Business Groups, Foreign Licences and Performance in Emerging Markets

Abstract

This paper aims at understanding the impact of external knowledge sourcing through licences on the operating performance of emerging market firms (EMFs). Distinguishing between the origins of technology, we claim that foreign licences provide superior scientific knowledge than domestic licenses, thus contributing more substantially to improve the operating performance of EMFs. However, the positive effect of foreign licences is weaker for firms affiliated to business groups, which can rely on a wider and more complex set of in-house intangible resources that provide the base for a superior competitive advantage with respect to non-business group. This in turn reduces, on the one hand, the complementarity between foreign licences and the resources of business groups, and on the other hand, the contribution of foreign licences to the creation or development of business groups' competitive advantage. We employ a dataset of 218 Indian firms observed from 2001 to 2013 (source: Prowess) to test our hypotheses, that are confirmed by the empirical analysis. Our results provide new insights on the relationship between inward licencing and performance, by showing the contingencies arising from the type of licence and the type of firm when considering EMFs.

1. Introduction

In the recent years, emerging market firms (EMFs) have gained significant importance in the world economy. Their performance has been persistently improving and many EMFs are becoming key players in an array of global industries (Awate et al., 2012; Cuervo-Cazurra and Genc, 2008; Kotabe et al., 2011;). In order to comprehend the drivers underlying this rapid

evolution, a deeper understanding of their capabilities and resources is needed. Scholars consider external knowledge sourcing and access to advanced technology as critical resources for EMFs, since such skills are paramount for developing innovation capabilities, competing effectively in the global economy, participating in the creation of value and, in turns, boosting profitability (Mudambi, 2008).

External knowledge sourcing occurs through numerous ways, including inward licensing, which is also one of the most common modes for acquisition of advanced technology. This practice, indeed, helps the firm to gain the technological knowledge that is required to develop new products and processes, to learn new skills and to become more efficient (Katrak, 1990; Pitkethly, 2001). However, the impact of inward technology licensing vary according to firm's specific characteristics, such as the absorptive capacity (Cohen and Levinthal, 1990). Tsan and Wang (2005), for instance, show that external technology acquisition affects performance when the firm is engaged in R&D, since this activity provides the capability to understand and employ effectively the knowledge embedded in the licence.

Extending this stream of literature, we argue that, when considering EMFs, the current understanding is impaired since the effect of external technological resources varies across different types of licences and different types of EMFs. Specifically, in the present study, we analyse the effect of technological resources secured through the acquisition of licences on the operating performance of the EMFs, by disentangling how the impact differ when distinguishing between foreign and domestic licences and between business groups versus other types of EMFs.

EMFs are late-comers from technologically laggard economies (Mathews, 2006). This means that the knowledge and technology embedded in domestic licences (i.e. licences developed by other EMFs in the home countries) are expected to be, on average, less advanced than the knowledge and technology embedded in foreign licences (i.e. licences developed by foreign

firms). As a consequence, EMFs strive to acquire advanced technological expertise abroad as they often cannot solely rely only on their own (and on domestically available) resources to catch-up (Awate et al., 2012; Buckley et al., 2016; Luo and Tung, 2007). The acquisition of external foreign technology is one of the most rapid ways that enables EMFs to gain advanced technological knowledge, which may be either more sophisticated or complementary compared to the existing firm's or domestic knowledge base (Chung and Yeaple, 2008). The extant literature confirms that sourcing technology from abroad enables EMFs to develop their competitive advantages and to raise their performance (Child and Rodrigues, 2005; Gammeltoft, 2008; Mathews, 2006). As a consequence, we argue that EMFs with a higher share of foreign over total licences reports, on average, a better operating performance.

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However, we also argue that the positive impact of foreign inward licensing on the firm's performance (Wang et al., 2013) is contingent on firm's affiliation with business groups, besides the absorptive capacity as shown by previous literature (Cohen and Levinthal, 1990; Tsan and Wang, 2005). Business groups provide each affiliated firms with a pool of diversified "network resources" (Gulati, 1998), i.e. resources that reside within and across the network of affiliates, and with the possibility to source, recombine and organise the proprietary knowledge and technology that is spread in the network. As a consequence, we claim that EMFs affiliated to business groups gain less benefits from foreign technology than non-business group firms. We expect, indeed, that business group affiliated firms can leverage their in-house advanced capabilities (some of which might even be provided by foreign affiliated companies) instead of relying on foreign licences. This means that business group affiliated EMFs can afford to substitute less-expensive in house and domestically available technology for foreign technological resources to enhance their performance. In other words, the technology

embedded in foreign licenses is expected to have a lower complementary effect with respect to business groups affiliated firms' resources and, hence, a lower marginal impact on its performance. Therefore, business groups affiliated firms have a lower need to acquire foreign technology, since they can combine their in-house valuable resources with the cheaper technology available in domestic licences. We support our argument by providing also evidence that business groups affiliated firms, unlike other types of EMFs, can boost their performance through their own intangible resources.

We employ a dataset of 218 Indian firms observed from 2001 to 2013 to test our hypotheses (source: Prowess). Our econometric analysis, which relies on 1249 observations, confirms that the operating performance of EMFs is higher when the share of inward foreign licences is larger. In addition, business groups exhibits a less positive effect arising from foreign over total licences with respect to other types of EMFs. Our results provide new insights on the relationship between inward licencing and performance, by showing the contingencies arising from the type of licence and the type of firm when considering EMFs. In addition, we show that EMFs' own intangible resources are too weak to improve their performance, and that foreign inward licences can be employed as a rapid route to the development of EMFs' competitive advantage. The same does not apply to business groups affiliated firms, which can leverage the intangible resources of the network of affiliates, thus relying on an "business group" ownership advantage that is comparable to that one of companies from advanced countries and that reduces the need for external technology sourcing, including the acquisition of foreign licences. We show that a substitution effect between business groups' intangible resources and foreign licences is likely to hold, thus reducing the positive impact of the foreign licences on performance.

The remaining of the paper is organized as follows. Section 2 provides the theoretical framework and the hypotheses development. Section 3 describes the data and the methodology employed in our empirical analysis. Section 4 displays the results, that are discussed in section 5 together with the main conclusions and future research developments.

2. Literature Review and Hypotheses

2.1 EMF and foreign technological resources

Technological resources are vital for enhancing the firm's competitive advantages and performance. These include all those tangible and intangible assets, skills, know-how, patents, and design which help the firm to innovate, expand and operate efficiently (Kafouros, 2008; Knight and Cavusgil, 2004: Tsang et al., 2008). Traditionally, firms develop technological resources internally within their organisational boundaries through their own research and development (R&D) units. Internalisation of R&D helps the firm to keep control over the technological know-how and tailor it according to the organisation's needs.

However, conducting R&D internally within the organisation often requires a large commitment of other resources of the firm, such as deployment of skilled human resource and spending of a large amount of finance. Furthermore, internal development of technological know-how is associated with higher degree risk and uncertainties associated with R&D projects (Caves et al., 1983, Contractor, 1981).

Constrained by the resource scarcity and the need to strengthen core-competencies, firms often resort to using inward licensing to access technological resources needed for enhancing performance and build competitive advantages (Atuahene-Gima, 1993; Bapuji et al., 2011; Chesbrough, 2003; Deeds and Hill, 1996; Deeds et al., 2000,; van de Vrande et al., 2011).

The need for technological resources and the constraints for developing them internally within the organisation are typically important for firms originating from emerging economies. EMFs are generally technologically deficient (Dunning et al., 2008). The technological resources available at their home are usually inferior in comparison to globally available technology developed in advanced economies. Consequently, EMFs are more inclined to source technological resources externally because the latter compensate for their technological backwardness and their own capabilities for R&D are limited (Duysters et al., 2009). Furthermore, sourcing external technological resources strengthens EMFs' knowledge base, giving access to "state of the art" technology (Chatterji and Manuel, 1993). Deng (2009) argues that external technology sourcing gives the firm a choice to acquire technology that matches their internal development activities, and accelerates the firm's pace of technology development. Technology sourced externally enhances firms' performance by supplementing and complementing with its internal resources, e.g. other intangible or tangible assets (Noori, 1990; Tsai and Wang, 2008).

Technological resources can be sourced domestically or from abroad. Although domestically available technological resources might come with cheaper license fee, these may not be sophisticated enough to uplift the EMF's technological backwardness. Foreign technological resources are usually more advanced than the domestically available resources. In fact, innovation activities and knowledge resources differ across countries, and firms can increase their knowledge base by sourcing technical capabilities dispersed worldwide and recombining different sources of knowledge that are globally dispersed (Cantwell, 1989; Chung and Yeaple, 2008). As a result, EMFs are implementing a "catch-up" strategy by acquiring knowledge assets located in advanced market economies (Awate et al., 2012; Deng, 2009).

Traditionally, inward licensing has been identified as one of the most common way through which patented information, technology and know-how can be transferred (Contractor, 1985;

Kotabe et al., 1996). International inward licencing, in particular, provides a door to advanced technology irrespective of its geographical origin for a firm unwilling (or unable) to directly invest abroad. Therefore, the acquisition of international licences can be considered as one of the methods used by firms to source technology outside their firm and country boundaries. This is a complementary perspective in the international business literature, which has mainly tackled the topic as part of a firm's overall international strategy, using the perspective of the licensor firm (for comprehensive literature review, see Mottner and Johnson, 2000).

Previous literature has shown that using external technology has strategic benefits to the firm's performance, such as reducing cost of internal development (Noori, 1990), increasing its technological capability (Chatterji, 1996), and increasing growth rate (Capon and Glazer, 1987). Tsai and Wang (2005) show a positive correlation between inward licensing and financial performance, but only when combined with the R&D activity. However, none of these studies distinguishes between foreign and domestic inward licences. The only exception is Wang, Roijakkers and Vanhaverbeke (2013), who show that Chinese firms that license-in foreign technologies tend to outperform those that predominantly license-in technologies from domestic sources. However, their focus is on innovation rather than on operating performance. Following all these arguments, we claim that it EMFs that use and acquire more foreign licences are likely to perform better than firms using only domestic licences. More specifically, in the case of EMFs, sophisticated technological knowledge sourced from foreign countries may lead to greater performance than technological knowledge sourced domestically, because it is higher the likelihood that imported technology favours more product and/or process innovation, as suggested by Wang, Roijakkers and Vanhaverbeke (2013). Therefore, we hypothesise that:

> Hypothesis 1 (H1): The operating performance of EMFs is positively affected by a larger share of foreign over total technological licences.

2.2 Business group affiliated EMFs and foreign technological resources

In recent years, scholars have provided empirical evidence suggesting that the firm tries to optimise the combination of external and internal technological resources to strengthen the firm's performance (Chesbrough, 2003; Frishammar et al., 2012). The ability of business group affiliated firms in this regards is significant. The literature on business group indicates that group-affiliated firms perform better than non-affiliated firms, since the former can leverage a pool of diversified resources owned and controlled by the whole network of firms affiliated with the group. thus giving birth to a larger range of synergies and complementarities that positively affect performance (Douma et al., 2006; Guillén, 2003; Tan and Meyer, 2010; Yiu et al., 2005;). Moreover, group affiliated firms have better abilities to recombine resources because the group often focus on the firm as a modality to replace or complement institutional voids or market imperfections in the market (e.g. Khanna and Rivkin, 2001) which are predominantly more prevalent in emerging markets.

The extant literature on business group also suggests an array of factors that explain the variation in performance of business groups affiliated firms against non-affiliate firms. Belezon and Berkovitz (2010) mention three critical characteristics related to the structure and organization of business groups, such as large scale and high diversification of their activities, availability of cheaper internal capital than outside capital, and generation of knowledge spillover from research activities within the network of group-affiliated firms.

In light of these idiosyncratic characteristics, we argue that business group affiliated EMFs benefit less from externally sourced foreign technological resources than non-business group affiliated firms. Since business groups are, on average, better endowed with resources, including technological and intangible assets, they can utilise in-house technological resources to substitute the need for external foreign technological resources. This leads us to suppose that

foreign technology has a less positive marginal effect on firm performance for business groups rather than non-business groups, also because foreign technology is often more expensive than domestically available technology. In other words, the complementarity effect of foreign licences is weakened in case of business groups and is likely to be largely offset by the higher cost of foreign technology. As a consequence, business-groups affiliated firms can obtain a positive impact on their performance even by complementing their advanced in-house resources with the technology embedded in domestic licenses, which is less advanced but also less expensive than foreign technology. Therefore, we hypothesise that:

> Hypothesis 2 (H2): The effect of the share of foreign over total technological licences on operating performance is less positive in EMFs affiliated to business groups than in non-affiliated.

3. Data and Methodology

3.1. Sample and empirical context

We find the Indian context particularly appropriate to test our theoretical framework and our hypotheses related to EMFs. In fact, India's indigenous technological capabilities in technology-related industry are significant, however many Indian firms still seek external technological resources overseas (Chittor et al., 2009). Indian firms have scaled up their competitive advantages by accessing foreign technology, e.g. Tata produced 'Nano', the world's cheapest car, by accessing advanced automobile technology from Bosh (Munjal et al., 2013). However, scholars (e.g. Awate, et al., 2015; Lall, 2000; Perri at al., 2015) argue that for developing countries, such as India, foreign technology is still very important because technological resources available in developed countries is comparatively more advanced than the technological resources available in developing countries. Recent studies suggest that

EMFs internationalize their activities primarily driven by learning motivations, leveraging global markers to gain knowledge and innovative ideas unavailable at home (Chittor et al., 2015; Luo and Tung, 2007). This has favoured the catch-up process of Indian firms, that is evolving at rapid pace but it is not completed yet.

To test our hypotheses, we employ a dataset on Indian firms known as 'Prowess'. The database is prepared by the 'Centre for Monitoring Indian Economy' and provides background information and financial data on Indian EMFs listed in the Indian stock exchange. It is argued that Prowess, which has been used in many studies on India (for example, Bhaumik et al., 2010; Chittoor et al., 2009, 2015; Gubbi et al., 2009), is "substantially richer" than other similar databases, such as 'Worldscope', which itself is a very popular firm level global database (Oura et al., 2009, p.4). Our analysis relies on a panel data composed of 218 EMFs operating in manufacturing and service industries, whose financial values are observed from 2001 to 2013. However, due to missing values, the final sample is composed of 1249 observations, since for some EMFs we are able to observe financial data for a smaller time span.

3.2 Variables

Our dependent variable is *Operating Profitability*, which is measured through the profit before depreciation, interests, taxes and amortization, also known as EBITDA (source: Prowess). This proxy is largely employed in the literature (see, for instance, Ghosh, 2001; Heron and Lie, 2002) since it allows to capture the effective performance of EMFs, by washing out the distortions arising from the selection of alternative asset depreciation schedules, from the specificity of the Indian tax regime and from the different strategic choices concerning the use of the financial leverage.

Our main explicative variable is *Foreign Licence Share*, which, similarly to Wang, Roijakkers and Vanhaverbeke (2013), is measured as the ratio between the royalty paid to foreign supplier and the total royalty paid by EMFs to acquire licences for technical knowhow (source: Prowess). Following the first hypothesis, we expect a positive relationship between this variable and the performance measure. The average value of foreign licence share is 45%, being slightly larger for non-affiliated (47%) than for affiliated (44%) EMFs.

The second main explicative variable is *Business Group*, a dummy taking value of 1 if the ownership of EMFs belongs to a corporate group and zero otherwise (source: Prowess). In our sample, 112 firms out of 218 (corresponding to 661 observations) are affiliated to a business group. Following the reasoning underlying hypothesis 2, we expect a positive effect of this variable on operating performance.

We also include a bunch of control variables. The first one is *Intangible Assets Share*, which is measured as the ratio between intangible and total assets (source: Prowess). This variable accounts for all the intangible resources owned by EMFs (such as the brand, the goodwill, the patents etc.), which reflect the traditional competitive advantage of the firms that is typically responsible for a superior performance (Delios and Beamish, 2001). We expect, hence, a positive correlation between this variable and the performance measure. A second control variable is *R&D expenditures*, which is measured as the total expenditures in R&D (source: Prowess, in millions of rupees) and which accounts for the knowledge and technology base of each EMFs (Tsai and Wang, 2008). Since R&D represents the input of the innovation activity, and since innovativeness is associated to a better performance, we expect a positive correlation between R&D and the dependent variable. We also control for the international business activity of EMFs through the variable *Foreign Export Share*, computed as the share between foreign export and total sales. This variable has been included not only to capture the benefits that are typically associated to foreign export, but also to account for the possibility that EMFs

can source knowledge and technology through their foreign activity, as an alternative to foreign licences.

We finally control for the experience and for the dimension of the company through the variables *Age* and *Size*, which are computed through the incorporation year and through the total assets of the EMFs, respectively. We finally introduced industry dummies (one for each NIC code at one digit level) and time dummies (one for each year), in order to control for industry and year fixed effects.

3.3 Model and Methodology

The final equation model is, hence, the following:

$$Operating\ Profitability_i^t = \alpha + \beta_1 Foreign\ Licence\ Share_i^{t-1} + \beta_2 Business\ Group_i + \beta_3 Controls_i^{t-1} + \varepsilon_i^t \quad (1)$$

where *t* is the year and *i* is the EMFs. We lagged the time variant explicative variables in order to limit reverse causality issues. To test the second hypothesis, we interacted the variables *Foreign Licence Share* and *Business Group*, thus using the following equation model:

$$Operating\ Profitability_i^t = \alpha + \beta_1 Foreign\ Licence\ Share_i^{t-1} + \beta_2 Business\ Group_i^t + \beta_3 Controls_i^{t-1} + \beta_4 (Foreign\ Licence\ Share_i^{t-1} * Business\ Group_i^t) + \varepsilon_i^t \quad (2)$$

Table 1 provides the correlation matrix and descriptive statistics of our dependent and explicative variables. As regards the methodology, due to the panel data nature of our variables, we employ a random effect model.

4. Results

The results of our empirical analysis are displayed in Table 2. Columns 1 and 2 show the results for model (1) and (2), respectively, while column (3) introduces a further interaction that has been performed to provide additional support to our main finding, as it is explained below.

As regards the control variables, Column 1 shows that R&D activity has a strong and positive correlations with the dependent variables ($p<0.01$), thus confirming that firms developing internal knowledge are more likely to increase their innovativeness, and hence, their performance. Results also show that larger firms are more likely to display a positive performance, being size positively correlated to the dependent variable ($p<0.01$). As far as *Age* is concerned, the negative and significant coefficient ($p<0.05$) provides evidence that younger firms tend to perform better than older firms. This result is likely to reflect the high growth rate that start-ups typically enjoy in their initial phase, being the variable less related to the role of experience. On the other hand, *Intangible Assets Share* and *Foreign Export Share* do not seem to have a statistically significant impact on the dependent variable *Operating Profitability*.

As regards our independent variables, Column 1 shows that *Foreign Licence Share* exhibits a positive and significant coefficient ($p<0.01$), thus confirming hypothesis 1, implying that the effect of foreign licensing on the firm's operating performance is positive. The variable *Business Group* shows a positive coefficient, even if it does not turn out to be significant at conventional levels.

Column 2 shows that the interaction between the variables *Foreign Licence Share* and *Business Group* is negative and significant ($p<0.05$), thus confirming hypothesis 2. Figure 1 provides further evidence that *Foreign Licence Share* has a less positive effect on the performance of business groups with respect to non-business groups. This indicates that the business group affiliated firm benefits less from the use of foreign technological resources.

As additional evidence, we also performed in Column 3 an interaction between the variable *Business Group* and the variable *Intangible Assets Share*, which allows us to investigate whether EMFs belonging to business group can effectively leverage the traditional competitive advantage based on intangible resources to improve their profitability. Column 3 shows, indeed, that the coefficient of the interaction between *Business Group* and *Intangible Assets Share* is positive and significant ($p<0.10$), thus confirming our intuition. Figure 2 provides confirmation that the effect of intangible resources on operating performance is much more positive in the case of business group than in the case of non-business groups.

Finally, Column 4 provides the results including in the regression model the two interactions together. Results hold and do not vary compared to the previous models.

5. Discussion and conclusions

Our paper provides some new insights on the role of external knowledge sourcing through licences and on its impact on operational performance. Our results show that foreign licences embed, on average, a superior technological and scientific knowledge than domestic licences, thus contributing to the development of a superior competitive advantage, with a positive impact on operational performance. However, this positive effect is weaker on business groups, which, on average, can rely on a wider and more advanced set of intangible resources that are available in-house and that provide the base for a superior competitive advantage with respect to non-business group. This in turn reduces, on the one hand, the complementarity between foreign licences and the resources of business groups, and on the other hand, the contribution of foreign licences to the creation or development of business groups' competitive advantage. Diversity and network of business groups allow the affiliated firm to obtain from the network the technological resources that are comparable to the one provided by the foreign licensor. Thus, business group affiliated firm can rely less on external knowledge sourcing and substitute

for resources provided by foreign technology licensor through the combination of internal network resources and domestic inward licensing, which are less expensive than the external foreign ones.

In contrast, the non-business group firms have no such wider resource base. Consequently, these firms are more dependent on the use of foreign technological resources. Furthermore, in comparison to the business group affiliated firm, EMFs' intangible resources are likely to be weaker, as suggested by Buckley, Elia and Kafouros (2010; 2013). Therefore, non-business group firms tend to have higher marginal effect on operating performance by the use of foreign technological resources accessed through licensing.

Our results also provide a contribution to the empirical literature on the relationship between business groups and performance (e.g. Belenzon and Berkovitz, 2010). We highlight that being affiliated to a business groups reduce the effectiveness of the impact of foreign licences on the operating performance.

Further, our result contribute to the literature on the relationship between inward licences and performance. Indeed, the distinction between foreign and domestic licences has been accounted for in the literature only by Wang, Roijakkers and Vanhaverbeke (2013), who, however, explores the impact on innovation performance. We add new insights by assessing the superior impact of foreign licenses also on operational performance. In addition, unlike Tsai and Wang, (2009), we find that (foreign) licences has a direct effect on EMFs' operating performance, without the need of the moderating effect of R&D. Our results can be explained by looking at the specific contexts in terms of timing and countries considered in the studies of Tsai and Wang (2009) and Wang et al. (2013). We highlight indeed how the context can affect the effectiveness of the direct impact of (foreign) inward licensing on operating performance. In fact, the two mentioned studies focus on a sample of Taiwanese during the period 1998-2002.;

conversely, our paper focuses on a sample of Indian firms in the period 2001-2013. This emans that the period considered in the former analysis corresponds to a very early stage of the raise of EMFs, when most of the companies were likley to lack of sufficient absorptive capacities. In this context, the R&D activity becomes crucial for the early-stage EMFs to develop the absoprtion capacities that are required to understand the external knowledge. In our paper we consider a longer and more recent period, during which several EMFs are likley to have developed the absoprtive capacities through several alternative mechanisms including not only R&D, but also the internationalization through alliances, joint ventures and foreing direct investments (Awate et al., 2015; Mathews, 2006; Piscitello et al., 2015) or the interaction with foreign multinational companies investing in India. This latter phenomenon represents another substantial difference between the context of India and Taiwan: the former country, indeed, has enjoyed several inward foreing direct investments in high-tech industries by foreign multinational companies from advanced economies, which contributed to the development of local technological clusters (e.g. in Bangalore) and reginal innovation systems (Chaminade and Vang, 2008). Indian EMFs are likley to have benefited from positive knowledge and technology spillovers by interacting with foreign companies (e.g. as suppliers or competitors), thus enabling them to develop their own absorptive capacities. In this context, the role of R&D, although still important, is likley to become less relevant in moderating the positive effect of (foreign) licences on operating performance.

5.1. Managerial Implications

As managerial implication, our findings confirm that inward licensing is an important mean for accessing foreign technological resources which assists the firm's operating and innovative performance (Tsai and Wang, 2009, Leone and Reichstein, 2012, Wang et al., 2013). The

extant literature on licensing suggests that foreign licensing improves the firm's efficiency, produce new products and processes. It also facilitates the firm's learning and aids in the development of internal capabilities of the firm, especially in the context of technology transfer from advanced to developing economies (Katrak, 1990, Pitkethly, 2001). We additionally find that EMFs not affiliated to business groups should consider the acquisition of foreign licences as a strategy to absorb advanced knowledge and technology that can be employed to develop a competitive advantage and, hence, to increase the operational performance. Conversely, EMFs belonging to business group, which are endowed with superior intangible assets thanks to their network of subsidiaries, should be aware that the same strategy is likely to provide a weaker (although still positive) effect on their operational performance. Indeed, the benefits in terms of knowledge and technology acquisition and in terms of creation of a competitive advantage are lower for business groups affiliated EMFs, and they might be even offset by the costs associated to the acquisition of foreign licences, which are typically higher than the costs associated to domestic licences or the use of in-house resources. As a consequence, the managers of EMFs belonging to business groups should explore the possibility to better exploit their in-house resources, which are available almost for free and which are likely to be as effective as foreign licences, and to combine them eventually with the domestic licences, which are less expensive although, on average, less technologically advanced. Alternatively, EMFs belonging to business groups might consider to make use of alternative forms of internationalization to source knowledge and technology and to boost their operational profitability, such as alliances and foreign direct investments.

5.2. Future research developments

Future analysis should explore, building on previous literature (e.g. Tsai and Wang, 2008), whether and how other forms of external knowledge sourcing, such as alliances and foreign

direct investments, provide an effective contribution to the development of the competitive advantage of business groups (and of other EMFs) and to the rise of their operational performance. Future analysis might also study the impact of foreign licences and the moderating effect of business group affiliation on other types of performance, such as innovation activity. A more fine-grained distinction of different typologies of business groups is also desirable in future studies, instead of using a simple dummy variable.

Tables and Figures

Table 1: Correlation matrix and descriptive statistics of the dependent and explicative variables

		1)	2)	3)	4)	5)	6)	7)	8)
1)	Operating Profit	1							
2)	Foreign Licence Share	-0.067	1						
3)	Business Group	-0.072	-0.074	1					
4)	Intangible Assets Share	-0.042	0.0514	-0.072	1				
5)	R&D expenditures	0.44	-0.064	-0.115	0.0032	1			
6)	Age	-0.145	0.051	-0.127	0.064	-0.049	1		
7)	Size	0.9305	-0.088	-0.085	-0.041	0.4269	-0.13	1	
8)	Foreign Export Share	-0.085	0.0411	-0.029	-0.061	-0.051	0.119	-0.08	1
	Observations	1249	1249	1249	1249	1249	1249	1249	1249
	Mean	0.815	0.033	0.529	0.011	0.229	-1.040	0.339	0.107
	Std. Dev.	2.984	0.800	0.499	0.031	1.806	1.299	1.518	0.150
	Min	-0.611	-1.833	0.000	0.000	-0.149	-5.151	-0.063	0.000
	Max	32.404	2.206	1.000	0.502	25.809	1.107	21.013	0.998

Table 2: Results of the random effect model; dependent variable: *Operating Profitability*

	(1)	(2)	(3)	(4)
Foreign Licence Share	0.112***	0.257***	0.106***	0.253***
	(2.90)	(4.20)	(2.74)	(4.14)
Business Group	0.106	0.118	0.049	0.059
	(1.18)	(1.32)	(0.52)	(0.62)
Intangible Assets Share	0.396	0.649	-1.215	-1.028
	(0.39)	(0.64)	(-0.93)	(-0.79)
R&D expenditures	0.122***	0.127***	0.122***	0.127***
	(5.97)	(6.21)	(5.95)	(6.20)
Age	-0.085**	-0.087***	-0.095***	-0.097***
	(-2.55)	(-2.60)	(-2.80)	(-2.87)
Size	1.540***	1.538***	1.537***	1.535***
	(52.58)	(52.64)	(52.47)	(52.53)
Foreign Export Share	-0.297	-0.274	-0.298	-0.275
	(-1.15)	(-1.07)	(-1.15)	(-1.07)
Business Group*Foreign Licence Share		-0.240***		-0.244***
		(-3.04)		(-3.10)
Business Group*Intangible Assets Share			4.142**	4.321**
			(1.97)	(2.06)
Industries Dummies	yes	yes	yes	yes
Time Dummies	yes	yes	yes	yes
Constant	0.232	0.186	0.254	0.208
	(0.41)	(0.33)	(0.45)	(0.37)
Number of groups	218	218	218	218
Number of observations	1249	1249	1249	1249
Chi-Square	4041.067***	4061.768***	4036.484***	4057.712***

* p<0.1, ** p<0.05, *** p<0.01

Figure 1: The effect of *Foreign Licence Share* on the operating performance of business groups (D_Business_Group=1) and non business groups (D_Business_Group=0).

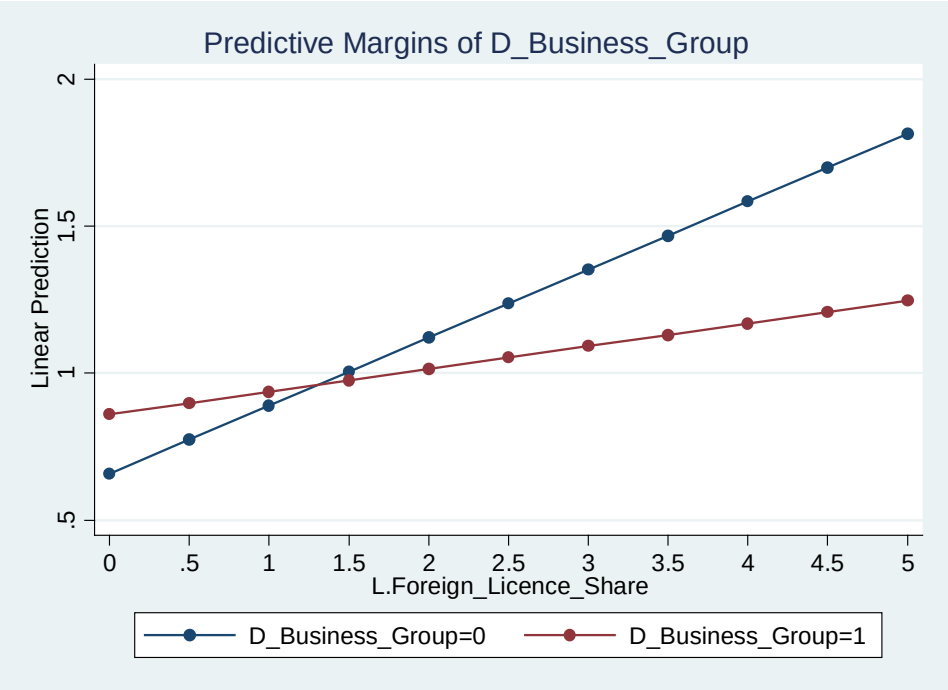
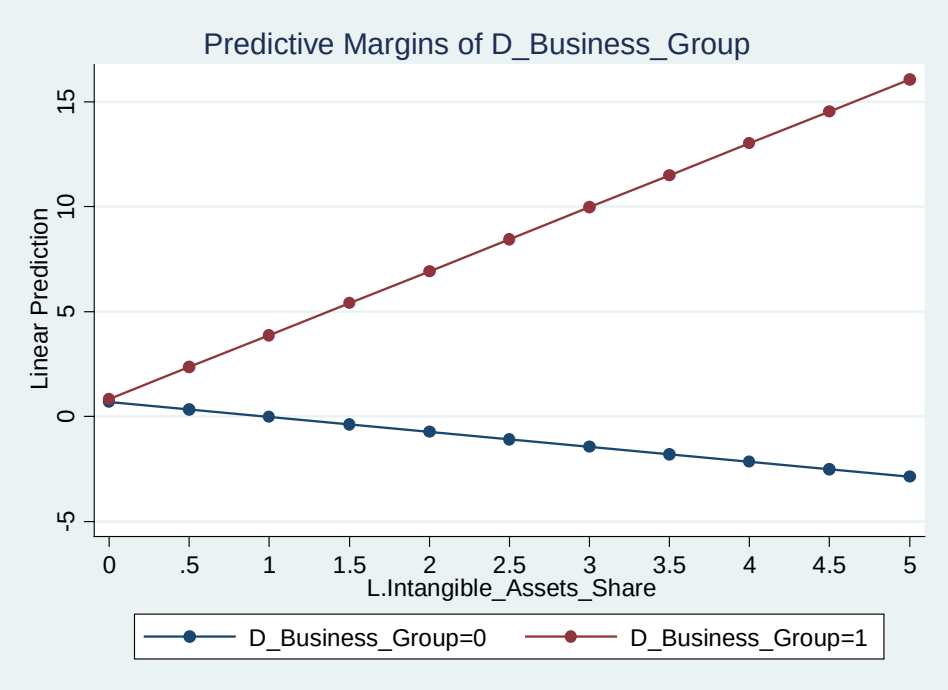


Figure 2: The effect of *Intangible Assets Share* on the operating performance of business groups (D_Business_Group=1) and non business groups (D_Business_Group=0).



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