

# FOREIGN DIRECT INVESTMENT AND DIVERSIFICATION MODE DECISION: THE ROLE OF LANGUAGE DIVERSITY<sup>1</sup>

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# **FOREIGN DIRECT INVESTMENT AND DIVERSIFICATION MODE DECISION: THE ROLE OF LANGUAGE DIVERSITY**

## **Abstract**

This paper analyzes the role language diversity plays on the diversification or establishment mode choice related to foreign direct investments; that is, the choice between greenfield investments and acquisitions. Basing on Transaction Cost Theory, the paper focuses on the impact of language diversity on the *ex ante* and *ex post* costs inherent in international acquisition processes. In order to empirically test our predictions, a database of foreign direct investments made by listed Spanish firms is used. Empirical results point towards a tendency to avoid acquisitions as establishment mode when investing in international contexts featured by high language diversity.

## **Key Words**

Cultural differences, language diversity, foreign direct investment, establishment mode, *greenfield* investment, acquisition, language barrier.

## 1. Introduction

Existing literature on foreign direct investment (FDI) has traditionally overlooked the potential influence of language diversity (LD) between the home and host countries on the choice of establishment (or diversification) mode; that is, the choice between greenfield or *de novo* investments and acquisitions. When investing through a greenfield investment, the foreign company creates a new entity in the local market and develops this market from scratch. On the contrary, when acquiring a firm already located in the host market, the foreign investor develops its project in the target market basing on different kinds of resources provided by the local firm which is acquired (Slangen & Hennart, 2007).

Even though some pioneering papers related to the internationalization paths of multinational firms point to language diversity as a main factor conditioning the psychic distance between the investing firm and the target host country<sup>2</sup>, differences in language have been rarely analyzed in empirical research. Different factors may underlie this systematic omission, among others, the broad acceptance of cultural distance (CD) as a main factor conditioning the diversification or establishment mode choice —traditionally, LD has been gathered together with other differences between countries within the concept of cultural distance.

Basing on the framework provided by Transaction Cost Theory (TCT), this paper aims at analyzing the role of language diversity on the foreign establishment mode choice. For empirical testing of our predictions we used a database collecting 383 FDIs carried out

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<sup>2</sup> See, for instance, papers by the Uppsala School (Johanson & Wiedersheim-Pausl, 1975; Johanson & Vahlne, 1977).

between 1989 and 2003 by listed Spanish companies whose shares are traded on the Madrid Stock Exchange. These FDIs are located in 44 different countries.

The paper has been organized in the following way: in section 2, we present a literature review on foreign establishment mode choice based on TCT. Next, we introduce in our study an analysis of the potential influence of language diversity on transaction costs inherent to an acquisition process. Section 3 presents the main features of the sample of FDIs used in this study, and explains the methodology used in order to test our predictions; while section 4 shows empirical evidence and a discussion of our results. Finally, we summarize the main conclusions and managerial implications derived from our study.

## **2. Literature review**

Transaction Cost Theory is the theoretical framework most frequently used in order to analyze the establishment or diversification mode choice —see Slangen & Hennart (2007) for an exhaustive review. Basing on this framework, foreign investors choose the establishment mode which minimizes transaction costs derived from the investment in the target country.

Different transaction costs arise when investing abroad through an acquisition: *Ex ante* or pre-acquisition costs are mainly related to obtaining accurate information that allows the investing firm to identify the true value of the target —the higher the information asymmetry affecting the FDI process, the higher the difficulties and costs related to the valuation and pricing of the target firm. *Ex post* or post-acquisition costs are related to opportunistic behaviors by the seller, the need to integrate in only one hierarchy the organization structure and personnel coming from two different companies —which, in turn, implies the risk of

turnover for top executives of the target—, as well as the risk of acquiring (and paying their market value) resources the investing firm does not need. An exhaustive analysis of both *ex ante* and *ex post* costs can be found in Balakrishnan & Koza (1993), Reuer & Koza (2000), López-Duarte & García-Canal (2002) and Chen & Hennart (2004).

The cultural distance between the home and the target countries has been traditionally pointed out as a factor increasing these transactions costs. The CD between two nations reflects existing differences in certain values, norms and behavioral rules between them (Shenkar, 2001); in other words, differences in “collective mental programs” shared by groups of people who live in the same national environment, with such programs being different from one group to another (Hofstede, 1980, 2001). A high cultural distance may boost the information asymmetry in the acquisition process, thus increasing costs relative to the search, valuation and pricing of potential target firms. Costs relative to the negotiation process between the acquirer and the target also increase when values, norms and behavior rules are not shared by both firms. (Balakrishnan & Koza, 1993; Chen & Hennart, 2004). In the same way, post-acquisition integration problems arise when the target’s decisions and behavioral rules are not well-known and/or understood by the foreign investor and vice versa. To get full cooperation from the seller also becomes harder as cultural distance increases — see, among others, Kogut & Singh (1988) and Woodcock *et al.* (1994). In addition, post acquisition integration problems may lead to the loss of valuable managers coming from the target or acquired company.

Most empirical research dealing with the foreign establishment mode choice contributes evidence regarding the tendency to invest through greenfield investments in high cultural distant countries in order to avoid the above referred costs —see Chang & Rosenweig (2001),

Vermeulen & Barkema (2001), Harzing (2002), Larimo (2003), Drogendick & Slangen (2006), Slangen & Hennart (2008) and Dow & Larimo (2009), as well as the exhaustive literature reviews by Shenkar (2001) and Harzing (2003)<sup>3</sup>. Due to such a broad acceptance of cultural distance as a main factor conditioning the internationalization paths and establishment mode choice, other factors related to the diversity among countries have been systematically overlooked in the literature on diversification mode (Dow & Larimo 2009); among them, the language diversity between nations.

As Luo & Shenkar (2006) point out, the existence of language barriers between the home and host countries of a FDI increases the so-called liability of foreignness; that is, the difficulties that the investing firm must overcome when it seeks to develop its activities in a foreign country<sup>4</sup>. In the same way, Demirbag *et al.* (2007) acknowledge language diversity between the home and host countries as a main factor conditioning transaction costs related to an internationalization process and, in turn, conditioning entry or diversification mode choices. However, language has been a neglected factor in international business literature, being known as “the forgotten factor” (Marschan-Piekkari *et al.*, 1997; Harzing & Feely, 2008). Different reasons may underlie such a lack of attention: firstly, as already said, language has been bundled into the broader term culture, so that researchers have implicitly analyzed its influence on firms’ decisions when analyzing the role of cultural distance between countries. Thereby, it has been thought unnecessary to focus on its independent role (Luo & Shenkar,

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<sup>3</sup> A second group of papers has focused on the role played by the acquired firm as provider of assets the foreign investor lacks; in particular, specific knowledge related to the host market. This knowledge would help to reduce the impact of the cultural distance the foreign investor must overcome to successfully develop his activity in the host market—see for instance, Kogut & Singh (1988), Hennart & Reddy (1997), López-Duarte & García-Canal (2002), and Jung (2004). Some recent studies point to the existence of a moderating effect of third variables in the relationship between cultural distance and diversification mode (Slangen & Hennart, 2008), or even show a not significant influence of CD on the choice of diversification mode (Brouthers & Brouthers, 2000 and Demirbag *et al.*, 2008).

<sup>4</sup> The *language barrier* concept is wider than the *language diversity* one; however, language diversity is a key factor in building language barriers (Harzing & Feely, 2008).

2006; Welch *et al.*, 2005), even though language diversity is not always captured by cultural distance measures (West & Graham, 2004). In addition it becomes particularly difficult to disentangle language effects from broader cultural influences, as far as language influences cultural and managerial values in international contexts (West & Graham, 2004): it is not only that the language a person learns as a child may influence his/her values and way of thinking, but also that language diversity may influence or condition the perceived cultural distance between two countries (Harzing, 2005; Harzing & Maznevski, 2002). Such an influence would be developed through “cultural accommodation” or “ethnic reinforcement” processes carried out by individuals who develop professional activities in countries where the spoken language is not their mother language. Through a cultural accommodation process, individuals working in a second language acquire some of the cultural attitudes and values associated with that language, because they are influenced (consciously or subconsciously) by the culture of that language. On the contrary, through the ethnic reinforcement process these individuals show a stronger endorsement of their natural cultural values; that is, the use of a second language makes their ethnicity more salient. Pre-eminence of American researchers, together with the dominance of the English language in international business (Fredriksson *et al.*, 2006; Harzing & Feely, 2008); as well as the complexity of the construct and the lack of existing scales (Dow & Karunaratna, 2006) may be other factors underlying the systematic omission of language diversity in the empirical studies on the diversification mode choice.

The following paragraphs aim at analyzing the influence of language diversity on the transaction costs derived from an international acquisition process.

### ***2.1. Language diversity and transaction costs in international acquisitions***

Language diversity between the home and host nations of the FDI increases the information asymmetry the foreign investor must face. Consequently, the above mentioned *ex ante* transaction costs relative to the valuation and pricing of the target also raise.

As a starting point, the acquirer and the target must choose the functional language of the process; that is, the language formally designed for verbal and written use by both of them in order to be able to negotiate and work together (Luo & Shenkar, 2006). If the native language of one of the firms involved in the acquisition process is chosen as functional language, the information asymmetry increases, as this firm will more easily and quickly accede to and control relevant information than the other; therefore, enjoying a favorable situation to negotiate and make decisions relative to the acquisition process. In summary, this firm will be in a stronger position than the other in controlling information and influencing decisions. In terms of Luo & Shenkar (2006) and Root (1994), the functional language becomes a control mechanism. Even when the functional language is a third one different from the mother tongues of both the acquirer and the target, *ex ante* transaction costs relative to getting accurate information and negotiating increase. In any case, the information asymmetry and *ex ante* transaction costs the foreign investor must face are the highest when the functional language is the target's mother tongue.

Language diversity also boosts post acquisition transaction costs. Costs relative to the integration process and to achieving a cooperative and non opportunistic behavior on the part of the target get upgraded in a language diversity context. First addressing *ex post* costs relative to integration processes, the existence of language barriers between the acquirer and the target may disturb the flows of information between them. As Kogut & Zander (1992)



point out, for cross border information and knowledge transfer (especially tacit knowledge) to be effective, communication integrity is vital. Even when the acquirer is relatively competent in the language of the target (or vice versa), loss of rhetorical skill is always present (Harzing & Feely, 2004). Therefore, misunderstandings are easily caused, due to, among others, filtration — messages are only partially transmitted— and distortion processes—intended meaning is altered during the transmission of the message— (Marschan-Piekkari *et al.*, 1997). In summary, language barriers between both firms involved in the acquisition process may not only prevent or disturb the flow of information between them, therefore challenging the integration of assets and knowledge, but also result in a loss of credibility and trust between them (Harzing & Feely, 2008; Luo, 2001).

Additionally, language diversity may also hinder successful management and the integration of human resources. On the one side, language can emerge as a source of power for some individuals: in an international business context, language skills may deliver power and opportunities to some individuals who otherwise would not enjoy such a position —see, among others, Andersen & Rasmussen (2004), Harzing & Feely (2008), Luo & Shenkar (2006), Marchan-Piekkari *et al.* (1997, 1999a, 1999b), Neal (1998), Welch *et al.* (2005). Language facility can give these individuals not only access to relevant information, but also the power to act as informal gatekeepers, allowing them to control the nature and flow of communication. In such a context, they may effectively influence negotiation and management processes, disturbing the intended hierarchy and modifying the authority channels; in summary, introducing a new source of conflict in the integration process. On the other, language diversity can lead to factions and the creation of groups within the workforce and managers. In international contexts, language is a strong candidate for the definition of group boundaries within the integration process (Harzing & Feely, 2008). When both firms

do not share the same mother tongue, language-based clusters are likely to emerge, and tensions between different clusters are likely to arise: interpersonal relationships and information transfers are easily achieved within each cluster, but not among different ones. Such a context creates a strong sense of exclusion (“we” and “they”), blocking effective collaboration and integration processes —see, for instance, Barner *et al.* (2007); Harzing & Feely (2008); Fredriksson *et al.*, 2006; Marchan-Piekkari *et al.* (1997, 1999a, 1999b); Neal (1998).

Now addressing costs relative to achieving a cooperative behavior on the side of the target, language diversity between both firms usually gives rise to opportunist behaviors. The choice of the functional language arises once again as a source of potential conflicts between both firms. Once the negotiation stage ends and the acquirer has bought the target, both of them must choose the functional language of the joint project; that is, the language they are going to use to be able to work together. As Root (1994) and Luo & Shenkar (2006)<sup>5</sup> point out, this functional language becomes a control mechanism for one of both firms (Luo & Shenkar, 2006; Root, 1994). Companies who accommodate the other firm’s language feel that they have relinquished some control over the relationship (Harzing & Feely, 2008), as the firm whose mother tongue is the project’s functional language might start to dominate the relationship —this is known as a power distortion process. In summary, selection of the functional language may introduce a superior-subordinate relationship in the integration process which does not necessarily reflect the actual responsibility or decision power agreed upon in the acquisition contract (Luo & Shenkar, 2006). When the functional language is the foreign investor’s mother tongue (or a third language different from the target’s one), personnel in the target may feel that they become subordinates to the acquirer’s personnel

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<sup>5</sup> Both papers analyze the role of the functional language as a control mechanism in the field of alliances or cooperation agreements.

and, therefore, react negatively to the acquisition process —opportunistic or non cooperative behavior.

In summary, language diversity between the home and host countries increases *ex ante* and *ex post* costs in an acquisition process. So it is to be expected that foreign investors avoid international acquisitions in language diversity contexts. Therefore, we pose the following hypothesis:

*Hypothesis: In an international context featured by language diversity, foreign investors will prefer to invest through greenfield investments rather than through acquisitions.*

### **3. Empirical analysis**

#### **3.1. Database**

In order to carry out our analysis, we created a database collecting the FDIs made through greenfield investments and acquisitions carried out between 1989 and 2003 by listed Spanish companies whose shares are traded on the Madrid Stock Exchange —one must bear in mind that Spanish outward FDI flows were not totally liberalized until 1988; as a consequence, our database collects all FDIs made by listed Spanish companies until 2003<sup>6</sup>.

FDIs made by Spanish firms have been identified by following this process: after preparing a list including all Spanish firms listed on the Madrid Stock Exchange for each year within our study, exhaustive and systematic research was carried out for each identified company by using reports presented by each firm to the *Comisión Nacional del Mercado de Valores* or

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<sup>6</sup> See Guillén (2005) for a detailed analysis of the accelerated international process experienced by Spanish firms since the beginning of the 90s.

CNMV (literally, the “National Stock Exchange Commission” which oversees the Madrid Stock Exchange), as well as other corporate reports, and the archives of the leading economic Spanish newspapers.

This research allowed us to identify 509 new FDIs, or FDIs that are the first investment relative to a particular internationalization project. FDIs located in host countries which pose legal constraints to particular kinds of establishment modes (for instance, total acquisitions) and FDIs related to privatization processes were eliminated from this database, since in both cases the foreign investor is not free to choose the entry mode. Additionally, FDIs located in host countries lacking any of the cultural or risk measures referred to in the following section were also eliminated. The final sample has been composed of 383 FDIs located in 44 different host countries. Latin America is the host region receiving the highest volume of Spanish FDIs, followed by the European Union and other OECD countries —85% of collected FDIs are concentrated in these three regions<sup>7</sup>. Acquisition processes account for a higher percentage of FDIs than greenfield investments —68 and 32% respectively. However, this is not a steady tendency across the period: as Graph 1 shows, *de novo* investments (mainly greenfield joint ventures) account for a higher number of FDIs during the first years in the period, while acquisitions rose sharply in the latter 90s and early 2000s. The database is relatively well-balanced between Spanish-speaking and non Spanish-speaking countries: 60% of collected FDIs are located in countries where Spanish is not an official language, while the remaining 40% is located in Spanish-speaking countries (mainly, in Latin American countries).

Insert Graph 1 about here

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<sup>7</sup> An exhaustive literature review relative to the Spanish FDI industry and geographical distribution can be found in Durán (2006).

### ***3.2. Dependent variable and methodology***

In order to prove our predictions, several binomial logistic regression models have been estimated. The dependent variable, mode of establishment, is a dichotomous one which equals 1 when the FDI has been carried out through an acquisition and 0 otherwise. In these models the likelihood that the investment is made through an acquisition is explained by the independent variables defined below. In these estimations, the coefficients obtained for each independent variable evaluate the effect of the increments of these variables on the likelihood of the dependent variable equaling 1.

### ***3.3 Independent and control variables***

A total of 5 different LD variables seek to approach the existence of linguistic diversity between Spain and each host nation. Firstly, we have used a basic dichotomous variable  $DL_I$  which values one when Spanish (which is the majority official language in the home country) is not an official language in the host country. This variable values 0 when Spanish is an official language in the host country, although not necessarily the only official language. Then, basing on the scale of language diversity proposed by Dow & Kuranaratna (2006)<sup>8</sup>, we developed four additional measures. This is a 5 point scale that focuses on the differences and similarities between languages, grouping them in families, branches within a family, and different level sub-branches. Following this scale, the highest score of language diversity (5 points) is given when the language spoken in the host country is classified in a family of languages different from Spanish. On the contrary, the lowest score of language diversity is coded when the language spoken in the host country is Spanish. Scores ranging from 4 to 2

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<sup>8</sup> This scale is based, in turn, on the study by Grimes & Grimes (1996).

reflect same family, but different branch; same branch but different sub-branch, and same sub-branch, but different language, respectively. Basing on this scale, the  $LD_2$  variable measures the language diversity between Spanish and the official language majority spoken in the host country; while  $LD_3$  measures the diversity between Spanish and the official language spoken in the host country which is closer to Spanish in this scale. As an example, both English and French are official languages in Canada. The former is the predominant or majority spoken one, so  $LD_2$  measures language diversity between Spanish and English. French is not the predominant language in Canada, but it is closer to Spanish in the scale, so  $LD_3$  measures language diversity between Spanish and this language.  $LD_4$  and  $LD_5$  are the same as  $LD_2$  and  $LD_3$  respectively, but modified in order to take into account the particularly high incidence of English within Spain. According to this scale, Spanish and English languages are classified in different families, so FDIs located in English speaking countries should be coded with the highest score of language diversity (5). However, there are some factors related to the educational Spanish system which contribute to make English a closer language for Spanish people: English is the foreign language every Spanish child is compelled to learn at school. As soon as a child begins his/her education at school, he/she starts learning English as a foreign language, and continues learning it until finishing the obligatory education at 16. Two extra years of high school (including English courses) are required before entering the university. Spanish business schools also offer more English training, as well as bilingual courses —the intensity of both depending on the university. In summary, the Spanish educational system emphasizes English learning. Therefore, English is far from being an unknown language for Spanish managers.

Several control variables have been included in our study in order to control their potential effect on the choice of mode of establishment. As a first step, the cultural distance between

the home and host countries have been included in the analysis. We have measured it through the Kogut & Singh Index based on Hofstede's cultural dimensions: *power distance*, *uncertainty avoidance*, *individualism and masculinity* —the fifth dimension identified by Hofstede & Bond (1988), that is the *long term orientation*, has not been used in this paper as it is available for only 23 countries. This is the measure most frequently used in the literature in order to measure the extent to which different cultures are similar or different —see the recent literature review by Larimo & Dow (2009)<sup>9</sup>.

We have also introduced in our analysis some variables which refer to *psychic distance stimuli* Dow & Karunaratna (2006), that is, to national level factors related to distances between nations which influence psychic distance perceptions as, for instance, differences in economic and industrial development, or geographic distance. A variable relative to the host country's risk rate has also been included.

The ECDEV 1 and ECDEV 2 variables seek to approach differences in economic development between Spain and the host countries collected in the database. These variables have been built using data from the World Development Report by The World Bank. In this report, the World Bank clusters different economies in four different groups considering each country's degree of economic development —high, middle-high, middle-low, and low economic development. Taking into account that Spain remains in the first cluster (high economic development) throughout the 15 years in the study, the ECDEV 1 is a dichotomous variable which values 1 when the host country is clustered in the second category (middle high economic development), while ECDEV 2 is a dichotomous variable

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<sup>9</sup> To use different cultural distance measures —as, for instance, those based on studies by House *et al.* (2004) or Schwartz (1999)— implied an important decrease of the number of FDIS in our database, as many host countries in our study lack such measures.

which values 1 when the host country is clustered in the third or fourth categories (lower economic development) and 0 otherwise<sup>10</sup>.

The Geographical Distance (GD) between Spain and each host country has been measured by the flying distance (kilometers) between the capital of Spain and the capital of each host country —this variable has been introduced in the model in logarithmic form.

In order to measure the political risk affecting the host country, we have used Euromoney Risk Ratings over the period of study —variable labeled as PR. The Euromoney rating is a comprehensive country risk rating which accounts for financial, economic and political risk. This rating uses a scale from 0 (lowest stability or highest possible country risk) to 100 (the lowest possible country risk). In order facilitate interpreting its coefficients, we have transformed this variable, so that PR values 100-Euromoney ranking.

Several control variables relative to foreign investors and FDI processes have been also included. Firstly, different variables related to investing firms' characteristics have been included; in particular, their size and experience. The investing firms' size (SIZE) has been measured through their market capitalization calculated on the 31<sup>st</sup> of December in the year previous to the FDI being made. A logarithmic transformation of this variable was done.

Regarding the investing firms' experience, two variables have been introduced in the analysis: their international or multinational experience (INT EXP) and their experience related to a particular host country (HC EXP). In both cases the experience has been measured through dichotomous variables. The INT EXP variable values one when the

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<sup>10</sup> As only two FDIs collected in our database were classified in the fourth category, we gathered together the third and fourth clusters.



foreign investor has carried out previous FDIs (regardless of the host country) and so has accumulated some degree of experience relative to foreign investment processes; while HC EXP values one when previous FDIs are located in the same host country as the FDI coded in the database.

When taking into account the foreign investor's host country experience, it is to be expected that this experience moderates the influence of both the cultural distance and the language diversity on the choice of mode of diversification —see Cho & Padmanabhan (2005). This potential moderating effect of host country experience on the role played by CD and LD has been measured through interaction effects:  $CD * HC\ EXP$  and  $LD * HC\ EXP$ . With the aim of increasing interpretability of these interaction effects and avoiding multicollinearity problems, all these variables have been mean-centered. Each variable has been centered by subtracting the mean score of the variable from each data-point. The mean value of each new centered variable is, thus, 0.

Additionally, different variables relative to the FDI process itself have been also included in the analysis; in particular, the entry mode chosen by the foreign investor to carry out the FDI, the year in which the FDI took place, and the industry. The entry mode has been measured through a dichotomous variable which values one when the foreign investor keeps 100% of the equity of the firm located in the host market and 0 otherwise. In order to measure time, we have used a counter variable which values 1 when the FDI was carried out in 1988 (the former year in our study), 2 for FDIs carried out in 1989, and so on. Finally, as our sample shows a high bias towards service firms, we have included in the model a dichotomous variable (IND) which values one when the investing firm competes in a manufacturing industry and 0 when it competes in a service industry.

Table 1 shows the correlation(s) matrix of the variables used in our empirical tests.

Insert Table 1 about here

As it is shown in the table, the pairwise correlation between LD variables and CD is quite high, but far from perfect (correlations range from 0.35 to 0.69, depending upon the LD variable used). Therefore, it seems that the CD variable only partially accounts for language differences between countries. Table 1 also shows high correlations between our independent variables (LD variables) and some control variables, as for instance, variables relative to country risk, economic development differences and geographic distance between nations —as shown in the table, the highest correlations are found for LD<sub>1</sub>, that is, the dichotomous variable. Correlations amongst these control variables are also high. Given this, logistic regressions were replicated avoiding these control variables. As results relative to our independent variables remained robust, these control variables were finally included in estimated models —as correlations are high, but not perfect, it becomes clear that each one of these variables gathers relevant information.

#### **4. Results and discussion**

Table 2 reports results from different logistic regression models. Regressions have been estimated using different specifications: control variables only, main effects related to language diversity between the home and host countries added, an interaction effect between the language diversity and the host country experience added, and an interaction effect between the cultural distance and the host country experience added. As it is shown in the

table, each one of these regression models was repeated using the five different LD variables above mentioned.

Insert Table 2 about here

The  $\chi^2$  of estimated models is statistically significant at 99% in all cases, and different observations are satisfactorily classified at percentages which range from 72.6 to 74.7%. This implies at least a 28% improvement over the chance rate which is 56.6% in our study — the chance rate equals to  $a^2 + (1-a)^2$ , where  $a$  is the proportion of acquisitions in our sample (68.15%).

Our results confirm the role of language diversity between nations as a main factor conditioning the choice of diversification or establishment mode: LD variables show a negative and statistically significant coefficient in all models from (2) to (16), except for model (9). Therefore, this is a solid result which remains steady regardless of the LD variable used to measure language diversity between countries. This result points to a lower preference for acquisitions as establishment mode in international contexts featured by language diversity between both countries. Therefore, it provides strong support to our hypothesis, as it seems that language diversity between both nations increases *ex ante* and *ex post* costs relative to acquisition processes.

When observing the coefficients of the interaction effects between language diversity and host country experience, we find that none are statistically significant, except for that in model (9). It seems that the experience accrued by the investing firm in the host country does not moderate the effect on language diversity on the upgrading of transaction costs when

investing through acquisitions. Although the positive and statistically significant coefficient in model (9) indicates a preference for greenfield investments once the foreign investor has accrued experience in the host country, this is too weak a result.

However, this experience clearly moderates the effect of cultural distance on transaction costs, as the positive and statistically significant coefficient of the variable  $CD*HC\ EXP$  shows in models (4), (7), (10), (13) and (16); once again, regardless of the LD variable used. As shown in the table, coefficients of the CD variable are not statistically significant in any of the estimated models, addressing to a non-significant effect of this variable on the choice of establishment mode when the foreign investor does not have experience in the host country (that is, when HC EXP variable values 0). This is an unexpected result, as most empirical evidence shows a negative influence of CD on the choice of acquisitions as establishment mode. This result can be derived from the inclusion in regression models of some factors relative to the diversity among countries (related to CD, but not explicitly included in its measures) which have been overlooked in the literature on establishment mode, as for instance, the language diversity, or differences in economic development or country risk rates. As already pointed out by Harzing (2003), studies that analyze the effect of cultural distance on internationalization processes, but do not include other measures of differences between countries, may obtain distorted results, as the CD variable might act as a proxy for these differences. Nevertheless, it seems clear that once Spanish foreign investors have accrued experience in the host country (HC EXP values 1); they prefer to carry out further investments in cultural distant countries through greenfield investments rather than through acquisitions.

To more easily understand the joint effect of variables, Graph 2 shows the graphic representation of interaction effects between LD variables and HC EXP; while Graph 3 shows that relative to the interaction effects between CD and HC EXP. As shown in these graphs, interaction effects between LD measures and host country experience are not relevant (except for that relative to LD<sub>3</sub>); while those relative to CD and HC EXP are always relevant.

Insert Graph 2 and Graph 3 about here

Now addressing results relative to other “psychic distance stimuli” variables, our results show that neither the geographical distance between countries nor the host country’s risk rate play a statistically significant role, while the distance relative to economic development influences the tendency to invest through acquisitions in a negative and statistically significant way: ECDEV<sub>1</sub> and ECDEV<sub>2</sub> variables show a negative coefficient across all models estimated, endowing results with a high degree of robustness. It seems that Spanish companies investing abroad prefer greenfield investments over acquisitions when investing in host countries which show a lower economic development degree than Spain. This result is in line with findings in previous literature —see, for instance, Larimo (2003).

Control variables relative to FDI’s characteristics show different results: The IND variable does not show a statistically significant coefficient in any of estimated models, therefore pointing to its non- relevant role in the choice of diversification mode. On the contrary, the variable measuring the year in which the investment was carried out, and that relative to the entry mode, show a statistically significant coefficient across all estimated models. While the former shows a positive sign, denoting a higher preference for acquisitions in the latter years of the analyzed period, the latter shows a negative sign, pointing out a lower preference for

acquisitions when the investing firm keeps 100% of the target equity. Although this latter result is in line with that found in recent studies (Demirbag et al., 2008), most empirical evidence does not find a statistically significant relation between entry and establishment mode —see, for instance, Barkema & Vermeulen (1998), and Larimo & Dow (2009).

Results relative to the YEAR variable may be contingent on the particular features of our database. As mentioned above, our database gathers FDIs carried out by Spanish firms since 1989; that is, since Spanish outward FDI flows were fully liberalized. Both the number of Spanish firms and the amount of outward FDI flows were not only extremely reduced before such liberalization, but much lower than expected given Spain's degree of economic and industrial development. In fact, due to this gap between economic development and outward FDI activity, Spain has been known in the literature as a *late investor* country; that is, a country which became actively involved in FDI processes too late as compared to its economic development. It seems that once Spanish firms accrued some degree of international experience by investing through greenfield joint ventures during the former years of the period, they tried to compensate for such a delay in their internationalization path by investing through establishment modes which accelerate the internationalization process: acquisitions.

Finally, it seems that neither the foreign firms size nor its international or host country experience play a relevant role in the choice of mode of diversification. It has to be noted, as previously mentioned, that the experience accrued by the foreign investor relative to each particular host country becomes statistically significant when considering its interaction effect with the cultural distance; that is, the HC EXP variable plays a relevant role in moderating the effect of cultural distance.

## 5. Conclusions and managerial implications

Our analysis demonstrates the need to unbundle language diversity from cultural distance in order to identify the role that it plays on the choice of diversification mode. When so doing, LD arises as a main factor conditioning transactions costs of an acquisitions process. The language diversity between the investing firm and the target increases the information asymmetry the foreign investor must face when investing abroad, and therefore, *ex ante* transaction costs relative to the valuation and pricing of the target and to the negotiation process. In the same way, the larger the language barriers between the acquirer and the target, the more difficult and costly the integration process of resources and personnel coming from both firms, and the harder it is to achieve a cooperative (non- opportunistic) behavior on the part of the target.

The empirical analysis carried out in this paper provides strong support for this idea, as results remain solid when using different measures of language diversity. Additionally, as our study controls the potential influence of different factors relative to the diversity among countries on the choice of mode of establishment —cultural, economic, risk and geographic distances—, these results allow us to analyze the isolated influence of language diversity.

### 5.1 Managerial relevance

For practitioners, our study sheds light on the choice of diversification mode when investing abroad. We find strong support for the role of language diversity as a main factor conditioning transaction costs. It seems that the role played by LD is even more relevant than the one played by the cultural distance between the home and the host countries.

Managers dealing with an international acquisition process should carefully handle the choice of the functional language of the project, as it may become a control mechanism for one of the firms involved in this process. Language can even emerge as a source of power for some individuals who enjoy a control position just basing on their language skills. Additionally, language barriers between both firms should be removed in order to facilitate the flow of information, the integration of assets, knowledge, and human resources; as well as to avoid the creation of factions or groups within the workforce and managers.

Our study also highlights that the experience accrued by the foreign investor in the host country does not moderate the increase of costs derived from language diversity. On the contrary, this experience seems to play a role as a moderator of the cultural distance's influence.

## ***5.2 Limitations and future research directions***

Although our results remain strong when using different measures of language diversity, they may not be necessarily applicable to other contexts, as the particular features of our sample may be somehow influencing these results—in particular, the over-representation of service firms and FDIs located Latin American countries. During the period analyzed in this paper large Spanish firms have expanded abroad and become large multinationals (Guillén 2005); while at the beginning of the 90s most of them were exclusively focused on the local Spanish market. Particularly, the 1996-1999 period features a large amount of FDIs made by a rather small group of firms (those in some service industries) and located in a particular host region (Latin America). The environment and challenges faced by Spanish firms are now very



different. It is therefore to be expected that Spanish outward FDI flows change, giving rise to FDIIs located in new geographical areas and made by Spanish firms competing in new industries. Thus, a study including more recent years is necessary to test if our results are applicable to other periods of time. Empirical studies dealing with investing firms coming from different countries, and different types of firms could also enrich the analysis.

We also think that more research is needed to better understand the role of different types of experience as factors moderating the transaction costs of different formulas to accede international markets. We think that future research should not only pay attention to the two types of experience already analyzed in this paper —international and host country experience—, but also to the experience related to the use of particular establishment modes —see Cho & Padmanabhan (2005)—, as well as to the experience accrued by the foreign investor in host nations which can be labeled as “similar” to each other —see Dow & Larimo (2009).

## **Acknowledgements**

## **References**

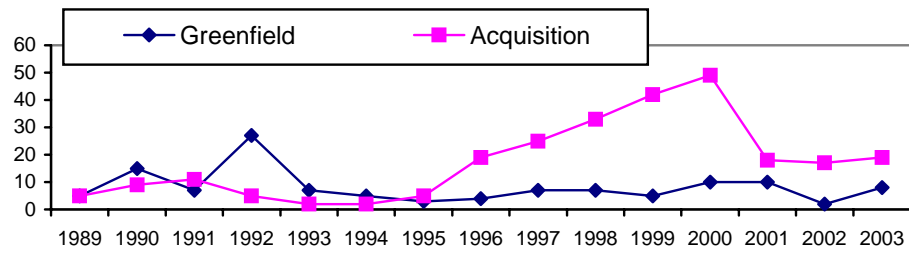
- Andersen, H. & Rasmussen, E. S. (2004). The role of language skills in corporate communication. *Corporate Communications. An International Journal*, 9(3): 231-242.
- Balakrishnan, S. & Koza, M. (1993). Information asymmetry, adverse selection and joint ventures. *Journal of Economic Behavior and Organization*, 20(1): 99-117.

- Barkema, H.G. & Vermeulen, F. (1998). International expansion through start-up or acquisition: A learning perspective. *Academy of Management Journal*, 47(1): 7-26.
- Barner-Rasmussen, W. & Björkman, I. (2007). Language fluency, socialization and inter-unit relationships in Chinese and Finnish subsidiaries. *Management and Organization Review*, 3(1): 105-128.
- Brouthers, K. & Brouthers, L. (2000). Acquisition or greenfield start-up? Institutional, cultural and transaction cost influences. *Strategic Management Journal*, 21(1): 89-97.
- Chang, S.J. & Rosenzweig, P.M. (2001). The choice of entry mode in sequential foreign direct investment. *Strategic Management Journal*, 22(8): 747-776.
- Chen, H. & Hennart, J.F. (2004). A hostage theory of joint ventures: Why do Japanese investors choose partial over full acquisitions. *Journal of Business Research*, 57(10): 1126-1134.
- Cho, K. & Padmanabhan, P. (2005). Revisiting the role of cultural distance in MNC's foreign ownership mode choice: the moderating effect of experience attributes. *International Business Review*, 14(3): 307-324.
- Demirbag, M.; Glaister, K. & Tatoglu, E. (2007). Institutional and transaction cost influences on MNEs' ownership strategies of their affiliates: Evidence from an emerging market. *Journal of World Business*, 42(4): 418-434.
- Demirbag, M.; Tatoglu, E. & Glaister, K. (2008). Factors affecting perceptions of the choice between acquisition and greenfield entry: The case of Western FDI in an emerging market. *Management International Review*, 48(1): 5-38.
- Dow, D. & Karunaratna, A. (2006). Developing a multidimensional instrument to measure psychic distance stimuli. *Journal of International Business Studies*, 37(5): 578-602.
- Dow, D. & Larimo, J. (2009). Challenging the conceptualization and measurement of distance and international experience in entry mode choice research. *Journal of International Marketing*, 17(2): 74-98.
- Durán, J. J. (2006). El auge de la empresa multinacional española. *Boletín Económico de ICE*, 2881, 13-33.
- Fredriksson, R.; Barner-Rasmussen, W. & Piekkari, R. (2006). The multinational corporation as a multilingual organization. *Corporate Communication: An International Journal*, 11(4): 406-423.
- Guillén, M.F. (2005). *The rise of the Spanish multinational firm: European business in the global economy*. Cambridge: Cambridge University Press.
- Harzing, A. (2002). Acquisitions versus greenfield investments: International strategy and management of entry modes. *Strategic Management Journal*, 23(3): 211-227.
- Harzing, A. (2003). The role of culture in entry mode studies: from negligence to myopia?. *Advances in International Management*, 15, 75-127.
- Harzing, A. (2005). The use of English questionnaires in cross-national research: Does cultural accommodation obscure national differences?. *International Journal of Cross-Cultural Management*, 5(2): 213-224.
- Harzing, A. & Feely, A.J. (2008). The language barrier and its implications for HQ-subsidiary relationships. *Cross Cultural Management: An International Journal*, 15(1): 49-60.

- Harzing, A. & Maznevski, M. (2002). The interaction between language and culture: A test of the cultural accommodation hypothesis in seven countries. *Language and Intercultural Communication*, 2 (2): 120-139.
- Hennart, J.F. & Reddy, S. (1997). The choice between mergers/acquisitions and joint ventures: The case of Japanese investors in the United States. *Strategic Management Journal*, 18(1): 1-12.
- Hofstede, G. (1980). *Culture's consequences: International differences in work related values*. Beverly Hills: Sage.
- Hofstede, G. (2001). *Culture's consequences: International differences in work-related values*, Beverly Hills: Sage, 2<sup>a</sup> ed.
- House, R.J.; Hanges, P.J.; Javidan, M.; Dorfman, P.W. & Gupta, V. (2004). *Culture, leadership, and Organizations. The GLOBE study of 62 societies*. California: Sage Publications.
- Johanson, J. & Vahlne, J.E. (1977). The internationalization process of the firms —a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1): 23-32.
- Johanson, J. & Wiedersheim-Paul, F. (1975). The Internationalization of the Firm —Four Swedish Cases. *Journal of Management Studies*, 12(3), 305-322.
- Jung, J. (2004). Acquisitions or joint ventures: Foreign market entry strategy of U.S. advertising agencies. *Journal of Media Economics*, 17(1): 35-50.
- Kogut, B. & Singh, H. (1988). Entering the United States by joint venture: Competitive rivalry and industry structure. In F.J. Contractor & P. Lorange (Eds.), *Cooperative strategies in international business*. Lexington: Lexington Books.
- Kogut, B. & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3 (3): 383-397.
- Larimo, J. (2003). Form of investment by Nordic firms in world markets. *Journal of Business Research*, 56(10): 791-803.
- Larimo, J. & Dow, D. (2009). The impact of cultural distance framework on foreign establishment mode decision: Hofstede vs. Schwartz vs. Globe. 35<sup>th</sup> EIBA Annual Conference, Valencia, Spain.
- López-Duarte, C. & García-Canal, E. (2002). Adverse selection and the choice between joint-ventures and acquisitions: Evidence from Spanish firms. *Journal of Institutional and Theoretical Economics (JITE)*, 158(2): 304-324.
- Luo, Y. (2001). Determinants of entry in an emerging economy: A multilevel approach. *Journal of Management Studies*, 38(3): 443-472.
- Luo, Y. & Shenkar, O. (2006). The multinational corporation as a multilingual community: Language and organization in a global context. *Journal of International Business Review*, 37(3): 321-339.
- Marschan-Piekkari, R.; Welch, L. & Welch, D. (1997). Language the forgotten factor in multinational management. *European Management Journal*, 15(5): 591-598.
- Marschan-Piekkari, R.; Welch, L. & Welch, D. (1999a). In the shadow: The impact of language on structure, power and communication in the multinational. *International Business Review*, 8 (4): 421-440.

- Marschan-Piekkari, R.; Welch, L. & Welch, D. (1999b). Adopting a common corporate language: IHRM implications. *The International Journal of Human Resource Management*, 10 (3): 377-390.
- Reuer, J. & Koza, M. (2000). Asymmetric information and joint venture performance: theory and evidence for domestic and international joint ventures. *Strategic Management Journal*, 21(1): 81-88.
- Root, F.R. (1994). *Entry Strategies in International Markets*. Washington: Lexington Books.
- Schwartz, S. (1994). Beyond individualism/collectivism: New cultural dimensions of values. In U. Kim, H. Triandis, C. Kagitcibasi, S. Choi, & G. Yoons (Eds.), *Individualism and collectivism: Theory, methods, and applications* (pp. 85-119). Thousand Oaks, Sage Publications.
- Shenkar, O. (2001). Cultural distance revisited: Towards a more rigorous conceptualization and measurement of cultural differences. *Journal of International Business Studies*, 32(3): 519-535.
- Slangen, A. & Hennart, F. (2007). Greenfield or acquisition entry: A review of the empirical foreign establishment mode literature. *Journal of International Management*, 13(4): 403-429.
- Slangen, A. & Hennart, F. (2008). Do multinationals really prefer to enter culturally distant countries through greenfields rather than through acquisitions? The role of parent experience and subsidiary autonomy. *Journal of International Business Studies*, 39(3): 472-490.
- Vermeulen, F. & Barkema, H. (2001). Learning through acquisitions. *Academy of Management Journal*, 44 (3): 457-476.
- Welch, D.E.; Welch, L.S. & Marschan-Piekkari, R. (2005). Speaking in tongues: language and international management. *International Studies of Management & Organization*, 35(1): 10-27.
- West, J. & Graham, J.L. (2004). A linguistic based measure of cultural distance and its relationship to managerial values. *Management International Review*, 44 (3): 239-260.
- Woodcock, C.P.; Beamish, P.W. & Makino, S. (1994). Ownership-Based Entry Mode Strategies and International Performance. *Journal of International Business Studies*, 25(2): 253-273.
- Zhao, H.; Luo, Y. & Suh, T. (2004). Transaction costs determinants and ownership based entry mode choice a meta-analytical review. *Journal of International Business Studies*, 35(6): 524-544.

**Graph 1. FDIs collected in the database: Greenfield investments and acquisitions**



**Table 1: Correlations Matrix**

	ACQ	LD <sub>1</sub>	LD <sub>2</sub>	LD <sub>3</sub>	LD <sub>4</sub>	LD <sub>5</sub>	CD	INTEXP	HCEXP	GD	ECDEV <sub>1</sub>	ECDEV <sub>2</sub>	PR	WOS	YEAR	SIZE	IND
ACQ	1	-.127*	-.130*	-0.079	-.150**	-.115*	-0.065	0.074	.101*	0.087	0.068	-0.053	-0.001	-.208**	.338**	.117*	-0.028
LD <sub>1</sub>		1	.790**	.759**	.674**	.662**	.419**	-.179**	-.146**	-.718**	-.720**	-.177**	-.718**	.234**	-0.03	-.295**	.272**
LD <sub>2</sub>			1	.947**	.790**	.763**	.647**	-.115*	-.177**	-.288**	-.606**	0.007	-.539**	.249**	0.052	-.253**	.272**
LD <sub>3</sub>				1	.741**	.796**	.694**	-.102*	-.173**	-.248**	-.578**	-0.043	-.567**	.255**	0.092	-.225**	.268**
LD <sub>4</sub>					1	.944**	.353**	-0.064	-.237**	-.352**	-.502**	.160**	-.293**	.213**	0.045	-.183**	.297**
LD <sub>5</sub>						1	.415**	-0.067	-.225**	-.288**	-.490**	0.088	-.355**	.212**	0.082	-.160**	.298**
CD							1	-0.024	-.152**	0.003	-.335**	-0.044	-.394**	.201**	0.036	-.118*	.128*
INTEXP								1	.286**	.196**	.144**	0.086	.124*	-.115*	.289**	.310**	-.173**
HCEXP									1	0.067	.139**	-.126*	-0.024	-0.031	.248**	.288**	-.231**
GD										1	.553**	.229**	.540**	-.180**	.143**	.225**	-.147**
ECDEV <sub>1</sub>											1	-.350**	.499**	-.159**	0.001	.240**	-.201**
ECDEV <sub>2</sub>												1	.544**	-.134**	0.071	-0.035	0.08
PR													1	-.225**	-0.033	.147**	-.102*
WOS														1	-.120*	-.199**	.234**
YEAR															1	.191**	0.073
SIZE																1	-.560**
IND																	1
Mean	0.680	0	0	0	0	0	0	0.870	0	3.582	0.340	0.190	27.523	0.270	9.210	9.290	0.270
SD	0.467	0.496	1.751	1.697	1.460	1.404	0.730	0.334	0.479	0.465	0.475	0.393	18.272	0.447	3.966	0.888	0.444

\*p<0.05; \*\*p<0.01

**Table 2: Logistic regression estimates of entry mode choice (ACQ =1)**

	Control Variables	LD <sub>1</sub>			LD <sub>2</sub>		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
CONSTANT	-3.178	.488	-.714	.394	-2.314	-3.323	-2.550
LD		-1.640 (.538)***	-1.568 (.549)***	-1.752 (.546)***	-.302 (.115)***	-.268 (.119)**	-.320 (.116)***
LD*HCEXP			.382 (.559)			.215 (.163)	
CD* HCEXP				.792 (.399)**			.756 (.396)**
CD	-.226 (.201)	.026 (.221)	.011 (.222)	.132 (.232)	.089 (.235)	.063 (.237)	.192 (.245)
INTEXP	-.302 (.406)	-.271 (.409)	-.314 (.414)	-.298 (.411)	-.323 (.413)	-.365 (.415)	-.349 (.416)
HCEXP	.017 (.288)	-.050 (.293)	-.030 (.295)	.016 (.301)	-.034 (.291)	.007 (.295)	.033 (.298)
GD	.638 (.417)	-.044 (.476)	-0.21 (.478)	-.116 (.482)	.633 (.422)	.600 (.425)	.614 (.424)
ECDEV <sub>1</sub>	-1.257 (.725)	-1.990 (.769)***	-1.902 (.780)**	-1.927 (.776)**	-1.650 (.740)**	-1.497 (.752)**	-1.572 (.747)**
ECDEV <sub>2</sub>	-1.913 (.823)	-2.319 (.844)***	-2.251 (.851)***	-2.280 (.854)***	-1.978 (.829)**	-1.881 (.836)**	-1.915 (.838)**
PR	.022 (.017)	.019 (.018)	.018 (.018)	.018 (.018)	.018 (.017)	.017 (.018)	.017 (.018)
WOS	-.925 (.281)	-.980 (.286)***	-.988 (.286)***	-1.004 (.289)***	-.899 (.283)***	-.904 (.284)***	-.914 (.285)***
YEAR	.192 (.035)	.204 (.036)***	.202 (.036)***	.205 (.036)***	.204 (.036)***	.203 (.036)***	.205 (.036)***
SIZE	.095 (.187)	.067 (.188)	.094 (.192)	.118 (.193)	.075 (.189)	.114 (.192)	.125 (.193)
IND	.149 (.349)	.349 (.360)	.380 (.363)	.434 (.367)	.278 (.357)	.334 (.362)	.355 (.364)
Model X <sup>2</sup>	64.33***	73.98***	74.44***	78.09***	71.53***	73.31***	75.33***
Correctly classified (%)	73.4	72.6	73.4	73.1	74.2	74.7	74.7
-2loglikelihood	415	405.35	404.89	401.24	407.8	406.02	404

Standard errors between parentheses. p<0.1; \*\*p<0.05; \*\*\*p<0.01

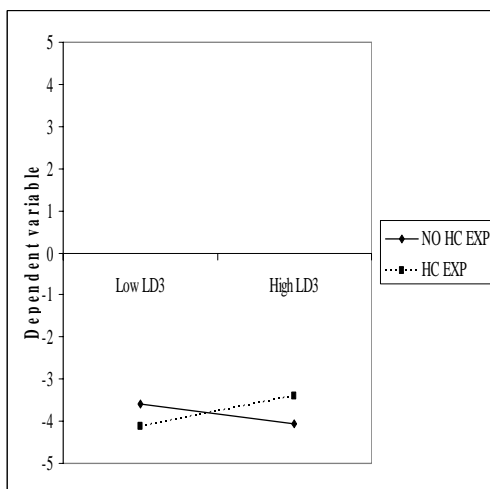
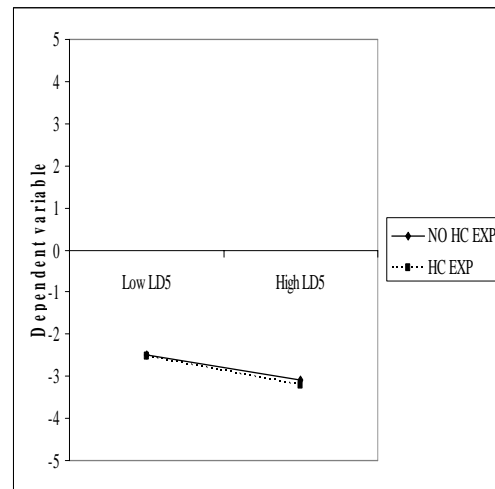
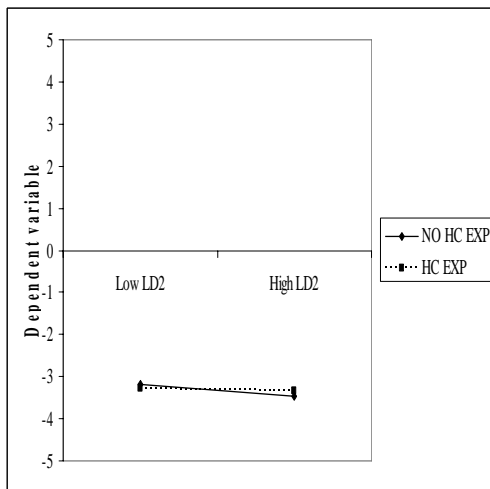
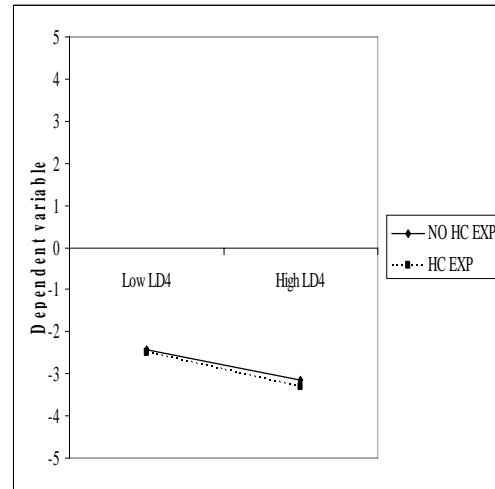
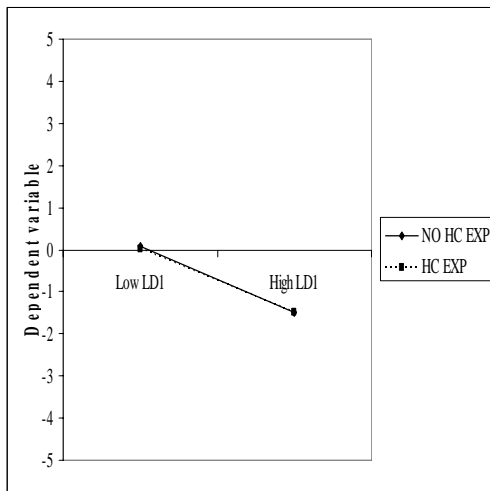
**Table 2: Logistic regression estimates of entry mode choice (ACQ =1) (cont.)**

	LD <sub>3</sub>			LD <sub>4</sub>			LD <sub>5</sub>		
	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)	Model (13)	Model (14)	Model (15)	Model (16)
CONSTANT	-2.898	-3.814	-3.223	-2.317	-2.876	-2.749	-2.859	-3.350	-3.297
LD	-.207 (.124)*	-.139 (.130)	-.218 (.125)*	-.230 (.104)**	-.240 (.115)**	-.228 (.105)**	-.214 (.108)**	-.205 (.121)*	-.207 (.109)*
LD*HCEXP		.353 (.179)**			-.042 (.215)			.042 (.229)	
CD* HCEXP			.700 (.394)*			.649 (.394)*			.632 (.394)*
CD	.002 (.244)	-.046 (.246)	.093 (.253)	-.104 (.208)	-.100 (.209)	-.038 (.215)	-.109 (.209)	-.112 (.210)	-.048 (.217)
INTEXP	-.321 (.410)	-.390 (.413)	-.342 (.412)	-.280 (.412)	-.280 (.412)	-.296 (.414)	-.296 (.410)	-.297 (.411)	-.311 (.412)
HCEXP	-.026 (.290)	.058 (.299)	.039 (.298)	-.093 (.294)	-.105 (.300)	-.032 (.301)	-.082 (.294)	-.071 (.301)	-.018 (.301)
GD	.685 (.418)	.654 (.421)	.676 (.421)	.395 (.438)	.390 (.439)	.385 (.440)	.540 (.423)	.543 (.424)	.536 (.425)
ECDEV <sub>1</sub>	-1.554 (.744)**	-1.336 (.755)*	-1.487 (.751)**	-1.238 (.724)*	-1.253 (.728)*	-1.158 (.733)*	-1.349 (.725)*	-1.332 (.731)*	-1.275 (.733)*
ECDEV <sub>2</sub>	-2.046 (.827)**	-1.920 (.833)**	-2.005 (.833)**	-1.640 (.832)**	-1.645 (.833)**	-1.594 (.839)*	-1.821 (.823)**	-1.814 (.824)**	-1.786 (.830)**
PR	.020 (.017)	.018 (.017)	.020 (.017)	.019 (.017)	.019 (.017)	.019 (.017)	.020 (.017)	.020 (.017)	.020 (.017)
WOS	-.898 (.282)***	-.914 (.284)***	-.911 (.285)***	-.872 (.283)***	-.873 (.283)***	-.883 (.286)***	-.886 (.283)***	-.886 (.283)***	-.897 (.286)***
YEAR	.202 (.036)***	.202 (.036)***	.203 (.036)***	.201 (.036)***	.201 (.036)***	.201 (.036)***	.201 (.036)***	.201 (.036)***	.202 (.036)***
SIZE	.090 (.187)	.155 (.193)	.134 (.191)	.130 (.189)	.132 (.189)	.168 (.192)	.134 (.189)	.133 (.189)	.168 (.192)
IND	.240 (.355)	.311 (.361)	.304 (.361)	.290 (.359)	.292 (.359)	.342 (.364)	.289 (.360)	.288 (.360)	.334 (.364)
Model X <sup>2</sup>	67.16***	71.28***	70.45***	69.27***	69.31***	72.10***	68.29***	68.32***	70.95***
Correctly classified (%)	73.4	74.2	73.6	73.4	73.6	72.8	72.6	72.1	72.3
-2loglikelihood	412.170	408.05	408.88	410.07	410.03	407.23	411.05	411.01	408.38

Standard errors between parentheses. p<0.1; \*\*p<0.05; \*\*\*p<0.01

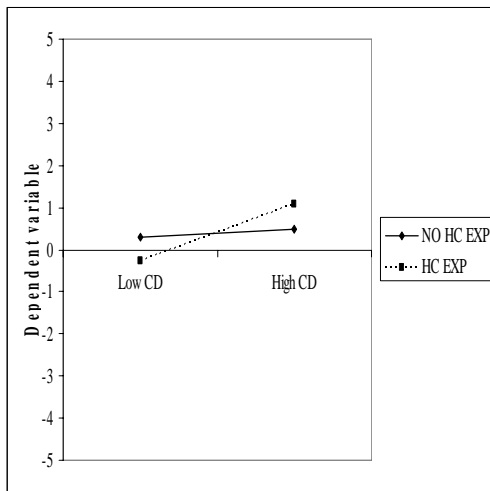


**Graph 2. Interaction effects LD HC EXP**

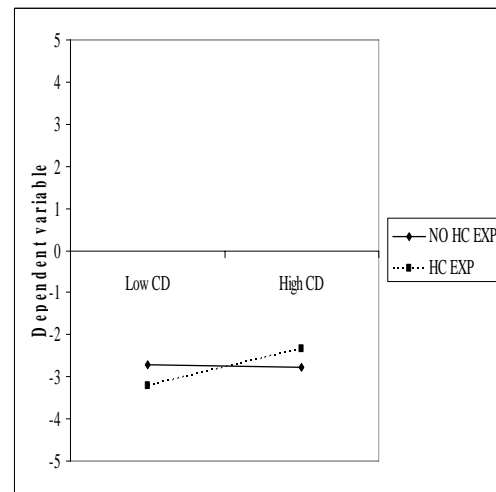


*Plots show the pattern of the interaction effect, but not accurate values of the dependent variable, as far as all control variables included in the regression models have not been standardized.*

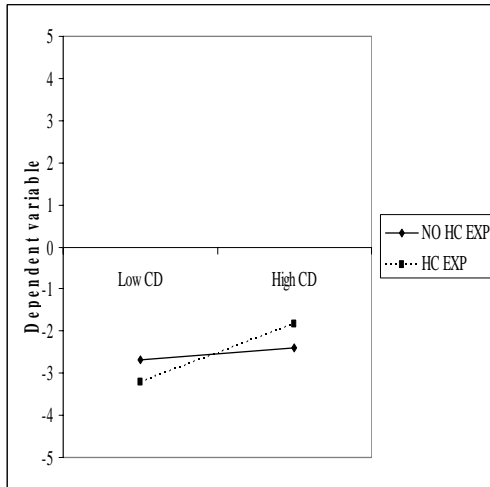
**Graph 3. Interaction effects CD HC EXP**



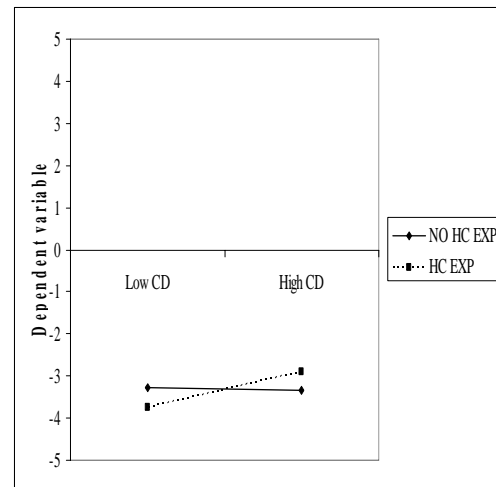
(LD<sub>1</sub>)



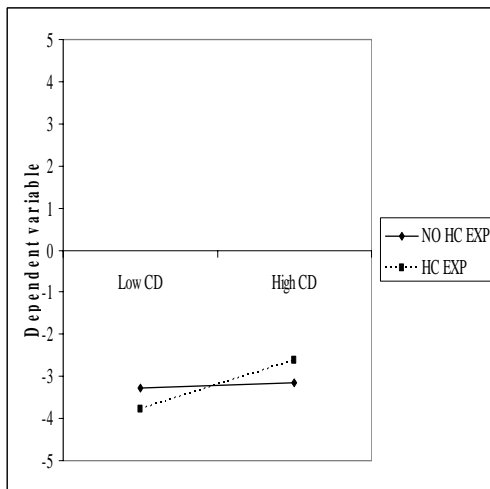
(LD<sub>4</sub>)



(LD<sub>2</sub>)



(LD<sub>5</sub>)



(LD<sub>3</sub>)

*Plots show the pattern of the interaction effect, but not accurate values of the dependent variable, as far as all control variables included in the regression models have not been standardized.*