Chapter 5

Data Analysis and Results

5.1 Introduction

This chapter presents data analyses and results of hypotheses testing based on the conceptual model presented in the Chapter Three. The chapter begins with a discussion on data preparation that includes missing data, assessment of construct reliability and validity, and multicollinearity. It continues with a brief description of firm characteristics, respondents' profile, followed by detailed results of analyses using path and cluster analysis.

5.2 Data Preparation Procedures

Data preparation procedures were performed to manipulate and transform raw data to enable the application of analytical procedures. Data preparation involves such preliminary investigations as checking for missing data, removing outliers, and assessing reliability and validity of measured constructs. The first task of data preparation concern exclusion of cases that did not meet the scope of interest of the study. The collected survey data totaled 403 cases. Nineteen cases were considered to be unqualified respondents for this research, including non-manufacturing firms, non-trading firms, and no longer exporting firms. The remaining 384 cases were retained for further examination.

5.2.1 Data Cleaning

Of the 384 cases, 14 cases (4.1%) were discarded on the basis of incomplete or missing data. This is in an acceptable range of not more than 10%. Main reasons for missing data appeared to be respondents skipping pages and their inability to answer questions. The remaining 370 cases contained no missing data among the measures of interest.

5.2.2 Non-sampling Errors

Non-sampling errors can be the result of non-coverage, non-response, data collection, or data input errors. Non-coverage errors are mainly related to incomplete sampling frames (Churchill 1999). Research units of analysis in this study are Thai exporters. Exporter directories held by the Thai Department of Export Promotion are the best source in Thailand for such information, as it includes all Thai exporting firms. Non-coverage errors also can be the result of sampling method. This study targets specifically only manufacturing firms of non-commodity products and trading firms, representing 13 industries as presented in Table 5.8. Even though non-coverage errors cannot be completely eliminated from this research by either sampling methods or sampling frames, the coverage satisfies research objectives. All respondents are exporters and their focus is on transactions in the international market. There is considerable variation in terms of firm size and industry in order to broaden the perspectives included in the survey.

The purpose of non-response assessment is to ensure that non-respondents are not different from respondents in terms of research variables of interest. For mail surveys, there are various reasons for non-response, including the questionnaire being lost, the respondent not being available to respond, and failure to remember to respond to the questionnaire. Checking for non-response bias is necessary in order to generalize research results, by showing that respondents are not different from those who did not respond. For this research, 1,975 sample members were classified as non-respondents because a completed questionnaire was not returned.

A frequently used method to assess non-response bias in mail survey is to test for significant differences between early and late responses (Armstrong and Overton 1977; Lambert and Harrington 1990). Past research has indicated that late respondents can be used as substitutes for non-respondents (Miller and Smith 1983). Therefore, mean differences between fast, medium, and late respondents' responses to the questionnaire were used to find any potential non-response bias. Responses of the 147 early respondents who responded to the first mailing were compared with those of the medium 150 respondents and the last 73 respondents. Eight survey items were randomly selected and ANOVA performed. The overall pattern of responses between

the three groups was quite similar with no statistically significant differences among the eight survey items noted. Results indicate that the sample is representative of the population of interest. ANOVA results are presented in Table 5.1.

Table 5.1

Analysis of Non-Response Bias by Selected Variables

Variables	Mean (Std. Deviation)				Statistics	
	Fast response (30-1-07 to 24-2-07) (*n*=147)	Medium response (25-2-07 to 11-4-07) (*n*=150)	Late response (after 11-4-07) (*n*=73)	Total (*n*=370)	*F* Value	*p* Value
Experience in Exporting	12.52 (7.71)	11.32 (7.48)	11.38 (8.20)	11.81(7.72)	1.03	0.36
Number of Full Time Employees	262.26 (428.79)	306.07 (604.82)	313.86 (653.75)	290.20 (551.70)	0.32	0.73
Export Involvement	6.78 (1.80)	6.83 (1.77)	6.38 (2.27)	6.76(1.89)	1.81	0.17
Satisfaction with EPPs	5.82 (1.61)	5.95 (1.57)	6.07 (1.78)	5.92 (1.63)	0.61	0.55
General Export Strategy	7.24 (1.46)	7.17 (1.62)	6.76 (1.78)	7.12 (1.60)	2.40	0.09
Marketing Mix Strategy	6.43 (1.61)	6.27 (1.88)	6.05 (1.90)	6.29 (1.78)	1.12	0.33
Subjective Performance 1	5.70 (2.30)	5.70 (2.23)	5.56 (2.45)	5.67 (2.30)	0.10	0.90
Subjective Performance 2	6.12 (1.84)	6.40 (1.75)	6.07 (2.18)	6.22 (1.88)	1.14	0.32

Note: values in parenthesis are Std. Deviation

Collected data were coded and entered into an SPSS for WINDOWS release 13.0 spread sheet which was previously constructed and tested. Strict controls against data input errors were enforced to ensure the integrity of the data. Controls taken included examination of the value of each data cell independently by two persons who proofread original data against a computer printout. The data set was further screened through examination of basic descriptive statistics (means, standard deviations, ranges) and frequency distributions, because values that are out of range or improperly coded often can be detected with such simple checks (Kline 1998; Tabachnick and Fidell 2001).

5.2.3 Data Distribution Audit

After cleaning the data, a data distribution audit was performed to investigate the pattern of responses. Forty-seven scale items were investigated for departures from normality in terms of skewness and kurtosis. Skewness and kurtosis were within the range of -1.0 to +1.0 and indicate the normality of data distributions. (Boomsma 1987; Ferrando 1999; Muthen and Kaplan 1985). However, data are still acceptable if their absolute values are not greater than 2.0 (Muthen and Kaplan 1985). As detailed in Appendix 3, all items show that they are at an acceptable level and all items were retained for further analysis.

5.2.4 Data Transformation

The second stage of data preparation is data transformation. The purpose is to transform data to an easily accessible format in the form of computed scales.

This research contained three constructs that had to be computed prior to further analysis: general export strategy, marketing mix strategy, and perceived gap. Items comprising these constructs had to be summed prior to further analysis. Export performance summed both subjective performance 1(sumsubperf1), and subjective performance 2 (sumsubperf2) items to be composite measures corresponding to the concepts discussed in section 4.2.7. All summed scales were assigned new variable names for further analysis as presented in Table 5.2.

Table 5.2

Data Transformation by Computed Scales

Description	Number of Items	Variable Names
general export strategy	9	genstg
marketing mix strategy	6	mktstg
subjective performance 1	5	sumsubperf1
subjective performance 2	9	sumsubperf2

Perceived gap in this study measures the actual satisfaction of firms with governmental export promotion programs. By applying satisfaction concept, value of dissatisfaction with each gap activity (18 activities) was calculated first. Then, the values of 18 perceived gaps (epdissat1-18) were calculated by applying an equation of Fishbein's Multiattribute Model of Attitude as discussed in section 4.2.3.

This study applied Fishbein's Multiattribute Model of Attitude as a fundamental concept by determining the perceived gap variable as follows:

$$epdissat\ i = activity\ importance\ i \times dissat\ i$$

When

epdissat i is the firms' perception of importance and dissatisfaction toward export activity i

activity importance i is the firms' perception of importance of activity for export operation i

dissat i is the transformed value of dissatisfaction with export promotion programs of the form : *10 – sat i*

The *epdissat i* means that perceived gap toward an export promotion activity equals the product of each importance belief about that activity times its importance evaluation. Average perceived gap values derived from the calculation are presented in Table 5.3.

Results in Table 5.3 show dissatisfaction with activities in the format of perceived gap values. From the perceived gap values, activities can be classified into two groups: big perceived gap activities and small perceived gap activities. The cutoff threshold value for designation as a big perceived gap is a value higher than the average of all values, 31.7. Therefore, values for the big perceived gap activities should be more than 32 and values for the small perceived gap activities should be less than 32. Thus, big perceived gap activities comprise epdissat 6, epdissat 9, epdissat 10, epdissat 12, epdissat 13, epdissat 14, and epdissat 18 (shown as shaded values in Table 5.4). Small perceived gap activities comprise epdissat 1, epdissat 2, epdissat 3, epdissat 4, epdissat 5, epdissat 7, epdissat 8, epdissat 11, epdissat 15, epdissat 16, and epdissat 17.

Table 5.3

Summary of Value of 18 Perceived Gaps Derived from Calculation

Items	Details	Average Gap Values
epdissat 1	Gathering information about export markets	29.4
epdissat 2	Obtaining information about export distributors	30.6
epdissat 3	Finding capital to finance exports	30.9
epdissat 4	Providing national export promotional programs	28.0
epdissat 5	Preparing export documentation	27.2
epdissat 6	Dealing with red tape of Thailand public institutions	34.2
epdissat 7	Developing qualified personnel in exporting	30.8
epdissat 8	Finding "experts" in export consulting	30.2
epdissat 9	Developing product to meet importer's quality standards	33.4
epdissat 10	Developing product design and style for export markets	32.9
epdissat 11	Developing export packaging	31.2
epdissat 12	Setting the competitive prices in export markets	36.3
epdissat 13	Identifying capable overseas distributors	37.0
epdissat 14	Payment from overseas distributors	32.6
epdissat 15	Transporting the product(s) exported	30.6
epdissat 16	Promoting in export markets	27.3
epdissat 17	Communicating with overseas customers	30.6
epdissat 18	Protecting against currency exchange rate fluctuations	37.7
Total average		31.7

5.3 Validity and Reliability

Validity and reliability of study measurements was determined in a three-phase procedure: literature review, pilot test, and factor analysis (Hair Jr., Black, Babin, Anderson, and Tatham 2006; Malhotra 2004).

Content validity is an evaluation of the extent to which a measurement scale captures the theoretical basis of the construct (Churchill 1979; Malhotra 2004). Measures have content validity if the scale development process include specifying the domain of the construct, generating a sample of items from this domain, and purifying the scales through initial data collection. Selection of items in the present study was based on the literature review. After determining the applicability of these constructs via the literature review, a pre-test of the questionnaire was administered. Corrections and improvements were made from the pre-test. As the existing scales have been drawn from the literature and have been purified using pre-test responses from academics and sample respondents, content validity can be assumed.

Measurements scales then were purified using exploratory factor analysis (EFA) and coefficient alpha. EFA was used initially as an exploratory tool to assist with two main purposes: summarization and data reduction. In summarizing the data, factor analysis derives underlying dimensions that, when interpreted and understood, describe the data in a much smaller number of dimensions than the original individual variables. Thus, EFA facilitates combining an original set of variables into a smaller set of constructs or underlying dimensions. Results of EFA are presented in Tables 5.5-5.8 including factor loadings of items and percentages of variance accounted for by individual factors. In this study, Principal Component Analysis method was used with eigenvalues set to unity. Factors are interpreted by examining their factor loadings or correlations with the original variables. Interpretation is facilitated by rotation, the second stage of factor analysis, in which original factors are redefined using different rotation techniques. Varimax rotation was used in this study. The goal is to simplify factors by maximizing the variance of loadings within factors, across variables (Tabachnick and Fidell 2001). Bartlett's Test of Sphericity was significant and the Kaiser-Meyer-Olkin measure of sampling adequacy exceed 0.80 for all anayses, indicating an acceptable sampling adequacy for the variable set.

The criterion for acceptance is based on eigenvalues greater than 1. Inspection of factor loadings were used to eliminate weak items in explaining the intended construct. Based on EFA results, the reliability of each construct was assessed using Cronbach's coefficient alpha. Coefficient alpha was required a minimum of 0.70 (Nunnally 1979; Peter 1977).

In regard to validity, convergent validity is indicated by high correlations with other items measuring the same construct. Discriminant validity is indicated by lower correlations with items measuring other constructs. For the present study, loadings of .40 or greater were desired for the primary factor to which an item belongs.

5.3.1 Perceived Gap

Eighteen items were used to operationalize the perceived gap construct and results of the factor analysis for items constituting the construct are presented in Table

5.4. Most factor loadings show an acceptable value of more than 0.40. Most items loaded on one factor alone, except perceived gap5, 8, 9, 12, 13, and 18, thus providing evidence of convergent and discriminant validity. Internal consistency was established by calculating Cronbach's alpha for each factor. Results in the Table 5.4 show that Cronbach's alpha meets the requirement of higher than 0.7. Although all factor loadings values were not low by usual standards (Hair Jr. *et al.* 2006), but perceived gap5 and 18 (shown as shaded values) exhibited an unexpected result of two dimensions. Thus, items perceived gap5 and 18 are candidates to delete from the factor components.

Table 5.4

Extracted Factors and Factor Loadings Related to Perceived Gaps

Factor and Items Loaded on Each Factor	**Factor 1**	**Factor 2**
Factor1: Export Operations and Information Related		
1. Providing national export promotional programs (perceived gap 4)	0.82	
2. Obtaining information about export distributors (perceived gap 2)	0.77	
3. Gathering information about export markets (perceived gap 1)	0.74	
4. Promoting in export markets(perceived gap 16)	0.73	
5. Communicating with overseas customers (perceived gap 17)	0.73	
6. Developing qualified personnel in exporting (perceived gap 7)	0.70	
7. Finding "experts" in export consulting (perceived gap 8)	0.66	0.41
8. Dealing with red tape of Thailand public institutions (perceived gap 6)	0.64	
9. Finding capital to finance exports (perceived gap 3)	0.57	
Factor2: Marketing Strategy Related		
10. Developing export packaging (perceived gap 11)		0.83
11. Payment from overseas distributors (perceived gap 14)		0.79
12. Developing product design and style for export markets (perceived gap 10)		0.78
13. Setting the competitive prices in export markets (perceived gap 12)	0.42	0.76
14. Transporting the product(s) exported (perceived gap 15)		0.71
15. Developing product to meet importer's quality standards (perceived gap 9)	0.46	0.70
16. Identifying capable overseas distributors(perceived gap 13)	0.52	0.62
17. Protecting against currency exchange rate fluctuations (perceived gap 18)	0.52	0.53
18. Preparing export documentation (perceived gap 5)	0.49	0.47
Eigenvalue	10.23	1.26
Percentage of variance	56.82	6.98
Cumulative variance explained	56.82	63.80
Cronbach's Alpha	0.92	0.93

Note: factor loadings less than 0.30 are not shown in table

Table 5.5

Extracted Factors and Factor Loadings Related to Export Marketing Strategy

Factor and Items Loaded in Each Factor	Factor 1	Factor 2
Factor1: General Export Strategy(genstg)		
1. My firm has clearly identified export countries to be entered (genstg6)	.81	
2. My firm has clearly identified the export customers to be served (genstg1)	.80	
3. My firm has established distinct goals and objectives for export operations (genstg3)	.80	
4. My firm has developed strategies for competing in export markets (genstg2)	.75	
5. My firm has developed strategies to expand export markets over the years (genstg7)	.74	.46
6. My firm has developed products in meeting export customers' wants over the years (genstg8)	.71	
7. My firm has provided sufficient budget to exploit export markets (genstg5)	.65	.47
8. My firm has had strategies to expand number of exportable products over the years(genstg9)	.63	.54
9. My firm has developed adequate capabilities to collect necessary information about export markets(genstg4)	.63	.50
Factor 2: Marketing Mix Strategy(mktstg)		
10.My firm has developed brand building strategies for export markets (mktstg1)		0.79
11. My firm has adequate promotion support to the distributors/subsidiaries (mktstg4)		0.78
12.My firm has strategies to develop channel distribution in export markets (mktstg3)	0.41	0.76
13.My firm has provided training given to the firm's sales force and distributors /subsidiaries (mktstg5)		0.75
14.My firm has developed pricing strategies for competing in export markets (mktstg2)		0.74
15. My firm has capabilities in adaptation of promotional strategy for export market venture (mktstg6)	0.52	0.67
Eigenvalue	9.12	1.25
Percentage of variance	60.82	8.31
Cumulative variance explained	60.82	69.13
Cronbach's Alpha	0.93	0.91

5.3.2 Export Marketing Strategy

Fifteen items were used to operationalize the export marketing strategy variable. Results of the factor analysis for items constituting the construct are presented in Table 5.5. Two factors emerged: "General export strategy" (items 1,2,3,4,5,6,7,8,9) and "Marketing mix strategy" (items 10,11,12,13,14,15). These factors are formed according to a predetermined model, which meets the validity test.

Most items loaded on one factor, again providing evidence of convergent and discriminant validity. Thus, these factors can be considered a dimension of export marketing strategy that also is supported by the literature. Internal consistency was established by calculating the Cronbach's alpha for each factor. Results in Table 5.5 show that Cronbach's alpha meets the requirement of higher than 0.7. Inspection of correlation values between general export strategy and marketing mix strategy factor found low correlations among them with a value of 0.26. This result shows no multicollinearity concern.

5.3.3 Export Performance

Two subjective export performance variables are used in this study: subjective export performance1and 2. Subjective export performance1 means the extent of a firm's satisfaction with the trend of export performance and comprises five items. Subjective export performance2 means the extent of a firm's perception of export objectives has been achieved and comprises nine items. Results of the factor analysis for items constituting the subjective export performance1 and 2 are presented in Tables 5.6 and 5.7. The solution produced one factor that explained 85.9% of the variance for subjective export performance1and 71.4% of the variance for subjective export performance2. Reliability is acceptable as indicated by a Cronbach's alpha of 0.96 and 0.95 for subjective export performance1 and 2 respectively. The set of items used to measure the same construct loaded heavily on the same factor for both subjective export performance1 and 2 indicating convergent validity (Churchill 1979).

Table 5.6

Extracted Factor and Factor Loadings Related to Subjective Performance1

Factor	Factor Loadings
Factor1:Subjective Performance1(subperf1)	
1. Trend of export sales revenue of the last three years (subperf1_2)	0.96
2. Export sales growth of the last three years (subperf1_5)	0.93
3. Trend of export sales volume of the last three years (subperf1_1)	0.92
4. Trend of ratio of export sales to total sales of the last three years (subperf1_3)	0.89
5. Trend of export profit of the last three years (subperf1_4)	0.85
Eigenvalue	4.30
Percentage of variance	85.93
Cronbach's Alpha	0.96

Table 5.7

Extracted Factor and Factor Loadings Related to Subjective Performance2

Factor	Factor Loadings
Factor1:Subjective Performance1(subperf2)	0.82
1. Increase export sales revenues	0.79
2. Increase export profits	0.86
3. Gain a foothold in the export markets	0.90
4. Increase firm's ability to compete	0.86
5. Improve international marketing skills	0.76
6. Build brand awareness and image	0.78
7. Improve product development skills	0.86
8. Increase distribution competence	0.79
9. Increase production capacity for exporting	0.85
Eigenvalue	6.42
Percentage of variance	71.36
Cronbach's Alpha	0.95

5.4 Firm and Respondent Characteristics

This section provides information about the 370 respondents with respect to firm characteristics and their personal profile. Questions pertaining to firm characteristics were asked in the last section of the questionnaire concerning principal industry, regions to export, time has been in exporting, and number of employees. In

the same section, respondent characteristics were asked concerning position in the firm, age, highest education, and years involved in export activity.

Table 5.8 shows that the sample consists of respondents from 13 industries. Food Products and Beverage represents the largest portion of the sample with 59 firms (15.9%). Developed countries are reported to be the largest portion of the region to export with 287 firms (77.6%). The distribution of responding firms by time has been in exporting is presented that the majority of firms (30.8%) have been in exporting 6-10 years. The average experience in exporting is 11.8 years. With regard to number of employees, the majority of firms (131 firms, or 35.4%) was 49 employees or below.

Table 5.8

Summary of Firm Characteristics

Detail	Number of Cases	Percent
Principal Industry of firms		
Automotive, Auto parts, and Accessories	26	7.0
Chemical/Machinery/Plastic Products	23	6.2
Electronic and Electrical Appliances	26	7.0
Food Products and Beverage	59	15.9
Furniture/Building Materials/Hardware Items	46	12.4
Household products	19	5.1
Gift, Decorative Items and Handicraft	37	10.0
Gems and Jewelry	18	4.9
Leather, PVC, and Footwear	17	4.6
Traveling and Sporting Goods	3	0.8
Textiles, Garment and Fashion Accessories	42	11.4
Medical Supplies, Health and Beauty Products, Cosmetics	20	5.4
Trading Company	16	4.3
Other*	18	4.9
Total	370	100.0
Regions to exportt**		
1. ASEAN	198	53.5
2. NICS	131	35.4
3. Other Less Developed Countries	138	37.3
4. Developed Countries	287	77.6
Time has been in exporting (Years)		
5 or below	96	25.9
6 - 10	114	30.8
11 - 15	55	14.9
16 - 20	68	18.4
21 - 25	14	3.8
26 - 30	18	4.9
More than 30	5	1.3
Total	370	100.0
Number of employees		
49 or below	131	35.4
50 - 99	55	14.9
100 - 149	33	8.9
150 - 199	21	5.7
200 - 249	27	7.3
250 - 299	12	3.2
300 - 499	28	7.6
500-999	36	9.7
1,000-1,499	11	2.9
1,500-2,999	12	3.2
More than 3,000	4	1.1
Total	370	100.0

Note: 1. * Other consists of stationary 2, packaging 7, printing 2, and musical instrument 1, and miscellaneous 6

2. ** More than one choice has been chosen

Table 5.9

Summary of Respondents' Personal Characteristics

Characteristics	Number of Cases	Percent
Position in the firm		
Managing director	143	38.6
Chief executive officer	22	5.9
General manager	57	15.4
Director	19	5.1
Manager	91	24.6
Commercial officer	30	8.1
Other*	8	2.2
Total	370	100.0
Age (years)		
Less than 30	35	34.9
30 - 40	129	35.1
41 - 50	130	18.6
51 - 60	69	9.5
More than 60	7	1.9
Total	370	100.0
Highest education		
Lower than secondary	2	0.5
Secondary/Vocational	28	7.6
Bachelor	180	48.6
Master	155	41.9
Doctoral	5	1.4
Total	370	100.0
Years involved in export activity (years)		
5 or below	119	32.2
6 - 10	114	30.8
11 - 15	61	16.5
16 - 20	54	14.6
21 - 25	12	3.2
26 - 30	9	2.4
More than 30	1	0.3
Total	370	100.0

Note : 1. * Other consists of Vice President 1, Accounting and Finance Officer 3, Secretary 2, and Consultant 2

Table 5.9 summarizes respondents' personal characteristics. The position of the majority of respondents is managing director (38.6%). Age of the majority of respondents (18.6%, or 130 respondents) is between 41 to 50 years while the largest portion of highest education with 180 respondents (48.6%) are holding bachelor

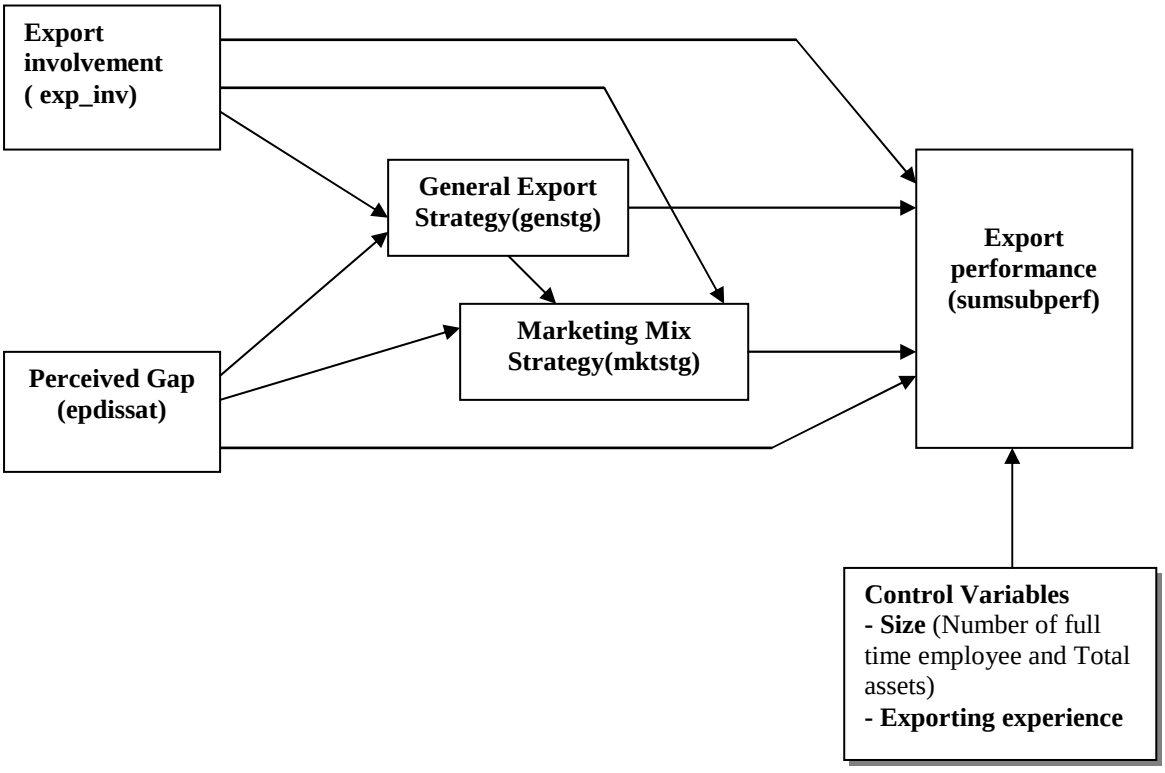
degree. The majority of respondents are involved in exporting activity 5 years or fewer (32.2%, or 119 respondents), with a mean value 10.5 years.

5.5 Causal Model

The study's causal model describes hypothesized relationships linking the model constructs. Variables were divided into four sets: export involvement, perceived gap, export marketing strategy, and export performance. However, as described earlier, export marketing strategy is composed of two factors: general export strategy and marketing mix strategy. The total of five constructs in the conceptual framework was operationalized into the causal model as presented in Figure 5.1.

Figure 5.1

Causal Model



5.5.1 Selection of Dependent Variables

The ultimate dependent variable for this study is export performance. This study measured export performance with three indicators as discussed in Section 4.2.7: objective export performance, subjective export performance1 (subperf1), and subjective export performance2 (subperf2). Objective performance variables are percentage of export sales to total sales and export profit rate. Subjective performance1 measures five aspects of export performance, and subjective performance2 (subperf2) measures nine aspects of export performance. To accomplish hypothesis testing, the most suitable dependent variable must be selected. Correlation analysis was used to make the dependent variable choice. Since perceived gap is the most important independent variable in this study, comparative correlations between perceived gap variables and two objective performance variables (percentage of export sales to total sales and export profit rate) as well as two subjective performance variables were examined. Both subjective performance1 and subjective performance2 have correlations with perceived gaps higher than either of the two objective performance variables. This result indicates that subjective performance is more appropriate as the dependent variable than objective performance. Selection between subjective export performance1and 2 then was done by using correlations analysis among all items comprising the two variables with results shown in Tables 5.10 and 5.11.

Table 5.10

Correlations among Items of Subperf1 (n=370)

	Subperf1_1	Subperf1_2	Subperf1_3	Subperf1_4	Subperf1_5
Subperf1_1	1				
Subperf1_2	0.93**	1			
Subperf1_3	0.80**	0.83**	1		
Subperf1_4	0.76**	0.79**	0.78**	1	
Subperf1_5	0.83**	0.87**	0.84**	0.82**	1

Note: All correlations are significant at $p < 0.01$ level, one-tailed.

Table 5.11

Correlations among Items of Subperf2 (n=370)

	Subperf2_1	Subperf2_2	Subperf2_3	Subperf2_4	Subperf2_5	Subperf2_6	Subperf2_7	Subperf2_8	Subperf2_9
Subperf2_1	1								
Subperf2_2	0.81**	1							
Subperf2_3	0.77**	0.70**	1						
Subperf2_4	0.75**	0.69**	0.81**	1					
Subperf2_5	0.63**	0.65**	0.71**	0.80**	1				
Subperf2_6	0.51**	0.55**	0.65**	0.62**	0.67**	1			
Subperf2_7	0.53**	0.53**	0.59**	0.70**	0.76**	0.70**	1		
Subperf2_8	0.66**	0.65**	0.72**	0.76**	0.75**	0.72**	0.74**	1	
Subperf2_9	0.69**	0.65**	0.66**	0.69**	0.64**	0.60**	0.63**	0.64**	1

Note: All correlations are significant at $p < 0.01$ level, one-tailed.

As presented in Tables 5.10 and 5.11, by comparing correlations between subperf1 and subperf2, it is found that subperf2 indicates a more suitable selection than subperf1, because subperf1 showed very high correlations among all items. Thus, subperf2 provides more information about export performance and is used in the causal model.

5.5.2 Control Variables Evaluation

Control variables for this study comprise firm exporting experience, number of full time employees, and total assets. To investigate whether control variables are useful for this study, correlations were used to test relationships between the control variables and sumsubperf2 as the selected export performance measurement.

Comparing correlations between the control variables and sumsubperf2 as the dependent variable, it is found that number of full time employees indicated the highest correlation with sumsubperf2 (0.19), followed by total assets (0.11). Results indicated no relationship between exporting experience and sumsubperf2 (correlation = -0.03). Thus, number of full time employees (employee) is included in the causal model as a control variable.

5.5.3 Multicollinearity

As a preparatory step, it is important to ensure that independent variables are free from multicollinearity. Multicollinearity occurs when any independent variable is highly correlated with one or more other independent variables used in the same data analysis procedure. Assessment of correlations of independent variables was under taken prior developing the causal model to investigate multicollinearity. Results of factor analysis related to perceived gaps which are the important independent variables as shown in Table 5.4, two factors emerged: Factor1 Export Operations and Information Related; and Factor 2 Marketing Strategy Related. A preliminary examination of the correlation between these two factors revealed a high correlation (0.80). High correlation of independent variables can distort analysis, making causal path results difficult to interpret. Therefore, the two factors could not be entered into the model simultaneously. Entering each perceived gap variable into the causal model as a separate predictor variable will avoid the multicollinearity problem.

In the study's causal model, independent variables therefore are export involvement (ep_inv) and perceived gaps. Inspection of correlation values between export involvement and each individual perceived gap variable (epdissat1-18), found low correlations among them with a maximum value of 0.11. This result shows no multicollinearity concern.

5.5.4 Data Distribution Audit for Independent Variables in Causal Model

In conclusion, the six variables presented in the causal model comprise two antecedents (export involvement (epx_inv) and the perceived gap variables (epdissat1-18)); two mediators (general export strategy (genstg) and marketing mix strategy (mktstg)); and subjective performance2 (sumsbubperf2) as a consequence. Number of employees (employee) also was entered into the model as a control variable.

A data distribution audit was performed to investigate the pattern of responses. Items comprising the five constructs in the model except the control variable were investigated for departures from normality in terms of skewness and kurtosis. Table 5.12 presents a list of the variables showing all values to be in acceptable ranges.

Table 5.12

Summary Statistics for Variables Used in Causal Model A (n=370)

Variables	N	Mean	Std. Deviation	Skewness	Kurtosis
exp_inv	370	6.76	1.89	-0.67	0.49
epdisssat1	370	29.41	14.63	0.61	-0.03
epdisssat2	370	30.61	15.35	0.85	1.04
epdisssat3	370	30.90	16.94	1.08	1.71
epdisssat4	370	28.00	14.67	0.86	0.85
epdisssat5	370	27.18	13.90	1.02	1.52
epdisssat6	370	34.20	18.39	0.96	1.08
epdisssat7	370	30.75	15.78	0.69	0.74
epdisssat8	370	30.19	16.41	1.01	1.34
epdisssat9	370	33.36	18.69	0.96	0.98
epdisssat10	370	32.91	18.01	0.83	0.79
epdisssat11	370	31.17	16.75	0.98	1.37
epdisssat12	370	36.26	20.03	0.75	0.30
epdisssat13	370	36.96	20.75	0.71	0.21
epdisssat14	370	32.58	19.89	0.84	0.55
epdisssat15	370	30.58	16.98	0.95	1.04
epdisssat16	370	27.30	15.84	1.08	2.00
epdisssat17	370	30.55	16.87	0.95	1.40
epdisssat18	370	37.73	21.71	0.68	0.15
genstg	370	7.12	1.60	-0.72	0.53
mktstg	370	6.29	1.78	-0.61	0.06
sumsubperf2	370	6.22	1.88	-0.76	0.34

5.5.5 Path Analyses

Path analysis is a structural equation model with observed variables. The aim is to provide estimates of the magnitude and significance of hypothesized causal connections between variables. Path analysis is used to test the fit of the observed correlation matrix against two or more causal models which are being posited.

A path diagram or a path model in visual form portrays relationships between independent, intermediary, and dependent variables. A path diagram can be constructed by writing the names of the variables and drawing an arrow from each variable to any other variable that is believed that it affects. A path coefficient is a standardized regression coefficient (beta) value to indicate the direct effect of a variable assumed to be an independent variable on dependent variable in the path model. According to Bryman and Cramer (1994), path coefficient and its details can be explained that: path coefficients are written with two subscripts; the path from 1 to 2 is written P21 note that the effect is listed first; in path language, e means causes outside the model; the e does not stand for measurement error, which is assumed to be zero; and when the model has two or more causal variables, path coefficients are partial regression coefficients which measure the extent of effect of one variable on another in the path model controlling for other prior variables, using standardized data or a correlation matrix as input.

As details of path coefficient identified by Bryman and Cramer (1994), it is concluded that the total causal effect of variable x on variable y is the sum of the values of all the paths from x to y. Considering "sumsubperf2" as the dependent variable in the Figure 5.1, and considering "exp_inv" as the independent varible, the *indirect effects* are calculated by multiplying the path coefficients for each path from exp_inv to sumsubperf2:

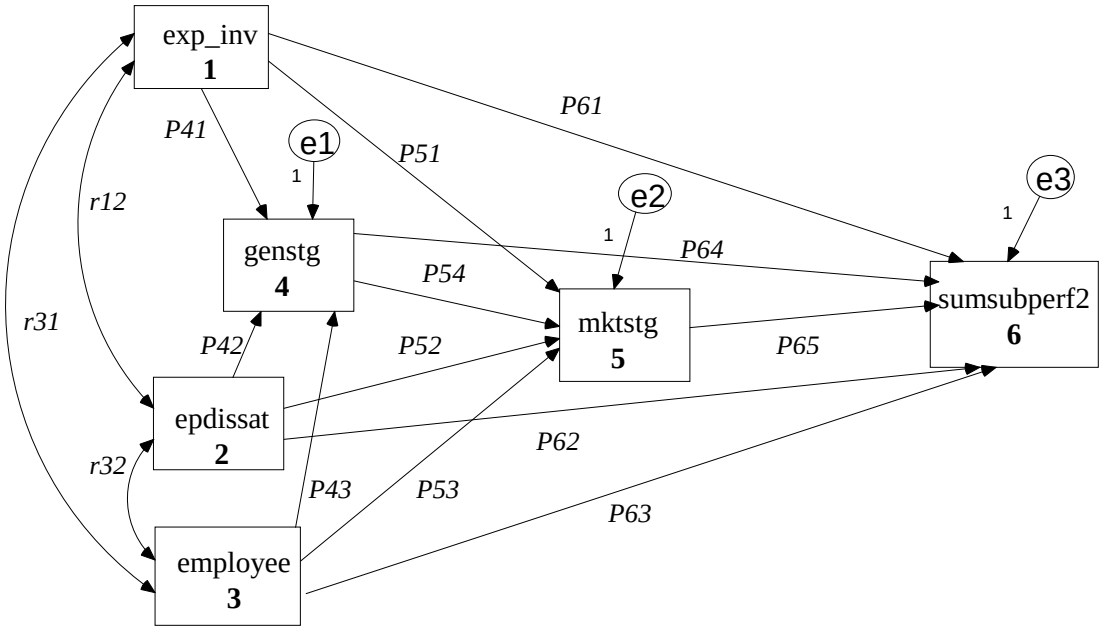
1. Direct Effect (DE)
   Equation 1: exp_inv -> sumsubperf2 = *P61*
2. Indirect Effect (IE)
   Equation 2: exp_inv -> genstg -> sumsubperf2 = *P41*P64*
   Equation 3: exp_inv -> genstg -> mktstg -> sumsubperf2
   = P41*P54*P65
3. Total Effect of export involvement (exp_inv) on subjective performance2 (sumsubperf2)
   = Direct Effect (DE) + Indirect Effect (IE)

The model procedure begins with a just–identified base model as shown in Figure 5.2. Model identification status is then investigated, followed by an attempt to estimate parameters of the model. At this stage, weak causal paths from the

independent variables to the dependent variables with bad fit indicators are trimmed. Finally, a final model then is developed that contains all remaining variables after trimming.

Figure 5.2

Just-Identified Base Model



Tables 5.13 presents standardized path coefficients and SMC values for all 18 just–identified models and the perceived gap variables. Three key results are discussed as follows. First, paths with consistently high standardized path coefficients comprise *P54, P41, P65, and P641* respectively. This can be described that associations between general export strategy and marketing mix strategy are highest for all perceived gap models (≈0.80), followed by associations between export involvement and general export strategy(≈0.43). Three other paths: general export strategy to subjective performance, marketing mix strategy to subjective performance; and export involvement to subjective performance show medium–sized path coefficients (≈0.17- ≈0.35). These findings confirm the positive associations between

export involvement, export strategy, and subjective performance. Second, the control variable (number of full time employees) is largely ineffective in its effects on general export strategy, marketing mix strategy, and subjective performance, seeing from very low standardized path coefficients of *P43, P53,* and *P63.* Table 5.13 also shows estimations of Squared Multiple Correlation (SMC) values which is a percentage of variance of observed variable caused by independent variables. Results can be described that about 19% of variance of SMC4 mainly caused by *P41***,** about 61% of variance of SMC5 mainly caused by *P54,* and about 51% of variance of SMC6 mainly caused by *P61, P64,* and *P65*.

Table 5.14 shows standardized path coefficients and SMC values for Trimmed models. *P43* for all perceived gap variables was deleted whereas *P42* of some perceived gap variables remain in the model. It can be assumed that trimming more paths of *P42* would not affect any changing of other values in the model. Inspection of no changes of the values of big paths, i.e., *P54, P 41, P64,* and *P65* as well as the SMC support this assumption.

Table 5.15 presents fit statistics for the trimmed model. Results of all models meet all fit index criteria. That is, all Chi-square/Degree of freedom (CMIN/*df*) are less than 2, $p > 0.05$, GFI ≥ 0.95, AGFI > 0.90, RMSEA < 0.08, and SRMR < 0.05, indicating a good fit for the model. Table 5.16 presents the standardized direct, indirect, and total effects among the variables which were calculated using bootstrapping. These effects were calculated at a confidence level 95% and the bootstrap was set equal to 500. Results of Standardized Total Effect show that general export strategy, marketing mix strategy, and export involvement are much stronger predictors of subjective performance2 than the 18 perceived gap variables. Results also show small but negative effects of all perceived gap variables on subjective performance2 seeing from the negative sign of all values.

Table 5.17 provides additional results for the 18 causal models. All Critical Ratios (Standardized Total Effect divided by Standard Errors) are higher than 1.96. All relationships among perceived gap variables and firm subjective export performance are significant in the expected direction at the significance level 0.05 and all describe substantive total effects on subjective performance (sumsubperf2).

Table 5.13

Standardized Path Coefficients and SMC Values for Just-Identified Models (n=370)

Perceived Gap Variables	***P41***	***P42***	***P43***	***P51***	***P52***	***P53***	***P54***	***P61***	***P62***	***P63***	***P64***	***P65***	***SMC4***	***SMC5***	***SMC6***
epdissat 1	.43	.01	.04	-.09	-.08	.07	.80	.17	-.09	.06	.30	.35	.19	.61	.51
epdissat 2	.43	-.07	.05	-.09	-.10	.07	.80	.17	-.10	.06	.30	.34	.20	.61	.51
epdissat 3	.43	-.02	.04	-.09	-.05	.06	.80	.18	-.09	.05	.29	.36	.19	.61	.51
epdissat 4	.43	-.01	.04	-.09	-.08	.06	.80	.17	-.06	.05	.29	.36	.19	.61	.51
epdissat 5	.42	-.07	.05	-.09	-.08	.07	.80	.17	-.10	.06	.29	.35	.20	.61	.51
epdissat 6	.43	-.03	.04	-.09	-.10	.07	.80	.17	-.12	.06	.30	.34	.19	.61	.51
epdissat 7	.43	.03	.04	-.09	-.15	.07	.81	.17	-.07	.06	.30	.35	.19	.62	.50
epdissat 8	.43	.04	.04	-.10	-.11	.06	.81	.17	-.09	.05	.30	.35	.19	.61	.51
epdissat 9	.43	-.03	.04	-.08	-.15	.06	.80	.17	-.14	.05	.32	.32	.19	.63	.52
epdissat 10	.43	-.01	.04	-.10	-.12	.07	.80	.16	-.14	.06	.31	.33	.19	.62	.52
epdissat 11	.43	.01	.04	-.09	-.06	.06	.80	.17	-.11	.06	.30	.35	.19	.61	.51
epdissat 12	.43	-.09	.05	-.07	-.16	.07	.79	.18	-.14	.07	.31	.31	.20	.63	.52
epdissat 13	.43	-.02	.04	-.09	-.10	.06	.80	.17	-.12	.06	.30	.34	.19	.61	.51
epdissat 14	.43	.01	.04	-.09	-.12	.06	.80	.18	-.06	.05	.30	.35	.19	.62	.50
epdissat 15	.43	-.11	.04	-.07	-.11	.06	.79	.19	-.11	.05	.29	.34	.21	.61	.51
epdissat 16	.43	.01	.04	-.09	-.04	.06	.80	.17	-.08	.05	.29	.36	.19	.61	.51
epdissat 17	.43	.00	.04	-.08	-.07	.06	.80	.18	-.11	.05	.30	.35	.19	.61	.51
epdissat 18	.43	-.03	.04	-.07	-.15	.07	.80	.18	-.10	.06	.31	.33	.19	.62	.51

Table 5.14

Standardized Path Coefficients and SMC Values for Trimmed Models (n=370)

Perceived Gap Variables	***P41***	***P42***	***P43***	***P51***	***P52***	***P53***	***P54***	***P61***	***P62***	***P63***	***P64***	***P65***	***SMC4***	***SMC5***	***SMC6***
epdissat 1	.44	Del	Del	-.09	-.08	.07	.80	.17	.-.09	.06	.30	.35	.19	.61	.51
epdissat 2	.44	-.06	Del	-.09	-.10	.07	.80	.17	-.10	.06	.30	.34	.20	.61	.51
epdissat 3	.44	Del	Del	-.09	-.05	.06	.80	.18	-.09	.05	.29	.36	.19	.60	.50
epdissat 4	.44	Del	Del	-.09	-.08	.06	.08	.17	-.06	.05	.29	.36	.19	.61	.51
epdissat 5	.43	-.07	Del	-.09	-.08	.07	.80	.17	-.10	.06	.29	.35	.20	.61	.51
epdissat 6	.44	Del	Del	-.09	-.10	.07	.80	.18	-.12	.06	.30	.34	.19	.61	.51
epdissat 7	.44	Del	Del	-.09	-.15	.07	.81	.17	-.07	.06	.30	.35	.19	.62	.50
epdissat 8	.44	Del	Del	-.10	-.11	.06	.81	.17	-.09	.05	.30	.35	.19	.61	.51
epdissat 9	.44	Del	Del	-.08	-.15	.06	.80	.17	-.14	.05	.32	.32	.19	.62	.51
epdissat 10	.44	Del	Del	-.10	-.12	.07	.80	.16	-.14	.06	.31	.33	.19	.61	.52
epdissat 11	.44	Del	Del	-.09	-.06	.06	.80	.17	-.11	.06	.30	.35	.19	.60	.51
epdissat 12	.44	-.08	Del	-.07	-.16	.07	.79	.18	-.14	.07	.31	.31	.20	.63	.52
epdissat 13	.44	Del	Del	-.09	-.10	.07	.80	.17	-.12	.06	.30	.34	.19	.61	.51
epdissat 14	.44	Del	Del	-.09	-.12	.06	.80	.18	-.06	.05	.30	.35	.19	.61	.50
epdissat 15	.45	-.11	Del	-.07	-.11	.06	.79	.19	-.11	.05	.29	.34	.20	.61	.51
epdissat 16	.44	Del	Del	-.09	Del	.06	.80	.17	-.08	.05	.29	.36	.19	.61	.50
epdissat 17	.44	Del	Del	-.08	-.07	.06	.80	.18	-.11	.05	.30	.35	.19	.61	.51
epdissat 18	.44	Del	Del	-.07	-.15	.07	.80	.18	-.10	.06	.31	.33	.19	.62	.51

Table 5.15

Fit Statistics for Trimmed Models in Table 5.15

Perceived Gap Variables	***Chi-Square***	***df***	***Chi-Square/df***	***p***	***GFI***	***AGFI***	***RMSEA***	***SRMR***
epdissat 1	.73	2	.36	.70	.99	.99	.00	.01
epdissat 2	.89	1	.89	.35	.99	.98	.00	.01
epdissat 3	.87	2	.43	.65	.99	.99	.00	.01
epdissat 4	.67	2	.34	.72	.99	.99	.00	.01
epdissat 5	.86	1	.86	.35	.99	.98	.00	.01
epdissat 6	1.16	2	.58	.56	.99	.99	.00	.02
epdissat 7	1.14	2	.57	.57	.99	.99	.00	.02
epdissat 8	1.40	2	.70	.50	.99	.99	.00	.02
epdissat 9	.98	2	.49	.61	.99	.99	.00	.01
epdissat 10	.71	2	.35	.70	.99	.99	.00	.01
epdissat 11	.68	2	.34	.71	.99	.99	.00	.01
epdissat 12	.87	1	.87	.35	.99	.99	.00	.01
epdissat 13	.87	2	.44	.65	.99	.99	.00	.01
epdissat 14	.66	2	.33	.72	.99	.99	.00	.01
epdissat 15	.70	1	.70	.40	.99	.99	.00	.01
epdissat 16	1.98	3	.66	.58	.99	.99	.00	.01
epdissat 17	.66	2	.33	.72	.99	.99	.00	.01
epdissat 18	.67	2	.33	.72	.99	.99	.00	.01

Table 5.16

Standardized Total Effects, Direct Effects, and Indirect Effects for Subjective Performance2 by Perceived Gaps

Perceived Gap Variables	Standardized Total Effect					Standardized Direct Effect					Standardized Indirect Effect				
	exp_inv	genstg	mktstg	perceived gap	employee	exp_inv	genstg	mktstg	perceived gap	employee	exp_inv	genstg	mktstg	perceived gap	employee
epdissat 1	.39	.58	.35	-.12	.09	.17	.30	.35	-.09	.06	.22	.28	.00	-.03	.03
epdissat 2	.39	.57	.34	-.17	.09	.17	.29	.34	-.10	.06	.22	.27	.00	-.07	.02
epdissat 3	.40	.58	.36	-.11	.08	.18	.29	.36	-.09	.05	.22	.29	.00	-.02	.02
epdissat 4	.39	.58	.36	-.09	.08	.17	.29	.36	-.06	.05	.22	.29	.00	-.03	.02
epdissat 5	.39	.57	.35	-.17	.08	.17	.29	.35	-.10	.06	.21	.28	.00	-.07	.02
epdissat 6	.40	.57	.34	-.15	.08	.18	.30	.34	-.12	.06	.22	.27	.00	-.03	.02
epdissat 7	.40	.58	.35	-.12	.08	.17	.30	.35	-.07	.06	.22	.28	.00	-.05	.03
epdissat 8	.39	.58	.35	-.12	.07	.17	.30	.35	-.09	.05	.22	.28	.00	-.04	.02
epdissat 9	.40	.57	.32	-.19	.07	.18	.32	.32	-.14	.05	.23	.25	.00	-.05	.02
epdissat 10	.39	.58	.33	-.18	.09	.16	.31	.33	-.14	.06	.22	.26	.00	-.04	.02
epdissat 11	.39	.58	.35	-.13	.08	.17	.29	.35	-.11	.06	.22	.28	.00	-.02	.02
epdissat 12	.41	.56	.31	-.24	.09	.18	.31	.31	-.14	.07	.23	.25	.00	-.09	.02
epdissat 13	.39	.58	.34	-.16	.08	.17	.30	.34	-.12	.06	.22	.27	.00	-.04	.02
epdissat 14	.40	.58	.35	-.10	.07	.18	.29	.35	-.06	.05	.22	.28	.00	-.04	.02
epdissat 15	.41	.56	.34	-.21	.08	.19	.29	.34	-.11	.05	.23	.27	.00	-.10	.02
epdissat 16	.40	.58	.36	-.08	.07	.17	.29	.36	-.08	.05	.22	.29	.00	.00	.02
epdissat 17	.40	.58	.35	-.14	.07	.17	.30	.35	-.11	.05	.22	.28	.00	-.03	.02
epdissat 18	.41	.58	.33	-.15	.09	.18	.31	.33	-.10	.06	.23	.27	.00	-.05	.02
Average	0.40	0.58	0.35	-0.15	0.08	0.17	0.30	0.34	-0.10	0.06	0.22	0.27	.00	-0.04	0.02

Table 5.17

Total Effects, Standard Errors, and Critical Ratios for Perceived Gap Variables and Subjective Performance2

Perceived Gap Variables	Standardized Total Effect					Standard Error					Critical Ratios				
	exp_inv	genstg	mktstg**	perceived gap	employee	exp_inv	genstg	mktstg	perceived gap	employee	exp_inv	genstg	mktstg	perceived gap	employee
epdissat 1	.39	.58	.35	-.12	.09	.05	.04	.06	.05	.03	7.80***	14.50***	5.83***	-2.38*	3.00**
epdissat 2	.39	.57	.34	-.17	.09	.05	.04	.06	.05	.03	7.80***	14.25***	5.67***	-3.28*	3.00*
epdissat 3	.40	.58	.36	-.11	.08	.05	.04	.06	.05	.03	8.00***	14.50***	6.67***	-2.33*	2.67*
epdissat 4	.39	.58	.36	-.09	.08	.05	.04	.06	.04	.03	7.80***	14.50***	6.00***	-2.00*	2.67*
epdissat 5	.39	.57	.35	-.17	.08	.05	.05	.06	.06	.03	7.80***	11.40***	5.83***	-3.07*	2.67*
epdissat 6	.40	.57	.34	-.15	.08	.05	.04	.06	.05	.03	8.00***	14.25***	5.67***	-3.13*	2.67*
epdissat 7	.40	.58	.35	-.12	.08	.05	.04	.06	.05	.03	8.00***	14.50***	5.83***	-2.64*	2.67*
epdissat 8	.39	.58	.35	-.12	.07	.05	.04	.06	.05	.03	7.80***	14.50***	5.83***	-2.58*	2.33*
epdissat 9	.40	.57	.32	-.19	.07	.05	.05	.06	.05	.03	8.00***	11.40***	5.33***	-3.90*	2.33*
epdissat 10	.39	.58	.33	-.18	.09	.05	.04	.06	.05	.03	7.80***	14.50***	5.50***	-3.79*	3.00*
epdissat 11	.39	.58	.35	-.13	.08	.05	.07	.06	.05	.03	7.80***	8.29***	5.83***	-2.73*	2.67*
epdissat 12	.41	.56	.31	-.24	.09	.05	.05	.06	.06	.03	8.20***	11.20***	5.17***	-4.09*	3.00*
epdissat 13	.39	.58	.34	-.16	.08	.05	.04	.06	.05	.03	7.80***	14.50***	5.67***	-3.10*	2.67*
epdissat 14	.40	.58	.35	-.10	.07	.05	.04	.06	.05	.03	8.00***	14.50***	5.83***	-2.17*	2.33*
epdissat 15	.41	.56	.34	-.21	.08	.05	.04	.06	.05	.03	8.20***	14.00***	5.67***	-3.94*	2.67*
epdissat 16	.40	.58	.36	-.08	.07	.05	.04	.06	.05	.03	8.00***	14.50***	6.00***	-1.72*	2.33*
epdissat 17	.40	.58	.35	-.14	.07	.05	.04	.06	.05	.03	8.00***	14.50***	5.83***	-2.78*	2.33*
epdissat 18	.41	.58	.33	-.15	.09	.05	.04	.07	.05	.03	8.20***	14.50***	4.71***	-3.43*	3.00*

Note: Significance Level: $p^{***} \leq 0.001$; $p^{**} \leq 0.01$; $p^{*} \leq 0.10$.

****** No Indirect Path Coefficient (Standardized Total Effect = Standardized Direct Effect)

5.6 Hypotheses Testing Results

This section presents results associated with hypotheses testing. Data to test the six hypotheses appear in Table 5.18. Most hypotheses except H1a and H4 are tested as a Total Effect (the sum of the direct and indirect effects) of the respective independent variables to dependent variables present in the hypotheses. Hypotheses H1a and H4 are tested as a Direct Effect because they have no indirect path coefficients between the independent and the dependent variables. All hypotheses and test results are stated as follows:

H1a: Export involvement has a positive impact on the general export strategy to be adopted.

H1b: Export involvement has a positive impact on the marketing mix strategy to be adopted.

H2: Export involvement has a positive impact on subjective performance.

H3: Firms' general export strategy has a positive impact on subjective performance.

H4: Firms' export marketing mix strategy has a positive impact on subjective performance.

H5a: Perceived gap of export promotion programs has a negative impact on the general export strategy to be adopted.

H5b: Perceived gap of export promotion programs has a negative impact on the marketing mix strategy to be adopted.

H6: Perceived gap of export promotion programs has a negative impact on subjective performance.

Inspection of critical ratios (C.R. - Products of Total Effects (or Direct Effects for H1a and H4) divided by Standard Errors) as shown in Table 5.18, indicates that Hypotheses H1a, H1b, H2, H3, H4, H5b, and H6 are all supported seeing from high significance levels which are greater than 1.96. Only H5a is not supported.

Table 5.18

Standardized Total Effects, and Critical Ratios by Perceived Gap Variables

Perceived Gap	H1a**		H1b		H2		H3		H4**		H5a		H5b		H6	
	DE	C.R.	TE	C.R.	TE	C.R.	TE	C.R.	DE	C.R.	TE	C.R.	TE	C.R.	TE	C.R.
epdissat 1	.44	11.00***	.26	5.20***	.39	7.80 ***	0.58	14.50***	0.35	5.83***	0.00	0.00 NS	-0.08	-2.67*	-.12	-2.38*
epdissat 2	.44	11.00***	.26	5.20***	.39	7.80***	0.57	14.25***	0.34	5.67***	-0.06	-1.20 NS	-0.15	-3.00**	-.17	-3.28**
epdissat 3	.44	11.00***	.26	5.20***	.40	8.00***	0.58	14.50***	0.36	6.00***	0.00	0.00 NS	-0.05	-1.67NS	-.11	-2.33*
epdissat 4	.44	11.00***	.26	5.20***	.39	7.80***	0.58	14.50***	0.36	6.00***	0.00	0.00 NS	-0.08	-2.67*	-.09	-2.00*
epdissat 5	.43	10.75***	.26	5.20***	.39	7.80***	0.57	11.40***	0.35	5.83***	-0.06	-1.20 NS	-0.13	-2.17*	-.17	-3.07**
epdissat 6	.44	11.00***	.26	5.20***	.40	8.00***	0.57	14.25***	0.34	5.67***	0.00	0.00 NS	-0.10	-3.33**	-.15	-3.13**
epdissat 7	.44	11.00***	.26	5.20***	.40	8.00***	0.58	14.50***	0.35	5.83***	0.00	0.00 NS	-0.15	-5.00**	-.12	-2.64*
epdissat 8	.44	11.00***	.26	5.20***	.39	7.80***	0.58	14.50***	0.35	5.83***	0.00	0.00 NS	-0.11	-3.67**	-.12	-2.58*
epdissat 9	.44	11.00***	.27	5.40***	.40	8.00***	0.58	11.60***	0.32	5.33***	0.00	0.00 NS	-0.15	-5.00**	-.19	-3.90**
epdissat 10	.44	11.00***	.26	5.20***	.39	7.80***	0.58	14.50***	0.33	5.50***	0.00	0.00 NS	-0.12	-3.00**	-.18	-3.79**
epdissat 11	.44	11.00***	.26	6.50***	.39	7.80***	0.58	8.29***	0.35	5.83***	0.00	0.00 NS	-0.06	-2.00*	-.13	-2.73*
epdissat 12	.44	11.00***	.28	5.60***	.41	8.20***	0.56	11.20***	0.31	5.17***	-0.08	-1.60 NS	-0.22	-4.40**	-.24	-4.09*
epdissat 13	.44	11.00***	.26	5.20***	.39	7.80***	0.58	14.50***	0.34	5.67***	0.00	0.00 NS	-0.10	-3.33**	-.16	-3.10**
epdissat 14	.44	11.00***	.27	5.40***	.40	8.00***	0.58	14.50***	0.35	5.83***	0.00	0.00 NS	-0.12	-4.00**	-.10	-2.17*
epdissat 15	.45	11.25***	.28	5.60***	.41	8.20***	0.56	14.00***	0.34	5.67***	-0.11	-2.20 NS	-0.20	-4.00**	-.21	-3.94**
epdissat 16	.44	11.00***	.26	5.20***	.40	8.00***	0.58	14.50***	0.36	6.00***	0.00	0.00 NS	0.00	0.00 NS	-.08	-1.72*
epdissat 17	.44	11.00***	.27	5.40***	.40	8.00***	0.58	14.50***	0.35	5.83***	0.00	0.00 NS	-0.07	-2.33*	-.14	-2.78*
epdissat 18	.44	11.00***	.28	5.60***	.41	8.20***	0.58	14.50***	0.33	4.71***	0.00	0.00 NS	-0.15	-5.00**	-.15	-3.43**

Note: TE = Total Effect ; DE = Direct Effect; C.R. = Critical Ratios ; Significance Level: $p^{***} \leq 0.001$; $p^{**} \leq 0.01$; $p^{*} \leq 0.10$.; NS = Non significant
** No Indirect Path Coefficient (Standardized Total Effect = Standardized Direct Effect)

5.7 Cluster Analysis

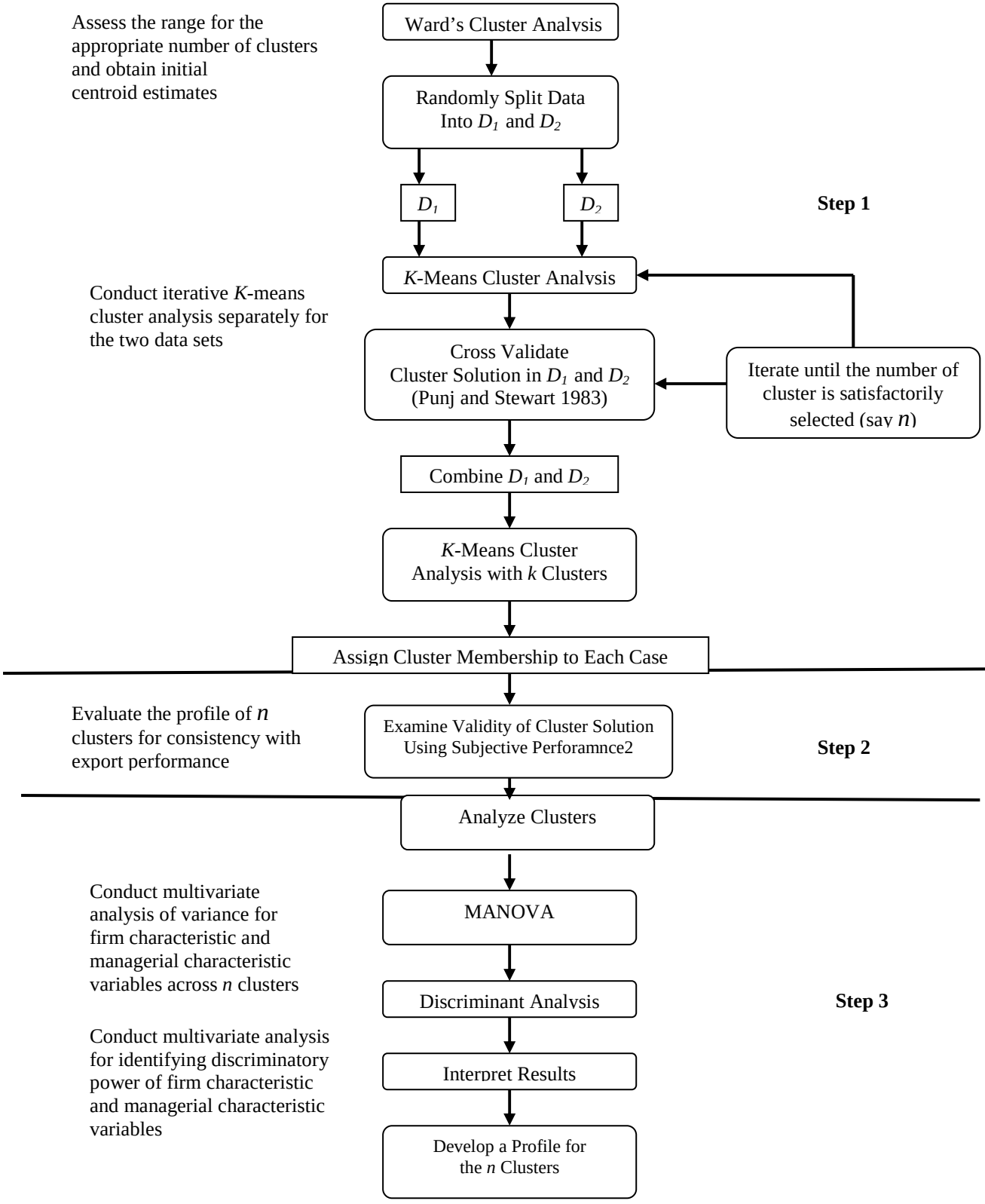
The main purpose of cluster analysis in this study is to examine in more managerial detail the relationship between of perceived gaps and firm performance. That is, path analysis results showed a relatively small but consistent negative effect of the 18 perceived gap variables on subjective performance2. The interest now is to divide respondent firms into relatively homogeneous groups based on their perceived gaps and then investigate to what extent these groups of firms have achieved their objectives for their export business. Analyses in this section follow a three-step clustering approach suggested by Singh (1990) and presented in Figure 5.3.

In the first step, the aim is to determine the optimal number of clusters based on hierarchical cluster analysis and to internally validate alternative cluster solutions. Perceived gap variables were used as inputs to cluster analysis in this step. The perceived gap variables are considered to be initial and central considerations in a firm's satisfaction with governmental export promotion programs. Perceived gap variables are measured with interval properties and allow the use of a distance metric in cluster analysis.

To begin the clustering procedure, the sample was randomly split into two data sets, D_1 and D_2, each containing 185 cases. D_1 was identified as the test sample and D_2 the internal validation sample. D_1 was used to generate possible alternative cluster solutions based on firm satisfaction. D_2, as an internal validation sample, then was used to select the most optimum among these solution alternatives based on cluster stability and reproducibility. To obtain some ideas about the number of clusters, Ward's clustering method was initially utilized. Then, using initial centroid estimates from Ward's clustering method, *K*–means cluster analysis was performed for several different starting cluster values produced by Ward's clustering method. The optimal number of clusters was chosen based on internal validation of the various cluster solutions.

Figure 5.3

The Three-Step Flow of Cluster Analysis Method Utilized in the Study



For a given cluster solution, the constrained solution classifies all cases in D_2 based on cluster analysis results from D_1, the test sample. The chance corrected coefficient of agreement, *Kappa*, was computed for the constrained and unconstrained solutions of D_2 cases (Lorr 1983). The optimal of clusters was chosen so as to maximize *Kappa*. Once this number was determined, D_1 and D_2 were pooled and input into a final *K*-means cluster analysis with the number of clusters specified at the optimal value.

In the second step, the optimal cluster uncovered in the first step is tested for external validity. That is, derived *K*-means clusters are tested for differences across clusters in terms of subjective performance. To the extent that respondents in derived clusters show between cluster differences in subjective performance2 the solution would tend to be valid.

In the third step, discriminant analysis is employed to determine characteristics that differ across derived cluster groups. Discriminating variables are sequentially entered into discriminant analysis and discriminating power of the perceived gap variables evaluated. Significant discriminant functions then are interpreted on the basis of standardized and structure coefficients to identify perceived gap variables that have substantive discriminating power.

To describe the first step, section 5.6.1 begins with an introduction to the study's clustering variables, is followed by more discussion of hierarchical and non-hierarchical cluster analyses in Section 5.6.2, and ends by presenting results obtained from the final *K*–means cluster analysis in Section 5.6.3.

5.7.1 Clustering Variables

Clustering variables consist of the seven big perceived gap measures: epdissat6, epdissat9, epdissat10, epdissat12, epdissat13, epdissat14, and epdissat18. A value that exceeds 32 was used as the cutoff threshold value for designation as a big perceived gap. Table 5.19 identifies the seven clustering variables obtained from this selection.

Table 5.19

Identification of the Seven Clustering Variables

Perceived Gap Variables	Details	Value
epdissat 6	Dealing with red tape of Thailand public institutions (perceived gap6) : Red tape	34.2
epdissat 9	Developing product to meet importer's quality standards (perceived gap9) : Product quality standard	33.4
epdissat 10	Developing product design and style for export markets (perceived gap10) : Product design and style	32.9
epdissat 12	Setting the competitive prices in export markets (perceived gap12): Setting the competitive prices	36.3
epdissat 13	Identifying capable overseas distributors (perceived gap13) : Capable distributors	37.0
epdissat 14	Payment from overseas distributors (perceived gap14) : Payment	32.6
epdissat 18	Protecting against currency exchange rate fluctuations (perceived gap18) : Protecting against currency	37.7

5.7.2 Hierarchical Cluster Analysis

Hierarchical clustering was used to obtain a priori information for the iterative *K*–means clustering employed in the second step of clustering and to deal with outliers. Ultimate outcomes of this step are to determine the optimum number of clusters, the starting point for the iterative *K*–means clustering used in the second step, and identification of any outliers for deletion prepared for the second step.

Hierarchical clustering requires two decisions pertaining to *a priori* knowledge about the possible range of the number of clusters and the algorithm to use in performing the clustering. As clustering variables comprise seven variables, a minimum of seven clusters is considered acceptable. As the number of industries studied in this research is 13, a maximum of 13 clusters is appropriate.

This study employed Ward's method as the hierarchical method of clustering to determine the optimal cluster solution range. Agglomeration coefficients were calculated for each cluster solution–a large increase in the agglomeration coefficient between any *n* and *n+1* cluster solution indicates the merger of two very different clusters. Inspection of changes in agglomeration coefficients help to indicate the optimal number of clusters. As presented in Table 5.20, agglomeration coefficients for Ward's method show large increases when moving from two clusters

to one cluster (67.5%), from three to two (19.1%), from four to three (16.1%), from five to four (6.3%), from six to five (6.4%), from seven to six (6.2%), from eight to seven (4.6%), from nine to eight (4.1%), from ten to nine (3.9%), and from eleven to ten (3.9%). On this basis, the cluster solution range was adjusted to be from two to 11 clusters. However, the percentage change in agglomeration coefficients when going from four clusters to three, from three to two, and from two clusters to one is large, consistent with the fact that respondents in this study are from 13 principal industries. Thus, the optimal solution was finally adjusted to a range of from eight to 11 clusters. Based on these findings, column vectors of means from eight to 11 clusters were used as the initial seed points for *K*-mean clustering procedure (see Appendix 4). Table 5.21 presents results of the final hierarchical clustering solutions in terms the number of cases in each cluster for the eight to 11 cluster solutions. Results of frequency distributions of clustering variables for each cluster solution indicate that no outliers exist for deletion.

Table 5.20

Analysis of Agglomeration Coefficients for Hierarchical Cluster Analysis (n=370)

Number of Clusters	Agglomeration Coefficient	Value Change in Coefficient to Next Level	Percentage Change in Coefficient to Next Level
13	285092.50	9578.77	3.4%
12	294671.27	11076.18	3.8%
11	305747.45	11856.43	3.9%
10	317603.88	12364.18	3.9%
9	329968.05	13390.43	4.1%
8	343358.48	15668.76	4.6%
7	359027.25	22394.55	6.2%
6	381421.80	24555.18	6.4%
5	405976.98	25629.14	6.3%
4	431606.13	69527.41	16.1%
3	501133.53	95845.19	19.1%
2	596978.72	403243.86	67.5%
1	1000222.58		

Table 5.21

Cluster Sizes for Final Hierarchical Clustering Results, 8 to 11 Cluster Solution (n=370)

Cluster	Number of Cases for Each Cluster Solution			
	8	**9**	**10**	**11**
1	89	89	89	12
2	83	57	57	77
3	29	29	29	57
4	38	38	38	29
5	74	74	74	38
6	19	19	19	74
7	14	14	14	19
8	24	24	15	14
9		26	9	15
10			26	9
11				26

The next step after the range of eight to 11 alternative cluster solutions has been identified from hierarchical cluster analysis is to derive and internally validate a chosen cluster solution using *K*-means clustering.

5.7.3 *K*–means Cluster Analysis

K–means clustering, a non-hierarchical procedure, was used to serve to adjust results obtained from the hierarchical procedure and to internally validate the chosen cluster solution. This is the last set of analyses in the first step of analysis.

In accord with the procedure recommended by Singh (1990), the 370 cases were randomly split 50:50 into two data sets, D_1 and D_2. D_1 was the test sample and D_2 was the internal validation sample. To obtain the number of clusters, D_1 was input for analysis using four initial centroids (eight to 11 clusters) estimates obtained from Ward's method. *K*–means clustering was performed on the D_1 test sample to get four different constrained cluster values. Results of column vectors of means ranging from eight to 11 clusters solutions produced by non-hierarchical *K*–means clustering procedure on the D_1 are presented in Appendix 5.

Next, the optimal number of clusters was chosen based on an internal validation of the various cluster solutions. This procedure is essentially a cross–validation using the D_2 sample with constrained and unconstrained solutions for each alternative cluster value. For the constrained solution, all cases in D_2 were classified. based on initial centroids from the D_1 sample. The proximity matrix based on Euclidean distances among cases was applied to assign each case to a cluster. The unconstrained solution classifies all cases in D_2 with no restrictions. Numbers of cluster members for constrained and unconstrained solutions of the D_2 sample are summarized in Table 5.22.

The computation of stability and reproducibility used the chance corrected coefficient of agreement, *Kappa*, for the two solutions of D_2 cases (constrained and unconstrained solutions are provided in Table 5.23). The maximum value of *Kappa* identifies which cluster solution is the most stable under both constrained and unconstrained solutions. The optimal number of clusters was chosen based on the maximum *Kappa* value, which is a ten-cluster solution identified as the shaded cell in Table 5.23.

Table 5.22

Summary of Number of Cluster Members for D2 Constrained and Unconstrained Scenarios (n=185)

Cluster	Number of Cases for Each Cluster Solution							
	8		9		10		11	
	C	U	C	U	C	U	C	U
1	12	12	12	12	16	16	3	3
2	48	13	50	13	49	12	28	28
3	24	24	24	24	21	47	47	17
4	13	48	13	50	12	49	17	47
5	63	63	50	50	47	21	2	2
6	10	10	10	10	11	11	45	45
7	9	9	9	9	9	9	9	9
8	6	6	6	6	3	3	6	6
9			11	11	6	6	13	13
10					11	11	5	5
11							10	10

Note: C denotes constrained and U denotes unconstrained scenario

Table 5.23

Cluster and Chance Corrected Coefficients of Agreement (n=185)

Cluster Solution	Symmetric Measures			
	Kappa	Gamma	Tau-B	Tau-C
8	.232	.193	.121	.104
9	.220	-.169	-.141	-.117
10	.421	.499	.444	.383
11	.227	-.096	.007	.006

Next, all cases in D_1 and D_2 were pooled and a final *K*–means cluster analysis performed with the final number of clusters determined at 10 to complete the first step of analysis. Results of the final clustering of the first step are discussed in the next section.

Table 5.24 contains mean values of clustering variables: epdissat6, epdissat9, epdissat10, epdissat12, epdissat13, epdissat14, and epdissat18 for the final *K*–means cluster solution, along with each cluster's respective number of cases. Cluster mean values, represented here are based on raw data scores. Clusters 10, 2, and 5 show the lowest mean values (smallest perceived gaps) in comparison to other clusters, and can be described as respondents who are mostly satisfied with export promotion programs. Clusters 8 and 9 contain respondents who are mostly dissatisfied with export promotion programs seeing from their high mean values (biggest perceived gaps).

Table 5.24

Mean Values of Clustering Variables (n=370)

	Cluster										
	1	2	3	4	5	6	7	8	9	10	Mean
epdissat6	32.5	22.1	42.9	40.7	32.7	35.6	74.6	66.9	64.6	6.7	41.9
epdissat9	33.4	19.5	50.0	49.4	27.2	38.7	30.1	75.5	79.7	8.0	41.1
epdissat10	33.7	18.4	48.9	46.5	27.5	42.0	34.7	69.1	78.2	6.7	40.6
epdissat12	35.6	17.9	52.7	55.8	31.3	52.1	50.5	63.2	84.0	8.5	45.2
epdissat13	34.9	19.7	48.1	55.8	33.1	55.7	61.9	62.6	86.5	5.2	46.3
epdissat14	37.1	18.9	35.3	52.9	23.9	70.4	26.4	61.6	70.1	6.4	40.3
epdissat18	49.5	20.0	40.0	72.8	29.7	36.5	58.6	48.0	86.0	5.6	44.7
Number of Cases	62	85	39	30	81	19	13	11	11	19	
Percentage of Respondents	16.8	23.0	10.5	8.1	21.9	5.1	3.5	3.0	3.0	5.1	

5.7.4 External Validity Test

The second step of analysis recommended by Singh (1990) is to test external validity of the optimal cluster solution produced by *K*–means clustering. For this procedure, firms' subjective performance2 was utilized to assess cluster external validity. If expectations of lower performance for the mostly dissatisfied firms are confirmed by results, external validity of the procedure and solution are supported and the derived cluster solution is practically valid.

The test of external validity was conducted using the subjective performance2 variable. Variability of subjective performance2 can be observed across the 10 clusters, as indicated in Table 5.25. That is, for the cluster solution to be valid, low subjective performance2 should be found in clusters whose members have high perceived gaps; high subjective performance2 should be found in clusters who have low perceived gaps.

Table 5.25

Mean Values for Subjective Performance2 by Cluster (*n*=370)

Validity Check Variable	Cluster										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Subjective Performance2	6.43	6.61	5.36	6.44	6.32	6.16	6.03	5.83	4.38	6.35	6.22

Table 5.25 presents mean values for subjective performance2 by cluster. Compared to the total mean (6.22), Clusters 1, 2, 5, and 10 (the clusters with the lowest values of dissatisfaction) show the highest values in subjective performance2. As expected, Clusters 3, 6, 7, 8, and 9 (clusters with high values of dissatisfaction) have a low value in subjective export performance2. However, contrary to expectations, Cluster 4 has a higher value in subjective export performance2 compared to the total mean value. Variation in mean performance values across the 10 clusters is significant for subjective performance2 ($F = 2.84$, $p < 0.05$) and the expected pattern is strongly supported with one exception. Tukey *post hoc* tests were done to examine which pairs of means are significantly different.

As presented in Table 5.26, *post hoc* test results indicate significant differences between Clusters 1 and 9; Clusters 2 and 3; Clusters 2 and 9; Clusters 4 and 9; and Clusters 5 and 9. Based on analyses described in this section, the derived 10-cluster *K*–mean solution can be considered externally validated.

Table 5.26 Tukey Tests: Multiple Comparisons for the Nine Clusters in regards to Subjective Performance2

Cluster(I)	Cluster(J)	Mean Difference (I-J)	Sig.
1	2	-0.18	1.00
	3	1.07	0.13
	4	-0.01	1.00
	5	0.11	1.00
	6	0.26	1.00
	7	0.40	1.00
	8	0.60	0.99
	9	2.04*	0.03
	10	0.08	1.00
2	3	1.25*	0.02
	4	0.17	1.00
	5	0.29	0.99
	6	0.44	0.99
	7	0.58	0.99
	8	0.78	0.95
	9	2.22*	0.01
	10	0.26	1.00
3	4	-1.08	0.32
	5	-0.96	0.18
	6	-0.80	0.86
	7	-0.67	0.98
	8	-0.47	1.00
	9	0.98	0.87
	10	-0.99	0.66
4	5	0.12	1.00
	6	0.27	1.00
	7	0.41	1.00
	8	0.61	1.00
	9	2.05*	0.05
	10	0.09	1.00
5	6	0.16	1.00
	7	0.30	1.00
	8	0.49	1.00
	9	1.94*	0.04
	10	-0.02	1.00
6	7	0.14	1.00
	8	0.34	1.00
	9	1.78	0.24
	10	-0.18	1.00
7	8	0.20	1.00
	9	1.64	0.47
	10	-0.32	1.00
8	9	1.44	0.71
	10	-0.52	1.00
9	10	-1.96	0.13

*The mean difference is significant at the .05 level.

Results from external validity also can be regarded to support nomological validity. Nomological validity refers to "the degree that the summated scale makes accurate predictions of other concepts in a theoretically based model" (Hair Jr. *et al.* 2006). Hypothesis 7 was proposed to examine whether the levels of perceived gaps predict the levels of subjective export performance of firms as described earlier in Chapter 3, Section 3.3.3.

H7: Firms with lower levels of perceived gap with export promotion programs will achieve higher levels of subjective performance than firms with higher levels.

Table 5.16 shows perceived gaps to be negatively related to subjective performance. This means that firms with lower levels of perceived gaps of export promotion programs achieve higher subjective export performance2 than firms with higher levels of perceived gaps, particularly for perceived gaps 1, 2, and 10 (Tables 5.24 and 5.25). Significance levels of perceived gaps in Table 5.17 lead to the conclusion of acceptable nomological validity for the hypothesis.

Further analyzing to develop the profile of each derived cluster follow the third step of cluster analysis proposed by Singh (1990) is in the next section. The aim of the next section is to examine whether firms with different perceived gaps have different identifying characteristics with a goal of describing a profile of derived clusters.

5.7.5 Analyses of Derived Cluster Solution

Normally, data not previously included in the cluster procedure are used to profile the characteristics of each cluster. These data are typically are demographic characteristics, psychographic characteristics, behavior patterns, and so forth (Hair Jr. *et al.* 2006).

Analyses began with selecting firm characteristic and managerial characteristic variables for developing profiles to describe all 10 clusters. Important firm characteristic in relation to export behavior and export performance of firm were chosen to describe the profiles: principal industry, width of market area, export

experience, and size of firm. The following six variables comprise firm principal industry, regions to export, number of export countries, export involvement, exporting experience, and number of full time employees. For managerial characteristic variables, three variables associated with export activity of firm were chosen: managerial exporting experience, years studied overseas, and trips overseas.

The next task for this section is testing whether the 10 clusters are different with respect to linear combinations of firm number of export countries, export involvement, exporting experience, number of full time employees, managerial exporting experience, year studied overseas, and trips overseas. The section identifies the combination of those variables that has optimum discriminating power among the derived clusters.

Multivariate analysis of variance, MANOVA, was used to examine distinctions among the derived 10 clusters in terms of the identified variables of interest. MANOVA takes into account correlations among the firm characteristic and managerial characteristic variables and uses the total information available for assessing overall group differences that is missing when examining each dependent variable separately. Statistics obtained from MANOVA showed significant differences on the set of firm characteristic variables and managerial characteristic variables (Wilks' *Lambda* = 0.77; $F = 1.51$; $p < 0.05$).

Next, discriminant analysis was used to identify which firm characteristic variables and managerial characteristic variables have the greatest discriminating power in differentiating among the 10 clusters. Discriminant analysis finds linear combinations of independent variable that best separate two or more classes of objects whose group membership is known. Discriminant analysis here is aimed at determining which combination of firm characteristic variables and managerial characteristic variables has the best discriminating capacities in discriminating among the 10 clusters. Discriminant analysis was performed simultaneously using the four firm characteristic variables and three managerial characteristic variables as predictors of group membership for the 10 derived clusters.

Multicollinearity, linear relationships among all pairs of predictors, and variance/covariance equality among the 10 groups are examined as a preparatory step following the requirements of discriminant analysis. The largest Variance Inflation

Factor (VIF) obtained from testing for multicollinearity is 1.75, much lower than 10, and indicates no multicollinearity concerns. Skewness and kurtosis values are shown in Table 5.27, the maximum absolute values for skewness and kurtosis are 3.80 and 17.13, much higher than the range of rule of thumb of -1.0 to +1.0 (Boomsma 1987; Ferrando 1999; Muthen and Kaplan 1985). However, the assumption of normality is less serious and violations lead only to reduced power (Tabachnick and Fidell 2001, p. 463) and are not a concern in this study because of the large sample size. Next, variance/covariance equality was analyzed using Box's *M* to test the assumption of homogeneity of covariance matrices. Box's *M* test statistic is evaluated to test the null hypothesis of equality of variance/covariance matrices across the 10 groups. Statistics obtained are Box's $M = 603.48$; $F = 2.03$; $df = 14593.83$; $p < 0.0001$. Results mean that covariance matrices are not equal in the population. However, sample size of this test is large and contributes to the significance of Box's *M*, a notoriously powerful test statistic. All firm characteristic variables and managerial characteristic variables are therefore entered to discriminant analysis.

Table 5.27

Analysis of Skewness and Kurtosis (n = 370)

	Mean	Standard Deviation	Skewness	Standard Error	Kurtosis	Standard Error
Number of export countries	10.07	10.29	2.32	0.13	6.12	0.25
Firm exporting experience	11.81	7.72	0.95	0.13	0.61	0.25
Export involvement	6.76	1.89	-0.67	0.13	0.49	0.25
Number of full time employees	290.20	551.70	3.80	0.13	17.13	0.25
Managerial exporting experience	10.49	6.89	0.86	0.13	0.23	0.25
Managerial year studied overseas	1.63	2.97	2.80	1.27	9.33	0.25
Managerial trips overseas	6.00	6.14	1.61	0.13	3.02	0.25

Table 5.28

Tests of Equality of Group Means Across the 10 Clusters

	Wilks' *Lambda*	*F*	*df1*	*df2*	*Sig.*
Number of export countries	0.964	1.497	9	360	0.147
Firm exporting experience	0.958	1.774	9	360	0.072
Export involvement	0.970	1.240	9	360	0.269
Number of full time employees	0.951	2.070	9	360	0.031
Managerial exporting experience	0.973	1.128	9	360	0.342
Managerial year studied overseas	0.959	1.724	9	360	0.082
Managerial trips overseas	0.944	2.375	9	360	0.013

Table 5.29 presents multivariate results for the 10–cluster discriminant analysis. Seven functions emerged from the analysis. The first discriminant function always accounts for the largest amount of variation in the disciminant groups. The second discriminant function is orthogonal to the first and explains the largest percentage of variance remaining (after variance for the first function is removed). Table 5.29 shows the first function accounts for 31.6 percent of the variance explained by the seven functions. The total amount of variance explained by the first function is $(0.280)^2$, or 7.8 percent. The next function explains $(0.263)^2$, or 6.4 percent, of the remaining variance (92.2 percent). Therefore, the total variance explained by Function 1 and 2 is 7.8 percent + (6.4 x 92.2 percent), or 14.2 percent of the total variation in the dependent variable. Doing similar calculations, the total variance explained by Functions 1, 2, 3, 4, 5, and 6 is 23.0 percent.

Table 5.29

Multivariate Results for Ten-Cluster Discriminant

		Percent of Variance		Canonical	Percent of Total Variance Explained	
Function	**Eigenvalue**	**Function**	**Cumulative**	**Correlation**	**Function**	**Cumulative**
1	.085	31.6	31.6	.280	7.8	7.8
2	.074	27.5	59.2	.263	6.4	14.2
3	.048	17.9	77.1	.214	3.9	18.1
4	.030	11.2	88.3	.171	2.4	20.5
5	.021	7.9	96.2	.145	1.7	22.2
6	.008	3.1	99.3	.091	0.6	22.9
7	.002	.7	100.0	.043	0.1	23.0

Wilks' *Lambda*

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 7	.770	94.216	63	.007
2 through 7	.836	64.756	48	.054
3 through 7	.898	38.973	35	.296
4 through 7	.941	21.998	24	.579
5 through 7	.969	11.260	15	.734
6 through 7	.990	3.641	8	.888
7	.998	.658	3	.883

5.7.6 Interpretations of the Derived Cluster Solution

Interpretation of the derived cluster solution was done by determining the relative importance of each firm characteristic and managerial characteristic in discriminating among the 10 clusters. Standardized coefficients, unstandardized coefficients, and structure coefficients are used for interpretation (Malhotra 2004, p. 542).

Table 5.30 shows the unstandardized and standardized canonical discriminant function coefficients for discriminant functions 1 and 2. Predictors with relatively large, standardized coefficients contribute to the discriminating power of the function more than predictors with smaller coefficients, and are, therefore more important. However, associations among the predictors can complicate the interpretation of standardized coefficients.

Table 5.30

Discriminant Function Coefficients

	Unstandardized Coefficients		Standardized Coefficients	
	1	2	1	2
Number of export countries	0.00	-0.06	0.05	-0.57
Firm exporting experience	0.04	0.13	0.27	1.01
Export involvement	0.14	-0.03	0.27	-0.06
Number of full time employees	0.00	0.00	0.46	0.02
Managerial exporting experience	-0.05	-0.07	-0.33	-0.49
Managerial year studied overseas	0.06	0.12	0.17	0.36
Managerial trips overseas	0.10	-0.04	0.58	-0.23

Examination of the structure loadings are more commonly considered for relative importance of the predictors. As shown in Table 5.31, structure loadings of independent variables are ranked in terms of their discriminating power. Sign of the coefficients do not affect the values; they simply indicate a positive or negative relationship between an independent variable with the indicated function.

Table 5.31

Structure Loadings for the First Two Discriminant Functions

Independent Variables	Structure Loadings of Function1		Structure Loadings of Function2	
	Structure Loadings	Rank	Structure Loadings	Rank
Number of export countries	.53	3	-.31	3
Firm exporting experience	.38	5	.57*	1
Export involvement	.47	4	-.01	7
Number of full time employees	.68*	1	.06	6
Managerial exporting experience	.06	7	-.12	5
Managerial year studied overseas	.33	6	.25	4
Managerial trips overseas	.68*	2	-.43	2

*Largest absolute correlation between each variable and the indicated discriminant function

To identify variables that are substantive discriminators, this study applies three general rules of thumb. First, Wilks' *Lambda*, the measure of the discriminatory power of the discriminant function is considered. To be qualified as a substantive discriminator on any discriminant function, Wilks' *Lambda* must be statistically

significant or should be significant on the first discriminant function. Second, to be a substantive discriminator, the variable of interest must exhibit a structure loading of ± 0.30 or higher (Hair Jr. *et al.* 1998). Third, to be a substantive discriminator, the structure loading must be significant.

Results comply with the first rule since Function 1 is the only significant discriminant function. Applying the ± 0.30-or-higher rule, all variables except managerial exporting experience qualify as substantive discriminators seeing from Function 1 shown in Table 5.31. From the third rule, correlation results between all firm characteristic variables and managerial characteristic variables with all discriminant scores for Function1 are significant at $p < 0.01$. This suggests that although having existing different contributions among them, all firm characteristic variables and managerial characteristic variables as a combination play an important role in discriminating among the 10 clusters.

Further interpretation focuses on structure loadings and group centroids with respect to each function. As shown in Table 5.31, loadings with asterisks indicate on which function each firm characteristic variable and managerial characteristic variable has the highest loading (e.g. number of full time employees and managerial trips overseas for Function 1 versus firm exporting experience for Function 2). Inspection of cluster centroids in Table 5.32 can identify the clusters that each function discriminates. For example, with Function 1, the mean value for Cluster 6 is -.654, for Cluster 7 is .685, for Cluster 9 is .517, and for Cluster 10 is -.545. Thus, it can be concluded that the primary source of differences is between: Cluster 6, 7, 9, and 10.

Table 5.32

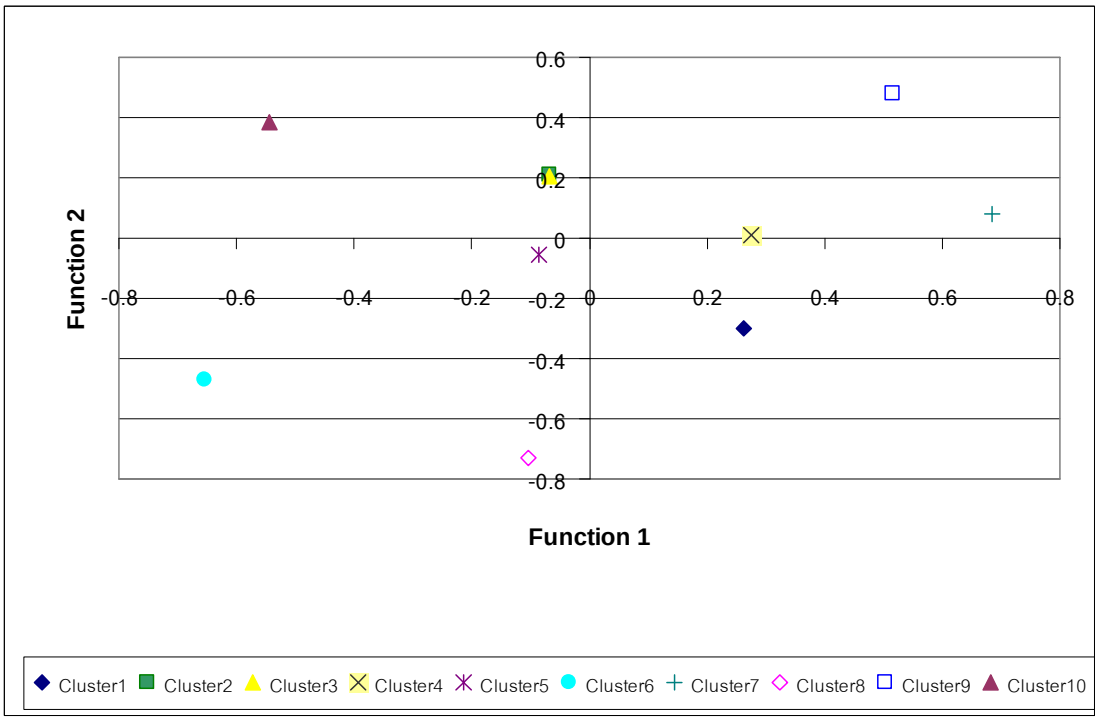
Values of Discriminant Functions 1 and 2 at Cluster Centroids

Cluster	Function	
	1	2
Cluster1	.263	-.299
Cluster 2	-.067	.211
Cluster 3	-.069	.204
Cluster 4	.276	.010
Cluster 5	-.085	-.053
Cluster 6	-.654	-.469
Cluster 7	.685	.082
Cluster 8	-.104	-.731
Cluster 9	.517	.482
Cluster 10	-.545	.383

Unstandardized canonical discriminant functions evaluated at group means

Figure 5.4

Cluster Centroids in Discriminant Function Space



Based on all criteria discussed in this section, it can be concluded that all predictors except managerial exporting experience were found to have discriminating power in distinguishing among the 10 clusters.

5.7.7 Description of Derived Cluster Solution

The third and last step of Singh (1990) is to develop a profile or description for all derived clusters. Profile development can be accomplished by identifying variables with substantive information and understanding different cluster means on each variable. Analysis of other issues concerning identification of the 10 clusters must be conducted in order to describe the clusters in more detail.

Table 5.33 presents principal industry of firms for the 10 clusters. Results from Table 5.33 indicate no differences between each cluster with regard to principal industry (*Chi-square* = 14.95, *df* = 9, and $p > .05$). The null hypothesis is therefore accepted and it is concluded that there is no association between cluster identity and principal industry.

Table 5.33

Number and Percentage of Firms for the 10 Clusters in Regards to Principal Industry

Principal Industry	Group 1 Cluster			Group 2 Cluster					Group3 Cluster		Total
	2	5	10	1	3	4	6	7	8	9	
Automotive, Auto parts, and Accessories	5	8	4	3	3	1	2	0	0	0	26
	19.2%	30.8%	15.4%	11.5%	11.5%	3.8%	7.7%	0%	0%	0%	100.0
Chemical/Machinery/Plastic Products	6	6	0	4	0	3	2	1	0	1	23
	26.1%	26.1%	0%	17.4%	0%	13.0%	8.7%	4.3%	0%	4.3	100.0
Electronic and Electrical Appliances	3	4	1	4	5	3	0	2	2	2	26
	11.5%	15.4%	3.8%	15.4%	19.2%	11.5%	0%	7.7%	7.7%	7.7%	100.0
Food Products and Beverage	12	17	1	11	4	5	4	1	2	2	59
	20.3%	28.8%	1.7%	18.6%	6.8%	8.5%	6.8%	1.7%	3.4%	3.4%	100.0
Furniture/Building Materials/Hardware Items	10	11	1	7	6	4	1	3	1	2	46
	21.7%	23.9%	2.2%	15.2%	13.0%	8.7%	2.2%	6.5%	2.2%	4.3%	100.0
Household products	2	4	2	5	1	1	1	0	2	1	19
	10.5%	21.1%	10.5%	26.3%	5.3%	5.3%	5.3%	0%	10.5%	5.3%	100.0
Gift, Decorative Items and Handicraft	12	8	2	6	2	1	1	3	2	0	37
	32.4%	21.6%	5.4%	16.2%	5.4%	2.7%	2.7%	8.1%	5.4%	0%	100.0
Gems and Jewelry	5	1	3	2	3	1	2	0	1	0	18
	27.8%	5.6%	16.7%	11.1%	16.7%	5.6%	11.1%	0%	5.6%	0%	100.0
Leather, PVC, and Footwear	6	2	1	4	0	2	0	0	0	2	17
	35.3%	11.8%	5.9%	23.5%	0%	11.8%	0%	0%	0%	11.8%	100.0
Traveling and Sporting Goods	2	0	1	0	0	0	0	0	0	0	3
	66.7%	0%	33.3%	0%	0%	0%	0%	0%	0%	0%	100.0
Textiles, Garment and Fashion Accessories	11	7	0	4	7	7	3	1	1	1	42
	26.2%	16.7%	0%	9.5%	16.7%	16.7%	7.1%	2.4%	2.4%	2.4%	100.0
Medical Supplies, Health and Beauty Products, Cosmetics	2	6	0	5	5	0	1	1	0	0	20
	10.0%	30.0%	0%	25.0%	25.0%	0%	5.0%	5.0%	0%	0%	100.0
Trading Company	3	2	1	4	2	1	2	1	0	0	16
	18.8%	12.5%	6.3%	25.0%	12.5%	6.3%	12.5%	6.3%	0%	0%	100.0
Other	6	5	2	3	1	1	0	0	0	0	18
	33.3%	27.8%	11.1%	16.7%	5.6%	5.6%	0%	0%	0%	0%	100.0
Number of Respondents	85	81	19	62	39	30	19	13	11	11	370

Table 5.34 presents region to export of firms for the 10 clusters. Visual inspection of percentage values in the Table show similar patterns of cluster membership for the four firm regions to export.

Table 5.34

Number and Percentage of Firms for the 10 Clusters by Export Region

Region to Export	Group 1 Cluster			Group 2 Cluster					Group3 Cluster		Total
	2	**5**	**10**	**1**	**3**	**4**	**6**	**7**	**8**	**9**	
	45	53	7	30	24	15	7	7	6	4	198
Asian Countries	22.7%	26.8%	3.5%	15.2%	12.1%	7.6%	3.5%	3.5%	3.0%	2.0%	100.0
	251	31	7	25	15	10	3	5	4	6	131
NICs	9.1%	23.7%	5.3%	19.1%	11.5%	7.6%	2.3%	3.8%	3.1%	4.6%	100.0
Less Developed	26	36	5	25	15	11	7	5	3	5	138
Countries	18.8%	26.1%	3.6%	18.1%	10.9%	8.0%	5.1%	3.6%	2.2%	3.6%	100.0
Developed	69	57	10	48	28	26	16	12	11	10	287
Countries	24.0%	19.9%	3.5%	16.7%	9.8%	9.1%	5.6%	4.2%	3.8%	3.5%	100.0

Note: More than one choice can be chosen for this question.

Table 5.35 summarizes mean values of perceived gaps and variables employed to describe the clusters as well as percentage and number of respondents for each cluster. Mean values indicate no relationship between cluster identity, perceived gaps, and any profile variable, except possibly number of export countries.

Based on results from all variables (Tables 5.33, 5.34, and 5.35), the 10 clusters can be identified to be three groups: highly satisfied clusters comprise Clusters 2, 5, and 10; medium satisfied/dissatisfied clusters comprise Clusters 1, 3, 4, 6, and 7; and highly dissatisfied clusters comprise Clusters 8 and 9. Details of each group can be described as follows:

Clusters 2, 5, and 10 are firms which are the first, second, and third highest satisfied with export promotion programs under consideration, both medium and large size firms, with number of full time employees approximately 121 to 304 employees, (as defined by Department of Industrial Promotion, small enterprise is a firm that has fewer than 50 employees, medium enterprise is a firm that has 50-200 employees, and large enterprise is a firm that has more than 200 employees). These clusters have long exporting experience (11.5 to 12.4 years) and approximately 7 to 10 export countries. Compare to other groups, management in this group have sufficient international experience with about 1 years studied in overseas and 3-5 trips to overseas within the last two years. Most firms in this group are in food and beverage and gift, decorative items and handicraft industry. Made up of 50 percent of sample, this group has the highest proportion of respondents.

Table 5.35

Mean Values of Variables for Cluster

Profile Variables	Group 1			Group 2					Group3		Mean
	Cluster			Cluster					Cluster		
	2	5	10	1	3	4	6	7	8	9	
Dealing with red tape of Thailand public institutions (epdissat6)	22.1	32.7	6.7	32.5	42.9	40.7	35.6	74.6	66.9	64.6	41.9
Developing product to meet importer's quality standards (epdissat9)	19.5	27.2	8.0	33.4	50.0	49.4	38.7	30.1	75.5	79.7	41.1
Developing product design and style for export markets (epdissat10)	18.4	27.5	6.7	33.7	48.9	46.5	42.0	34.7	69.1	78.2	40.6
Setting the competitive prices in export markets (epdissat12)	17.9	31.3	8.5	35.6	52.7	55.8	52.1	50.5	63.2	84.0	45.2
Identifying capable overseas distributors (epdissat13)	19.7	33.1	5.2	34.9	48.1	55.8	55.7	61.9	62.6	86.5	46.3
Payment from overseas distributors (epdissat14)	18.9	23.9	6.4	37.1	35.3	52.9	70.4	26.4	61.6	70.1	40.3
Protecting against currency exchange rate fluctuations (epdissat18)	20.0	29.7	5.6	49.5	40.0	72.8	36.5	58.6	48.0	86.0	44.7
sumsubperf2	6.61	6.32	6.35	6.43	5.36	6.44	6.16	6.03	5.83	4.38	6.22
Number of export countries	8.2	10.7	6.9	12.5	8.7	12.0	7.2	12.0	11.8	13.0	10.1
Exporting Experience	12.4	11.5	11.7	10.5	12.1	14.6	8.2	14.5	8.5	14.6	11.8
Export Involvement	6.9	6.6	5.9	6.9	6.4	7.3	6.6	7.4	6.3	7.2	6.8
Number of full time employees	304.6	248.1	121.9	385.3	218.7	283.4	75.6	756.0	185.2	440.5	290.2
Managerial exporting experience	10.7	9.8	8.1	9.6	10.6	13.0	12.2	10.8	12.5	10.4	10.5
Managerial years studied overseas	1.7	1.3	0.7	1.7	2.3	1.9	0.8	0.9	1.9	4.1	1.6
Managerial trips overseas	5.0	5.6	2.5	7.6	6.0	8.0	4.12	7.5	8.6	6.7	6.0
Number of Respondents	85	81	19	62	39	30	19	13	11	11	370
Percentage of Respondents	23.0	21.9	5.1	16.8	10.5	8.1	5.1	3.5	3.0	3.0	100.0

Clusters 1, 3, 4, 6, and 7 (Group 2) comprise firms that are moderately either satisfied or dissatisfied with the export promotion programs under consideration, either medium or large size firms with number of full time employees ranging from 76 to 756 employees. Most firms in this group are in the food and

beverage industry. Compared to Group 1 and Group 2, this group shows moderate subjective performance2 with long exporting experience (8 to 14 years) and approximately 12-13 export countries. Compared to other groups, management in this group have sufficient international experience with about 1-2 years studied overseas and 4-8 trips to overseas within the last two years.

Clusters 8 and 9 (Group 3) comprise firms which are the most dissatisfied with export promotion programs under considerations. Both medium and large size firms are found, with number of full time employees approximately 185 to 440 employees. This group shows the lowest subjective performance2 with long exporting experience (8 and 14 years) and approximately 7 to 10 export countries. Compared to other groups, management in this group have higher international experiences with about 2-4 years studied overseas and 7-9 trips overseas within the last two years. Made up of six percent of sample, this group has the lowest proportion of respondents.

5.8 Summary of Hypotheses Testing Results and Discussions

This chapter has reported results and interpretation of the statistical analysis of the data. Table 5.36 summarizes results of hypotheses testing and discussion for each hypothesis follows:

5.8.1 Relationship between Firm Export Involvement and Export Marketing Strategy and Export Performance

Positive relationships between export involvement and export marketing strategy and export performance of firms were hypothesized in H1a, H1b, and H2. As shown in Table 5.18, these hypotheses are all supported by path analysis testing. Results indicate that firm export involvement has a positive association with firm's general export strategy and marketing mix strategy seeing from the estimated coefficient of 0.44 with C.R 11.00 at $p \leq 0.001$ for H1a, and the estimated coefficient of 0.26 with C.R 5.20 at $p \leq 0.001$ for H1b. Results also provide support for the positive relationship between firm's export involvement and subjective export

performance indicating from the estimated coefficient of 0.40 with C.R 8.00 at $p \leq 0.001$.

This result is consistent with findings reported by Douglas and Wind (1987) and Cavusgil and Zou (1994). They have proposed that the more international experience a firm has, the more likely its ability to enable effective marketing strategy and produce better performance. Findings from this study confirm that the greater the experience gained from involving export operations, the more the degree of marketing strategy competence and consequently the more the achievement in export performance.

5.8.2 Relationship between Export Marketing Strategy and Export performance

The relationship between export marketing strategy and export performance was tested in Hypotheses H3 and H4. Results of C.R in Table 5.18 provide support for both hypotheses. This indicates that firms' export marketing strategy which consists of general export strategy and marketing mix strategy have a positive relationships with firms' export performance seeing from the estimated coefficient of 0.58 with C.R 14.50 at $p \leq 0.001$ for H3, and the estimated coefficient of 0.35 with C.R 5.83 at $p \leq 0.001$ for H4. These results are consistent with theoretical expectations. Most past research has theorized the positive impact of export marketing strategy on export performance and found support for that expectation (Cavusgil and Zou 1994; Donthu and Kim 1993; Shamsuddoha and Ali 2006). In this study, measurement of general export strategy comprised nine items: clearly identify the export customers, develop strategies for competing in export markets, establish distinct goals and objectives for export operations, develop adequate capabilities to collect necessary information about export markets, provide sufficient budget to exploit export markets, clearly identify export countries to be entered, develop strategies to expand export markets over the years, develop products in meeting export customers' wants, and have strategies to expand the number of exportable products. Marketing mix strategy comprised six items: develop brand building strategies for export markets, develop pricing strategies for competing in export markets, have strategies to develop channel distribution in export markets,

have adequate promotion support for the distributors/subsidiaries, provide training given to the firm's sales force and distributors /subsidiaries, and have capabilities to adapt promotional strategy for export market ventures. All items represent favorable factors to help exporters to improve their export operations. Moreover, general export strategy directly impacts on marketing mix strategy because marketing mix strategy is designed to accommodate general export strategy. Results from this study confirm that exporters can achieve higher export performance through constructing a proactive general export strategy and marketing mix strategy and implement these strategies (Cavusgil and Zou 1994).

5.8.3 Relationship between Perceived Gap of Export Promotion Programs and Export Marketing Strategy and Export Performance

Hypotheses H5a, H5b, H6, and H7 were concerned with the negative relationship between perceived gap of export promotion programs and export marketing strategy and export performance. Path analysis results in Table 5.18 indicate that perceived gaps of export promotion programs are not significantly related with general strategy but are significantly associated with marketing mix strategy (estimated coefficient ≈ 0.15 with C.R ≈ 4.00 at $p \leq 0.01$) and subjective export performance (estimated coefficient ≈ 0.18 with C.R ≈ 3.00 at $p \leq 0.05$). Thus, Hypothesis H5a is not supported, while Hypotheses H5b and H6 are supported. This suggests that lack of satisfaction with export promotion programs is negatively associated with only marketing mix strategy, not with general export strategy. This indicates that the governmental export promotion programs are generally designed to provide marketing support to exporting firms involving product, price, channel, and promotion strategies. These findings confirm that the greater the firms' satisfaction with governmental export promotion programs and have a positive perception of them, the higher the firms' competency to develop better marketing mix strategy and leading to better achievement in export operations. This study also supports the positive relationship between satisfaction with export promotion programs and export performance reported by Marandu (1995). In contrast, results do not support the relationship between perceived gap of export promotion programs and general export

strategy. As a result, firms are able to create export strategies regarding customer and market identification, necessary information collection, setting competitive strategies, and providing sufficient budget to exploit export markets but not on the basis of satisfaction or dissatisfaction with the governmental export promotion programs.

Table 5.36

Summary of Hypotheses and Test Results

Hypothesis	Expected Relationship	Statement of Hypothesis	Hypothesis Supported
H1a	Positive	Export involvement has a positive impact on the general export strategy to be adopted.	Yes
H1b	Positive	Export involvement has a positive impact on the marketing mix strategy to be adopted.	Yes
H2	Positive	Export involvement has a positive impact on subjective performance.	Yes
H3	Positive	Firms' general export strategy has a positive impact on subjective performance.	Yes
H4	Positive	Firms' export marketing mix strategy has a positive impact on subjective performance.	Yes
H5a	Negative	Perceived gap of export promotion programs has a negative impact on the general export strategy to be adopted.	No
H5b	Negative	Perceived gap of export promotion programs has a negative impact on the marketing mix strategy to be adopted.	Yes
H6	Negative	Perceived gap of export promotion programs has a negative impact on subjective performance.	Yes
H7	Negative	Firms with lower levels of perceived gap with export promotion programs will achieve higher levels of subjective performance than firms with higher levels.	Yes

Hypothesis H7 was concerned with the relationship between levels of perceived gaps with export promotion programs and subjective export performance of firms. As shown in Table 5.17, the negative relationship between perceived gaps of export promotion programs and subjective export performance was significant (estimated coefficient $\approx$ -0.15 with C.R $\approx$ 3.00 at $p \leq 0.05$). Results from Tables 5.24 and 5.25 indicate that firms with lower levels of perceived gaps of export promotion programs achieve higher subjective export performance than firms with higher levels of perceived gaps. Thus, Hypothesis H7 is supported.

5.9 Conclusion

This chapter tests hypotheses developed in Chapter 3. Tests were conducted by using path analysis and cluster analysis. Test results support all study hypotheses except H5a. The next chapter concludes research findings and provides implications for persons in the field of international marketing. Limitations of the study and recommendations for future research are also provided.