

TABLE OF CONTENTS

	Page
Acknowledgement	iii
Thai abstract	iv
English abstract	vi
Table of contents	vii
List of tables	ix
List of figures	x
Chapter 1 Introduction	1
1.1 Statement and significance of the problem	1
1.2 Research objectives	4
1.3 Education/application advantages	4
1.4 Scope of Research	4
Chapter 2 Principle and Literature Review	6
2.1 The Supply Chain Management	6
2.2 The Balanced Scorecard	10
2.3 Fuzzy set theory	12
2.4 The Analytic Hierarchy Process (AHP)	14
2.5 Quartile	16
2.6 The Simple Additive Weighting (SAW) method	17
2.7 Review of Literature	17
Chapter 3 Research Designs and Methods	27
3.1 Study related theory to the knowledge base and reference in this research	27
3.2 Identify and study supply chain characteristics of export frozen foods	27
3.3 Develop framework to measure the performance of supply chain management	29
3.4 Determine the weight of each criterion in the measurement	29
3.5 Measure the performance of supply chain management	32
3.6 Identify strengths and weaknesses and suggestion for exported Frozen foods	32
Chapter 4 Performance Measurement Framework for Supply Chain Management	34
4.1 The exported frozen food supply chain and performance	34
4.2 Performance measurement framework	40
4.3 Determination of the criterion importance weight	49
4.4 The weight of balanced scorecard perspectives	52
4.5 The sensitivity analysis	60
Chapter 5 The Measurement Result of Exported Frozen Foods	64
5.1 General Characteristics of the sample organizations	64
5.2 Supply chain performance measurement result	65

TABLE OF CONTENTS (cont.)

	Page
5.3 The SWOT analysis of the exported frozen foods	86
5.4 The TOWS matrix for exported frozen foods	91
Chapter 6 Conclusion and discussion	94
6.1 Thesis conclusion	94
6.2 Result discussion	97
6.3 Research discussion	97
References	99
Appendices	103
Appendix A The questionnaire used in the thesis	104
Appendix B Name of experts	133
Appendix C Pairwise comparison result for criteria's weight	139
Appendix D Pairwise comparison result of Balanced Scorecard perspectives' weight	163
Appendix E The division for data analysis	173
Appendix F Data analysis to prioritize the Balanced Scorecard perspectives by fuzzy AHP method	180
Appendix G The measurement result	190
Vita	202

LIST OF TABLES

Table		Page
1.1	Export value proposition to divide the value of frozen food exports	3
2.1	The level of importance for AHP	16
2.2	Random Index (RI)	16
2.3	Literature reviews of performance measurement	23
3.1	The level of importance	30
3.3	Research method and results	33
4.1	Definition of main criteria for Primary framework of performance measurement	42
4.2	Definition of sub-criteria for Primary framework of performance measurement	42
4.3	How to collect the data for each criteria	47
4.4	Level of information exchange	48
4.5	Comparison for the main criteria of the first expert	49
4.6	The average from comparison of main criteria from 9 experts	50
4.7	The sensitivity analysis for main criteria	61
5.1	Range of production accuracy rate	66
5.2	Range of damage rate	68
5.3	Range of Ratio of transportation and inventory cost	69
5.4	Range of customer complaints	71
5.5	Range of customer on time rate	73
5.6	Range of supplier on-time rate	74
5.7	Range of returned product rate	77
5.9	The SWOT analysis of the exported frozen foods	88
5.10	The TOWS matrix for exported frozen foods	92

LIST OF FIGURES

Figure		Page
1.1	Major food exporters in the world of 2550.	2
1.2	Percentages of export value of food compared to other export sectors	3
2.1	The reason for applied supply chain management	7
2.2	The structure of supply chain process	8
2.3	The relationship between four perspectives in the BSC	12
2.4	Triangular membership function	13
2.5	The hierarchy of the hierarchical analysis process	14
2.6	Mapping of C-suite and P-suite issues for integrated framework	18
2.7	Conceptual framework of agri-food supply chain performance	20
3.1	The overall research process.	28
3.2	The determine weight process	30
3.4	The triangular membership functions	31
4.1	The exported frozen foods supply chain	34
4.2	The step to create framework of performance measurement	41
4.3	The performance measurement for export frozen food supply chain management	45
4.4	The structure of measurement framework	51
4.5	The relationship between the performance criteria and balanced scorecard perspective	52
4.6	The balanced scorecard perspectives' weight of product accuracy rate	53
4.7	The balanced scorecard perspectives' weight of damage rate	54
4.8	The balanced scorecard perspectives' weight of ratio of transport and inventory cost	55
4.9	The balanced scorecard perspectives' weight of customer complaints	55
4.10	The balanced scorecard perspectives' weight of customer on-time rate	56
4.11	The balanced scorecard perspectives' weight of supplier on-time rate	57
4.12	The balanced scorecard perspectives' weight of returned product rate	57
4.13	The balanced scorecard perspectives' weight of customer contract and level of information exchange	58
4.14	The balanced scorecard perspectives' weight of supplier contract and level of information exchange	59

LIST OF FIGURES (cont.)

Table		Page
4.15	The balanced scorecard perspectives' weight of the overall measurement	59
4.16	Sensitivity analysis of the weight of efficiency criterion	61
4.17	Sensitivity analysis of the weight of responsiveness criterion	61
4.18	Sensitivity analysis of the weight of quality criterion	62
4.19	Sensitivity analysis of the weight of inter-organizational alignment criterion	62
5.1	Percentage of informants divided by work position	64
5.2	Percentage of sample organizations divided by product type	66
5.3	Percentage of production accuracy rate	66
5.4	The comparison of each product type for percentage of production accuracy rate	67
5.5	Percentage of damage rate	68
5.6	The comparison of each product type for percentage of damage rate	69
5.7	Ratio of transportation and inventory cost	70
5.8	The comparison of each product type for ratio of transportation and inventory cost	71
5.9	Percentage of customer complaints	72
5.10	The comparison of each product type for percentage of customer complaints	73
5.11	Percentage of customer on-time rate	74
5.12	The comparison of each product type for percentage of customer on-time rate	75
5.13	Percentage of supplier on-time rate	76
5.14	The comparison of each product type for percentage of supplier on-time rate	76
5.15	Percentage of returned product rate	77
5.16	The comparison of each product type for returned product rate	78
5.17	The result of the customer contract and the level of information exchange	79
5.18	The comparison of each product type for customer contract and the level of information exchange	80
5.19	The result of the supplier contract and the level of information exchange	81
5.20	The comparison of each product type for supplier contract and the level of information exchange	81
5.22	The score of main criteria of performance divided by product type	84
5.23	The score of performance measurement divided by product type	86
6.1	The structure of measurement framework by Balanced Scorecard approach	95