

## CHAPTER 6

### DATA ANALYSIS AND RESULTS

#### 6.0 Overview for Chapter 6

The previous chapter detailed the research methodology adopted to test the proposed theoretical models, and to answer the research questions of the study. Therefore, the purpose of this chapter is to present the results of the data analysis for Model 1, Model 2 and Model 3. Starting with discussions on the preliminary data analysis such as data editing and coding, data screening, and response rate, this will be followed by the sample characteristics for both individual and firms. Next, the data description will be presented. The final part in this chapter includes the discussion on the results of the study using PLS as an analysis tool. This involves two stages; the assessment of measurement models and the assessment of structural models.

#### 6.1 Data Editing and Coding

After collecting data from the top management team in public listed companies, editing of the data were performed in order to ensure completeness and consistency of the data. Editing is considered as a part of the data processing and analysis stage (Zikmund, 2003). According to Sekaran (2000), respondents who completed at least 75% of the questionnaire are considered acceptable while those with more than 25% unanswered questions are excluded. The missing data are considered as missing values (Kinner & Taylor, 1996; Sekaran, 2000), as discussed in the next subsection. Coding was used to assign numbers to each answer (Malhotra, 1996) and allowed for

the transfer of data from the questionnaire to SPSS (Statistical Package for the Social Sciences). These procedures can be undertaken either before the questionnaire is answered (pre-coding), or after (postcoding) (DeVaus, 1995). In this thesis, the coding procedure was undertaken by establishing a data file in SPSS, and all question items were pre-coded with numerical values. Data editing procedures were undertaken after data were entered into the data file in order to detect any errors in data entry.

## 6.2 Data Screening

Data screening is the first stage in data analysis and is crucial before proceeding with PLS modeling. It involves checking the accuracy of the data input, dealing with missing values, and detecting outliers (Tabachnick & Fidell, 2007). This is to ensure the data have been correctly entered and the distribution of variables is normal before proceeding to the next stage. The validity of the results may be problematic if the variable distributions deviate dramatically (Coakes & Steed, 2007). However, nonparametric techniques such as PLS, does not require normal distribution on the data (Chin & Newsted, 1999). The processes of the data screening which involved the missing data treatment and detection of outliers are described in the next section.

### 6.2.1 Dealing with Missing Data

In order to assess the accuracy of the data input, means and standard deviations were used. All responses were within the plausible 7-point Likert scale. It is common to have data sets with missing values in every survey (Coakes & Steed, 2007; Hair et al., 1995). The missing data usually occurs when one or more questions in the survey are left unanswered by a respondent. The researcher should prevent missing data by providing instruments that are clear and unambiguous. Despite the best efforts done by the researcher, missing data occurs for many reasons. However, if the missing data

account for less than 5% in a single variable and the loss of the data are accidental and not systematic, it is considered to be of little concern (Kline, 2005). When dealing with missing data, the blank cell can be omitted or assigned value codes (Coakes & Steed, 2007). In this study, there were 15 out of 5382 data points or 0.28% that randomly contained missing data. According to Cohen and Cohen (1983), the missing value data of up to 10% is not considered large and unlikely to be problematic in the interpretation of the research results. It is also not a major problem if the missing data are less than 5% in a single variable (Kline, 2005). It can be seen in Table 6-1 that the missing data in each variable ranges between 0.14% and 0.48%. To solve the issue of missing data, mean substitution is the easiest and best treatment if the proportion of missing value is 5% or less (Tabachnick & Fidell, 2007). Mean substitution is one of the most widely used methods because it is based on valid responses and makes the mean the best single replacement of missing data (Hair, et al., 2005). Thus, in this study the mean is used to substitute the missing data.

However, before any decision is made on which method is suitable to deal with missing data, Tabachnick and Fidell (2007) suggested two ways of evaluating the degree of missing data. Firstly, the researcher needs to evaluate the amount of missing data, and secondly, to evaluate the patterns of missing data. It is important to check the missing data pattern because it may be related to specific items or occur randomly. The pattern of missing data should occur randomly in the questionnaires, and if not, it will lead to biased estimates of the results (Tabachnick & Fidell, 2007). As mentioned before, the screening of the data in SPSS showed that (refer to Table 6-1), there was no variable that had more than 5% of missing data and this was considered acceptable (Churchill, 1995) and thus, the assessment of the missing data pattern was not necessary.

Table 6-1: Total and Percentage of Missing Data (N= 138)

Items	Dimensions	Number of Missing Values	Number of Data Points	Percentage
5	Innovativeness	1	690	0.14%
5	Proactiveness	1	690	0.14%
5	Risk Taking	3	690	0.43%
5	Corporate Venturing	2	690	0.29%
8	Organic Structure	2	1104	0.18%
5	Dynamism	3	690	0.43%
3	Hostility	1	414	0.24%
3	Firm Performance	2	414	0.48%
39	Total	15	5382	0.28%

### 6.3 Response Rate

As mentioned in previous chapter, data were collected among the companies listed on the main market, Bursa Malaysia. There were 660 questionnaires distributed and 141 were returned. Three of the surveys had more than 30% of the items unanswered, resulting in an effective sample of 138 usable completed questionnaires. This represented an effective response rate of 20% which was deemed usable for further analysis. This 20 percent response rate is considered as practical for most of the surveys conducted in Malaysia generated a response rate of between 10 to 20 percent (Ramayah et al., 2005). For example, Lai (2006) obtained 17.5 percent, and Chang (2001) obtained 18 percent response rate from manufacturing companies across Malaysia.

### 6.4 Sample Characteristics

As mentioned before, there are three models in this study. Thus, each model has its own profile information. In this section, the respondent's profile and firm's profile will be presented. The firm's profile is important because the unit of analysis used in this study is at firm level.

### 6.4.1 Profile of the Individual Respondents for Model 1

The results shown in Table 6-2 indicate differences in the demographics of the respondents including gender, age, educational qualifications, ethnicity, working experience, and positions in the firm. As illustrated in Table 6-2, the analysis of the final sample profile showed a higher number of male (88) respondents than females (50), representing a ratio of 63.8% and 36.2%, respectively. The majority of the respondents were above 40 years old, representing 52.2% (72). Most of the respondents were Chinese, 47.8% (66), followed closely by Malays, 43.5% (60). With regard to the respondents' educational qualifications, more than half of the respondents had a Bachelor's Degrees, 56.5% (78). In terms of working experience, 82.6% (114) of the respondents had more than 10 years of working experience, with almost half of the respondents working as senior managers, 49.3% (68).

Table 6-2: Respondent's Profile Model 1

Demographic Variables	Number of Respondents (N=138)	Valid Percentage
<b>Gender</b>		
Male	88	63.8
Female	50	36.2
<b>Age</b>		
Less than 30 years old	8	5.8
31-40 years old	58	42.0
41-50 years old	55	39.9
More than 50 years old	17	12.3
<b>Ethnicity</b>		
Malay	60	43.5
Chinese	66	47.8
Indian	3	2.2
Others	9	6.5
<b>Education Level</b>		
Diploma	12	8.7
Bachelor's Degree	78	56.5
Masters Degree	32	23.2
Professional Certificate	15	10.9
Others	1	0.7
<b>Working Experience</b>		
Less than 10 years	24	17.4

10-20 years	66	47.8
21-30 years	39	28.3
More than 30 years	9	6.5
<b>Position</b>		
Manager	24	17.4
Senior Manager	68	49.3
Vice President	19	13.8
CEO / President	10	7.2
Director	15	10.9
Executive Director	2	1.4

#### 6.4.2 Profile of the Individual Respondents for Model 2

The respondents profile for Model 2 is illustrated in Table 6-3. The sample in this model was drawn from Model 1. The total sample included in this Model 2 was 130 (8 respondents were excluded from analysis due to unknown company name, thus impossible to obtain secondary data). Similar to Model 1, the demographics of the respondents include gender, age, educational qualification, and ethnic, working experience, and position in a firm. As illustrated in Table 6-3, Model 2 also showed a higher number of male respondents 63.8% (83) with another 36.2% (47) of female respondents. The majority of the respondents were above 30 years old at 93.9% (122). Most of the respondents were Chinese, 47.7% (62), followed closely by Malays, 43.1% (56). With regard to the respondents' educational qualifications, more than half of the respondents had a Bachelor's Degree at 56.9% (74). With respect to working experience, 81.5% (106) of the respondents had more than 10 years of working experience, with almost half designated as senior managers, 49.2% (64). The respondents' profile is similar to that of Model 1, but slightly different in terms of sample size.

Table 6-3: Respondent's Profile Model 2

Demographic Variables	Number of Respondents (N=130)	Valid Percentage
<b>Gender</b>		
Male	83	63.8
Female	47	36.2
<b>Age</b>		
Less than 30 years old	8	6.2
31-40 years old	55	42.3
41-50 years old	50	38.5
More than 50 years old	17	13.1
<b>Ethnicity</b>		
Malay	56	43.1
Chinese	62	47.7
Indian	3	2.3
Others	9	6.9
<b>Education Level</b>		
Diploma	10	7.7
Bachelor's Degree	74	56.9
Master's Degree	31	23.8
Professional Certificate	14	10.8
Others	1	0.8
<b>Working Experience</b>		
Less than 10 years	24	18.5
10-20 years	62	47.7
21-30 years	35	26.9
More than 30 years	9	6.9
<b>Position</b>		
Manager	24	18.5
Senior Manager	64	49.2
Vice President	17	13.1
CEO / President	10	7.7
Director	14	10.8
Executive Director	1	.8

#### 6.4.3 Profile of the Firms for Model 1

Based on the firm's profile as illustrated in Table 6-4, more than half of the firms, 77 (55.7%) had been a public-listed company for 10 years or less and 61 (44.2%) firms had been public-listed for less than 10 years. 45 of the firms had been established for 10 to 20 years, (32.6%), followed by the firms with 21 years to 30 years of establishment, 34 (24.6%) while only 8 (5.8%) firms had been established

for more than 50 years. The majority of the firms, 127 (92%) were Malaysian-owned. Next, in terms of number of employees, 106 (76.9%) firms had more than 300 employees. Off the 14 sectors included in this study, 40 firms (29%) were in the industrial products sector, representing the biggest number of firms in a particular sector, followed by consumer product sector with 35 firms (25.4%).

Table 6-4: Firm's Profile for Model 1

Demographic Variables	Number of Firms (N=138)	Valid Percentage
<b>Duration as PLC</b>		
Less than 5 years	21	15.2
5-10 years	40	29
11-15 years	29	21
16-20 years	26	18.8
21-25 years	5	3.6
26-30 years	4	2.9
More than 30 years	13	9.4
<b>Firm's Base</b>		
Multinational Subsidiary	11	8.0
Malaysian-owned Company	127	92.0
<b>Age of the Firm</b>		
Less than 10 years	11	8
10-20 years	45	32.6
21-30 years	34	24.6
31-40 years	21	15.2
41-50 years	19	13.8
more than 50 years	8	5.8
<b>Number of Employees</b>		
Less than 300 employees	32	23.2
300-600 employees	36	26.2
601-900 employees	15	10.9
901-1200 employees	11	8.0
1201-1500 employees	8	5.8
1501-1800 employees	5	3.6
1801-2100 employees	5	3.6
More than 2100 employees	26	18.8
<b>Sector</b>		
Consumer Products	35	25.4
Construction	3	2.2

Demographic Variables	Number of Firms (N=138)	Valid Percentage
Services	18	13.6
Finance	5	3.6
Properties	14	10.1
Industrial Products	40	29
Trading	8	5.8
IPC	1	0.7
Hotels	2	1.4
Plantations	7	5.1
Technology	5	3.6

#### 6.4.4 Profile of the Firms for Model 2

Table 6-5 shows the firm profile for Model 2. The sample was drawn from Model 1. However, in this Model, only 130 samples were included in the analysis. More than half of the firms, 75 (57.6%) had been public-listed companies for 10 years or less and 55 (42.3%) firms had been public-listed for less than 10 years. Most of the firms were between 10 to 20 years of establishment, 42 (32.3%), followed by the firms of 21 to 30 years of establishment, 29 (22.3%) and only 8 (6.2%) firms that had been established for more than 50 years. The majority of the firms, 119 (91.5%), were Malaysian-owned company. Next, in terms of number of employees, 99 (76.2%) firms had more than 300 employees. Of the 14 sectors included in this study, 38 firms (29.2%) were in the industrial product sector, which represented the highest number of firms in a particular sector, followed by the consumer product sector with 34 firms (26.2%).

Table 6-5: Firm's Profile for Model 2

Demographic Variables	Number of Firms (N=130)	Valid Percentage
<b>Duration as PLC</b>		
Less than 5 years	17	13.1
5-10 years	38	29.2
11-15 years	28	21.5

Demographic Variables	Number of Firms (N=130)	Valid Percentage
16-20 years	25	19.2
21-25 years	5	3.8
26-30 years	4	3.1
More than 30 years	13	10.0
<b>Firm's Base</b>		
Multinational Subsidiary	11	8.5
Malaysian-owned Company	119	91.5
<b>Age of the Firm</b>		
Less than 10 years	11	8.5
10-20 years	42	32.3
21-30 years	29	22.3
31-40 years	21	16.2
41-50 years	19	14.6
more than 50 years	8	6.2
<b>Number of Employees</b>		
Less than 300 employees	31	23.8
300-600 employees	30	23.1
601-900 employees	15	11.5
901-1200 employees	11	8.5
1201-1500 employees	8	6.2
1501-1800 employees	5	3.8
1801-2100 employees	4	3.1
More than 2100 employees	26	20.0
<b>Sector</b>		
Consumer Products	34	26.2
Construction	2	1.5
Services	18	13.8
Finance	5	3.8
Properties	14	10.8
Industrial Products	38	29.2
Trading	7	5.4
IPC	1	.8
Hotels	1	.8
Plantations	6	4.6
Technology	4	3.1

#### 6.4.5 Profile of the Firms for Model 3

Table 6-6 shows the firms' profile in Model 3. The sample consists of 35 firms from two sectors; consumer and industrial products. Most the firms in Model 3 had been public listed between 5-10 years, 13 (37.1%). Unlike previous models, in Model

3, most of the firms had been established between 21 years to 30 years, 42 (32.3%), followed by the firms between 10 years to 20 years of establishment, 8 (22.9%) while only 3 (8.6%) firms had been established for more than 50 years. Similar to the previous two models, the majority of the firms, 31 (88.6%) were Malaysian-owned. More than half of the firms, 21 (60%) had more than 901 employees. The majority of the firms were from the Consumer Products sector, 26 (74.3%) and only 9 (8.6%) of the firms were from the Industrial Products sector.

Table 6-6: Firm's Profile for Model 3

Demographic Variables	Number of Firms (N=35)	Valid Percentage
<b>Duration as PLC</b>		
Less than 5 years	1	2.9
5-10 years	13	37.1
11-15 years	8	22.9
16-20 years	9	25.7
21-25 years	2	5.7
26-30 years	0	0
More than 30 years	2	5.7
<b>Firm's Base</b>		
Multinational Subsidiary	4	11.4
Malaysian-owned Company	31	88.6
<b>Age of the Firm</b>		
Less than 10 years	5	14.3
10-20 years	8	22.9
21-30 years	9	25.7
31-40 years	5	14.3
41-50 years	5	14.3
more than 50 years	3	8.6
<b>Number of Employees</b>		
Less than 300 employees	1	2.9
300-600 employees	10	28.6
601-900 employees	3	8.6
901-1200 employees	6	17.1
1201-1500 employees	4	11.4
1501-1800 employees	0	0
1801-2100 employees	1	2.9
More than 2100 employees	10	28.6

Demographic Variables	Number of Firms (N=35)	Valid Percentage
<b>Sector</b>		
Consumer Products	26	74.3
Industrial Products	9	25.7

## 6.5 Analysis and Results of PLS

### 6.5.1 Descriptive Statistics

The mean, standard deviation, minimum value and maximum value of each indicator were examined using SPSS version 19.0. Table 6-7 provides the details of the descriptive statistics calculated from the survey instruments for Model 1 and 2. Table 6-8, Table 6-9 and Table 6-10 show the construct's descriptive statistics for Model 1, 2 and 3 respectively. All of the indicators in Model 1 were measured by the Likert scale ranging from 1 to 7. Only the dependent variables in Model 2 utilised objective data. In Model 3, all the data that were measured utilised objective data.

Table 6-7 : Descriptive Statistics for Survey Indicators (Model 1 and 2)

Construct	Label	MODEL 1				MODEL 2			
		Min	Max	Mean	SD	Min	Max	Mean	SD
Innovativeness	Innov_1	1	7	5.10	1.451	1	7	4.50	1.686
	Innov_2	1	7	4.04	1.632	1	7	4.11	1.610
	Innov_3	2	7	5.12	1.256	2	7	5.34	1.354
	Innov_4	1	7	4.38	1.723	1	7	4.50	1.691
	Innov_5	4	7	5.41	1.023	3	7	5.37	1.034
Proactiveness	Pro_1	2	7	4.43	1.328	1	7	4.46	1.564
	Pro_2	1	7	4.42	1.602	1	7	4.40	1.588
	Pro_3	1	7	4.61	1.401	1	7	4.55	1.386
	Pro_4	2	7	4.52	1.216	2	7	4.47	1.237
	Pro_5	1	7	4.88	1.430	1	7	4.85	1.426
Risk Taking	Risk_1	2	7	5.04	1.298	2	7	4.98	1.302
	Risk_2	1	7	4.16	1.595	1	7	4.16	1.570
	Risk_3	1	7	4.63	1.430	2	7	4.61	1.395
	Risk_4	1	7	4.11	1.629	1	7	4.11	1.600
	Risk_5	1	7	4.36	1.643	1	7	4.37	1.632
Corporate Venturing	CV_1	1	7	4.25	1.629	1	7	4.23	1.639
	CV_2	1	7	4.51	1.705	1	7	4.39	1.682
	CV_3	1	7	3.96	1.763	1	7	3.91	1.746

Construct	Label	MODEL 1				MODEL 2			
		Min	Max	Mean	SD	Min	Max	Mean	SD
	CV_4	1	7	4.46	1.581	1	7	4.42	1.563
	CV_5	1	7	4.13	1.593	1	7	4.03	1.594
	CV_6	1	7	4.01	1.826	1	7	3.93	1.775
Organic Structure	OS_1	1	7	3.71	1.544	1	7	3.67	1.512
	OS_2	1	7	3.72	1.574	1	7	3.72	1.512
	OS_3	1	7	4.18	1.421	1	7	4.16	1.393
	OS_4	1	7	4.21	1.447	1	7	4.18	1.443
	OS_5	1	7	4.59	1.310	1	7	4.56	1.307
	OS_6	2	7	5.12	1.262	2	7	5.08	1.239
	OS_7	1	7	3.69	1.708	1	7	3.80	1.702
	OS_8	1	7	4.02	1.477	1	7	4.04	1.462
Environmental Dynamism and Hostility	ED_1	1	7	4.18	1.501	1	7	4.57	1.635
	ED_2	1	7	4.05	1.441	1	7	3.82	1.630
	ED_3	1	7	3.98	1.502	3	7	4.49	1.104
	ED_4	1	7	4.52	1.595	1	7	3.93	1.359
	ED_5	1	7	3.70	1.645	2	7	4.47	1.345
	EH_1	3	6	4.50	1.062	1	7	4.17	1.519
	EH_2	1	7	3.88	1.357	1	7	4.07	1.374
	EH_3	2	7	4.46	1.319	1	7	3.98	1.471
Firm Performance	Growth	2	7	5.29	1.128	-	-	-	-
	ROA	4	7	5.50	.998	-	-	-	-
	ROS	2	7	5.38	1.320	-	-	-	-

\*Min=Minimum, Max=Maximum, SD=Standard Deviation

Table 6-8: Overall Descriptive Statistics for Constructs (Model 1)

Construct	Minimum	Maximum	Mean	Standard Deviation
Innovativeness	2.71	6.86	4.8996	1.03152
Proactiveness	2.29	6.86	4.5331	1.23054
Risk Taking	1.60	6.60	4.4594	1.16228
Corporate Venturing	1.00	7.00	4.2198	1.37908
Organic Structure	1.88	6.75	4.1558	1.04831
Environment	2.00	6.13	4.1594	0.91492
Overall Firm Performance	2.67	7.00	5.3913	0.99627

Table 6-9: Overall Descriptive Statistics for Constructs (Model 2)

Construct	Minimum	Maximum	Mean	Standard Deviation
Innovativeness	2.71	6.86	4.8374	1.05587
Proactiveness	2.29	6.86	4.5052	1.23573
Risk Taking	1.60	6.60	4.4472	1.17685
Corporate	1.00	7.00	4.1518	1.37371

Construct	Minimum	Maximum	Mean	Standard Deviation
Venturing				
Organic Structure	1.88	6.75	4.1524	1.03679
Environment	2.00	6.13	4.1890	0.93382
ROA	-3.74	4.60	.000005385	1.45664
ROS	-7.88	6.42	.000020020	2.16153
Sales Growth	-8.73	83.71	.9466	8.83034

Table 6-10: Descriptive Statistics (Model 3)

Construct	Minimum	Maximum	Mean	Standard Deviation
Innovativeness	.00	4.39	1.0408	1.31391
Proactiveness	5.23	100.00	58.8794	28.73176
Corporate Venturing	1	11	3.11	2.742
ROA	-3.07	3.40	-.0948	1.39144
ROS	-3.14	5.54	.1389	1.81342
Sales Growth	-.86	12.29	1.8340	3.88196

## 6.6 Analysis of the Data

As mentioned in the previous chapter, the analysis and interpretation of a PLS model involves a two-stage process. Firstly, it concerns the assessment of the measurement model (outer model) and secondly, the assessment of the structural model (inner model) (Barclay et al., 1995). Since Model 3 utilised secondary or actual data, only Model 1 and 2 needed to be assessed at the first stage.

### 6.6.1 Stage One: Assessments of Measurement Model

As discussed in Table 5-12 (Chapter 5), before move on to the second stage, the validity and reliability of the measurement model for this study is evaluated using the following analyses: internal consistency reliability, indicator reliability, convergent validity and discriminant validity (Urbach & Ahlemann, 2010). The following subsections present the findings for each of the analysis used to evaluate the reliability and validity of the measurement model for this study.

### 6.6.1.1 Indicator Reliability or Factor Loadings

Table 6-11 illustrates the factor loadings or individual item's reliability for Models 1 and 2. As illustrated in Table 6-11, the loadings below the cut off value of 0.50 were removed and excluded from further analysis as suggested by Hair et al. (2010).

As seen in Table 6-11, in Model 1, 2 items were removed for innovativeness, 1 item in risk taking, 3 items in organic structure construct, and 6 items in environmental construct. in Model 2-Profitability, 1 item was removed due to low loading, 1 item in corporate venturing, 2 items in organic structure, and 2 items in organic structure. In Model 2-Growth, 2 items were removed for innovativeness construct, 3 items in risk taking, 1 item in corporate venturing, 2 items in organic structure, and 3 items in environmental construct. After removing the items, that has loadings below 0.5, next, the composite reliability, convergent validity, and discriminant validity were assessed.

Table 6-11: Factor Loadings for Models 1 and Model 2

Construct	Items	Loadings		
		Model 1	Model 2	
		Overall	Profitability	Growth
Innovativeness	Innov_1	0.882	0.762	0.895
	Innov_2	Removed	Removed	Removed
	Innov_3	0.831	0.942	0.905
	Innov_4	Removed	0.579	Removed
	Innov_5	0.878	0.787	0.787
Proactiveness	Pro_1	0.908	0.897	0.903
	Pro_2	0.868	0.848	0.987
	Pro_3	0.867	0.848	0.779
	Pro_4	0.853	0.866	0.676
	Pro_5	0.876	0.901	0.683
Risk Taking	Risk_1	0.8668	0.802	Removed
	Risk_2	0.8161	0.818	Removed
	Risk_3	0.8708	0.872	Removed
	Risk_4	0.5097	0.675	0.952
	Risk_5	Removed	0.658	0.962

Construct	Items	Loadings		
		Model 1	Model 2	
Corporate Venturing	CV_1	0.847	0.823	0.926
	CV_2	0.756	0.847	0.773
	CV_3	0.847	0.837	0.825
	CV_4	0.890	0.847	0.802
	CV_5	0.869	0.819	0.628
	CV_6	0.716	Removed	Removed
Organic Structure	OS_1	Removed	Removed	0.716
	OS_2	Removed	0.676	0.837
	OS_3	0.539	0.852	0.743
	OS_4	0.685	0.829	0.694
	OS_5	0.756	0.700	Removed
	OS_6	0.926	0.731	Removed
	OS_7	Removed	Removed	0.649
	OS_8	0.627	0.764	0.844
Environmental Dynamism and Hostility	ED_1	Removed	0.609	Removed
	ED_2	Removed	0.701	0.738
	ED_3	0.826	0.604	0.688
	ED_4	Removed	0.803	0.768
	ED_5	0.846	Removed	Removed
	EH_1	Removed	0.702	0.679
	EH_2	Removed	Removed	Removed
	EH_3	Removed	0.851	0.817
Firm Performance	Growth	0.799	-	-
	ROA	0.883	-	-
	ROS	0.914	-	-

#### 6.6.1.2 Internal Consistency Reliability or Composite Reliability

Composite reliability was used to assess the inter-item consistency of the measurement items. As shown in Tables 6-12 (Model 1), Table 6-13 (Model 2-Profitability) and Table 6-14 (Model 2-Growth), the composite reliability values ranged between 0.823 and 0.942, which are more than the cut value of 0.7 as suggested by Fornell and Larcker (1981). Thus, all construct measurements in this study have satisfactory indicator reliability.

#### 6.6.1.3 Convergent Validity

The assessment of convergent validity requires the examination of the average variance extracted (AVE) measure (Fornell & Larcker, 1981). The purpose of the AVE

is to measure the amount of variance of the indicator which is accounted by the construct relative to the amount due to the measurement error. Thus, the AVE should exceed 0.5, which indicates that more than 50% of the indicators' variance can be captured by construct (Bořow-Thies & Albers, 2010:596 ). Table 6-13 (Model 2-Profitability) and Table 6-14 (Model 2-Growth), the AVE values exceeded the recommended value of 0.5 (Hair et al., 2010) which ranged from 0.515 and 0.916. The results illustrate adequate convergent validity and unidimensionality, thus, all the constructs were valid measures of their respective constructs based on their parameter estimates (Chow & Chan, 2008).

Table 6-12: Results of Reliability and Validity of Measurement Model 1

Model Construct	Number of Items	Composite Reliability (CR) <sup>a</sup>	Average Variance Extracted (AVE) <sup>b</sup>
Innovativeness	3	0.898	0.746
Proactiveness	5	0.942	0.765
Risk Taking	4	0.857	0.609
Corporate Venturing	6	0.926	0.678
Organic Structure	5	0.838	0.517
Environment	2	0.823	0.699
Overall Performance	3	0.900	0.751

Table 6-13: Results of Reliability and Validity of Measurement Model 2-Profitability

Model Construct	Number of Items	Composite Reliability (CR) <sup>a</sup>	Average Variance Extracted (AVE) <sup>b</sup>
Innovativeness	4	0.857	0.606
Proactiveness	5	0.883	0.790
Risk Taking	5	0.878	0.593
Corporate Venturing	5	0.918	0.652
Organic Structure	6	0.892	0.580
Environment	6	0.862	0.515

Table 6-14: Results of Reliability and Validity of Measurement Model 2-Growth

Model Construct	Number of Items	Composite Reliability (CR) <sup>a</sup>	Average Variance Extracted (AVE) <sup>b</sup>
Innovativeness	3	0.898	0.747
Proactiveness	5	0.906	0.663
Risk Taking	2	0.956	0.664

Corporate Venturing	5	0.895	0.635
Organic Structure	6	0.885	0.564
Environment	5	0.956	0.916

Note:

<sup>a</sup> Composite Reliability (CR) = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}

<sup>b</sup> Average Variance Extracted (AVE) = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}

#### 6.6.1.4 Discriminant Validity

Discriminant validity indicates the degree to which one construct differs from the others. Following the suggestion by Urbach & Ahlemann (2010) in Table 5-12 (Chapter 5), the measurement model's discriminant validity is assessed by using two measures: 1) Fornell and Larcker's (1981) criterion, and 2) cross loading. Thus, the measurement model considered having discriminant validity when it fulfils these two conditions:-

- i) Fornell and Larcker's (1981) criterion - the square root of the AVE exceeds the correlations between the measure and all other measures, and,
  - ii) cross loading - the indicators' loadings are higher against their respective construct compared to other constructs
- i) Fornell and Larcker's (1981) criterion**

The first discriminant validity assessment, which is the Fornell and Larcker's (1981) criterion is assessed. The square root of the AVE is calculated manually to determine the construct discriminant validity. As shown in Tables 6-15 (Model 1), Table 6-16 (Model 2-Profitability) and Table 6-17 (Model 2-Growth), the constructs in this study fulfilled these conditions because the diagonal elements were greater than the off-diagonal elements in the corresponding rows and columns. Thus, it can be concluded that the measurement model demonstrated adequate Fornell and Larcker's criterion.

Table 6-15: Discriminant Validity of Constructs (Model 1)

	1	2	3	4	5	6	7
1. Corporate Venturing	<b>0.823</b>						
2. Innovativeness	0.364	<b>0.864</b>					
3. Organic	0.137	0.307	<b>0.719</b>				
4. Performance	0.321	0.398	0.229	<b>0.866</b>			
5. Proactiveness	0.380	0.297	0.137	0.395	<b>0.875</b>		
6. Risk Taking	0.155	0.108	0.155	0.217	0.465	<b>0.780</b>	
7. Environmental	0.064	0.032	0.363	0.159	0.053	0.189	<b>0.836</b>

Diagonals (in bold) represent the square root of AVE while the other entries represent the correlations.

Table 6-16: Discriminant Validity of Constructs (Model 2-Profitability)

	1	2	3	4	5	6
1. Corporate Venturing	<b>0.808</b>					
2. Innovativeness	0.308	<b>0.778</b>				
3. Organic	0.121	0.102	<b>0.761</b>			
4. Proactiveness	0.353	0.287	0.178	<b>0.872</b>		
5. Risk Taking	0.127	0.142	0.119	0.468	<b>0.770</b>	
6. Environment	-0.057	-0.115	0.268	-0.009	0.243	<b>0.718</b>

Diagonals (in bold) represent the square root of AVE while the other entries represent the correlations.

Table 6-17: Discriminant Validity of Construct (Model 2-Growth)

	1	2	3	4	5	6
1. Corporate Venturing	<b>0.797</b>					
2. Innovativeness	0.013	<b>0.864</b>				
3. Organic	0.205	0.149	<b>0.751</b>			
4. Proactiveness	0.076	0.300	0.146	<b>0.814</b>		
5. Risk Taking	0.313	-0.049	0.100	0.192	<b>0.815</b>	
6. Environment	-0.036	0.150	0.154	0.040	0.284	<b>0.957</b>

Diagonals (in bold) represent the square root of AVE while the other entries represent the correlations.

## ii) Cross loading

The second discriminant validity evaluation is the cross loading or convergent validity. The convergent validity can be established when there is a high degree of correlation between two different sources responding to the same measure (Sekaran & Bougie, 2010:327). Thus, it is important that the items share more variance with its measure than other variables in a particular model. Therefore, in this study, the

loadings and crossloading tables are shown in Table 6-18 (Model 1), Table 6-19 (Model 2- Profitability) and Table 6-20 (Model 2-Growth). These tables show that the items' loadings are higher against their respective construct compared to other constructs in the model. It can be concluded that the second assessments of the measurement model's discriminant validity are satisfied. This study therefore concludes that the measurement model has established its discriminant validity.

Table 6-18: Loadings and Cross Loadings (Model 1)

Items	1	2	3	4	5	6	7
CV_1	<b>0.847</b>	0.317	0.138	0.234	0.338	0.153	0.097
CV_2	<b>0.756</b>	0.336	0.164	0.298	0.328	0.118	0.142
CV_3	<b>0.847</b>	0.248	0.133	0.246	0.323	0.200	0.099
CV_4	<b>0.890</b>	0.344	0.044	0.296	0.331	0.077	0.006
CV_5	<b>0.869</b>	0.298	0.086	0.284	0.321	0.104	0.001
CV_6	<b>0.716</b>	0.229	0.123	0.206	0.218	0.131	-0.039
Innov_1	0.297	<b>0.882</b>	0.333	0.415	0.207	0.005	0.064
Innov_3	0.316	<b>0.878</b>	0.214	0.288	0.344	0.246	0.002
Innov_5	0.337	<b>0.831</b>	0.224	0.303	0.243	0.07	0.003
OS_3	0.059	0.026	<b>0.539</b>	-0.034	0.182	0.147	0.186
OS_4	0.059	0.076	<b>0.685</b>	0.074	0.075	0.129	0.255
OS_5	0.074	0.179	<b>0.756</b>	0.083	0.026	0.039	0.175
OS_6	0.165	0.359	<b>0.926</b>	0.263	0.17	0.168	0.39
OS_8	0.014	0.060	<b>0.627</b>	0.075	0.089	0.106	0.138
Growth	0.337	0.362	0.0830	<b>0.799</b>	0.364	0.154	0.036
ROA	0.243	0.273	0.303	<b>0.883</b>	0.307	0.206	0.204
ROS	0.254	0.391	0.214	<b>0.914</b>	0.352	0.203	0.176
Pro_1	0.300	0.268	0.141	0.317	<b>0.908</b>	0.362	-0.006
Pro_2	0.320	0.247	0.136	0.286	<b>0.868</b>	0.377	-0.022
Pro_3	0.342	0.273	0.111	0.313	<b>0.867</b>	0.379	-0.002
Pro_4	0.301	0.211	0.106	0.411	<b>0.853</b>	0.440	0.153
Pro_5	0.394	0.304	0.112	0.369	<b>0.876</b>	0.452	0.064
Risk_1	0.144	0.187	0.21	0.244	0.435	<b>0.867</b>	0.17
Risk_2	0.143	-0.004	0.037	0.113	0.321	<b>0.816</b>	0.129
Risk_3	0.135	0.077	0.147	0.168	0.366	<b>0.871</b>	0.185
Risk_4	0.005	-0.099	-0.093	0.06	0.324	<b>0.51</b>	0.058
ED_3	-0.005	0.036	0.326	0.129	0.071	0.176	<b>0.826</b>
ED_5	0.109	0.018	0.283	0.137	0.019	0.14	<b>0.846</b>

Bold values are loadings for items, which are above the recommended value of 0.50

Table 6-19: Loadings and Cross Loadings (Model 2-Profitability)

Items	1	3	3	4	5	6
CV_1	<b>0.823</b>	0.267	0.096	0.335	0.111	0.015
CV_2	<b>0.847</b>	0.258	0.171	0.287	0.078	-0.042
CV_3	<b>0.837</b>	0.214	0.093	0.329	0.172	-0.011
CV_4	<b>0.847</b>	0.291	-0.002	0.296	0.067	-0.073
CV_5	<b>0.819</b>	0.236	0.066	0.299	0.105	-0.107
Innov_1	0.293	<b>0.762</b>	0.196	0.181	<b>-0.056</b>	-0.093
Innov_3	0.280	<b>0.942</b>	0.097	0.315	0.225	-0.089
Innov_4	0.063	<b>0.579</b>	-0.065	0.125	0.166	0.003
Innov_5	0.325	<b>0.787</b>	0.092	0.220	0.003	-0.195
OS_2	0.033	-0.145	<b>0.676</b>	0.104	0.025	0.237
OS_3	0.122	0.035	<b>0.852</b>	0.231	0.150	0.202
OS_4	0.088	0.023	<b>0.829</b>	0.079	0.084	0.201
OS_5	0.063	0.101	<b>0.700</b>	0.020	<b>-0.018</b>	0.145
OS_6	0.163	0.291	<b>0.731</b>	0.175	0.131	0.203
OS_8	0.026	0.035	<b>0.764</b>	0.113	0.069	0.224
Pro_1	0.284	0.244	0.216	<b>0.897</b>	0.365	-0.087
Pro_2	0.319	0.198	0.203	<b>0.848</b>	0.382	-0.062
Pro_3	0.310	0.255	0.102	<b>0.848</b>	0.384	-0.048
Pro_4	0.270	0.184	0.159	<b>0.866</b>	0.428	0.073
Pro_5	0.356	0.340	0.125	<b>0.901</b>	0.452	0.019
Risk_1	0.130	0.187	0.147	0.441	<b>0.802</b>	0.163
Risk_2	0.118	0.025	0.059	0.326	<b>0.818</b>	0.283
Risk_3	0.115	0.113	0.118	0.377	<b>0.872</b>	0.226
Risk_4	-0.007	0.021	0.026	0.331	<b>0.675</b>	0.180
Risk_5	0.064	0.125	0.038	0.293	<b>0.658</b>	0.088
ED_1	0.065	0.079	0.245	-0.051	0.187	<b>0.609</b>
ED_2	0.037	-0.097	0.196	0.017	0.210	<b>0.701</b>
ED_3	-0.002	0.038	0.257	0.088	0.183	<b>0.604</b>
ED_4	-0.221	-0.247	0.177	-0.064	0.213	<b>0.803</b>
EH_1	-0.018	-0.053	0.131	-0.034	0.146	<b>0.702</b>
EH_3	-0.019	-0.052	0.232	0.013	0.154	<b>0.851</b>

Bold values are loadings for items, which are above the recommended value of 0.5

Table 6-20: Loadings and Cross Loadings (Model 2-Growth)

Items	1	2	3	4	5	6
CV_1	<b>0.926</b>	0.019	0.296	0.052	0.282	-0.039
CV_2	<b>0.773</b>	-0.027	0.296	0.128	0.271	-0.041
CV_3	<b>0.825</b>	-0.017	0.234	0.059	0.287	0.026
CV_4	<b>0.802</b>	-0.069	0.310	-0.065	0.273	0.093

Items	1	2	3	4	5	6
CV_5	<b>0.628</b>	-0.107	0.265	-0.006	0.253	0.085
ED_2	0.077	<b>0.738</b>	-0.127	0.215	0.011	0.152
ED_3	0.038	<b>0.688</b>	0.046	0.176	0.006	0.110
ED_4	-0.157	<b>0.768</b>	-0.248	0.259	-0.111	0.112
EH_1	0.032	<b>0.679</b>	-0.012	0.171	-0.067	0.027
EH_3	0.027	<b>0.817</b>	-0.075	0.274	-0.047	0.120
Innov_1	0.292	-0.088	<b>0.895</b>	-0.002	0.120	-0.171
Innov_3	0.262	-0.088	<b>0.905</b>	-0.025	0.250	0.160
Innov_5	0.330	-0.186	<b>0.787</b>	-0.042	0.244	-0.130
OS_1	-0.059	0.350	-0.119	<b>0.716</b>	0.124	0.003
OS_2	0.054	0.224	-0.127	<b>0.837</b>	0.110	0.006
OS_3	0.102	0.202	0.060	<b>0.743</b>	0.277	0.140
OS_4	0.066	0.216	0.071	<b>0.694</b>	0.109	0.015
OS_7	0.091	0.203	-0.003	<b>0.649</b>	0.127	0.075
OS_8	0.081	0.211	0.061	<b>0.844</b>	0.170	0.009
Pro_1	0.282	-0.063	0.239	0.189	<b>0.903</b>	0.255
Pro_2	0.318	-0.041	0.212	0.190	<b>0.987</b>	0.286
Pro_3	0.283	-0.029	0.235	0.075	<b>0.779</b>	0.330
Pro_4	0.303	0.090	0.197	0.119	<b>0.676</b>	0.227
Pro_5	0.339	0.025	0.293	0.104	<b>0.683</b>	0.330
Risk_4	-0.055	0.201	-0.074	0.067	0.306	<b>0.952</b>
Risk_5	-0.017	0.092	0.000	0.013	0.242	<b>0.962</b>

Bold values are loadings for items, which are above the recommended value of 0.5.

### 6.6.2 Stage Two: Measurement of the Structural Model (Testing of the Hypotheses)

The next step after analyzing the Measurement Model in a PLS analysis is to create a structural model, by analyzing the inner model. First, the author examined the path loadings between constructs to identify significance using computed T-statistics. To test for significance, all of the data were run using 1000 bootstrapped samples as recommended by Davidson and MacKinnon (2000), with 138 cases per sample for Model 1, 130 samples for Model 2 and 35 sample sizes for Model 3.

After running the analysis for direct effect, the next step is the inclusion of the moderating variable (environmental dynamism and hostility) interactions in the relationship between innovativeness, proactiveness, risk taking, corporate venturing,

organic structure, and firm performance. Only Model 1 and 2 were tested for moderation analysis. PLS path modelling provides more accurate estimates of the moderating effect by taking into account the measurement errors that attenuate the estimated relationships and improve the validation of theories (Chin et al., 2003; Henseler & Fassott, 2010). In order to test the effect of dynamism and hostility of the environment, every predictor and moderator was multiplied to create an interaction construct (i.e. innovativeness x environment) to predict firm performance (Chin et al., 2010; Henseler & Fassott, 2010).

### 6.6.3 Structural Model 1 – Overall Firm Performance Model

#### 6.6.3.1 Direct Effect – Overall Firm Performance Model

Table 6-21 presents the results of the hypotheses in Model 1. The  $R^2$  value was 0.265, suggesting that 26.52% of the variance in the firm performance can be explained by the corporate entrepreneurship dimensions and organic structure. The  $R^2$  value of 0.2652 is considered acceptable in corporate entrepreneurship research, where prior research in similar fields have the  $R^2$  ranged from 0.01 to 0.348.

Unlike the two models, in this Model 1, firm performance is a unidimensional construct although corporate entrepreneurship may influence growth and profitability differently. This is because of high correlations ( $r = .498, .557, \text{ and } .758$ ) among the firm performance dimensions (ROA, ROS and sales growth), thus overall firm performance index was constructed to serve as the dependent variable in the analysis.

Table 6-21 shows that innovativeness (Hypothesis 1a), proactiveness (Hypothesis 2a), and corporate venturing (Hypothesis 4a) were positively related to firm performance. Meanwhile, risk taking (Hypothesis 3a) and organic structure (Hypothesis 5a) have no relationship with overall firm performance. It can be seen in

Table 6-21 that innovativeness ( $\beta = 0.246$ ,  $p < 0.01$ ) was the strongest predictor of firm performance followed closely by proactiveness ( $\beta = 0.243$ ,  $p < 0.01$ ,  $t$ -value = 2.93) and corporate venturing ( $\beta = 0.119$ ,  $p < 0.10$ ).

Table 6-21: Hypotheses and Results for Direct Effect (Model 1)

Hypothesis	Relationship	Path Coefficient	$t$ Value	Supported
H1a	Innovativeness $\rightarrow$ Overall Firm Performance	0.246	3.098***	Yes
H2a	Proactiveness $\rightarrow$ Overall Firm Performance	0.243	2.933***	Yes
H3a	Risk Taking $\rightarrow$ Overall Firm Performance	0.045	0.863	No
H4a	Corporate Venturing $\rightarrow$ Overall Firm Performance	0.119	1.605*	Yes
H5a	Organic structure $\rightarrow$ Overall Firm Performance	0.092	1.203	No
$R^2$			0.265	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.3.2 Moderating Effects – Overall Firm Performance

Table 6-22 presents the moderating interaction results. The variance explained was 34.8%. Of the five hypotheses formulated, three hypotheses were significant. However, one of the significant hypothesis was not supported, which was risk taking (Hypothesis 8a) because it revealed a negative direction ( $\beta = -0.183$ ,  $p < 0.01$ ,  $t$ -value = 2.463). Thus, only two hypotheses in this model were supported. Dynamic and hostile environment moderated the relationship between innovativeness and overall firm performance ( $\beta = 0.195$ ,  $p < 0.01$ ,  $t$ -value = 2.328). The relationship between corporate venturing and overall firm performance was also moderated by the environment factors ( $\beta = 0.146$ ,  $p < 0.01$ ,  $t$ -value = 2.030). This indicates support for Hypothesis 6a and Hypothesis 9a.

Table 6-22: Hypotheses and Results for Moderating Effects (Model 1)

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H6a	Innovativeness * Environment → Overall Firm Performance	0.195	2.328***	Yes
H7a	Proactiveness * Environment → Overall Firm Performance	-0.078	1.003	No
H8a	Risk Taking * Environment → Performance	-0.183	2.463***	No
H9a	Corporate Venturing * Environment → Overall Firm Performance	0.142	2.030***	Yes
H10a	Organic * Environment → Overall Firm Performance	-0.062	0.803	No
	$R^2$		0.348	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.4 Structural Model 2 – Profitability Model

##### 6.6.4.1 Direct Effects – Profitability Model

The dependent variable for Model 2 which is firm performance, was divided into two, i.e. growth and profitability. These multi-dimensions of firm performance were divided into two construct, which is growth and profitability. The correlation analysis found that, both construct are not significantly correlated ( $r = -.028$  and  $-.045$ ). Thus, in this section, the results of the profitability model will be presented and the growth model is presented in the next subsection.

Unlike  $R^2$  value in Model 1, Model 2 has a lower value in  $R^2$  which was 0.128, suggesting that 12.8% of the variance in the firm's profitability can be explained by innovativeness, proactiveness, risk taking, corporate venturing and organic structure. This may be due to the fact that there were only two items in profitability (ROS & ROA). Table 6-23 shows that there were three hypotheses supported which are

innovativeness, risk taking and organic structure. This indicates support for Hypothesis 1b, Hypothesis 3b and Hypothesis 5b.

As shown in Table 6-23, the highest predictor for firm profitability was the risk taking dimension which showed the strongest relationship with firm performance ( $\beta = 0.247$ ,  $p < 0.01$ ,  $t\text{-value} = 3.168$ ). This is followed by innovativeness ( $\beta = 0.104$ ,  $p < 0.10$ ,  $t\text{-value} = 1.628$ ) and organic structure ( $\beta = 0.112$ ,  $p < 0.10$ ,  $t\text{-value} = 1.531$ ). Meanwhile, proactiveness, and corporate venturing were found to have no relationship with firm profitability.

Table 6-23: Hypotheses and Results for Direct Effect for Model 2

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H1b	Innovativeness → Firm Profitability	0.104	1.628*	Yes
H2b	Proactiveness → Firm Profitability	0.051	0.852	No
H3b	Risk Taking → Firm Profitability	0.247	3.168***	Yes
H4b	Corporate Venturing → Firm Profitability	0.004	0.051	No
H5b	Organic structure → Firm Profitability	0.112	1.531*	Yes
	$R^2$		0.128	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.4.2 Moderating Effects – Profitability Model

Further, the moderating effect for the profitability model was included as shown in Table 6-24. The  $R^2$  for this Model was increased to 0.282, explaining 28.2% of the firm's profitability. Only two hypotheses were significantly and positively related to firm performance which were risk taking ( $\beta = 0.170$ ,  $p < 0.01$ ,  $t\text{-value} = 2.215$ ) and organic structure ( $\beta = .145$ ,  $p < 0.05$ ,  $t\text{-value} = 1.720$ ). Thus, Hypothesis 8b and Hypothesis 10b were supported. These relationship indicates that the impact of

risk taking and organic structure on firm profitability was greater under higher levels of environmental dynamism and hostility.

Table 6-24: Hypotheses and Results for Moderating Effects for Model 2

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H6b	Innovativeness * Environment → Firm Profitability	0.020	0.283	No
H7b	Proactiveness * Environment → Firm Profitability	0.029	0.339	No
H8b	Risk Taking * Environment → Firm Profitability	0.170	2.215***	Yes
H9b	Corporate Venturing * Environment → Firm Profitability	0.089	1.031	No
H10b	Organic * Environment → Firm Profitability	0.145	1.720**	Yes
	$R^2$		0.282	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

### 6.6.5 Structural Model 2 – Growth Model

#### 6.6.5.1 Direct Effect – Growth Model

In structural model 2, the growth model shows that out of the five hypotheses formulated, only three were significantly and positively related to firm growth. Table 6-25 shows that risk taking ( $\beta = 0.171$ ,  $p < 0.01$ ,  $t$ -value = 2.126), corporate venturing ( $\beta = 0.199$ ,  $p < 0.05$ ,  $t$ -value = 1.727) and organic structure ( $\beta = 0.134$ ,  $p < 0.05$ ,  $t$ -value = 1.926) were positively related to firm growth. This indicated there are supports for Hypothesis 3c, Hypothesis 4c and Hypothesis 5c. All independent variables accounted for 9.5% of the variance for firm growth.

Table 6-25: Hypotheses and Results for Direct Effects for Model 2 (Growth)

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H1c	Innovativeness → Firm Growth	0.056	1.073	No
H2c	Proactiveness → Firm Growth	-0.048	0.526	No
H3c	Risk Taking → Firm Growth	0.171	2.126***	Yes
H4c	Corporate Venturing → Firm Growth	0.199	1.727**	Yes
H5c	Organic structure → Firm Growth	0.134	1.962**	Yes
	$R^2$		0.095	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.5.2 Moderating Effects – Growth Model

Table 6-26 illustrates the hypotheses testing results when moderating variables were included in the relationship between independent variables and firm growth. Of the five hypotheses formulated, only three were found to be significant and positively related to firm growth. It was found that the environmental factors moderate the relationship between risk taking ( $\beta = 0.223$ ,  $p < 0.05$ , t-value = 1.780), corporate venturing ( $\beta = 0.310$ ,  $p < .05$ , t-value = 2.037) and organic structure ( $\beta = 0.142$ ,  $p < 0.05$ , t-value = 2.037) and firm growth. Thus, the results in this model provide support for Hypothesis 8c, Hypothesis 9c and Hypothesis 10c. This indicates that the positive association between risk taking, corporate venturing and organic structure and a firm's growth were stronger under higher environmental uncertainty. The  $R^2$  of this moderating effect model is 29.7%.

Table 6-26: Hypotheses and Results for Interaction Effect for Model 2

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H6c	Innovativeness * Environment → Firm Growth	0.047	0.454	No
H7c	Proactiveness * Environment → Firm Growth	0.032	0.384	No
H8c	Risk Taking * Environment → Firm Growth	0.223	1.780**	Yes
H9c	Corporate Venturing * Environment → Firm Growth	0.310	2.043***	Yes
H10c	Organic * Environment → Firm Growth	0.142	2.037***	Yes
	$R^2$		0.297	

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

### 6.6.6 Structural Model 3

Similar to Model 2, Model 3 also has two dimensions of firm performance which are the firm's profitability and growth. Before proceeding to the structural model test, the correlation test was conducted to assess whether there was significant correlation between profitability and growth. The results revealed that the firm's profitability and growth were not correlated ( $r = .140$  and  $.439$ ). Thus, the firm's growth and profitability are two distinct dimensions and can be treated as multidimensional constructs. In Model 3, only the direct effect of three independent variables which are innovativeness, proactiveness and corporate venturing in relation to firm profitability and growth, are analyzed.

#### 6.6.6.1 Structural Model 3 – Profitability Model

Table 6-27, which reports the results for a firm's profitability showed that innovativeness and corporate venturing were negatively related to firm profitability. Thus, the hypotheses were not supported. The results also indicate that none of the hypotheses were supported. Based on Table 6-27, 11.6% of the variance in a firm's profitability was explained by innovativeness, proactiveness, and corporate venturing.

Table 6-27: Hypotheses and Results for Model 3

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H1b	Innovativeness → Firm Profitability	-0.2577	1.5021*	No
H2b	Proactiveness → Firm Profitability	0.1191	0.6165	No
H4b	Corporate Venturing → Firm Profitability	-0.2263	1.4713*	No
$R^2$		0.116		

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.6.2 Structural Model 3 – Growth Model

Table 6-28 illustrates the results of the firm's growth as a dependent variable in the Model 3. It shows that corporate venturing was positively related to firm performance ( $\beta = 0.3037$ ,  $p < .10$ ,  $t$ -value = 1.380). This model shows that 10.52% of variance in a firm's growth was explained by the innovativeness, proactiveness, and corporate venturing.

Table 6-28: Hypotheses and Results for Model 3

Hypothesis	Relationship	Path Coefficient	t Value	Supported
H1c	Innovativeness → Firm Growth	-0.0604	0.2145	No
H2c	Proactiveness → Firm Growth	-0.0266	0.3670	No
H4c	Corporate Venturing → Firm Growth	0.3037	1.3797*	Yes
$R^2$		0.1052		

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 6.6.7 Moderating Effect Size ( $f^2$ ) for all Models

As mentioned in section Chapter 5 the formula to calculate the moderating effect is as follows:-

$$f^2 = \frac{R_{Included}^2 - R_{Excluded}^2}{1 - R_{Included}^2}$$

The moderating effect is not conducted in Model 3 because the moderating interaction was not tested. Thus, only Model 1 and 2 was assessed for moderating effect ( $f^2$ ). According to Cohen (1988),  $f^2$  is assessed as 0.02 (small), 0.15 (medium) and 0.35 (large). Table 6-29 illustrates the calculation of moderating effect size. The moderating effects size were 0.127 (Model 1), 0.214 (Model 2 – Profitability) and 0.214 (Model 2 – Growth) respectively indicating that the dynamism and hostility of the environment had a small and moderate effect on the corporate entrepreneurship-performance relationship.

Table 6-29: Moderating Effect Size ( $f^2$ )

Model	Moderating Effect Size ( $f^2$ )
Model 1	$(0.348 - 0.265) / (1 - 0.348) = 0.127$
Model 2 – Profitability	$(0.282 - 0.128) / (1 - 0.282) = 0.214$
Model 2 – Growth	$(0.297 - 0.095) / (1 - 0.297) = 0.287$

#### 6.6.8 Predictive Relevance ( $Q^2$ ) for all Models

The predictive relevance ( $Q^2$ ) shows how well the data collected empirically can be reconstructed with the help of the model and the PLS parameters (Aker et al., 2011; Fornell & Cha, 1994). The model has predictive relevance, if  $Q^2 > 0$ , and in contrast, if  $Q^2 < 0$  the model has lack of predictive relevance (Hair et al. 2012). In this study, as shown in Table 6-30, the  $Q^2$  was in the range of -0.0435 to 0.3095. Out of 8 sub-models, there were three sub-models that had  $Q^2$  of less than 0, indicating that the model has lack of predictive relevance. The highest  $Q^2$  was in the sub-models in Model 2 using actual growth as the dependent variable and with moderating interaction.

Table 6-30: Predictive Relevance ( $Q^2$ ) Value

Model	Predictive Relevance ( $Q^2$ ) Value
Model 1 (Direct Effect)	0.2031
Model 1 (With Moderating)	0.2479
Model 2 – Profitability (Direct Effect)	0.0982
Model 2– Profitability (With Moderating)	0.1947
Model 2 – Growth (Direct Effect)	-0.0435
Model 2– Growth (With Moderating)	0.3095
Model 3 – Profitability	-0.0589
Model 3– Growth	-0.0589

Formula:-

$$Q^2 = 1 - \frac{\sum_D E_D}{\sum_D O_D}$$

Where,

E = The sum of squares of prediction error

O = The sum of squares error using the mean for prediction

D = Omission distance

Table 6-31: Summary of Hypotheses

**Hypothesis 1: There is a direct positive relationship between innovativeness and firm performance (overall firm performance, growth, and profitability)**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H1a (Model 1)	Overall Performance	0.246	3.098***	Yes
H1b (Model 2)	Profitability 2	0.104	1.628*	Yes
H1c (Model 2)	Growth 2	0.056	1.073	No
H1b (Model 3)	Profitability 3	-0.2577	1.5021*	No
H1c (Model 3)	Growth 3	-0.0604	0.2145	No

**Hypothesis 2: There is a direct positive relationship between proactiveness and firm performance (overall firm performance, growth, and profitability)**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H2a (Model 1)	Overall Performance	0.243	2.933***	Yes
H2b (Model 2)	Profitability 2	0.051	0.852	No
H2c (Model 2)	Growth 2	-0.048	0.526	No
H2b (Model 3)	Profitability 3	0.1191	0.6165	No
H2c (Model 3)	Growth 3	-0.0266	0.3670	No

**Hypothesis 3: There is a direct positive relationship between risk taking and firm performance (overall firm performance, growth, and profitability)**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
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H3a (Model 1)	Overall Performance	0.045	0.863	No
H3b (Model 2)	Profitability 2	0.247	3.168***	Yes
H3c (Model 2)	Growth 2	0.171	2.126***	Yes

**Hypothesis 4: There is a direct positive relationship between corporate venturing and firm performance (overall firm performance, growth, and profitability)**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H4a (Model 1)	Overall Performance	0.119	1.605*	Yes
H4b (Model 2)	Profitability 2	0.004	0.051	No
H4c (Model 2)	Growth 2	0.199	1.727**	Yes
H4b (Model 3)	Profitability 3	-0.2263	1.4713*	No
H4c (Model 3)	Growth 3	0.3037	1.3797*	Yes

**Hypothesis 5: There is a direct positive relationship between organic structure and firm performance (overall firm performance, growth, and profitability)**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H5a (Model 1)	Overall Performance	0.092	1.203	No
H5b (Model 2)	Profitability 2	0.112	1.531*	Yes
H5c (Model 2)	Growth 2	0.134	1.962**	Yes

**Hypothesis 6: Moderating effect of environmental dynamism and hostility to innovativeness-performance relationship.**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H6a (Model 1)	Overall Performance	0.195	2.328***	Yes
H6b (Model 2)	Profitability 2	0.020	0.283	No
H6c (Model 2)	Growth 2	0.047	0.454	No

**Hypothesis 7: Moderating effect of environment to proactiveness-performance relationship**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H7a (Model 1)	Overall Performance	-0.078	1.003	No
H7b (Model 2)	Profitability 2	0.029	0.339	No
H7c (Model 2)	Growth 2	0.032	0.384	No

**Hypothesis 8: Moderating effect of environment to risk taking-performance relationship**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H8a (Model 1)	Overall Performance	-0.183	2.463***	No
H8b (Model 2)	Profitability 2	0.170	2.215***	Yes
H8c (Model 2)	Growth 2	0.223	1.780**	Yes

**Hypothesis 9: Moderating effect of environment to corporate venturing-performance relationship**

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H9a (Model 1)	Overall Performance	0.142	2.030***	Yes
H9b (Model 2)	Profitability 2	0.089	1.031	No
H8c (Model 2)	Growth 2	0.310	2.043***	Yes

#### Hypothesis 10: Moderating effect of environment to organic structure-performance relationship

Hypothesis	Dependent Variables	Path Coefficient	t-value	Supported
H10a (Model 1)	Overall Performance	-0.062	0.803	No
H10b (Model 2)	Profitability 2	0.145	1.720**	Yes
H10c (Model 2)	Growth 2	0.142	2.037***	Yes

### 6.7 Summary of Chapter 6

Chapter 6 provided explanations on the preliminary data analysis such as data editing, coding, and data screening. Next, the profile characteristics of respondents and sample firms on all 3 main models and 8 sub-models were also presented. Finally, the PLS was used to investigate the determinants of large firm performance. In the first stage of PLS, the data were tested for its reliability and validity. Only items that demonstrated satisfactory reliability and validity were included for further analysis. The item loadings must be 0.5, the composite reliability values must be more than 0.7 and AVE value should be 0.50 and above. The data were then used for testing the hypotheses formulated. The total hypotheses for the three models amounted to 33 hypotheses, but out of this, only 17 hypotheses were supported. The moderating effect size ( $f^2$ ) of environmental hostility and dynamism was small in Model 1 and medium in Model 2. Off the 8 sub-models, 5 had predictive relevance ( $Q^2$ ). The discussions on the study findings, their implications, limitations, and suggestions for future research will be discussed in the next final chapter.