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Welfare implications of international financial integration☆

Jong-Wha Lee, Kwanho Shin *

Department of Economics, Korea University, South Korea

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ABSTRACT

Focusing on technology spillover from foreign direct investment (FDI) inflows, this paper investigates the welfare implications of financial integration. Calibrations of a neoclassical growth model with international technology diffusion show that when technology catch-up due to FDI inflows is considered, the welfare gains from financial integration substantially increase, which contrasts with the small gains from additional, capital-accumulation effects of financial integration. The estimates suggest that by further enhancing financial integration, emerging Asian economies, such as the People's Republic of China (PRC) and the largest four Association of Southeast Asian Nations (ASEAN) countries, will experience substantial welfare gains.

1. Introduction

As emerging economies have deregulated their financial markets over recent decades, there has been a rapid increase in cross-border capital transactions. This continuous financial opening has left emerging market economies more financially integrated with global markets. Despite the rapid financial developments in emerging markets, few researchers have investigated the welfare implications of financial integration in the regions. This study attempts to fill this gap by estimating the welfare gains from financial integration in emerging Asian economies.

In general, there have been two approaches in the literature attempting to quantify the welfare implications of financial integration. The first approach focuses on the manner by which financial integration enables a pooling of risks across countries. According to this approach, welfare gains are measured by the degree of consumption risk shared through financial integration (Cole and Obstfeld, 1991; Backus et al., 1992). The second approach emphasizes the production side and measures welfare gains by the degree of acceleration in growth due to foreign capital (Gourinchas and Jeanne, 2006). This approach shows in particular that financial integration speeds up capital accumulation through the inflow of foreign capital.

The welfare gains quantified by both approaches are generally small. The gains, reported as the permanent percentage increase in expected consumption equivalent to the increase in welfare gains through financial integration, vary from either less than 0.1 percent or up to 1 percent. Reported gains are small largely because the approaches focus mainly on the direct impact of financial integration, such as the sharing of consumption risk and capital accumulation. However, the welfare gains can be larger if we include other, indirect ways through which financial integration contributes to economic growth. In particular, foreign direct investment is considered an important channel for productivity growth through international technology diffusion.

Recent empirical studies show that disparities in the level of technology—and not in human or physical capital—explain the bulk of the difference in income or output per worker across economies (Hall and Jones, 1999; Easterly and Levine, 2001). Theoretical and empirical studies also show that technology diffusion plays an important role for technologically lagging economies to catch up with the global technology "frontier". In particular, it is believed that inward foreign direct investment (FDI) is an important channel for the diffusion of technology across countries. Based on a simple calibration exercise, Hoxha and Kalemli-Ozcan (2007) recently showed that if technological improvement is also taken into consideration, the impact of capital integration on welfare is about twice as large as otherwise.

The main goals of our study are twofold. First, by using aggregate measures of productivity, we empirically test if FDI flows narrow the technology gap relative to the technologically advanced country.

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* Corresponding author. Tel.: +82 2 32902220.
E-mail addresses: jongwha@korea.ac.kr (J.-W. Lee), khshin@korea.ac.kr (K. Shin).

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Second, by using our empirical estimates, we document the extent to which welfare in emerging Asian economies including the People's Republic of China (China) and the largest four Association of Southeast Asian Nations (ASEAN) countries (Indonesia, Malaysia, the Philippines, and Thailand) is enhanced by financial integration. By assuming that financial integration leads to welfare improvement—not only through the direct effect of the rapid accumulation of capital but also through the indirect effect of technology diffusion—the calibration exercise is deeply rooted in our empirical findings. While Hoxha and Kalemli-Ozcan's calibration is based on the findings of microeconomic studies on the impact of FDI on the productivity of firms, our calibration exercise is rooted in the empirical specifications used in our paper, which directly capture the extent of technology catch-up of a developing country with the frontier country.

The remainder of the paper is organized as follows. In section 2, we briefly review the literature on the relation between FDI and technology diffusion and illustrate the main features of the evolution of FDI flows in the data. Section 3 introduces a model of technology diffusion and Section 4 empirically tests the effect of FDI on technology catch-up. Based on the empirical findings in Section 4, we calibrate a model in Section 5 to investigate the welfare implications of financial integration in Asia. Concluding remarks are in Section 6.

2. FDI and technology diffusion

An economy's technological advancement depends on innovations of its own technology and the adoption of technologies produced elsewhere. For countries low on the technology ladder, the imitation and adoption of new technologies provide opportunity for catching up with technologically more advanced countries. This "advantage of backwardness" (Gerschenkron, 1962) implies that the larger the gap in the technology level relative to the advanced country, the faster the lagging economy can catch up with the global technology frontier. Recent growth models, such as those of Grossman and Helpman (1991, Chapters 11 and 12), and Barro and Sala-i-Martin (2004, chapter 8), incorporate the role of technology diffusion in economic growth.

While technology can diffuse through a variety of channels, FDI by multinational corporations (MNCs) is often regarded as one of the most important channels for international technology diffusion. MNCs themselves account for a substantial part of the world's research and development (R&D) investment, and can play a major role in the diffusion of new technology. Recent work on economic growth highlights the role of FDI in the technology diffusion process. Findlay (1978) postulates that FDI increases the rate of technical progress in the host country through a "contagion" effect from the more advanced technology, management practices, and other things etc., used by the foreign firms. Wang (1990) incorporates this idea into a neoclassical growth framework by modeling the increase in "knowledge" as a function of FDI. Borensztein et al. (1998) provide a simple, endogenous growth model in which the more advanced "knowledge" embodied in FDI allows host countries to introduce new varieties of capital goods at lower cost, thereby leading to a higher rate of technology progress.

The adoption of advanced technologies by less-advanced countries is not free and requires effort and capabilities. Abramovitz (1986) uses the phrase "absorptive capacity" to denote domestic capabilities for absorbing foreign technology spillover. In particular, the lack of human capacity for adopting new technologies is considered a crucial factor that limits the absorptive capability of a nation. Nelson and Phelps (1966) construct a model in which the facilitation of new knowledge is only possible when a sufficient level of human capital is present in a developing country.

Many recent models also highlight the complementary effects between human capital and technology, as both human capital and technology investment are endogenous choices of society. Redding (1996), for instance, assumes that both forms of investments in human capital and technology (R&D) exhibit pecuniary externalities and are strategic complements. In his model, the incentives to invest in each are interdependent and, thus, multiple equilibria exist: an economy can either fall into a "low-education, low-technology" position or achieve a "high-education, high-technology" position. Acemoglu and Zilibotti (2001) point out that technologies invented in advanced countries are more skill-complementary. Hence, the mismatch between skills and technology leads to differences in productivity even when all countries have equal access to new technologies.

A substantial number of recent papers empirically investigate technology spillover from the presence of foreign firms at the firm, industry or economy levels (see the survey of Lim, 2001). The evidence based on firm- or industry-level data is not yet fully conclusive. Blomstrom (1986) and Kokko (1994) find a positive effect of FDI on productivity at the sectoral level in Mexico. In contrast, based on firm-level data from Venezuela, Aitken and Harrison (1999) find no evidence of a positive spillover from foreign to domestic firms. Similarly, Djankov and Hoekman (2000) find no significant technology spillover between foreign and domestic firms in the Czech Republic.

While these studies focus on the effect of FDI on horizontal spillover, that is, the effect that multinational firms have on domestic firms in the same sector, recent studies examine vertical spillover from the presence of multinationals to their local suppliers or customers. For Indonesian and Lithuanian firms, Blalock and Gertler (2008) and Jovorcik (2004) find evidence of positive FDI spillover through backward links, that is, spillover from the presence of multinationals in upstream sectors to domestic suppliers of intermediate inputs.

At the economy-wide level, Blomstrom et al., 1994 find FDI has a significant positive effect on growth, but the effect is confined to high-income developing countries. But Blonigen and Wang (2004) provide contrasting evidence that FDI has a significantly positive effect only in less-developed countries.

Some studies find evidence that to have positive technology spillover through FDI, the host country must have an absorptive capacity for new technologies that manifest in FDI. Using a panel dataset over 69 developing countries between 1970 and 1989, Borensztein et al. (1998) show that FDI contributes to productivity growth when the host economy has a minimum threshold stock of educated workers as an absorptive capacity for FDI technology spillover. Likewise, Xu (2000), using data on the affiliates of multinationals in the United States (US), finds positive spillover from US multinationals on productivity growth in host countries that have a minimum stock of human capital. Subsequent empirical studies also establish the importance of various means of domestic absorptive capacities, other than human capital, for technology spillover from FDI. Durham (2004) and Alfaro et al., 2004 find that for a broad cross-section of countries, financial or institutional development in host economies of FDI plays an important role in absorptive capacity for technology spillover through FDI and economic growth.

3. A model of economic growth with technology diffusion

We use a growth-accounting framework to decompose the level of output per worker into the levels of inputs and labor-augmented productivity. In this framework, the labor augmented productivity measures the level of technology.

We assume a Cobb–Douglas production function, that is,

$$Y = K^{1-\alpha}(AhL)^{\alpha} \tag{1}$$