An Annotated Bibliography of the Organization Theory and Decision Theory Literature Related to Investigating the Role of Development Stage in University Technology Transfer

and the Implications for Public Policy

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Introduction

This annotated bibliography summarizes literature related to a planned study of the role of development stage in university technology transfer. The preliminary research question to be examined is whether development stage helps to explain why private sector companies choose not to pursue university-created technologies that seem to align with their missions and profit motives even when the companies appear to have the resources to do so.

I reviewed the related literature related in the context of the three perspectives that I will use to investigate the research question. The first perspective is public sector economics to understand why government involvement and intervention is appropriate and necessary in the market for university-created technology. The second perspective is organization theory and behavior to understand how organizations function in the context of university technology transfer. The third perspective is descriptive decision theory to understand how organizations make decisions to acquire university-created technology.

I have already explored the literature through the lens of the first perspective of public sector economics. I summarized these results in a separate annotated bibliography and literature review focused on the public-sector economics perspective. Those efforts specifically focused on literature related to (1) the definition of technology, (2) the definition of university technology transfer, (3) the role of the federal government in university technology transfer, and (4) determinants of success in university technology transfer. The current annotated bibliography focused on literature related to the second and third perspectives (i.e., organization theory and behavior and decision theory). It specifically focused on literature related to (1) methods for studying human behavior in the context of organizations, and (2) how decisions are made within organizations.

The literature reviewed included books published by reputable third-party publishers and peer-reviewed scholarly journal articles. I identified the initial group of materials included in this annotated bibliography through database searches of various relevant key terms such as “organization theory”, “decision theory”, and “descriptive decision theory.” I reviewed the bibliographies of that initial set of literature to identify additional related literature. I also included relevant literature identified during the completion of coursework for other classes in the Public and Social Policy (PSP) program at Saint Louis University.

Annotated Bibliography

Fisher, A. (2004). *The logic of real arguments* (Second ed.). New York, NY: Cambridge University Press.

Fisher details a method for understanding and evaluating natural language arguments that one might encounter in written texts and during academic study. Fisher explains how to identify and extract the elements of the argument and how to evaluate the soundness of the argument. The framework that Simon (1997) offers for understanding the decision-making process bears a striking resemblance to the structure of natural language arguments described by Fisher. As such, the approach and framework that Fisher provides might have application in understanding organization decision-making in the context of university technology transfer.

Gertner, J. (2012). *The idea factory: Bell Labs and the great age of American innovation*. New York, NY: Penguin Press.

In a sense, this source can be considered a case study of converting basic research into private sector market offerings that benefit the public interest. It provides insight into the relationship between basic research, applied research, development, and manufacturing at Bell Telephone Laboratories. The account that Gertner offers provides additional evidence that challenges the conceptualization of a linear process from basic research that produces basic scientific insights to applied research that determine how to make practical use of such insights (p. 29, 150-151). The case of Bell Telephone Laboratories suggests that absolute freedom in basic research is counterproductive to generating research outcomes that benefit the public interest. Like food, freedom in basic research is healthy in moderation but unhealthy in excess (p. 194). Gertner references a paper that Bell Labs researcher Andrew Odlyzko wrote in 1995 that seems particularly relevant to understanding why private sector companies often do not pursue university-created technologies that seem relevant to their focus even when the companies appear to have the resources to do so. Odlyzko observed that it was no longer logical or necessary for private sector companies to invest in basic research for two key reasons. First, it took too long for private sector companies to generate an adequate financial return. Second, the base of scientific discoveries was so broad that it was now possible for a private sector company to generate sufficient profits by focusing on incremental improvements (p. 334). These two patterns seem consistent with a tendency of private sector companies to focus on later development stage technologies. Gertner also cites a 2008 study by Fred Block and Matthew Keller titled “Where do innovations come from?” which found that 77 of 88 U.S. organizations that produced innovations rated among the top 100 by R&D magazine in 2006 benefited federal funding (p. 332). These facts support the notion that development stage plays a significant role in technology transfer outcomes but they don’t quite answer the question of why development stage plays such a significant role.

Simon, H. A. (1997). *Administrative behavior: A study of decision-making processes in administrative organizations* (4th ed). New York, NY: The Free Press.

This source provides a useful scaffold for structuring a study of the role of development stage in university technology transfer. It provides a framework for using decision making as the basis for understanding organizations. Chapters 4, 6, 8, and 10 focus on the sociology of administration – what one might call descriptive administration theory. Chapters 3, 9, and 11 emphasize what Simon calls the practical science of administration – what might be apply labeled as normative administration theory (pp. 356-360). Simon argued that decision making is the primary activity of organizations. Every physical action undertaken on behalf of the organization involves both “deciding” and “doing” (p. 1). For each action, there are a multitude of antecedent decisions that must occur to enable the final decision governing the action. Simon believed that the study of organizations must focus on the operative employee and the way their decisions and actions are influenced by the organizational context because the physical tasks of executing an organization’s intentions fall to operative persons who generally occupy the lowest level of the organization hierarchy (p. 2). As with physical tasks, there is specialization regarding decisions in organizations. Simon argued that two general kinds of decisions are made in organizations (p. 4). Value judgements are decisions geared toward the selection of final goals for the organization. Factual judgements are decisions involved in the implementation and achievement of final goals. Antecedent decisions are based on numerous facts (verified and presumed) as well as values, conditions, and constraints, which as a collective Simon called the premises of the final decision governing an action – that is, the decision premises (p. 23). Simon conceived of organizational decision making as a “decision-fabricating process” that involved fact-finding, intuition, guessing, analysis, reasoning, design, and negotiation (p. 24). In this production analogy, decision premises originate in various parts of the organization and are assembled into a final decision. Vertical decision making refers to the division of decision making responsibilities between operative and supervisory personnel within the organization (p. 23). Also relevant is Simon’s critique of role theory and the idea that roles determine behavior, which he argues is too constraining in its original connotation of dramatic part. Simon counters that a role specifies some, but not all, of the premises that underlie a decision (pp. 24-25).