

## Chapter 87

# Diffusion of Technology via FDI and Convergence of Per Capita Incomes: Comparative Analysis on Europe and the MENA Region

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### **ABSTRACT**

*This chapter analyzes the convergence of incomes towards the FDI home country in Europe and in the MENA region, separately; and the prerequisites to derive benefit from FDI in a comparative manner. The per capita income convergence towards the major FDI home country, US, is estimated higher for Europe compared to the MENA region. However, the differences in the convergence values are not so wide between some sub-groups of these two regions. The absorptive capacity hypothesis, together with the investment capacity explains the discrepancies between not only the two regions as a whole, but also sub-groups within each region. The strong complementary effects between FDI and both absorptive and investment capacity suggest that economic policy aimed at fostering growth should try to benefit more from FDI by increasing the absorptive capacity-enhancing own R&D activities and promoting human capital- as well as by improving investment environment to attract more of it.*

### **INTRODUCTION**

According to the new growth theory, technological improvement is the main source of economic growth and diffusion of technology is the basic mechanism of per capita income convergence among countries. Therefore, the growth rate of a country depends on the state of domestic technology relative to that of the rest of the world. In this setting, if technology diffusion were national in character, there would be no possibility for convergence of incomes. Each country would grow at a rate determined by its own

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research effort. However, in reality research in one country benefits from knowledge created in others, providing a mechanism by which a laggard country would tend to catch up, formulated by the diffusion of technology models of endogenous growth theory.

Strong diffusion is the only force towards convergence because it equalizes differences in technology across countries (Keller, 2001). The reason is that almost the entire Research & Development (R&D) activity in the global economy is concentrated in a small number of industrial countries and, yet, not all of the other countries stagnate relative to the frontier. In a typical model of technology diffusion, the rate of economic growth of a backward country depends on the extent of the adoption and implementation of new technologies that are already in use in leading countries. Therefore, measuring the convergence of per capita incomes is important in order to assess whether comparatively less advanced countries manage to decrease the technological gap with more advanced ones.

The new growth literature underlines international trade and foreign direct investment (FDI) as transmission mechanisms that link a country's growth rate to economic developments in its partners (Grossman & Helpman, 1994). In general, empirical studies on international technology diffusion find evidence that there is significant cross-country technology diffusion via international trade channels. However, evidence related to FDI as a technology diffusion mechanism is ambiguous. On one hand, the results of empirical studies on developed countries show that FDI is a channel through which technology is internationally diffused (Lichtenberg & van Pottelsberghe de la Potterie, 1996; Barrel & Pain, 1997; Barrel & Pain, 1999; Choia, 2004). On the other hand, results of research on relatively less developed countries find no evidence supporting the existence of technology spillovers from foreign firms to domestically owned firms, as shown by Haddad and Harrison (1993) for Morocco or Aitken and Harrison (1999) for Venezuela.

These results imply that only developed countries can benefit from technological spillovers stemming from FDI, leaving no room for developing countries to catch-up. However, Borensztein, de Gregorio, and Lee (1995) empirically examine the role of FDI in the process of technology diffusion and economic growth in developing countries, suggesting that FDI is an important vehicle for the transfer of technology, contributing to growth in larger measure than domestic investment only when the host country has a minimum threshold stock of human capital. Xu (2000) also links the different outcomes obtained for developed and developing countries to the fact that most developing countries fail to reach the minimum human capital threshold level in order to benefit from the technology transfer. Bijsterbosch and Kolasa (2009) affirm the importance of human capital on the effect of FDI on convergence of productivity in the Central and Eastern Europe towards that of the euro area. Similarly, Neto and Veiga (2013) also find a positive effect of FDI on productivity growth and on GDP growth once the initial level of human capital is considered.

Recent studies based on firm-level data confirm that what matters is the absorptive capacity – not only human capital level, but also own R&D activities as implied by the theoretical models of technology diffusion- to benefit from positive spillovers, both for developed and developing countries. Regarding the former, e.g. Ben Hamida (2013) concludes that only local firms which have largely invested in absorptive capacity in Switzerland gain benefit from spillovers, stemming mainly from technology transfer. Similarly, the results of Chen et al. (2010) indicate a general pattern where industries with high absorptive capacity in China are better than low-end industries in absorbing spillovers from foreign-owned firms.

In summary, empirical studies on diffusion of technology confirm that human capital plays an important role in order for a country to benefit from foreign spillovers. Furthermore, they suggest that countries themselves must also engage in R&D activities so that they derive benefit from foreign knowledge. Ac-

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