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Foreign direct investment and technology spillover in Iran: The role of technological Capabilities of subsidiaries

Ali Salim^{a,*}, Mohammad Reza Razavi^a, Masoud Afshari-Mofrad^b^a Islamic Azad University, Science & Research Branch, Tehran, Iran^b Department of Information Technology Management, Tarbiat Modares University, Tehran, Iran

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ABSTRACT

Foreign direct investment (FDI) plays a significant role in global business by providing new markets and marketing channels, cheaper resources, access to new technologies, products, skills and financing. One of the most important aspects of FDI for a host country is technology spillover through which domestic firms gain access to new technologies from international enterprises. Iran, as a developing country, has had some form of engagement with foreign capital for more than 150 years. Nevertheless, there are limited studies on the role of FDI in technology spillover in Iran. This study investigates the effect of technological capabilities of foreign subsidiaries on the relationship between FDI and technology spillover channels including Demonstration effect, Training effect, Collaboration effect, Linkage effect and Worker turnover. A questionnaire was completed by 100 subsidiary units based in Iran. The sample consists of all foreign subsidiaries active in different industry or service sections all over the country. The results of running logistic regression model on data from questionnaires showed that FDI could not affect spillover channels directly. Yet, the results proved that technological capabilities of subsidiary units, as mediating players, have a positive influence on two spillover channels namely Demonstration effect and Training effect.

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1. Introduction

Attracting foreign direct investment (FDI) has become an essential part of development strategies among developing countries and many researchers have tried to investigate FDI impacts on the host economy. Most of these studies can be divided into two main categories: direct approach and indirect approach. In direct approach, researchers have mostly concentrated on economic issues of FDI such as financial resources, capital formation, and tax relief. In indirect approach, studies often focus on the interaction between foreign enterprises and host national innovation system (NIS) in terms of technology transfer and capability building, technology spillover, human resource development, monetary externalities and so on (Lall and Narula, 2004). These studies claim that through spillover effect of FDI, host countries might be able to improve their technological capability, organizational efficiency and management skills and in some cases, start endogenous growth (Wei, 2000). Thus, it is vital for developing countries to identify the impacts of FDI on their economy in terms of technological capability building.

Due to its unique geographical location at the cross roads connecting Asia and Europe, natural resources, large domestic market with a current population of more than 75 million, as well as easy access to neighboring markets with approximately 300 million inhabitants, Iran,

as a developing country, has had some form of engagement with foreign capital for more than 150 years. In recent decades, governments have tried to encourage foreign investors to invest in different sectors of economy by providing incentives such as tax relief, flexible employment regulations, and legal guarantees and protection. Iran's 5th five-year development plan (FYDP) suggests strategies to attract at least 30–40 billion dollars of foreign investment annually. Despite international sanctions and some complexities in operating requirements of investing in Iran, foreign investors are still active and they have concentrated their activity in a few sectors of the country especially oil and gas industry, vehicle manufacturing, petrochemicals and so on. According to FDI data from Organization for Investment Economic and Technical Assistance of Iran, Fig. 1 depicts the amount of FDI in Iran over the period of 1994–2011.

In spite of the long history of FDI in the country and government efforts to attract foreign investment, there are few studies on the role of FDI in technology spillover in Iran. To overcome this shortcoming, in this study the effect of foreign direct investment on technology spillover, considering the role of technological capabilities of subsidiary units, is investigated. Technological capabilities of subsidiary units are divided into five main categories including: production capability, maintenance capability, adoption capability, process improvement capability and new product development capability (Lall, 1992; UNIDO, 2003). Also, five technology spillover channels are recognized including Demonstration effect, Training effect, Collaboration effect, Linkage effect and Worker turnover (Blomstrom and Kokko, 1997; Murillo, 2002).

* Corresponding author.

E-mail address: salim.ali13@gmail.com (A. Salim).

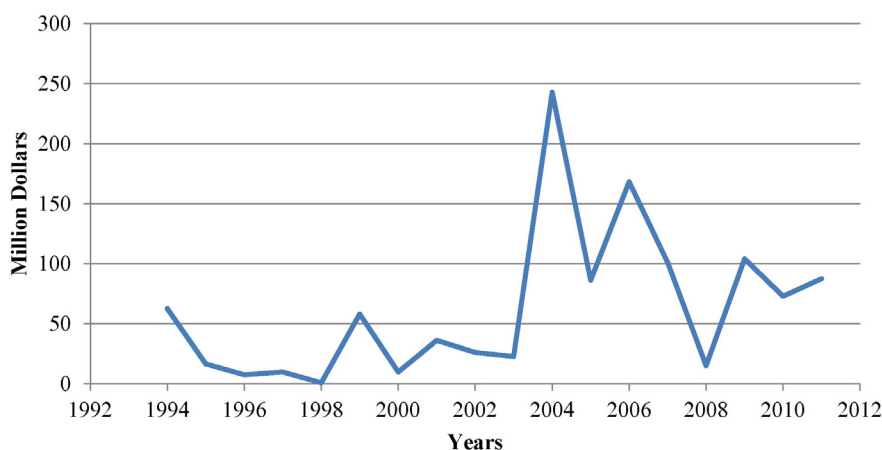


Fig. 1. Amount of FDI in Iran [1994–2011].

Thus, the main questions of this study are:

- Does FDI directly lead to technology spillover from foreign enterprises to domestic firms in Iran?
- What is the role of technological capabilities of subsidiary units in the relationship between FDI and technology spillover in Iran?

The rest of this paper is organized as follows: Section 2 reviews the literature on foreign direct investment and technology spillover. The conceptual model of the study is depicted in this section. In Section 3, research methodology is presented. Section 4 describes the findings of the study and Section 5 is devoted to discussion and policy implications. Finally, Section 6 summarizes the results of this study.

2. Research background

In this section, a brief literature review of foreign direct investment and its impact on technology spillover is presented. At the end, the conceptual model of the study is described.

2.1. FDI

By definition, foreign direct investment is establishment of a business operation in a country by a foreign corporation through setting up a new wholly-owned affiliate, or acquiring a local company, or forming a joint venture in the host economy (Moran, 2001). Many researchers, especially economists, have studied different aspects of FDI from the perspective of host countries and/or foreign investors. For example, some studies concentrated on the motivations of a corporation for investing abroad. These studies emphasized that foreign investors must possess some ‘compensating’ or ‘firm specific’ advantages, such as superior technology, differentiated product, a popular brand name or lower costs due to economies of scale, if they are to risk investing abroad (Kindleberger, 1970; Hymer, 1976). Narula and Dunning (2000) mentioned four main motives for investing abroad including: 1) seeking natural resources; 2) seeking new markets; 3) restructuring existing foreign production and 4) seeking new strategic assets. Caves (1974) proved that improved allocative efficiency, technical efficiency and technology transfer are the most important benefits of FDI for the host economy. Also, Cheng and Kwan (2000) investigated the determinants of the location of FDI in China and they showed that large regional market, good infrastructure and preferential policy have a positive effect but wage cost has a negative effect on FDI. From a governance view, Morrissey and Udomkerdmongkol (2012) scrutinized the relationship between good governance in the host country, domestic private investment and FDI. Their results demonstrated that corruption and political instability are

the most important governance indicators which affect investment. They also proved that in politically stable regimes, an increase in FDI reduces domestic private investment while total investment increases (Morrissey and Udomkerdmongkol, 2012). Buchanan et al. (2012) utilized an institutional perspective toward FDI and illustrated that good institutional quality is a critical determinant of FDI which along with correct macroeconomic environment, guarantees FDI stability. Also, considering FDI as a channel for spillovers of technological nature, Krammer (2015) confirmed that good institutions play a moderating role in the relationship between foreign technological spillovers and productivity.

Some researchers focused on other aspects of FDI such as the impact of intellectual property right (IPR) regimes or entrepreneurship climate in the host country on foreign direct investment. Branstetter and Saggi (2011), for instance, proved that strengthening of IPR protection in host countries leads to increase in FDI flow through reducing the rate of imitation. In contrast, Mathew and Mukherjee (2014) claimed that stronger IPR in the host country might in some cases result in reduced inward FDI. They argue that if the patent protection is weak in the host country, foreign firms may prefer to sell their products through FDI because of the possibility of imitation. But a stronger patent regime may reduce the foreign firm's incentive for FDI because there is less risk of imitation (Mathew and Mukherjee, 2014). Huang (2003) noted that FDI is determined in part by the strength or weakness of local entrepreneurship in the host country. He argued that since local firms with poor entrepreneurial skills pose no threats to foreign firms, countries with poor entrepreneurial climate might succeed in attracting more FDI (Huang, 2003).

It is essential to note that although right government policy and presence of other pre-requisites for proper functioning of the market might ensure that FDI contributes to development in developing countries, some researchers asserted that FDI is not a panacea and it would be a mistake to consider these potential benefits to be automatic or universal. They mentioned “surplus extraction through transfer pricing or excessive royalty payments, predatory practices or manipulation of consumer preference, restrictions on exporting or R&D activities of subsidiaries and manipulation of the overall national policy of the host country” as some of the potential ill-effects of FDI (Chang, 2003). In fact, some empirical studies demonstrated that in a number of cases, FDI to developing countries has failed to live up to its promise. For instance, a United Nations report cast doubts on the development contribution of FDI in Africa and claimed that it is undermined by the lack of tax revenues, significant profit repatriation, capital flight and a negative impact on local firms (UNCTAD, 2005). Also, Zhang (2001) analyzed data from 11 economies in Latin America and East Asia and concluded that the extent to which FDI contributes to growth depends on country specific characteristics such as human capital conditions,

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