Asymmetries in Knowledge Dissemination from the Industrial Triad to Asia

Linghui Tang[1]
The College of New Jersey

Len J. Trevino[2]
Loyola University New Orleans

Abstract. This paper examines the asymmetric effect of R&D spillovers from Europe, Japan, and North America to nine Asian economies through trade, foreign direct investment (FDI), and information technology (IT). Due to the existence of tacit knowledge, the absorptive capacity of recipient countries plays an important role in knowledge transfer. Our empirical results indicate that knowledge dissemination from Japan via trade is associated with higher absorptive capacity. Meanwhile, positive spillover effects from Europe via FDI and from North America via IT occur when the Asian countries have high absorptive capacity.

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1. Introduction

The unprecedented economic growth of Hong Kong, Singapore, and South Korea during the 1960s and beyond, followed by the more recent emergence of China and India, has triggered enormous interest regarding the contributing factors behind these economic successes. Although political, cultural, and institutional factors all play pivotal roles in this diverse region of the world, capital accumulation and productivity growth have been considered the most important drivers of growth in this region (Krugman, 1994; Young, 1994; and Felipe, 1999). More specifically, a common feature shared by Asian economies that are experiencing or have experienced fast economic growth is the learning of technology, management, and innovations from industrial countries through trade, foreign direct investment (FDI), and information technology (IT). The purpose of this paper is to explore the

[1] Associate Professor, Department of Finance and International Business, School of Business, The College of New Jersey, Ewing, NJ 08628. Email: tang@tcnj.edu Phone: 609-771-2240
[2] Gerald N. Gaston Eminent Scholar Chair in International Business, College of Business, Loyola University New Orleans, New Orleans, LA 70118. Email: ltrevino@loyno.edu phone: 504-864-7970

asymmetric effect of knowledge dissemination to Asian countries when information originates from different countries and is transferred through different channels.

Research on R&D spillovers that occur through international trade is well documented (see, for example Coe and Helpman, 1995; Coe, Helpman, and Hoffmaister, 1997). FDI as an additional channel for international R&D spillovers has been studied extensively, although extant literature has produced mixed results.[3] In addition to the traditional spillover channels such as trade and FDI, recent studies by Madden and Savage (2000), Wong (2004), and Tang and Koveos (2008) have shown how knowledge transfer can also take place through disembodied channels, that is, the knowledge transfer not associated with a piece of equipment or the establishment of a multinational corporation, but related to the internet, telephone communications, scientific literature, international conferences, and tourism. The reason that we are interested in comparing embodied and disembodied channels can be viewed in terms of social versus technical system of globalization. Much has been said about the benefits of the technical system such as trade and FDI in bridging the knowledge gap between developed and developing countries. Relatively speaking, it is much more difficult to measure the impact of a social system such as the global network created by IT. Therefore, a systematic comparison will help to further understand the role of disembodied channels in worldwide knowledge dissemination.

Moreover, existing research has ignored the asymmetric impact of knowledge spillovers originated from different countries. R&D spillovers from Europe, Japan, and North America, for example, have been treated similarly even though geographic, cultural, and institutional distance between Asian countries and the industrial triad are large. As pointed out by Rosenzweig (1994), it is naïve to assume that human behaviour is the same all over the world and ignore the cultural impact on management practices. Although the conventional wisdom suggests that Japan should have a greater impact in Asia than other developed countries due to geographic and cultural proximity (see Kogut and Singh, 1988; Grosse and Trevino, 1996), we argue that the asymmetric spillover effect depends on the conduit through which knowledge is disseminated. As a result, Japan does not always have the dominance in Asia in terms of knowledge spillovers. More specifically, we first divide R&D stocks from G7 countries into three groups: Europe (France, Germany, Italy, and the U.K.), Japan, and North America (U.S.A. and Canada). It is worth mentioning that R&D stocks from G7 countries account for 93 percent of total OECD R&D stocks, which in turn account for 96 percent of total world R&D expenditures in 1990 (Coe et al. 1995, p. 134).Then, we investigate how knowledge

[3] Research using firm level data for R&D spillovers through FDI includes Haddad and Harrison (1993), Aitken and Harrisson (1999), and Chung, Michell, Yeung (2003), and Wei and Liu (2006). The studies that use national level FDI data include Lichtenberg and Pottlsberghe de la Potterie (1996), Hejazi and Safarian (1999), and Xu (2000). For knowledge transfer to developing countries through FDI, see Feinberg and Majumdar (2001) and Meyer (2004).