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FDI inflows, transfer of knowledge, and absorptive capacity: The case of Mozambique

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The literature has discussed the impact of Foreign Direct Investment (FDI) on host economies, but has overlooked the case of the least-developed countries (LDCs) and, in particular, the transfer of knowledge to these economies. Drawing on different streams of the literature (FDI impact, knowledge transfer, and absorption capacity), this paper analyzes how a country's absorptive capacity may moderate the transfer of knowledge. By collecting and analyzing secondary data of FDI inflows and education, we examine the case of Mozambique. Data show that a country's low educational level, and thus low absorptive capacity, may prevent effective knowledge transfer. We argue that policies that are aimed at expatriation, emigration, and tertiary education can help to increase the potential impact of FDI inflows. The main contribution of this paper to the literature is to examine how absorptive capacity and transfer of knowledge inter-relate within LDCs.

Key words: FDI inflows, transfer of knowledge, absorptive capacity, education.

INTRODUCTION

Foreign Direct Investment (FDI) inflows may impact hosts' economies in different ways. They may affect trade balance; shift the market structure – increasing competition or concentration; foster linkages between foreign and local firms; alter consumption patterns; and transfer resources, such as capital, knowledge, technology, and organizational practices (Dicken, 2011; Dunning and Lundan, 2008; Jones, 2005; Meyer, 2004; Blomström and Kokko, 2002; Slaughter, 2002; UNCTAD, 2001). These impacts, which may trigger positive and negative spillovers, thereby benefiting or harming the host economies are, however, not yet well understood (Meyer, 2004). Hence, they need to be further investigated. One impact that deserves more analysis is the impact of FDI on the least-developed economies. These countries have

increasingly hosted FDI inflows (UNCTAD, 2013). However the effects of the latter on the former have not received much attention in the literature.

In the case of the transfer of knowledge and technology, for instance, positive spillovers and externalities are conditioned by organizational and environmental factors, such as 'the nature of the host economy, especially its level of human capital development and the quality of its infrastructure and institutions' (Jones, 2005). Therefore, if the country has no local qualified workforce or, in other words, the local absorptive capacity does not exist, it is unlikely that knowledge will be transferred and diffused throughout the local economy. As Blomström and Kokko (2002:10) argue, '...FDI and human capital interact in a complex manner. While inflows create a potential for

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spillovers of knowledge to the local labor force, at the same time the host country's level of human capital determines how much FDI it can attract and whether local firms are able to absorb the potential spillover benefits.' This is a critical issue, principally for developing and least-developed countries that depend on this transfer to lever their economic development and national welfare (Meyer, 2004). Thus, national governments are likely to play a pivotal role in increasing the effectiveness of the process of transferring knowledge.

How can governments, especially those of the least-developed countries, increase the probability that knowledge, which is brought in by foreign investors, is effectively transferred to their countries? Jones (2005:261) suggests that they 'can improve the ability of their enterprises to absorb foreign technologies by investing in education and infrastructure.' Indeed, both of them are required for an effective transfer of knowledge (i.e., for local organizations to absorb and apply knowledge). However, these investments require a long time before their consequences can be evidenced. Since FDI inflows to developing countries, including those in Africa, have rapidly increased in recent years (UNCTAD, 2013), much of the knowledge may not be transferred and/or absorbed, if the host countries have no real capacity to absorb it. Therefore, the challenge for some countries, particularly those with a deficient education and infrastructure, is to prevent 'knowledge waste' - knowledge that is transferred to the country, but it is not absorbed and used to benefit the economy and leverage its economic development.

In this paper, we contend that least-developed economies with low educational levels and poor infra-structures and institutions may adopt policies regarding expatriates, emigrants, and tertiary education that are intended to rapidly increase their absorptive capacity and, hence, their effective transfer of knowledge. Although educational investments and policies remain fundamental, these are long-term issues. Thus, complementarily, short- and medium-term policies may help both national governments and MNEs to challenge the transfer of knowledge issue. With regard to the latter, it is important to understand how institutions, mainly educational ones, may be a hindrance to enhancement of local absorptive capacity. This understanding is likely to affect decisions in Human Resources' policies and practices, such as recruitment, training, and expatriation. For the former, it is important to design institutions and educational policies aimed at maximizing positive effects of transfer of knowledge in order to increase externalities (Meyer, 2004).

We draw from three streams of literature: the impact of FDI inflows on host economies; transfer of knowledge; and absorptive capacity. The literature on the impact of FDI inflows on host economies has examined the effects that resources, which were brought by foreign firms, may have on host economies (Dunning and Lundan, 2008;

Jones, 2006; Meyer, 2004; Blomström and Kokko, 2002; Slaughter, 2002; UNCTAD, 2001), but does not examine specific impacts, such as the transfer of knowledge, on the least-developed countries. The literature has analyzed at length the transfer of knowledge issue (Kumar and Ganesh, 2009), mainly from the (inter- and intra-) organizational viewpoint (Szulanski, 1996) and within the MNE context (Kostova and Roth, 2002; Kostova, 1999). However, it disregards how the country's absorptive capacity may affect this transfer. Finally, another stream of literature has focused on the absorptive capacity issue or, more precisely, factors that determine the extent to which knowledge is transferred, absorbed, and used by a recipient organization (Cohen and Levinthal, 1990; Zahra and George, 2002). Again, this stream overlooks how the existing absorptive capacity in least-developed countries may affect the transfer of knowledge. By looking at them conjointly, we hope to disentangle the multiple *enjeux* of the impact of the transfer of knowledge to the least-developed economies.

In order to support this discussion, we consider the case of Mozambique. This case illustrates well our arguments because, on the one hand, the country has received increasing FDI inflows in recent years, which potentially can have positive spillovers and externalities on its economy. On the other hand, the low educational level of the country's population (MINED, 2011) remains a hindrance that is likely to undermine positive spillovers. Thus, beneficial effects may not be realized. First, we present data about FDI inflows to Mozambique – by amount and sector – in recent years. Secondary data was collected from the World Investment Report (WIR), which is published annually by the United Nations Conference and Trade Development (UNCTAD) and is a major source of information about worldwide FDI flows. Secondly, we present an historical account of Mozambican education since the country's independence in 1975. Again, secondary data about the country's education (World Bank, 2013; UNESCO, 2013) were collected from reports that have been published by international organizations, such as the World Bank and UNESCO, and by governmental bodies, such as the Ministry of Education. Using inductive reasoning, we discuss how education and absorptive capacity interplay and, hence, affect the transfer of knowledge. We suggest that adopting policies regarding expatriation, emigration, and tertiary education may contribute to an increase in knowledge transfer to least-developed economies.

The article is structured as follows. In the next sections, we discuss the impacts of FDI inflows on host economies, particularly the transfer of knowledge and how absorptive capacity can influence the outcome of this transfer. Subsequently, we examine the case of Mozambique: first, data about the macroeconomic environment and FDI inflows are presented, and then the latest developments concerning Mozambique's

educational system are analyzed. In the following section, we discuss the main challenges to the transfer of knowledge that FDI inflows raise and how government may act to ensure that the potential benefits of the transfer of knowledge are effectively realized.

FDI inflows and the transfer of knowledge

FDI inflows may have different impacts on host economies (Dunning, 1994; UNCTAD, 1992; Slaughter, 2002; Dunning and Lundan, 2008). For instance, foreign affiliates can affect the volume and composition of host country imports and/or exports; increase market competition or concentration, shifting the local market structure; establish links to local suppliers (linkage effect); transfer resources (knowledge, capital, and employment) that may spread to the rest of the economy (spillover effect); circumvent host government policies; and change consumption patterns. The analysis of these impacts is not straightforward. It must consider the economic sector, the MNE, the entry mode, the nature of the host economy, the degree of development, domestic policies, and so on, before the FDI impacts can be understood (Jones, 2005). For example, spillovers are related to the host economy's capacity to absorb them (Kokko, 1994).

With regard to the transfer of knowledge in particular, MNEs are major channels through which this resource flows into host economies, fostering their economic growth (UNCTAD, 1992). As Jones (2005:262) argues, 'given the central role of innovation in economic growth, such knowledge transfers might provide one of the most important ways in which firms act as engines of growth.' Knowledge and technology may be transferred within MNEs (e.g., between headquarters and subsidiaries or among subsidiaries) or between foreign affiliates and local firms. In the former case, since MNEs are major actors in the development of technologies (UNCTAD, 1992), their affiliates may access knowledge from the headquarters or other affiliates, which enables them to offer updated products and services in the host economies. This access may make them more competitive and, hence, trigger a 'demonstration effect' (Jones, 2005) that prompts domestic firms to compete more actively and to upgrade their product/services and to adopt more efficient organizational practices (UNCTAD, 1992).

In the second case, foreign affiliates may establish links with domestic firms (Dunning and Lundan, 2008; Jones, 2005; Blomström and Kokko, 2002; UNCTAD, 2001). These links constitute channels through which tangible and intangible assets are transferred from home to host economies (UNCTAD, 2001; Duarte, 2001). Jones (2005:274) argues that, 'there is convincing evidence of the positive linkages between multinationals and suppliers in many developing countries over recent decades. Foreign affiliates are often more demanding in their

specifications and delivery targets, while more willing to provide assistance and advice to local firms.' For domestic firms, access to foreign technological and managerial knowledge by linkages with MNE subsidiaries can increase their competitiveness in domestic markets. A research study that was carried out by one of the authors showed that, following the acquisition of local companies by foreign companies, the acquirers tend to require suppliers to improve their product and production quality standards, while providing them with technical support so that the latter can introduce needed changes (Duarte, 2001). To sum up, there is compelling evidence that foreign investment may transfer knowledge to both the investor's affiliates worldwide and local companies.

Since knowledge transfer requires the availability of qualified and formally educated people, MNEs, which tend to be knowledge-intensive firms, may affect the host-country labor markets by increasing, for instance, the demand for skilled personnel. Blomström and Kokko (2002:16) say that 'there is increasingly clear evidence that MNCs may have a noticeable impact on tertiary education in their host countries.' As Slaughter (2002:16) argues, 'there is compelling evidence that affiliates' demand for skilled labor is stimulated by their receipt of their parent's technology and investments in physical capacity.' This higher demand for skilled workers and managers may raise some challenges for the host economy. In some countries, a scarcity of skilled employees, primarily technical, may force foreign affiliates to bring expatriates. Nevertheless, some countries restrict the employment of foreign nationals, limiting those that MNEs can hire. If there is a lack of skills available locally and MNEs face restrictions in bringing in expatriates, governmental authorities need to design and implement educational, qualification and training policies that will enable local inhabitants to acquire the necessary skills or risk losing their attractiveness to MNEs. As Blomström and Kokko (2002:16) have indicated, since MNEs provide attractive employment opportunities and demand skilled labor, they may encourage governments to invest in higher education.

On the other hand, MNEs may affect the supply of skills in host country markets. First, they can bring in qualified people. In countries where there is a shortage of qualified human resources, foreigners can provide knowledge, expertise, know how, and capabilities. Secondly, MNEs can contribute to local human resource development by formal or informal training. For example, they can assist their local suppliers to develop the latter's human resources as they are vital to the success and sustainability of the linkages. This assistance can be particularly useful in countries where there is a scarcity of skilled workers, such as Mozambique, or where firms' efforts to improve their human resources face financial and institutional constraints (UNCTAD, 2001:144). Thirdly, a supply of skilled workers who have been trained by MNEs (either in-house or by suppliers) may disseminate (spillover)

knowledge throughout the rest of the host country. People may change jobs and transfer previously acquired knowledge to domestic firms (Jones, 2005: 273) or set up their own businesses (Blomström and Kokko, 2002). Although MNEs can channel knowledge into host economies, the effectiveness of this transfer depends on the local absorptive capacity.

In sum, local governments are particularly interested in designing policies to attract foreign investment as they may leverage economic growth. If they are successful in doing so, some impacts on their host countries, such as employment creation, linkages, and trade, may appear quickly. Because these impacts are highly visible, they may bring political dividends to domestic governments. Other impacts, such as the transfer of knowledge, are less tangible and may take longer to realize. They require policies regarding education, research, and technology, which demand a long-term view and political determination to implement. Therefore, the main challenge for local governments, and especially for those of the least-developed countries, is to improve the country's absorptive capacity. In doing so, governments can maximize the potential outcome from the transfer of knowledge. In the following section, we will discuss how absorptive capacity determines the transfer of knowledge.

Transfer of knowledge and absorptive capacity

Since knowledge is an organization's most important asset, the ability to create new knowledge is what makes some companies more competitive than others (Grant, 1996; Nonaka and Takeuchi, 1995). This ability is particularly evident within MNEs that normally have structured R&Ds functions that are directed to the development of new products. One example is MNEs within technology-intensive economic sectors, such as pharmaceutical, chemical, and machinery, which invest massively in the creation of new knowledge and technology. Their competitiveness depends on this ability, among other factors. Aside from creating knowledge, the capacity to transfer it, either within the organization or to different organizations, may be a distinctive resource (Zahra and George, 2002), especially for MNEs. These firms may develop sophisticated systems of thinking and strategic attitudes and use advanced technologies that are not easily transferable because of cultural barriers (Kedia and Bhagat, 1988), especially when the transfer involves developing countries (Buckley and Casson, 1991). Thus, much of their success depends on their ability to transfer knowledge between headquarters and subsidiaries and among subsidiaries. The success of the transfer depends on the type or features of knowledge/technology and the absorption capacity of the recipient organization (Kedia and Bhagat, 1988).

Nonaka and Takeuchi (1995) distinguish between tacit

and explicit knowledge. The former may be associated with 'knowing how' and the latter with 'knowing about facts and theories' (Grant, 1996:111). For this author, 'the critical distinction between the two lies in transferability and the mechanisms for transfer across individuals, across space, and across time.' Zander and Kogut (1995:85) argue that the transfer of manufacturing capabilities, for example, is influenced by the degree to which these capabilities may be codified and taught. To them, how easily a capability can be codified and taught provides the most direct insight into the degree to which it is tacit and difficult to communicate, and has a significant effect on the hazard of transfer. Tacit knowledge that cannot be codified, but only observed through its application and acquired through practice, is better transferred by social interaction. However its transfer between people is slow, costly, uncertain (Kogut and Zander, 1992) and, therefore, challenging.

Arvidsson (2000) argues that there are two paradoxes about knowledge transfer. The first is the transfer paradox: the most valuable knowledge, tacit knowledge, is also the stickiest knowledge. So, tacit knowledge is expensive and difficult to articulate and materialize or codify so that others can easily absorb it. The second paradox is the evaluation paradox: tacit knowledge is also the most difficult knowledge to evaluate and assess. Arvidsson thus concludes that corporate managers cannot intentionally manage knowledge. Instead, aspects of knowledge and the recipients determine if a transfer takes place. Due to the nature of tacit knowledge, its transfer demands socialization mechanisms, such as meetings, people exchanges (expatriation, for example), technical visits, training, direct discourse or conversation, and so on. So, the more tacit the knowledge is, the stronger the links between the parts involved in the transfer need to be.

In addition to type of knowledge, another determinant of knowledge transfer effectiveness is the recipient's absorptive capacity (Szulanski, 1996). Zahra and George (2002:186) define absorptive capacity as 'a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability.' Absorptive capacity has two dimensions – potential capacity and realized capacity. The first means acquisition (identification and acquisition) of knowledge and assimilation of capacities (interpretation of information). The second means transformation (combination of existing knowledge and new knowledge) and exploitation (application). Absorptive capacity is normally analyzed at the organizational level. At this level, absorption refers to a set of organizational capabilities that ease the process of absorbing outside knowledge (Zahra and George, 2002). The use of external knowledge depends on previous knowledge, because it permits one to assess and understand the value of new information, to absorb it and to use it (Cohen and Levinthal, 1990). Thus,

the absorption of external and new knowledge takes place only if there is related knowledge in the organization and there are professionals who have differing backgrounds so that new knowledge can be used more creatively.

Even though absorptive capacity is an organizational feature, it materializes only through organizations' personnel (Minbaeva et al., 2003). This means that the education, qualifications, training, and professional experience of individuals ultimately determine an organization's absorptive capacity. Thus, the issue can also be analyzed at the country level. At the country level, absorptive capacity may be broadly associated with the extent to which the population is formally educated. In other words, the higher the educational level of the host country's population, the more likely it is that the latter will absorb the knowledge and technology transferred by MNEs. Also, absorptive capacity may be related to the number of institutions that foster research and innovation. Both the case of Japan, 'which demonstrated a considerable amount of absorptive capacity as it sought to create a modern economy from the late nineteenth century onwards' (Jones, 2005:262), and, more recently, the case of China demonstrate how absorptive capacity may leverage economic growth (Lin, 2011).

Although the transfer of resources, including knowledge, may potentially leverage economic growth, this potential has not been realized historically (Jones, 2005:266). As Blomström and Kokko (2002:15) indicate, there is strong evidence that points to the potential for significant spillover benefits from FDI. However, whether these spillovers will be realized depends on local firms learning to absorb foreign knowledge. Thus, education is a key requirement of achieving spillover benefits. Several reports from such international organizations as UNESCO, UNDP, and the World Bank have demonstrated that education is commonly a critical issue in the least-developed countries. So, it is not unlikely that benefits that FDI inflows may bring about are not realized. Both national governments and MNCs may have a role in improving existing absorptive capacity and, consequently, the extent to which knowledge is transferred into host economies. For national governments, the challenge is to design short-, mid- and long term educational policies. The MNEs may impact formal education, mainly tertiary education, and provide training for their employees.

METHODOLOGY

In order to discuss how education may influence absorptive capacity and, hence, transfer of knowledge to the least-developed economies, we opted to use a case study. As Yin (1994:12-3) indicates, a case study is 'an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when

the boundaries between phenomenon and context are not clearly evident.' The case study method copes with different variables of interest, relies on multiple sources of evidence, and benefits from the prior development of theoretical propositions to guide data collection and analysis. Thus, the case study method is a comprehensive research strategy that 'comprises an all-encompassing method – with the logic of design incorporating specific approaches to data collection and to data analysis.' The case study may use different sources of evidence including documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. The advantage of using multiple sources of evidence is that findings and/or conclusions are more convincing if based on several different sources of information (Yin, 1994).

Three major reasons led us to select Mozambique as a case study. First, it has one of the world's lowest Human Development Indices (HDI). A factor that contributes to this low HDI is the low educational level (adult illiteracy). Secondly, is the low number of students enrolled in primary and secondary schools and the low number of students enrolled in sciences at the tertiary education level. Thirdly, the country has received growing FDI inflows in recent years. These facts combine to make Mozambique an exemplary case for the examination of FDI inflows and transfer of knowledge to least-developed economies. As Yin (1994) suggested, we discuss a contemporary phenomenon within its real life context. The boundaries between it and context are not clearly evident.

As documentary sources on FDI inflows and education are relatively scarce in Mozambique, gathering facts and figures about the country is a challenging task. So we have relied on data compiled by international organizations. The data on the country's macroeconomic figures (economic growth, GDP, and GDP per capita) and FDI inflows (volume and economic sectors) were collected from reports that were published by both international (the United Nations Conference on Trade and Development, the United Nations Development Program, and the World Bank) and national (Investment Promotion Centre) organizations. For the historical account of Mozambican education, we relied, first, on academic sources (Thomaz: 2001; Hedges, 1999; Tole, 1995; Newitt 1995) to contextualize the evolution of Mozambican education before and after the country's independence in 1975. The World Bank and UNESCO publications were invaluable sources of Mozambican primary and secondary education data (illiteracy rates and enrollment). Reports that were published by the Ministry of Education, in 2000 and 2011, provided data about tertiary education (the number of students enrolled and the academic fields that students searched most frequently).

Data concerning FDI inflows and education were analyzed from the viewpoint of opportunity and challenge. First, we discuss how Mozambique's high economic

growth rates in recent years may contribute to the leveraging of FDI inflows. These investments may transfer knowledge, technology, know how, and expertise to Mozambique, although this transfer will be moderated by local absorptive capacity and, hence, education. Secondly, we analyze the extent to which economic sectors that have received foreign investment coincide with academic subjects pursued primarily by tertiary level students. If there is a gap between economic sectors and academic fields, it should help to undermine the transfer of knowledge effects, such as spillovers.

The case of Mozambique

An account of Mozambique's FDI inflows in recent years

Following the signing of the Peace Agreement in 1992, which ended a 16-year civil war, the Mozambican economy has substantially changed. Since 1993, Mozambique's GDP has grown by more than 6.0 percent annually, except in 1995 and 2000 (World Bank, 2013). Between 2001 and 2010, the country's GDP grew by 7.9 percent annually. It is expected to grow by 7.7 percent between 2011 and 2015 (Economist, 2011). In 2011, the country's GDP amounted to \$12.8 billion (US). The Mozambican GDP per capita increased from \$260 (US) in 1992 to \$970 (US) in 2011 and is expected to grow by an average of 5.5 percent annually until 2016. Despite this growth, Mozambique's GDP per capita is still below the average for low income countries (UNCTAD, 2011; World Bank, 2013). Mozambique's Human Development Index (HDI) continues to be one of the lowest in the world (0.327), which gives the country a rank of 185 out of 187 countries that have comparable data (UNDP, 2013).

In future years, the country's economic growth will be driven by a boom in the mining industry and investment in the gas sector (UNCTAD, 2012a). The country's steady economic growth, together with increasing world demand for mineral commodities, has prompted foreign companies to invest in Mozambique, mainly in the primary sector (natural gas and coal). Whereas FDI inflows to Mozambique amounted to only \$25 million (US) in 1992 and \$139.2 million (US) in 2000, they reached \$2.09 billion (US) in 2011 (UNCTAD, 2012a) and \$5.2 billion (US) in 2012 (UNCTAD, 2013), almost double what the country hosted the year before. The UNCTAD FDI Attraction Index, which measures countries' success in attracting FDI (combining total FDI inflows and inflows relative to GDP), indicates that Mozambique has improved significantly (UNCTAD, 2012a; World Bank, 2013). In the group of structurally weak, vulnerable, and small national economies, Mozambique topped first in FDI inflows in 2012 (UNCTAD, 2013). The FDI inward stock increased from a mere \$ 25 million (US) in 1990 to \$ 12,632 billion (US) in 2012.

Three of the 10 largest greenfield projects in LDCs (a group that includes 49 countries) that were announced in 2011 are in Mozambique. An important infra-structural investment announced (the largest greenfield project in LDCs in 2011) is the construction of a power plant by Jindal Steel & Power of India. If it materializes, this will be the largest greenfield investment in electricity in Mozambique since 2003. The investment is estimated at \$3 billion (US) and is expected to create 368 jobs (UNCTAD, 2012a). The discovery of huge offshore gas deposits has also helped to attract foreign investors. In 2012, Mozambique near doubled its volume of FDI inflows (UNCTAD, 2013). In 2012, as in the previous, three of the largest greenfield projects in LDCs that were announced in 2012 were in Mozambique. Two of them were in the infra-structure sector (fossil fuel electric power) and one was in the real estate sector (UNCTAD, 2013).

An account of the development of education in Mozambique

During the colonial period, education was clearly not a priority in Mozambique. In the early 1960s, there were three high schools in the country's capital and only a few others in the other cities. Investments in educational infrastructure were concentrated primarily in urban areas, where most Europeans and their descendants lived. The majority of the local population did not benefit from the existing educational system. In 1960, for instance, African students accounted for only 13 percent of total student enrollment (Newitt, 1995; Hedges, 1999). Portugal, the colonial power, did not emphasize education and so could not provide its colonies with an infrastructure that was unavailable to the Portuguese population itself. The illiteracy rate in Portugal during the 1970s was 20.5 percent, but in Mozambique it was around 90 percent (Isaacman and Isaacman, 1983:12). Furthermore, ethnocentrism at colonial schools was massive. Students were obliged to study Portugal's geography despite the local reality (Thomaz, 2001: 45). The poor preparation of teachers only worsened the situation (Hedges, 1999: 121).

After independence in 1975, a major concern of Frelimo (the Mozambique Freedom Movement) was education and the educational qualifications of the local population. Despite several shortcomings – the departure of teachers and the lack of books and schools – efforts were made throughout the country to provide some education to the people. In the first five years after independence, the illiteracy rate declined from 95 percent to 75 percent (Isaacman and Isaacman, 1983). Despite the extensive literacy campaigns, the education was biased by Marxist ideology and neglected technical and professional issues (Tole, 1995). In the 1980s, the civil war, a serious economic crisis, and political instability caused serious

damage to the country's infra-structure including the educational system. Since the end of the war, government authorities, with the support of international agencies, have attempted to improve the country's educational system. However, these efforts have been undermined by such factors as widespread poverty (82 percent of the population live on less than \$2 dollars [US] a day), low life expectancy (which at birth was 50 years in 2010), and the devastating impact of AIDS (the HIV rate among adults of 15 to 49 years of age is 11.3 percent). Despite this, the educational situation has been changing. Whereas only 43 percent of children attended primary schools in 1991, 92 percent (89 percent of girls and 94 percent of boys) were in school in 2010 (net enrolment). If we take gross enrollment into account, this changes to 111 percent (it can be greater than 100 percent when students younger or older than the official age for a given level of education are enrolled in that level). Figures for secondary school attendance are less positive. In 1999, only three percent of young people attended school, but, in 2010, this figure had risen to 16 percent. If gross enrolment is considered, this figure becomes 25 percent. The primary to secondary transition rate is still 50 percent. Since 44 percent of Mozambique's population is less than 15 years of age, increasing this transition rate, as well as figures for secondary schools, remains a challenge for local governments (World Bank, 2013; UNESCO, 2013).

Regarding tertiary education, the first university (Universidade Eduardo Mondlane today) was not created until 1968. Until 1974, students of African origin represented less than one percent of all students. When the university began, it had 2,400 students. However, this number declined from 1977 to 1989 and increased only from 1990 onwards. At this time, other institutions of higher education were created and both public and private educational institutions began an expansionist movement to other cities. In 2000, there were ten HEIs in Mozambique (MINED, 2000). By 2010, the number of HEIs had grown to 44. During the same period, the number of students who attend an institution of higher education grew from 10,000 to 80,000 (Rosário, 2012; MINED, 2011).

Some issues, however, may undermine the effects that this growing number of students could have on the country's economy, particularly the lack of convergence between offer and market demands. Data from the Ministry of Education show that 9,600 students from six public and private HEIs were enrolled in 2000 primarily in economic sciences (including management), engineering (including architecture), law, educational sciences, social sciences, agricultural sciences, natural sciences and medical sciences. More than 40 percent were in economics/management, law, and social sciences. Only 25 percent were enrolled in the engineering area (MINED, 2000). A decade later, the divergence between offer and market demands has widened. In 2009, there

were around 60,949 and 20,301 students in public and private HEIs respectively. More than 75 percent of students were enrolled in educational, social, and human sciences, management, and law. In contrast, and despite Mozambique's needs, fewer than 15 percent of students are enrolled in areas, such as engineering, natural and physical sciences, mathematics, statistics, IT, and so on (MINED, 2011). A large part of foreign investments is concentrated in the infra-structure and the primary sectors, and both largely require professionals from the technical areas. This creates a gap between what the market demands and HEIs prepare (Rosário, 2012). Taking into account data about FDI inflows and education, we now discuss how foreign investments may constitute a channel through which external knowledge is transferred to the Mozambican economy, but that this opportunity will arise only if the related educational challenges are addressed.

Challenges and opportunities of FDI inflows to Mozambique

Mozambique has been receiving an increasing volume of FDI inflows that are likely to produce positive effects in the country. For example, Article 7 of Mozambique's Law on Investment says that carrying out investments addresses objectives, such as creating jobs for national workers and raising the level of professional skills of Mozambique's labor force; promoting technological development and improving entrepreneurial productivity and efficiency. Some impacts, such as the creation of jobs, should be felt shortly after investments have been made. However, it should be noted that none of the largest greenfield investments that have been announced during the last two years are expected to create numerous jobs. Other impacts, such as the raising of professional skill levels, the transfer of knowledge and the development of knowledge spillovers, should take much longer to notice. As mentioned by different authors, a requirement for these impacts to occur effectively is the existence of sufficient absorptive capacity, which depends, in turn, on education. Therefore, if rising investment means an opportunity for Mozambique to lever economic development (Meyer, 2004), it also creates challenges for the country's authorities, with education being the most important one. As Guy (2009: 252) has stated, 'upgrading from low-wage assembly to higher paid, higher-skilled part of the value chain' [...] implies an increase in the absorptive capacity of a country's companies and research institutions.' How this challenge is addressed will determine the future impacts of these foreign investments on the country.

Mozambique still ranks 185th of 187 countries in the last Human Development Report (UNDP, 2013). A particular component of HDI shows the extent of the challenge. Mozambique's adult population has an

average of 1.2 years of schooling. Overall, literacy among adults (older than 15 years old) was 56.1 percent in 2010, below the regional average of 62.6 percent. Such a low level of schooling is likely to undermine an effective transfer of technology, knowledge, and know how. Thus, this specific impact may remain as potential and not be realized. Such a situation obviously cannot be changed in a short period of time. It will take years and even decades before a shift is noticeable. Since the outcome of governmental investment in education cannot be seen immediately, other ways to facilitate knowledge transfer (i.e., to avoid 'knowledge waste') should be considered. However, these ways are only provisional as a consistent, continuous, and sustainable transfer of knowledge will depend on long-term education and scientific investment and public policies.

Governments tend to welcome foreign investments (Spar, 2001), but seem somewhat less receptive to foreign employees and restrict their hiring on the assumption that foreign companies need to hire local people. In Mozambique, for instance, enterprises may employ foreigners, but are subjected to quotas. The foreign workers employed in a large enterprise (more than 100 employees) may not constitute more than five percent of the total number of employees (Frey, 2007). Although this policy may be politically sensible, foreign companies will not hire locally, unless there are sufficient qualified professionals available. Restrictions on employing foreigners may actually prevent economic and business growth (Economist, 2013). However, such restrictions may eventually force MNEs to hire and, therefore, train locals (Blomström and Kokko, 2002). Even though foreign companies may provide training to local employees, there is an issue that should not be overlooked. It is that '... the methods of MNE human capital development are often likely to be firm-specific rather than aimed at developing general human capital skills such as numeracy, literacy, and problem solving' (Slaugther, 2002: 21). This sort of training may be invaluable, but not effectively improve both and realized absorptive capacities that depend on general skills that are provided mainly by formal education. In order to avoid 'knowledge waste,' we argue that short- and medium-term measures may be appropriate, whereas long-term measures do not produce concrete outcomes.

First, we argue that a more nuanced view of expatriation would be suitable in the Mozambique context. Present foreign investments are concentrated in the primary and infra-structure sectors, which are capital- and technologically-intensive. Such investments demand highly-qualified, technical professionals that the Mozambique educational system may be unable to provide. There is a divergence between the type of professionals demanded by foreign companies and those that educational institutions prepare. While this gap remains, it is likely that foreign companies will rely on expatriates. With a serious economic crisis touching Europe and other

developed economic areas, a great contingent of highly qualified, but unemployed, people may be looking for opportunities elsewhere. Mozambique may be an attractive target. Some could argue that opening its doors to foreigners would deprive nationals of valuable jobs as they cannot always compete with better qualified and experienced professionals. Although this may be true, restricting their entry means depriving a country of sources of know-how and knowledge, such as tacit knowledge, for which the success of transfer relies on people. So, restriction policies may limit somewhat one of the most valuable impacts that these FDI inflows can have on Mozambique, namely the transfer of knowledge. Thus, objective and targeted migration policies that are aimed at attracting talented professionals according to Mozambique's needs may contribute to bringing the most sought and needed knowledge to the country. Again, there are no ready formulae, but expatriates can contribute in different ways to the dissemination of knowledge throughout the host country.

Secondly, we contend that policies that seek to attract Mozambicans who have emigrated may also contribute to the dissemination of knowledge into the economy. The last LDC Report considers this issue extensively. Brain drain, for example, is more prevalent in LDCs than in other developing countries. Emigration data demonstrates that Mozambique is one of the LDCs with the highest share of emigrants (four percent) as a percentage of total LDC emigrant stocks in 2010. More than 30 percent of Mozambique's high-skilled labor force lives abroad (UNCTAD, 2012b:94). The same is true for a group of other LDCs. Thus, the return of students and long-term emigrants is one mechanism by which the stock of knowledge and skills of emigrants can contribute to the accumulation of human capital in the home country. Another mechanism, which was discussed in the 2012 LDC Report is the diasporas of knowledge networks that, if well organized, can serve as 'brain banks.' These diasporas can become a source of knowledge sharing and technology transfer with their home countries. As has been argued in this report, technology appears to diffuse more efficiently through culturally and nationally linked groups (UNCTAD, 2012b:106). The potential contribution to the home country of highly-skilled LDC nationals is not realized automatically. The achievement of this potential depends on institutional, political, and economic conditions. For example, as long as Mozambique's economy grows (and the economic crisis in developed countries persists) and the labor market increases (mainly for qualified people), Mozambicans who previously left may choose to return. However, highly-skilled emigrants tend to share little knowledge with their home countries if the latter do not undergo rapid structural transformation (UNCTAD, 2012b:86).

Although actions and policies that are aimed at expatriates and emigrants may compensate temporarily for the scarcity of formally educated workers, they are

unsustainable in the long-term. Only if there is a set of short- and long-term educational policies for Mozambique is it likely that the potential transfer of knowledge will be fully realized. Changing the overall education panorama will take decades, although some measures in the area of higher education may take less time to produce visible results. As technologically-intensive foreign investment should increase the demand for graduates in related areas, students are likely to look for such courses. In turn, this will increase the demand for academics by HEI. So, thirdly, we point out that governmental policies may prioritize the qualification and training of both students and academics that will help the country to respond to the demands of the labor market and, more importantly, become levers for the transfer of knowledge. More oriented tertiary education policies should help to increase absorptive capacity, hence transfer of knowledge and spillovers.

Final considerations

The literature has largely established that FDI inflows may impact host countries in several ways. Foreign companies may affect trade exports; forge linkage with domestic companies; increase competition; and transfer technology, know-how, and knowledge. However, the literature has disregarded FDI impacts on the least-developed countries, particularly the transfer of knowledge. Since these countries have received more FDI inflows lately, the study of their impact may contribute to clarifying several issues. It may help, for instance, to further understand, how transfer of knowledge and absorptive capacity relate to each other within LDC contexts and, also, how local governments can play a pivotal role by designing policies to improve local absorptive capacity.

The high economic growth rates in some LDCs should attract MNCs that looking for opportunities to expand elsewhere. Foreign companies have invested in the exploitation of natural resources and the construction of infra-structure. Such projects normally require resources – finance and knowledge – that local economic agents (private and public) do not possess. These projects can serve to channel knowledge, know how, technology, and expertise that may be later diffused throughout a country's economy by linkages or spillovers. In turn, this diffusion may help to leverage LDCs' economic growth and to create a more competitive economy. However, as many authors have argued, both transfer and diffusion are conditioned by the host country's educational level, institutions, and infra-structure.

In the case of some LDCs, such as Mozambique, investments have been concentrated in areas (infra-structure and natural resource exploitation) that normally require highly-skilled, technical professionals. Even if these projects do not normally create an impressive

number of jobs, they are – due their extension and complexity – likely to create several linkages. Thus, the demand for these professionals by (directly and indirectly) related companies should increase. However, the diffusion of knowledge (spillover) depends on its absorption by the qualified and skilled people who are employed by other organizations. As Cohen and Levinthal (1990) argue, the transfer and diffusion of knowledge depend on existing and related knowledge that permits one to assess and understand the value of new information and to absorb it and use it. In other words, there is a realized absorptive capacity, which means transformation (a combination of existing knowledge and new knowledge) and exploitation (application), only if people can absorb and use knowledge to create new value.

As LDCs commonly lack formally qualified people, the transfer and diffusion of knowledge remain a challenge for both foreign companies and local governments. As MNEs are normally repositories of updated knowledge, technology, know-how, and organizational practices, they may transfer these resources to the local economy directly or indirectly. The training of local workers and linkages to local companies are examples of ways of increasing the stock of knowledge within the host economy. In the case of LDCs, however, foreign affiliates may have to build up more adapted strategies and practices to transfer of knowledge as an organizations' most valuable knowledge is also the most difficult to transfer (Arvidsson, 2000). Local companies that become suppliers to foreign companies may have an opportunity to access more modern and updated knowledge and technology and, hence, to increase their competitiveness. If they do not have absorptive capacity, foreign companies may also design strategies and practices that ease the transfer of knowledge to their local suppliers.

Although foreign companies may transfer knowledge to LDCs and help to improve the absorptive capacity of the latter, local governments must design complementary policies to accelerate and deepen both processes. Long-term policies involve investments in primary, secondary and tertiary education. LDCs, like Mozambique, have already devoted some effort to increasing the number of children who are enrolled in primary and secondary schools. Despite the importance of these investments in changing effective absorptive capacity, they must be accompanied by other policies. More nuanced policies regarding expatriation and emigration should help to avoid 'knowledge waste' (i.e., knowledge that is absorbed, but not used). If well designed, these policies may help in the transformation and application (realized absorptive capacity) of transferred knowledge. Also, tertiary education policies that are more oriented to technological undertakings should help to increase absorptive capacity and, hence, the transfer of knowledge and creation of spillovers. In summary, how foreign affiliates and governments deal with the transfer of

knowledge and absorption capacity will determine whether FDI will have durable positive effects on LDCs.

The main contributions of this paper to the literature on FDI impacts on host economies are in the examination of the issue of FDI impacts, particularly, the transfer of knowledge within LDCs contexts and, also, how absorptive capacity and transfer of knowledge inter-relate within these contexts. This paper has some limitations that may be addressed in future investigations. As in any single case study, the intention is not to make statistical generalizations, but to contribute to the theoretical debate. Thus, since FDI inflows and education figures vary from one LDC to another, other papers can explore further how the transfer of knowledge and absorptive capacity (potential and realized) inter-relate in different countries. It would be particularly interesting to explore how governments have challenged the gap between supply and demand in the job market resulting from foreign investments. Another limitation of this paper is that it does not discuss the transfer of knowledge from the micro viewpoint. A closer examination of how MNCs have dealt with the transfer of knowledge in LDCs should also clarify the role of these economic agents to shift the absorption capacity and their influence on the job market.

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