Outward FDI from Developing Country MNEs as a Channel for Technological Catch-up

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One of the more recent aspects of the globalization process is the rise and the increasing outward expansion of multinational enterprises (MNEs) from developing countries. Among the more promising effects of this phenomenon is a potentially positive development impact: through outward foreign direct investment (OFDI) developing country MNEs acquire new knowledge, which contributes to the technological catch-up of their home countries. This paper reviews the recent literature on OFDI from developing countries, with a critical focus on the theory and evidence of FDI as a channel for technological catch-up. This literature suggests that the features and global business environment of current emerging country MNEs is different from those of latecomer firms in earlier decades. Modularity of production in an increasing number of sectors, combined with weak national innovation systems (NIS) in many developing countries explain why the sourcing of strategic assets—including technology and innovation—from abroad through OFDI has become such an important channel for technological catch-up.

Keywords: Developing country MNEs, Internationalization, FDI, Technological catch-up

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I. Introduction

An increasingly important aspect of globalization is the growing number of developing country multinational enterprises (MNEs).[1] This is demonstrated by the annual Fortune 'Global 500' ranking of the top 500 MNEs across the world: in 2009, 86 companies in the list were from developing countries, compared to 69 in 2007 and only 19 in 1990.

These companies are small relative to the world's largest MNEs, they are owned by developing country nationals (in some cases with government a major capital shareholder), and operate on a global basis through subsidiaries, outsourcing, and integration in Global Value Chains (GVCs) and Global Production Networks (GPNs) (UNIDO 2006).

According to UNCTAD (2009), outflows of foreign direct investment (OFDI) from developing and transition economies reached 19% of world total in 2008. Asia has the highest level of FDI outflows, but this trend is spreading to all regions. In terms of stocks, developing countries account for more than 15% of the world total, with the following regional composition: Asia 65.7% of total stock, followed by Latin America with 21.7%, the transition economies with 8.7%, and Africa with 4%. Within each region, a few countries play the leading role: China, India, and the ASEAN countries in Asia; Mexico and Brazil in Latin America; Russia among the transition economies; and South Africa in Africa. With regard to the sectors involved, the concentration of FDI is high in services and, more recently, natural resources.

The typology of investments varies widely across countries and sectors. Emerging country MNEs usually invest through mergers and acquisitions (M&A) in industrialized countries to get access to technologies, know-how, skilled human capital, globally recognized brands, and market opportunities. Greenfield investments are frequent in other developing countries, with the notable exception of a large number of direct investments in the natural resources sectors, where joint ventures with local players and acquisitions are more common (UNCTAD 2007).

UNCTAD (2009) compares the 100 largest non-financial MNEs with the top 100 from developing countries, based on some key indicators and degree of internationalization. Table 1 reports some of these indicators showing that, although differences are still large, the interna-

[1] Although most of these MNE originate from emerging economies, throughout this paper we use the terms "developing" and "emerging" country MNEs interchangeably.

TABLE 1
TOP 100 MNEs WORLDWIDE AND FROM DEVELOPING COUNTRIES

	Top 100 MNEs worldwide		Top 100 MNEs from developing countries	
	2007	% change 2006/07	2007	% change 2006/07
Assets ($ billion)				
Foreign	6,116	16.6	767	34.3
Total	10,702	15.8	2,186	29.0
Foreign as % of total	57.0	0.4	35.0	1.4
Sales ($ billion)				
Foreign	4,936	21.0	737	21.8
Total	8,078	14.0	1,617	24.0
Foreign as % of total	61.0	3.6	46.0	-0.8
Employment (thousands)				
Foreign	8,440	-1.66	2,638	22.6
Total	14,870	-3.4	6,082	15.9
Foreign as % of total	57.0	0.98	43.0	2.4

Source: UNCTAD (2009).

tional profiles of MNEs from developing countries is increasing, especially when foreign assets and employment are taken into account. As a consequence, the overall level of internationalization, which UNCTAD measures through the composite transnationality index (TNI), shows rapid improvement among developing country MNEs and, in mature sectors, such as electrical and electronic equipment, is above the level of the top 100 MNEs worldwide (UNCTAD 2009).

The rapid rise of MNEs from emerging countries has attracted the attention of the business and economics literature, with an increased number of contributions and Special Issues of journals such as *Journal of International Business Studies* (2007), *Journal of International Management* (2007), *International Journal of Technology and Globalization* (2008), and *Industrial and Corporate Change* (2009), appearing after publication of the 2006 UNCTAD World Investment Report which first documented this new phenomenon.

The aim of this paper is to review this theoretical and empirical literature with a special focus on emerging MNEs as a channel for technological catch-up by their home countries. The literature on technological catch-up stresses that firms acquire technological capability

through a combination of internal R&D efforts and access to external knowledge (Lee and Lim 2001). The channels for accessing external knowledge are diverse and include informal learning, licensing, strategic alliances, and FDI. The increasing importance of OFDI from emerging country firms, as reported above, makes a review of this literature interesting to derive empirical evidence on how such firms contribute to technological catch-up.

The paper is organized as follows. Section 2 summarizes the theoretical and empirical backgrounds to developing country MNEs. Section 3 explores how OFDI contributes to technological catch-up in emerging countries. Section 4 concludes and provides some directions for future research.

II. What is So Special about MNEs from Developing Countries?

The literature on the international activities of firms is based mainly on observation of MNEs from the so-called triad (*i.e.*, US, EU, and Japan). Scholars such as Lall (1983), Tolentino (1992), and Wells (1983) investigated the first MNEs from developing countries (mostly Latin American and Asian), which appeared in the international market between the end of the 1970s and the beginning of the 1990s, but no *ad-hoc* theories were developed. It is only recently, following a rise in OFDI activity by developing and transition economies, that a strand of literature has emerged arguing that some appropriate theory needs to be elaborated (among others see Child and Rodrigues 2005; Goldstein 2007; Mathews 2002a; Sauvant 2008).

Traditionally, MNE theory has addressed such questions as why firms internationalize (Buckley and Casson 1976; Vernon 1966), why they do it through FDI (intra-firm) rather than through inter-firm modalities such as trade or licensing agreements (Hymer 1976), and which modalities are favored along their internationalization processes (Johanson and Vahlne 1977).

The most influential approach to studying the international activities of MNEs is represented by the *eclectic paradigm*, originally proposed by John Dunning (1981). According to the so-called Ownership-Location-Internalization (OLI) framework, the decision of firms to expand their activities abroad *via* FDI depends on three kinds of advantages: *ownership* advantages, which represent the ownership of firms' specific

resources to be exploited externally; *location* advantages, which depend on the characteristics of the host country (*e.g.*, natural resource endowments); and *internalization* advantages, which depend on the opportunity to internalize firm specific advantages rather than exploit them in the market through arm's length transactions.

The OLI framework includes no specific provision explaining the pattern of internationalization of developing country MNEs and this has been criticized on two different grounds. First, because firms from developing countries might not possess the same competitive advantages as firms from developed countries and, thus: "If they invest abroad, it is not on the basis of "O," and the parameters that determine the degree of "I" in their foreign operations are different" (Goldstein 2007, p. 81). According to this asset exploration view, firms internationalize in order to get access to the strategic resources they need, being motivated by "learning objectives that allow these firms to overcome the initial resource hurdles arising due to technological gaps and late mover disadvantages in international markets" (Aulakh 2007, p. 237). Moon and Roehl (2001) define these as *unconventional* FDI, that is, strategic investments in order to strengthen rather than to exploit the set of resources owned by the firm. Thus, internationalization becomes a strategy aimed at strengthening the firm itself based on the accumulation of resources previously not available.[2]

Second, and related to the first point, the OLI framework is a (comparative) static model, that takes into account only the existing advantages prior to the FDI decision, but does not explain the opportunities for the development and evolution of firm capabilities over time based on accumulated experience in the international market. The main criticisms of this view draw on the knowledge based (Kogut and Zander 1993) and dynamic capabilities approach (Teece *et al.* 1997), both of which are extensions of the resource based theory of the firm (Barney 1991).

Based on these criticisms, Mathews (2002a) proposed an ad-hoc theoretical framework, founded entirely on the observation of a group of dynamic firms originating in the Asia-Pacific region, referred to as the "Dragon Multinationals," and which are recognized by several international organizations such as UNIDO (2003; 2006) and OECD

[2] This point has been widely stressed in the literature. See among others, Chen and Chen (1998); Child and Rodrigues (2005); Li (2007); Luo and Tung (2007); Makino *et al.* (2002); Yiu *et al.* (2007).

(2006). In a number of successive works Mathews (2002a, 2002b; 2006a, 2006b, 2006c, 2006d) focuses on the adoption of a resource based analysis of what — in his opinion — is not explained by the existing theories (and especially the eclectic paradigm). To take account of the fact that MNEs from emerging countries often do not possess stocks of domestic assets that can be exploited abroad, but rather that international expansion is aimed at the search for new resources, Mathews (2002a) proposes the so-called Linkage-Leverage-Learning (LLL) framework. *Linkages*, such as joint ventures, strategic alliances and other forms of collaboration in global value chains with foreign companies (the incumbents) represent a fast and efficient way to access the resources that emerging MNEs lack. Once linked, 'latecomer' firms use their global connections to *leverage* their resources and particularly their cost advantages, and to *learn* about new sources of competitive advantage and how to operate internationally. Within this framework, the global economy is described as a set of resources available to firms, and internationalization is defined more broadly as: "the process of the firm's becoming integrated in international economic activities" (Mathews 2006b, p. 16). Unlike the predictions of the OLI framework, the first phase of MNE formation is most likely to be motivated by asset-exploring rather than with asset-exploiting reasons.

Moreover, in the early stages, this internationalization process is often interlinked to inward FDI activity at home (Li 2007), which provides local firms with the unique chance to enter into established global production networks, enhancing their capabilities (Chen and Chen 1998; Hitt *et al.* 2000; Makino *et al.* 2002). Luo and Tung (2007) stress the capacities of emerging country MNEs to take advantage of inward FDI (*via* original equipment manufacture, joint ventures, or participation in Global Value Chains (GVCs)), which, in turn, allow firms to develop their own capabilities and to become more competitive abroad through experiential learning. This depends on the capacity of firms to leverage external resources, which is dependent on the extent to which foreign firms are willing to share their resources, and on domestic 'absorptive capacity,' defined as the ability of the firm to identify, assimilate, and exploit external knowledge (Cohen and Levinthal 1990). According to Zhang (2009), the role of foreign MNEs through technological spillovers, knowledge transfers, and the establishment of forward and backward linkages, is a sound opportunity to enhance absorptive capacity during the "pre-catching up" stage. Indeed, empirical analyses of the determinants of emerging country OFDI find that

inward FDI play a significant and positive role in explaining the internationalization of local MNEs (Banga 2009; Pradhan 2009). An excellent example of this process is Asian subcontractors in the IT and the electronics sectors, which "have prospered as contract manufacturers, most visibly in the fields of information technology and consumer electronics. In the process, through their own learning and innovation efforts, many of them are becoming original design manufacturers (ODMs) and original brand manufacturers (OBMs), in a pattern of development and internationalization" (UNIDO 2006, p. 18).

The innovative contribution of the LLL framework for the analysis of emerging country MNEs has been widely debated in the literature. The main criticism is that the focus is almost exclusively on firms originating in the fast growing countries in the Asia Pacific region, making it difficult to extend it to developing countries generally (Narula 2006). Also, based on the growing empirical evidence, it seems that some latecomer firms might possess certain unique, different from the traditional, competitive advantages that explain their internationalization strategies (Dunning 2006). Dunning *et al.* (2008) acknowledge a relative lack of firm specific O-advantages in developing country firms and highlight the importance of country specific ownership advantages in determining these outward FDI activities. Moreover, Dunning and Lundan (2008) recognize the importance of institutions as an essential component in the internationalization process of firms and, consequently, have incorporated some institutionally related variables into the three initial components of the eclectic paradigm.

According to the literature on latecomer firms, the role of home country institutions and particularly government is key to shaping the process of internationalization of domestic firms (Ramamurti 2008), and especially in the case of Asian firms (Buckley *et al.* 2008). In the case of China, the role played by government has been stressed repeatedly in the literature since many Chinese MNEs are State Owned Enterprises (SOE); at the same time, the Chinese government has also supported some selected private firms through instruments such as preferential loans, easier and cheaper access to capital, favorable tax regimes, selection of international partners for joint ventures in order to make them internationally competitive (Athreye and Kapur 2009; Buckley *et al.* 2007; Child and Rodrigues 2005; Li 2007; Liu and Tian 2008). Reporting on the case of Haier, Duysters *et al.* (2008) outline the importance of the support provided by central government through direct financial contributions and its role as "supporter and organizer

of technology networks" to enhance the company's technological capabilities. Yiu *et al.* (2007) provide an empirical assessment of the rise in international venture activities in a sample of Chinese firms. They include in their analysis institutional variables such as linkages with domestic institutions (*i.e.,* central and local governments, financial institutions, trade associations, research centers) and participation in business networks. These variables play a statistically significant role in the internationalization process. On the basis of their empirical findings, they conclude that, for firms in countries at an early stage of development, the presence of institutional network ties represents an outstanding ownership advantage on which to base international activity. Analyzing the case of Huawei, Zhang (2009) finds that one of the main determinants of its global success was the strong network of alliances that the firm was able to create with local universities, which, in turn, contributed to enhancing the company's absorptive capacity.

State support and formal and informal institutional network ties represent a competitive resource for the international activities of domestic companies in a number of other countries, see Goldstein and Pananond (2007) on Singapore and Thailand, Kim and Rhe (2009) on Korea, and Kalotay and Sulstarova (2008) on Russia. Finally, for the Indian pharmaceutical sector, Athreye and Godley (2009) and Chittoor and Ray (2007) stress the relevant role of the Indian Government in promoting the establishment of many MNEs in the high technology sectors, through investment efforts and regulatory activities.

With regard to other specific advantages of emerging MNEs, Mathews points out that the same condition of being a latecomer in the international market may represent an advantage in itself for firms engaged in the process of internationalization. This is related to access to low cost labor and, in some cases, low cost access to natural resources (*e.g.*, Brazil and Russia), but also, for instance, to the opportunity to access advanced technologies and innovations (through imitation) and, thus, to catch-up more rapidly (Mathews 2006b). Cuervo-Cazurra and Genc (2008) stress that developing country MNEs enjoy greater competitive advantage compared to MNEs from developed countries, in the more difficult institutional environments, such as characterize the group of the least developed countries. According to these authors, developing country MNEs are able to take advantage of their familiarity with a context with poor institutions, and turn their relative disadvantage into advantage. Also, developing country MNEs possess the technological capabilities useful for operating in a devel-

oping country context, as highlighted in a study by Kumar (2008) on India, in terms of "frugal engineering" endowing the ability to manufacture low cost versions of goods for mass markets.

From what it has been said so far, we see that the internationalization process of companies in developing countries is characterized by some very relevant peculiarities with respect to what is proposed by the traditional framework for studying MNEs. Acknowledgment of these peculiarities combined with increasing empirical evidence on this phenomenon, is generating a new and interesting stream of literature. In the next section, we focus on how this literature contributes to enhancing the knowledge on emerging MNEs as a channel for technological catch-up.

III. Internationalization as a Strategy for Technological Catch-up

A. Technological Catch-up in Developing Countries

Technological catch-up has always fascinated economists. The spectacular performance of the Newly Industrializing Countries (NICs) in Asia animated debate and encouraged novel conceptualizations of economic growth and structural change. The Asian experience cannot be explained as the result of the import and adoption of technologies and organizational models developed in advanced countries, as implied by the theory of economic growth that prevailed in the 1950s and 1960s. A large body of investigations on Asian NICs is challenging the view that catching up is basically a question of relative speed, in a race along a fixed track, in which latecomers take advantage of mature technologies, forerunners' experience and reduced market uncertainty (Perez 1988).

The very broad literature on technological catch-up has shifted the emphasis from resource endowments and comparative advantage, to institutional variables, building up of capabilities and dynamic creation of competitive advantage.[3] While the role of government *vs.* market was central to some of the earliest studies on latecomer Asian firms (Amsden 1989), later work emphasizes the important role of other factors than

[3] It is not possible to review this very rich literature here, we note the IS approach (for a recent focus on IS in developing countries see Lundvall *et al.* 2009) and Sanjaya Lall's major contribution to this field (see among others Lall 1992, 1993, 2001).

institutional setting and government in the catch-up model. In particular, the innovation system (IS) approach makes it clear that technological change is affected by firm-specific efforts and systemic interactions with other firms, technology organizations, universities, R&D laboratories, research institutes, and financial institutions.

It has also been shown that the IS approach needs enrichment by the international dimension (Bunnel and Coe 2001; Carlsson 2006) and, in developing countries, this argument becomes even stronger (Pietrobelli and Rabellotti 2009). Indeed, the extra-national influences on the innovation process are particularly crucial given that new frontier innovation is rarely created in developing countries and the bulk of knowledge and technology has to be imported.

Technology imports played an important role in the technological catch-up of the earlier latecomer firms in Japan, South Korea and Taiwan, and are playing a similar role in current latecomer developing country firms' catch up. However, in terms of the attitude towards imported technology, there are important differences in the catch-up models in the current developing country MNEs and earlier latecomer firms, for example, from South Korea. The Korean catch-up model can be described as a three-stage model (Kim 1997): the first stage is acquisition of mature technology from developed countries; in the second stage, firms acquire process development and product design capabilities; and in the third stage, firms develop their own product innovation capabilities through significant R&D investments. Korean firms invested heavily in assimilating imported technology, much of it originating from Japan. Also, a specificity of the Korean model is that government restricted FDI in favor of foreign technology licensing and government procurement policies. In the words of Liu (2005, p. 8) "they imported foreign technology but did not innovate together with foreign companies. They focused on in-house R&D to be able to improve imported and 'mature' foreign technology gradually; and did not simply rely on foreign technology for their new products."

Compared to the experiences of Korean firms in the past, current developing country MNEs (especially Chinese companies) are putting less effort into the assimilation of foreign technology and more into innovation (Liu 2005). In the case of China, although companies have relied on reverse engineering as a learning and development strategy, the fragmentation between technology users and technology within the NIS is one of the main reasons why Chinese firms have not been able to master and innovate based on imported technology as rapidly as

their earlier counterparts in South Korea (Liu and White 2001). The catch-up model of Chinese MNEs is described by Liu (2005) as two-stage. In the first stage, firms acquire technology from abroad (mainly through imports or inward FDI) and exploit it to pursue market-oriented product innovation, benefitting from lower production costs. In particular, and in contrast to the Korean experience, China has relied heavily on FDI to access foreign technology, admitting foreign firms conditional on their signing up to joint-ventures with domestic firms in order that the latter can benefit from interacting with more advanced technology suppliers. In the second stage, Chinese companies are trying increasingly to improve their technological capabilities through international technology alliances and M&A with firms in developed countries.

Another important specificity of the catch-up model of current developing country MNEs compared to earlier latecomer MNEs is related to the global context in which firms operate. Compared to the 1960s and 1970s when Korean firms started to expand, the current business environment is radically different. The modularization of production in a growing number of sectors, favored by information technology and technological progress has enabled the disintegration of production processes, allowing the outsourcing of several activities, including both production and design and R&D. This phenomenon has two major consequences for the context in which developing country MNEs operate. Firstly, developing countries are increasingly becoming the location of R&D and high tech activities and not only of mature technology, as was the case in earlier decades according to the product life cycle theory (Vernon 1966). This makes it possible for firms in developing countries to become acquainted with new technology at an earlier stage, and to learn from its application. Secondly, it is not necessary for developing country firms to master the entire production process from R&D to manufacturing of components, assembly, logistics, marketing, and after-sales service; they can decide to specialize in just one activity. This strategy enables latecomer firms to outsource abroad those activities (usually the most skill and technology intensive) for which they lack the necessary capabilities. Therefore, strategic OFDI in developed countries is a frequent option for many latecomer MNEs.

The next section provides a review of the literature on OFDI from developing country MNEs, to investigate its importance for accessing knowledge and enhancing learning and innovation.

B. How OFDI Can Contribute to Technological Catch-up: Some Empirical Evidence

In developing countries, access to external knowledge is considered a key factor for technological catch-up and OFDI is becoming a popular strategy for speeding up this process. Lee and Lim (2001) propose an interesting model to explain how Korean industries have been able to catch-up technologically on the basis of a combination of their existing knowledge base and their technological effort. With particular reference to the case of D-Ram production, Lee and Lim stress the key role played by access to external knowledge through R&D outposts in Silicon Valley. Mu and Lee (2005) apply this model to the telecommunication industry in China, again emphasizing the role played by external strategic alliances in technological catch-up.

The position of 'latecomer' MNEs within global and regional networks is stressed by Mathews (2006a) as one of the peculiar 'ownership' assets characterizing companies from developing countries in their internationalization process. According to Ramamurti (2008), a group of "global first-mover" developing country MNEs, operating mainly in the high-technology industries (*e.g.*, Embraier in the aircraft industry, Huawei in telecommunications, Suzlon Energy in wind power) has been able to jump some technological stages and grow fast by adopting a strategy of greenfield investment in emerging countries, and M&As in developed countries. Strategic acquisitions provide a faster alternative to building technological capabilities in house, and, especially for developing country firms, allows access to more advanced resources through direct transfer of knowledge (Pradhan and Singh 2008). Empirical evidence confirming the acquisition of strategic assets through foreign acquisitions at earlier stages of development is provided by Niosi and Tschang (2009) for Indian and Chinese software firms. And in a study of a sample of Indian firms, Elango and Pattnaik (2007) show that rather than building capabilities for international operations following a sequential process (as suggested by the Uppsala model of internationalization), these companies have been able to enter the international market more quickly through extensive exploitation of foreign partnerships in established networks of firms.

This pattern of rapid internationalization characterizes the several well known MNEs such as Acer from Taiwan and Cemex from Mexico (Mathews 2002a), Samsung from Korea (Lee and Slater 2007), Tata from India (Goldstein 2008) and the three Chinese "global champions"

in the electronic industry — Haier, Lenovo, and TLC (Li 2007). Similar to other Chinese companies, Haier, based on its strategic capacity to participate in more advanced networks of firms and its level of absorptive capacity, has been able to "leapfrog" some of the stages of internationalization (Li 2007). Bonaglia *et al.* (2007) also describe an 'accelerated' internationalization pattern of three MNEs in the white goods sectors of China, Mexico, and Turkey. In a study on the Indian pharmaceutical sector, Athreye and Godley (2009) stress the importance of foreign acquisitions to tap into more advanced resources missing in the home market.

The acquisition of strategic assets, such as technology, know-how, managerial and marketing skills, recognized brands and reputation, is one of the classical motivations for OFDI, and is dominant among MNEs from developing countries that invest in developed countries (UNCTAD 2006). These OFDI aimed at sourcing assets not fully developed at home are reversing the traditional direction of knowledge flows (*i.e.*, from parent to subsidiary) (Narula 2010). Some recent empirical evidence on Chinese OFDI, in countries such as the UK (Buckley *et al.* 2007; Cross and Voss 2008; Liu and Tian 2008), Italy (Pietrobelli *et al.* 2010), and Germany (Schüler-Zhou and Schüller 2009), confirms the relevance of strategic asset seeking motivations. Based on a survey of Chinese companies in the UK, Cross and Voss (2008) find that the main reasons for internationalization are the need to acquire new and advanced management skills and to tap into pools of knowledge. Further empirical evidence on these motivations is provided by case-studies on Chinese MNEs such as Haier, Lenovo, BOE, and TCL (Li 2007; Liu and Buck 2009). For evidence on other countries, several studies stress the importance of strategic asset seeking motivations by MNEs from Taiwan (Makino *et al.* 2002), Mexico, Poland and Romania (Hitt *et al.* 2000) and Brazil (Carvalho *et al.* 2010).

In a recent study of Chinese investments in Italy, Pietrobelli *et al.* (2010) show that Chinese investments in this country are motivated by market seeking given that Italian consumers are considered very demanding and particularly sophisticated. In sectors such as domestic appliances, Italy is seen as a test market for products that will be suitable for the European market in general. Location in Italy is strategic in terms of catching up with European tastes and requirements, of quality of products, design, and post-service assistance. In interviews conducted by Pietrobelli and colleagues, Chinese managers stressed the importance of being close to consumers in order better to understand

their needs and their culture and to receive feedback. The importance of being embedded in an industrial area with an established old manufacturing tradition was one of the reasons for Haier's choice to locate its European headquarters in Varese. The area of Varese is well known for its white goods production and is home to other important companies, such as Philips and Whirpool, and firms specialized in components and intermediary phases. The agglomeration of several specialized firms generates positive externalities arising from the presence of a pool of specialized workers and suppliers and specialized knowledge on markets and technologies. These agglomeration advantages attracted Haier and influenced its decision about where to establish its European headquarters (Duysters *et al.* 2008).

Haier in Italy has made two acquisitions: the Meneghetti refrigerator plant in 2001 and Elba cooking appliances in 2009. Another case of Chinese acquisition in Italy is Benelli, an established motorcycle producer which, at the time of its acquisition (2005) by Quianjiang, was in serious financial trouble. Alongside the desire to acquire a well-known brand, the deal was aimed at the acquisition of Benelli's manufacturing and R&D facilities and it has become Quianjiang's European R&D centre for high-quality production (Pietrobelli *et al.* 2010).

The strategy of M&A is becoming increasingly common among emerging MNEs. The intensification of cross-border M&A activities is primarily motivated by the desire to rapidly obtain and control strategic assets. This is confirmed by Tata's main acquisitions discussed in Goldstein (2008), who points out that they were aimed at improving the company's position in higher value activities in some of its operational sectors, and gaining a foothold in more advanced markets. Focusing on the case of Tata's automotive division and another big Indian automotive group, Amtek, Pradhan and Singh (2008) show that OFDI represent a source of cross-border knowledge flows. In a succeeding empirical analysis the authors show that Indian OFDI is a significant determinant of the domestic R&D performance of Indian automotive firms, especially when directed to developed countries.

Based on case studies of companies such as Lenovo, Huawei, Haier, and TCL, Deng (2009) and Rui and Yip (2008) analyze the rationale for foreign acquisition activity, emphasizing that it offers a means to compensate for competitive disadvantage and is a low cost way of leveraging advantages in production capabilities (*e.g.*, the case of Lenovo) and the institutional support received for these operations. Rui and Yip (2008) rightly stress the difficulties involved in these operations and

the importance of culture and management capabilities for their success. Referring to the well known cases of Lenovo and Huawei, they emphasize that the capacity to integrate and combine Chinese culture with world class Western management systems is key to the success of these acquisitions.

Therefore, although many firms in developing countries hold considerable amounts of financial resources which makes it relatively easy for them to acquire advanced country companies that find themselves in financial distress, some difficulties with respect to managerial styles and business culture might represent a constraint to the rapid acquisition of knowledge and capabilities and, therefore, to technological catch-up.

IV. Conclusions

The significant increase in internationalization among firms from developing economies has attracted the attention of business scholars and economists. In this paper we focused on how OFDI from developing countries, particularly directed to developed countries, can contribute to technological catch up. OFDI do indeed represent an increasingly important channel to access knowledge and to build key capabilities in field such as technology, design, management, and marketing. The empirical evidence is growing and shows that much OFDI from countries such as China and India, is based on strategic asset seeking motivations and the need to rapidly acquire direct knowledge about more sophisticated markets in developed countries. Emerging MNEs, through greenfield investments but increasingly through acquisitions, undertake early internationalization in order to tap into technological, managerial and market knowledge and human capital that is available in the developed countries, to acquire the resources that are lacking or in short supply in their home countries.

The literature includes a number of case studies showing the relevance of this channel for catch up. However, this line or research is new and we can draw no definite conclusions. Moreover, there are some biases because many analyses are focused on a few selected case studies of successful companies, from a limited number of countries, and a limited number of sectors. More robust empirical evidence and collection of appropriate data are needed. There is also an urgent need for robust empirical research on the determinants of the different internationali-

zation strategies through outward FDI by developing country MNEs. These determinants are likely to vary depending on a number of factors including industry and country characteristics.

First, according to the sector in which they operate and the degree of modularity of production, as pointed out by Lee and Lim (2001), the nature of the innovative activities of firms trying to catch up depends on the technological regime in their industries. Regimes where innovation is more predictable and frequent are thought to give latecomers more opportunities to catch up. However, given that this prediction is based on the Korean experience, which followed a different path of catch-up with respect to the current emerging countries, it might be that outward FDI can allow firms to bypass the characteristics of the technological regimes of their industries. Moreover, modularity of production may be making it possible for latecomer firms to catch-up in sectors with a higher technology content and where innovation is less predictable. More research is needed to address this question.

Second, according to the characteristics of the innovation systems of their home countries, the opportunities for catch-up through OFDI may change. It is possible that countries with more developed IS are less motivated to enter foreign markets than countries with weaker or less efficient NIS. But it could also be that a well developed IS is a condition for building domestic technological capability and, therefore, generating MNEs with a sufficient level of absorptive capacity. This link between IS and OFDI would make another interesting line of research.

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