



# Technology, innovation and knowledge: The importance of ideas and international connectivity



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## ABSTRACT

The relevance of ideas is at the core of the IB field and has been captured in concepts like technology, innovation and knowledge. While these concepts have evolved over the last decades, the point that the ideas and the international connectivity are central for IB remains genuine. This paper is an attempt to take stock of the evolution of the concepts technology, innovation and knowledge in IB literature along the past five decades with a particular focus on the role of the *Columbia Journal of World Business (CJWB)* and the *Journal of World Business (JWB)* in this evolution. Likewise, our objective is to offer a research agenda for the coming decade. We proceed in two steps. First, we scrutinize how the IB literature has progressed and expanded over the last five decades, illustrating this on the basis of articles published in CJWB and JWB. Second, we take a helicopter view on this literature and reflect on the insights we have gained and the challenges the IB field has ahead that can constitute the basis for a future research agenda. We highlight the importance of creating a micro-foundation of knowledge processes where mechanisms on the interaction between the higher levels (nation, firm, teams) and the individual level are clarified.

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## 1. Introduction

The importance of ideas and creativity in value creation processes is dramatically increasing and they are at the heart of business. Investments in human capital, machinery and infrastructure are all very important ingredients, but it is the ideas of where and how to use them that are key to the development and growth of businesses. The global context with its diverse knowledge pools and clusters provides both valuable sources for new knowledge and also outlets for leveraging innovation when selling the new outputs in a wide range of markets.

Over the years the importance of ideas for international business (IB) has been captured in different concepts like technology, innovation and knowledge. The focal concepts have evolved over time, but the key point that the ideas are central for IB remains as sincere as ever. In fact, the possession and internalization of intangibles in the form of ownership advantages constitutes

the main explanation for the existence of multinationals (e.g. Buckley & Casson, 1976; Dunning, 1993). Morck and Yeung (1991) demonstrated that only multinationals with substantial R&D and marketing intangibles were valued at a premium over purely domestic firms. Recent estimates demonstrate that well over three quarters of the value of publicly traded firms can be traced to intangibles (Mudambi, 2008).

Much has been written about technology, innovation and knowledge in an international context. Certainly, the literature has matured to a point where we have seen numerous review papers and meta-analyses on these issues (e.g. Alavi & Leidner, 2001; Wijk, Jansen, & Lyles, 2008; Michailova & Mustaffa, 2012). This paper is an attempt to take stock of what we in the IB scholarly community know about ideas and creativity, the role of *Journal of World Business (JWB)* in this literature and to offer a research agenda for the coming decade. With this aim, we document the development of these issues in the IB literature mainly on the basis of articles published in JWB, and then we will reflect on insights from the vast literature and point at areas for future research.

Technology, Innovation and Knowledge are three related phenomena and concepts that have been at the core of the worldwide economy evolution and the international business

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growth during the last fifty years. *Technology* refers to the tools and machines that are used to solve real-world problems. *Innovation* is a new idea, a more effective device or process. *Knowledge* is the familiarity with or understanding of something such as facts, information or skills.

A striking example of the power of these phenomena is Malcolm P. Mclean's idea (dating back to the 1950s) of transporting entire truck-trailers (containers) without unloading the cargo when switching the mode of transportation e.g. from train to ship. This idea turned out to be one of the most powerful innovations, promoting containerization and the inter-modal cargo transport, which has been a major driver of globalization through the lowering of logistics and transport costs.<sup>1</sup> In this example the development of the container reflects the *technology*, the idea of inter-modal cargo transport is the *innovation* and the *knowledge* is represented by Malcolm P. Mclean's substantial previous experience in the transport sector.

IB scholarship has developed along two contextual levels when dealing with these three concepts. At one level, in what might be called "macro-IB", there is the study of aggregate levels of business activity at the inter-country and even inter-regional level (where by regions we refer to groups of countries). This level of IB research is mainly developed on the foundations of international trade theory. A useful organizing framework for innovation and knowledge at this level is the national systems of innovation (NSI) approach (Lundvall, 2007) that has provided an explanation about the location advantages for firms as well as about the effect that foreign direct investment (FDI) spillovers have on the host countries.

At another level, in what might be called "micro-IB", there is the study of international activities of firms. The most important firms for study at this level of IB research are multinational enterprises (MNEs). This level of research developed by applying insights mainly derived from industrial organization economics (Buckley & Casson, 1976). Beginning with the work of Kogut and Zander (1993), an even larger literature has mushroomed, studying MNEs' innovation and knowledge management, as they tap into diverse pockets of knowledge around the world in order to buttress their competitive advantages.

We want here to highlight two key aspects – the more external interaction between the firm and the location and the internal interaction between the firm and the lower levels of teams and individuals – that have affected these two levels of analysis and shaped the importance of innovation, knowledge and technology for IB literature. The firm is conceptualized as the agent that combines the external exposure (in terms of adapting, positioning, sourcing, leveraging ideas) with the internal mobilization (in terms of creation, integration and dissemination of ideas). This conceptualization points at the MNE's role of orchestrating both the interaction with the location and the interaction with individuals in the MNE.

### 1.1. Interaction between the firm and the locations

Both the macro-IB and the micro-IB studies are engaged with the interaction between the firm and the international environment (Dunning, 1993; Rugman & Verbeke, 2001). Within this literature, the mobile firm specific advantages (carried by MNEs) and immobile location bound advantages (attached to the locations) must evolve together in order to create value. A

traditional view on location would imply that location bound advantages are generic resources available to all firms in the particular location (Dunning, 1993). However, more recent research challenges this view by suggesting that MNEs differ in their location capability ("sense of place"). This implies that not all MNEs are equally good at making the most of the location bound advantages in a given location (Zaheer & Nachum, 2011).

An integral part of this literature that relates to ideas and creativity is the explicit recognition of the ongoing progression of "fine-slicing" (Mudambi, 2008). Creative activities are being constantly honed and separated into more narrowly defined "specialized" (non-repetitive) activities, with the remainder becoming "standardized" and repetitive. Continual innovation results in persistent activity down-skilling and de-skilling: components of activities that were once creative become standardized, modularized and amenable to being offshored to low-cost, low-skill locations or being automated. There is a concomitant process of "value migration", i.e., as specialized activities are down-skilled and become standardized, value becomes concentrated with the activity slices that remain non-repetitive. In other words, the creative "heart" of an activity becomes more narrowly defined (Contractor, Kumar, Kundu, & Pedersen, 2010).

This more narrow definition has both a cost and a capability aspect. High knowledge activities are expensive, so defining them more narrowly reduces costs. However, more specialization also increases innovation and customization capabilities. Related to this process of "fine-slicing" is the configuration of the firm's activities. The MNE's activities are arranged in such a way that they make the most of the geographic dispersion by constructing a global network. MNEs can thereby access dispersed pools of knowledge fostering their innovation. Consequently, by interacting with locations MNEs have the possibility to organize their activities for balancing the exploitation of their current knowledge base and the exploration of new knowledge bases (Cantwell & Mudambi, 2005; Cantwell & Mudambi, 2011).

### 1.2. Interaction between the firm and the individuals

Orchestration of the multinational firm relies heavily on connectivity: inter- and intra-organizational networks as well as between and within locations. Connectivity appears in two forms – organization-based "pipelines" created and maintained by MNEs and individual-based personal relationships that often arise within communities of practice, networks or global diasporas (Lorenzen & Mudambi, 2013). While the key role of connectivity, has been recognized in the IB literature the bulk of the research has focused on the organizational level of analysis, i.e., intra-MNE knowledge flows (Foss & Pedersen, 2004) and MNE knowledge sourcing in clusters and global centers of excellence (Cantwell & Mudambi, 2011). The point we make here highlights the importance of individual actors in determining outcomes. MNEs, communities of practice and networks provide respectively formal and informal operating frameworks within which individual employees undertake innovative activities.

The foregoing discussion highlights two important themes for future developments in IB research. First, recognizing the importance of the individual level of analysis enables us to distinguish between the ability to undertake knowledge-centric actions that further the interests of the organization (e.g., the MNE) and the willingness to do so (Mudambi, Pedersen, & Andersson, 2014). This ability-willingness divide and more generally the microfoundations of the knowledge processes have received relatively little attention in the IB literature thus far (Foss & Pedersen, 2004) as the prime focus has been on knowledge sharing on organizational level. Even the limited lower level literature is

<sup>1</sup> Some decades ago Peter Drucker pointed out that "... there was not much new technology involved in the idea of moving a truck body off its wheels and onto a cargo vessel. ... but ... without it, the tremendous expansion of world trade in the last forty years – the fastest growth in any major economic activity ever recorded, could not possibly have taken place."

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