SME-Based Alliance Use: A Three Country Comparison of Environmental Determinants and Individual Level Moderators

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Abstract

This study investigates the direct influence of perceived environmental uncertainty and the moderating influence of key decision leader orientations in determining alliance use among small- to medium-sized enterprise (SMEs) manufacturers. This investigation compares findings across samples of SMEs drawn from Norway, Australia, and Costa Rica. The results suggest a significant link between alliance use and perceived environmental uncertainty for each country. This link was found to vary based on the source for the uncertainty, the country in which the SME is located, and the entrepreneurial and individualism/collectivism orientations of the SMEs' key decision leaders.

Introduction

Alliances, generally defined to be relatively enduring agreements that establish exchange relationships between cooperating firms (Gulati, 1993; Lorange & Roos, 1992) have grown by almost ten-fold since 1980 (Lynch, 1993). Alliance use among small- to medium-sized enterprises (SMEs) is often an integral component of the networking process critical in the obtaining of support and resources for survival (Birley, 1985; Ostgaard & Birley, 1994). Two theoretical frameworks that have been applied in order to explain the determinants of alliance use are transaction cost theory (Williamson, 1985) and social control theory (Ouchi, 1979). Proponents of transaction cost theory, argue that firms form alliances primarily in response to environmental uncertainty (Hennart, 1991; Hill 1990; Williamson 1985). Several researchers have suggested that transaction cost theory, with its primary focus on environmental determinants, places too little emphasis on the role of the social networks in

which the firm is embedded or on the role of the key decision leaders of the firm in determining alliance use (Ghoshal & Moran, 1996; Gulati, 1993; Larson, 1992).

A model of alliance use which focuses on the role of both environmental factors and individual level moderators in determining alliance use has been suggested by Dickson and Weaver (In press). These researchers argue, consistent with transaction cost theory, that the primary determinant of alliance use is environmental uncertainty. Their model extends transaction cost theory by suggesting that the relationship between environmental uncertainty and alliance use is moderated by the individual orientations of the firm's key decision

leaders. Specifically it is argued that the entrepreneurial orientation and the individualism/collectivism orientation of the firm's key decision leaders has a moderating influence on their perceptions of the firm's environmental and the range of response options. These researchers develop their model based on a sample of SMEs drawn from a single country. They suggest that because of the culture-specific aspects of their model that its applicability in other national settings should be a focus for future research. The purposes of the present study was two-fold. First, the validation of the general model proposed by these researchers was tested using samples of SMEs drawn from three separate national groups. Second, the differences in the significance of model variables was compared across countries through a qualitative assessment.

Theoretical Foundations

Environmental Uncertainty and Alliance Use

Transaction cost theory specifies that alliance use is motivated by a desire to reduce environmental uncertainty (Hennart, 1991: Williamson, 1985). When firm leaders are faced with uncertainty regarding transactions, they will tend to move the transactions from the market and to place them within relationships providing greater levels of control (Podolny, 1994). Environmental uncertainty arises when firm leaders have a lack of faith in their ability to assess the external environments of their firms or the effect of changes that may occur in those environments (Milliken, 1987). Alliance researchers have traditionally viewed environmental uncertainty as an objective state but a number of theorists have argued that the perceptions that firm leaders have regarding their firms' environments are a more critical factor in determining firm level behavior (Boyd & Fulk, 1996; Buchko, 1994). Buchko (1994) and Covin and Slevin (1989) have argued that environmental uncertainty is in reality a multidimensional construct. Dickson and Weaver (In press) found evidence that SME decision leaders differentiate between the dimensions of uncertainty based on the source of the uncertainty. Their research suggested five potential sources for the uncertainty that motivates firm leaders to use alliances. Those five sources are: 1) general uncertainty relating to markets, barriers to trade, and rapidly changing economies of scale; 2) uncertainty relating to technological demand and volatility; 3) uncertainty related to the future potential for profit and growth; 4) uncertainty related to the predictability of a particular component of the firm's environment, and; 5) uncertainty related to growing demands for internationalization.

Although there is evidence that perceived uncertainty is a factor in determining alliance use regardless of the national setting for the firm (Buchko, 1994), thus far there has been no empirical research exploring the differences, if any, in the impact of the multiple sources for perceived uncertainty. In order to test the role that the various types of perceived uncertainty might play in determining alliance use by SMEs from different national settings we proposed the following hypotheses:

Hypothesis 1a: Alliance use will be associated with perceptions of a general uncertainty regarding the firm's external environment.

Hypothesis 1b: Alliance use will be associated with perceptions of uncertainty regarding the technological environment of the firm.

Hypothesis 1c: Alliance use will be associated with perceptions of uncertainty regarding the future potential for growth and profits in the firm's principal industry.

Hypothesis 1d: Alliance use will be associated with perceptions of uncertainty regarding the ability to predict specific components of the firm's environment.

Hypothesis 1e: Alliance use will be associated with perceptions of uncertainty regarding the internationalization demands of the firm's environment.

The Role of Key Decision Leader Orientations in Moderating Environmental Perceptions

There is growing evidence to suggest that the human agents within firms play an important role in determining alliance use (Ghoshal & Moran, 1996; Larson, 1992). Proponents of social control theory suggest that the individual as well as the social networks surrounding the firm play a role in the alliance process. Dickson and Weaver (In press) suggest that for SMEs the individual orientations of the firms' key decision leaders play a role in the alliance use process by moderating perceptions of environmental uncertainty. Two individual orientations which have been proposed as having an influence over environmental perceptions are the firm leader's entrepreneurial orientation (Covin and Slevin, 1989; Palich & Bagby, 1995) and the leader's individualism/collectivism orientation (Wagner, 1995).

An entrepreneurial orientation is generally defined as an orientation towards innovative and proactive behavior as well as towards risk taking (Lumpkin & Dess, 1996). The link between this orientation and alliance use is conceptualized as a relationship in which the firm leader's entrepreneurial orientation moderates how he or she perceives the uncertainty of the firm's environment. Palich and Bagby (1995) argue that entrepreneurially oriented leaders are likely to frame seemingly risky and uncertainty environments in a more positive light than are more conservatively oriented firm leaders. In order to test this assumption across different national settings we propose:

> Hypothesis 2: The entrepreneurial orientation of an SME's key decision leader will moderate the leader's perceptions of each source of environmental uncertainty.

Wagner defines an individualism/collectivism orientation as "an analytical dimension that captures the relative importance people accord to personal interests and to shared pursuits" (1995: 153). Individualists value independence and self sufficiency while collectivists value cooperation and shared support (Hui, 1988). There is evidence to suggest that this individual orientation influences judgements regarding the tradeoff between environmental uncertainty and the risk associated with cooperative behavior (Wagner, 1995). There is also evidence that the leader's individualism/collectivism orientation is linked to his or her entrepreneurial orientation (McGrath, MacMillian & Scheinberg (1992). High levels of individualism have generally been found to be associated with innovation (Shane, 1993) and risk taking (McGrath, MacMillian & Scheinberg, 1992). We propose:

> Hypothesis 3: The individualism/collectivism orientation of an SME's key decision leader with moderate the leader's perceptions of each source of environmental uncertainty.

> Hypothesis 4: The individualism/collectivism orientation of an SME's key decision leader will moderate the relationship between the leader's entrepreneurial orientation and the leader's perceptions of each source of environmental uncertainty.

Controlling for other Environmental and Firm-Specific Variables

In order to provide a clear picture of the roles of each of the proposed determinants and moderators of alliance use it is necessary to control for a number of environmental and firm-specific variables which have been proposed by past research as being linked to alliance use. These variables include the principal industry of the SME which as been posited as a surrogate for a wide range of environmental factors including the objective environment of the firm (Osborn & Baughn, 1987). The extent of a firm's involvement in international trade has

also been associated with alliance use (Morris & Hergert, 1987). Finally, resource dependency theory (Pfeffer & Salancik, 1978) suggests that the resource base of the firm plays an important role in the alliance process (Gulati, 1993).

Methodology

Key Decision Leader Design

Levels of analysis assumptions are important in the present research given the association of individual level perceptions and orientations with firm level behaviors. There is strong theoretical support for the assumption that firms of the size included in this study (more than six, but less than five hundred employees) are extensions of the individuals that are in charge (Lumpkin & Dess, 1996). For firms of this size both the strategic posture and the organizational outcomes for the firm are generally assumed to be determined by the key

decision leader within the firm. In accordance with these assumptions a key informant design was used.

Sample

The study consisted of an extensive survey assessing a wide range of alliance issues that was mailed, through a randomized process to manufacturing firms in Norway, Australia and Costa Rica. Every attempt was made to make the sample selection and survey methodologies for each country equivalent. The methodologies did vary due to differing constraints in each country. The sample included 2,465 SMEs in Norway--used in the original study by Dickson and Weaver (In press), 973 SMEs in Eastern Australia, and 1,255 SMEs in Costa Rica. Mailing lists were developed for Norway through the use of KOMPASS On-Line systems--an electronic data base providing reliable addresses for manufacturing firms. Because there were no readily available electronic data bases for business listings in Eastern Australia and Costa Rica, membership roles from chambers of commerce as well as several types of industry affiliations such as trade groups and exporting associations and business directories were use to develop comprehensive master lists of firms which fit the size and industry specifications used in this study. Manufacturers representing ten different industry groups encompassing most of the industries which have been traditionally utilized in alliance research were included in the master lists. SMEs were selected at random to be included in the final survey process.

Response Assessment

In Norway and Eastern Australia a two-wave mailing process was used. The first wave consisted of a mailing to all SME manufacturers randomly selected. A second wave mailing was sent to all firms which had not responded within thirty days. In Costa Rica no second wave mailing has as of yet been completed. Table 1 provides the descriptive statistics and response rates for the firms surveyed. Although a portion of the survey addressed issues relevant only to firms with alliance relationships, all firms were encouraged to complete all other parts of the survey in order to provide a picture of both firms using alliances and those that were not. The Norwegian mailing resulted in 433 (17.6%) useable surveys. The Australian mailing resulted in 166 (17.1%) useable surveys. The single mailing in Costa Rica resulted in 87 (7.0%) useable surveys. These response rates appear to be consistent with those generally reported for small, entrepreneurially-oriented firms (Alpar & Spitzer, 1989).

Response assessment was accomplished in two ways. First, a series of analysis of variance procedures was use to test for significant differences across all study variables with wave considered as a main effect. No significant differences were found for any of the study variables in either the Norwegian or Australian samples. A follow-up assessment was provided through a randomized telephone survey of non-respondents. In Norway 50 nonrespondents were surveyed. The responses revealed that 56 percent maintained alliance relationships

(compared to 58.2% of responding firms maintaining alliances). The most common reason given for nonresponse was being too busy (44%). In Australia 30 nonrespondents were surveyed. Responses indicated that 46 percent maintained alliance relationships (compared to 65.5% of the survey respondents). The most common reason given for nonresponse was no recollection of having received the survey (42%). No follow-up assessment was possible for Costa Rica.

Our assumptions regarding the key decision leader status of the survey respondents was tested through an assessment of the ownership status of the respondent and a series of analysis of variance procedures in which ownership/nonownership was considered as a main effect. Forty-six percent of the Norwegian respondents held some ownership with just under 50 percent holding a majority share. Seventy-five percent of the Australian respondents reported ownership with 67 percent holding a majority position. Sixty percent of the Costa Rican respondents held some ownership with 44 percent reporting holding a majority share. These statistics along with the nonsignificant results for the analysis of variance assessment support our assumption that the survey respondents are key decision leaders within their firms.

Measures

Alliance use. Alliance use was based on reports by the key decision leaders surveyed regarding the SMEs' use or non-use of alliances. The types of alliance relationships reported included joint ventures; equity investments from both large and small firms; technology alliances relating to either product or process research; export management and trading companies; and long-term agreements relating to marketing, distribution, or production. While a number of firms also reported holding more short-term and less strategically motivated forms of relationships (Hagedoorn, 1993), none reported holding these types of relationships exclusively. On average in the three samples over 90 percent of the SMEs responding indicated that they maintained multiple alliances and multiple types of alliances.

Independent Variables. Perceived environmental uncertainty was measured through the use of items developed by Covin and Slevin (1989) and Schultz, Slevin and Covin (1995). The multidimensional nature of these items was established by Dickson and Weaver (In press). The environmental perception measures assess the five dimensions of perceived environmental uncertainty presented in the theory discussion of this paper. The first dimension, general uncertainty, was assessed through a 5-item scale with reliabilities ( ) ranging from .64 to .69. Technological uncertainty was assessed using a four item scale (= .69 to .79). The four items assessing the perceptions of profit and growth were worded to reflect certainty rather than uncertainty regarding this dimension (= .74 to .86). Uncertainty relating to a lack of predictability was assessed by two items (= .59 to .62). Finally, uncertainty related to internationalization demands was measured using a two item scale (= .60 to .62).

The entrepreneurial orientation of the SMEs' key decision leaders was assessed through the use of an 8-item measure developed and tested by Covin and Slevin (1989). The items measure the leader's tendencies towards innovation, their proactiveness towards competitors and their tendencies towards risk taking. The reliability estimates ( ) for this variable ranged from .79 to .81.

The individualism/collectivism orientation of the SMEs' key decision leaders was assessed through a reduced form of a scale developed by Erez and Earley (1987). The factor validity for the reduced scale was provided by Dickson and Weaver (In press) and the construct validity by Wagner (1995). Reliability estimates ( ) ranged from .60 to .71.

Control Variables. The SME's principal industry was used as a measure of the objective environment of the firm. The international involvement of the SME was based on the firm's export sales as a percentage of total sales. Firm resources were assessed through three measures. The first, firm size, was based on the number of employees. The financial strength measure was based on a 14-item scale developed by Covin and Slevin (1989) that assess the importance and satisfaction associated with seven financial performance criteria. Reliability estimates ( ) for this measure ranged from .79 to .91. A final measure of the resource base of the firm was based on the number of managerial employees.

Translation

The original English version of the survey was translated into both Norwegian and Spanish using a back translation process. Following the translation process, teams of business leaders and academicians were used to assess the quality of the translation and to aid in revising all industry and business terminology to fit the Norwegian and Costa Rica community.

Limitations

Three specific limitations in the design of this study should be noted. First, the lack of follow-up for the Costa Rican sample indicates that caution should be taken in generalizations made based on the results of this initial exploratory survey. Second, the relatively high percentages of responding firms maintaining alliances in the Australian sample and in the Costa Rican sample suggests that firms not using alliances may be under represented in these samples. At this point in time we know of no other random survey results of SME manufacturers in these two business communities that would provide strong evidence of the actual number maintaining alliance relationships. Third, due to the perceptual nature of a number of this study's independent variables there is a potential for common method variance. An assessment of the intercorrelations of the study variables as well as the results of a single factor test recommended by Podsakoff and Organ (1986) do not suggest a problem with common method variance.

Data Assessment

Logistic regression, which is particularly useful in situations of a dichotomous outcome variable and both continuous and categorical experimental variables, was used in this study. The beta coefficients provided by a logistic regression procedure give the change in log odds of obtaining the outcome variable when there is a change of one unit in the predictor variable. In this study alliance use was the outcome variable. If the logistic coefficient for a variable is significant and positive it suggests that the variable increases the odds of obtaining the outcome variable while a negative coefficient indicates a decrease in the odds. When interaction effects are included in a logistic regression the signs of the associated coefficients must be interpreted with care due to the presence of the interaction. A post hoc analysis used to assess these interactions is reported in the results section. Based on the advice of Hosmer and Lemeshow (1989) the study variables were entered into the logistic regression in stages in order to assess the relative impacts. Only the final models are reported in Table 2. Two additional model assessments not provided by the logistic procedure are included in this study. The first is a random proportional chance model in which the hit rate is give by the equation:

$$P^2 + (1 - p)^2,$$

where p is the probability that an event has occurred (Gulati, 1995: 103). The second model assessment is a Pseudo R^2 which is give by the equation:

$$R^2 = 100(L_o - L_p) / L_o,$$

where L_o is the log-likelihood for the null model and L_p is a log likelihood of a model which includes all variables of interest (Hosmer & Lemeshow, 1989: 148).

Results

Table 1 provides the descriptive statistics for the sample and the survey items. Table 2 provides the results of the logistic regression procedure. The predicted outcome for the

Place Table 1 and 2 About Here

logistic regression analysis is alliance use with non-use as the default group. All three models of SME-base alliance use presented in Table 2 are significant overall, supporting the conclusion that the general model does hold across the three separate country samples assessed in this study. The significance level of the Costa Rican model suggests that caution should be taken in drawing generalizations from these findings. The hit rate for each model is considerably higher than that which would be expected by random chance (the random proportional chance model). Pseudo R^2 values range from .20 for the Norwegian sample to .52 for the Costa Rican sample. These values along with the significant chi-square values suggest that the model is doing a reasonable job of explaining SME-based alliance use in each of the country samples.

A comparison of the beta coefficients for each model provides a number of interesting findings relating to the roles of perceived uncertainty and individual orientations in determining alliance use when these factors are compared across countries. Since both the size of the sample and the scale of the variables impact the chi-square value and the size of

the beta coefficients, the coefficients cannot be directly compared across samples in this study. What can be compared is the significance or non-significance of the model variables.

Norway. The environmental perceptions which are found to be significant predictors of alliance use for the Norwegians are perceptions of general uncertainty and perceptions of a potential for future profit and growth. The signs of the main effects suggest that the greater the perceived level of general uncertainty the greater the use of alliances. Perceptions of a future potential for profit and growth is found to be inversely related to alliance use. The greater the certainty that the future hold a promise for profits and growth, the less likely the Norwegian SMEs are to want to use alliance relationships. Both the key decision leader's entrepreneurial orientation and individualism/collectivism orientations were found to significantly moderate the relationship between these two environmental perceptions an alliance use. The three-way interaction suggests that the relationship between the decision leader's entrepreneurial orientation and perceptions of the environment varies based on the leader's individualism/collectivism orientation. A post hoc analysis of these moderating relationships was conducted in which the sample was divided into four separate groups and logistic regression models calculated for each group. The groups were made of up: (1) individualistic leaders with high entrepreneurial orientations, (2) collectivist leaders with high entrepreneurial orientations, (3) individualistic leaders with low entrepreneurial orientations, and (4) collectivist leaders with low entrepreneurial orientations. The results of this analysis suggest that Norwegian decision leaders with collectivist orientations and low entrepreneurial orientations are most effected by these perceived environmental dimensions.

Australia. The single environmental perception dimension which emerged for the Australian SMEs was the perception of a future potential for profits and growth. Interestingly, the relationship unlike the Norwegian model, is an inverse one. The greater the perceived future potential for profit and growth the more likely the Australian SMEs are to use alliances. As in the Norwegian model, the decision leader's individual orientations are shown to have a moderating influence. The post hoc analysis suggests that for the Australian SMEs the unit change in the profit and growth dimension is associated with a larger change in the group of leaders with both collectivist and highly entrepreneurial orientations.

Costa Rica. Three environmental perceptions emerge as significant in predicting alliance use for the Costa Rican SMEs. Similar to the Australians, perceptions of a future potential for profit and growth is positively associated with alliance use. Unlike the Norwegians, while general uncertainty is associated with alliance use the relationship is an inverse one. Also for the Costa Ricans uncertainty relating to international demands is positively associated with the use of alliances. The individual orientations of the key decision leaders were found to moderate the relationship between each of these perceived environmental dimensions and alliance use. The post

hoc analysis revealed that the Costa Rican leaders with more individualistic and entrepreneurial orientations were most influenced by general uncertainty and perceptions of a future potential for profit and growth. Collectivist leaders with low entrepreneurial orientations were most influenced by uncertainty relating to internationalization.

Discussion And Conclusion

The overall results of this research provide a number considerations for future SME-based alliance research. These findings support the role of perceived environmental uncertainty in determining alliance use but they suggest a much more complex relationship than has been assumed in the past. Specifically, three dimensions of environmental uncertainty were found to significantly predict alliance use. These dimensions included a general uncertainty relating to the firm's environment providing support for Hypothesis 1. A belief in the future potential for profits and growth was found to be associated with alliance use supporting Hypothesis 3. Finally, uncertainty relating to internationalization demands was found to be associated with alliance use supporting Hypothesis 5. The complexity of this relationship was revealed by the changes in the direction of these relationships and by the evidence provided for the moderating influence of the individual orientations of key decision leaders.

Perceptions of general uncertainty is associated with alliance use for the Norwegians, but is associated with non-use for the Costa Ricans. A perception of a future potential for profits and growth reduces the likelihood of alliance use for the Norwegians yet increases the use for both the Australians and Costa Ricans. This suggests that the Norwegians may view alliances as a hedge against uncertainty but that the Australian and Costa Rican SMEs may view alliances as a strategy for use when the future is perceived to be more certain and to hold a promise for profit and growth. For the Costa Rican SMEs, uncertainty relating to the demands of internationalization significantly increase the odds of alliance use.

The logistic regression results indicate that the entrepreneurial and individualism/ collectivism orientations of the key decision leaders moderate the relationship between perceived environmental uncertainty and alliance use. This finding is consistent across all three samples, but the combination of orientations most strongly associated with each dimension change from one country to the other. The perceived environmental uncertainty-alliance use link was strongest for collectivist managers with low entrepreneurial orientations in the Norwegian sample. The link was strongest for collectivist managers with higher entrepreneurial orientations in the Australian sample. The orientations most associated with the perceived environmental uncertainty-alliance use link changed for the Costa Ricans based on the source of the uncertainty.

In addition to the suggestion that the individual orientations of key decision leaders influence both the level and direction of the relationship between environmental uncertainty and alliance use these findings seem to indicate that the principal country of the SME also has an influence on this linkage. The findings that different combinations of individual orientations are most strongly associated with each environmental dimension based on the country for the sample is intriguing and suggests the need for future explorations in order to provide explanations. It may be that these differences are simply a product of the false assumption that these orientations are the same for all cultures. On the other hand these findings may indicate real differences in how decision leaders with these various combinations of individual orientations perceive and respond to their environments. Although suggesting additional layers of complexity for our understanding of the determinants of alliance use, the present research does provide two unique considerations. First, perceived uncertainty is significantly linked to alliance use but the link varies based on the source for the uncertainty. Second, the link between perceived environmental uncertainty and alliance use is significantly influence by the entrepreneurial and individualism/collectivism orientations of the SMEs' key decision leaders.

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Table 1
Descriptive Statistics[a]

	Norway	Australia	Costa Rica
Net number of firms surveyed	2465	973	1255
Number of firms responding	433 (17.6%)	166 (17.1%)	87 (7.0%)
Firms reporting alliance relationships	252 (58.2%)	108 (65.0%)	67 (77.0%)
Average firm size (number of employees)	42.21	33.84	113.10
Average number of managers	4.38	4.54	5.92
Average percentage of sales as exports	13.76%	1.06%	29.46%
Mean for entrepreneurial orientation	3.01	2.95	3.15
Mean for individualism/collectivism	3.61	3.30	3.75
Mean for general uncertainty	2.99	3.15	3.07
Mean for technological uncertainty	2.92	2.93	2.89
Mean for certainty of growth and profits	2.61	2.71	3.26
Mean for lack of predictability	2.65	2.83	2.54
Mean for internationalization uncertainty	3.11	2.29	3.13

[a]The correlation matrix for each country sample is not included but is available upon request from the authors.

Table 2

Logistic Regression Analysis for Alliance Use/Non-Use: 3 Country Comparison[a]

Variables	Norway	Australia	Costa Rica
Constant	1.389	5.758	-11.468
Industry[b]	(cat)*	(cat)	(cat)
Export Intensity	.014*	.015	-.014
Firm Size (Number of Employees)	.001	.054*	-.004
Firm Financial Strength	.280	.304	.861
Managerial Resources	.076	-.186	.510
General uncertainty	17.499**	-18.594	-254.071*
Technological uncertainty	-.072	-.2.233	-33.104
Certainty of growth and profits	-10.057*	22.224*	172.384*
Lack of predictability	-8.281	-.106	-16.261
Internationalization uncertainty	4.342	-4.890	63.546*
Entrepreneurial orientation (E/O)	1.636	.999	12.144
Individualism/collectivism (I/C)	1.271	-3.325	-3.085
E/O x General uncertainty	-4.980*	5.714	84.041*
E/O x Technological uncertainty	.632	1.600	12.144
E/O x Certainty of growth and profits	2.916*	-6.866*	-57.999*
E/O x Lack of predictability	2.250	-1.301	2.419
E/O x Internationalization uncertainty	-1.396	.708	-21.363*
I/C x General uncertainty	-4.475*	6.364	65.389*
I/C x Technological uncertainty	-.021	.542	8.549
I/C x Certainty of growth and profits	2.931*	-6.767*	-43.279
I/C x Lack of predictability	2.385	-.452	5.414
I/C x Internationalization uncertainty	-1.172	1.609	-16.302
I/C x E/O x General uncertainty	1.313*	-2.009	-21.695*
I/C x E/O x Technological uncertainty	-.142	-.337	-3.306
I/C x E/O x Certainty of growth and profits	-.876*	2.163*	14.356
I/C x E/O x Lack of predictability	-.676	.482	-.899
I/C x E/O x Internationalization uncertainty	.401	-.237	5.552
N	433	166	87
-2 logarithmic likelihood	458.58	130.40	45.33
2	114.77***	75.51***	48.47
df		36	36
Overall hit rate[b]	36	80.00%	86.21%
Random proportional chance model hit rate	72.04%	54.54%	64.59%
Pseudo R	51.34%	.37	.52
	.20		

[a]The control variables for each model have not been rescaled therefore the beta weights for each model cannot be directly compared. Comparisons can be made based on the variables which are significant for each model.

[b]Betas for the individual industry categories are not reported but are discussed in the text.

p < .10, *p < .05, **p < .01, ***p < .001