Shrader, Rodney C., Benjamin M. Oviatt, and Patricia P. McDougall (1997), "Overcoming foreign market risks: The case of new ventures," Paper Presented at the Annual Academy of Management Conference, Boston, August 1997.

Stinchcombe, Arthur (1965), "Social structure and organizations," in Handbook of Organizations, James G. March, ed. Chicago: Rand McNally.

Teece, David J., Gary Pisano, and Amy Shuen (1997), "Dynamic capabilities and strategic management," Strategic Management Journal, 18(7), 509-533.

Waters, Malcolm (1995), Globalization. London: Routledge.

Williamson, Oliver E. (1985), The Economic Institutions of Capitalism. New York: Free Press.

Zacharakis, Andrew L. (1997), "Entrepreneurial entry into foreign markets: A transaction cost perspective," Entrepreneurship Theory & Practice, (Spring), 23-39.

Technology Small Firms. London: Pinter Publishers.

Oviatt, Benjamin M., and Patricia P. McDougall (1997), "Challenges for internationalization process theory: The case of international new ventures," Management International Review, 37(Special Issue 2), 85-99.

Oviatt, Benjamin, and Patricia P. McDougall (1994), "Toward a Theory of International New Ventures," Journal of International Business Studies, 25(1), 45-64.

Reuber, A. R., and Eileen Fisher (1997), "The influence of the management team's international experience on the internationalization behavior of SMEs," Journal of International Business Studies, 28(4), 807-825.

Roberts, Edward B. (1991), Entrepreneurs in High Technology. New York: Oxford University Press.

Roberts, Edward B., and Senturia Todd A. (1996), "Globalizing the emerging high-technology company," Industrial Marketing Management, 25, 491-506.

Root, Franklin R. (1994), Entry Strategies for International Markets. New York: Lexington Books.

Lindqvist, Maria (1991), Infant Multinationals: The Internationalization of Young, Technology-Based Swedish Firms. Unpublished doctoral dissertation. Stockholm: Stockholm School of Economics, Institute of International Business.

Madhok, Anoop (1997), "Cost, value and foreign market entry mode: The transaction and the firm," Strategic Management Journal, 18, 39-61.

McDougall, Patricia P., Scott Shane, and Benjamin Oviatt (1994), "Explaining the Formation of International New Ventures: The Limits of International Business Research ," Journal of Business Venturing, 9(Nov. 1994), 469-487.

Meldrum, M. J. (1995), "Marketing high-tech products: The emerging themes," European Journal of Marketing, 29(10), 45-58.

Murray, Gordon C. (1996), "A Synthesis of Six Exploratory, European Case Studies of Successfully-Exited, Venture Capital Financed, New Technology Based Firms," Entrepreneurship Theory and Practice, 20, 44-60.

Oakey, Ray, Roy Rothwell, and Sarah Cooper (1988), The Management of Innovation in High-

---- (1990), "The mechanism of internationalization," International Marketing Review, 7(4), 11-24.

Jolly, V. K., Matti Alahuhta, and Jean-Pierre Jeannet (1992), "Challenging the incumbent: how high-technology start-ups compete globally," Journal of Strategic Change, 1, 71-82.

Klein, Saul, Gary L. Frazier, and Victor J. Roth (1990), "A transaction cost analysis model of channel integration in international markets," Journal of Marketing Research, 27(May), 196-208.

Knight, Gary A., and S. T. Cavusgil (1996), "The born global firm: A challenge to traditional internationalization theory," Advances in International Marketing, 8(11-26).

Kogut, Bruce, and Harbir Singh (1988), "The effect of national culture on the choice of entry mode," Journal of International Business Studies, 19(3), 411-432.

Leonidou, Leonidas C., and Constanine S. Katsikeas (1996), "The export development process: An integrative review of empirical models," Journal of International Business Studies, (Third Quarter 1996), 517-551.

Lindell, Martin, and Necmi Karagozoglu (1997), "Global strategies of US and Scandinavian R&D intensive small- and medium-sized companies," European Management Journal, 15(1), 92-100.

Gemünden, Hans G. (1991), "Success factors of export marketing: a meta-analytic critique of the empirical studies," in New Perspectives on International Marketing, Stanley J. Paliwoda, ed. London: Routledge.

Heide, Jan B., and George John (1994), "Interorganizational governance in marketing channels," Journal of Marketing, 56(April), 32-44.

Hennart, Jean F. (1989), "Can the 'new forms of investment' substitute for the 'old forms'?," Journal of International Business Studies, 20(2), 211-234.

Hennart, Jean-Francois (1990), "A transaction cost theory of equity joint ventures," Strategic Management Journal, 9(4), 361-374.

Hill, Charles W. L., Peter Hwang, and W. C. Kim (1990), "An eclectic theory of the choice of international entry mode," Strategic Management Journal, 11, 117-128.

Johanson, Jan, and Jan-Erik Vahlne (1977), "The internationalization process of the firm -A model of knowledge development and increasing foreign market commitment," Journal of International Business Studies, 4, 20-29.

Brush, Candida G., and Pieter A. Vanderwerf (1992), "A comparison of methods and sources for obtaining estimates of new venture performance," Journal of Business Venturing, 7, 157-170.

Butchart R. (1987), "A new UK definition of high-technology industries," Economic Trends, 400, 82-88.

Cavusgil, S. T. (1980), "On the internationalization process of the firm," European Research, 8(6), 273-281.

Cavusgil, S. T., and Shaoming Zou (1994), "Marketing strategy-performance relationship: An investigation of the empirical links in export markets," Journal of Marketing, 58, 1-21.

Cavusgil, S. T., Shaoming Zou, and G. M. Naidu (1993), "Product and promotion adaptation in export ventures: An empirical investigation," Journal of International Business Studies, 24(3), 479-506.

Davidson, W. H., and D. G. McFetridge (1985), "Key characteristics in the choice of international technology transfer mode ," Journal of International Business Studies, 16(Summer), 5-21.

Erramilli, M. K., and C. P. Rao (1993), "Service firms' international entry-mode choice: a modified transaction cost analysis approach ," Journal of Marketing, 57(July), 19-38.

Bamberger, Ingolf, and Michael Evers (1994), "Internationalization behavior of small and medium-sized enterprises - empirical results," in Product/Market Strategies of Small and Medium-sized Enterprises, Ingolf Bamberger, ed. Aldershot: Ashgate Publishing.

Barkema, Harry G., and Freek Vermeulen (1998), "International expansion through start-up or acquisition: A learning perspective," Academy of Management Journal, 41(1), 7-26.

Bell, Jim (1995), "The internationalization of small computer software firms - A further challenge to stage theories," European Journal of Marketing, 29(8), 60-75.

Bloodgood, James M., Harry J. Sapienza, and James G. Almeida (1996), "The internationalization of new high-potential U.S. ventures: Antecedents and outcomes," Entrepreneurship Theory & Practice, 20, 61-76.

Boter, Håkan, and Carin Holmquist (1996), "Industry characteristics and internationalization processes in small firms," Journal of Business Venturing, 11, 471-487.

Brüderl, Josef, and Rudolf Schüssler (1990), "Organizational mortality: The liabilities of newness and adolescence," Administrative Science Quarterly, 35, 530-547.

Bibliography

Agarwal, Sanjeev, and Sridhar Ramaswami (1992), "Choice of foreign market entry mode: Impact of ownership, location and internalization factors," Journal of International Business Studies, 23(1), 1-27.

Andersen, Otto (1997), "Internationalization and Market Entry Mode: A review of theories and conceptual frameworks," Management International Review, 37(Special Issue 2), 27-42.

---- (1993), "On the internationalization process of firms: A critical analysis," Journal of International Business Studies, 24(2), 209-231.

Anderson, Erin, and Hubert A. Gatignon (1986), "Modes of foreign market entry: A transaction cost analysis and propositions," Journal of International Business Studies, 17(3), 1-26.

Anderson, James C., and James A. Narus (1990), "A model of distributor firm and manufacturer firm working partnerships," Journal of Marketing, 54(1), 42-58.

Aulakh, Preet S., and Masaaki Kotabe (1997), "Antecedents and performance implications of channel integration in foreign markets ," Journal of International Business Studies, 27(1), 145-175.

TABLE 5

Estimation Results of the Probit Models

Variable	**Model I**	**Model II**	**Model III**
Firm Size	0.095	0.119	0.08
	(0.008)***	(0.002)***	(0.037)**
Management - living experience abroad	-0.106	-0.129	-0.105
	(0.081)*	(0.058)*	(0.140)
Management - Previous work experience in internationally operating firm	-0.020	-0.017	-0.091
	(0.734)	(0.801)	(0.199)
Firm experience in international sales prior to market entry (in years)	-0.004	0.006	-0.224
	(0.780)	(0.680)	(0.231)
Domestic Sales Mode	0.368	0.457	0.343
	(0.000)***	(0.000)***	(0.000)***
Products based on new combinations of tested technology	0.162	0.128	0.118
	(0.069)*	(0.188)	(0.272)
Products based on novel technology developed outside	0.319	0.346	0.258
	(0.001)***	(0.002)***	(0.043)**
Products based on novel technology developed in-house	0.204	0.179	0.188
	(0.021)**	(0.062)*	(0.073)*
Degree of Customization	-0.068	-0.053	-0.057
	(0.001)**	(0.017)**	(0.016)**
Cost of Sales	0.001	-0.009	0.041
	(0.976)	(0.800)	(0.307)
Industry: Software	-0.084	-0.061	0.010
	(0.424)	(0.591)	(0.929)
Industry: IT Hardware	0.070	0.060	0.112
	(0.435)	(0.553)	(0.284)
Industry: Engineering	0.122	0.141	0.157
	(0.179)	(0.173)	(0.145)
Industry: Biotechnology/Medical Technology	0.429	0.460	0.469
	(0.000)***	(0.000)***	(0.000)***
R&D expenditures	-0.003	-0.002	-0.003
	(0.030)**	(0.142)	(0.080)*
Target Country: Absolute Market Size	-0.005	-0.033	-0.005
	(0.006)***	(0.078)*	(0.010)***
Target Country: Country Risk	0.001	0.001	0.001
	(0.643)	(0.538)	(0.730)
Number of observations	398	339	297
Log Likelihood	-219.26	-185.52	-167.71
chi2 (df)	109.98	98.90	76.22
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.20	0.21	0.19
Classification ratio	70.60	73.16	71.04

*** 1 % Significance Level; ** 5 % Significance Level; * 10 % Significance Level
Base case: An electronics company selling products incorporating tried and tested technology

TABLE 4

Geographical Focus of International Activities

Unit of Analysis	**Entries**		**Firms**	
Entry Mode	Current Entries	%	First Country Entered	%
EU/EFTA	307	56	138	57
US & Canada	106	19	56	22
East Asia (Japan, HK, Sing., Korea, Taiwan)	37	7	14	6
Australia & New Zealand	25	5	6	2
Emerging Markets, Europe	12	2	2	1
South America	3	1	3	1
Middle East	22	4	11	5
Emerging Markets, Asia	13	2	4	2
Other	21	4	10	4
Total	**547**	**100**	**244**	**100**

TABLE 3

First and Current Entry Modes

Entry Mode	**First Entry**	**%**	**Current Entry**	**%**
Exporting	241	44	199	36
Agents	68	12	60	11
Distributors	198	36	227	42
Sales joint venture	12	2	27	5
Wholly-owned sales subsidiary	7	1	15	3
Licensing	11	2	9	2
Missing / other	10	2	10	2
Total	**547**	**100**	**547**	**100**

Note: The table shows the first and current entry modes used in the most important foreign markets for the company's best selling product.

TABLE 2

International Activities of Sample Firms

Variable	Mean	Std Dev	Min	Max	Median
International sales (% Total Firms)	67.9	46.7			
Share of non-domestic revenue (%)	38.4	31.7	1	100	30
Number of countries entered	10.0	11.9	1	90	6
Years before first international sales	2.2	2.1	0	10	2

TABLE 1

Descriptive Statistics

Variable	**Mean**	**Std Dev**	**Minimum**	**Maximum**	**Median**
Age	5.8	2.6	0	10	6
Sales, first year *	274	508	0	6900	124
Sales, last year *	1215	1722	50	16100	650
Employees, first year	4.4	6.5	1	50	3
Employees, last year	20.0	24.2	1	180	12
R&D intensity (% of sales)	16.7	22.0	0	150	8
R&D intensity (% of employees)	30.7	23.0	0	1.00	25

* sales in £000

Notes:

[1] As Oviatt and McDougall (1994) point out, this may not be a disadvantage. For international new ventures, organizational routines that make no difference whether sales are domestic or international can be a source of future competitive advantage.

[2] Furthermore, this variable allows us to capture different effects that impact on the sales channel choice irrespectively of the setting. It is not the objective of the present study to determine those factors as we are primarily interested in the implications of doing business in a foreign environment. We do, however, include this variable as a proxy in order to avoid a possible bias in our results.

[3] The chosen service NACE codes (telecommunications services and software) only allow for a crude classification of relatively new industries such as software. Accordingly, retail outlets for software and computer hardware are frequently classified as NACE 72.20. The sharp reduction of the number of eligible firms can be attributed mainly to the removal of these firms from the database.

[4] Respondents did for example indicate sales modes such as the formation of export co-operatives and global distribution deals with multinationals. In the latter case, the sales transaction has been carried out between the UK subsidiary of the multinational and the start-up, whose international activities mainly consisted of setting up technical support offices abroad. Due to their heterogeneity, these entry modes are excluded from the analysis.

[5] We are grateful to one of the reviewers whose comments helped to clarify this point.

[6] We have also estimated our models excluding this variable. This did not lead to any directional changes of the effects of the independent variables. Furthermore, there were no changes of significance and the magnitude of effects in relation to each other remained fairly similar. Results are available from the authors on request.

Appendix 3:

Correlation Table

	distri	size	exp_abr	exp_mult	exp_int	dis_dom	rd_sh	tec_2	tec_3	tec_4	custom	cost
distri	1.0000											
size	0.0567	1.0000										
exp_abr	-0.0795	0.0201	1.0000									
exp_mult	0.0295	-0.0390	0.1802*	1.0000								
exp_int	0.0164	0.0842	-0.0147	0.0904*	1.0000							
dis_dom	0.2893*	-0.0318	-0.1262*	0.1157*	-0.0037	1.0000						
rd_sh	-0.1010*	0.0797	0.0418	0.0077	-0.0827	-0.0837	1.0000					
tec_2	0.0732	-0.0869*	0.0095	-0.0232	-0.0904*	0.1850*	-0.0689	1.0000				
tec_3	0.0108	0.0680	0.0041	0.0481	0.0487	-0.1242*	0.1407*	-0.2449*	1.0000			
tec_4	-0.0297	-0.0702	0.0684	-0.0710	0.0375	-0.1103*	0.1279*	-0.5418*	-0.3213*	1.0000		
custom	-0.2262*	0.0335	0.0297	0.0071	-0.0167	-0.1706*	-0.0843*	0.0303	0.0284	-0.0951*	1.0000	
cost	0.0103	0.1584*	0.0176	0.0347	0.1447*	-0.0433	0.0853*	-0.0707	0.1711*	0.1145*	0.3004*	1.0000

* significant at p>0.05

distri	dummy (1 = foreign sales through distributors, 0 = direct exporting)
size	size of the firm
exp_abr	living experience abroad (1 = yes, 0 = no)
exp_mult	work experience in internationally operating firm (1 = yes, 0 = no)
exp_int	international experience of firm (year of analysed entry decision - year of first foreign sales)
dis_dom	domestic sales through dealers / distributors (1 = yes, 0 = no)
rd_sh	R&D expenditure relative to total sales
tec_2	new combinations of existing technology (1 = yes, 0 = no)
tec_3	product incorporates novel technology developed externally (1 = yes, 0 = no)
tec_4	product incorporates novel technology developed internally (1 = yes, 0 = no)
custom	extent to which product requires client-specific customisation (1=little, 5=substantial)
cost	pre- and after sales requirements during the commercialisation (1=little, 5=substantial)

Appendix 1

Industry sectors included in the study

Industry	NACE Classifications
Software	7220, 7260
IT and Communications Hardware	3001, 3002, 3220, 3230
Engineering	3320, 3330, 3340
Life Sciences and Medical Technology	2441, 2442, 3310
Other (mainly electronics, components)	3110, 3120, 3210, 3530, 2416, 2417

Note: The NACE classification system is the European Union-wide equivalent of the SIC code system.

Appendix 2

Operationalization of variables

a) Innovativeness of Technology:

How would you best describe the innovativeness of your product or service?

- ☐ It incorporates 'tried and tested' combinations of existing technology
- ☐ It incorporates new combinations of existing technology
- ☐ It incorporates novel technology that has been developed elsewhere
- ☐ It incorporates novel technology that had to be developed specifically for this product by your company

b) Customization

Please describe the extent to which your product or service requires:

	low				substantial	does not apply
Individual client customization	☐	☐	☐	☐	☐	..... ☐

c) Transaction Cost Intensity

Please describe key characteristics of the product / service, particularly the extent to which it requires:

	low				substantial	does not apply
Technical consultation prior to sales	☐	☐	☐	☐	☐	..... ☐
Complex or time-consuming installation	☐	☐	☐	☐	☐	..... ☐
Regular maintenance and/or upgrades	☐	☐	☐	☐	☐	..... ☐
Specialized training required for front line and sales personnel	☐	☐	☐	☐	☐	..... ☐

marginal importance in our sample. Further research on those technology start-ups that engage in a wider spectrum of entry modes could reveal whether or not the effects identified by our research can account for differences between the involvement of intermediaries and the completely internalized entry decisions when firms set up foreign subsidiaries. Second, our study can, for the moment being, not reveal any performance implications of the choice of different entry modes. Despite the availability of data on firm growth, we cannot presently distinguish between cause and effect for the majority of firms in our sample, i.e. the growth could either be a result of the chosen entry mode or vice versa. However, we plan to contact the participants of our study again in the future in order to investigate long term performance implications of different market entry strategies. Finally, our sample is drawn exclusively from high-tech start-ups in the UK. Further research should therefore address whether similar findings can be reported from other countries and other industry sectors characterized by the presence of internationally operating entrepreneurial start-ups.

resource constraints prevent firms from choosing between the two discussed entry modes. Instead, managers should be aware that the choice is more likely to be influenced by the degree of customization of the product.

Finally, it appears that in getting a new, technologically advanced product into the market, start-ups with a necessarily limited record of achievement should seriously consider collaboration in order to exploit the track-record or reputation of an established intermediary. The much quoted concept of "liability of newness" posits that young firms face disadvantages as stable relations with clients are not yet established (Stinchcombe 1965; Brüderl and Schüssler 1990). In cross-border business relationships, this may well amplify into what we call the "liability of alienness". The dislike of customers in relying on small, untested and foreign suppliers is particularly important in the sensitive field of medical technology as is evidenced in our results. However, this antipathy to uncertainty by customers can be extended to all users of mission-critical technologies provided by young and unproven, third party suppliers. In such circumstances, and particularly where there are costly implications for product failure or non-performance, an exclusive dependence on a young company provider is not an acceptable proposition for any established corporate user. The use of a trusted distributor, or more accurately ‘value-added reseller’, and its existing sales force is frequently the only effective way for a young high tech company to present products to mainstream customers early in its development. Distributors may also be essential for supplying widely dispersed customers in a continental scale market like the USA or where there are major cultural disparities between provider and user such as China.

Limitations

Our study is, of course, not without limitations. First, we only focus on two distinct entry modes in our analysis. We do so, as licensing and entry modes requiring direct capital investments were only of

appropriate choice. If there are serious question marks regarding the firms' ability to provide user support in distant markets, the firm may have little choice but to chose a more established and recognized distributor. In making this choice, the firm is in effect subcontracting a part of its growth strategy to an agent. For the latter, the young firm is only one of a number of clients. In addition, the firm’s bargaining power may be quite small in comparison to other, bigger, higher volume and longer committed clients of the distributor. As a result, a situation with high conflict potential emerges. To the distributor, providing a service to this type of immature firm represents a series of necessary but highly speculative, specialist investments or sunk costs. The distributor's choice of accepting the innovative products of an unknown start-up will therefore depend on the projected sales volume. As a result, young firms that cannot meet their distributors' expectations will be left with no other choice than to sell direct.

At a pragmatic level, our research has identified a number of practical implications for the managers of technology-based start-ups. We isolate three findings which we believe professional managers might find helpful. Firstly, those young firms wishing to use distributors in foreign markets can benefit from using collaborative relationships in their domestic market first. Learning effects in managing relationships with intermediaries may be more easily gained in the domestic market and at less cost. In certain circumstances this learning may also be less risky given, for example, easier communication and/or negligible psychic distance. Even for "born global" firms, market based experimentation in the domestic market may still have these advantages.

Secondly, those firms which sell a highly customized product should be prepared to commit appropriate resources to their pre-sales and after-sales service strategy given their reliance on direct exports. In giving this advice, we are aware that our research findings show that firms appear to choose a mode of foreign market entry irrespective of the resource implications of the commercialization process. Similarly, our findings also showed that the size or resource endowment of individual firms had a very weak, albeit statistically significant, effect on the choice of mode of market entry. In short, it does not appear that

capability theorists) had a higher chance of being dealt with through collaborative arrangements rather than being exported. While this indicates the international market entry forms are actually influenced by product specific factors, the effects observed directly contradict the theoretical prescriptions and findings on technology transfer modes of larger firms (Davidson and McFetridge 1985). However, they do corroborate the recent findings of Robertson and Gatignon (1998) who report that firms that experienced higher technology uncertainties were more likely to engage in alliances.

Our strongest predictor of the chosen foreign entry mode was the existing, domestic sales mode of the firm.[6] The effect of this variable can be explained in two ways. First, it is a proxy for different strategic and structural influence factors that impact on sales channel choice irrespectively of the context. This variable therefore partly accounts for unobservable effects whose determination was not among the objectives of the study. Second, the explanatory effect of this variable is arguably due to the presence of embedded routines and experiences with the domestic sales mode. This finding does therefore support theoretical propositions which stress the importance of firm-specific routines and the path dependence of organizational outcomes (Madhok 1997). However, further research should necessarily use a more refined measure in order to determine to what extent foreign entry decisions are a result of path dependency or company marketing strategy.

Managerial Implications

The results of this research confirm what the high tech entrepreneurial manager will already know. Namely, that the early decision of an appropriate mode of exporting is not a trivial activity. On the contrary, it is an activity of the most profound strategic import and has implications which are long term in their effect. In an ideal world, it is likely that any firm would prefer to be in charge of its destiny and would chose a direct export mode of operation or build up a wholly owned subsidiary. Yet, the latter is usually without the reach of a young start-up company. Exporting, on the other hand, is not always an

having to acquire or invest in certain skills in order to guarantee the effective commercialization of a client manufacturer's product. Such a commitment is only attractive to the distributor if a large volume of sales is a reasonably guaranteed consequence of this investment. All other things being equal, customization and after-sales support should both act as a barrier to the interest or involvement of intermediaries in the sales process. However, from the point of view of a firm who wants to serve a large or remote foreign markets, the use of a local distributor may be the only practicable way of providing the necessary customer focused infrastructure for installation, maintenance, upgrading and/or training of end-users. We tried to decompose this dilemma and argued that highly customized products are more likely to be exported by manufacturers directly because of their singular familiarity with their core technology. The costs of acquiring these specialized technological skills may be prohibitive and economically irrational for a distributor. However in certain cases when the distributor already has a portfolio of related products and technologies in place, the relative costs of both learning and subsequently operationalizing the standard and routinized tasks of installation, end-user training and maintenance are likely to be much lower because of both scale and scope effects. Therefore, in these circumstances, selling a volume product or product family whose commercialization requires high levels of support through intermediaries might be less problematic. The fact that the two variables have different effects in the regression (significantly negative in the case of customization vs. insignificantly positive for sales support) is therefore an interesting result in itself which goes a certain way to support our reasoning. It suggests that customization represents a barrier to involving intermediaries whereas the attendant cost of sales support can be managed and may even be a source of attractive profit for the distributor given sufficient trading volume to ensure scale effects.

The newness of the technology incorporated did have a significant impact on the choice of the entry mode, albeit in the opposite direction to that which we hypothesized. Compared to the base case of mature and tested technologies, transactions involving products that incorporated more innovative technology (and hence embodying a higher degree of tacit knowledge according to the organizational

assistance of intermediaries. A possible interpretation of this finding is that internationally experienced managers do not need to rely on the superior market knowledge or commercial network of a local distributor in order to commercialize their products abroad. Their tenure abroad means that they already have their own personal networks and are able to evaluate them in comparison to the services offered by a distributor. We conclude from these findings that, as far as the high-tech start-ups of our sample are concerned, experiential knowledge, the key variable in the internationalization process theory (Andersen 1997), is of limited value to explain the entry mode choices of the firms in our sample. This echoes the findings of other researchers (see for example Bell 1995). In addition, our findings could provide further evidence for those researchers that argued that different entry modes represent to a lesser extent distinct levels of commitment determined by past experience but rather distinct managerial choices determined by product- and firm-specific considerations (Andersen 1993; Leonidou and Katsikeas 1996).

In the case of start-ups, the choice of foreign entry modes may therefore represent a compromise between the limited resources of the start-up and the support requirements demanded by the customers of its products. As hypothesized, our results indicate a high degree of required customization led to the exclusion of intermediaries during the sales process. Products that require a high level of client-specific adaptation are more likely to be sold directly by the manufacturer. We argue that this is the case because the expertise and tacit knowledge required to configure a product according to customers' detailed specifications is more likely to reside with the manufacturer and not with the intermediary. We further hypothesized that start-ups whose products require extensive pre- and after sales support will be more likely to sell via distributors. However, this hypothesis could not be supported as the level of required support did not affect the choice of entry mode significantly.

We would suggest the following interpretation of this result. The effects of the variables 'customization' (H6) and 'after-sales support' (H7) are somewhat related which is also manifest in the significant positive correlation between the two.[5] From the distributor's point of view, they both incorporate the notion of

(68%) did engage in international sales. On average, these technology based young firms sold 38% of their turnover in foreign countries and 33% of the firms generated more turnover from international than domestic sales. Respondents typically sold into 10 countries at the time of the survey and had initiated international activities two years after formation. Given the importance of international activities, we then looked at the target countries and entry modes used. The majority of firms chose countries within Western Europe for their first market entry. However, the most frequently targeted country is the United States (19% of all entries). A sizeable proportion of firms (42%) entered more distant non-European markets first. Strategic considerations and the exploitation of new opportunities rather than psychic/economic distance are more likely to account for these entry decisions.

Looking at the sample average, these young firms elected to choose entry modes that were not very resource intensive. But among these low-resource entry modes, the use of intermediaries was currently more prevalent than direct exporting. Arguably, selling via distributors represents a more complex and advanced managerial arrangement due to the requirement to attract, train, incentivise and monitor a third party agent. We therefore expected, all other things being equal, the use of foreign intermediaries to be more prevalent among more experienced and larger firms. As hypothesized, we found a positive effect of firm size on the propensity to sell via intermediaries. However, an analysis of the marginal effect reveals that - similarly to the statistically significant but weak effect of R&D intensity - the real impact of that variable is quite small. Firm differences of at least one order of magnitude need to be present in order to have a substantial impact on the choice of entry mode. The influence of experience on mode choice turned out to be contrary to our hypotheses. Direct firm experience did not have a significant impact on the commitment of the chosen entry mode. However, as intensive experience with foreign operations cannot realistically be expected among *young* firms initiating their *first* foreign sales, we also tested for management's international experience, a substitute for direct company experience. This variable did have a significant impact on the choice of entry mode, albeit not in the hypothesized direction. This result suggests that managers who have lived abroad are actually more likely to sell internationally without the

only the absolute market size appears to have a significant impact on the entry mode decision. The size of a national market thus seems to be positively related with the propensity to use distributors. The estimates for country risk did not have a statistically significant effect within the model.

In order to examine the validity of our findings, we tested two additional models. Over time, some sample firms had changed the modes of market entry employed. Thus, the current entry mode could be a result of dynamic learning effects rather than reflecting actual differences in firm or product characteristics. Model II therefore only includes those entry modes that have not been subject to changes over time. We make a further modification in model III. In this model, only those entry modes that represent at least 10% of the total turnover of the firm were included. Our results could be biased due to the presence of reactive, unsolicited foreign sales that are not a result of firm-specific factors or managerial action. Choosing a relatively high threshold of 10% should lead to the exclusion of the majority of these cases. The estimation of both model II and model III did confirm the results of our main model. Model II and III equally represent statistically significant solutions and their respective classification ratios of 70.60 and 71.04 compare favorably to chance criteria of 50% (model II) and 51% (model III). Furthermore, as table 6 shows, the effects of our explanatory variables in the three models are strikingly consistent. The only differences were marginal changes of statistical significance for management's foreign living experience in model III and the insignificance of one of the technology dummy variables in models II and III. The latter does however not contradict the results of model I, as "newer" technologies remain more likely to be sold through intermediaries when compared to the base case.

Discussion

From the above analysis, a couple of results merit further consideration. First, we were surprised by the very high incidence of international activities among the firms in our sample. A majority of start-ups

accepted. Hypothesis 3 also has to be rejected. Living experience abroad and previous work for an internationally operating company are both negatively related to the use of intermediaries. However, only living experience abroad is statistically significant. Hypothesis 4 was supported. Firms that used distributors domestically also had a higher propensity to use intermediaries for their international sales. A comparison of the marginal effects also shows that this variable has also the strongest effect of all the variables included in the model. H5, following the organizational capability perspective, stated that the products of firms which export directly incorporated newer technologies than the products of those firms which entered foreign markets via intermediaries. This hypothesis has to be rejected. Compared to the base case of a product incorporating tried and tested combinations of existing technology, more advanced technology tends to be sold via intermediaries. However, the coefficients indicate that this is a curvilinear relationship, as the probability to sell via an intermediary is highest for products which had the second highest score of technological novelty. H6 is supported by the model. Products that require extensive customization are more likely to be sold internationally without making use of intermediaries. H7 cannot be accepted. The measures used to operationalize the costs of commercialization turned out to have a statistically insignificant impact on the decision to involve intermediaries in the sales process.

PLEASE INSERT TABLE 5 ABOUT HERE

Among the control variables, only one industry effect turned out to be significant. All other things being equal, firms in biotechnology and medical technology rely much more on intermediaries to sell their products abroad when compared to the base case of the electronics industry. Effects for software, engineering and IT hardware were not significantly different form the base case. Research and development intensity was used as a control variable and resulted in a significant, albeit weak effect. Accordingly, firms that have higher R&D expenditures have a lower propensity to sell via distributors. However, as the size of the marginal effect in table 6 indicates, firm differences of at least one order of magnitude need to be present in order to have a substantial impact. Finally, among the country variables,

markets. However, there are important numbers of *individual firms* that that deviate from this pattern. The fact that the single most important target country, both in terms of first entry and absolute numbers of market entries, is the US suggests that entry mode choices are also driven by more compelling strategic reasons than psychic distance alone. The economic size of the target market or the recognition of significant, country-specific opportunities may be more persuasive factors. We will now present the results of the regressions and investigate to what extent the chosen firm-specific, product-specific and country-specific factors influenced the foreign entry decision.

Regression Analysis

To test the hypotheses stated above, we estimated three Probit models with the entry mode (1=distributor, 0=direct export) as dependent variable. These two entry modes capture 78% of the observed entry modes in our sample. Still, we had to exclude 28 cases due to missing information on one or more independent variables. We report the marginal parameter coefficients of the model in order to compare the magnitude of the effects of the different variables. We estimated our principal model including all cases available for analysis (model I). We will base our discussion of the hypotheses primarily on the results of this first model.

The overall solution is statistically significant at $p>0.0001$. Among the 398 entry mode choices for which all variables were complete, 213 (55%) firms chose distributors and 174 (45%) firms chose to export directly. The classification ratio of over 70% therefore suggests that the predictive ability of the estimated model represents a substantial improvement over the 55% maximum chance criterion (equivalent to assuming that all firms are distributors). In all three models, the measure of size is positively related to the use of distributors and the effects are highly significant in a statistical sense. However, when looking at the marginal effects, the real impact of size on entry mode is very small. Nonetheless, H1 can be accepted. The international experience of the firm at the time of the market entry is not significantly related to the choice of a particular sales mode in any of the three models. H2 therefore cannot be

of entry modes over time reflect a tendency to use arrangements that represent a higher commitment to international sales. Out of the 121 observed changes, 95 (79%) represented a move towards increasing commitment to foreign sales. These descriptive findings provide further evidence for the validity of our choice to compare direct exporting and exporting via distributors as the main strategic options for the majority of high-tech start-ups.

Geographical spread of entries:

Table 5 gives an overview over the geographical spread of the international firms in our sample. The most important markets for British high-tech start-ups are found in Western European countries followed by North America and East Asia. Looking at individual countries, however, the most frequently entered export market is the US with 96 entries, followed by France (68) and Germany (64).

PLEASE INSERT TABLE 4 ABOUT HERE

In terms of the first market entered - which may not be the firms' largest market - a similar picture emerges. While the majority of firms (138; 57%) had their first international sales in Western Europe, the most popular country of first entry was the US (52; 21%). It is noteworthy that 43% of first entries were made to countries that do not belong to the EU/EFTA. When looking at the second, third, fourth and fifth market entries, a similar pattern is evident (not shown here). These results lend broad support to the findings of Lindqvist (1991) and Bell (1995). While a narrow majority of firms chose geographically close countries for their first international sales, an important minority of firms entered spatially distant markets first.

The above descriptive results suggest that there is some support for the theoretical claims of process models when one looks at the *aggregate sample*, i.e. firms' entry modes changed over time to reflect an increase of commitment to foreign markets, and a majority of firms first sells into relatively close

operations in 10 countries (median 6). A third of these firms (34%) generated more than 50% of their revenues from non-domestic sales. 28% of all internationalizes generated international revenues within their first year of formation. This latter group, which may be termed 'born international' now generates on average 46% of their revenues from foreign sales. Roughly half of the sample firms (46%) had entered their first foreign market by the end of their second year. However, foreign direct investment in internationally dispersed assets played a minor role among the firms in our sample. Only 11 companies had established either a joint venture or a wholly owned subsidiary in order to manufacture their products abroad.

PLEASE INSERT TABLE 2 ABOUT HERE

Entry Modes

As our chosen unit of analysis is the market entry decision, we asked respondents to provide us with information on their three most important foreign markets defined by their contribution to the total sales of the firm's best-selling product. This resulted in a dataset of 547 market entry decisions. 10 cases had to be excluded from the analysis, because respondents could either not provide country level sales or indicated that they operated using entry modes that were difficult to classify.[4]

PLEASE INSERT TABLE 3 ABOUT HERE

Out of the 547 market entry decisions in our sample, the preferred current entry mode used by the firms was distributors (42%) followed by direct exporting (36%), use of sales agents (11%). Market entry modes that required some form of direct investment were not extensively used by the firms in our sample. 27 entries (5%) were carried out using the joint venture form and 15 entries (3%) were via wholly owned subsidiaries. The generation of international sales revenues through licensing equally had a marginal role (9; 2%). In comparison with the first entry modes used by these firms, it appears that aggregate changes

existing technology, novel technology developed externally or novel technology developed specifically for this product by the company. The extent to which a product requires client-specific customization and the transaction costs incurred during the sales process were each measured using a 5 point Likert scale (see appendix 2). The four items measuring transaction costs were then combined into a single scale (alpha 0.73). Dummy variables were included to specify whether or not the firm belonged to a particular industry. We divided the firms up into the five industry categories: software, IT and communications hardware, engineering, bio- / medical technology and electronics (see appendix 1). Country risk ratings were obtained from the publication *Institutional Investor* (see also Shrader, Oviatt and McDougall 1997). Due to the high correlation between country risk data and GDP per capita data ($r=0.93$, $p>0.0001$), we only included risk in our analysis.

Results

Out of the 362 firms that participated in the survey, we subsequently only retained firms with international activities. Altogether, 246 (68%) firms were engaged in international sales. Table 1 describes these respondent firms. On average, they were 6 years old, started with 5 employees and had grown to 22 employees by the time of the survey. 8% of the firms indicated that they did not carry out any research and development activities. Both the indicators for R&D share and percentage of employees working on product development suggest that the remaining 92% of sampled firms operate in very technology-intensive and/or knowledge-intensive areas and spend, on average, the equivalent of 15% of their annual sales revenue on research and development.

PLEASE INSERT TABLE 1 ABOUT HERE

Table 2 gives an overview of the international activities of the start-ups in our total sample. On average, these firms generated 38% of their total turnover from international sales (median 30%) through

information on sales, sales change (in relation to the previous financial year), number of employees and credit rating. The latter measure reflects the credit worthiness of the firm as attributed by credit rating analysts and is therefore of particular interest when judging the overall performance status of a firm. The absence of significant differences suggests that the firms in our sample do not differ from the non-respondents.

Operationalization of Variables

In specifying the entry modes, we followed the definitions of Root (1994), Klein, Frazier and Roth (1990) and Aulakh and Kotabe (1997). Accordingly, we asked respondents to specify whether the chosen mode of their international activities was direct exporting, the use of an agent or sales representative selling on a commission basis, the use of a distributor, a sales joint venture, a wholly owned sales subsidiary or licensing. We asked firms to make a similar statement concerning their domestic sales mode. Size is measured using two variables, sales during the last financial year and number of employees. Due to the high correlation of these two variables ($r=0.74$, $p>0.0001$), we constructed a single measure out of the standardized scores. We decided against using the share of non-domestic revenues as a measure of experience (Aulakh and Kotabe 1997). In principle, we accept the reasoning behind that choice, i.e. firms that score high on that measure have an understanding of foreign operations. However, we argue that in the case of a sample composed of start-ups, it is impossible to distinguish between cause and effect, i.e. the share of non-domestic revenues could at the same time be a function of the entry modes used. Therefore, we measure international experience as the number of years the firm has already been engaged in international operations prior to entering a particular market. In order to operationalize the international experience of the firms' senior managers, we include dummy variables on whether the founders had lived abroad or had worked for internationally operating companies prior to starting their present business (Bloodgood, Sapienza and Almeida 1996). The innovativeness of the technology employed was measured using a four item scale (see appendix 2). Respondents were asked whether their products are best classified as incorporating tried and tested combinations of existing technology, new combinations of

operating in those industries which had at least three employees in 1997 and had been founded between 1987 and 1996 were identified. We acknowledge that this method can not consider high-tech firms in industries that are not included by the Butchart definition. Yet, as opposed to targeting low-technology sectors in the search for high-technology start-ups, the proposed approach was expected to result in an increased likelihood of obtaining responses from firms that fulfil the specified eligibility criteria. In total, a gross sample of 7,788 UK firms was identified. All identified company records were subsequently screened to exclude those firms whose business activities suggested that they were not carrying out any research and development activities (e.g. retailers, wholesalers and assemblers). As a result, 3,590 firms were retained as eligible for inclusion in the research sample.[3] 2,000 firms were then chosen using a random sampling process stratified by size class and service/manufacturing.

Based on a review of the specialized literature, a four page questionnaire was developed. Four pilot case studies were carried out to test whether or not the questions in the survey instrument appeared relevant, easy to understand and unambiguous to the target respondents. As a result, the questionnaire was modified to take into account the expressed concerns. An introductory letter and questionnaire followed by three reminders, where appropriate, were posted to the managing directors of these 2,000 firms. Managing directors have in past studies been used to collect data on the overall performance of entrepreneurial firms and have been identified as reliable source of information (Brush and Vanderwerf 1992). 134 envelopes came back unopened from companies which could no longer be located at their address in the database. Nine companies wrote back saying they were in the process of receivership. 61 firms contacted the researchers indicating that they did not wish to participate in the survey. Altogether, 466 firms returned the completed questionnaires resulting in a response rate of 24% among those firms that had received the questionnaire. After consistency checks to confirm that each firm fulfilled all the criteria for eligibility (i.e. firms had to be less than ten years old and independently owned firms), 362 (19%) firms could be retained in the dataset. T-tests using the original Dun and Bradstreet data were performed to check for non-response bias. No statistically significant differences were detected using

internationalize, we do not think that this variable has an impact on the entry modes chosen. Therefore, we argue that the dimensions are better represented by measuring transaction costs directly and by measuring the maturity of the technology. Due to its widespread use in empirical studies, however, we include R&D intensity as a control variable to detect any firm-level effects it might have on the choice of entry mode. We do not present any hypotheses regarding the target country, but also include it as a control variable. We follow the approaches of Erramilli and Rao (1993), Shrader, Oviatt and McDougall (1997), Barkema and Vermeulen (1998) and include the additional variables country risk, absolute size of the target country and GDP per capita. We also include further dummy variables to control for any industry-specific effects that may impact on the chosen sales mode.

To summarize, like other researcher before us (e.g. Cavusgil, Zou and Naidu 1993), we attempt to explain the international entry modes using firm-specific variables, product-specific variables and variables specific to the environment in which the firms operate. Firm size and experience in international activities can be seen as operationalizations of the internationalization process model. Experience with the domestic sales mode and the innovativeness of the technology can be seen as operationalizations of the OC perspectives, whereas product characteristics are proxies for the transaction cost perspective.

Method

For the purpose of this study, a high-tech start-up is defined as being a legally independent company which is not older than ten years and which operates in one or more high-technology sectors. An operationalisable definition of high-technology sectors in the UK has been established by Butchart (1987). He provides a definition of high-tech industries based on the two ratios of R&D expenses to sales and employees working in R&D to total employees. Employing this definition, 33 high-technology industries were identified as having above-average expenditures for research and development (see appendix 1 for a list of included industries). Using a database obtained from Dun and Bradstreet, firms

may not be motivated to push a complex product which requires substantial pre-sale consulting and installation efforts. Therefore, products and services which incur substantial costs during the sales process should make it more difficult to align the interests of the start-up and a potential distributor. However, selling a technologically advanced product is likely to require an effective support infrastructure (Meldrum 1995). Using distributors which can exploit economies of scale and scope not available to the young firm may be the only way to provide the necessary infrastructure to service foreign customers. Furthermore, the costs of learning how to perform the relatively standardized tasks of installation, end-user training and maintenance are likely to be relatively low when the distributor has already has a portfolio of related products in place. Therefore, we hypothesize that, in international markets, distributors represent the preferred vehicle for start-ups to ensure effective customer support for products whose commercialization is resource-intensive.

H7: The pre- and after-sales transaction costs of products sold into foreign markets via intermediaries are higher than those of firms which export directly.

Control Variables:

We include R&D intensity as a control variable. It has in the past been used as a proxy variable in studies have that applied the framework of transaction costs to international market entry choices (Davidson and McFetridge 1995) in order to operationalize asset specificity and information asymmetries in exchange relations. We argue that there are two problems with this measure. First, it constitutes an *input* variable and may not necessarily have an impact on the asset specificity required to commercialize the *output* of the firm. High R&D expenditures may not give rise to asset specificity or information asymmetries per se. Indeed, higher R&D investment may even allow a reduction in transaction costs by designing out complexity for the customer. Second, it is usually measured at firm level not at product level because it is difficult to obtain R&D intensity (R&D expenditure divided by sales) on a product group basis. While high R&D expenditures and the need to amortize them quickly probably has an impact on the decision to

without involving intermediaries (Bell 1995). Furthermore, it is more probable that the technological skills required to tailor a particular product to the needs of a customer reside within the company that developed the product rather than with the distributor in a target country.

H6: Products sold into foreign markets via intermediaries require less client-specific customization than those of firms that export directly.

The tools of transaction cost economics (TCE) have also been widely used to analyze the determinants of entry mode choices. In essence, TCE is concerned with finding the most efficient institutional or contractual arrangement for economic transactions (Hennart 1989). As opposed to following the methods used by researchers who measured transaction costs indirectly by defining situations in which asset specificity and uncertainty are supposedly high (see for example Anderson and Gatignon 1986; Hennart 1990), we follow the approach of Klein, Frazier and Roth (1990) and attempt to measure the costs involved in the selling process of high-technology goods directly. During the sales process of high-technology goods, the vendor may be required to spend considerable time advising and educating the potential customer on the key features and relative merits of the product. After the sale, more complex products may require installation by trained staff, regular after sales service and periodic upgrades (Cavusgil and Zou 1993; Hutt and Speh 1992). To carry out these tasks, the sales and technical staff of the vendor will require particular skills. In the case of exporting, these skills are normally resident within the manufacturer. Selling a product via an intermediary, however, requires those skills also to be already present within, or transferable to, the distributor. The producer may therefore have to provide regular training to the staff of the intermediary in order to transfer the necessary skills and routines in order to support effectively the product. High up-front investments into these specific assets reduces the subsequent bargaining power and margins of the party incurring these costs. Zacharakis (1997) argues a small entrepreneurial firm is more likely to be obliged to reduce the distributor's set-up costs through the provision of training or other transfers than a large established multinational. Furthermore, a distributor

firm's know-how from the locational effect. In summary, collaborative arrangements will be preferred in countries where the idiosyncratic ways of doing business erode the value of firm-specific know-how. Conversely, a firm is less likely to involve third parties if firm-specific know-how is inimitable or immobile thereby making the sharing of routines with intermediaries difficult (Hill, Hwang and Kim 1990; Madhok 1997). This suggests that a firm will have a higher propensity to avoid the use of intermediaries if its technology is very advanced or unfamiliar with potential users in its target market. Given the importance of tacit knowledge for such products, market based support infrastructures may not be effective nor available (Meldrum 1995) Therefore, effective commercialization may only be possible by internalization of the sales process. Idiosyncratic ways of doing business abroad may therefore represent a lesser barrier than in the case of more established technologies, especially if the product is sold to industrialized countries. Collaborations are expected to occur more frequently when the technology is more mature and established, a proposition that has received some validity in earlier research on international technology transfers (Davidson and McFetridge 1985).

H5: The products of firms that sell into foreign markets via intermediaries are technologically more mature than those of firms that export directly.

Previous research on internationalization has found that product characteristics impact on the way that firms manage their international activities (Cavusgil and Zou 1994; Cavusgil, Zou and Naidu 1993). They have also been found to influence the chosen entry modes in the case of young technology-based firms (Lindqvist 1991). The importance of client-specific customization as a barrier to internationalization has been reported in studies that examined product characteristics of international start-ups (Lindell and Karagozoglou 1997; Murray 1996; Roberts and Senturia 1996). The transformation from offering customized technology solutions to standardized or 'shrink-wrapped' products in which the technology is embedded is associated with an increasing market orientation of the firm (Roberts 1991). Companies whose products are tailor-made for particular customers have been found to be more likely to sell directly

H3: Managers of firms which sell into foreign markets via intermediaries will be more likely to have international experience than managers of firms which export directly.

The experience of the firm is also a key variable in contributions that applied the organizational capability (OC) perspective to the choice of entry modes (Aulakh and Kotabe 1997; Madhok 1997). OC theorists argue that present outcomes are strongly influenced by past experiences and routines which have become embedded in the organization (Madhok 1997). If a firm uses a particular sales channel in its domestic market, it may be expected to replicate this familiar practice (i.e. negotiation of contracts, incentivising and motivating intermediaries) in foreign markets. Thus, the higher costs or risks of arranging more complex foreign sales modes can arguably be reduced through leveraging experiences gained earlier in a domestic market.[2]

H4: Firms will sell into foreign markets via intermediaries rather than export directly if they already use distributors for their domestic sales.

The OC perspective argues that a firm's value creating activities are a function of its resource and capability base. (Madhok 1997; Teece, Pisano and Shuen 1997). Madhok distinguishes between activities where the focus is on capability development and activities where the focus is on the exploitation of an existing advantage. In the case of start-ups - given our focus on sales modes - we argue that the objective of their international sales is to exploit to the full the commercial value of their technological competency in order to ensure their survival. Madhok also introduces the notions of 'ownership effect' and 'locational effect'. The former is represented by the ratio of embedded-to-generic firm-specific know-how, whereas the latter is defined as the ratio of embedded-to-generic market-specific knowledge (Madhok 1997). According to Madhok, a firm will carry out a transaction itself (internalization) if there is a high potential for the erosion in the value of a firm's know-how stemming from the ownership effect. On the other hand, a firm will have a preference for collaboration, if there is a high potential for the erosion in the value of a

H1: Firms that sell into foreign markets via intermediaries are larger than firms that export directly to end-customers.

A related hypothesis concerns the international experience of the firm. The internationalization process perspective argues that firms increase their commitment to international sales over time as their experiential knowledge of foreign markets increases (Johanson and Vahlne 1977; 1990). According to this logic, firms that are more experienced in international sales are expected to use more resource intensive entry modes. This view also posits that, over time, firms that start international sales with low commtiment entry modes switch to entry modes that require a higher degree of commitment as a result of better knowledge of foreign markets. Formalizing a distribution agreement frequently involves legal and other administrative costs. The distributor's staff need to be trained in selling the product, installing it and providing subsequent maintenance or upgrades. Therefore, we believe that the use of distributors represents a more committed entry mode that is used by more experienced firms.

H2: Firms that sell into foreign markets via intermediaries are more experienced in international operations than firms that export directly to end-customers.

It is, however, not necessary that experience in international operations has to be gained by the firm as organizational entity. A *young* firm initiating its *first* market entries cannot be expected to have direct experiential knowledge of international operations embodied in its processes and routines.[1] In the case of start-ups, the founders' international experience can be a substitute for organizational experience. If key management in the young firm have previous experience in foreign markets, a firm may initiate cross-border activities using more complex entry modes. Accordingly, the international experience of senior managers has in the past been used to predict the scale and scope of international activities of start-up firms (Bloodgood, Sapienza and Almeida 1996; Reuber and Fischer 1997).

Rao 1993 Davidson and McFetridge 1984; Kogut and Singh 1988). Accordingly, we will develop a set of hypotheses to test which variables account for the choice between direct exporting and exporting via distributors as the two predominant modes of foreign market entry for technology-based start-ups.

Hypotheses

This discussion of our research objective leads to the generation of seven related or closely associated hypotheses concerning those factors which will most instrumentally influence the choice of channel mode used in entering first foreign markets. As has already been stressed, the choice for the young firm of either going alone (direct exporting) or to ally with a partner (use a distributor) is of pivotal strategic importance given the risk/reward implications of this decision. Direct exportinge gives the firm autonomy and control but denies it the assets (including networks) and experience of the distributor. Alternatively, to contract with the distributor raises the sensitive issues of sharing profit margins. The latter is likely to be influenced by the distribution of bargaining power within the manufacturer-distributor relationship (Zacharakis 1997). From the local distributor's perspective, the smaller the foreign manufacturer and the lower the potential sales volume, the less profitable the medium term relationship. Below a certain projected sales volume, the decision to provide the service will not be bilateral but will, in practice be solely that of the distributor. Aligning the objectives of the two parties has been widely studied in a domestic context (e.g. Anderson and Narus 1990; Heide and John 1994). Yet, in a foreign country, the task of monitoring a distributor is likely to be even more difficult for a small entrepreneurial firm. Therefore, selling via an established distributor relationship is likely to require higher up-front investment than exporting. In the particular case of technology-based start-ups, the availability of resources is probably an even more crucial predictor of subsequent firm actions (Oakey, Rothwell and Cooper 1988). Accordingly, we argue that this route to foreign markets will be employed by start-ups commanding greater resources.

distributors is essentially a choice between an internal arrangement and an arrangement involving an external third party, the tools of TCE are applicable to model the decision. Yet, the TCE approach assumes a capacity for discretionary resource deployment. For example, the commercialization of a product incorporating very advanced technology may require a high degree of asset specificity. If this asset specificity leads to high costs of involving a distributor, a firm is expected to switch from direct exporting to a sales subsidiary once its foreign sales to a particular country exceed a certain level. However, this option may not reflect the reality of resource constraint start-ups. They may rather be inclined, or obliged,, to establish collaborative relationships with intermediaries in order to get access to assets, resources and capabilities which they do not own. Co-operation may not be a choice but an imperative for the young firm. The widespread use of collaborative strategies in technology-intensive industries has triggered the development of the organizational capability (OC) perspective. Compared to TCE, its proponents argue that it represents a superior approach for the analysis of collaborative governance arrangements (Madhok 1997). To date, we do not know of any study that has applied the organizational capability perspective to the internationalization of smaller, entrepreneurial firms.

The key elements of these three competing internationalization theories (stage, TCE and OC) can be isolated as separate and independent sets of variables in our decision model. Accordingly, they are incorporated in our hypothesis construction. The employment of an integrated multivariate approach should provide further evidence whether or not these set of variables explain the choice of entry modes made by high-tech start-ups. Following established research practice, we have chosen the entry decision and not the firm as the unit of analysis. Like many other researchers, we argue that entry decisions are a function of firm-specific factors, product-specific factors and target country specific factors (Cavusgil, Zou and Naidu 1993; Erramilli and Rao 1993). Essentially, the choice between direct exporting and sales via distributors is a choice between an internalized transaction or an externalized transaction involving intermediaries. We find ourselves within the established tradition of researchers that have conceptualized entry modes choices as a binary choice (see for example Barkema and Vermeulen 1998; Erramilli and

finance ongoing development activities. On the other hand, as many technology-based start-ups experience negative cash-flows during their early years, they may lack the necessary human and financial resources required for the effective commercialization of their products on their own. Given these resource constraints, identifying end-customers and providing pre- and after-sales support services may better be handled by a local partner. The downside of this arrangement is that revenues have to be shared between the start-up and the distributor. Additional costs can be incurred by the start-up because of the need to provide technical training and the creation of incentives and monitoring mechanisms. Early on, technology entrepreneurs therefore have to make complex and highly strategic trade-offs given that the choice of the foreign sales mode may have profound implications both in terms of costs and revenue generation.

Third, the main theoretical frameworks in the field of international business which analyze entry modes come to somewhat different conclusions when applied to firms that are at the same time young (or inexperienced) and operate in high-technology sectors. Process models (Johanson and Vahlne 1977; 1990) see commitment to internationalization as a function of experiential knowledge of foreign markets. Accordingly, a start-up company would be expected to gain initial experience through reactive exporting before proactively venturing into foreign markets. The choice between direct exporting and the use of more complex and proactive entry modes is thus dependent on firm experience and foreign market knowledge. Despite having received empirical support, process models and the subsequently developed "stage models of internationalization" (e.g. Cavusgil 1980; Reid 1981) are frequently criticized for being too deterministic and for failing to take firm specific factors other than experience into account (Andersen 1993). A rival approach, the transaction cost economics (TCE) approach, has been very influential as it provides a decision rule with regard to individual entry decisions. Firms are expected to choose the governance or entry mode that minimizes the costs of carrying out particular transactions. In its application, TCE is essentially concerned with comparing different institutional arrangements for carrying out economic activity (Williamson 1985). As the choice between direct exporting and involving a foreign

international operations during their early years. Rapid and sometimes very resource-intensive market entries into different countries were described. Some extreme cases were international from inception and performed different activities along their value chain in different countries (McDougall, Shane and Oviatt 1994). Together, these findings contrast previous research which looked at the international activities of more traditional small and medium-sized enterprises (Bamberger and Evers 1994; Dalli 1994; Leonidou and Katsikeas 1996). However, they also leave questions about the determinants of the choice of a particular entry mode largely unaddressed. Acknowledging the dearth of empirical studies in this area, Oviatt and McDougall (1997) concluded that there is a need for further work to analyze the prevalence and determinants of international entrepreneurship.

Research Objective and Hypotheses

The purpose of this study was to use a large data set to determine what modes of foreign market entry our respondent firms actually chose and what where the primary reasons for their elected choices. The modeled entry decision was simplified to the choice between selling abroad by either direct exporting or through the use of distributors. Our reasons for this choice are both pragmatic and theoretically justified. First, we receive empirical support from previous studies which report that exporting and the use of intermediaries are in reality the two predominant alternatives employed by entrepreneurial high-technology firms (Bell 1995; Lindqvist 1991). In short, our model mirrors what small firms actually do.

Second, the choice between direct exporting and the use of distributors is of utmost managerial relevance for technology entrepreneurs. With the singular exception of the US economy, the finite market opportunities in many countries may not justify the development expenditures for certain highly-specialized niche technologies unless international expansion is considered from inception. Technology-based start-ups therefore face a dangerous dilemma. On the one hand, they may be forced to venture abroad to help amortize their initial development expenditures and to generate sufficient revenues to

from over-dependence of foreign markets. Their empirical findings on US firms that high-risk countries were entered using low risk / low commitment market entry modes and vice versa support their theoretical argument.

Two theoretical papers analyze the structural aspects of international activities in more detail. Oviatt and McDougall (1994) looked at international new ventures (INVs), a type of firm that "from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" (Oviatt and McDougall 1994, p.49). They argue that sustainable INVs need to have an innovative organizational structure - for example assuming a controlling position in a network or utilizing hybrid arrangements involving sub-contractors and intermediate sellers. More directly related to the choice of entry mode, Zacharakis' (1997) contribution explicitly deals with the choice of export agents and distributors in order to enter international markets. Interestingly, Zacharakis only considers the use of intermediaries as he claims that direct exporting is not an appropriate choice for start-ups. Given the wealth of studies on exporting (see Leonidou and Katsikeas 1996, for a recent review) and internationalization processes (Johanson and Vahlne 1990), that indicate that direct exporting is actually a widespread entry mode of small firms, we believe that Zacharakis perspective is somewhat too constrained to capture the full scope of decisions that managers of a new venture will face.

These contributions represent important first steps in explaining the entry decisions of internationally operating start-ups. These studies have a number of common elements. The firms investigated were predominantly operating in high-technology industries. In addition, the majority of the studies had an explicit focus on young firms. Findings from quantitative surveys agree that the preferred entry modes of technology-based start-ups are characterized by relatively low resource commitment and are directed towards commercialization rather than foreign production. However, they also report that technology-based start-ups had a tendency to enter several foreign markets within a shorter time-span than more. Most papers based on a case study methodology have included firms which made bold commitments to

1996), and characteristics of founders and key employees (Boter and Holmquist 1996; McDougall, Shane and Oviatt 1994; Murray 1996; Roberts and Senturia 1996). Quantitative studies surveyed by the authors have analyzed structural characteristics of the firms, including age, size and technology intensity (Lindell and Karagozoglou 1997; Lindqvist 1991), market entry forms (Bell 1995; Lindqvist 1991; Shrader, Oviatt and McDougall 1997), geographical spread of foreign sales (Bell 1995; Shrader, Oviatt and McDougall 1997), the relation between strategic orientation and growth/profitability (Bloodgood, Sapienza and Almeida 1996; McDougall and Oviatt 1996; Shrader, Oviatt and McDougall 1997), characteristics of founders and key employees (Bloodgood, Sapienza and Almeida 1996), and the role of risk in internationalization decisions (Shrader, Oviatt and McDougall 1997).

Three empirical studies, stand out which investigate entry modes in more detail. Lindqvist (1991) reports that the preferred entry modes of the Swedish firms in her sample were direct exporting and foreign sales via intermediaries such as agents and distributors. However, she does not investigate the determinants influencing the choice of entry modes. Instead, she explores the propensity to use sales subsidiaries. Here, she finds no or weak relationships between entry mode choices and product characteristics, R&D intensity or market size. Lindqvist's findings suggest that internationalization could be understood as 'jumping a threshold', i.e. once the firms have decided to operate internationally, their choice of entry modes is not influenced by structural characteristics such as size and R&D intensity. In Bell's (1995) study of the international operations of Irish, Finnish and Norwegian software firms, 70% of all sales transactions were carried out either through direct exports or via agents and distributors. Few firms engaged in foreign direct investment (FDI) and, when this did occur, they were preoccupied with setting up marketing and sales subsidiaries. Firms that commercialized highly customized products almost exclusively relied on direct exporting whereas firms that sold standard, off-the-shelf products were more likely to use sales intermediaries. Shrader, Oviatt and McDougall (1997) argue that different entry modes represent different degrees of resource commitment and, hence, risk for the firm. They argue that firms actively manage their risk in international operations by balancing entry-mode risk, country risk and risk

Introduction

During the last decade, the phenomenon of globalization has received considerable attention and has shaped both the discourse and actions of managers, policy makers and academics. Research on the topic is rooted primarily in sociology, cultural studies, political science and economics. A common denominator is the definition of globalization as “a process in which the constraints of geography on social, cultural, political and economic arrangements recede” (Waters 1995). One manifestation of a globalizing world is the emergence of entrepreneurial start-ups which have an international outlook from inception. Some of these firms even carry out different activities along their value chain in different countries thereby blurring the national identity of the firm. The international activities of these exceptional young firms - labeled "infant multinationals" (Lindqvist 1991), "born globals" (Knight and Cavusgil 1996; McKinsey & Company 1993) and "international new ventures" (Oviatt and McDougall 1994) - have received an increasing amount of attention from researchers over the last couple of years. Yet relatively little attention has been devoted to the empirical analysis of foreign entry modes. Most studies provide descriptive information on the chosen entry modes but, with the exception of Lindqvist (1991), Bell (1995) and Shrader, Oviatt and McDougall (1997), few researchers have attempted to explain the choice of entry modes. This omission is even more surprising given that it is widely acknowledged that the initial foreign entry behavior of a young firm can be of major importance in its future economic success.

Previous Research in International Entrepreneurship

Empirical studies in international entrepreneurship have been both exploratory and, less frequently, explanatory in nature. While some have had an explicit focus on international business theories, others have focussed more on general performance issues. Qualitative studies have described product characteristics (Jolly, Alahuhta and Jeannet 1993; Murray 1996; Roberts and Senturia 1996), market entry forms (Jolly, Alahuhta and Jeannet 1993; McDougall, Shane and Oviatt 1994; Roberts and Senturia

THE INTERNATIONAL MARKET ENTRY CHOICES OF START-UP COMPANIES IN HIGH-TECHNOLOGY INDUSTRIES

Abstract

For a young, resource constrained, technology-based start-up embarking on international sales, the choice of entry mode is a strategic decision of major importance. Yet, within the emerging research stream of international entrepreneurship, curiously little attention has been devoted to the empirical analysis of foreign market entry forms. We address this important issue by analyzing the determinants of 398 export decisions taken from a UK survey of 246 technology-based start-ups with international activities. Our findings show that the entry mode decision is necessarily a trade-off between the resources available and the support requirements of the customer. Issues of the innovativeness of the technology and the historic channel experience of the firm in its domestic market are particularly strong determinants of mode choice. We suggest that an organizational capability perspective on these firms' behavior offers a better explanation of their entry decisions than either transaction cost or stage theories.

Executive Summary:

Choosing the appropriate market entry mode is a critical, strategic decision for resource-constrained, start-up companies seeking to maximize revenues by international expansion. It emerges from previous studies, and is confirmed by the present research, that the most widely used channels selected by start-up companies are direct exporting or exporting via distributors. Yet, the conceptual literature rarely recognizes the material distinctions between these two entry modes. Given the profoundly different implications for both operating costs and revenue generation, the choice between these two alternatives represents a pivotal strategic decision for a young firm with high growth ambitions.

Selling via a distributor has the advantage of rapidly accessing a potential customer base and contracting an established, quasi-specialist sales force to provide product support in foreign markets. However, generating the appropriate incentives and monitoring intermediaries requires managerial attention and incurs significant additional costs. Importantly, the firm's profit margins now have to be shared between the two parties. Direct exporting, conversely, is less complex operationally and the firm retains management autonomy. The primary responsibility and opportunity of learning from customers and for realizing growth targets remains with the manufacturer. However, direct exporting leads to higher costs in identifying and contacting end-customers. It may not be a suitable entry mode if a product requires regular support. We address these important issues by analyzing the determinants of 398 export decisions taken from a survey of 246 technology-based, UK start-ups with international activities. Our results indicate that firms selling products that incorporate innovative technology tend to rely on distributors and their established reputation. We argue that this choice is made because of what we call the "liability of alienness", i.e. the lack of a track-record of a *young foreign* start-up. In addition, distributors were predominantly chosen in large target markets which suggests that the sunk costs incurred to set up a commercial relationship with an intermediary require a certain sales volume. Foreign distributors were also chosen when the start-ups used intermediaries in their home market. This implies that there are substantial learning benefits to be gained from using a particular entry mode initially in the domestic setting. Direct exporting, on the other hand, is chosen when a product requires a high degree of client-specific adaptation. This is an indicator that the skills to customize a high-technology product are difficult or costly to transfer. Finally, managers with previous international working experience had a tendency to export directly rather than involve intermediaries.

THE INTERNATIONAL MARKET ENTRY CHOICES OF START-UP COMPANIES IN HIGH-TECHNOLOGY INDUSTRIES

Oliver Burgel
Warwick Business School
The University of Warwick
Coventry CV4 7AL, United Kingdom
E-mail: o.burgel@warwick.ac.uk
Tel.: 44-1203-572546
Fax: 44-1203-524628

Gordon C. Murray
Warwick Business School
The University of Warwick
Coventry CV4 7AL, United Kingdom
E-mail: gordon.murray@warwick.ac.uk
Tel.: 44-1203-524622
Fax: 44-1203-524628

Acknowledgements:

Oliver Burgel is a research fellow and Gordon Murray is a senior lecturer in Strategic Management at Warwick Business School. The authors would like to thank the Anglo-German Foundation for the Study of Industrial Society, Apax Partners & Co Ventures Ltd. and the Innovation Unit of the Department of Trade and Industry for their generous financial support. We are also indebted to Dun and Bradstreet UK Ltd. for providing the database from which the sample is drawn. The authors acknowledge the valuable contributions of Andreas Fier and Georg Licht from the Center for European Economic Research in Mannheim, Germany, and Robin Wensley from Warwick Business School. The views expressed in this paper are solely those of the authors as is the responsibility for any errors of fact or omission. An earlier version of this paper was presented at the International Conference on Globalization and Emerging Businesses in Montreal, August 1998.