Overcoming frictions in transnational knowledge flows: challenges of connecting, sense-making and integrating

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Frictions in Transnational Knowledge Flows: Challenges of Connecting, Sense-Making and Integrating

by

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Abstract (ca. 100 words): The increasing interconnection of local, trans-local and transnational knowledge networks is the outcome of the co-evolution of (i) knowledge centers, typically city regions, (ii) epistemic communities that are grounded in and connect these regions, and (iii) firms, usually multinational enterprises (MNEs). This interaction has created opportunities for innovation, but it is also impeded by a range of frictions that arise in the process of integrating locally embedded knowledge from geographically dispersed and culturally disparate regions across different countries. This paper develops a simple model of how such frictions that MNEs encounter in their knowledge internationalization process can be overcome through ongoing processes of connecting, sense-making and integrating.

Keywords: connecting; economic geography; integrating; international business studies; sense-making; transnational knowledge flows

JEL Codes: D85; F21; F23; R11

1. Introduction
The increasing dispersion of value creation over geographic space has received attention in both the fields of economic geography and international business. However, the perspectives of these two literatures have been quite different (Fuller, 2018; Gugler, 2018). With increasing interest in the organization of global linkages, economic geography research has analyzed how firms and regions enter internationalization processes. It has focused on the ways in which firms are at the same time embedded in existing territorial economic networks of varying geographic scales, while connecting to new ones (Scott, 2001). In contrast, international business is traditionally focused on the multinational enterprise (MNE) that leverages local resources and orchestrates activities across national borders. It treats the distinction between the home and host ‘locations’ of an MNE as critical, and has largely emphasized the nation state as its unit of location analysis (Mudambi et al., 2018). In studying international linkages, international business research has tended to prioritize the analysis of corporate networks, such as parent-subsidiary relationships, over territorial embeddedness – being mostly concerned with integration in business networks that may or may not be spatially bounded, while treating the location/region essentially as an independent source of advantages or disadvantages for geographically mobile firms.

Whereas much work in economic geography is focused on localized configurations of economic activities, there is also a tradition of investigating global networks of production, how
they are configured, what power asymmetries develop, and how these impact opportunities for development or upgrading (Gereffi, 1994; Henderson et al., 2002; Humphrey and Schmitz, 2002; Gereffi et al., 2005; Yeung and Coe, 2015; Coe, 2018). This work on global commodity chains, value chains and production networks is interdisciplinary and intersects with international business and development studies. Investigations are particularly sensitive to economic situations in and connections with developing countries and develop a multi-scalar perspective of how complex networks of influences and power asymmetries affect the internationalization process. While rich in empirical detail, few studies systematically investigate the frictions and barriers associated with knowledge processes, and the consequent effects on value creation outcomes. Integrating the lenses of economic geography and international business will allow us to develop a holistic, co-evolutionary analysis of the extent to which the potentials of increasing global knowledge connectivity can be realized.

This special issue is aimed at integrating these perspectives to develop a more holistic view of the co-evolution of regional economies and MNEs in a spatial perspective, by simultaneously considering trans-corporate, trans-regional and transnational levels of knowledge generation. While the literatures on clusters of localized knowledge flows and on international business knowledge networks have tended to proceed largely independently of one another, with just some occasional cross-referencing, recent trends in scholarship in each of these fields have created the potential for a more substantial conversation (e.g. Bathelt et al., 2004; Glückler, 2006; Cantwell, 2009; Bathelt and Glückler 2011; Beugelsdijk and Mudambi, 2013; Bathelt and Cohendet, 2014; Cano-Kollmann et al., 2016; Cantwell and Salmon, 2018; Jones, 2018; Cook et al., 2018). Building on long-standing traditions, economic geographers have focused attention on the causes and effects of international interdependencies between regions, accentuating the spatial differentiation and interrelatedness of activities (e.g. Scott and Storper, 2003; Li et al., 2012; Li and Bathelt, 2018). In international business greater consideration has been given to interactions between firms and different social and political institutional contexts at the national level (Berry et al., 2010; 2014).

The international business field has also become more concerned with the rising diversity of firm and non-firm actors involved in cross-border business connections and the formation and growth of international business networks. For instance, discussions about the emergence and evolution of competence-creating subsidiaries (Cantwell and Mudambi, 2005), while
emphasizing the local embeddedness of such entities, have generally presumed the prior existence of localized knowledge networks at the host site/location, to which subsidiaries can then connect. This strand of international business literature, which treats competence-creating subsidiaries as nodes in transnational knowledge networks (Ghoshal and Bartlett, 1990), references and draws upon economic geography literature on local clusters, but without contributing much directly to the latter. The increasing interconnection of local and transnational knowledge networks gives rise to significant opportunities, but these are beset by concomitant frictions. In this paper we develop a co-evolutionary model that analyzes the processes underlying the integration of contextually embedded knowledge from multiple geographically dispersed and culturally disparate locations (Meyer et al., 2011; Phelps and Fuller, 2016).

Real-world globalization processes have helped to bring the two subject areas closer together owing in part to commonalities in the trends and the challenges that are confronting organizations and regional economies. As capability building and knowledge creation processes become more internationally connected, this critically affects the competitive advantages of firms and territories alike. As far as knowledge and innovation processes are concerned, the relevant firms are mostly MNEs (Cantwell and Mudambi, 2005), while the territories within which knowledge is contextually embedded are typically city regions (Scott, 2001). Recent research emphasizes that the global economy is being driven by close interrelationships and interdependencies between MNEs and urban agglomerations, sometimes described as the relation of “flowers and bees” (Cano-Kollmann et al., 2016) although this metaphor becomes less relevant in the context of knowledge flows. While there is a growing literature that connects economic geography and international business, both have to some degree neglected the boundaries and frictions beyond the level of the nation state that generate challenges, inefficiencies or blockages in these processes.¹

To achieve their objectives both firms and regional economies have become more open or porous. Theoretically, this requires integrating the private good and public good views of knowledge. The former view is dominant within the international business canon that focuses on

¹ There is a wide-ranging literature in international business focusing on challenges of cross-border business processes, including knowledge processes. However, as emphasized by Mudambi et al. (2018), analysis at both larger (e.g. continental) and smaller (e.g. cluster, city region) spatial scales is extremely limited. While the economic geography literature is much more nuanced in its treatment of spatial scale, effects on both the opportunities and frictions of trans-local knowledge processes are also under-researched (Fuller, 2018).
value appropriation by MNEs; these firms leverage knowledge inflows to buttress their competitive advantage (Cantwell and Mudambi, 2011). The latter view has more currency within the economic geography literature that is more focused on the nature and growth of agglomerations and clusters; the growth of these regions is shaped by untraded interdependencies that are connected with regional and cross-regional knowledge networks (Scott and Storper, 2003). Some of these are intended, while others are unintended and it is rarely possible to have one without the other. At the same time there are institutional structures in place that block or divert knowledge flows so that integration is only partially enabled. To link different local and national settings and to generate trans-local and transnational corporate networks always requires connecting the diverse social, cultural, institutional and political contexts that produce different understandings, practices, expectations and views of the world.

While experienced firms have processes in place to avoid or overcome potential frictions in their transnational engagement, this is by no means a routine process. Both firms and regional economies often require active engagement to make trans-local connections, to engage in sense-making across contexts, and to produce integrative frameworks, be it in the form of policies or external partners. It is the associated frictions, their impact on emerging knowledge networks and the processes that help to manage differences in international business networks that are at the center of this paper. The goal is to go beyond both geographically bounded and firm-centered knowledge creation processes and develop a broader and deeper understanding of the complementarity between international and regional knowledge creation. In the process we develop a deeper understanding of the association between those capabilities that are internal and those that are external to organizations and territories. In pursuing this goal, we will discuss frictions in transnational knowledge flows in section 2 and in section 3 we develop a simple conceptualization of how these can be overcome. Section 4 links the papers of this special issue to this framework and section 5 concludes.

2. Frictions in Transnational Knowledge Networks

There is a tendency in the literature on globalization in general and foreign direct investment in particular to view corporate internationalization as a process which follows a rational agenda. Accordingly, MNEs assess new or advantageous resources in a different country and rationally evaluate where (in which region) to engage and in which form (Glückler, 2006; Dicken, 2015).
Similar views prevail in much of the literature on internationalization that are dominated by works analyzing investment and expansion, whereas studies on divestment and retrenchment are relatively rare (Benito, 2005; Coe and Wrigley, 2007; Fuchs et al., 2017). Many investments in other countries achieve only low productivity, do not succeed in penetrating new markets, or fail altogether. Recent work about back-shoring indicates the co-existence of some varied and sometimes distinctly conflictual factors (Christopherson et al., 2014). Most of the international business strategy literature that is grounded in economics has focused on average tendencies or effects rather than the (sometimes considerable) variation around those averages. Case study research that stresses the diversity of MNE experiences has remained a minor part of this literature (although it has had greater currency in international business consultancy and teaching).

Of course, in both economic geography and international business, this has been known for some time. Past work in economic geography has emphasized the importance of localized business configurations, such as clusters and innovation systems, in organizing production and innovation processes because of agglomeration economies that can be exploited but also because of frictions and risks that can be avoided or minimized (Cooke and Morgan, 1998; Bathelt et al., 2004; Tallman et al., 2004; Duranton and Puga, 2004). This has been confirmed in studies since Hägerstrand (1967) that have found that the intensity of interaction decreases with distance (Anselin et al., 2000; Howells, 2002). International business studies have investigated related issues and found that firms tend to internationalize first into countries that have similar institutional conditions and that these are often (though not always) geographically proximate. In interpretations by the Uppsala school of internationalization (Johanson and Vahlne, 1977), the problems that result from a lack of knowledge and experience in a new foreign market have been termed liabilities of foreignness (Zaheer, 1995). More recently, these have been recognized as liabilities of outsidership (Johanson and Vahlne, 2009; Cantwell and Mudambi, 2011) and are handicaps for any firm (foreign or domestic) that does not have ready access to established business networks within a regional economy.

The underlying factors that generate frictions, barriers and uncertainties are manifold, and rooted in the deep institutional differences that arise over long periods, and significant elements of path dependency (Christopherson, 2002; 2007; Wood et al., 2017). They involve formal elements such as different languages and different legal systems – but also informal elements
that result from different traditions and specific knowledge dynamics and are grounded in different belief systems and different ways of doing things. The consequences are different standards, learning processes, divisions of labor and business cultures. These structures and practices are shaped by specific labor markets, education systems, capital-labor relationships and other aspects that generate diversity of innovation systems and varieties of capitalism (Hall and Soskice, 2001; Nelson and Sampat, 2001; Berry et al., 2014; Glückler and Bathelt, 2017).

Such differences can be fundamental and it is by no means a trivial process to overcome them. One problem is that foreign investors are often seen as intruders that aim to acquire knowledge and resources in order to transfer them elsewhere to their advantage. In economic geography, part of the work on localized systems of production (e.g. innovative milieus, industrial districts) views such investments as potential threats that could weaken the competitiveness of a regional business system in the long term (Amin, 1993; Herrigel, 1993; OECD, 2007). This resonates with the work of Hymer (1976) in international business. Similar views encourage the closure of existing networks and the creation of outsidership and may prevent access to or full exploitation of foreign markets and resources.

The frictions that inhibit international integration within knowledge-based communities are also due to forces of competition (Shaver and Flyer, 2000; Alcacer and Zhao, 2012), as well as micro-political processes like headquarters-subsidiary powerplays (e.g. Cantwell and Mudambi, 2005) and the ‘not-invented-here’ syndrome (Katz and Allen, 1982). These have been a focus of attention in the international business and innovation management literature. In addition, many important forms of resistance to international knowledge integration lie outside these communities themselves – but are intensified through ‘othering practices’ (Franz et al., 2018). In such situations, analogous to what is discussed below, trust needs to be created and long-term commitment demonstrated in order to open up localized networks and become part of them (Beaverstock, 2004; Faulconbridge, 2006). Increasingly, what we see in the knowledge economy is that investing firms become aware of this and engage in give-and-take processes by actively integrating their activities into localized networks (Molnár and Lengyel, 2016; Cohendet et al., 2018).

In the more globally connected information age, and given the considerable increase in knowledge complexity and hence in interrelatedness across formerly separate fields or disciplines, international integration has become necessary for local knowledge development.
The deepening local differentiation and diversity of knowledge, and of the contexts in which knowledge is used and applied, is increasingly the source of opportunities for the forging of new knowledge combinations (Bathelt and Glückler, 2011; Cano-Kollmann et al., 2016; Cantwell and Salmon, 2018). Thus, for knowledge-based actors that entrepreneurially generate new value-creating business opportunities, international openness and integration, heterarchy and informality in associations are all vital. Knowledge is best sought, developed and combined through a level playing field in which status depends on reputation and contribution, and not on embedded positions of power. In contrast, for those actors who hold positions of power in organizations, in market places, in the provision of finance or in business connections, rent extraction is facilitated by a relatively closed system of relationships with powerful gatekeepers, by the segmentation of markets and by the protection and reinforcement of organizational and administrative hierarchies (Dicken, 2014).

Precisely because they rely on openness, informality and reciprocity in relationships carried on at a distance, transnational knowledge flows tend to be costly and difficult to create and to sustain. They cannot be formed overnight, take time to cultivate and strengthen and impose stress on the firm’s human resources. As a consequence, these networks are often characterized by trade-offs that require a strategic choice of focus over the kinds of knowledge integration that might be pursued. For instance, some international knowledge networks may emphasize spatial diversity or decentralization by combining more disparate locations, while others focus more on technological diversity (Cantwell and Piscitello, 1999; Wang and Zhao, 2018). These represent two distinct knowledge search patterns. The former focuses on combining knowledge across a wider range of geographically dispersed locations, while the latter emphasizes building more complex knowledge combinations within or across a smaller number of regions. Moreover, in more open informal networks, higher potential rewards may also be associated with greater risks, and the distribution of gains is both more uncertain ex ante and more likely to be in flux. This may be acceptable to those actors driven by creative, entrepreneurial instincts to develop something original and influential, but it is likely to be resisted by those concerned primarily with the generation and capture of rents. For instance, scientists are often driven by the pursuit of knowledge, whereas shareholders are typically motivated by bottom-line considerations and these two sets of interests co-exist in all innovative firms (Stern, 2004).
Despite existing knowledge about related processes, much contemporary research focuses on the conditions of how firms internationalize, where they move, how they organize their market entry, what kind of motivations guide their investments, and how they gain access to new resources abroad – whereas frictions have received relatively less attention in the literature. It is clear that experienced MNEs can master this process quite well as they have done this successfully before and know precisely what resources and knowledge to mobilize in order to guarantee success in entering a new country and region context (Dicken, 2015). They benefit from experiential knowledge that they can apply to relevant situations and have managerial staff that is well-equipped to conduct such processes. However, large firms, while often successful, still rely on personal relationships and networks as much as on organizational capacity to succeed in this process (Bathelt and Glückler, 2011; Lorenzen and Mudambi, 2013).

The situation for small and medium-sized, less experienced firms is much more uncertain (Casson, 2005). They bear tremendous risks as they often do not have the internal resources and capabilities to lead them through the internationalization process. If necessary, they have to rely on external contacts and resources to guide them. In other words, they need external facilitators or must rely on existing personal and corporate relationships (internal facilitators) to support their investment decisions and generate access to resources and partners at the other end (Bathelt and Li, 2015). The generation of pipelines to different regions and markets is full of frictions and requires the establishment of personal and organizational relations alike (Lorenzen and Mudambi, 2013).

The process of employing other firms and individuals also requires the development of trust, as critical knowledge can get lost through unintended knowledge transfers and be stolen and imitated by others (Bathelt and Li, 2015). Many small and medium-sized firms with little or no experience therefore approach large and well-known organizations, such as banks, accountants or consultants, to guide this process. These organizations benefit from institutional trust which develops through reputational effects from their past activities in similar processes (Glückler and Bathelt, 2017; Rallet and Torre, 2017). Alternatively, firms may hire specialized managers who have undertaken such processes before and have a good reputation with respect to their professionalism and competence in the internationalization process. Another option for small firms is to hire staff or students with a background in a target country’s business culture and develop personal trust in those individuals’ capabilities before using them as boundary spanners.
in the investment process (Aldrich and Herker, 1977). In home countries with a strong multicultural background or target countries with diverse diasporas, it may be straightforward to develop such personal relations. The work on the New Argonauts, transnational communities and family networks supports this (Saxenian, 2006; Henn, 2012).

However, in many investment processes, there is no immediate network of partners in the target region. While international business research tends to focus on overcoming the institutional distance to other countries, the urban or regional scale is often neglected, yet it is often at least as important to consider as the national one (Alcacer and Chung, 2007; Li and Bathelt, 2018; Mudambi et al., 2018). Extant research often discusses which firms are successful in mastering this process rather than actually how this is managed. A localized perspective is crucial because urban areas may have a particular manufacturing core that is highly specialized in terms of its localized resources and capabilities (Duranton and Puga, 2004). Investing firms need to connect with their regional environment first and find effective partners to be able to develop a national presence. They often need to find access to the localized networks and knowledge ecologies and integrate them with their global networks (Meyer et al., 2011; Bathelt and Cohendet, 2014; Turkina et al., 2014). To become part of these localized networks, support policies in the home country are quite decisive. By establishing networks of public facilitators in foreign regions such as foreign representations of business associations and chambers of commerce, related support enables investing firms to benefit from institutional trust when creating local partner networks abroad. Of course, such processes can also have imperfections and can lead to the exclusion of potentially important alternatives.

3. Conceptualization of Transnational Knowledge Flows: Connecting, Sense-Making and Integrating

We take as our starting point that knowledge flows between regions and countries involve the interaction between those firms and epistemic communities that are essential for the development and use of this knowledge. Drawing from the discussion in the previous sections, we develop a simple model from a MNE perspective that illustrates how, following investment decisions, the respective knowledge flows are managed, what types of frictions, barriers and differences have to be overcome, and which processes are at work. We suggest that the knowledge-based relationships between actors in transnational contexts depend on three processes, or phases, of a
complex translation process: (i) connecting, (ii) sense-making and (iii) integrating (see Figure 1). Fuchs et al. (2017) refer to these processes in a similar context as interspace, although we are not actually confronted with a physical space – but rather view this as ongoing knowledge processes. The general setting shown in Figure 1 refers to a situation where firms generate an investment link between two industrialized regions in two different countries to access complementary knowledge pools. We thus refer to knowledge-generating MNEs that develop or have a physical presence in the location. As the literature has documented extensively that knowledge is highly contextual and, often, cannot be sourced remotely (Martin and Moodysson, 2011). The source and target organizations operate in different cultural and institutional contexts, different production and innovation systems and are embedded in different localized knowledge ecologies. While our focus is on the investing MNE, many other actors are involved in this process, including the regional networks of firms in both the source and target regions, their extensions in the corresponding national production and innovation systems, as well the different levels of governments that generate policies and legal frameworks enabling stabilized patterns of interaction (Glückler and Bathelt, 2017). All of this supports the development of specialized regional/national knowledge ecologies and dynamics. While these are attractive differences to tap into because of their potential to spark novel knowledge and innovation, they also create barriers for communication, interaction and knowledge flows. It is the processes of connecting, sense-making and integrating that are of specific interest in this paper as they are essential to overcoming the frictions and barriers that exist.

3.1 Connecting
By connecting, we refer to the various channels through which knowledge may flow between the firms and related communities in different regions and countries as described in the context of Figure 1. As noted before, this is a broad concept that has been conceptualized differently in the international business and economic geography literatures. However, these different conceptualizations – both the private good view of knowledge that is dominant in international business and public good view of knowledge that is more typical in economic geography – reach
a common conclusion, recognizing that global connectivity is increasingly important for the
success of both firms and regional economies. We have in mind here especially scientific and
 technological knowledge that is relevant to processes of production and value creation.

The amount of connections regulates the volume or intensity of international knowledge
flows between regions and across countries (Cano-Kollmann et al., 2016). Within and across
economies, knowledge is transmitted through social or cultural networks, broadly conceived. In
economic geography, social networks are a fundamental characteristic of interfirm relations that
develop over time and are shaped through the embeddedness of economic action in specific
contexts and prior experience in such contexts (Bathelt and Glückler, 2011). In specialized
industry agglomerations, this leads to the development of interfirm networks and specialized
knowledge ecologies (Malmberg and Maskell, 2002; Bathelt et al., 2004; Tallman et al., 2004).
As in international business, social networks are generally construed as being constituted of ties
within or between organizations, such as parent-subsidiary relations or global production
networks involving both personal and organizational elements (Lorenzen and Mudambi, 2013).
However, knowledge is commonly transmitted through open community channels (that could be
depicted as buzz), rather than through specific one-to-one ties between given pairs of individuals
or organizations (pipelines). When regions are intensively socially connected in this communal
sense, then an actor in one region is more likely to learn of knowledge that originated in the other
region, even if that actor cannot identify the original source of that knowledge or indeed may not
be aware of its origin.

This is the kind of social transmission that Marshall (1890) had in mind when he spoke of
knowledge as being ‘in the air’ – although that expression was originally designed to refer to a
purely local rather than an international social context. The rate at which knowledge is
disseminated does not depend so much on the existence or the absolute number of direct ties
between specific actors, but instead depends more on the extent to which an idea or a piece of
knowledge resonates and is viewed as interesting and potentially important in the relevant
community or social group. This community includes those actors that can immediately make
sense of related knowledge, often even without extensive consultation among its members. At
the level of the individual actor one may no longer recall where or when one first learned of
some knowledge, but one does remember if that idea was featured repeatedly in conversations
with other members of the community. This social acceptance or impact becomes a kind of
yardstick for its significance within that community. It is the community that retains and
distributes knowledge beyond any specific individual relationship or tie, and beyond any
particular organization. Thus, the most pertinent level of analysis for knowledge flows is neither
the individual nor the organization but the community of which they are part. Conversely, the
channel for knowledge transmission is essentially constructed at the social level rather than the
individual actor or organizational level. And as epistemic communities have become more
internationalized, this has been associated with an increase in international knowledge flows
(Cohendet et al., 2014). These connections should be viewed as linkages across communities
rather than purely individual or organizational ties.

The knowledge embedded in each regional context has developed within the specific
production system and institutional conditions, as well as the specific innovation networks in
place, and hence has a significant element of uniqueness. The strength of international
knowledge connections thus directly relates to their potential to connect spatially separated,
specialized knowledge ecologies or local-buzz pockets (Henn and Bathelt, 2018). If there is a
direct tie between agents in the respective communities, this generally implies that the process
has already moved beyond merely connecting, to entail aspects of sense-making and integrating
in the knowledge-based relationships concerned. It is well known that connecting regions is
made more likely by the geographic, ethnic or institutional closeness between their respective
communities (Boschma 2005; Rallet and Torre, 2017), and so the number and strength of
individual or organizational ties generally reflects these underlying likelihoods of social
connecting. The volume of knowledge flows between regions is a function of the extent of
connecting in this social or communal sense. As we have noted, it involves a wide range of
actors representing firms and epistemic communities as well as a variety of other actors
associated with regional economies, including universities, research institutes, public bodies and
authorities.

3.2 Sense-Making

Sense-making is a concept that, according to organization theory, “involves turning
circumstances into a situation that is comprehended explicitly in words and that serves as a
springboard into action” (Weick et al., 2005: 327). It comprises the intelligibility and
interpretation of knowledge flows in a recipient community, and the consequent ability of that
community to adapt the knowledge received for local purposes, which is related to what could be termed absorptive capacity (Cohen and Levinthal, 1989) of a location or region. The degree of intelligibility of knowledge and the way it is understood in a receiving regional economy influences the usability of that knowledge in local applications. Making sense of the knowledge that has been created in and disseminated from other regions goes beyond connecting internationally and entails the capacity to render that knowledge intelligible, usable and relevant for the purpose of developing new applications in the received local context.

This form of localized absorptive capacity is not dependent only on the presence of regional capabilities (Cohen and Levinthal, 1989; Maskell and Malmberg, 1999), but also on the relatedness of knowledge pools between socially connected spatial entities (Bathelt and Glückler, 2011). The degree of relatedness has numerous dimensions since all knowledge is embedded in a field, in a geographic context as well as an institutional setting (Glückler and Bathelt, 2017). The field refers to the technological dimension (Cantwell, 1989) and the geographic context to the meaning given to knowledge within the region where it arises (Anselin et al., 2000). The institutional setting has two components: one is related to government regulation at different territorial scales and the other one to the fact that firms imbue knowledge with a specific connotation associated with their industry and their own organizational routines (Nelson and Winter, 1982).

When knowledge is moved from one region to another it is generally necessary for it to be first decontextualized and then re-contextualized in line with local ways of thinking and understanding (Brannen, 2004). The frictions that impede knowledge flows arise from both de-contextualizing knowledge from its source environment to identify its essence and re-contextualizing it to make it comprehensible to individuals in its target environment. This process requires actors who understand both the source and target contexts to make them effective as boundary-spanners (Aldrich and Herker, 1977; Schotter et al., 2017). More distant contexts may sometimes generate more radically different and hence potentially more valuable new meanings and novel forms of applicability because their knowledge ecologies involve different applications, organizations and knowledge components (Li and Bathelt, 2018). It is not merely that the applicability of knowledge may shift when that knowledge is introduced into a new context, but also that the primary domain of application may be in a different industry or business area.
Sense-making is critical beyond merely connecting with respect to the tacit element of knowledge. Tacit knowledge tends to diffuse far more slowly across geographic space, and it is subject to more vital institutional impediments to common understandings. Tacit knowledge is associated with what has been termed social technologies that rely on wider structures of social and organizational relationships than do physical technologies (Nelson and Sampat, 2001). Institutions are relatively sticky when compared with the technologies used in production, as the knowledge of physical technologies is both more open in character and continuously adapted through the novelty that arises from experimentation and problem-solving.

Thus, cross-border diversity in the way in which the same knowledge is understood and operationalized is not just the outcome of different historical pathways (Acemoglu and Robinson, 2012), and the unpredictability and contingency of changes in local paths over time, but it is also due to the intentional shaping of these processes by public policies that reflect specific local interests, customs and traditions or the workings of institutional entrepreneurs (DiMaggio, 1988) – who “help establish market institutions in the process of their business activities” (Li et al., 2006: 358). So what appear to be the most striking and relevant characteristics of knowledge in one region are not necessarily the same in another one.2

3.3 Integrating

By integrating we refer to sustained interactions or mutual responsiveness between agents located in different regions and countries. Ongoing exchange brings about or enables the development of new combinations of knowledge drawn from distant and often diverse sources. The degree of knowledge-based integration between regions inevitably deepens the interdependencies between local/regional and transnational knowledge networks. These have been shown to be different in terms of scale: transnational networks are significantly larger and more diverse than are subnational ones and therefore impose heavier burdens on managers’ bounded rationality, as well as requiring different kinds of capabilities (Scalera et al., 2018).

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2 An important perspective in this context is the role of path dependency in the capacity of external agents to make sense of the knowledge created in their territorial context. For instance, the set of potential additional locations for each MNE is crucially dependent on its extant location portfolio (Hutzschenreuter et al., 2011) as MNE managers learn from ongoing operations, which in turn affects their perception of cultural distance. For instance, an MNE with long-time operations in Vietnam may find expanding to Laos far less challenging that one that has never ventured into Asia before.
New combinations are the essence of innovation in the modern world (Schumpeter, 1934; Arthur, 2009), while in recent times MNEs have intentionally cultivated distributed international knowledge networks in order to facilitate international technology development through the discovery and pursuit of novel combinations of knowledge (Cantwell, 1989).

Combining knowledge that has been sourced from different locations/regions in novel ways entails a step beyond the transfer, diffusion or transmission of knowledge (connecting in our sense) or the mutual development of distinct localized understandings of knowledge and how it might be applied (sense-making). Integrating different lines of knowledge requires an interdependence between activities conducted in different regions, since combining knowledge is not like the bolting together of modular components that can each be taken off the shelf. Generally integrating depends on some further adaptation and refinement of each of the knowledge elements that are incorporated into a new system, sometimes termed a process of critical revision (Rosenberg, 1982; Li et al., 2012; Cohendet et al., 2014). Refinements of knowledge, and the discovery of complementary knowledge needed for the effective integration of individual parts into a new target combination, often depends on some deeper association or familiarity with the kinds of foreign contexts that specialize in those allied strands of development. Therefore, the more regions become specialized in particular avenues of knowledge development, the more they need some regularity of interchange with actors situated in or familiar with other regions whose fields of specialization are different, even if related. This is a cross-border role especially played or facilitated within global value chains by MNEs or through trade networks.

The evolution towards competence-creating MNE subsidiaries is often understood as entailing a greater degree of separation or independence from their MNE corporate groups, since it usually depends on an increase in subsidiary autonomy (Andersson and Forsgren, 2000; Cantwell and Mudambi, 2005). However, in terms of international knowledge linkages the local specialization and focus of competence-creating subsidiaries generally implies an increase in cross-border integration with their headquarters (Chini, 2004; Berry, 2014; Cantwell and Piscitello, 2015), which may depend on their capacity to capture the attention of the parent firms (Monteiro et al., 2008; Monteiro, 2015). This is because the search for novel local applications in a MNE’s core knowledge areas requires new combinations of the traditional knowledge base of the firm with knowledge derived from local networks. It involves some deeper exploration and
refinement of critical knowledge in ways not previously considered. When it comes to reworking the core knowledge of the MNE the support and expertise of the parent firm is vital, since it has a reservoir of understandings and experience in that core knowledge base that may often be needed to help solve problems. As a corollary and a *quid pro quo*, integration is the process through which distant knowledge becomes part of a firm’s overall knowledge base, especially related to innovation, across its various locations.

Our model of connecting, sensemaking and integrating has two key goals. First, it brings together economic geography and international business perspectives on knowledge flows within global innovation networks, through which epistemic communities, firms and regional economies co-evolve. Second, it balances the creative opportunities of these transnational knowledge flows for innovation against the frictions that impede the realization of their potential. In practice, if frictions can be overcome increased knowledge flows across space through communal channels (connecting) lead to greater knowledge-based interactions between MNE networks and regional economies (sense-making and integrating). But, of course, there are then important feedback effects from knowledge combination or integration to connectivity, so that the process as a whole becomes a widening spiral rather than a closed circular loop or unidirectional effect. Taken as a whole, the perspective offered by our model will enable researchers to create a more complete picture of the global knowledge creation systems that are the lifeblood of the modern economy.

4. **Local-Global Dynamics and Tensions**

Since local, trans-local and transnational knowledge networks are becoming increasingly interconnected, greater attention needs to be paid to the relationships between them. As discussed in the previous section, this interconnection is impeded by significant frictions that arise in the process of integrating embedded knowledge from dispersed and culturally disparate regions. This theme is developed in this special issue using a diverse set of lenses, which all aim to integrate international business and economic geography perspectives. While the papers put together in this special issue have been written from different disciplinary backgrounds and while their focus is on different aspects related to the internationalization process of firms and regions, they all speak to issues highlighted in our conceptualization, particularly to the link between local and global dynamics and the tensions between them.
Phelps and Wood (2018) investigate site-selection consulting firms as facilitators that provide boundary-spanning services to MNEs as they invest in different countries. The paper highlights the fact that site-selection consulting firms are often important players in the process of accessing local knowledge in the internationalization process, or in the terminology developed in this paper in connecting, sense-making, as well as integrating. Site selection is a process often neglected in international business studies, which tend to focus on the national level, rather than the specific location region. However, as shown in the paper and argued in the special issue, contextualization occurs at all spatial scales (Mudambi et al., 2018) and understanding the subnational (regional) context can be crucial with respect to success or failure of the entire investment process. The paper also shows that these are not simply services that can be purchased off the shelf but that their quality depends on close interaction between the consultancies and the investing firm. Location consulting firms create more than just knowledge about specific sites but also about the corresponding regions, markets and how to access them (Bathelt and Li, 2015). This is not always a process without problems. For instance, the view of the world and what is important for the consulting firm, as well as its loyalties (for instance being linked to regions and cities in the target country), can shape the outcome of the process and may lead to situations in which large urban agglomerations are proposed as sites for all investors, while locations with specific regional knowledge pools and a particular fit for certain investors may be overlooked. While these consultancies can significantly reduce the frictions in cross-border knowledge processes, it is important to examine their motivations and incentives. When these diverge from those of either the knowledge source or the knowledge target (or both), it is necessary to incorporate appropriate precautions to guard against opportunism.

In the analysis by Cohendet et al. (2018), the videogame industry is used as an example to illustrate processes that link regions or clusters at a global level. The study shows that it is important to incorporate a corporate perspective to understand how regional clusters in the knowledge economy become globally successful, thus integrating work in economic geography and international business. Unlike perceived truths in previous work on industry agglomerations, they show that local affiliates of leading MNEs do not automatically lead to knowledge outflows or other negative effects from these clusters. Instead MNE affiliates are involved in the regional innovation processes and the active formation of clusters. In a buzz-and-pipeline dynamic (Bathelt et al., 2004), these MNEs transfer the global common infrastructure of innovation that is
related to their industry to the local level. More specifically, they are actively involved in generating a local common that links the activities of communities of specialists (underground) with the corporate world (upperground). In other words, they undertake all three processes of connecting, sense-making and integrating knowledge, generating specialized local dynamics that can be observed in specific places, spaces, events and projects.

The study by Buciuni and Pisano (2018) is situated in the context of manufacturing clusters in developed countries that have come under pressure due to global competition. The authors evaluate the possibilities of maintaining manufacturing strength in these regions by comparing corporate strategies in a natural experiment. They analyze firm strategies in two pairs of proximate clusters in Italy that are specialized on similar industries. The study reveals that those regions that have successfully integrated into global value chains, while maintaining strong design and development competencies, have been the most successful in securing manufacturing activities while others have suffered from decline (De Marchi et al., 2017). Alternative strategies that involve functional specialization by, for instance, focusing on brand development can also be successful in the long-run but go along with sometimes substantial regional job losses in manufacturing (Aage and Belussi, 2008). Buciuni and Pisano (2018) emphasize in their paper the role of so-called knowledge integrators that link localized technological capabilities to global markets in retaining manufacturing strength. This finding complements the buzz-and-pipelines argument put forward by Cohendet et al. (2018) emphasizing the role of external linkages for regional growth. At the same time, it reinforces the need for boundary-spanning support in the processes of connecting, sense-making and integrating to reduce frictions associated with cross-regional knowledge processes.

Both the studies by Wang and Zhao (2018) and Phene and Tallman (2018) use the semiconductor industry as a research context, which has received a great deal of attention from innovation scholars because of its well-defined structure of product generations and demarcations between the various industry processes (e.g. design, hardware, firmware, software, operating systems). Both papers make a contribution at the nexus of economic geography and innovation studies/management. The paper by Wang and Zhao (2018) supports claims that have long been made in cluster theory, namely that local competition leads to differentiation and innovation processes resulting in an increase in the technological distance between firms. When firms have a multinational structure (with geographically dispersed subsidiaries), their
knowledge base across different regions is more diverse than that of single-site firms. The paper argues that when multinational semiconductor firms locate in clusters, they choose specific technological profiles to benefit from localized knowledge spillovers, not having to worry too much about losing knowledge to local competition due to their diversified competence in global technology space. While the paper assumes that those MNEs included are able to overcome frictions in transnational knowledge flows and have achieved knowledge integration, one implication is that they minimize the threats posed by local competitors in the host regions through their position in global technology space. Further, they aim to overcome liabilities of outsidership through practices of local interaction and thus support Cohendet et al.’s (2018) claim that MNEs should not necessarily be viewed as intruders into regional production systems.

Phene and Tallman (2018) investigate in a panel study of US semiconductor MNEs how affiliates react to changes in the different regional and national contexts in which they operate, and how this affects innovation processes at subsidiary locations. In the knowledge-based economy, MNE affiliates engage in localized search processes to engage with and take benefit of the heterogeneous resources and specialized industry structures that exist in the different location regions of the corporate group. To do this successfully and access localized knowledge resources, firms need to embed themselves into the respective subsidiary regions (Andersson et al., 2002) and become insiders in the specific knowledge ecologies (Johanson and Vahlne, 2009). As such, the paper emphasizes co-evolutionary processes of geographical and organizational development (Cano-Kollmann et al., 2016). It is through such processes that broader corporate knowledge spillovers, which are characteristic of true transnational firms, can take place (Wang and Zhao, 2018). This supports findings in economic geography that urban-regional or cluster contexts become increasingly important with respect to knowledge-based innovation processes (Tallman et al., 2004; Li and Bathelt, 2018) as reservoirs of specialized knowledge flows.

Amendolagine et al.’s (2018) paper looks at frictions in the knowledge internationalization process in emerging market MNEs by investigating acquisition processes by Chinese and Indian MNEs in Europe, North America and Japan. While acquisitions can be a mechanism to overcome potential frictions by generating immediate access to local networks and resources, Amendolagine et al. (2018) report that in the case of emerging market acquirers such frictions are not resolved but typically shifted toward a different level, namely intra-corporate relations. While the frictions are not themselves at the center of the analysis, the role of
absorptive capacity is directly affected by them as these acquisitions often do not lead to elevated innovativeness later on. The authors emphasize the role of status as an expression of reputation and show that leading foreign investors and firms that are well-known through media reports are doing better than others in tapping into foreign local knowledge pools (Golinski and Henn, 2015; Franz et al., 2018). This echoes earlier findings in the context of advanced economy MNEs, according to which leading firms can more easily become insiders in knowledge clusters, while lagging firms experience more difficulties (Cantwell and Mudambi, 2011). Overall, Amendolagine et al. (2018) underline the point made in this paper that MNEs are facing substantial frictions in accessing transnational knowledge networks through acquisitions and that they need to implement effective connecting, sense-making and integrating processes to leverage knowledge across space.

Finally, based on a study on innovation processes in the UK, Gagliardi and Iammarino (2018) suggest that domestic firms and foreign subsidiaries react differently to market risks. In particular, domestic firms reduce their engagement in innovation more than subsidiaries do. One would be tempted to link this to the literature on national business systems and varieties of capitalism (Hall and Soskice, 2001) to argue that firms in periods of uncertainty focus on their core competencies which are, in the British case, less associated with internal R&D processes. This may be different for the average foreign investor from other European countries. However, the study also shows that this difference is less pronounced in urban areas, echoing findings reported by Cantwell and Mudambi (2011) that incentives for inward investment in high-unemployment rural areas attract especially low knowledge activities. This seems to be related to the knowledge dynamics that exist in such regions and calls for a smaller spatial scale of analysis (Alcacer and Chung, 2007; Bathelt and Cohenet, 2014; Mudambi et al., 2018).

5. Conclusion

Transnational knowledge networks involve a positive-sum game between the world’s major centers for knowledge development, each of which experiences a virtuous cycle of interaction between the regional/domestic knowledge base and corresponding linkages with international knowledge sources. However, this is unlikely to occur in every region. The global innovation system is made up of a hierarchy of knowledge centers, with those lower down in the pyramid providing service functions those higher up (Cantwell and Janne, 1999; Meyer et al.,
2011) – although this not a simple hierarchy. Firms originating from higher order knowledge centers in an industry selectively draw upon and use knowledge taken from more specialized centers lower in the hierarchy to create new combinations with the core knowledge developed in their home region. However, firms or competence creating subsidiaries in intermediate centers may also develop critical knowledge nodes around local/regional expertise, such that their relationships with actors in higher order centers becomes more balanced. Other regions, in both advanced and emerging markets, that begin with a less favorable internal knowledge base may instead experience a vicious cycle in the relationship between local and international knowledge, falling further behind (Cantwell, 1987), while yet another group may engage in building global cluster networks and trigger virtuous cycles of transnational knowledge generation (Bathelt and Li, 2015; Li and Bathelt, 2018). As transnational knowledge networks involve more and more culturally and cognitively dissimilar regions, the challenges associated with comprehending contextually embedded knowledge (let alone leveraging or integrating it) grow exponentially. This generates resistance to understanding knowledge from other geographical contexts, especially when perceived as less advanced. If so, then the outcome may be an accentuation of uneven spatial development and an increased divide between virtuous and vicious cycles (Li et al., 2012) and between the fortunes of urban and non-urban areas (Storper, 2018). While entrepreneurial, knowledge-based industries find the greatest opportunities for creative change in dynamic urban regions (Florida, 2002), rent-seeking businesses can generally achieve higher returns in more stable, less dynamic environments.

Hence, the interests of non-urban areas increasingly excluded from transnational knowledge networks may come to be more closely aligned with the interests of rent-seeking businesses. Correspondingly traditional suspicions of international relationships often resonate or are revived there more readily and may well be one of the underlying drivers of the current global rise of populism (Storper, 2018; Mudambi, 2018; Parnreiter 2018). It is the combination of co-developing corporate knowledge with multiple localized knowledge ecologies which unfolds specific dynamics in different parts in the world, that enables firms and regional economies to create virtuous cycles of development. In order to develop to this stage, more locations and regions have to be actively connected to be able to benefit from transnational knowledge flows and participate in virtuous development cycles. However, simply linking these regions is not enough. While the intentionality of MNEs to leverage the advantages of
knowledge pipelines cannot be denied, their ability to do so is predicated by the bounded rationality of their managers, among other aspects. And firms may fail to grasp both value creation and value capture opportunities that are within reach. The argument developed in this paper is that the respective firms have to be actively engaged with the processes that connect, make sense and integrate the different knowledge bodies which are shaped by different cultural and institutional conditions. This is not a one-time effort but requires continuous engagement in never-ending cycles of connecting, sense-making and integrating phases (see Figure 1). The mainstream economic geography and international business literatures have not paid sufficient attention to these processes – and to the frictions that impede them.

To overcome frictions and engage in boundary spanning also needs to be considered from a higher level of human interaction in terms of identity (Fuchs et al., 2017). Boundaries separate groups of individuals or communities from those that are different, but in doing so, they simultaneously also define the identity of these groups. The identity function of boundaries implies that knowledge integration must be predicated on the spanning of identities and creating legitimacy on both sides of the boundary. This includes organizational as well as locational boundaries at various levels.

As a corollary of this paper, we believe that research projects in the future need to look much more systematically into the frictions and failures in international business development. While such studies do exist, it appears that a large part of the literature is biased toward studying entry rather than exit, firm expansion rather than contraction and success rather than failure. Part of this bias can be attributed to the bias in official statistics that often do not capture the large number of unsuccessful cases and problems that are typically not registered but come and go quietly. And a region’s inability to establish virtuous cycles of knowledge development is difficult to measure. The key issue here, we believe, is to study the associated connecting, sense-making and integrating processes and who is involved in them, as well as who is not. This must involve both qualitative work and case study research, as well as attempts of quantification by generating new datasets on such processes, or on their absence.

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References


Figure 1: Overcoming Frictions in Transnational Knowledge Networks from the Perspective of a Multinational Enterprise: Connecting, Sense-Making and Integrating