Executive Summary

Office of the National Economic and Social Development Board (NESDB), a governmental unit responsible for developing database and research on Logistics Cost of Thailand, initiated a study on "Upgrading Competitiveness of Thailand's Logistics: Phase 3", with an objective to collect the data of "Inventory Carrying Cost" of Thai companies in order to estimate "Inventory Holding Cost" of Thailand and further estimate Logistics Cost per Gross Domestic Product (GDP) of Thailand.

In this study, we adopted the "Structured Questionnaire" method to collect the Inventory Carrying Cost of Logistics data from Thailand's main industries. We collected a total of 1,087 samples which followed the survey criteria at a 95% of confidence level. The samples were divided into 3 groups, 513 small-sized companies (47.2%), 302 medium-sized companies (27.8%), and 272 large-sized companies (25.0%).

After collecting the survey, we calculated and compared the Inventory Carrying Cost of Logistics using three various inventory figures: a) using Inventory at 31 December 2008, b) using average Inventory of 2008 calculated by each company and c) using average Inventory of 2008 calculated by Effinity Co. Ltd,. Moreover, the collected data was analysed based on 5 methods: 1) Overall Perspective, 2) Sizing Perspective, 3) Industry Perspective, 4) Industrial Grouping Perspective and 5) Industrial Grouping and Sizing Perspective. We decided to use **the average Inventory of the year 2008** calculated by each company to estimate Thailand's Inventory Carrying Cost of Logistics because there was no significant difference between using the figures of Inventory recorded at any of the 3 periods, and also these figures represented the real value of inventory that we received from the companies themselves. In addition, we categorized the sample size into Industrial Grouping and

Sizing Perspective to estimate the inventory carrying cost, given that it was considered to be the most accurate statistic methods under limited number of sample size and it could reflect characteristics of each industry in Thailand more properly.

In determining the estimated Inventory Carrying Cost of Logistics, we employed 5 different calculation methods, including Arithmetic Mean, Geometric Mean, Median, Mode, and Weighted Average in order to identify a suitable averaging method. However, we decided to use **the Geometric Mean method** to determine the average of Inventory Carrying Cost of Logistics in this study. The reason behind such the decision was because Geometric Mean is the most appropriate method for non-normal distributed data, based on the international standard of statistic calculation.

Table A: Estimation of Inventory Carrying Cost Categorizing by Industrial Grouping and Sizing using Average Inventory of 2008 calculated by each company

			using Average 2008 Inventory calculated by company (Unit : million Baht)		
ISIC		Size	Aritmetic Mean	Median	Geometric Mean
A01-A02	Agricultural	L	n.a.	n.a.	n.a.
		M	n.a.	n.a.	n.a.
		S	2,554.99	1,458	1,303
C10-C14	Mining	L	4,378.18	2,493	2,179
		M	47.96	47	46
		S	2,546.47	1,915	1,947
D15-D16	Food and Tobacco	L	17,336.21	6,255	7,441
		M	5,919.78	2,637	3,026
		S	10,758.01	4,199	5,340
D17-D19	Textile, Leather and Clothing	L	5,006.44	4,070	3,683
		M	6,749.33	3,539	3,898
		S	17,817.22	9,333	8,784
D20	Wood Manufacture, Product of Wood, and Cork	L	n.a.	n.a.	n.a.
		M	1,271.11	751	905
		S	12,050.72	3,073	5,054
D21-D22	Paper Manufacture and Printing	L	2,499.34	892	1,046
		M	1,753.87	975	895
		S	1,978.02	1,132	1,300
D23-D25	Coke, Chemicals, Rubber, and Plastic Manufacture	L	16,379.95	8,029	7,475
		M	12,105.28	6,869	6,128
		S	24,055.04	9,766	11,065
D26-D27	Non-Metallic Mineral and Basic Metal Manufacture	L	11,697.63	6,633	6,867
		M	2,721.05	1,955	1,695
		S	9,197.22	4,758	4,579
D28	Fabricated Metal Manufacture	L	6,742.86	4,135	3,884
		M	3,359.17	1,781	1,962
		S	47,088.55	23,675	22,071
D29-D33	Machinery and Equipment Manufacture	L	23,868.83	9,126	10,141
		M	5,188.10	3,308	3,447
		S	11,735.19	5,069	5,373
D34-D35	Motor Vehicle and Transport Equipment Manufacture	L	18,517.01	9,459	8,685
		M	3,416.11	1,189	1,364
		S	5,030.96	3,990	2,576
D36-D37	Furniture and Other Manufacturing	L	2,166.66	779	1,081
		M	19,759.26	3,993	2,668
		S	14,042.93	9,162	7,867
	Total		329,739.47	156,443.27	155,777.14

As a result of using the average Inventory of 2008 data calculated by each company and the Geometric Mean calculation using Industrial Grouping and Sizing Perspective, Thailand's Inventory Carrying Cost estimation is approximately 155,777.14 million Baht, an equivalence of 1.72 percent of Thailand's Gross Domestic Product 2008 (GDP'08). As a result, this implies the β of 5.21 percent.

However, the ratio of Thailand's Inventory Carrying Cost to the GDP of Thailand and the β estimations in this study are significantly different from that of the NESDB (at 4.65 percent of GDP'08 and 19 percent respectively). Three reasons can be used to explain such the difference. Firstly, the inventory values of companies in Agricultural, Mining, and Industrial Sector, collected and calculated from the questionnaire, were lower than the values used by NESDB (secondary data from Industrial Census, provided by The National Statistical Office). Secondly, many companies did not have in-depth collection of costs data of which they could have omitted the costs of obsolescence, shrinkage, and pilferage collection and lastly, there is no data collection of some costs that are related to Inventory Carrying Cost collection in Thailand such as, Inventory Taxes.

In conclusion, two recommendations can be made from this study for further development of Thailand Logistics.

1) Providing knowledge about Inventory Carrying Cost to entrepreneurs, especially in Small and Medium Enterprise (SME) so that they can have better understanding of such matter which in turn will help improve their system of collecting costs data for a better database and further development to lower costs that are related to Inventory. This will lead to systematic data collection and increase efficiency of carrying inventory and supply chain.
2) Adapting the assumption usage of Cass method to fit Thailand's Context. In the future, a more in-depth study should be conducted about the components of β and other costs related to Inventory Carrying Cost; for example, Insurance, Obsolescence, Shrinkage, and Pilferage. This will result in a better estimation of Inventory Carrying Costs of Logistics. Moreover, we should further explore and conduct a study of this same methodology with a larger sample size in order to represent the whole country more appropriately and correctly again, once entrepreneurs and owners of related business have been educated and provided with information and knowledge they need about inventory costs data collection.