values, and overarching logics of organizations engaged in scientific discoveries or the firms reliant on these discoveries. Instead, we suggest leveraging the ability of hybrid organizations to integrated public and private value creation can create more robust interfaces with both universities and private firms.

As our second contribution, we show a domain in which organizations pursuing hybrid business models are not merely *different*, but in fact may be *better* than either nonprofit or strictly for-profit models. In contrast to

past research, which examines, for example how customers may view hybrid organizations more favorably (Dean & McMullen, 2007), the model we developed here shows that hybrid organizations may be *inherently* better to address situations where public and private value are intimately linked and integrating these two types of value is critical for the success of the organization. As a result, our findings contribute to the broader conversation on the theoretical underpinnings of hybrid organizations' possible sources of competitive advantages. In addition, our model sheds some light on whether or not hybrids, nonprofits, and for-profits are substitutes or complements and furthermore, which situation-specific factors helped shape relationships between these types of organizations.

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