

The New Geography of Knowledge – Asia’s Role in Global Innovation Networks

Dieter Ernst (Economics), East-West-Center Honolulu (USA)

Political debates about globalization are focused on offshore outsourcing of manufacturing and services. But these debates neglect important changes in the geography of knowledge that are creating new challenges and opportunities for learning and innovation strategies at the firm level as well as for policy-makers.

As globalization has been extended beyond markets for goods and finance into markets for technology and knowledge workers, this has increased the organizational and geographical mobility of knowledge (Ernst, 2005a and 2003a). Global corporations are at the forefront of these developments. Profound changes are transforming their innovation management - an increasing vertical specialization (“fragmentation”) of knowledge production gives rise to global innovation networks (GINs) that integrate dispersed engineering, product development and research activities across firm boundaries and geographic borders (Ernst, 2007b)¹.

These networks have expanded well beyond the traditional high tech regions in the US, the EU and Japan. There are now multiple locations for innovation and even lower-order or less developed centers can still be sources of innovation (Cantwell, 1995: 172). I will show that much of the action now is in Asia, especially in China and India².

The spread of global innovation networks has intensified technology-based global competition, brutally exposing “structural deficiencies in ... (the role that) ... both the public and private sectors” play in the development of national, regional and sector-specific innovation systems (Tassey, 2007: 86). There is a growing recognition that current learning and innovation strategies at the firm level and technology policy at the industry level are showing diminishing returns and should be questioned and revised.

However, much of these debates are focused on the leading large economies, and the main concern is how to foster breakthrough innovations that can support technology leadership. The prize is to win in the “global innovation race” (Baumol, 2004). There is little research on the role of new players from the so-called ‘emerging economies’ in global innovation networks.

In this paper, I will explore changes in the geography of knowledge that reflect and that are driven by the spread of global innovation networks (GINs). Drawing on a unique data base developed at the East-West Center, I will examine what we know about their drivers and impacts. And I will highlight specifically Asia’s role in these networks and discuss how integration of Asian firms into these networks affects learning, capability formation and innovation. The message of the paper can be summarized as follows:

First, the emergence of GINs is real and not just something nascent that we can expect in the future. This contrasts with a widespread perception that “globalized R&D networks ...are still limited in number and mostly concentrated with big firms.” (OECD, 2008a: para 64). As is so often the case, econometric analysis dominates policy debates, and its findings are inconclusive. I will show that we are in fact right in the middle of a rapid expansion of these networks. But I will also show that this process is complex, that it involves multiple actors and firms of different size, giving rise to a diversity of networking strategies and network

¹ According to the U.S. National Science Board, “the speed, complexity, and multidisciplinary nature of scientific research, coupled with the increased relevance of science and the demands of a globally competitive environment, have ... encouraged an innovation system increasingly characterized by networking and feedback among R&D performers, technology users, and their suppliers and across industries and national boundaries.” (National Science Board, 2004, Volume I, page IV-36).

² China and India are the most prominent examples. But the list of new locations includes both large countries like Russia, Brazil, Argentina, Mexico, South Africa, and (possibly) Vietnam, and many smaller countries, like Korea, Taiwan, Malaysia, Singapore, Israel, the Gulf states, Poland, the Czech Republic, Hungary, and the Baltic states.

architectures. The paper highlights the systemic nature of the forces that are driving and enabling the geographical dispersion of innovation networks. Hence, we are dealing with lasting changes in the geography of knowledge³.

Second, I will show that Asia's role in these networks is increasing (albeit still from a low level) and that the resurgence of China and India plays an important role. However, the new geography of knowledge is not a flatter world. Instead, integration into global innovation networks creates a handful of new, yet very diverse and intensely competing innovation offshoring hubs in Asia. There is clear evidence that the US, Europe and Japan retain their dominance in science and in high-impact intellectual property. However, we also find a substantial increase in the mobility of knowledge. To the degree that the diversity of network players, locations, business models and network arrangements is increasing, this provides opportunities for knowledge diffusion, enabling Asian network participants to enhance learning, absorptive capacity and innovative capabilities.

Third, I will show that nothing is automatic about these processes and that they cannot be left to market forces. While integration into global networks of production and innovation has facilitated the catching-up of Asian firms as fast-followers, it now may become a mixed blessing, unless there are appropriate policies in place to develop absorptive capacity and innovative capabilities both at the firm level and across the industry.

We still have some way to go before we can give conclusive answers to the question: Is network integration a poisoned chalice for Asian firms or will it reduce entrenched barriers to innovation? I will highlight however three propositions: (i) 'Absorptive capacity' is critical for attempts to develop and upgrade innovative capabilities. (ii) Asian firms now must increase R&D to avoid diminishing returns of network integration. And (iii), integration into diverse networks of production and innovation may well provide new lower-cost opportunities for 'industrial upgrading through innovation'. "Technology diversification" that combines incremental and architectural innovations can serve as a complementary and arguably less costly option to "technology leadership" strategies.

In the first part of the paper, I introduce a conceptual framework to examine the drivers of these networks and their impacts on learning and innovation. In part two, I use the EWC data base to establish what is new about GINs and how important is Asia's role in these networks. Finally, in part three I discuss how integration of Asian firms into these networks might affect learning, capability formation and innovation. (A conclusion will follow, based on discussions during the symposium.)

³ This implies that Tassef is right, when he argues in his book "The Technology Imperative" (2007) that both firm strategies and government policies need to adjust.