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## Global Innovation Networks – Organizations and People

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## ABSTRACT

Innovation is increasingly the outcome of global networks that connect geographically dispersed knowledge centers. The international business (IB) literature has developed a sophisticated understanding of the multinational enterprise (MNE) as an organization generates value by integrating knowledge across national borders. We advance this literature by making three key arguments. First we highlight the three megatrends that shape the strategy of the modern MNE: the disaggregation of the value chain into ever narrower activities, the migration of value to knowledge-intensive intangibles and the rise of huge emerging markets like China and India, whose domestic firms can grow to enormous size before venturing abroad. Second, we trace these three megatrends to falling spatial transaction costs, enabled in the main, by digitalization. Third, we draw on earlier research on the generic forms of global linkages, arguing that the IB literature has limited itself to organizational pipelines, while paying relatively little attention to personal relationships. The latter are particularly important in the genesis of both entrepreneurship and radical innovation, but are particularly sensitive to the anti-globalization policies. An environment where technology continues to reduce spatial transaction costs, while policy raises them, strengthens large MNEs at the expense of innovative international new ventures.

## 1. Introduction

The distribution of economic value creating activities across space has intrigued scholars since at least the nineteenth century. The modern study of this phenomenon has its roots in the classic work of Marshall (1920). Over the course of the last century, it has been studied from different perspectives, leading to the formation of several research communities and each with an associated body of literature. Economic geographers and regional scientists mainly study the characteristics of *places* while international business scholars focus on the *organization* of economic activities. In other words, economic geographers' and regional scientists' main focus of interest is the location, while for international business scholars, it is the (multinational) firm. Over the last few decades, innovation has received increasing amounts of attention from both research communities who recognize it as one of the key drivers of the modern knowledge economy.

The study of global innovation networks has been undertaken within three major literatures: international business, economic geography and innovation management. In the main, these literatures have moved along in parallel with one another, but their actual analytical connections remained very limited, so that the analysis of global innovation networks remains partial and fragmented. The main goal of this special issue is to work at the nexus of these three research communities and literatures and build knowledge conduits among them. This research aims to encourage cross- and inter-disciplinary dialog with the view of building a holistic view of

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the spatial organization of global innovation.

We begin by characterizing the three major trends that are changing the face of economic activity. Thereafter, we relate these trends to the two generic forms of connectivity that enable the very functioning of global innovation networks. These two forms are based on organizations (mainly MNEs) on the one hand and people (internationally mobile entrepreneurs) on the other. We use our analysis to highlight both causes and effects of the current disenchantment with globalization, especially in advanced economies – disenchantment that has resulted in the several important policy changes aimed at stemming the steady advance of globalization that began at the end of World War II. We argue that while policy changes may move to limit global connectivity, technology will continue to enable it. This suggests that negative effects of policy are likely to be asymmetric and strengthen larger MNEs at the expense of entrepreneurs and small firms. This analysis enables us to identify key avenues for future innovation research. Finally, we summarize the papers in this special issue and relate them to our overarching theme of connectivity.

## 2. Three megatrends

There are three megatrends that underlie much of the change that we have witnessed over the last few decades and that will continue to shape the world economy. The first megatrend is the shift from trade-in-goods to trade-in-activities. Beginning several decades ago, but accelerating rapidly over the last decade, products and services are increasingly emerging from global value chains (GVCs) that are geographically dispersed around the globe. These GVCs are orchestrated, in the main, by multinational enterprises (MNEs) and increasingly disaggregated and fine-sliced into narrow, highly specific activities that are undertaken in economic clusters. These narrow activities produce intermediates (and not complete goods or services) and these compose the vast majority of all international trade today.

The second megatrend is the rise of knowledge-intensive intangibles. Value is rapidly migrating out of tangible goods and services that are becoming commoditized and into the soft intangibles that encase them. These intangibles arise from specialized, upstream knowledge (R & D, patents, inimitable organizational routines, software, training) and downstream knowledge (brands, trademarks, customer service) activities. This migration of value has dramatically magnified the importance of innovation, concomitantly shortening technology lifecycles.

The third megatrend is the rise of emerging markets. The number of locations where the highly specific GVC activities can be performed has ballooned over the last two decades. A long list of cluster locations in Asia and South America and even some parts of Africa have become integral parts of GVCs. These locations are tightly woven into global economy and give rise to perceptions of “flatness” perceived by many lay observers.

### 2.1. Knowledge-intensity, offshoring, and modularization

The traditional international business view of the global economy is rooted in two centuries of international trade theory (Mudambi, 1998). In this view, goods and services are produced in geographical locations and international trade occurs when these are exchanged across national borders. However, this textbook view has been slowly diverging away from the reality of international trade for almost half a century. Over the last twenty years, the rise of GVCs has heralded the disaggregation of goods and services and the geographic dispersal of the underlying activities. Thus, what is now undertaken in a location is not a good or service, but an activity.

The fine-slicing of individual activities in GVCs occurs in a very specific manner. Aided by advancing technology, managers continually separate activities into specialized (non-repetitive) components and standardized (repetitive) ones. Specialized activities tend to be associated with knowledge-intensive intangibles, whereas standardized activities tend to be characterized by relatively low knowledge-intensity and based on tangibles. As noted above, knowledge-intensive intangibles appear in two broad forms: those based on upstream R & D knowledge and those based on downstream marketing knowledge.

The reason managers continually fine-slice the value chain is to lower the cost of producing the standardized, low-knowledge components. One way to do this is through offshoring to low-cost emerging market economies (Andersson et al., 2016). However, in order to geographically disperse the activities that underlie a good or a service, it is necessary to make them separable. The main process through which this occurs is modularization, whereby the final value proposition is constituted as a set of plug-and-play modules. (McDermott et al., 2013).

While the extent of modularity is affected by engineering and physical realities, managers have significant flexibility in designing the strategic architecture of the good or service they deliver to their customers. In other words, the observed extent of modularity is the outcome of both engineering and strategy. Modularization also facilitates the black-boxing of technologies so that the knowledge and capabilities related to one module can be disconnected from those in another. Thus, the orchestrating firm can maintain control of the system architecture while outsourcing even modules with high knowledge-intensity (Kotha and Srikanth, 2013).

### 2.2. Digitalization, automation and emerging markets

A second route to reducing the cost of repetitive low-knowledge activities is through technology-propelled automation. Advances in extant technologies like robotics and artificial intelligence as well as in rapidly emerging technologies like 3D printing are changing the face of the modern production systems. While the precise effects of automation differ across the sectors, we can discern two common characteristics. The key enabler of the dramatic advances in automation is digitalization and the most important economic and social outcome is the drastic decline in employee headcount per unit of output (Autor et al., 2003). Thus, while output

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