



Document de treball 2003/5:

**Wholly-Owned Subsidiaries Versus Joint Ventures:
The Determinant Factors in the
Catalan Multinational Manufacturing Case**

Montserrat Álvarez

Institut d'Economia de Barcelona
Edifici Florensa
Adolf Florensa, s/n
08028 Barcelona
Tel.: 93 403 46 46
Fax: 93 402 18 13
E-mail: ieb@pcb.ub.es
<http://www.pcb.ub.es/ieb>

WHOLLY-OWNED SUBSIDIARIES VERSUS JOINT VENTURES: THE DETERMINANT FACTORS IN THE CATALAN MULTINATIONAL MANUFACTURING CASE ^{a,b}

Montserrat Álvarez^c

ABSTRACT: The aim of this paper is to investigate the factors influencing the choice between establishing a wholly-owned subsidiary (WOS) or entering into a joint venture (JV) as made by Catalan manufacturing firms investing abroad. The validity of certain key transaction-cost hypotheses in this case is tested using binomial logistic regression. Results indicate that a Catalan manufacturing firm is more likely to set up a wholly-owned subsidiary if the firm is sufficiently large, has had substantial experience in the host country geographical region, but is young and possesses little general experience in the international sphere. On the other hand, a Catalan firm is more likely to invest via a WOS if the firm possesses intangible or tacit assets and operates within a technologically advanced sector. Finally, a joint venture is preferred by a Catalan firm if the potential host country is perceived to imply a high degree of instability and risk or has a high rate of growth.

Key words: wholly-owned subsidiary (WOS), joint venture (JV), multinational enterprises (MNEs), Catalonia.

JEL Classification: F21, F23.

RESUMEN: El objetivo de este documento es investigar los factores que influyen en la elección entre establecer una filial de plena propiedad o una joint venture, realizada por las empresas catalanas manufactureras que invierten en el exterior. Por medio de una regresión logística binomial comprobamos para este caso la validez de una serie de hipótesis provenientes de la teoría de los costes de transacción. Los resultados obtenidos indican que una empresa manufacturera catalana implantará más probablemente una filial de plena propiedad si la empresa es suficientemente grande, tiene una experiencia sustancial en la zona geográfica del país de destino, pero es joven y posee poca experiencia general en el ámbito internacional. Por otro lado, una empresa catalana tiene más probabilidad de implantar una filial propia también si la empresa posee activos intangibles o tácitos y opera en un sector avanzado tecnológicamente. Finalmente, preferirá una filial de propiedad compartida si el país de destino implica un alto grado de inestabilidad o riesgo o si tiene una elevada tasa de crecimiento.

Palabras clave: filial de plena propiedad, filial de propiedad compartida o joint venture, empresa multinacional, Cataluña.

Códigos JEL: F21, F23.

^a Comments are welcome. The opinions expressed in the papers do not necessarily reflect the IEB's opinions.

^b The author acknowledges the comments of an anonymous referee and the financial support of the project *Grup Consolidat de Recerca de la Generalitat de Catalunya 2001 SGR 00030*. A first draft of this paper was presented at the *XXVIII Simposio de Análisis Económico* held in Seville in 2003.

^c Corresponding address:

Department of Econometrics, Statistics and Spanish Economy - University of Barcelona
Av. Diagonal, 690, 08034 Barcelona
Telephone: + 34 93 402 45 98 - Fax: + 34 93 402 18 21
e-mail: montserratalvarez@ub.edu

1. Introduction

In recent years there has been a significant growth in both foreign direct investment (FDI) flows and in the number of multinational enterprises (MNEs) in the world. Spain and Catalonia have mirrored this pattern, and in the last decade, have experienced a great increase not just in terms of investment flows in general, but particularly in terms of outward flows and specifically manufacturing flows. Nowadays, outward direct investment flows are greater than inward ones for the Catalan manufacturing sector. Simultaneously, there has been a substantial growth in the number of Catalan manufacturing enterprises establishing production subsidiaries abroad.

This paper investigates Catalan investment overseas. The question of foreign investment paying attention on entry mode determinants, specifically, has been extensively studied in the international literature. However, little research has been carried out in relation to Spain¹ and none at all in relation to Catalonia, which makes the contribution of this paper a novel one. The aim of our research is to investigate -in relation to well-founded hypotheses in the literature on the subject- the factors that influence the choice made by Catalan manufacturing firms between setting up a wholly-owned subsidiary (WOS) as opposed to a joint venture (JV).

The next section (Section 2) briefly reviews, therefore, the existing theoretical and empirical literature on entry mode determinants². Section 3 describes the data used in this empirical study, the methodology applied and the proposed econometric model. Section 4 outlines the hypotheses that test our econometric model and explains the results obtained. Finally, Section 5 discusses our conclusions and the limitations of the study.

¹ See, for example, Molero (1998), Pla (1999) and Ramón (2001). The specific choice between WOS and JV has only been studied by López and García (1998,1999), albeit within a more general framework.

² A particular case of which is the choice between WOS and JV.

2. Theoretical and empirical literature review

Research on factors that determine the choice between setting up a WOS or a JV in a foreign country corresponds within the more extensive theoretical and empirical literature on entry modes. The theoretical literature about entry-mode determinants has basically conformed to the notion of transaction costs theory (TCT) (Williamson, 1975, 1985) applied to the international field. Our particular research draws on the work of Hennart (1991), Gatignon and Anderson (1986), Alonso (1994) and Hill et al (1990), whose research is grounded wholly or partially in TCT. However, we have also drawn on resource-based theory, primarily on the work of Kogut and Zander (1993) and Madhok (1997,1998).

The more integrated entry modes - such as WOS - mean greater control but also require a major commitment in terms of resources and imply both greater risk and less flexibility (Hill et al 1990). Summarising the conclusions obtained in the literature, a firm may prefer to invest through a WOS in the following conditions:

1. It possesses very specific assets, or assets with great potential for generating profits. In this case, an investing firm may prefer to protect itself against possible opportunistic behaviour by a partner using firm's assets to pursue its own interests. Moreover, the firm would prefer not to have to share the potentially high revenues that its assets may generate.
2. It possesses tacit assets related to the firm internally and its organisation, which cannot be easily transmitted to an external partner. In this case, a WOS is preferable to a JV, irrespective of the possible transaction costs attached.

On the other hand, a firm may prefer to invest through a JV in the following situations:

1. The firm needs to share risks (for instance, important when a host country is economically and/or politically unstable).
2. The firm needs additional resources to invest abroad.
3. The firm needs to be supplied with complementary knowledge by a partner (for instance, when a firm does not have adequate trade experience or country-specific experience, or when the host country is perceived to be very different to the home

country). This kind of knowledge is very difficult to obtain in the marketplace due to the associated high transaction costs.

Empirical studies have usually focused on firm-specific variables and country-specific variables in their approach to these theoretical notions. Listed in Table 1 – and used in our proposed econometric model - are the variables that have produced the best explanatory results.

Table 1. Entry mode determinant factors

Variables	Value	Authors
Firm size (assets, sales, employees)	Positive	Kogut and Singh (1988b), Gomes-Casseres (1989, 1990), Makino and Neupert (2000), Hennart and Larimo (1998), Mutinelli and Piscitello (1998a, 1998b), Lecraw (1984), Agarwal and Ramaswami (1992b), Erramilli et al (1997), Agarwal and Ramaswami (1992a), Pan and Tse (2000), Pla (1999), Ramón (2001), Brouthers and Brouthers (2001)
International experience	Positive	Gatignon and Anderson (1988), Hennart (1991b), Hennart and Larimo (1998), Madhok (1998), Mutinelli and Piscitello (1998a, 1998b), Padmanabhan and Cho (1996, 1999), Agarwal and Ramaswami (1992b), Erramilli (1991), Agarwal and Ramaswami (1992a), Contractor and Kundu (1998), Pla (1999), Ramón (2001), López and García (1998, 1999), Meyer (2001), Brouthers and Brouthers (2001), Asiedu and Esfahani (2001)
Technological advantages (generally, R&D expenditure/sales). Also subjective perceptions such as asset specificity, asset tacitness, or similar	Positive	Gatignon and Anderson (1988), Kogut and Singh (1988b), Gomes-Casseres (1989, 1990), Hennart and Larimo (1998), Mutinelli and Piscitello (1998a, 1998b), Padmanabhan and Cho (1996, 1999), Fagre and Wells (1982), Madhok (1998), Lecraw (1984), Agarwal and Ramaswami (1992b), Erramilli et al (1997), Kim and Hwang (1992), Kogut and Zander (1993), Brouthers et al (1996), Molero (1998), Pla (1999), López and García (1998, 1999)
Marketing and product differentiation advantages (generally, advertising expenditure/sales). Also perceived importance of product quality or brand	Positive	Gatignon and Anderson (1988), Gomes-Casseres (1989, 1990), Fagre and Wells (1982), Lecraw (1984), Erramilli et al (1997), Pan (1996), Agarwal and Ramaswami (1992a), Brouthers et al (1996), Pan and Tse (2000), Contractor and Kundu (1998), Ramón (2001)
Socio-cultural distance	Negative	Gatignon and Anderson (1988), Madhok (1998), Gomes-Casseres (1989, 1990), Mutinelli and Piscitello (1998a, 1998b), Padmanabhan and Cho (1996, 1999), Agarwal and Ramaswami (1992b), Pan (1996), Erramilli (1991), Kim and Hwang (1992), Brouthers et al (1996), Tse et al (1997), Pan and Tse (2000), Pla (1999), Ramón (2001), López and García (1998, 1999), Brouthers and Brouthers (2001), Asiedu and Esfahani (2001)
Economic or political risk (volatility of operating environment)	Negative	Gatignon and Anderson (1988), Mutinelli and Piscitello (1998a, 1998b), Madhok (1998), Agarwal and Ramaswami (1992b), Pan (1996), Contractor (1990), Kim and Hwang (1992), Agarwal and Ramaswami (1992a), Pan and Tse (2000), Contractor and Kundu (1998), Ramón (2001)
Country size or growth. (generally, an attractive market).	Positive	Gomes-Casseres (1989, 1990), Hennart (1991b), Makino and Neupert (2000), Agarwal and Ramaswami (1992b), Contractor (1990), Lecraw (1984), Agarwal and Ramaswami (1992a), Brouthers et al (1996), Contractor and Kundu (1998), Ramón (2001)

Source: Author.

3. Data and methodology

In accordance with the theoretical and empirical literature of the previous section, data needed to be assembled on Catalan investing firms and foreign host countries for our analysis of the factors determining the choice between a WOS and a JV. In order to collect data on Catalan manufacturing MNEs, a survey was conducted in the early part of 2002 in the form of a brief questionnaire mailed out to firms owning at least one overseas production subsidiary in 2001. The companies were selected from data provided by the Catalan Government (Fontrodona and Hernández, 2001). Host country data were obtained from secondary sources such as the World Bank, UNESCO, Hofstede (1980, 2001), and the investment magazine *Institutional Investor*.

The response rate for the survey was 71.34%, representing 228 production subsidiaries. The distribution of these 228 subsidiaries by geographical location and industry, respectively, is summarised in Tables 2 and 3. Catalan manufacturing MNEs owning at least 95%, and less than 95% of the subsidiary's equity capital, respectively, are classified in the tables as WOS and JV. The ratio WOS:JV is 43:57³.

Table 2. 228 Catalan manufacturing subsidiaries: distribution by geographical region

Geographical area	WOS	JV
Africa	14%	86%
Latin America	48%	52%
Asia	23%	77%
NAFTA Area	38%	62%
Rest of Europe	35%	65%
European Union	62%	38%

Source: Author

³ JVs are more numerous in our database than in that of Fontrodona and Hernández (2001), where JVs represented 52% of the sample.

Table 3. 228 Catalan manufacturing subsidiaries: distribution by industry

Industry	WOS	JV
Food and beverages	43.8%	56.3%
Wood and cork	33.3%	66.7%
Machinery	42.9%	57.1%
Transport	53.3%	46.7%
Electrical material	18.2%	81.8%
Electronic material, precision instruments and office machinery	90.9%	9.1%
Minerals and non-ferrous metals	72.2%	27.8%
Printing	50.0%	50.0%
Plastics and rubber	25.0%	75.0%
Paper articles	50.0%	50.0%
Metal products	40.0%	60.0%
Chemical products	40.0%	60.0%
Textile products, leather and footwear	18.2%	81.8%

Source: Author

From the survey we obtained firm-specific variables – see Table 4 - to be subsequently used as explanatory variables in our econometric model. Insufficient information was available from Catalan manufacturing multinational enterprises in relation to research and development expenditure and advertising expenditure (both as a percentage of sales), each of which is frequently used as a proxy variable for, respectively, a firm's technological advantage and marketing/product differentiation advantage. Thus, following the empirical literature - e.g., Gatignon and Anderson (1988) and Mutinelli and Piscitello (1998a) - we used the corresponding industrial sector data as proxies for these variables⁴.

⁴ The data used was taken from the *Encuesta sobre innovación tecnológica en las empresas* produced by the Spanish statistics office and *Estadística, producció i comptes de la indústria*, produced by the Catalan statistics office.

Table 4. Firm-specific variables used as explanatory variables in our econometric model

Variable (ACRONYM)	Description
Size (SIZE)	Number of employees
Experience (EXP)	Number of years in existence
Subsidiaries (SUBS)	Number of foreign subsidiaries
Number of zones (ZONES)	Number of geographical zones (EU, Latin America, NAFTA, Asia, Africa, rest of Europe), where a firm has international experience (subsidiaries)
Presence in an the area (PRES)	The value of 1 is given to a firm if it has a significant trade presence in the host country's geographical region. (By 'significant' is meant that more than 20% of a firm's exports go to this region and that it has sales/distribution subsidiaries there)
Subsidiary age (SUBAGE)	Number of years in existence of the subsidiary
R+D (R+D)	Research and development expenditure as a proportion of total sales. (The figure used represents the Catalan industry sector in which the firm operates)
Advertising (ADV)	Advertising expenditure as a proportion of total sales. (The figure used represents the Catalan industry sector in which the firm operates)
Asset specificity (SPEC)	Degree of asset specificity, as perceived by management
Asset tacitness (TACIT)	Degree of asset tacitness, as perceived by management

Source: Author

Likewise, in line with both Kogut and Zander (1993) and Kim and Hwang (1992), we included variables that represented subjective management perceptions of a firm's assets and knowledge. More specifically, we wished to investigate the degree of specificity and tacitness of a firm's assets, in the opinion of management, and, consequently, the extent to which these assets were considered too sensitive or too complex to share with a partner⁵. The appendix describes the questions asked as the basis for developing an asset specificity (questions 1-6) and asset tacitness (questions 7-10) index⁶.

Finally, Table 5 lists the variables considered in relation to the countries where the 228 Catalan subsidiaries are located. As mentioned above, the data was sourced from a range of secondary sources (mainly the World Bank) and choice was restricted by criteria of homogeneous availability.

⁵The choice between setting up a WOS or a JV is highly strategic, and for this reason we believe that management perceptions in relation to a firm's assets may play a prominent role in the decision.

⁶The average of the responses to questions 1-6 and 7-10, respectively, of a firm's managers was used for our econometric calculations in order to construct an asset-specificity and asset-tacitness index.

Table 5. Country-specific variables used as explanatory variables in our econometric model

Variable (ACRONYM)	Description
Gross domestic product (GDP)	Host country GDP at constant prices (average for the last 7-10 years).
GDP growth rate (GROWTH)	Host country annual GDP growth rate (average for the last 7-10 years).
Socio-cultural distance (SCD)	Socio-cultural distance between Spain (Catalonia) and the host country, based on Hofstede's (1980, 2001) four cultural dimensions. Used was Kogut and Singh (1988) formula for obtaining a socio-cultural distance index: $CD_j = \sum_{i=1}^4 \{(I_{ij} - I_{ih})^2 / V_i\} / 4$, where I_{ij} is country j's rating along cultural dimension i, I_{ih} is the rating for Spain (country of reference, h) and V_i is the variance for cultural dimension i
Risk (RISK)	Host country risk level (average for the last 7 years), obtained from the <i>Institutional Investor</i> index (based on a periodic survey mailed to more than 100 international banks). This index awards a higher value to less risky countries.
Students in third-level education (3L-ED)	Number of students in third-level education as a proportion of the host country population (average for the last 7-10 years).
Number of scientists and engineers (SCI-ENG)	Number of scientists and engineers per 1000 inhabitants (average for last 7-10 years).

Source: Author

The variables listed in Tables 4 and 5 were included in the econometric model we propose here to explain the factors that determine a Catalan manufacturing MNE's choice between setting up a WOS or a JV. The ultimate aim is to test well-established hypotheses from the theoretical and empirical fields in relation to factors determining entry mode.

The proposed econometric model, in line with the empirical literature, is a binomial logistic regression model. The endogenous variable takes one of two values: 1 to represent WOS and 0 to represent JV. The independent variables explain, then, the probability of a subsidiary being a WOS rather than a JV. The total number of observations in this case was 228 and stepwise regression was used for the analysis⁷.

⁷ Authors studying foreign direct investment (FDI) have also used this or similar methods; e.g., Gutiérrez and Heras (2000), Anderson and Coughlan (1987), Contractor (1990), Dunning (1977), Root and Ahmed (1979), Maté (1996b), Molero (1998), Liu et al (1997). We began with a model that included all the independent variables, but dropped the least significant variable after each step, thus terminating with a model in which all the variables were significant at 10%. This procedure is widely used, despite the fact that it may be affected by problems associated with data mining.

Our model is formulated as follows:

$$Y^*_r = \alpha + \beta X_r + u_r \Leftrightarrow \text{Prob}(Y_r=1) = F(\alpha + \beta X_r),$$

where F is the logistic distribution function, $Y_r=1$ indicates that subsidiary r is a WOS, and Y_r^* is a latent variable which is not observable, and would indicate, for instance, the net benefits of setting up a WOS compared to a JV which, if positive, will lead to the creation of a WOS, and if negative, to the creation of a JV. These net benefits depend on a set of explanatory variables in the vector X_r , where $X_r = (\text{SIZE}_{ir}, \text{EXP}_{ir}, \text{SUBS}_{ir}, \text{SUBAGE}_{ir}, \text{SPEC}_{ir}, \text{TACIT}_{ir}, \text{ZONES}_{ir}, \text{PRES}_{jir}, \text{R+Dir}, \text{ADV}_{ir}, \text{GDP}_{jr}, \text{GROWTH}_{jr}, \text{RISK}_{jr}, \text{SC}_{jr}, \text{3L-ED}_{jr}, \text{SCI-ENG}_{jr})$, as defined in Tables 4 and 5 above, and where r is the subsidiary, i is r 's parent company and j is the country where r is set up.

4. Hypotheses and results

Using the data and methodology described in the previous section, and in accordance with the theoretical and empirical literature, the following hypotheses (H1-H8) will be tested:

H1: The larger a firm, the more likely it is to set up a WOS (instead of a JV) in a foreign country. In questions of size, larger firms (i.e. firms with more employees) have more resources, information and financial leverage, and therefore do not need a partner in order to invest abroad.

H2: The more experienced a firm, the more likely it is to set up a WOS (instead of a JV) in a foreign country. This hypothesis takes account of experience in general (years in existence) as well as international experience and its extent (i.e. number of foreign subsidiaries and the number of geographical regions where these subsidiaries are present). Firms that are more experienced in management and organisational terms, as well as in the international field, will not require the support that can be provided by a partner. On the other hand, if a firm has had extensive experience in a particular geographical region (measured via the variable 'presence in the area'), i.e. if it has acquired substantial knowledge of the markets in a region, then it is more likely to set up independently via a WOS rather than via a JV. This experience represents knowledge that would be almost impossible to acquire in the open market due to its tacitness and the associated transaction costs.

H3: The more specific and tacit management perceives a firm's assets to be, the more likely the firm is to set up a WOS (instead of a JV) in a foreign country. If a firm possesses specific assets, a partner that acts opportunistically can cause substantial damage to the firm. Moreover, asset tacitness may make it difficult to share assets with a partner in a productive way; know-how, for example, is particularly difficult to share, due to this implicit tacitness.

H4: The more intensive an industry in terms of technology and advertising, the more likely a firm operating in that sector is to set up a WOS (instead of a JV) in a foreign country. Industrial technological intensity (R&D expenditure/sales) and

industrial advertising intensity (advertising expenditure/sales) represent, respectively, a firm's technological and marketing/product differentiation advantages. A firm with advantages of this kind may be apprehensive about a JV with a partner who may behave opportunistically and erode these advantages. Moreover, investment in a WOS means that a firm does not have to share the potentially high profits that these advantages may bring.

H5: The more unstable and riskier the host country, the less likely a firm is to set up a WOS (instead of a JV) there. A country that is economically and politically unstable has a high level of risk associated with it. This would indicate the need for a partner to share these risks. A JV is a more flexible option that makes it easier to withdraw from a market in the event of a deterioration in operating conditions.

H6: The more socio-culturally distant a country, the less likely a firm is to set up a WOS (instead of a JV) in that country. An operating environment that is substantially different from the usual environment of the investing firm (in terms of customs, institutions and traditions) would indicate the need for a partner to share the burden of managing a subsidiary and foreign workforce.

H7: The more attractive a host country market (in terms of GDP or GDP growth), the more likely a firm is to set up a WOS (instead of a JV) in that country. In these circumstances, a WOS is the more attractive option because it means that the potentially high revenues to be obtained in this market do not have to be shared. Nonetheless, Hennart (1991) points out that a JV is often the fastest route to entering an attractive market.

H8: The more human capital (third level students) and technological capital (scientists and engineers) in a country, the less likely a firm is to set up a WOS (instead of a JV) in that country. If a firm is interested in improving its knowledge base or learning new operating methods, then entering into a JV with local partners is a suitable approach to investing in a country with substantial quantities of these strategic assets.

Three variants of the econometric model are proposed, as follows: Model 1 includes, in the first step of the stepwise regression, all the variables described in Tables 4 and 5; Model 2 includes all the variables with the exception of asset specificity and tacitness; and finally, Model 3 includes all the variables except R+D and advertising. The main difference between Models 2 and 3 is that the latter only considers subjective measurements from the point of view of the management about the firm's assets, whereas the former only includes objective measurements in relation to the industry's assets as a whole.

Table 6. 228 Catalan manufacturing subsidiaries: WOS vs JV determinants ⁸

	Binomial logistic regression Model 1	Binomial logistic regression Model 2	Binomial logistic regression Model 3
Size (hundreds of employees)	0.0218** (3.61)	0.0218** (3.60)	0.0231** (3.82)
Experience	-0.0150* (-2.42)	-0.0139* (-2.27)	-0.0148* (-2.46)
Subsidiaries	-0.0760* (-2.53)	-0.0761* (-2.54)	-0.0740** (-2.48)
Presence in the area	1.218* (2.34)	1.154* (2.24)	1.434** (2.78)
Tacitness	0.332* (2.05)	--	0.383* (2.39)
R+D	0.467* (2.20)	0.507* (2.43)	--
Risk	0.0195** (2.65)	0.0162* (2.29)	0.0187** (2.58)
GDP growth rate	-0.106 ⁺ (-1.77)	-0.112 ⁺ (-1.86)	-0.103 ⁺ (-1.73)
Goodness-of-fit	R2 Nagelkerke: 0.243 R2McFadden: 0.148 χ^2 : 44.89** Percentage of correct predictions: 0: 80.2 1: 59.4 Total: 71.2	R2 Nagelkerke: 0.222 R2McFadden: 0.132 χ^2 : 39.99** Percentage of correct predictions: 0: 78.5 1: 52.1 Total: 67.11	R2 Nagelkerke: 0.219 R2McFadden: 0.131 χ^2 : 39.94** Percentage of correct predictions: 0: 79.3 1: 56.25 Total: 69.4
Observations	228	228	228

Notes: (i) z-statistics in brackets. (ii) **Significant at the 1% level. *Significant at the 5% level. ⁺Significant at the 10% level.

As far as results are concerned, Hypothesis 1 is fulfilled, in that size positively correlates with the probability of setting up a WOS instead of a JV. This conclusion is also supported by Spanish entry mode studies by Pla (1999) and Ramón (2001). In relation to entry mode determinants - including WOS vs JV - at the international level,

⁸ Explanatory variables significant to $p < 0.10$. All three models include a constant term. Models run under Limdep and SPSS.

similar results have also been obtained by Kogut and Singh (1988b), Gomes-Casseres (1989, 1990), Makino and Neupert (2000), Mutinelli and Piscitello (1998a, 1998b), Lecraw (1984), Agarwal and Ramaswami (1992b), Erramilli et al (1997), Agarwal and Ramaswami (1992a), Pan and Tse (2000), and Brouthers and Brouthers (2001).

Hypothesis 2 is also confirmed if we take into account the dummy variable in relation to substantial experience in a host country's geographical area as implying a greater knowledge of the country's market and environment. This conclusion was also reached in empirical studies at the international level by Stopford and Wells (1972), Hennart (1991), Hennart and Larimo (1998), Mutinelli and Piscitello (1998a, 1998b), and Brouthers and Brouthers (2001)⁹.

Geographical dispersion of a firm's foreign subsidiaries is not a significant variable, whilst the number of foreign subsidiaries and firm's general experience (years in existence) are both negatively related to the probability of setting up a WOS instead of a JV (a result that contradicts Hypothesis 2). In the case of Catalan MNEs, it seems that relatively younger and less internationally experienced firms have a preference for investing abroad independently. This somewhat surprising result has also been obtained by Asiedu and Esfahani (2001), Erramilli (1991) and Ramón (2001). A possible explanation is a greater degree of ethnocentricity; in other words, in spite of their inexperience, Catalan firms prefer more integrated entry modes in order to preserve their *modus operandi*. Another possible explanation is that inexperienced firms find it more difficult to assess a partner's behaviour and therefore choose more integrated entry modes so as to avoid possible problems.

Hypotheses 3 and 4 are only partially satisfied. They hold for perceived asset tacitness and industrial R+D expenditure, but not for perceived asset specificity and advertising expenditure, even though the coefficient for asset specificity is significant and positive at $p < 0.15$. Similar findings in relation to technological intensity were obtained, for instance, by Stopford and Wells (1972), Kogut and Singh (1988b), Gomes-Casseres (1989, 1990), Gatignon and Anderson (1988), Padmanabhan and Cho (1996, 1999),

⁹ Many of these authors considered country rather than regional experience. But, following Mutinelli and Piscitello (1998), it seems reasonable to assume that if a firm has entered neighbouring countries, it will have obtained social, political and business knowledge that will be of use in the target country.

Fagre and Wells (1982), Erramilli et al (1997), Asiedu and Esfahani (2001), Molero (1998), and Pla (1999). Moreover, our findings in relation to subjective management perceptions are confirmed by Kim and Hwang (1992) (tacitness), Kogut and Zander (1993) (complexity, teachability, codifiability), Contractor and Kundu (1998) and Ramón (2001) (importance of product quality and brand), and Pla (1999) (tacitness and specificity).

Hypothesis 5, referring to level of risk, is fully satisfied. Similar findings were described in Ramón (2001), Durán (1987), Gatignon and Anderson (1988), Mutinelli and Piscitello (1998a, 1998b), Madhok (1998), Agarwal and Ramaswami (1992b), Pan (1996), Contractor (1990), Kim and Hwang (1992), Agarwal and Ramaswami (1992a), Pan and Tse (2000), and Contractor and Kundu (1998).

Socio-cultural distance (Hypothesis 6) is neither positively or negatively significant in relation to the endogenous variable. A possible explanation is that Catalan firms are only interested in the fact of having acquired knowledge of a specific market as a consequence of its experience in that country or neighbouring countries. In other words, degree of socio-cultural difference is not significant because the investing firm feels confident, on the strength of previous experience acquired in the region, of being able to deal with local workers, suppliers, customers and government authorities. Empirical studies in the field have reported mixed results for the relationship between socio-cultural distance and the probability of establishing a WOS: thus, negative results were obtained by Pla (1999), López and García (1998, 1999), Gatignon and Anderson (1988), Mutinelli and Piscitello (1998a, 1998b), Erramilli (1991), Agarwal and Ramaswami (1992a, 1992b), Brouthers and Brouthers (2001), Barbosa and Louri (2002) and Asiedu and Esfahani (2001), whereas positive results were described by Ramón (2001), Pan (1996), Padmanabhan and Cho (1996, 1999) and Madhok (1998). It may be that for Catalan MNEs the positive and negative relationships cancel each other out and thereby produce a final result that is not significant (as found in Contractor and Kundu, 1998 and Larimo, 1992)¹⁰.

¹⁰ This positive relationship can be explained by the fact that, in culturally distant countries, it is more difficult for a partner to adapt to an investing firm's production processes and organisation. Moreover, it is more difficult to assess whether or not a partner is acting opportunistically.

In relation to Hypothesis 7, GDP is not significant and GDP growth rate is negatively significant. A firm investing in a more dynamic host country is more likely to do so via a JV, as the fastest method of entry that enables a unique opportunity to be immediately exploited¹¹. Hennart (1991) and Gomes-Casseres (1989, 1990) obtained similar results, but opposite results were described in Barbosa and Louri (2002) and Makino and Neupert (2000)¹².

Finally, the role of strategic assets (Hypothesis 8) is not significant. Catalan manufacturing MNEs do not take into account the possibility of updating their knowledge base by entering into joint ventures with local partners in countries with substantial stores of human and technological capital. In other words, Catalan firms are more concerned about protecting rather than updating their own knowledge.

Subsidiary age is not a significant variable. This is hardly surprising as the average age of Catalan subsidiaries is only seven years, so it could be considered that looking currently at the problem WOS vs. JV or in the beginning (when the concrete subsidiary was set up) is nearly the same in this case¹³.

5. Conclusions

In this article, we studied the factors influencing the choice between setting up a WOS or a JV in a host country by Catalan manufacturing MNEs. Our findings would point to a Catalan firm choosing to establish a WOS rather than a JV if the firm is large, if it possesses tacit assets and knowledge (as perceived by management), if it is involved in technologically intensive industries, and if it has a considerable experience in the geographical region in which the host country is located (even if lacking in substantial

¹¹ Although this explanation refers to the WOS vs. JV decision prior to entry to a market and not after the event (as in our study), the average age of Catalan subsidiaries is only seven years. As the GDP growth rate was measured as the average for the last seven years, too, we can therefore consider that this explanation is still valid.

¹² Many authors use the rate of growth for individual industries rather than for the economy as a whole, for reasons of homogenous data availability criteria.

¹³ In relation to obstacles encountered in the investment process - specifically if host countries had prohibited them from setting up a WOS - no Catalan firm reported any problems. We therefore assumed that no prohibition existed. The *Institutional Investors Index*, nonetheless, could be considered to account for this variable.

international experience). On the other hand, a Catalan firm is more likely to enter into a JV in order to operate in economically/politically uncertain countries and in countries with a high rate of growth.

It is appropriate at this stage to point out some of the limitations of this study. For instance, the choice of explanatory variables might be considered arbitrary, in the sense that there are many other possible variables underlying the different approaches to TCT, the theoretical basis for this paper. This criticism, however, applies to all empirical studies based on TCT, which, as well as Dunning's eclectic paradigm (Dunning, 1977, 1993), could be considered more a taxonomy of possible variables to be included in empirical analyses, than a theory per se. In other words, the absence of clear structural models in this theoretical field is one of the main reasons for this arbitrariness. Nevertheless, in our study we included variables 1) for which it was possible to obtain homogeneous data for our firm and country database, 2) that were extensively used in empirical studies of entry mode determinants, and 3) that permits well-established theoretical hypotheses in relation to entry mode determinant factors to be tested. Future lines of investigation, however, could involve the inclusion of another set of variables in our model, as well as the investigation of interaction between some of the variables considered in this paper.

Finally, given the difficulty of obtaining individual data for Spanish and Catalan multinational firms, we were obliged to carry out our own survey, which in itself has the drawback that our conclusions are not entirely comparable to similar studies, and cannot be considered representative of the whole population.

APPENDIX

1. Subjective perceptions of a firms' assets, assessed on a 7-point Likert-type scale.

1=Total agreement; 7= Total disagreement

1. Our production technology is totally specific to our firm.
2. Our system of organisation is totally specific to our firm.
3. Our product is totally adapted and specific to our customers.
4. Preservation of our product quality is essential to our success.
5. Preservation of our brand reputation is essential to our success.
6. It would be difficult and harmful to transmit our human and physical capital to other businesses.
7. Our technology is highly complex and difficult to both explain and comprehend.
8. Our system of organisation is highly complex and difficult to both explain and comprehend. An extensive period training is necessary for our employees to learn our *modus operandi*.
9. It is impossible to understand our firm's *modus operandi* without spending some time in the company.

2. Correlation matrix

	SUBAGE	EXP	SIZE	SUBS	SPEC	TACIT	ZONES	PRES	R+D	ADV	GROWTH	GDP	RISK	3L-ED	SC	SCI-ENG
SUBAGE	1,000															
EXP	,152	1,000														
SIZE	-,066	,277	1,000													
SUBS	,004	,119	,611	1,000												
SPEC	,026	,213	,173	,175	1,000											
TACIT	,043	,088	,031	-,010	,495	1,000										
ZONES	-,083	,018	,233	,481	,184	,127	1,000									
PRES	,023	,125	,082	,253	-,010	-,055	,192	1,000								
R+D	-,112	,052	,187	,152	,018	,108	,254	,207	1,000							
ADV	,146	,125	-,101	-,050	-,176	-,325	-,014	,135	,127	1,000						
GROWTH	-,023	,077	-,037	-,103	-,001	-,031	-,061	,082	,036	,068	1,000					
GDP	,087	-,006	-,101	,036	-,007	-,155	,029	-,050	-,018	,231	-,081	1,000				
RISK	,030	,045	,099	,183	-,029	-,188	,027	,139	,001	,094	-,065	,560	1,000			
3L-ED	,123	-,042	-,008	,160	-,022	-,177	,021	,061	-,103	,161	-,361	,646	,621	1,000		
SC	-,059	,033	-,075	-,003	,016	,053	,084	-,047	-,010	,095	,426	,287	,193	-,048	1,000	
SCI-ENG	,056	-,050	-,016	,161	-,025	-,096	,098	-,030	-,008	,153	-,481	,672	,655	,769	,159	1,000

Bibliography

- Agarwal, J. P. and Ramaswami, S. (1992a), "Choice of foreign market entry mode form: The impact of ownership, location and internalization", *Journal of International Business Studies*, 1st. Quarter, 1-27.
- Agarwal, S. and S. Ramaswami (1992b), "El potencial de mercado y la diferencia sociocultural en la elección de joint –ventures", *Economía Industrial*, gener-feb, 67-76.
- Alonso, J. A. (1994), "El proceso de la internacionalización de la empresa", *Información Comercial Española*, 725, 127-143.
- Anderson, E. and H. Gatignon (1986), "Modes of foreign entry: A transaction cost analysis", *Journal of International Business Studies*, vol. 17, 1-26.
- Anderson, E. and A. Coughlan (1987), "International market entry and expansion via independent or integrated channels of distribution", *Journal of Marketing*, vol. 51,1, 71-82.
- Asiedu, E. and H.S. Esfahani (2001), "Ownership structure in foreign direct investment projects", *Review of Economics and Statistics*, 83,4, 647-662.
- Barbosa, N. and H. Louri (2002), "On the determinants of multinational ownership preferences: evidence from Greece and Portugal", *International Journal of Industrial Organisation*, 20, 493-515.
- Brouthers, K. and Brouthers, L. (2001), "Explaining the national cultural distance paradox", *Journal of International Business Studies*, 32,1, 177-189.
- Brouthers, K., Brouthers, L. and S. Werner (1996), "Dunning's eclectic theory and the smaller firm: the impact of ownership and locational advantages on the choice of entry-modes in the computer software industry", *International Business Review*, 5,4, 377-394.
- Buckley, P.J. and M. Casson (1976), *The future of the multinational enterprise*. London: MacMillan.
- Contractor, F. (1990), "Ownership patterns of US joint ventures abroad and the liberalization of foreign government regulations in the 1980s: evidence from the benchmark surveys", *Journal of International Business Studies*, 1st quarter, 55-73.

- Contractor, F. and S. Kundu (1998), "Modal choice in a world of alliances: analyzing organizational forms in the international hotel sector", *Journal of International Business Studies*, 29,2, 325-358.
- Dunning, J. H. (1977), "Trade, location of economic activity and the multinational enterprise: A search for an eclectic approach", IN: Ohlin, B.; Hesselborn, P.O. and P.M. Wijkman (eds.), *The international allocation of economic activity*. London: MacMillan.
- Dunning, J. H. (1993), *Multinational Enterprises and the global economy*. Workingham: Addison-Wesley.
- Durán, J.J. (1987), "Decisiones de inversión directa en el exterior de la empresa española, 1979-1985", *Información Comercial Española*, 643, 73-86.
- Erramilli, M. (1991), "The experience factor in foreign entry behaviour of service firms", *Journal of International Business Studies*, vol.22, 3, 479-501.
- Erramilli, M., Agarwal, S. and S. Kim (1997), "Are firm-specific advantages location-specific too?", *Journal of International Business Studies*, 4th quarter, 735-758.
- Fontrodona, J. and J.M. Hernández (2001), *Les multinacionals industrials catalanes. 2001*. Barcelona. Departament d'Indústria, Comerç i Turisme de la Generalitat de Catalunya. Direcció General d'Indústria.
- Gatignon, H and E. Anderson (1988), "The multinational corporation's degree of control over foreign subsidiaries: an empirical test of a transaction cost explanation", *Journal of Law, Economics and Organization*, 42, 305-336.
- Gomes-Casseres, B. (1989), "Ownership structures of foreign subsidiaries", *Journal of Economic Behaviour and Organization*, 2, 1-25.
- Gomes-Casseres, B. (1990), "Firm ownership preferences and host government restrictions: an integrated approach", *Journal of International Business Studies*, 1st quarter, 1-24.
- Gutiérrez, A. and L. J. Heras (2000), "La proyección exterior de las empresas españolas: una contrastación empírica de la teoría gradualista de la internacionalización", *Información Comercial Española*, 788, 7-20.
- Hennart, J. F.(1982), *A theory of the multinational enterprise*. Ann Arbor: University of Michigan Press.
- Hennart, J. F. (1988), "A transaction cost theory of equity joint ventures", *Strategic Management Journal*, 9, 361-374.

- Hennart, J. F. (1991) "The transaction costs theory of joint ventures: an empirical study of Japanese subsidiaries in the United States", *Management Science*, 37, 483-497.
- Hennart, J. F. and J. Larimo (1998), "The impact of culture on the strategy of multinational enterprises: does national origin affect ownership decisions?", *Journal of International Business Studies*, 29,3, 515-538.
- Hill, C., Hwang, P. and W. Kim (1990), "An eclectic theory of the choice of international entry mode", *Strategic Management Journal*, 11, 117-128.
- Hofstede, G. (1980), *Culture's consequences: international differences in work-related values*. London: Sage Publications.
- Hofstede, G. (2001), *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. (2nd edn). London. Sage Publications.
- IDESCAT, *Estadística, producció i comptes de la indústria* (several years).
- INE (2000), *Encuesta sobre innovación tecnológica en las empresas* (several years).
- Institutional Investor* (several years).
- Kim, W, and P. Hwang (1992), "Global strategy and multinationals entry mode choice", *Journal of International Business Studies*, 1st quarter, 29-53.
- Kogut, B. and H. Singh (1988): "The effect of national culture on the choice of entry mode", *Journal of International Business*, Vol. 19, pp. 411-432.
- Kogut, B. and U. Zander (1993), "Knowledge of the firm and the evolutionary theory of the multinational corporation", *Journal of International Business Studies*, 4th quarter, 625-645.
- Lecraw, D. (1984), "Bargaining power, ownership, and profitability of transnational corporations in developing countries", *Journal of International Business Studies*, Spring/summer, 27-43.
- Liu, X., Song, H., Wei, Y. and P. Romilly (1997), "Country characteristics and foreign direct investment in China: a panel data analysis", *Weltwirtschaftliches Archiv*, 133 (2), 313-330.
- López, C. and E. García (1998), "La estructura de propiedad de la inversión directa en el exterior", *Investigaciones Económicas*, XXII (1), 19-44.
- López, C. and E. García (1999), *Foreign investors' choice of mode of entry: an integrative framework*. Working Document No 191 Universidad de Oviedo.
- Madhok, A. (1997), "Cost, value and foreign market entry mode: the transaction and the firm", *Strategic Management Journal*, 18, 39-61.

- Madhok, A. (1998), “ The nature of multinational firm boundaries: transaction costs, firm capabilities, and foreign market entry mode”, *International Business Review*, 7, 259-290.
- Makino, S. and K. Neupert (2000), “National culture, transaction costs, and the choice between joint venture and wholly owned subsidiary”, *Journal of International Business Studies*, 31, 4, 705-713.
- Maté, J. M. (1996), “Factores determinantes del comportamiento diferencial de las empresas industriales españolas que invierten en el extranjero”, Working Document No. 129. Fundación Fondo para la Investigación Económica y Social. Confederación Española de Cajas de Ahorros.
- Meyer, K. (2001), “Institutions, transaction costs, and entry mode choice in Eastern Europe”, *Journal of International Business Studies*, 32,2, 357-367.
- Molero, J. (1998), “Patterns of internationalization of Spanish innovatory firms”, *Research Policy*, 27, 541-558.
- Mutinelli, M. and L. Piscitello (1998a), “ The entry mode choice of MNEs: an evolutionary approach”, *Research Policy*, 27, 491-506.
- Mutinelli, M. and L. Piscitello (1998b), “The influence of firm’s size and international experience on the ownership structure of Italian FDI in manufacturing”, *Small Business Economics*, 11, 43-56.
- Padmanabhan, P. and K. Cho (1996), “Ownership strategy for a foreign subsidiary: an empirical investigation of Japanese firms”, *Management International Review*, vol.36,1, 45-65.
- Padmanabhan, P. and K. Cho (1999), “Decision specific experience in foreign ownership and establishment strategies: evidence from Japanese firms”, *Journal of International Business Studies*,30,1, 25-44.
- Pan,Y. (1996), “Influences on foreign equity ownership level in joint ventures in China”, *Journal of International Business Studies*, 1st quarter, 1-26.
- Pan,Y. and D. Tse (2000), “The hierarchial model of market entry modes”, *Journal of International Business Studies*, 31,4, 535-554.
- Pla, J. (1999), “Filiales y entrada en los mercados internacionales. Factores determinantes”, *Revista de Economía Aplicada*, No.20, vol. VII, 29-51.
- Ramachandran, V. (1993), “Technology transfer, firm ownership, and investment in human capital”, *Review of Economics and Statistics*, 75, 664-670.

Ramón, A. (2001), “Determinantes de la forma de expansión internacional. El caso de la industria hotelera española”, IV Encuentro de Economía Aplicada, Reus (Tarragona).

UNESCO, *Statistical Yearbook*, varios años.

Website of the Dirección General de Comercio e Inversiones del Ministerio de Economía, www.mcx.es/polco

Website of the Instituto Nacional de Estadística, www.ine.es

Website of the Institut d'Estadística de Catalunya, www.idescat.es

Williamson, O. E. (1975), *Markets and hierarchies*, New York: The Free Press.

Williamson, O. E. (1985), *The economic institutions of capitalism*. New York: The Free Press.

World Bank, *World Development Indicators*, CD-ROM.

SÈRIE DE DOCUMENTS DE TREBALL DE L'IEB

2000

2000/1 - Esteller, A.; Solé, A., "Vertical Income Tax Externalities and Fiscal Interdependence: Evidence from the US"

Publicat a: *Regional Science and Urban Economics*, 31 (2-3), pàgs. 247-72, 2001.

2000/2 - Castells, A., "The role of intergovernmental finance in achieving diversity and cohesion: the case of Spain"

Publicat a: *Environment and Planning C: Government and Policy*, 19 (2), pàgs. 189-206, 2001.

2000/3 - Costa, M.T.; Segarra, A. (URV); Viladecans, E., "Pautas de localización de las nuevas empresas y flexibilidad territorial"

2000/4 - Costa, M.T.; Duch, N.; Lladós, J. (UAB), "Determinantes de la innovación y efectos sobre la competitividad: el caso de las empresas textiles"

Publicat a: *Revista Asturiana de Economía*, 20, pàgs. 53-80, 2001.

2000/5 - Solé, A., "Determinantes del gasto público local: necesidades de gasto vs. capacidad fiscal"

Publicat a: *Revista de Economía Aplicada*, 9 (25), pàgs. 115-56, 2001, sota el títol "Determinantes del gasto público local: ¿Necesidades de gasto o capacidad fiscal?"

2000/6 - Barberán, R. (U. de Zaragoza); Bosch, N.; Castells, A.; Espasa, M., "The redistributive power of the Central Government Budget"

2001

2001/1 - Espasa, M., "The territorial redistribution of the EU budget. Empirical evidence at national and regional level"

Publicat a: *Environment and Planning C: Government and Policy*, 19 (5), pàgs. 771-790, 2001, sota el títol "The territorial redistributive power of the EU budget. Empirical evidence at national and regional level"

2001/2 - Viladecans, E., "La concentración territorial de las empresas industriales: un estudio sobre la unidad geográfica de análisis mediante técnicas de econometría espacial"

Publicat a: *Papeles de Economía Española*, 89/90, pàgs. 308-320, 2001, sota el títol "La concentración territorial de las empresas industriales. Un estudio sobre el tamaño de las empresas y su proximidad geográfica"

2001/3 - Castells, A., "La descentralización de las políticas sociales en el Estado del Bienestar"

2001/4 - Bosch, N.; Pedraja, F. (U. de Extremadura); Suárez-Pandiello, J. (U. de Oviedo), "The influence of Environmental Variables in Measuring the Efficiency of Refuse Collection Services: An Application to the Spanish Municipalities"

Publicat a: *Local Government Studies*, 26 (3), pàgs. 71-90, 2000.

2001/5 - Solé, A., "Budget spillovers in a metropolitan area: typology and empirical evidence"

2001/6 - Sanromà, E.; Ramos, R. (UB-AQR), "Local human capital and external economies: evidence for Spain"

2001/7 - Leonida, L. (U. Della Calabria); Montolio, D., "Convergence and Inter-Distributional Dynamics among the Spanish Provinces. A Non-parametric Density Estimation Approach"

2001/8 - García Quevedo, J., "University research and the location of patents in Spain"

Publicat a: *Papeles de Economía Española*, 93 pàgs. 98-108, sota el títol "Investigación universitaria y localización de las patentes en España"

2001/9 - Esteller, A.; Solé A., "Tax Setting in a Federal System: The Case of Personal Income Taxation in Canada"

Publicat a: *International Tax and Public Finance*, 9, pàgs. 235-57, 2002, sota el títol "An empirical analysis of vertical tax externalities: The case of personal income taxation in Canada"

2001/10 - Durán J.M.; Gispert, C. de, "Fiscalidad medioambiental sobre la energía: propuestas para España "

Publicat a: *Energía, fiscalidad y medio ambiente en España*, a A. Gago i X. Labandeira (Dir.), 7, pàgs. 171-192, 2002, sota el títol "La imposición energético-ambiental en España"

SÈRIE DE DOCUMENTS DE TREBALL DE L'IEB

2001/11 - Álvarez, M., "España y la senda de desarrollo de la inversión directa: una aproximación"

2002

2002/1 - Bosch, N.; Espasa, M.; Sorribas, P., "La capacidad redistributiva y estabilizadora del presupuesto del Gobierno Central Español"

Publicat a: *Hacienda Pública Española/Revista de Economía Pública*, 160 (1), pàgs. 47-76, 2002.

2002/2 - García Quevedo, J., "The location of innovation. Universities and technological infrastructure in Spain"

2002/3 - Viladecans Marsal, E., "The growth of cities: Does agglomeration matter?"

Publicat a: J.C. Jiménez (Dir.) *Economía y territorio: Una nueva relación*, pàgs. 97-125, 2003, sota el títol "Los factores de crecimiento de las ciudades"

2002/4 - Pons Novell, J.; Tirado Fabregat, D.A. (UB), "Discontinuidades en el crecimiento económico en el periodo 1870-1994: España en perspectiva comparada"

2002/5 - Bosch, N.; Espasa, M.; Sorribas, P., "The redistributive, stabiliser and insurance effects at territorial level of "federal" government budgets"

Publicat a: *Environment and Planning C: Government and Policy*, 21, pàgs. 597-613, 2003.

2002/6 - Callejón, M. (UB); **García Quevedo, J.**, "Las ayudas públicas a la I+D empresarial. Un análisis sectorial"

2003

2003/1 - Solé Ollé, A.; Viladecans Marsal, E., "Fiscal and growth spillovers in large urban areas"

2003/2 - Gual, J. (IESE); **Trillas, F.**, "Telecommunications Policies: Determinants and Impact"

2003/3 - Leonida, L. (U. Della Calabria); **Montolio, D.**, "Public Capital, Growth and Convergence in Spain. A Counterfactual Density Estimation Approach"

2003/4 - Álvarez, M., "FDI Determinant Factors: The Case of Catalan Multinational Manufacturing Firms"