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Book Review / Compte rendu

Breznitz, Shiri M. (2014). *The Fountain of Knowledge: The Role of Universities in Economic Development*. Stanford: Stanford University Press. Pages: 197. Price: $60.00 USD (cloth).

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"The fountains of knowledge" as a phrase was first used by John Locke in "An Essay Concerning Human Understanding," published in 1690, to describe how knowledge is founded, i.e., that all the ideas we have spring from either our observations about "external sensible objects" or our internal reflections. Professor Breznitz's book examines the more restricted topic of the commercialization of biotechnology research at Yale and Cambridge Universities. An accurate title would be "University technology transfer: Two case studies in the USA and the UK." The primary audience for this book is that of technology transfer officers and university administrators in the biosciences. Breznitz, an economic geographer, collected data from interviews, documents and reports, on the regional economy, the universities, and companies, with a total of 69 in depth interviews in Cambridgeshire and 46 in New Haven, Connecticut, between 2003 and 2008 with updates in 2013.

The book begins with an examination of the traditional roles of universities as research and teaching with an acknowledged pressure on modern universities to "pay back the community" as a third role. The higher education literature [see Donald (1997), *Improving the environment for learning*] cites a continuum of five roles of the university in interaction with the community, from universal to local: as an intellectual or nerve center of a learning society, as a center for research and technological advance, as a critic of society, as a guide to society for the betterment of human kind, and in the education of students to meet the job requirements of society. In her "Tale of two renowned universities," Cambridge ranking third and Yale ranking tenth in the Times Higher Education World rankings for 2013, Breznitz notes the mission of Cambridge to contribute to society at the highest international levels of excellence. She also notes its "noncontrolling" policy toward commercial exploitation of academic know-how and links with industry generally. Yale is introduced as having a historical culture of non-involvement with the community in general and with industry in particular in the early 1990s.

The research literature on technology transfer in Chapter 2 is divided into external and internal factors. Most notable among the external factors is government legislation that ranges from the intended missions and funding of universities to intellectual property policies and tax incentives provided by governments. Environmental factors describe relationships between institutions on national and regional levels. Internal factors include culture, policy and organization. Within the university culture, Clark's (1998) concept of "instrumental interactivism," the interaction of all elements and policies in the university, is introduced as key to the transformation of a university. A significant policy issue is the share of royalties allocated to inventors. A higher percentage of royalties to faculty members tends to increase the number of inventions licensed to existing companies, but to decrease the number of university "spin-outs." The higher the inventor's royalty share, the lower the incentive to spin out a company. In the two case studies, Cambridge provides a higher share to inventors, while Yale provides a lower share, which promotes the creation of spin-out companies. The third set of internal factors are concerned with the organization of technology transfer offices: personnel, business experience and past success. Breznitz states that the technology transfer office is the university resource with the strongest impact on the creation of spin-out companies.

Most salient in the historical and national frameworks of the two countries described in Chapter 3 is the early emphasis on conducting applied research in the land grant universities as stipulated in the US federal government's Morrill Acts of 1862 and 1890, and the contrasting late entry of government funding for research after the second world war in the UK. Chapter 4, entitled Yale University, tracks the astounding renaissance of research and community renewal spearheaded by its president, Richard Levin, from 1993 to 2013. From an unsafe campus to a re-imagined city, and with the aid of nearby venture capital in Stamford-Greenwich, Yale University became a focal point for the biotechnology industry, with one to eight spin-out companies each year after 2003. In contrast, in Chapter 5, the University of Cambridge, with its decentralized collegiate organization and broad mission of overall excellence, has less clear policies pertaining to technology transfer. Two of the Cambridge colleges set up their own science parks, several charities provide significant funding, and the government also provides substantial research funding. The "Cambridge phenomenon" of the mid-1980s speaks to the high-tech cluster around Cambridge, but the number of biotechnology spin-outs annually is small (zero to two) after 2003.

In her comparison of the two cases in Chapter 6, Breznitz focuses on three factors of organizational change: intensity, velocity and inclusion. High intensity change at Yale included involvement throughout the university and its administration and extended into the community. At Cambridge, the technology transfer process was diffuse and changes came in response to external reports and funding. According to Breznitz, the changes occurred at the central administration level but were not coordinated with departments or colleges, nor with interested parties outside the university such as venture capital firms, science parks and local firms. The velocity of change was rapid at Yale University, taking three years. At Cambridge, a series of changes took place over seven years but because of this extended time frame appeared to lead to confusion. Change at Yale included the creation of an office to support collaboration among the university, the city of New Haven and the State of Connecticut in an attempt to affect local economic development. Cam-

bridge's technology transfer changes were internal to the university and did not include other regional players. Breznitz goes on to compare other technology transfer offices at Stanford, MIT and Georgia Tech, and concludes that there is no "secret sauce" although important factors and best practices can guide decisions.

In conclusion, Breznitz affirms that it is important to realize that universities are heterogeneous, complex organizations. She then raises criticisms of the "third role" of universities, technology commercialization. Questions of the identity of universities and of academic freedom are countered by the argument that funding follows initial research, hence science is not altered by the connection to corporate needs and financial gain. A potentially more controversial argument is made that if technology commercialization is to be sustainable, it needs to become part of the faculty promotion and tenure process. No commentary is put forth on how this might occur or, for example, whether it could be entered on CVs as research and/or service or in a new and different category. The book closes on a quiet note: that universities are *fountains of knowledge* and that they need to be encouraged to continue to teach and conduct research, while making a positive contribution to their local economies – but the economic contribution should not be their main mission.

References

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