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THE KNOWLEDGE ECONOMY: EMERGING ORGANIZATIONAL FORMS, MISSING MICROFOUNDATIONS, AND KEY CONSIDERATIONS FOR MANAGING HUMAN CAPITAL

**TEPPO FELIN, TODD R. ZENGER, AND
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In this paper we outline an increasingly predominant, “communal,” perspective of the emerging knowledge economy and explore its emphasis on various nonmarket mechanisms of production. Although the communal perspective suggests organizational forms, governance mechanisms, and knowledge processes that may facilitate knowledge creation and knowledge transfer, we argue that it misses the seemingly contradictory trends of organizational disaggregation and the foundational importance of market mechanisms in knowledge creation. We contrast and partly reconcile these two perspectives of the knowledge economy and highlight key considerations related to the microfoundations of knowledge and human capital management. © 2009 Wiley Periodicals, Inc.

Keywords: knowledge economy, organizational forms, human resources, microfoundations

Across a broad range of disparate literatures, a consensus has emerged that our society is moving toward a postindustrial or postbureaucratic society in which knowledge and information drive economic growth (Albert & Bradley, 1997; Bell, 1973; Benkler, 2006; Bresnahan, Brynjolfsson, & Hitt, 2000; Castells, 2000; Huber, 2004; Machlup, 1980; Powell & Snellman, 2004; Sunstein, 2006; Teece, 2003). The radical, economywide shift toward information- and knowledge-

intensive professional services is indicative of this trend (e.g., Drucker, 1993; Greenwood & Empson, 2003; Heckscher & Adler, 2006; Maister, 1993; Teece, 2003; Webster, 1995). Defined by its “greater reliance on intellectual capabilities than on physical inputs” (Powell & Snellman, 2004, p. 199), the knowledge economy puts emphasis on human capital. Thus, organizational scholars and practitioners must recognize the urgent need to adjust their models, assumptions, and practices significantly to account

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for how work is and will be performed and organized in an increasingly information- and knowledge-intensive world (Blair & Kochan, 2000; Boisot, 1999; Castells, 2000; Foss, 2006; Nahapiet, Gratton, & Rocha, 2005; Powell & Snellman, 2004; Teece, 2003). As Zenger and Hesterly (1997) note, “there is growing evidence of a fundamental shift in the forms that govern economic activity” (p. 210; cf. Huber, 2004).

Important questions accompany the emerging knowledge economy, questions for which managers and HR professionals need practical answers. These questions include:

- How will work be organized and performed in the future?
- What is the emerging nature of the employment relationship?
- Which of the emerging organizational forms will predominate?
- Which organizational forms will most effectively create and govern knowledge?
- How do we best conceive of and practically operationalize knowledge management?
- What role will incentives and ownership play in the knowledge economy?

Addressing these questions defines HR professionals’ strategic work (cf. Barney & Wright, 1998). However, answering these questions is far from easy because of various contradictory trends and differing prescriptions for how best to manage, create, and transfer knowledge. As Adler (2001) notes, the “economy’s growing knowledge intensity is pushing the employment relationship in several somewhat contradictory directions” (p. 220; see also Blair & Kochan, 2000; Cappelli, 2005). Thus, articulating theoretical and practical solutions for managing HR in the knowledge economy has been problematic.

Many scholars describing the new knowledge-based economy emphasize its more collective or communal nature and structure (the communal perspective), and they have focused on the importance of nonmarket mechanisms in knowledge

creation and production. We first review this important perspective and note that scholars have ignored critical individual microfoundations. Specifically, by microfoundations we mean those key, compositional and micro, generally individual-level factors that need to be understood and specified in order to explain any collective phenomenon (Felin & Hesterly, 2007), including communal knowledge creation. Furthermore, we highlight the trend in today’s knowledge economy toward organizational disaggregation and the increased importance of market mechanisms (such as high-powered incentives), which operate concurrently with, though seem to contradict, the communal perspective. Next, we explain the microfoundations and market mechanisms that underpin organizational disaggregation and the communal governance forms observed in the knowledge economy. Because of the increasingly central role of HR professionals in knowledge management, we also discuss key factors related to knowledge and human capital management.

A Primer on Knowledge and Communal Forms of Organization

A growing number of scholars suggest that the knowledge economy requires governance that extends beyond a single organization’s boundaries to networks and communities of firms and larger groups of individuals (Adler, 2001; Benkler, 2006; Brown & Duguid, 2001; Castells, 2000; Kogut, 2000; Powell, Koput, & Smith-Doerr, 1996). Scholars advocating these communal forms for the knowledge economy argue that “community—particularly in the form of community of practice—is increasingly recognized as the organizational principle most effective in generating and sharing new knowledge” (Adler, 2001, p. 220; Benkler, 2004). Others reinforce this perspective, arguing that “communities of practice” (Brown & Duguid, 2001; Wenger, 1999; Wenger, McDermott, & Snyder, 2002) or “collaborative communities” (Adler, Kwon, & Heckscher, 2007; Heckscher & Adler, 2006; Nahapiet et al., 2005; O’Mahony & Ferraro,

2007), or “peer and social production” (Benkler, 2006), or “governance in community forms” (for a recent overview, see O’Mahony & Ferraro, 2007) are the organizational forms that best define the knowledge economy. This perspective envisions “the emergence of a networked information economy” (Benkler, 2006, p. 2) that functions as the backbone of the knowledge and information economy (see Boisot, 1999; Castells, 2000; Powell, 1990).

The case for communal organizing is anchored in the logic that the complexity and scope of information and knowledge render any organization or hierarchy, let alone an individual, incapable of storing and producing critical knowledge (see Boisot, 1999; Castells, 2000; Kogut, 2000; Lee & Cole, 2003). Forms of collective governance, including networks of both loosely and tightly linked relationships, are required to accumulate and create knowledge. The communal perspective suggests that the organization and its boundaries have become increasingly “permeable” (Powell et al., 1996, p. 143) and even superfluous as networks and communities more effectively gather and recombine knowledge from disparate sources (Freeman & Audia, 2006; Nahapiet et al., 2005). Furthermore, some argue that “as production is reconfigured to allow planful control over *ever-larger aggregates*—from individual tasks to whole work processes, larger firms, then entire supply chains—the *role of the market as a coordinating mechanism* is progressively subordinated” (Adler & Heckscher, 2006, pp. 77–78, emphasis added; cf. Powell et al., 1996).

A central feature of the emerging knowledge economy, according to communal scholars, is its increased shift away from such market mechanisms as high-powered incentives and ownership—these market mechanisms are thought to create unnecessarily adversarial relationships in organizations by hindering cooperation and information sharing (Benkler, 2006; Ghoshal & Moran, 1996; cf. Ferraro et al., 2005). Market-based mechanisms, these scholars argue, stifle cooperation and trust in organizations—the very elements necessary for knowledge creation in the knowl-

edge economy (Adler, 2002; Adler et al., 2007; Ghoshal, 2003; Nahapiet et al., 2005). Some scholars even question whether the full benefits of collaborative communities and the associated knowledge creation can be unleashed under a capitalist market system (Adler & Heckscher, 2006, pp. 67–77; see also Adler, Forbes, & Wilmott, 2007, p. 8; Benkler, 2006; Grey & Wilmott, 2005), because “capitalist development corrodes traditional forms of community” (Adler & Heckscher, 2007, p. 12). Instead, they call for the communal forms of organizing that post-World War II organizations exhibited (see Ferraro, Pfeffer, & Sutton, 2005, p. 19) or for the collective forms of the more traditional community-oriented models of “pre-capitalist societies” (see Adler & Heckscher, 2006, p. 14).

The communal perspective of knowledge, then, emphasizes various “nonmarket” mechanisms and argues for a “new modality of production: commons-based peer production,” rather than “market-based” exchange based on “property rights” (Benkler, 2006, p. 60). (See Table I.) From a communal perspective, individual effort and contribution in the knowledge economy are driven by volunteerism and intrinsic motivation rather than by extrinsic rewards. Central to this motivation is people’s desire to belong and to share a sense of identity and purpose. The communal perspective highlights open-source innovation—“a community-based model of knowledge creation”—as an idealized model of knowledge creation and production (Lee & Cole, 2003, p. 633; see also Benkler, 2006; Weber, 2004; or O’Mahony & Ferraro, 2007). In such communities, exchange based on self-interest and incentives gives way to collaboration, social interaction, and forms of governance that meet communal ideals where knowledge is freely shared and transferred and trust acts

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TABLE I Knowledge and Microfoundations

Key Dimensions	Communal Perspective	Microfoundations of Knowledge Production
Locus of Activity and Knowledge	Higher, collective levels and community	Disaggregation, nested levels, individuals
Emerging Forms and Governance Mechanisms	Networks, communities of practices, collaborative communities	Markets in hierarchy, partnerships, experts, projects
Organizational Boundaries	Permeable, giving way to higher collectives	Based on transaction, individual interest
Decision Making	Large-scale consensus-building	Expert and individual discretion
Key Conceptions of the Market (in Hierarchy)	Social embeddedness and problem of incentives and competition	Invisible hand mechanism
Modality of Production	Commons	Property rights and individual knowledge
Idealized Metaphor and Form	Family and precapitalist society, community of practice	Market and disaggregated forms (for example, partnerships)
Organizing Logic	Social interaction and culture	Self-selection and interest
Problems	Social loafing, boundaries, incentives	Interest alignment
Imputation of Outcomes	To collective	To the individual
Basis of Social Interaction	Trust	Results and interests
Conception of Self	Interdependent with the social, problem of the self	Core self with interests and preferences and expertise
Ownership	Hard to conceptualize for knowledge—no ownership	Individual imputation and appropriation of residual rights central to collective effort

as a key organizing principle (Adler & Hecksher, 2006, p. 60; Benkler, 2002; Lee & Cole, 2003; O'Mahony & Ferraro, 2007).

The Need for Microfoundations

Extant communal and collective forms of organizing, along with the emphasis on non-market mechanisms that motivate effort, initially seem to be a reasonable description of production in the emerging knowledge economy. The communal perspective, however, ignores an equally prevalent (and partly contradictory) trend toward organizational disaggregation and particularly toward the more marketlike features of emerging organizational forms, such as networks and communities. In short, the microfoundations are missing. To understand knowledge governance and the associated implications for human capital management fully, we must

explore the complementary and seemingly contradictory features of these trends.

Although the communal perspective views market incentives and property rights as destructive to the cooperation essential in networked and collective governance, we contend that microlevel market mechanisms are the essential building blocks of a knowledge-based economy. Indeed, market mechanisms and microfoundations enable rather than impede networks and communal forms of organization and associated knowledge creation. Understanding these microfoundations of knowledge creation (cf. Felin & Foss, 2005; Felin & Hesterly, 2007) is critical to understanding knowledge creation as a whole. In short, microfoundations provide a more complete picture of the knowledge economy and emphasize the more atomistic, marketlike organizational forms that also characterize it.

Two omissions in the communal perspective highlight the need to discuss microfoundations and the associated implications for knowledge and human capital management.

First, by focusing on communities and collectives and by viewing organizational boundaries as permeable or even superfluous, the communal perspective causes us to lose focus on a fundamental question: What are the appropriate boundaries of communal organizing? With its focus on “ever-larger aggregates,” the communal perspective might suggest that knowledge creation and transfer occur most effectively when organized in one large community or firm, effectively subsuming the market (cf. Coase, 1937; see Adler, 2001; Lee & Cole, 2003; Powell et al., 1996). The ethos of organizing into ever-larger communities and networks, however, causes us to lose sight of the fact that significant costs and productivity losses are associated with any form of collective or communal production or decision making. These costs and losses reflect microfoundations and include well-established factors related to social loafing, motivation, groupthink, deindividuation, social comparison, and envy (e.g., Festinger 1954; Latane, Williams, & Harkins, 1979; Nickerson & Zenger, 2008; Walster et al., 1973). In short, despite the implicit assumption of communal approaches, as Latane et al. (1979) caution, “many hands don’t make work light”—which also is the case in the knowledge economy. Indeed, free-riding and social loafing and conflict can be problems in even the most virtuous community (cf. Stroebe, Diehl, & Abakoumkin, 1992). This suggests that there should be clear boundaries and limits to organizations’ and communities’ possible size and scope (Nickerson & Zenger, 2008). More generally, the implied prescriptions by communal scholars to organize around larger collectives and communities must be reconciled with evidence of “disaggregation” and the increased use of marketlike structures (Zenger & Hesterly, 1997)—the surprising benefits of creating knowledge through smaller, disaggregated organizational forms

where high-powered, marketlike incentives play an important role in motivating individual effort (Zenger, 1992, 1994). Although communal knowledge creation and disaggregation are not necessarily incongruous, they still need to be reconciled conceptually.

Second, and closely related to the point regarding the boundaries of communal organizing, the communal perspective does not specify the decision and ownership rights associated with communal forms of governance. Instead, the perspective assumes that organizational forms such as community or networks will somehow naturally create coherence in individual interests, and that ownership does not matter (Benkler, 2006). Collective considerations subsume discretion, motivation, and other individual-level factors. The communal perspective argues that the communal mechanisms of social interaction, culture, and trust create unified collective action, decision making, and consensus (cf. Adler, 2001). Yet, the microfoundations of this “large-scale consensus building” (Hecksher, 2004, p. 161; for further discussion of consensus, see O’Mahony & Ferraro, 2007; cf. Sugden, 2001)

are not specified; for example, no guidance is given for how divergent interests might be reconciled. Specifically designing organizational forms and associated governance mechanisms requires specifying “in whose interests an organization should be controlled” and “*how* decisions and *policies ought* to be made, *by whom*, and for whom” (we use the definition by Greenwood & Empson, 2003, p. 912, emphasis in original; cf. O’Sullivan, 2000). If we are to understand a knowledge economy in which these networked forms are undeniably more prevalent, our understanding of these forms must also reflect the increased infusion of market incentives and the microfoundations that enable these exact communal forms.

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Disaggregation, the Microfoundations of Knowledge, and Human Capital

To understand the knowledge economy fully, we must reconcile two seemingly contradictory trends: the increased prevalence of both communal organizational forms and the opposite trend of organizational disaggregation (Zenger & Hesterly, 1997). Broadly defined, organizational disaggregation means not only

Hierarchy, authority, and managerial intervention increasingly are superseded by organizational forms that capitalize on individual judgment and expertise via better alignment of high-powered incentives.

that the size of the subunit and the entire organization is decreasing (cf. Rossi-Hansberg & Wright, 2007), but also that purposeful and organizational activity is rapidly increasing (Bhide, 2000; Coleman, 1991) and that entrepreneurial activity—measured, for example, by new business filings—has radically increased (Bhide, 2000; Birch, 1987; cf. Baumol, 2002). Significant increases in temporary employment relationships further magnify organizational disaggregation (Barker & Christensen, 1998), including an increase in outsourcing (Coyle-Shapiro & Morrow, 2006) and the use of contingent and freelance workers (Teece, 2003). Organizational disaggregation is happening not just economywide but also

within organizations. Overall, individuals increasingly are working in smaller organizations or subunits, and under nontraditional employment relationships and organizational forms.

Coordination-enhancing tools, such as information technology, drive organizational disaggregation in the knowledge economy. Specifically, these tools allow people with disparate expertise and specialization to coordinate via disaggregated and looser at-will collective arrangements (cf. Bresnahan, Brynjolfsson, & Hitt, 2002). Information technology, for example, has lessened the need for employee colocation and direct interaction (Bresnahan et al., 2000). Cleaner interfaces in projects with multiple experts allow for looser structures and coordination that do not rely on direct

hierarchy and managerial intervention. In fact, as we will discuss later, hierarchy, authority, and managerial intervention increasingly are superseded by organizational forms that capitalize on individual judgment and expertise via better alignment of high-powered incentives (Zenger & Hesterly, 1997; cf. Greenwood & Empson, 2003; Teece, 2003). Of course, there are limits to the extent that disaggregated production and knowledge creation is feasible (see Rossi-Hansberg & Wright, 2007, for an economic perspective on this matter). Nonetheless, the trend toward looser and smaller organization appears particularly evident in knowledge- and human capital-intensive professional services settings and also in economies more widely (Teece, 2003; also see Greenwood & Empson, 2003; Maister, 1993). The underlying ethos of organizing, then, is increasingly one of smaller and disaggregated forms rather than larger and aggregated forms. The treaty-like relationships (Teece, 2003) between individuals, of course, do not mean that people need to be viewed as wholly atomistic entities interacting in markets that are independent of social relationships. Rather, as we will discuss, disaggregation allows for the better imputation of individual effort and ability with outcomes and rewards in team production settings.

The communal approach to knowledge creation, of course, is not directly antithetical to organizational disaggregation. Indeed, networks or communities and disaggregated organizational forms are necessary complements: disaggregated, nonhierarchical structures enable networked, communal forms. By focusing only on these collective and communal structures without discussing the market mechanisms and microdynamics that make them possible, however, the communal perspective does not paint a complete picture of the knowledge economy.

For example, communal perspective scholars have highlighted open-source organizing as a new model of communal and social production that heavily relies on *non-market* mechanisms, such as trust, intrinsic motivation, and communal knowledge sharing. Recent large-scale studies of this form of

production, however, point out its striking marketlike features, which in essence support a more disaggregated, individualistic view. Open-source production, for instance, is extremely disaggregated: most open-source projects simply involve one person or only a small, productive team (Healy & Schussman, 2003; Mockus, Fielding, & Herbsleb, 2002). Open-source production also has proved to be a powerful talent-sorting mechanism that signals the value of talent and ability to potential employers (Lerner & Tirole, 2002; Lepakaki & Mustonen, 2009; Spence, 2002). Furthermore, while the communal literature heavily emphasizes intrinsic motivation, nonetheless recent empirical work has also noted the critical importance of extrinsic motivation in open-source settings (Roberts et al., 2006), for example, as highly talented individuals are able to appropriate value via the reputations they develop. Although the communal perspective highlights various macro- and nonmarket mechanisms, these emerging forms' disaggregated nature and marketlike features also need to be detailed and recognized.

In what is considered one of the most authoritative descriptions of the open-source movement (Benkler, 2006, p. 66; Sunstein, 2006), Eric Raymond (2001) notes that "the [open source] world behaves in many respects like a free market or an ecology, a collection of selfish agents at tempting to maximize utility which in the process produces a self-correcting spontaneous order more elaborate and efficient than any amount of central planning could have achieved" (p. 52).

Organizational disaggregation, then, provides the general backdrop and trend for understanding the microfoundations of both the knowledge economy and the communal perspective. In the remainder of this section, we identify and explain the following key microfoundations of knowledge creation in the knowledge economy: (1) high-powered incentives and motivation, (2) discretion and ownership, (3) self-selection and interest alignment, and (4) human capital heterogeneity. These microfoundations are a relatively unexplored undercurrent of the knowledge

economy and further provide much-needed individual-level underpinnings for the extant collective or communal perspective of knowledge production (see Table I). These microfoundations also suggest key considerations for human capital management in the knowledge economy.

High-Powered Incentives and Motivation

Disaggregated organizational forms are central to the knowledge economy because they increasingly allow the use of targeted, high-powered, marketlike incentives (Zenger & Hesterly, 1997). The disaggregation of organizations, along with the associated developments in information technology and measurement, have facilitated the increased use of marketlike mechanisms for attracting talent and inducing individuals to create and share knowledge. As Zenger and others persuasively show, smaller, disaggregated organizations allow for a better alignment between individual effort or ability and rewards (Zenger, 1992, 1994; cf. Olson, 1965, pp. 27–29).

The problems of larger collectives and communities with regard to incentives and motivation are counterintuitive and surprising, thus requiring further explanation. The reason that "the market mechanism fails to optimize the production and distribution of knowledge" (Adler & Hecksher, 2006, p. 29), even with marketlike structures within organizations (Zenger & Hesterly, 1997), may be closely associated with the fact that within large organizations or communities, rewarding talent with market mechanisms is severely constrained because of problems of social comparison costs and envy (Zenger, 1992, 1994). Thus, talented individuals with high levels of expertise are suboptimally rewarded in larger organizations because their compensation is weakly linked to performance (Nickerson & Zenger, 2008), even though their very efforts contribute disproportionately to collective outcomes (Felin & Hesterly, 2007). In fact, research suggests that highly talented individuals in knowledge-intensive settings leave to join or start

smaller organizations because the latter offer more marketlike incentives and better reward effort and ability (Zenger, 1994). Naturally, the migration of talented individuals has detrimental consequences for the knowledge outcomes of the organizations they leave (Felin & Hesterly, 2007; Somaya, Williamson, & Lorinkova, 2007). Both the migration to more “collective” and more disaggregated organization, then, are as much a reflection of the inability of large hierarchies to offer market-based mechanisms as they are of the power of collective forms.

Of course, the fact that high-powered incentives operate more effectively in smaller organizations and disaggregated forms does not eliminate the need for larger collective and communal arrangements (cf. Jones, Hesterly, & Borgatti, 1997). On the contrary, *the access to high-powered incentives in markets and smaller organizations necessitates networked collectives and makes them possible*. Through networks of loose, collective arrangements, smaller organizations with high-powered incentives both competitively and cooperatively exchange and produce knowledge. Thus, the rise of smaller, disaggregated organizations complements the distributed knowledge production in communities, specifically because these small organizations naturally have alliances and other communal arrangements. High-powered incentives, therefore, are a critical microfoundation that enables collective arrangements and communal forms of organizing.

Managers and HR professionals running large enterprises need to be aware of the competition from disaggregated, networked sets of small firms that benefit from high-powered incentives and marketlike structures. To compete, larger organizations can replicate marketlike forms and incentive systems that optimally align effort and ability with outcomes. For example, large organizations should disaggregate and organize their human capital into smaller and more focused groups and subunits, thus allowing for alignment between abilities or effort and rewards. Larger collectives tend to specify

and narrow the range of possible incentives inaccurately (Nickerson & Zenger, 2008). The problem of incentive alignment is particularly magnified with high-performing individuals, leading to the risk that they will leave to join smaller organizations or to start their own firms. Managers and HR professionals should be attuned to problems of organizational size and associated disincentives and seek to create smaller subunits that create a tighter link between individual effort and ability and rewards.

Discretion and Ownership

From the perspective of microfoundations, individuals are both the central creators and repositories of knowledge. Expertise is the key currency of the knowledge economy, and expert *discretion* provides perhaps the critical source of knowledge in organizations (Tece, 2003; also see Greenwood & Empson, 2003, p. 917). An important microfoundation, then, is the autonomy and discretion organizations give to experts and individuals (cf. Foss & Foss, 2002).

The partnership model is a common form of governance in the knowledge economy for capitalizing expertise and individual discretion and knowledge (Greenwood & Empson, 2003, p. 909; Tece, 2003). Specifically, this model not only explicitly recognizes that “the knowledge of individuals represents the key income-generating asset” of organizations (Greenwood & Empson 2003, p. 917), but also gives these individuals (i.e., the partners) maximum latitude and discretion in decision making (cf. Maister, 1993). The partnership model is a more marketlike, targeted organizational form that not only taps into individuals’ highly specialized discretion, skills, and capabilities, but also more directly rewards effort and talent. Ownership and associated rights to the value created are at once allocated to individuals and consolidated with partners, who also have wide discretion about the actions that should be taken.

The partnership form also partly resolve common agency problems by making agents act as principals (see Greenwood & Empson,

2003). Moreover, they resolve traditional problems of team production and collective action because internal monitoring is less costly than monitoring by an external principal or stakeholder. The partnership form mitigates traditional problems of hierarchical monitoring and inducement of the correct actions manifest in shareholder-owned companies because it gives experts wide discretion that is directly linked with ownership, rewards, and accountability. This structure also allows partners increased autonomy and discretion regarding the activities that should and can be taken, and responsibility and commensurate rewards for the outcomes (cf. Foss & Foss, 2005). The alignment between ownership and outcomes is important because experts within organizations also have the capabilities and knowledge to make the best decisions (Teece, 2003).

To highlight the link between the micro-foundations of ownership and discretion more carefully, we can consider any collective effort or joint production as a two-stage game of value creation and value appropriation (Coff, 1999, 2008). The problem is that the two are often decoupled, particularly in larger collective settings where each stakeholder's contribution is hard to describe, and there is dispute about the appropriation of the created value. When both discretion and ownership are in the same hands, as the partnership form allows, then value creation and appropriation are more tightly linked.

A central point here is that discretion, autonomy, and ownership in a knowledge economy need to be pushed down toward lower levels, where the organization's key knowledge assets reside. Pushing decision making and discretion to this level may be counterintuitive, as collective and communal scholars have focused on higher-level consensus building and social interaction as the key knowledge source. Partnership and other disaggregated forms of organization in professional services have begun to address these issues (Teece, 2003).

As an important point of contrast, the communal perspective specifically argues that ownership and property matters are increasingly irrelevant in the knowledge

economy, as property rights give way to the "commons" (see Benkler, 2002, 2006). Scholars argue that "the salient characteristic of commons, as opposed to 'property,' is that no single person has exclusive control over the use and disposition of any particular resource in the commons" (Benkler, 2006, p. 60), and knowledge cannot be meaningfully owned. Although imputing individual rights to a specific element of knowledge (outcome) may be difficult, individuals nonetheless maintain ownership over the essential factor that generates knowledge: themselves. Because individuals still have discretion over where to work, how hard to work, and so on, these property rights are central to creative production in the knowledge economy. More than ever, ownership of discretionary capabilities is central to creating knowledge (cf. Foss & Foss, 2005).

Although we emphasize expert discretion, the communal perspective places greater focus on collective consensus—specifically, where decisions and associated actions originate from social interaction. The distinction between a focus on individual expertise and a focus on collective consensus is subtle but important. Again, the assumption from the communal perspective is that the collective jointly gets things right. Hence, the key mechanism that the communal perspective focuses on is the interaction of individuals (a "wisdom of crowds" argument) rather than the underlying expertise of the interacting individuals. This, of course, is not to say that building consensus is unimportant in the knowledge economy; it simply means that a communal focus misses and abstracts (and assumes) away the underlying capability in the individuals who are interacting and their discretionary efforts to interact with and create particular communities.

A key implication for managers and HR professionals is to link more tightly ownership, discretion, and associated outcomes. "Managing" human capital might appear to be an oxymoron in this case, because the "management" of human capital involves allowing increased discretion and linking it with the appropriate ownership and accountability for actions taken.

Organizational forms such as the partnership model increasingly allow this linkage and call for organizations to tie individual discretion more tightly to the appropriate accountability and rewards. We might note that our focus here does not disregard intrinsic motivation; rather, discretion and ownership may also include the efforts and motivation outside extrinsic rewards. Furthermore, rather than resort to the commons, ownership for decisions and the discretion to make choices are central in the knowledge economy. Although knowledge production is about knowledge sharing and recombination, the most important work is cognitive, occurring in people's minds. Knowledge production is, thus, at once both more individualistic and more communal than, for instance, the production of manufactured goods. Therefore, although hierarchy may play a more limited role in the knowledge economy, individual autonomy and high-powered incentives are critical.

Self-Selection and Interest Alignment

A third microfoundation of the emerging knowledge economy is that individuals who have differing knowledge, skills, and abilities self-select into organizations based on individual values and interests. Emerging organizational forms increasingly allow for self-selection based on interest both *within* and *across* organizations—that is, expert discretion and abilities drive the organizing process in the knowledge economy (cf. Schneider, 1987). Self-selection *within* organizations means that organizations increasingly allow individuals to choose their work (Foss, 2003); self-selection *across* organizations means that individuals, particularly expert talent, increasingly choose (or establish) different organizational settings or work on a project basis as agents under loose employment treaties or contracts (rather than formal organizations). Consequently, individual self-selection and interests are powerful mechanisms of coordination, organization, and knowledge sharing.

Individual self-selection and organization based on interests are also increasing, given numerous labor market trends in the emerging knowledge economy, such as an aging workforce, increased information intensity, relatively strong economies and associated opportunities for mobility, increased entrepreneurship, and other related trends (for an overview, see Brockbank & Ulrich, 2005; Cappelli, 2005; also see Luthans, Yousseff, & Avolio, 2006, pp. 4–6). These trends have resulted in an “employees’ market” in which choices for talented individuals with expertise appear rather plentiful for the foreseeable, long-term future (Bresnahan et al., 2000; Cappelli, 2005).

The increased availability of information allows access to information about others’ interests, which further accelerates the self-selection process in organizations. Self-selection based on interest provides a more marketlike organizing logic and coordination mechanism for the knowledge economy, thus determining the composition of organizations and teams. Although some extant work suggests that price is the basic coordination mechanism from a microfoundational perspective (see Adler, 2001, p. 219) and that trust and consensus are the key lubricants of coordination within the communal perspective (see Table I), interest and self-selection also provide key mechanisms for thinking about social interaction and associated knowledge creation. People make consequential choices about where to work, how to work, what to work on, whom to work with, and whom to trust (cf. Schneider, 1987); individuals self-select to work on particular projects or with particular organizations.

It is critical to note that self-selection by interest is also a highly valuable “democratic” sorting process for organizations in assessing project and action viability (see Knudsen & Levinthal, 2007, for a related discussion of polyarchy). There are, indeed, some interesting links here with the communal perspective. Specifically, people can evaluate projects and organizational initiatives based on individual interest and expert judgment. Projects that are

not deemed feasible or valuable will not garner sufficient individual support. The literature on self-managed teams suggests similar intuition (Kirkman & Rosen, 1999). Of course, these “democratic” forms of governance driven by self-selection and interest may leave more mundane yet critical activities unaccomplished (cf. Zenger, 2002). The logic of self-selection, on the other hand, particularly applies to highly skilled experts and talent, specifically those whose abilities, interests, and effort increasingly provide organizations’ key valuable resources (Teece, 2003) and whose choices and self-selection provide a rough decision heuristic for which projects should or should not be pursued. The organization, then, may intervene, via its hierarchy and associated alignment of incentives, to ensure that the mundane yet critical organizational activities are accomplished. Intervening at the level of project selection (via hierarchy or managerial authority), however, may not be advisable, as the key knowledge is specifically embedded in these experts and individuals. The balance between expert discretion and managerial intervention needs to be carefully considered (cf. Ewing, 2007).

Managers and HR professionals, then, should create an environment in which individuals can accumulate and recombine knowledge via self-selection and interest alignment. Allowing individuals to self-select into projects they see as opportunities either to accumulate or to create knowledge is vital to managing in the knowledge economy. Individuals seek the opportunity to self-select, a vital step to creating communities where knowledge is effectively recombined and transferred. Individuals—particularly experts—prefer choice. Consequently, permitting people to choose projects increases their effort and optimizes their use of knowledge. In reconsidering emergent employment relationships and in designing jobs and organizational forms, HR professionals need to take into account self-organization by interests, both across organizations (through labor markets) and within them (through project organization and selection).

Management, therefore, may choose organizational forms such as projects and other loose interactions organized around interests. Such organization by interests may result in organization models used in the Hollywood entertainment industry (Miles, Snow, Matthews, Miles, & Coleman, 1997), in which coordination and interaction are handled via self-selection and project-related events—individuals interact for relatively short periods when jointly creating a product and then disband. This type of arrangement is feasible within organizations outside the entertainment industry, as Foss (2003; cf. Ewing, 2007) discusses in his research on organizational forms adopted by Oticon. Professional services and the increasingly prevalent partnership models of organizing also naturally tap into individuals’ interests (Teece, 2003).

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Human Capital Heterogeneity

The final, key microfoundation highlights the heterogeneity of expertise critical to the knowledge economy (e.g., Bresnahan et al., 2000, 2002; Felin & Hesterly, 2007). This diversity of ability and knowledge is the key raw material of the knowledge economy (Teece, 2003). Punctuating the importance of the emerging recognition of talent and the associated need to reconsider management and HR practices, Teece notes that “the nature of the firm itself must change if the full potential of top talent is to be unlocked” (p. 895). As Teece further notes, although differences and heterogeneity in underlying human capital have not increased over time, talent and specialized expertise have become more central in the knowledge economy. Talent attracts clients and others with talent as well as defines an organization’s reputation. This rainmaking ability is particularly important in professional services organizations, such as the investment banking industry. As Chacar and Coff (2001) find, when top investment

bankers leave highly prestigious organizations, a predominance of key customers and key talent leave to join the new organization. Thus, over time, stratification and sorting based on ability and expertise increase within the economy (cf. Garicano & Hubbard, 2007), with information technology being an important enabler (Bresnahan et al., 2000, 2002).

Fruitfully highlighting human capital heterogeneity adds to the communal and collective perspective by moving the focus down a level of analysis. In other words, to understand why a particular organization or collective effort performs better than another, one must first look at the role that individual capabilities and expertise play in shaping collective capabilities and performance (Felin & Hesterly, 2007). The underlying assumption of the communal perspective is that individuals are roughly homogeneous (given the focus on collective constructs; for an overview see Felin & Hesterly, 2007), and knowledge is more often created in situational and communal relationships rather than by individuals (cf. Davis-Blake & Pfeffer, 1989). The assumption of individual and human capital homogeneity, of course, remains subtle and implicit. It is reflected more in the *emphasis* on higher levels and relationships rather than in any explicit statements that individuals no longer matter (though see Murmann, Aldrich, Levinthal, & Winter, 2003, p. 21). The bottom line is that the focus on higher collectives and various relationships subtly sidelines such questions as: *Who* composes the organization? *Who* creates and captures value? *Who* has or creates relationships with *whom*? (Felin & Foss, 2005). Such important matters as interest and self-selection also are implicitly assumed away (Nahapiet & Ghoshal, 1998).

In sum, although there has been some tendency to discount (or not to emphasize) the role of talent and human capital heterogeneity in organizational outcomes (see Pfeffer & Sutton, 2006, p. 85), we suggest that such heterogeneity is an important component and driver of the knowledge economy. From the communal perspective, the logic of steering away from rainmakers and top talent

is specifically rooted in the matters of social comparison and envy: rewarding the extreme performers for high performance results in social comparison costs that complicate efforts to motivate (Nickerson & Zenger, 2008; Zenger, 1992). Recognizing that firms incur costs in luring talent, however, certainly does not mean that their efforts are misguided. Furthermore, disaggregated forms of organization and communities have allowed for a better alignment between individual abilities and effort and organizational outcomes.

A critical underlying pillar of the microfoundational approach for the emerging knowledge economy is recognizing that people are the source of knowledge, discretion, expertise, and activity. Consequently, talent and expertise are critical resources, and accessing talent is *the* critical capability for generating competitive advantage in the knowledge economy (Barney & Wright, 1998; cf. Gardner, 2002). In fact, we can equate knowledge management with talent management. Furthermore, we can also suggest that although the knowledge economy is built around collaboration and networks, it is, first and foremost, an economy of talent and expertise—and one in which talent and expertise are effectively unleashed. Thus, although significant HR effort (from a collective and communal perspective) is rightfully spent on thinking about teams, relationships, communities and networks, and associated systems, processes, and configurations for managing knowledge, our discussion of microfoundations suggests that managers' and HR professionals' time and resources should focus on hiring and retaining individuals whose talent and expertise provide the key foundation for high performance. Communal and other structures take care of themselves when the proper individuals are hired and retained.

The Challenge Facing HR Professionals

There have been increasing calls for HR professionals to be well-versed in “external

business realities” and the “fundamental driving forces of business” (Brockbank & Ulrich, 2005, p. 489). The emerging knowledge economy and the seemingly contradictory conceptualizations of the organizational forms that create knowledge, such as communal forms and organizational disaggregation, certainly are among the key “external realities” in which HR professionals should be fully conversant, given their increasingly critical role in knowledge management and the design of work and organizations. We have discussed an emerging perspective of the knowledge economy—the collective or communal perspective (Brown & Duguid, 2001; Castells, 2000; Heckscher & Adler, 2006; Lee & Cole, 2003; Powell, 1990)—and

highlighted the need to understand the underlying dynamics, such as disaggregation and associated market mechanisms that make these new organizational forms possible. A key challenge facing HR professionals is to design the appropriate organizational forms and employment relations that allow for human capital to be fully unleashed, balancing both the individual- and collective—level factors that drive knowledge creation. However, while extant work has heavily emphasized various collective and communal arrangements, we have argued that there also needs to be a re-newed focus on key individual-level considerations and market mechanisms that make the knowledge economy possible.

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