Research Policy 43 (2014) 914–925

Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Closed or open innovation? Problem solving and the governance choice☆

Teppo Felin[a,*], Todd R. Zenger[b,1]

[a] University of Oxford, Said Business School, Park End Street, Oxford OX1 1HP, UK
[b] Olin Business School, Washington University, Campus Box 1133, One Brookings Drive, St. Louis, MO 63130-4899, USA

ARTICLE INFO

Article history:
Received 2 September 2012
Received in revised form
28 September 2013
Accepted 28 September 2013
Available online 7 November 2013

Keywords:
Open and closed innovation
Governance choice
Strategy
Problem solving

ABSTRACT

Scholars have recently highlighted the promise of open innovation. In this paper, we treat open innovation—in it's different forms and manifestations—as well as internal or closed innovation, as unique governance forms with different benefits and costs. We discuss how each governance form, whether open or closed, is composed of a set of instruments that access (a) different types of communication channels for knowledge sharing, (b) different types of incentives, and (c) different types of property rights for appropriating value from innovation. We focus on the innovation "problem" as the central unit of analysis, arguing for a match between problem types and governance forms, which vary from open to closed and which support alternative forms of solution search. In all, the goal of this paper is to provide a *comparative* framework for managing innovation, where we delineate and discuss four categories of open innovation governance forms (markets, partnerships, contests and tournaments and user or community innovation) and compare them with each other and with two internal or closed forms of innovation governance (authority and consensus-based hierarchy).

1. Introduction

Open innovation has received increased attention over the past decade (Chesbrough, 2003, 2006; von Hippel, 2005; von Hippel and von Krogh, 2003; von Krogh et al., 2003; Laursen and Salter, 2006; for an overview see Dahlander and Gann, 2010; Van de Vrande et al., 2010; West and Bogers, 2011). Open innovation scholars have focused on the need for focal organizations to transcend their boundaries by sourcing knowledge and technology externally. This research argues that environmental uncertainty and the complexities of innovation and knowledge recombination have led to the increased permeability of organizational boundaries and the need for organizations to interact with their environment and external stakeholders in more open ways. The notion of open innovation has encompassed a wide range of external actors, including users, customers, suppliers, universities, and competitors. The underlying mechanisms for accessing external knowledge and fostering open innovation have, in turn, encompassed a range of alternatives including contests and tournaments, alliances and joint ventures, corporate venture capital, licensing, open source platforms, and participation in various development communities.

Scholars have recently started to look at the governance implications of open innovation. In general, the findings suggest that increased linkages to and knowledge flows from various external partners, particularly in uncertain environments, lead to improved innovation outcomes (West and Bogers, 2011). For example, Fey and Birkinshaw (2005) (cf. Dahlander and Gann, 2010) argue and find that a firm's R&D and innovation performance increases as more relational governance modes are utilized, such as linkages to alliance partners and universities. In line with this argument, Keil et al. (2008) also find that the increased use of various, more open governance forms—e.g., alliances, CVC investments, JVs—leads to increased innovation outcomes for firms. The central intuition, whether we are talking about formal governance arrangements, or informal search (Ahuja and Lampert, 2001; Laursen and Salter, 2006; Tether and Tajar, 2008), is that an increase in the number of external linkages and breadth of search can have beneficial outcomes for organizations striving to innovate. Along these lines, Leiponen and Helfat (2010) also find that an increased number

* Corresponding author. Tel.: +44 1865 288912.
E-mail addresses: teppo.felin@sbs.ox.ac.uk (T. Felin), zenger@wustl.edu (T.R. Zenger).
[1] Tel.: +1 314 935 6399.

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http://dx.doi.org/10.1016/j.respol.2013.09.006

of external knowledge sources leads to increased innovation and better financial performance. Love et al. (2013) (cf. Powell et al., 1996) point to similar findings by highlighting how the "breadth of external innovation linkages" can lead to improved innovation outcomes. Beyond this focus on the breadth or number of external ties, yet other studies have highlighted the benefits of interacting with specific external constituents, such as users and communities (Jeppesen and Frederiksen, 2006; also see Chatterji and Fabrizio, 2013; Foss et al., 2011a,b) or universities (Bercovitz and Feldman, 2007).

While the case for increasing access to external knowledge and greater openness in innovation is compelling, the *comparative* and *managerial* governance implications of this argument are not quite as clear. The aforementioned work focuses on firm-level aggregates—for example, on how certain types or aggregate quantities of external linkages or governance modes can lead to increased innovation (Fey and Birkinshaw, 2005). But any advice or prescriptions based on firm-level aggregates (that is, for the firm as a whole to increasingly use more open governance modes) can lead to mis-specified governance solutions at the micro level.[2] After all, firms continue to exist and organizational boundaries appear to remain highly relevant for organizing innovation activities (cf. Williamson, 1991).[3] Thus a more fine-grained, nuanced and normative approach is needed, focused on the micro-level, comparative choices that managers face when innovating, with particular attention to *when* more open versus more closed forms—and vice versa—might be more beneficial. Thus our focus is on the respective benefits and costs of disparate open *and* closed forms of governance. In short, when should firms use specific open forms of governance versus when should they use alternative, more closed forms?[4]

Scholars have indeed begun to address these, more comparative, governance-oriented questions in the context of innovation (e.g., Afuah and Tucci, 2012; Lakhani et al., 2012; Van de Vrande et al., 2009; also see Baldwin and von Hippel, 2012). For example, Afuah and Tucci (2012) recently compare two governance forms, crowdsourcing versus internal sourcing, and highlight how the "probability of crowdsourcing" increases depending on the nature of the problem (cf. Nickerson and Zenger, 2004). Van de Vrande et al. in turn look at how "firms tackle different types of uncertainty with different governance forms" (2009: 62). And, Veugelers and Cassiman (1999) (cf. Geyskens et al., 2006) study the make or buy decision in the context of innovation and place emphasis on the role of firm size and industry characteristics in determining governance choice. We seek to contribute to this emerging body of research on the comparative aspects of governing innovation.

Our specific focus is examining how attributes of the innovation "problem" (cf. Nickerson and Zenger, 2004) define the choices of governance. We seek to articulate the microanalytic benefits and costs of disparate forms for governing innovation and their respective limits in application (cf. Zenger et al., 2011). Importantly, our contribution is in comparatively examining the unique problem solving attributes of distinct governance forms associated with innovation. We examine the composition of forms by evaluating their access to (a) different communication channels for knowledge sharing, (b) different types of incentives, and (c) different types of property rights.[5] We first discuss the importance of problems as the central unit of analysis. We then delineate two closed (hierarchy and consensus) and four open (markets/contracts, partnerships/alliances/CVC, contests/tournaments/platforms, users/communities) forms of governance and discuss how each, respectively, implicates communication channels for knowledge sharing, incentives and property rights. Our goal, in all, is to provide theoretical reasoning for when and why certain forms of governance work best, specifically in the context of problem solving and innovation. Our approach is normative and prescriptive, adopting the perspective of the manager of a focal firm tasked with organizing to optimize innovative output. Naturally, managing innovation is likely to be a complex amalgamation of open and closed governance forms, where organizational boundaries are more permeable in some situations—depending on the nature of the innovation problem—and less so in others. But focusing on problems as a unit of analysis provides an unapologetically pragmatic and managerially oriented approach for studying the microanalytics of innovation governance and choice.

2. Innovation, problem solving, and governance choices

Innovation is a multi-faceted, multi-level concept and scholars have focused on varied aspects of innovation (for an overview of the innovation literature, see Crossan and Apaydin, 2009).[6] Without getting mired in the vast literature and varied definitions of innovation, we simply focus on innovation as the process by which existing knowledge and inputs are creatively and efficiently recombined to create new and valuable outputs. More specifically, our interest is in how this recombinative process of innovation is efficiently organized or governed. Our effort therefore encompasses inputs, processes, and outputs across varying levels of analysis, but with the aim of examining how firms efficiently manage and govern the process of assembling and organizing inputs to generate valuable outputs.[7] The central actor in our theory is the manager, who seeks to effectively govern, manage and organize problem solving associated with innovation.[8]

[2] Some have also voiced concerns that increasingly engaging external constituents and outsourcing might "hollow out" the firm (Foss, 2003).

[3] Some have argued that the knowledge economy, and the associated need for external linkages, will essentially make firm boundaries superfluous (e.g., Benkler, 2002; Hadfield, 2011).

[4] Firm boundaries, after all, still exist, even though some have argued that the knowledge economy and the associated need for external linkages will make them superfluous (Benkler, 2002; Hadfield, 2011).

[5] We might note that we treat the respective governance forms as relatively discrete choices (as idealized pure types), in line with existing work in transaction cost economics (Williamson, 1991). But we certainly recognize that these forms are not completely discrete, but rather, continuous. But for purposes of theorizing we feel that an idealized approach will surface key considerations (cf. Weber, 1949), both for scholars and managers.

[6] Crossan and Apaydin, based on their extensive literature review, provide the following, broad definition of innovation—"innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services and markets; developments of new methods of production; and establishment of new management systems. It is both a process and an outcome" (2009: 1155).

[7] In line with our broad definition, as argued by others (e.g., West and Bogers, 2011: 4), the open innovation literature also adopts "an expansive definition of innovation," focused broadly on "new"-ness: new products, technologies, processes and so forth.

[8] Extant work on open innovation focuses not just on the inflows of knowledge, but also outflows. We thank an anonymous reviewer for pointing this out. We focus largely on the inflows of knowledge. There is indeed relatively little work on outflows, for example, outflows are only mentioned once in each of two recent reviews of the open innovation literature (e.g., Dahlander and Gann, 2010; West and Bogers, 2011). These outflows, however, have recently been discussed in the form of externalities to openness, where more open firms essentially seem to benefit from positive externalities (Roper et al., 2013).