

國立臺灣大學國際企業學研究所

博士論文

Graduate Institute of International Business

College of Management

National Taiwan University

doctoral dissertation



顧客集中程度對於廠商績效之影響

The Impact of Customer Concentration on Firm Performance

翁雪玉

Pim Soonsawad

指導教授：任立中博士

Advisor: Lichung Jen, Ph.D.

中華民國九十九年一月

January, 2010

# Acknowledgements

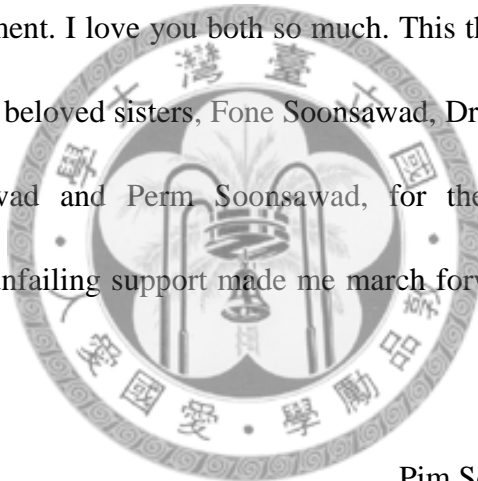
This dissertation is the result of study as a Ph.D. student at the Department of International Business, Major of Marketing Management, National Taiwan University. I would like to thank more people than can be mentioned in this acknowledgement for their constructive encouragement and generous support in making this dissertation possible.

First of all, I would like to express my deepest gratitude to my advisor, Professor Jen, Lichung, who has given me the chance learn with him and bring me into the academic field. He is always supports me with kindness and patience has given inspiring guidance along my Ph.D. journey. He taught me and made me enthusiastic about marketing strategy and Hierarchical Bayesian Modeling teaching. His passion gave me the energy to do the research and complete this dissertation. This could not have been possible without your guidance and assistance. Next, I would like to thank the members of Ph.D. committee who have also been invaluable: Professor Jen, Lichung, Professor Chen, Homin, Associate Professor. Lin, Chris, J., Associate Professor Hsieh, Ming-Huei, and Associate Professor Chou, Chien Heng for their insightful advice. I really appreciate your efforts in assisting me and resolving your differences of opinion for the benefit of my education.

I would like to thank all the teachers who have coached me during my Ph.D. program, and thank my classmates Shao, Kung Hsin, Wang, Wei-Lin for their great

friendship and assistance during the preparation process. Special thanks are dedicated to Mr. Kittilert Pattraprayoon for his warm encouragement and assistance my work on this dissertation. I also thank all of people who accompanied me during this process.

Finally, I would like to thank my dear parents, Thong-in Soonsawad, and Phonglak Soonsawad, for their loving consideration and raising me to have a passion for education and great confidence in achieving academic excellence all these years. I owe this dissertation, like everything I have ever accomplished, to their constant support and encouragement. I love you both so much. This thesis is dedicated to you. I also want to thank my beloved sisters, Fone Soonsawad, Dr. Pan Soonsawad and my brother, Tape Soonsawad and Perm Soonsawad, for their support and sincere encouragement. Their unfailing support made me march forward bravely. Thank you very much.



Pim Soonsawad  
January, 2010

International Business Department  
Marketing Management  
National Taiwan University

## 摘要

客戶集中發揮著越來越重要的作用對企業的營銷策略。重視客戶集中在文學是放在 80/20 規則，小集團的利潤的客戶能產生收入的 80% 為公司。但是，關鍵的問題是什麼程度，客戶的濃度可產生最高利潤的公司。本文的目的是為了回答這個問題的關係，調查集中和公司的財務業績的因素，從而會影響這種關係。阿面板數據組裝了一套利用兩個數據庫的數據，即 comScore 的網絡行為數據庫和計算機統計金融數據庫。數據分析的基礎上縱向大型二級數據的 52 樣本上市公司，美國在線通過採用分層貝葉斯模型的分析方法。結果表明，客戶集中度有積極或消極影響公司業績這取決於每個公司。影響程度的客戶集中在公司業績將主持 5 個變量：長度訪問時間，頁面瀏覽量，產品種類，渠道戰略，以及企業規模。調查結果提供指引，以電子商務營銷經理；表示強烈關注客戶集中度應納入發展的營銷戰略，吸引和留住客戶的盈利目標。該公司可以安排合適的營銷成本參與最有利可圖的網上客戶群，幫助企業制定個性化的策略超過競爭對手。

關鍵詞：客戶集中，財務業績，公司的特點，搜索行為和電子商務。

## Abstract

Customer concentration is playing an increasingly important role for firms' marketing strategies. Much attention in customer concentration literature is placed on the 80/20 rule that a small group of profitable customers can generate 80% of revenue for firms. However, a key question is what degree of customer concentration can generate the highest profit for a firm. In this paper, the goal is to answer this question by investigating the relationship of concentration and firm's financial performance and the factors that could impact on this relationship. A panel data set was assembled using data from two databases; the comScore web behavior database and the COMPUSTAT financial database. The research was based on longitudinal analyses of large-scale secondary data of fifty-two samples of publicly traded US online companies by adopting the Hierarchical Bayesian model approach in analysis. The results indicate that the customer concentration rate has a positive or negative impact on firm performance which depends on each firm. The degree of impact of customer concentration on firm performance would be moderated by five variables: length of visit time, page views, product types, channel strategy, and firm size. The findings provide guidelines to E-commerce marketing managers; indicating a strong focus on degree of customer concentration should be incorporated into the development of a marketing strategy by attracting and retaining target profitable customers. The firm can allocate suitable marketing costs to the most profitable online customer group;

which assists firms in setting customized strategy over competitors.

Keywords: customer concentration, financial performance, firm characteristics, searching behavior, and E-commerce.



# Table of Contents

ACKNOWLEDGEMENTS .....	I
摘要.....	III
ABSTRACT.....	IV
LIST OF TABLES .....	VIII
LIST OF FIGURES.....	IX
CHAPTER 1: INTRODUCTION.....	1
1.1) RESEARCH OBJECTIVE.....	4
1.2) A CONCEPTUAL FRAMEWORK OF THE STUDY.....	5
1.3) EXPECTED CONTRIBUTION .....	12
CHAPTER 2: LITERATURE REVIEW.....	14
2.1) CONTEXT OF CONCENTRATION.....	20
2.2) FINANCIAL PERFORMANCE INDEX.....	30



2.3) FIRM CHARACTERISTICS.....	33
2.4) WEB SEARCHING BEHAVIOR.....	38
<b>CHAPTER 3: RELATIONSHIP OF CUSTOMER CONCENTRATION AND FIRM PERFORMANCE.....</b>	<b>40</b>
3.1) HYPOTHESIS DEVELOPMENT.....	41
3.2) RESEARCH METHODOLOGY.....	52
<b>CHAPTER 4: EMPIRICAL STUDY RESULTS.....</b>	<b>64</b>
4.1) DESCRIPTIVE STATISTICS .....	65
4.2) CUSTOMER CONCENTRATION AND FINANCIAL PERFORMANCE.....	76
4.3) HIERACHICAL BAYESIAN MODEL AND HYPOTHESIS TESTING RESULT.....	79
<b>CHAPTER 5: DISCUSSION AND CONCLUSION.....</b>	<b>91</b>
5.1) DISCUSSION AND MANAGERIAL IMPLICATIONS.....	93
5.2) CONCLUSION, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS.....	97
<b>REFERENCES.....</b>	<b>99</b>
<b>APPENDIX.....</b>	<b>113</b>





# List of Tables

TABLE 2.1: PREVIOUS LITERATURE ON CUSTOMER CONCENTRATION.....	15
TABLE 3.2: ALL SAMPLES BASED WEBSITES.....	56
TABLE 4.1: DESCRIPTION OF VARIABLES.....	67
TABLE 4.2: THE IMPACT OF CC ON FINANCIAL PERFORMANCE (TOBIN'S Q) .....	77
TABLE 4.3: THE IMPACT OF CC ON FINANCIAL PERFORMANCE (TOBIN'S Q) OF YAHOO.....	77
TABLE 4.4: THE RESULT OF HB MODEL: INDIVIDUAL LEVEL.....	81
TABLE 4.5: HIERACHICAL BAYESIAN MODEL IN AGGREGATE LEVEL RESULT.....	84
TABLE 4.6: SUMMARY OF RESULTS.....	90
TABLE 3.1: FIFTY-TWO ONLINE US COMPANIES IN DIFFERENT INDUSTRIES OVER A FINANCIAL QUARTER FROM JANUARY 2006 TO DECEMBER 2007.....	113



# List of Figures

FIGURE 1.1: THESIS'S CONCEPTUAL FRAMEWORK .....	9
FIGURE 2.1: THE "80/20" CUSTOMER PYRAMID .....	23
FIGURE 2.2: ORDINARY LORENZ CURVE.....	25
FIGURE 2.3: INVERTED LORENZ CURVE.....	26
FIGURE 4.1: AVERAGE CUSTOMER CONCENTRATION RATES OF EACH FIRM IN SAMPLE .....	68
FIGURE 4.2: THE PERCENTAGE OF COMPANIES (%) OF VARIED CUSTOMER CONCENTRATION (BASED ON TOP 20% CUSTOMERS' MONETARY VALUE) .....	69
FIGURE 4.3: AVERAGE TOBIN'S Q OF EACH FIRM IN THE SAMPLE.....	70
FIGURE 4.4: CATEGORIZATION OF TOBIN'S Q FOR EACH FIRM.....	71
FIGURE 4.5: THE FIRM CHARACTERISTICS OF THE COMPANIES.....	71
FIGURE 4.6: FIRST YEAR OF EACH E-COMMERCE FIRM .....	72
FIGURE 4.7: THE PERCENTAGE OF COMPANIES (%) OF FIRM TYPES IN THE SAMPLE .....	73
FIGURE 4.8: AVERAGE PAGE VIEWS OF EACH COMPANY PER VISIT FOR VISITORS & BUYERS.....	74
FIGURE 4.9: AVERAGE DURATION OF EACH VISIT FOR VISITORS & BUYERS PER COMPANY .....	75
FIGURE 4.10: THE DISTRIBUTION OF ACROSS FIRMS.....	82
FIGURE 4.11: THE IMPACT OF CC ON FINANCIAL PERFORMANCE ON THE DISTRIBUTION OF ACROSS FIRMS .....	83

# Chapter 1: Introduction

Companies in economically advanced nations continue to invest large amounts of money in developing the internet. Companies have spent almost \$2.5 trillion to build internet infrastructure around the world since 1994. The advantages of the internet, include lower interaction costs; the network effects created by increasing returns; and greater economies of scope and scale. These advantages can force internet businesses to consolidate considerably. E-commerce models specify the cost advantage of 15-20 percent will increase many successful first movers. The number of internet hosts, 10 million in 1996, increased to 172 million by January 2003, and further increased to 626 million in 2009 (Internet Systems Consortium 2009). However, some companies spend vast amounts of money to get e-commerce sites up and running only to not achieve profits. These companies may not realize the 80/20 rule; spending a lot of firm resources with all online customers, not the right top 20% of online customers. The 80/20 rule suggests that by capturing the largest and most profitable customer a company can be more successful, this rule is utilized by many successful e-commerce businesses; for example, FedEx, U.S. West, First Union, GE Capital, Bank of America, and The Limited (Zeithaml et al. 2001). All firms are aware at some level that their customers differ in profitability or assess the distribution of profitability (Mulhern 1999). Therefore, most firms target the most valued customers. Much attention is placed on the concentration of profits among

customers. Schmittlein et al. (1993) presented 80/20 type laws that mean 20 percent of the customers account for 80 percent of the sales or profit.

Previous literature focused on this concept, illustrates that the expected concentration since it attempts to capture the real, long-run behavior of the clients observed by one whole year of data, is likely to be closer to the “true” concentration. Colombo and Jiang (1999) have used a Stochastic Recency, Frequency and Monetary value (RFM) model to quantify this concentration effect while examining the difference between making decisions based on the observed lifetime values compared with the expected lifetime values. Their result illustrated that the top 20% of clients are predicted to account for about 65% of the total lifetime future contribution. Their method is a good estimation for customers’ response probabilities and expected expenditures to an offer from their purchase history. Mulhern (1999) provided a conceptual foundation for measuring customer profitability related to measuring customer lifetime value in direct marketing and the measures of customer concentration degree of profits. Nevertheless, little research in the marketing literature has addressed the relationship of customer concentration (CC) and firm performance in online firms.

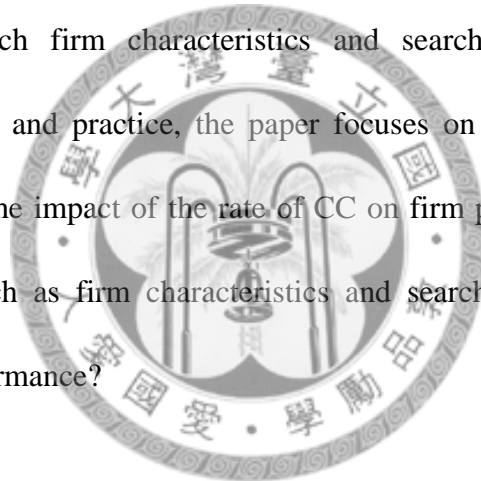
The 80/20 rule requires that companies use customer information effectively. Recently, customer information has become increasingly important because the prevalence of internet creates a unique e-commerce industry (Kandampully 2003). A customer database provides a valuable resource for companies to understand their

customers such as the customer searching behaviors and e-commerce transactions. To adopt both a customer database and a financial database, this dissertation develops and tests a conceptual framework based on data from databases, that (1) identifies the relationship between CC and firm performance; (2) describes firm characteristics (product type, channel, firm size and firm age) that moderate the customer concentration to business performance; (3) investigates search behavior (page viewed and duration per person per visit) as moderators of the relationship between CC and business performance.

This thesis has five chapters: chapter one: introduction which presents the research objectives; a conceptual framework of the study; and the expected contribution to academia and to the field of marketing. Chapter two reviews the literature related to customer concentration; firm characteristics; and searching behavior. Chapter three provides the hypothesis and research methodology. Chapter four describes the empirical study results using the Bayesian methods to test the hypotheses. The last chapter provides the discussion; managerial implications; research limitations and conclusion.

## 1.1) Research Objectives

While much attention in marketing literature is placed on the 80/20 rule, very little research has addressed the empirical studies of whether the customer concentration (CC) rate has any effect on firm performance. In this paper, the goal is to start filling this gap by investigating the reasons behind the phenomenon of concentration and firm performance. We aim to examine the impact of the degree of CC on firm performance based on longitudinal analyses including investigates moderating effects such firm characteristics and searching behavior. To fully contribute to academia and practice, the paper focuses on answering two research questions: 1) What is the impact of the rate of CC on firm performance? 2) How do moderating factors such as firm characteristics and search behavior affect CC to promote business performance?



## 1.2) A Conceptual Framework for the study

Firms place the customers at the center of all marketing action. All firms are aware at some level that their customers differ in profitability or assessment of the distribution of profitability (Kotler 2003; Mulhern 1999). The 80/20 laws are consistent with marketing theories that organizational profits are mostly concentrated among a small set of customers (Day and Wensley 1983; Schultz and Schultz 1998). This concept indicates a certain degree of concentration in customer purchases; i.e., the extent to which a large portion of the product's total purchases are made by a small fraction of all customers. This situation may create several major concerns for prospective buyers. The small group of customers can turn the business from unprofitable to profitable. Therefore, the information on the concentration or distribution of profits could be adopted for the firm's decisions of targeting marketing strategy toward the most valued customers (Mulhern 1999).

Figure 1.1 presents a conceptual framework of this thesis which seeks to explore the relationship and moderating effects between CC and business performance. This thesis is divided into three parts: Research Gap I, Research Gap II and Research Gap III.

### ***Research Gap I:***

Recent years have witnessed a huge increase in the numbers of online retailers and an exponential expansion in the volume of online shoppers (Goode and Harris 2007). As more online firms adopt a CC concept to their firm, it has become increasingly important to understand how the degree of CC relates to the firm's performance. Previous research presented negative association between customer concentration and future stock returns that cannot be reconciled with the pricing of risk in efficient markets (Patatoukas 2009). A basic premise of this thesis is that the CC rate is correlated with firm performance. Specifically, the purpose of the current study is to determine whether the customer concentration rate is positively linked to performance; however the concentration rate will be moderated by some factors. To link the customer concentration rate to firm performance, it is necessary to understand how the customer concentration rate and firm performance will be measured. Based on this study, Lorenz curve adopted in calculate customer concentration rate. Performance was measured by using Return on Assets (ROA), Return on Equity (ROE), and Tobin's q.

### ***Research Gap II:***

#### ***Firm Characteristics***

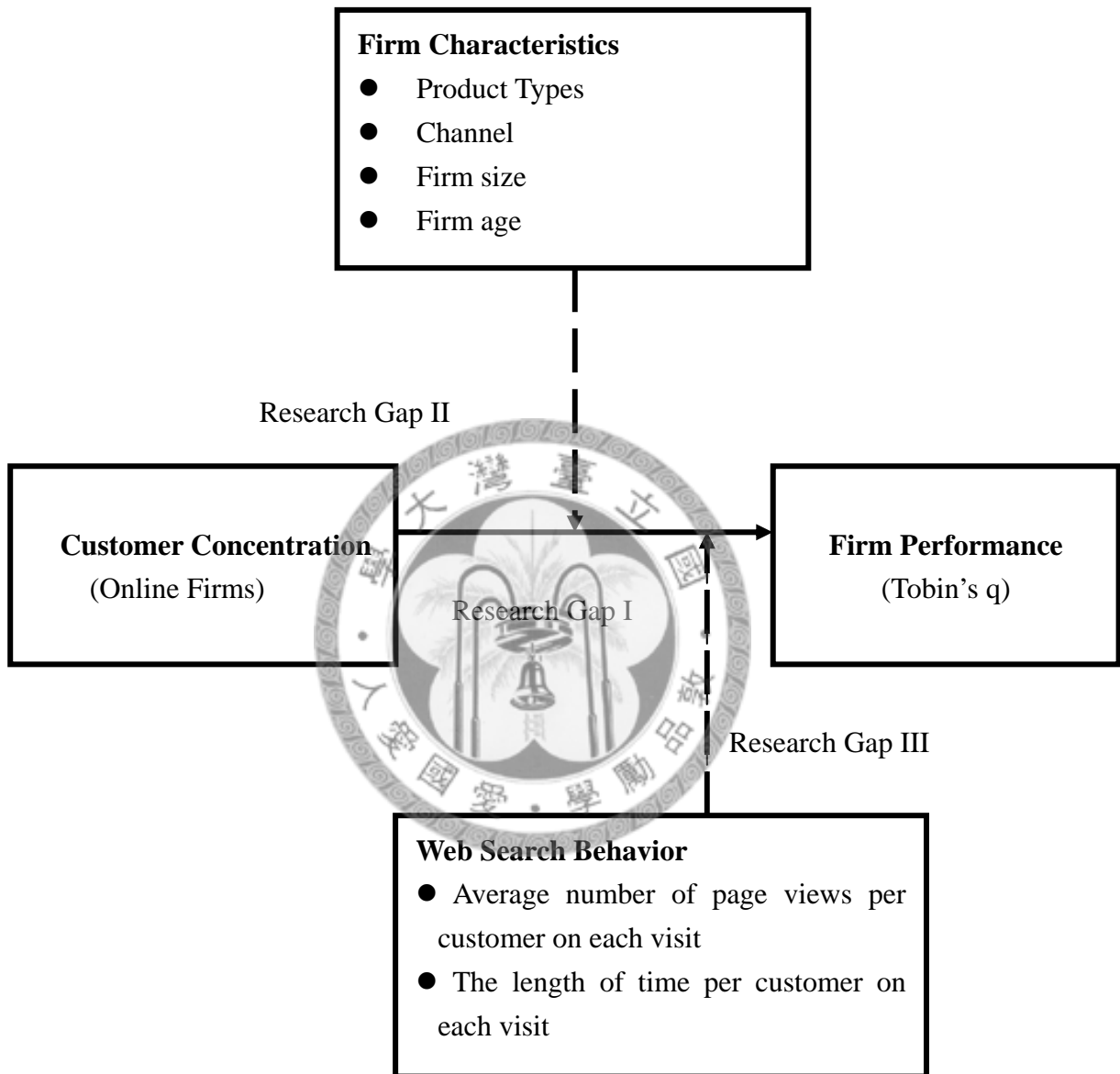
Traditional “brick and mortar” stores are already being supplemented by a



multitude of electronic storefronts populating the World Wide Web. No single brick-and-mortar store can offer 50,000 products, but an online store has the capability to offer a limitless number of them (Deitel 2001). E-commerce business has played a central role in the emerging digital New Economy. In the business model of E-commerce profitability is driven by revenue expansion rather than on cost reduction, since the model endeavors to build long-term customer relationships (Rust and Kannan 2003). For that reason four firm characteristics of online retailers are considered as moderators of the relationship of the CC rate to firm performance: product types, channel, firm size, and firm age. 1) Product Types: this paper considers three product types: durable goods, non-durable goods as tangible products, non-durable goods as intangible products (services) (Kotler 2003); 2) Channel: online-retailers with existing off-line experience have an advantage over pure-play E-tailers owing to their existing market-based assets, which include branding and customer relationships that they can leverage in the internet market place and prior knowledge about the retailing domain (Mahajan et al. 2002). Two categories of retailers are considered: single channel and multi-channel (online and offline); 3) Firm size: is postulated to be an important factor that affects performance of firms. Firm size has been previously measured using revenues, sales, assets, and number of employees (Harrison et al. 1988). Ittner and Larcker (1998) suggested that one of the primary assumptions of customer satisfaction measurement is that higher satisfaction levels improve future financial performance by increasing revenues from existing customers (due to higher purchase quantities and lower price elasticity's) and

improving customer retention. Their analysis provides an early test of customer satisfaction measures' ability to predict future accounting performance. It is noted that revenue is an indicator of the firm's visibility, related to customer satisfaction and impact on its performance of the firm (Ittner and Larcker 1998). For these reasons, revenue was chosen as a variable for this study; and 4) Firm age: firm age is calculated from the incorporation of the firm (parent company). Also, the age of the E-tailing business was measured by calculating from 1<sup>st</sup> November 2009 minus the start date of online operations. Adopting firm characteristics of E-commerce business yields insights into the important implication of customer concentration to firm performance.





**Figure 1.1: Thesis's Conceptual Framework**

### ***Research Gap III***

#### ***Web Search Behavior***

The ability of Web sites to track the behavior of their visitors has been considered one of the most promising facets of the new medium (Bucklin and Sismeiro 2003). A key measure of website activities is page views, which is the number of distinct pages viewed by a Web user over the duration of a single visit to a domain (Bhat et al. 2002). Two variables of search behavior serve as moderators: the average number of page views per customer on each visit and the length of time (minutes) per customer on each visit. Some research focuses on search behavior on an individual level; however, the research indicated that search behavior on the individual level contributed to implications on the firm level (Johnson et al. 2004). Search behavior is a variable which identifies dynamic development of firm's customer database. This might help firms identify their marketing strategy in the E-commerce market. Therefore, this thesis explores search behavior based on firm-level analysis.

These two factors can assess site characteristics and performance in various ways based on the relationship of customer concentration and firm performance. Demers and Lev (2001) illustrated that page views and duration related to website "stickiness" which refers to site's ability to retain a surfer at their site once a customer has arrived

there. Also, web site “stickiness” is a desirable quality since a "sticky" site may be able to generate higher advertising rates from advertisers who believe that visitors are more likely to spend sufficient time at the site to view the advertisements. Demers and Lev (2001)’s study showed that stickiness is positively associated with market values of Internet stocks.



### **1.3) Expected Contribution**

The online-business world is increasingly organizing itself around customers rather than products. This is an inevitable reaction to a series of traditional trends. Customer focus requires a new approach such as the truth of CC strategy. In marketing, customer concentration degree can influence customer relationship management, customer value, customer loyalty, brand equity, and other marketing strategies of a firm. The flexibility of the Internet allows an online firm to execute customer concentration in a way lead all its other marketing efforts.

Based on prior academic marketing literature, the major premise is that the 80/20 rule of CC in online business positively impacts an online firm's performance. This research uses three main variables: Research Gap I: the relationship between CC degree on firm performance; Research Gap II: the moderators of firm characteristics have been proposed; and Research Gap III: the firm moderator based on customer indicators, which is search behavior to assess how customer concentration impacts firm performance. Research Gap II and III are a major differences between the proposed model and previous CC studies.

The main contributions of the study are expected to be of both theoretical and

practical significance. Theoretically, the study aims to provide an understanding of the role of CC in relationship to customer purchases and the impact on firm performance in the domain of World Wide Web businesses. Moreover, the moderators such as firm characteristics (product types, channel, firm size, and firm age) and search behavior (average number of page viewed per customer per visit and the length of time per customer on each visit) underlying the relationship between CC degree and firm performance are explored. The practical benefits are expected to be guidelines to marketing managers which will include that they should have a strong interest in learning about the degree of customer concentration when they develop a marketing strategy. In addition, the findings will have the ability to help various types of E-commerce businesses to identify their target customers. Consequently, this study can be useful for boosting e-commerce strategy. For example, based on the customer database and the financial database, the company can decide suitable total marketing costs involved in the most profitable online customer group; resulting in greater firm profitability compared to competitors. Managers can target major customers by tracking costs and revenues of this group; therefore, enhancing the financial value of companies.

## Chapter 2-Literature Review

Overall, this thesis adds to the literature in several significant ways. First, this thesis identified several previous unexplored gaps in the literature. Second, this thesis extends several perspectives on E-commerce business, firm strategy on consumer behavior phenomenon. To this point, most existing academic study has drawn on only one perspective.

This thesis first introduces the customer concentration literature. Next, this thesis adds the firm characteristics and search behavior to explain the relationship between customer concentration and firm performance. Lastly, a financial performance index is introduced as the dependent variable. The key components of previous research related to CC are presented in Table2.1.





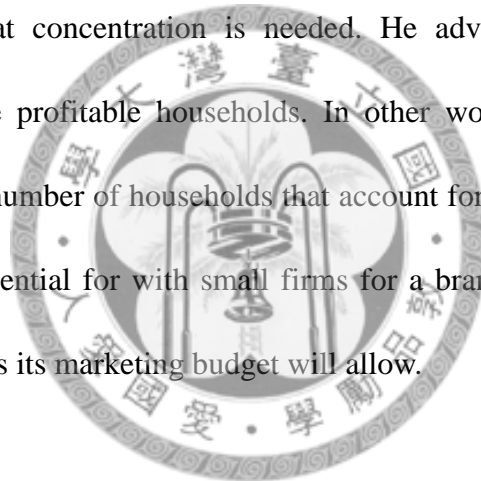
**Table 2.1: Previous Literature on Customer Concentration**

Studies	Year	Highlights of Key Results
Lilien	1979	The size of marketing budgets decreased as customer concentration increased.
Lilien	1983	The level of expenditures in trade fairs was greater for a product early in its life cycle when sales are high, when the company has an aggressive plan, and when customer concentration was low.
Kerin and Cron	1987	Customer concentration as company influence affects trade show performance.
Birley and Westhead	1990	Small firm growth related to competitor strength and customer concentration. When concentration is high so is customers' bargaining power. Low concentration implies a lack of power by customers but a start-up with a limited sales force may have difficulty establishing close contact with its customer base. This leaves it vulnerable to late entering competition from established firms.
Schmittlein et.al.	1993	Modeling approach for estimating the true level of relevant concentration among customers.
Bucklin et.al.	1995	Within informational services, customer concentration plays the strongest role. Where customers were few, channel structures that move information directly are present.
Balakrishnan et.al.	1996	Customer concentration and cost structure factors are likely to influence a firm's decision to adopt JIT.
Anschultz	1997	Brand success requires to less and more profitable households.
Mulhern	1999	Providing measuring customer profitability and the measures of the degree of concentration of profits among customers.
Li and Calantone	1998	High customer concentration implies a larger risk to firms in losing such important customers, providing a greater incentive to understand and monitor their satisfaction.
Zeithaml et.al.	2001	Empirical studies have supported rule of thumb, long-term studies of bank patrons' account behavior and perceptions of service quality that top 20 percent produced 82 percent of the bank's retail profits.
Raaij	2005	Customer profitability analysis (CPA)--individual and aggregate level-- can help improve strategic marketing planning.
Morgan et.al.	2005	Customer concentration positively affects firms' CS data scanning.
Pitta et.al.	2006	Explore the costs and benefits of online customer loyalty.
Patatoukas	2009	Customer concentration and future stock returns are negatively associated that cannot be reconciled with the pricing of risk in efficient market.

A primary customer concentration concept by Lilien (1979) posited that an understanding of marketing mix decisions is very important for marketing industrial products. Lilien (1979) presents models for advertising expenditures, marketing expenditures, marketing, budget allocations, year-to-year changes in advertising spending and for selection of distribution channels. The level of marketing expenditures and the split of marketing into advertising and sales are shown to be affected by a few, general product and market characteristics of which, product sales and the number of customers are key. A change in advertising spending is related to changes in market share, changes in product plans and changes in the number of competitors are modified by the number of customers, their concentration and the size of the advertising budget. This research showed a common occurrence for marketing; the size of marketing budgets decreased as customer concentration increased, which is not necessarily advantageous for firm performance. Kerin and Cron (1987) illustrated the concept that CC of a company affects performance, especially at trade shows. The paper suggests that marketing executives should rely only cautiously on collective industry wisdom and macro-characteristics of an industry to drive trade show participation and budgeting decisions. Later, Birley and Westhead (1990) studied small firm growth related to competitor strength and customer concentration. Their study was based on Porter's (1980) five groups whose actions may limit a firm's profitability. The groups are defined as competitors, customers, suppliers, potential competitors, and suppliers of substitute products. When concentration is high so is

customers' bargaining power. Low concentration implies a lack of power by customers, but a start-up with a limited sales force may have difficulty establishing close contact with its customer base. This leaves the company vulnerable to late entering competition from established firms.

According to the relationship between CC and brand loyalty, Anschuetz (1997a; 1997b) suggested that the 80-20 rule that describes buyer concentration is a predictable feature of consumer behavior for established brands. His research countered the idea that concentration is needed. He advised that brand success requires less and more profitable households. In other words, instead of focusing narrowly on the small number of households that account for the greatest profitability per household, it is essential for with small firms for a brand to become as popular among category users as its marketing budget will allow.



Customer concentration focus based on customer purchasing behavior was started by the research of (Schmittlein et al. 1993), the research proposed a modeling approach for estimating the true level of relevant concentration among customers by adopting the Negative Binomial Distribution (NBD) model which is used to predict a variety of market statistics such as distribution of purchase frequencies across households, the average number of purchases per buyer. The research focused on the concept that 20 percent of the customers account for 80 percent of the purchases. His result determined that markets can be segmented in various ways. Then, Bucklin et al.

(1996) illustrated that within informational services, customer concentration plays the strongest role. Where customers were few, channel structures that move information directly are present. They measure CC as 50% customer fragmentation, which is measured as the percent of a business's end-users that account for 50% of total purchases of its products. Next, Mulhern (1999) developed the concept of measuring customer profitability and the measures of the degree of concentration of profits among customers. Li and Calantone (1998) demonstrated that high CC implies a larger risk to firms in losing such important customers, providing a greater incentive to understand and monitor their satisfaction. Then, Raaij et al. (2003) studied customer profitability analysis (CPA) and concluded that—the individual and aggregate level can help improve strategic marketing planning. Recently, Dennis et al. (2006) illustrated a strategic framework by integrating theoretical works in consumer loyalty and online business which was period during 1993 to 2006. Their result provides information and action approaches to consumer marketers that may increase the success of providing want satisfying market offerings.

As the relationship between CC and firm performance, previous research illustrated that customer concentration has a significant impact on performance. Balakrishnan et al. (1996) investigated firm-specific characteristics (Firm's customer concentration degree and cost structure factors) affect a firm's ROA and are likely to influence a firm's decision to adopt just in time (JIT). Their results showed that the higher level of a firm's CC, the less powerful it is in negotiating prices and other

contractual arrangements with its customers. Thus, firms with greater CC are less likely to retain financial gains from JIT adoption. Zeithaml et al. (2001) presented empirical studies that have supported the rule of thumb, long-term studies of bank patrons' account behavior and perceptions of service quality showed that the top 20 percent produced 82 percent of the bank's retail profits. Morgan and Rego (2006) illustrated how CC positively affects firms' CS data scanning. Recently, Patatoukas (2009) provided contradictory evidence that CC and future stock returns are negatively associated and cannot be reconciled with the pricing of risk in an efficient market. This study will further clarify the impact of CC on performance.



## 2.1) Context of Concentration

Marketing theorists have recognized differences among consumers in their firm value. Some of the literature deals with heavy versus light users of products and services and notes that heavy users are valuable not only for their contribution to volume and revenue but also for their positive effects on profit. Most firms are aware at some level that their customers differ in profitability, and recognize the “80/20 rule” – 20 percent of customers produce 80 percent of sales or profit for the company (Schmittlein et al. 1993). Zeithaml et al.(2001) developed a “customer pyramid” using a four tier system—Platinum, Gold, Iron, Lead—which categorized customers based on different expected levels of profit. Platinum and Gold customers are valued while Iron and Lead tiers are less attractive (Dennis et al. 2006). The authors postulated that highly profitable customers can and should be pampered appropriately, customers of average profitability can be cultivated to yield superior profitability, and unprofitable customers can be either made more profitable or weeded out. Therefore, an understanding of the degree of customer concentration can help an online retailer more effectively allocate company resources across customers and better target high-potential customers. Koch and Rasche (1988) introduced four steps to lock on core customers: 1) Knowing and recognizing who the profitable customers are; 2) Providing special services to the 20% of customers; 3) Developing new products or services for them; 4) Being devoted to keep core customers. Therefore, firms can

control the major cost and get higher profitability.

### *2.1.1) Definition and Basic Concept*

The paper describes the two main basic concepts of customer concentration literature: 1) The 80/20 rule; 2) the Customer Pyramid

#### ***The 80/20 Rule***

As a marketing concept, firms place the customers at the center of all marketing action. All firms are aware at some level that their customers differ in profitability or the assessment of the distribution of profitability (Mulhern 1999; Schmittlein et al. 1993; Zeithaml et al. 2001). Therefore, most firms target the most valued customers. According to Schmittlein et al. (1993) much attention is placed on the concentration of profits among customers because 80/20 type laws mean that 20 percent of the customers account for 80 percent of the purchases or sales or profit. In addition, this 20 percent of the customers spend more and require less service and are less price sensitive (Schnaars 1998). Some authors developed the “80/20 Customer Pyramid” (Rust 2000). The 80/20 type laws are consistent with marketing theorists concepts that the organizational profits are mostly concentrated among a small set of customers (Day and Wensley 1983; Schultz and Schultz 1998). This rule implies a certain degree of concentration in customer purchases; i.e., the extent to which a large portion of the

product's total purchases are made by a small fraction of all customers. This situation may create several major concerns to prospective buyers. The small group of customers can turn the business from unprofitable to profitable. Therefore, the information on the concentration or distribution of profits could be adopted for the firm's decisions of targeting marketing strategy toward the most valued customers (Mulhern 1999).

### ***Customer Pyramid***

A Customer Pyramid is desirable whenever the company has customers who differ in profitability; however, the company is delivering the same levels of service to all customers. In these situations, limited firm resources are stretched across a wide group of customers, probably undeserving its best customers.

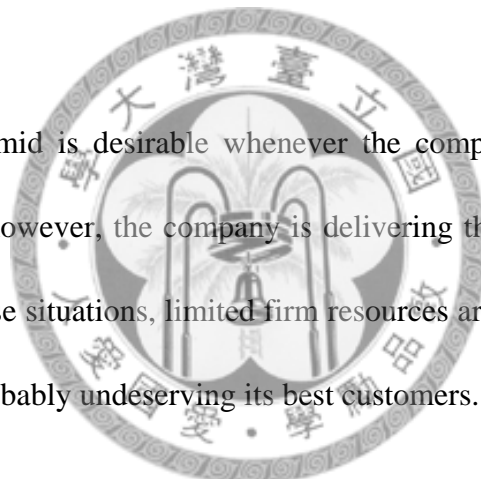
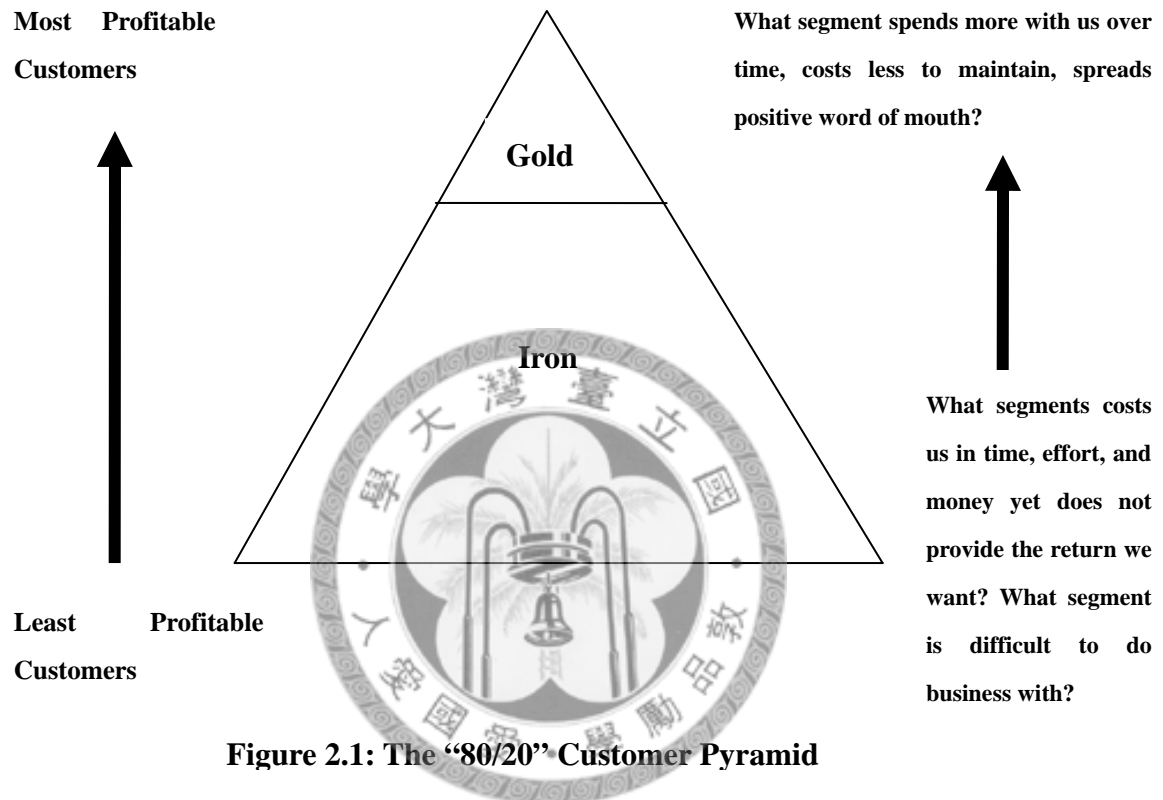


Figure 2.1 reflects the size of the Gold Tier as 20% of customers who can be identified as the most profitable in the company. The rest are the Iron Tier, undistinguishable from each other but different from the Gold Tier in profitability (Rust 2000). While, Zeithaml et al. (2001) illustrated Customer Pyramid in four tiers: Platinum, Gold, Iron, and Lead. The *Platinum tier* describes the company's most profitable customers; who are often heavy users that are not overly price sensitive. The platinum tier is loyal and customers are more willing to try new products or



services. Gold customers are heavy users who are not particularly loyal and may seek discounts.



The two less attractive tiers, Iron and Lead represent much lower profit potential than others. Iron tier customers are valuable because they utilize capacity, however the low profitability and lack of loyalty do not justify special treatment. Lead tier customers generate losses.

Online firms can apply the “Customer Pyramid” to their marketing strategy. That is on the Platinum tier, online firms should provide high value, high margin products

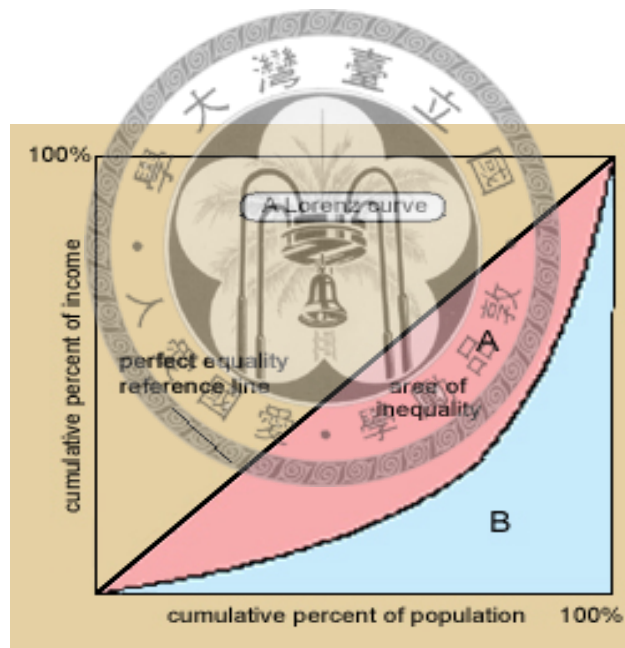
and services. For example, the Dell computer company sells its systems online. The very best customers of Dell should get a complete satisfaction guarantee. Lead tier customers should get a guarantee with fewer features (Dennis et al. 2006)

### 2.1.2) *Customer Concentration Measurement*

Customer concentration measurement is the evaluation of the how profitability varies across customers. Assessing the distribution of profitability is extremely important because it reveals the extent to which an organization depends on a small set of customers for its profits. Information on the distribution or concentration of profits can also be used for target marketing decisions. While much attention is placed on the concentration of profits among customers (the so-called 80/20 rule), previous marketing literature has addressed the measurement and meaning of such profit concentration. Schmittlein et al. (1993) provides a statistical basis for evaluating purchase concentration with the negative binomial model. Mulhern (1999) presented an empirical analysis that deals strictly with purchase volumes, not profitability. This thesis demonstrates four measurements of customer concentration: 1) The Lorenz Curve; 2) Gini coefficient; 3) Schultz coefficient; and 4) the method of Schmittlein et al. (1993)

## *The Lorenz Curve*

A Lorenz curve in economics is often used to illustrate the extent that income or wealth is distributed unequally in a particular society (Sen 1977). It presents the degree of inequality that exists in the distribution of two variables. The area enclosed within the diagonal and the Lorenz curve (area A) represents the actual amount (per cent) of distributional inequality. The maximum amount of inequality that could possibly exist is the total area below the diagonal (area A + area B) as Figure 2.2.

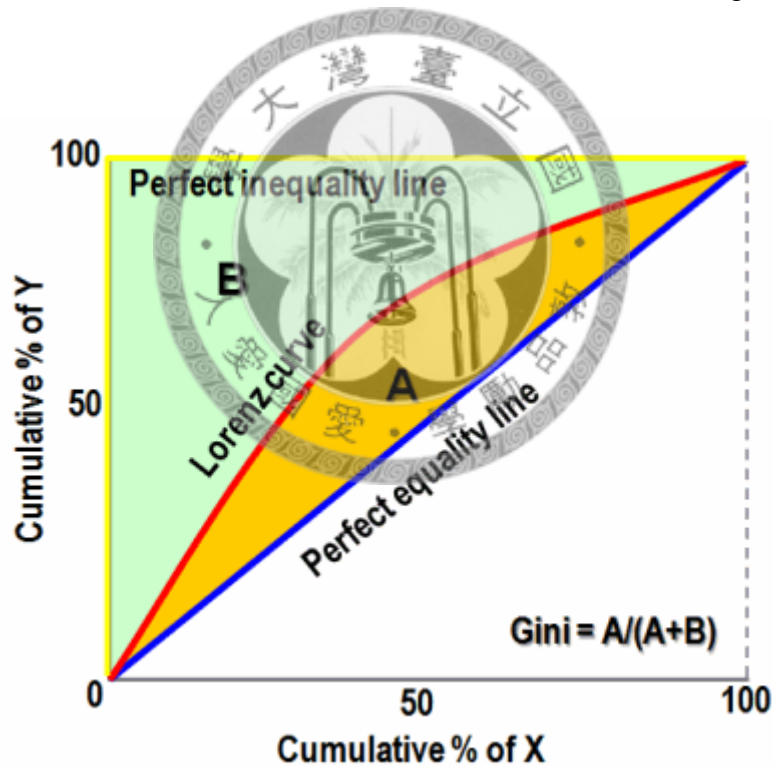


**Figure 2.2: Ordinary Lorenz Curve**

Schmittlein et al. (1993) explained the Lorenz curve with CC. If the customers are sorted from those making the fewest purchases to those making the most, and the cumulative number of purchases plotted, the Lorenz curve  $L(p)$  is the proportion of total volume (total purchases) accounted for by those households in the  $p^{\text{th}}$  percentile

or less. If the Lorenz curve had been a 45 degree straight line, then every household would have purchased exactly the same amount. This Lorenz curve line implies no concentration of purchasing; that is everyone purchases the same amount.

A weakness of using the Lorenz curve for profitability analysis is that it cannot portray those customers who represent a financial loss to a firm, because a loss would cause the bow to drop below the horizontal axis. To solve this problem an “Inverted Lorenz Curve” is used (Schmittlein et al. 1993; Storbacka 1997) as Figure 2.3.



**Figure 2.3: Inverted Lorenz Curve**

The lower bound eliminates the possibility that a portion of the customer base constitutes more than 100% of the profit. Also, the inverted Lorenz curve is more

amenable for marketing purposes, since marketers are often concerned with the segment that produces the highest profit margins (Mulhern 1999).

### ***Gini Coefficient***

In addition this study will use the modified Gini coefficient which can be calculated using the area between the curve and the 45-degree line divided by the area under the diagonal (Storbacka 1997). The modified Gini coefficient is based on the differences in profit of all pairs of customers compared to the over overall mean or extreme values that decide other disparity measures (Mulhern 1999). The modified Gini coefficient for a Lorenz curve is defined as:



where  $A$  is the area above the diagonal and  $B$  is the area below the diagonal line. For the inverted Lorenz curve, the modified Gini coefficient, similar to the Schultz coefficient, has a minimum of zero but no upward bound.

### ***Schultz coefficient (S)***

Schutz (1951)'s coefficient was originally designed to measure inequality:

$$\bar{s} = \sum_{P_i \geq \bar{P}} (\bar{p}_i / \bar{P} - 1)$$

The original Schutz (1951) formulation is based on deviation of the Lorenz curve from the line of perfect equality. Cowell (1977) defined the Schultz coefficient as a measure of the longest vertical distance between the 45-degree line and the Lorenz curve. The value of the Schultz coefficient, as measured in the units of the vertical axis, is between 0 and 100. The Schultz coefficient can exceed 1.0 in the inverted Lorenz curve. Mulhern (1999) illustrated that the higher Schultz coefficients present the greater concentration of customer profit.

***The measurement of Truth in concentration***

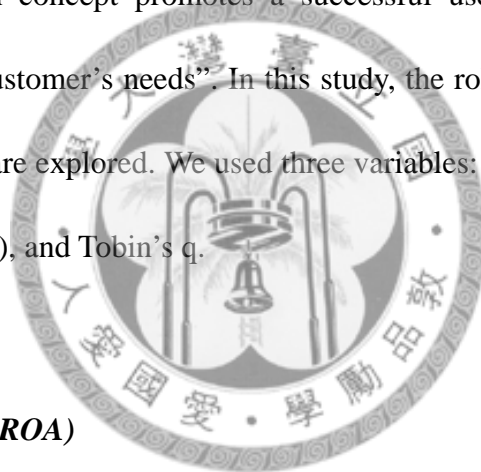
A measure of disparity (concentration) of customer purchases is proposed by Schmittlein et al. (1993), named NUNBD (Non-User Negative Binomial Distribution) framework. They show that if purchasing rates are distributed gamma across the population of customers, one parameter of the gamma distribution,  $r$ , can act as an inverse measure of purchase concentration. Mathematically,  $1/r$  is the squared coefficient of variation in purchase rates across customers. NUNBD model is a useful parameters which are direct measures of concentration and penetration regarding 80/20 laws, it contributed to concentration and penetration strategy, both get more customers and get more business from existing customers. This is important

dimensions for marketing decisions. However, it is not as easily computed or communicated as the more geometric-based measures described above (Schmittlein et al., 1993).



## 2.2) Financial Performance Index

The key to a competitive strategy is the use of Customer Relationship Management (CRM) that focuses on customer value, satisfaction, retention, and loyalty. These strategic thrusts are the basic to generate a profitable revenue stream which is component of a firm's financial performance (Javalgi et al. 2005) which is related to profitability, sales, return on investment, and shareholder value. The customer concentration concept promotes a successful use of CRM strategy that “fulfillment of target customer's needs”. In this study, the roles of financial measures for E-commerce firms are explored. We used three variables: Return on Assets (ROA), Return on Equity (ROE), and Tobin's q.



### ***Return on total assets (ROA)***

Return on Assets is defined as the ratio of net profits after taxes divide by total assets. ROA shows the percentage of profit that a company earns in relation to its overall resources. Previous studies illustrated customer relationship management effects on ROA (Han et al. 1998; Reinartz et al. 2004).



### ***Return on equity (ROE)***

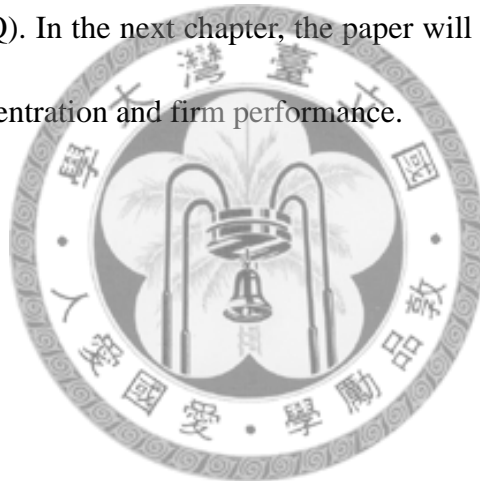
Return on Equity is defined as net profits after taxes divided by stockholders' equity (common equity). A firm's return-on-equity (ROE), which is affected by how much the firm is able to keep as profits for each dollar of sales the firm makes, and how many sales dollars the firm is able to generate for each dollar of its assets the firm has (Palepu et al. 2004).

### ***Tobin's $q$ ( $Q$ )***

Tobin's  $q$  is defined as the market value of equity at the end of year plus the book value of liabilities divided by the book value of total assets (Tobin 1969). A firm that creates a market value that is greater than the replacement cost of its assets is perceived as using its resources more effectively and thus as creating increased shareholder value (Anderson et al. 2004; Lewellen; and Badrinath 1997). A firm that does not create incremental value has a Tobin's  $q$  equal to 1. The use of Tobin's  $q$  for capturing intangible value is based on the assumption that the long-run equilibrium market value of a firm must be equal to the replacement value of its assets, thus ensuring a  $q$  of one. Instances where  $q$  is greater than one signify an unmeasured source of value; which contributes to a firm's long-run competitive advantage and, hence, long-run value (Kotha et al. 2001). In marketing, Tobin's  $q$  has been applied in measuring the value of brand equity (Simon and Sullivan 1993). Recently, Anderson

et al. (2004) found a positive association between customer satisfaction and shareholder value after controlling for fixed, random, and unobservable factors. They measure shareholder value by using Tobin's q. Tobin's q is used at the firm level to measure performance.

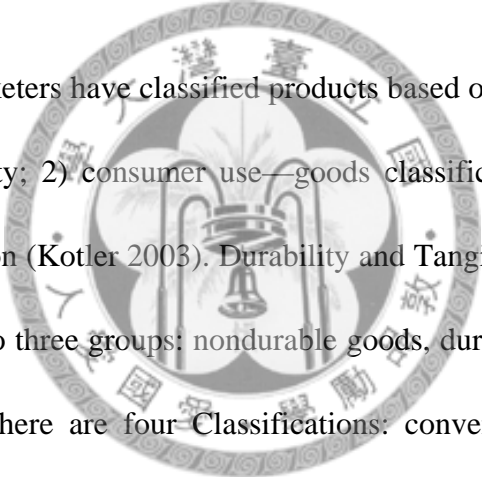
Overall, these three measures provide indicators of the most important aspects of a firm's short-term and long-term performance, using historical accounting financial performance data (e.g. ROA and ROE) and more forward-looking financial market analysis (e.g., Tobin's Q). In the next chapter, the paper will illustrate the relationship between customer concentration and firm performance.



## 2.3) Firm Characteristics

The four firm characteristics of online retailers as moderator of the relationship of CC rate to financial performance considered in this paper are: product types, channel, firm size, and firm age.

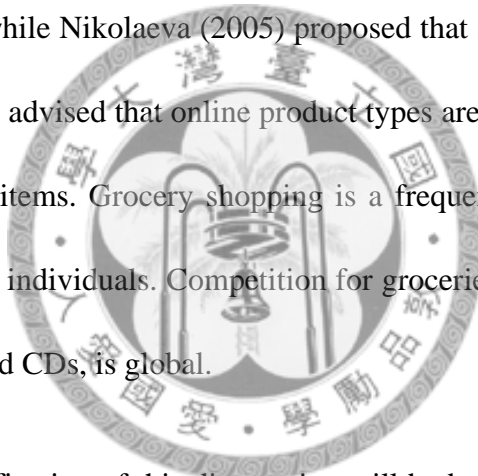
### 2.3.1) *Product Type*



Traditionally, marketers have classified products based on three characteristics: 1) durability and tangibility; 2) consumer use—goods classification; and 3) industrial use—goods classification (Kotler 2003). Durability and Tangibility Classification: the product is classified into three groups: nondurable goods, durable goods and services. For Consumer-Goods there are four Classifications: convenience goods, shopping goods, specialty goods, and unsought goods. There are three classifications for Industrial-Goods in terms of how they enter the production process and their relative costliness: materials and parts, capital items, and supplies and business services.

Nelson (1970a) provided a model whereby goods were classified by whether the quality variation was ascertained predominantly by search or by experience (labeled “search goods” and “experience goods”). Features of a search good can be evaluated from externally provided information, while experience goods need to be personally

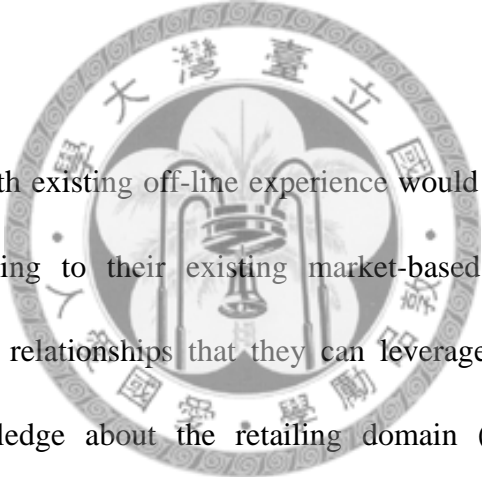
inspected (Peterson et al., 1997). Many researchers presented the experience versus search good classification in the marketing literature (Bloom; and Pailin 1995; Ford et al. 1990; Franke et al. 2004; Wright and Lynch 1995). The recent study of Huang et al. (2009) discussed the concept that search and experience goods classification provides important insights into consumer behavior in online environments, since the fundamental differences in the type of information consumers seek for these two types of products has not changed (Nelson 1970b). De Figueiredo (2000) classified books, CDs, and videos as quasi-commodity group of products based on consumers' ability to judge their quality; while Nikolaeva (2005) proposed that software be added to this group. Chu et al. (2008) advised that online product types are categorized into grocery items and non-grocery items. Grocery shopping is a frequent and repetitive activity and can be a burden for individuals. Competition for groceries tends to be local while non-groceries, books and CDs, is global.



The product classification of this dissertation will be based on the durability and tangibility classification (Kotler, 2003). This thesis considers three product types: 1) durable goods; 2) non-durable goods as tangible products; and 3) non-durable goods as intangible products (services). Durable goods are goods that normally do not quickly wear out and can survive many uses such as automobiles, electronic equipment, and home furnishings and are expensive relative to most consumers' incomes (Bruce et al. 2006). Nondurable goods are tangible goods that are used up when used once or after a few uses, or that have a lifespan of less than 3 years. These

goods are consumed quickly and purchased frequently such as cosmetics, personal products and the like. Services are intangible, inseparable, variable, and perishable products (Kotler, 2003). To parallel with this classification system, products and services are categorized along three dimensions that are more relevant in the context of the internet: cost and frequency of purchase, value proposition, and degree of differentiation (Peterson et al. 1997a).

### 2.3.2) *Channel*



Online-retailers with existing off-line experience would have an advantage over pure-play E-tailers owing to their existing market-based assets, which include branding and customer relationships that they can leverage in the internet market place and prior knowledge about the retailing domain (Mahajan et al. 2002). Multichannel online retailers can benefit from cross-channel promotional activities; they can present incentives for their customers to shop on-line (Nikolaeva 2005). Srinivasan and Moorman (2005b) considered the effects of two key strategic commitments of online retailers on the performance effect of CRM: their brick-and-mortar experience and their online entry timing. However, firms with multiple channels; brick and mortar firms that engage in E-tailing may fall to channel conflict. Channel conflicts can occur when the choice means of reaching customers (e.g. a Web-based store) competes with the existing channel brick and mortar

(Balasubramanian 1998; Stern and EI-Ansary 1992). This study investigates channel variables on single (online) and multi-channels which include offline and online.

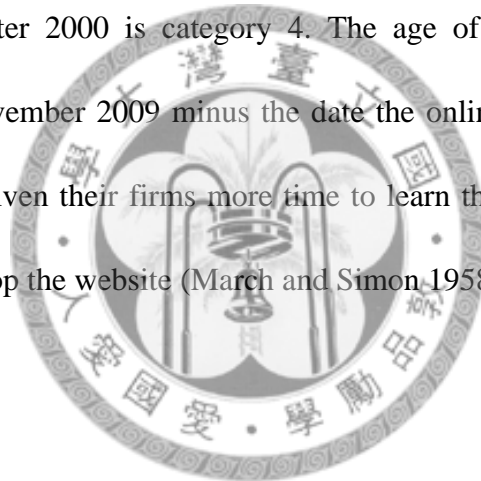
### 2.3.3) *Firm size*

Firm size is postulated to be one important factor that affects analyst of firms. On the demand side, small firms typically have more to gain from an Internet channel addition than large firms do (Alba et al. 1997). The smaller the firm, the more it can benefit from the geographic market expansion and brand-switching opportunities offered by the addition of an Internet channel. Though large firms may not have such a significant increase in demand, large firms may be better able to command a higher price and or margin (Geyskens et al. 2002). Firm size has been previously measured using revenues, sales, assets, and number of employees. Revenue is the indicator of the firm's visibility, impact on its environment, and resource utilization, as well as a measure of the complexity and stability of the firm (Harrison et al. 1988). For these reasons, revenue was chosen. This variable is equal to one if a firm's average revenue more than \$US 3 billion and zero otherwise.

### 2.3.4) *Firm Age*

Like firm size, firm age has been posited to have a strong impact on resources and performance (Aldrich and Auster 1986). Previous research discussed the impact

of firm's age and strategic orientation on its performance depending on the firm's order of entry (Durand and Coeurderoy 2001). Mitchell (1994) showed that as firms age, firms develop commercially viable routines and become more sophisticated in their operation. In this paper firm age relates to the age of the parent firm and the age of the online division. Age of the parent firm is calculated since the date that firm was established. This study considers firm from the year that Parent Company/ Publicly-held Company began the business. The study uses four age intervals for firms: prior to 1970 is category one; 1970 to 1990 is category two; 1990 to 2000 is category three; and after 2000 is category 4. The age of the online operation is calculated from 1<sup>st</sup> November 2009 minus the date the online website started. Older websites would have given their firms more time to learn through the trial and error process and later develop the website (March and Simon 1958).



## 2.4) Web Searching Behavior

The ability of Web sites to track the behavior of their visitors has been considered one of the most promising facets of the new medium (Bucklin and Sismeiro 2003). The existing literature on Web site modeling can be classified into studies that analyze within-site behavior (e.g., which pages to visit, how long to stay, whether or not to make an online purchase) and studies that analyze across-site behavior (e.g., which sites to visit). Bucklin and Sismeiro (2003) presented a modeling approach to explain the basic aspects of within-site browsing behavior at the individual level. Therefore search behavior in this study based on within-site behavior data of each website which is a proxy of analysis of website characteristics at firm level. In this study, two variables of search behavior are used as moderators: average number of page views per customer on each visit and the length of time (minutes) per customer on each visit.

### 2.4.1) *Average number of page views on each site visit*

A key measure of website activities is page views, which is the number of distinct pages served to a Web user over the duration of his or her visit to a domain (Bhat et al. 2002). Huberman et al. (1998) propose a “law of surfing.” In their model, the distribution of the number of pages requested by users could be accurately predicted by simple assumptions of surfing behavior.



2.4.2) *The length of time (minutes) per customer on each visit*

Demers and Lev (2001) demonstrated that two variables (average number of page views on each site visit and the length of time [minutes] per customer on each visit) related to website “stickiness” which refers to site’s ability to retain a surfer at their site once a customer has arrived. Web site “stickiness” is a desirable quality since a "sticky" site may be able to generate higher advertising rates from advertisers who believe that visitors are more likely to spend sufficient time at the site to view the ads. Demers and Lev (2001)’s study showed that stickiness is positively associated with market values of Internet stocks.



## Chapter 3: Relationship of Customer

### Concentration (CC) and Firm Performance

The 80/20 rule states that there is an inbuilt imbalance between causes and results, inputs and outputs. In this study, we applied the 80/20 to CC. Customer concentration has two major issues that marketing researchers need to consider. Firstly, a small group of profitable customers can generate 80% of revenue for firms. In this case, CC is used in business to boost profits; therefore, a firm needs to invest firm's resources (time, money, employees) on those customers that generate profits (on top customers since the loyalty of this group of customers can enhance performance. Secondly, the 20% of customers can determine whether a business is profitable. Restrictions on CC may be good for large company but, in general, are considered harmful to new firms. It has yet to be proven that CC can be used in the area of a firm's financial improvement. Also, should the positive relationship between customer concentration and firm performance be under some conditions? This dissertation explores this relationship for E-commerce firms.

### **3.1) Hypothesis Development**

#### *3.1.1) Customer Concentration (CC) and Firm Performance*

Benjamin and Wigand (1995) argue that E-commerce most likely leads to more intense competition because it gives the possibility of head-to-head comparisons at low or zero cost, and E-Commerce provides more shopping options for the consumer. For this reason, firms need to allocate resources efficiently to focus on profitable target customer group(s). For example, Federal Express Corporation has revolutionized its marketing philosophy by categorizing its business customers internally as the good, the bad, and the ugly--based on their profitability (Zeithaml et al. 2001). Also, Amazon.com offered "the Eyes" program, which is a personal notification service in which customers can register their interests in a particular topic or author on Amazon's website. Once customers register they are notified (by e-mail) each time a book by their favorite author, or about their favorite topic, or interest is published (Kotha 1998). This strategy is likely to result in future sales for the firm (Rajgopal et al. 2000). Providing different service to customers depending on their profitability is becoming an effective and profitable marketing strategy for other firms such as FedEx, U.S. West, First Union, Hallmark, GE Capital, Bank of America, and The Limited (Zeithaml et al. 2001). These firms have discovered that they need not serve all customers equally well--many customers are too costly to do business with and have little potential to become profitable, even in the long term. Especially when

one considers the high level of competition in the E-commerce market, it is expected that higher CC will result in higher firm performance.

*Hypothesis I: When engaging in the e-commerce market, online firms with a higher customer concentration focus will be able to gain higher revenues than firms with a lower customer concentration focus.*

### 3.1.2) *Moderating Effects of Firm Characteristics and Web Searching Behavior*

Research has found that online shoppers expect a greater selection of products from online retailers versus brick-and-mortar establishments (Cognitavive 1999; Lohse and Spiller 1998). Successful Internet marketing depends on the product and service types being marketed (Peterson et al. 1997b). Product type affects consumer attitude to shopping online (Bhatnagar et al. 2000; Liao and Cheung 2001; Peterson et al. 1997b). Many diverse vendors, determined by the type of product, from florists to manufacturers of durable goods, as well as service providers such as airlines and hotels that have rushed to do business on the Internet (Bhatnagar and Ghose 2004). Kotler (2003) used product characteristics as a basis for classifying products into three categories: durability, tangibility and use goods.

Durable goods are defined as goods whose product life is longer than the time horizon over which the retailer makes price changes. Durable goods are complex and expensive products, for which consumers are expected to engage more often in public

interactions when making a purchase. Day and Landon (1977) suggest that when considering a purchase of a durable good, "the chances that the consumer will do nothing at all or take only private actions are lower but still appear to be substantial". While, for most nondurable goods, demand is independent over time, i.e., current sales do not have a negative impact on future sales (Elmaghraby and Keskinocak 2003). For non-durable goods (tangible and the service industry), the consumer segments are based on usage, situation, and frequency of use. Several E-commerce firms main offerings are non-durable goods; for example, Expedia and Travelocity (airline tickets and other travel products), Shopper.com and Yahoo Shopping (electronics), and Amazon (books and music). Consumers have been reported to shop on Amazon to take advantage of its superior user interface and product information, and subsequently purchase at lower-priced at Buy.com (Bank 1999). Degeratu et al. (2000) find that price sensitivity is lower for on-line grocery shoppers than for shoppers in conventional supermarkets. Lynch and Ariely (1998) find that providing more product information to customers leads to improved product fit and reduced price sensitivity.

Non-durable goods are a core Internet product categories and the foundational products of on-line pioneers that attracted most online diversified consumer interest. Specifically, Liang and Huang (1998) concluded that not all products and services are suitable for marketing electronically. They suggested that books and flowers are more likely to be ordered by consumers than shoes, toothpaste, and microwave ovens. This

is primarily due to the difference in their perceived transaction costs. The electronic commerce lowers the search cost but raises the examination, payment, and post-service costs. Later, Poon and Swatman (1999) presented product and service type classification system that will significantly influence the consumer choice between a retail store and the Internet shopping mall. Their result indicated that the products and services that have a low outlay, are frequently purchased, have intangible or service related goods (i.e. those based on digital assets) value proposition, and are relatively high on differentiation are more likely to be purchased via the Internet. In parallel, online transactions for services through being involved in the inseparability of production and consumption enable consumers to derive immediate satisfaction. The service industry, such as hotels, can get profit from various specific customer segments (Awh 1998; Yelkur and Herbig 1997). On the contrary, consumer satisfaction from goods purchased online is subject to a prolonged delay and difficult for consumers to predict the quality of goods (Liu and Wei 2003). Recently, Vijayarathy (2002) showed that consumer intentions to shop online for intangible products were higher than their intentions to shop for tangible products.

*Hypothesis II: E-commerce firms selling non-durable goods (tangible products), will weaken the impact of customer concentration on firm performance than E-commerce firms selling services.*

What makes e-commerce a significant departure from “brick and mortar” exchange is the sequencing of events that take place during the completion of a transaction (Kollock 1999). Previous research has investigated how purchase behavior differs between online stores and traditional supermarkets (Danaher et al. 2003; Degeratu et al. 2000; Fox et al. 2004). An increasing number of businesses are choosing the Web as an alternative channel for developing a brand reputation, for transacting with and servicing customers and investors, or simply for public relations purposes (Subramaniam; et al. 2000). Recent research in the online environment has also emphasized satisfaction as fundamental to establishing customer loyalty. Danaher et al. (2003), based on study of large number of product categories, reported that brand loyalty is substantially higher in online stores than in brick-and-mortar stores. In an empirical study using both online and offline contexts, Shankar et al. (2003) found that overall satisfaction enhanced loyalty and that the positive relationship between satisfaction and loyalty is in fact stronger online than offline. Recently, Kim et al. (2004) suggested that two broad types of Internet businesses exist: pure online firm (pure plays) and firms with both online and offline businesses (clicks-and-bricks). During the earlier stages of e-business, pure plays would be in a stronger competitive position since it would be more flexible and better able to leverage their first mover advantages (Kim et al. 2004). Netscape provides a good example of a pure online firm that was able to seize a dominant share of the browser market by ignoring conventional rules (Yoffie and Cusumano 1999). Dell is another company that gained significant advantages by pursuing an online strategy. While, clicks-and-bricks firms

face various problem issues, including cannibalization of higher margin sales, channel conflict, high costs of implementation, and customer retention, emerge and continue to frustrate marketers (Denise and Geoffrey 2002). Supporting, challenges of multichannel integration include heavy investments in unconvincing multichannel strategies and technologies that result in a poor return on investment (ROI) and problems in bringing together and standardizing data about customers or resulting from interaction with them (Stone et al. 2002). A survey of 50 retailers in the USA revealed that 48 per cent had learned nothing about their cross-channel customers and the biggest problem they faced was their inability to recognize known customers across all touch-points (Forrester 2001). For example, Barnes & Noble's decision to spin-off Barnesandnoble.com as a separate organization is now viewed as a mistake. It prevented the online store from capitalizing on the many advantages provided by Barnes & Noble's network of physical stores (Porter 2001). Similarly, visitors to the Web site of Angus and Robertson, an upscale Australian book retailer, are likely to be confused by the low prices emphasized by the company's online store, since this theme is inconsistent with the up market positioning of the company's physical stores (Merrilees 2001).

*Hypothesis III: Click and mortar firms will weaken impact of customer concentration on firm performance than strictly online firms.*

(Notice: Click and mortar refers to firms with brick and mortar and online sales.)



In E-commerce research, characteristics such as firm size are considered important in influencing a customer's trust towards a firm (Doney and Cannon 1997). Firm size refers to the firm's overall size (e.g., financial resources) and its market share position. Large size and market share indicate that the firm has a large number of customers and has followed through with commitments made to its customers. A small online firm is defined as one that is run under the direct supervision of the owner; a large firm is not directly controlled by the owner. Small businesses often face difficulties and hardship because of the lack of resources (financial, personnel, skills, etc.) and their fragility in the formative stage (Poon and Swatman 1999). Arnott and Susan (2002) revealed that small firms are using significantly fewer Internet tools of any type than their larger counterparts which may be explicable by resource arguments or by the relative cost risk to smaller firms. Unlike much larger E-commerce firms, SMEs taking up E-commerce have very little choice of strategy. Feindt et al (2002) indicated that small online firm must start out in a niche market, with some means of differentiating themselves from their competition. A survey conducted found that 36% of small businesses established web sites primarily to advertise and promote their business, compared to 9% who established one to sell or market online (CyberAtlas 2001). Likewise, Pratt (2002)'s survey of 444 SMEs found that many SMEs were reluctant to conduct transactions on line; more than 80% were only using the Internet to communicate (via e-mail) and gather business information. Poon and Swatman (1999) also postulate that small businesses are not reaping

significant short-term benefits from Internet commerce. Small firms rarely are equipped for such a fundamental long-term planning process (Shrader et al. 1989).

*Hypothesis IV: Small E-commerce firms will weaken impact from customer concentration on firm performance than large online firms.*

Firm age has often been posited to have a strong impact on resources and performance (Aldrich and Auster 1986). As firms age, they develop commercially viable routines and become more sophisticated in their operations (Mitchell 1994). Srinivasan and Moorman (2005a) considered the effects of two key strategic commitments of online retailers on the performance effect of CRM: their brick-and-mortar experience and their online entry timing. Their findings indicate that firms with moderate online experience are better able to leverage CRM into superior customer satisfaction outcomes than firms with either low or high online experience. Early online movers also have the opportunity to learn through the trial and error process and develop the website further (March and Simon 1958). In addition, Carpenter and Nakamoto (1989) illustrate the idea that consumers have stronger preferences for the first brand they try. Consumers are more familiar with the design, navigation, and checkout process of the sites they visit initially. This allows the formulation of a firm age hypothesis:

*Hypothesis V: E-commerce firms with more experience in e-tailing will have stronger impact from customer concentration on firm performance than firms with less experience E-commerce firms.*

Esmeralda (2002) identified the trait that dotcom survivors had significantly higher levels of asset productivity and unique visitors--such as page views, stickiness, click-through rate, and conversion rate. A previous study has offered a set of website dimensions which are ease of use and website content, that are most likely to have a significant impact on website satisfaction (Wolfenbarger and Gilly 2003). The underlying rationale for the significant impact of these two dimensions (ease of use and website content) on satisfaction is that if a website is easy to navigate or proposed relevant content, the user can easily view more pages. Enormous potential exists in studying an individual's behavior as visitors navigate from page to page. Hoffman and Novak (1996) proposed a concept of flow in describing the general customer experience online. Mandel and Johnson (2002) showed that preferences, and hence purchasing decisions, are often constructed online while navigating through the store. Therefore, the content of the pages viewed can be very important both in determining the type of shopper involved and in predicting purchases. Demers and Lev (2001) illustrated that these two variables related to website "stickiness" which refers to site's ability to retain a surfer at their site once a customer has arrived there. Also, web site "stickiness" is a desirable quality since a "sticky" site may be able to generate higher advertising rates from advertisers who believe that visitors are more likely to spend

sufficient time at the site to view the ads. Contrary to Patatoukas (2009), Demers and Lev (2001)'s study showed that stickiness is positively associated with market values of Internet stocks. Also, Esmeralda (2002) found that the number of unique visitors of online firm is significantly correlated with measures of market value and growth.

*Hypothesis VI: E-commerce firms with higher page views per customer on each visit, will have stronger impact of customer concentration on firm performance than firms with a lower page views per customer on each visit*

Bucklin and Sismeiro (2000) developed a model of page views in terms of the number of pages viewed and the duration of each page view. Their results proposed that visitors with time constraints are either more efficient or more focused in their product searches and learn more quickly across site visits. Users who spend less time per session the more they visit the site (Lohse et al. 2000). The online visitors who make more frequent store visits are more likely to purchase in any given visit. Nevertheless, online visitors at an increasingly frequent rate also have higher conversion rates (purchasing propensity) than those online visitors who are showing a slowdown in their visit frequencies (Moe and Fader, 2001). Johnson (2003) indicated that cumulative duration of visits is most common loyalty metric of Web sites. Later, Sismeiro and Bucklin (2004) suggest that the more time and effort that visitors invest in the site, the more likely they are to eventually buy at the site (as evidenced by the positive effect of total time spent and the user's input effort on interactive pages). In

parallel, the longer web surfers stay on a website, the higher is the probability of a purchase or use behavior (Dreze and Zufryden 1998). For instance, eBay is a highly successful website, listed on the New York Times top ten stickiest sites because visitors spend approximately 90 minutes a month (Johnson, 2003). Although longer duration presented the propensity to purchase of online visitors, shorter duration implied the loyalty of online customers on website.

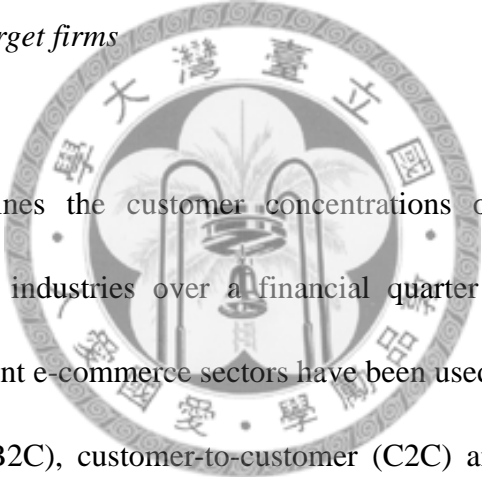
*Hypothesis VII: E-commerce firms with longer duration per customer, per visit will weaken impact of customer concentration on firm performance than firms with shorter duration per customer per visit.*

In this section the author has developed hypotheses of the relationship between customer concentration and firm performance. Each of the hypotheses will be empirically tested in the next chapter.

## 3.2) Research Methodology

The sample of this study was collected from secondary sources and public company records. The selected databases currently fit the requirement of this study's need. Two databases, consumer behavior and financial, were integrated and input to a unique file. This section describes the criteria for target firms, the data collection methods and then introduces the measurements which were employed in this study.

### 3.2.1) Target firms



This thesis examines the customer concentrations of fifty-two online US companies in different industries over a financial quarter from January 2006 to December 2007. Different e-commerce sectors have been used to conduct the research: business-to-customer (B2C), customer-to-customer (C2C) and business to business E-Commerce businesses as shown in Table 3.1 (in Appendix A). E-commerce is defined as “maintaining business relationships and selling information, services, and commodities by means of computer telecommunications networks” (Electronic Commerce, 2008). B2C e-commerce focuses mainly on commercial activities and transactions between businesses and consumers such as amazon.com (Melian-Alzola; and Padron-Robaina 2007). Consumer-to-consumer e-commerce presents transactions between or among consumers mediated by third parties such as eBay.com.

B2B must consider their companies' distributors, resellers, retailers and partners (Tangpong et al. 2009).

Publicly traded companies must make their financial data available to everyone; therefore, US online companies have been selected. The condition is that the online enterprise must be a publicly held company or a subsidiary of a publicly held company. Target firms were identified on two stock exchanges: 1) NASDAQ (National Association of Securities Dealers Automated Quotations) is the largest electronic screen-based equity securities trading market in the United States; 2) NYSE (New York Stock Exchange) is the largest stock exchange in the world by United States dollar value of listed companies' securities. In addition, the companies must have a transaction history of trading online with customers; sites which are intended to provide information, but are not selling a product or service will not be considered. Extra sources are incorporated into the data analysis, such as HOOVERS, Yahoo finance website to double check the reliability and found more data.

### 3.2.2) *Data Collection*

To examine the relationship of customer concentration rates and financial performance in different industries, a panel data set was assembled using data from two databases-- that are comScore web behavior database and COMPUSTAT financial database. Through a research alliance with the Wharton Research Data Services

(WRDS), this hosted data service has become the locus for quantitative data research and provides access Compustat and comScore database.

The 52 US online companies included in comScore database were selected as the sampling frame for various reasons. First, the comScore database provides accurate and reliable insights into consumers' online behavior both purchasers and non-purchasers<sup>1</sup>. Comscore Media Metrix (CMM) randomly recruits a representative sample of personal computer (PC) users and tracks these users' usage at home (Coffey 1999). These users agree to install a computer program (or PC meter) that runs in the background and monitors computer usage. Second, comScore offers disaggregated datasets including machine identifier; demographic data (most education—head of household), census region, household size, oldest age—head of household, household income, children present, racial background, connection speed, country of origin, zip code); transaction data (product name, product category, product quantity, product total price and total shopping basket); and session information (Identifies a session of activity, domain ID, referring domain name, pages viewed, duration at site, date of activity, time of activity). Lastly, five independent variables were chosen from comScore database which may influence business performance; 1) CC rate of buyers; 2) average number of pages view; 3) duration of pages viewed;4 ) firm size (less than or equal to 10,000 employees and more than 10,000 employees); and firm age (parent

---

<sup>1</sup> The comScore Web Behavior Database captures detailed browsing and buying behavior at domain level by 100,000 internet users across the United States (Wharton Research Data Services website, 2009).



company age and website age).

Since the COMPUSTAT database is for listed public company data and some company websites are not publicly traded subsidiaries; weighted independent variables by sales of subsidiary companies were converted into independent variables of the parent company. The total sample size includes 52 publicly traded firms which operate 57 websites as shown in *Table 3.2*. Most firms in the sample (23 firms) have a December 31 fiscal year end. Others of fiscal year end have 31 January, 28 February, 31 May, 31 July and 31 August. The financial data is separated quarterly based on the fiscal year end of each company during a two year period; noting that related to available comScore data is just 1 January 2006 to 31 December 2007. For example, Macy's Inc. has fiscal year end on January 2006, the first quarter is February to May 2006, the 2<sup>nd</sup> quarter is June to August 2006, the 3<sup>rd</sup> quarter is September to November 2006, the 4<sup>th</sup> quarter is December to February 2007, the 5<sup>th</sup> quarter is March to May 2007; the 6<sup>th</sup> quarter is June to August 2007, and the 7<sup>th</sup> quarter is September to November 2007.

**Table 3.2: All samples based on websites**

Categories of Data	Number of Websites	Number of data being used for calculation (Time)
Number of Websites with 8 quarters	23	184
Number of Websites with 7 quarters	24	168
Number of Websites using Annual Data	1	2
Number of Websites with Weight Method	9	30
Total	57	384

Later, the data were coded by employing a corresponding identifying code (TIC) of the fifty two companies of the samples listed and searching in COMPUSTAT database. Financial data was during the period of January 2006 to December 2007, including net incomes, sales, total assets, total liability, shareholders equity, price close and market value from the COMPUSTAT North America database<sup>2</sup> The data is arranged quarterly as described above during this two year period (then, the data will be compared to comScore data and COMPUSTAT data based on the quarterly analysis model). The data is constructed using three dependent variables, which are return on assets (ROA), return on equity (ROE), and Tobin's q.

<sup>2</sup> a database of U.S. and Canadian fundamental and market information on more than 24,000 active and inactive publicly held companies.

Missing financial data was obtained from company websites and stock data was obtained from yahoo.com; any samples where there was missing data were omitted. Information on number of employees is collected from electronic annual reports/quarterly filing report of each company's website during period from January 2006 to December 2007. Each firm needs to provide a complete data for the period of study. The matching data of customer database on comScore and financial database on COMPUSTAT demonstrate the relationship between CC rate and financial performance by quarter in each company in different industries which this result is valuable information for marketing decisions. All data is quarter-end. The final data was arranged into a balanced panel structure, the sample consists of 52 companies totaling 384 observations.

### 3.2.3) *Measurement*

The Bayesian approach is concerned in the probability of hypotheses being true or false and the orderly revision of judgment about the truth value of these hypotheses as new information accumulates. The drawback of traditional statistics, such regression, was the avoidance of attaching probabilities to the hypotheses. The Bayesian inference has added to traditional inference of the concepts of: (a) Making wrong decisions' costs; (b) the concern on the truth value of "hypotheses" in probability terms (Green and Frank 1966). Allengy and Rossi (2008) argue that asymptotic distribution theory provides extremely poor approximations to the

posterior, a hierarchical discrete choice model for panel data is virtually impossible to conduct inference on without Bayesian methods. Rossi and Allenby (2003) explained that the Bayesian framework provides an integrated approach to modeling, incorporation of prior information, and inference. Inference points to making a posteriori statements about all unobservables including both parameters and, as yet unrealized, data (prediction). Bayesian inference adheres to the likelihood principle and is conducted using formal rules of probability theory. Rossi and Allenby (2003) illustrated that Bayesian methods provide a better approximation to the level of uncertainty or, in opposition, the amount of information provided by the model and the data than other approaches. For instance, consider two-step procedures in which a subset of parameters are estimated in the first stage, then the second stage estimates the remaining parameters, conditional on the first subset. Hierarchical Bayes Estimation offers a very powerful way for “borrowing” information from every respondent in the data set to improve the accuracy and stability of each individual’s part-worths. It has consistently proven successful improving the predictive validity of both individual-level models and market simulation share results (Orme and Howell 2009). Lenk and DeSarbo (2000) provide an example of how a full Bayesian procedure outperforms an approximate two-step procedure for clustering problems.

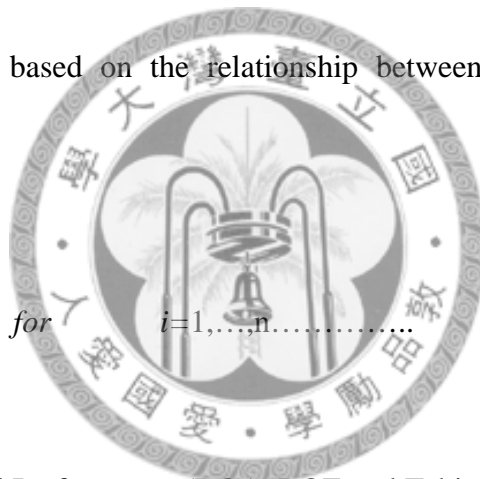
The model is estimated in a Hierarchical Bayes (HB) framework. Hill (1965) originally presented the Bayesian analysis of random effects models. Howard (1965) has described a Bayesian-type approach—dubbed “dynamic inference”—as a means

for describing certain types of customer brand switching Lindley and Smith. (1972) and Smith (1973) describe the HB analysis of linear models. Berger (1985) provides a review of HB models and their analysis. Recent applications of HB models to marketing include new product diffusion (Lenk and Rao 1990), coupon redemptions (Lenk 1992), and brand choice (Allenby and Lenk 1994; Allenby and Lenk 1995).

### 3.2.4) Statistical Model

Each online firm based on the relationship between CC rate and financial performance model

$$Y_i = X_i B_i + \varepsilon_i \text{ for } i=1, \dots, n \dots \dots \dots \quad (3.1)$$



$Y_i$  = Financial Performance (ROA, ROE and Tobin' s q) of each firm,  $m$  is quarter data where  $(m_i \times 1)$  vector;

$X_i$  = Customer concentration 20%, where  $(m_i \times 2)$  vector;

$\beta_i$  = Regression coefficients, where  $(2 \times 1)$  vector;

$\varepsilon_i$  = Error term, This  $(m_i \times 1)$  vector, where follow multivariate normal distribution  $N_{m_i \times 1}(\varepsilon_i / 0, \sigma^2 I_{m_i})$ . This variable captures all other factors which influence the dependent variable  $Y_i$  other than the regressors  $X_i$ .

The second level of calculation is aggregate level, the model is shown below

$$\beta_i = \Theta' z_i + \delta_i \quad (3.2)$$

$\beta_i$  = The vector which is regression coefficient of the first level ( $2 \times 1$ ) vector;

$z_i' = [1, Z_{1i}, Z_{2i}, Z_{3i}, Z_{4i}, Z_{5i}, Z_{6i}, Z_{7i}, Z_{8i}, Z_{9i}, Z_{10i}]$ ,  $Z_{1i}$  is channel,  $Z_{2i}$  is product type,

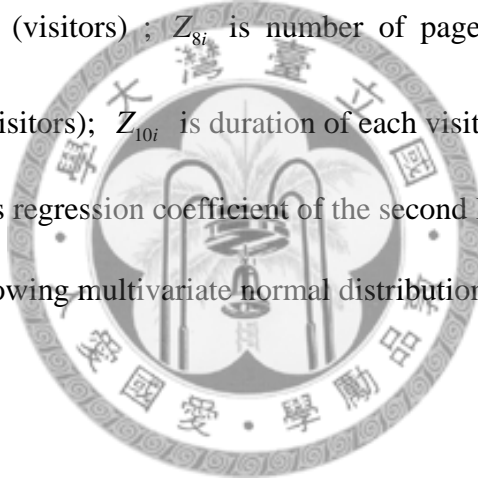
$Z_{3i}$  is firm size,  $Z_{4i}$  is firm age,  $Z_{5i}$  is firm type,  $Z_{6i}$  is firm online dates (days);  $Z_{7i}$  is

number of page views (visitors);  $Z_{8i}$  is number of page views (buyers);  $Z_{9i}$  is

duration of each visit (visitors);  $Z_{10i}$  is duration of each visit (buyers).

$\Theta$  = The vector which is regression coefficient of the second level ( $11 \times 2$ ) vector;

$\delta_i$  = ( $11 \times 2$ ) vector, following multivariate normal distribution  $N_{11 \times 2}(\delta_i / 0, \Lambda)$ .



Parameter Derivation:

Before doing posterior distribution of the Hierarchical Bayesian model (HB), the

likelihood function and prior distribution of parameters should be given first.

According formulation (3.1) and (3.2), likelihood function shown as follows;

$$\ell(\beta_i, \sigma^2 / Y_i, X_i) \propto \sigma^{-\frac{m_i}{2}} \exp \left[ -\frac{1}{2\sigma^2} (Y_i - X_i \beta_i)' (Y_i - X_i \beta_i) \right] \quad (3.4)$$

$$\ell(\Theta, \Lambda / B, Z) \propto |\Lambda|^{-\frac{1}{2}} \exp \left\{ -\frac{1}{2} \text{tr} \left[ \Lambda^{-1} (B - Z\Theta)' (B - Z\Theta) \right] \right\} \quad (3.5)$$

Prior distribution setting of each parameter is shown;

$$\sigma^2 \text{ of probability distribution is } \left[ \sigma^2 | r_0, s_0 \right] = IG \left( \sigma^2 \left| \frac{r_0}{2}, \frac{s_0}{2} \right. \right) \quad (3.6)$$

$$\Theta^* \text{ of probability distribution is } \left[ \Theta^* | u_0, v_0 \right] = N_{pq} \left( \Theta^* | u_0, v_0 \right) \quad (3.7)$$

$$\Lambda \text{ of probability distribution is } \left[ \Lambda | f_0, G_0^{-1} \right] = IW_n \left( \Lambda | f_0, G_0^{-1} \right) \quad (3.8)$$

Under the condition that all other parameters are given, posterior distribution of  $\beta_i$ ;

$$\begin{aligned} p(\beta_i | \text{Rest}) &\propto \ell(\beta_i, \sigma^2 | Y_i, X_i) \cdot f(\beta_i) \\ &= N_{m_i} \left( Y_i | X_i \beta_i, \sigma^2 I_{m_i} \right) N_p \left( \beta_i | \Theta' z_i, \Lambda \right) \\ &\propto \exp \left[ -\frac{1}{2} \cdot \frac{1}{\sigma^2} (Y_i - X_i \beta_i)' (Y_i - X_i \beta_i) \right] \cdot \exp \left[ -\frac{1}{2} (\beta_i - \Theta' z_i)' \Lambda^{-1} (\beta_i - \Theta' z_i) \right] \\ &\propto N(\beta_i | u_i, V_i) \\ V_i &= \left( \frac{1}{\sigma^2} X_i' X_i + \Lambda^{-1} \right)^{-1}; u_i = V_i \left( \frac{1}{\sigma^2} X_i' Y_i + \Lambda^{-1} \Theta' z_i \right) \end{aligned}$$

Under the condition that all other parameters are given, posterior distribution of  $\sigma^2$ ;

$$\begin{aligned} p(\sigma^2 | \text{Rest}) &\propto \prod_{i=1}^n \ell(\beta_i, \sigma^2 | Y_i, X_i) \cdot f(\sigma^2) \\ &= \prod_{i=1}^n N_{m_i} \left( Y_i | X_i \beta_i, \sigma^2 I_{m_i} \right) \cdot IG \left( \sigma^2 \left| \frac{r_0}{2}, \frac{s_0}{2} \right. \right) \\ &\propto \left\{ \prod_{i=1}^n \sigma^{-\frac{m_i}{2}} \exp \left[ -\frac{1}{2} \sigma^{-2} (Y_i - X_i \beta_i)' (Y_i - X_i \beta_i) \right] \right\} \cdot \left\{ (\sigma^2)^{-\left(\frac{r_0}{2}+1\right)} \exp \left( -\frac{s_0}{2\sigma^2} \right) \right\} \\ &\propto IG \left( \Lambda \left| \frac{r_n}{2}, \frac{s_n}{2} \right. \right) \\ r_n &= r_0 + \sum_{i=1}^n m_i; s_n = s_0 + \sum_{i=1}^n (Y_i - X_i \beta_i)' (Y_i - X_i \beta_i) \end{aligned}$$

Posterior distribution of  $\Theta$  ;

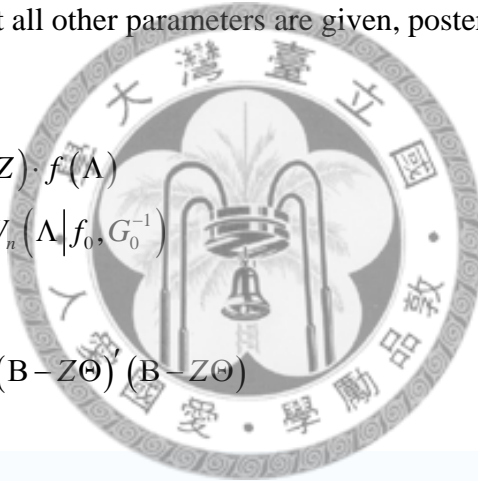
Under the condition that all other parameters are given, posterior distribution act of

$\Theta^* = \text{vec}(\Theta')$  as;

$$\begin{aligned} p(\Theta^* | \text{Rest}) &\propto \ell(\Theta^*, \Lambda | B, Z) \cdot f(\Theta^*) \\ &= N(B^* [Z \otimes I_n] \Theta^*, I_n \otimes \Lambda) \cdot N(\Theta^* | u_0, V_0), B^* = \text{vec}(B') \\ &\propto N(\Theta^* | u_n, v_n) \\ V_n &= [(Z'Z \otimes \Lambda^{-1}) + V_0^{-1}]^{-1}; u_n = V_n [(Z' \otimes \Lambda^{-1}) B^* + V_0^{-1} u_0] \end{aligned}$$

Under the condition that all other parameters are given, posterior distribution of  $\Lambda$  as;

$$\begin{aligned} p(\Lambda | \text{Rest}) &\propto \ell(\Theta, \Lambda | B, Z) \cdot f(\Lambda) \\ &= N_{n \times 3}(B | Z\Theta, I_n, \Lambda) \cdot IW_n(\Lambda | f_0, G_0^{-1}) \\ &\propto IW_n(\Lambda | f_n, G_n^{-1}) \\ f_n &= f_0 + n; G_n^{-1} = G_0^{-1} + (B - Z\Theta)'(B - Z\Theta) \end{aligned}$$

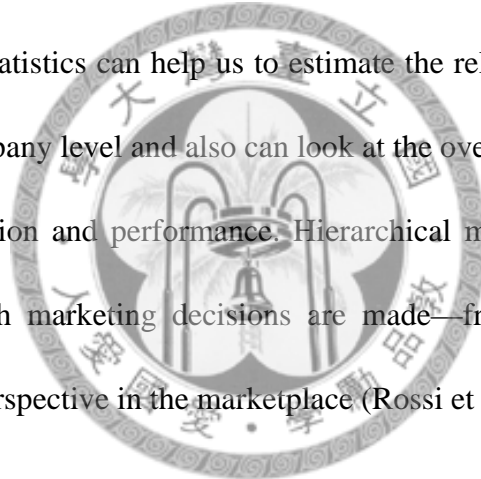


Why blue? This research used Gibbs Sampling (MCMC: Markov chain Monte Carlo algorithm) estimated model parameters  $(\beta_i, \sigma^2, \Theta, \Lambda)$ . Gibbs Sampling is a simulation tool for obtaining samples from a non-normalized joint density function. Ipso facto, such samples may be “marginalized,” providing samples from the marginal distribution associated with the joint density (Gelfand, 2000). Zeger and Karim (1991) used Gibbs sampling to analyze the posterior distributions of generalized linear models with random effects. Estimating the model with Monte Carlo methods such as



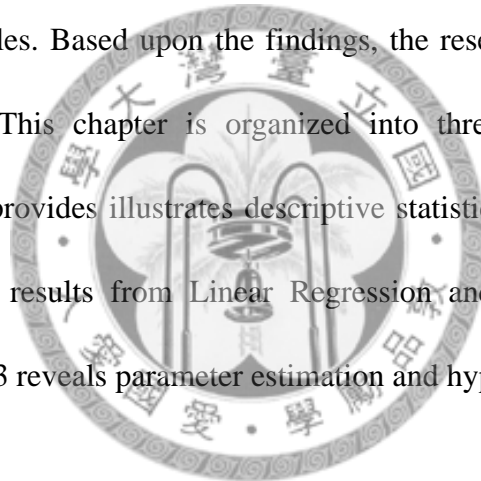
the Gibbs sampling leads to substantial advantages in understanding online firm strategy based on consumer purchasing, that is it yields estimates of all model parameters, including estimates of model parameters associated with specific firm.

In summary, the advantages of Bayesian statistics can be attributed to a number of factors in the research: the individual level data point is not sufficient enough to prove data. Bayesian hierarchical models offer tremendous flexibility for solving this problem. In addition, this data cannot prove everything together, if an aggregate model is used rather than an individual, it means we ignore heterogeneity among companies. Bayesian statistics can help us to estimate the relationship between  $x$  and  $y$  at the individual company level and also can look at the overall between relationship of customer concentration and performance. Hierarchical models match closely the various levels at which marketing decisions are made—from individual company level to all company perspective in the marketplace (Rossi et al. 2005).



## Chapter 4: Empirical Study Results

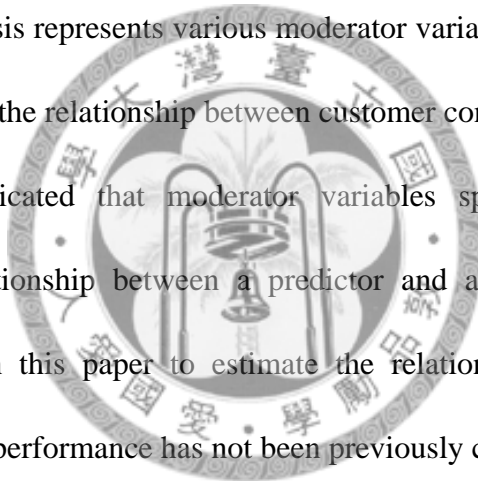
The preceding chapter illustrated the definition of all the variables in this study; customer concentration, the financial performance index, firm characteristics, and web search behavior. This chapter describes the empirical research and related findings. The focus of this research is to examine the impact of the degree of customer concentration on firm performance including investigating the moderating effects of the above noted variables. Based upon the findings, the research hypotheses will be accepted or rejected. This chapter is organized into three sections. Section 4.1 analyzes the data and provides descriptive statistics of the results. Section 4.2 presents empirical results from Linear Regression and Hierarchical Bayesian model (HB). Section 4.3 reveals parameter estimation and hypotheses testing results.



## 4.1) Descriptive statistics

This section aims to quantitatively summarize a data set which proposed overall view of the data being analyzed. Table 4.1 summarizes the empirical measures of the relationship between customer concentration and firm performance used in the study. These measures were used to test the seven research hypotheses. Fifty-two publicly-traded online US companies, in different industries, over quarterly of a fiscal year from 1<sup>st</sup> January 2006 to 31<sup>st</sup> December 2007 are used in this study. Table 4.1 indicated two groups of factors for HB analysis. Firstly, X and Y are individual level (first level) analysis in which X represents customer concentration 20%. The customer concentration was measured quarterly across all buyers of the firms during a two year period between 2006 and 2007. Y represents financial performance (Tobin's q) which was measured quarterly during the period of analysis. Secondly, Z is the aggregate level (second level) of analysis. This level is represented by two variables: firm characteristics and web search behavior. The first firm characteristics variable represents channel, dummy variable coded 1 if the firm is multi-channel and 0 if not. The second variable represents website's product type (Z2), dummy variable coded 1 if the firm non-durable goods (tangible) and 0 if not. The third variable represents firm size (Z3) which is measured by firm's revenue, dummy variable coded 1 if the firm's revenue more than \$US 3 Billion and 0 if not. The fourth variable represents parent company's age which is measured from the time the company started operations, coded 1 if the firm began operations before 1970, and coded 2 if the firm

began operations between 1970 and 1990, and is coded 3 if the firm began operations after 1990. The last firm characteristics variable represents firm online dates (days) which is measure by counting first of November 2009 minus the date of the website started. Then, the first web search behavior variable represents average number of page views of visitors (Z6). The second web search behavior variable represents average number of page views of buyers (Z7). The third web search behavior variable represents the duration of each visit of visitors (Z8). The last web search behavior variable represents the duration of each visit of buyers (Z9). The prominent feature of the variables in this thesis represents various moderator variables which modify either form and/or strength of the relationship between customer concentration and Tobin's q. Rosenberg (1968) indicated that moderator variables specify the form and/or magnitude of the relationship between a predictor and a criterion variable. The variables researched in this paper to estimate the relationship between customer concentration and firm performance has not been previously considered.

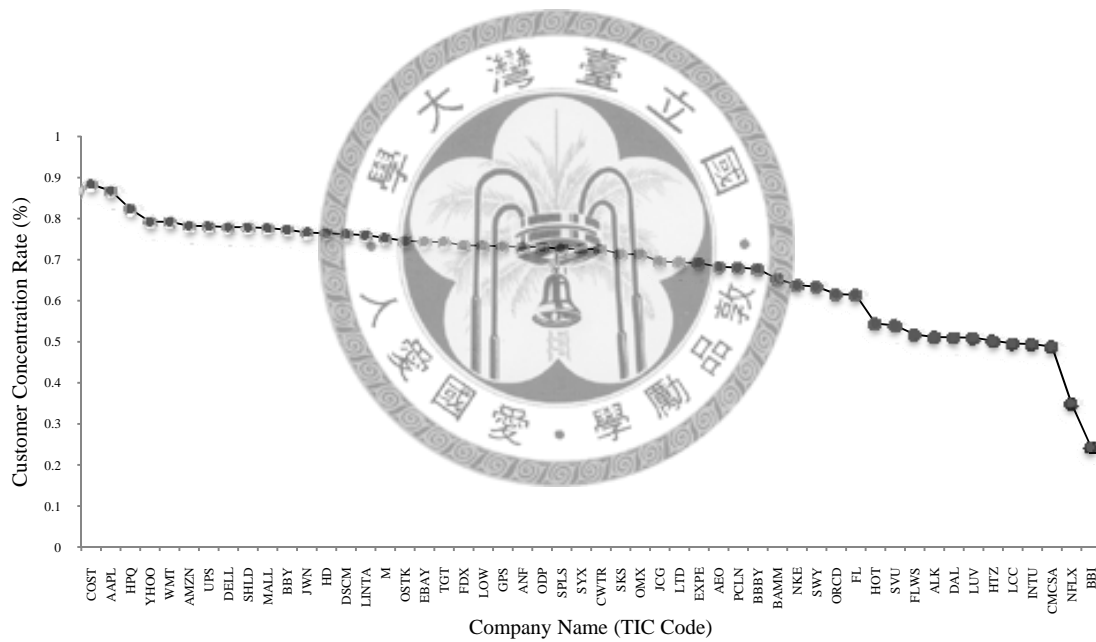


**Table 4.1: Description of Variables**

Variables	Variable Name	Definition
<i>Individual Level</i>		
X	Customer Concentration 20%	The Degree of Customer Concentration
Y	Tobin's q	Financial Performance
<i>Aggregate Level</i>		
Z1	Channel	Single Channel Multi Channel (online retailer with existing offline experience)
Z2	Web site 's Product Type	Durable Goods Non-Durable Goods (Tangible) Non-Durable Goods (Intangible)= Service
Z3	Firm Size (Revenue)	< and = \$US 3 Billion > \$US 3 Billion
Z4	Parent Company's Age (Years)	Before 1970 Exactly Year since Parent Company start the business From 1970 to 1990 After 1990
Z5	Firm Online Dates (Days)	Based on 1 Nov 09
Z6	Page Views (Visitor)	Number of Pages Viewed by visitors (Average)---(Pages)
Z7	Page Views (Buyers)	Number of Pages Viewed by buyers (Average)---(Pages)
Z8	Duration (Visitors)	Duration Time of visitors (Average)---(Minutes)
Z9	Duration (Buyers)	Duration Time of buyers (Average)---(Minutes)

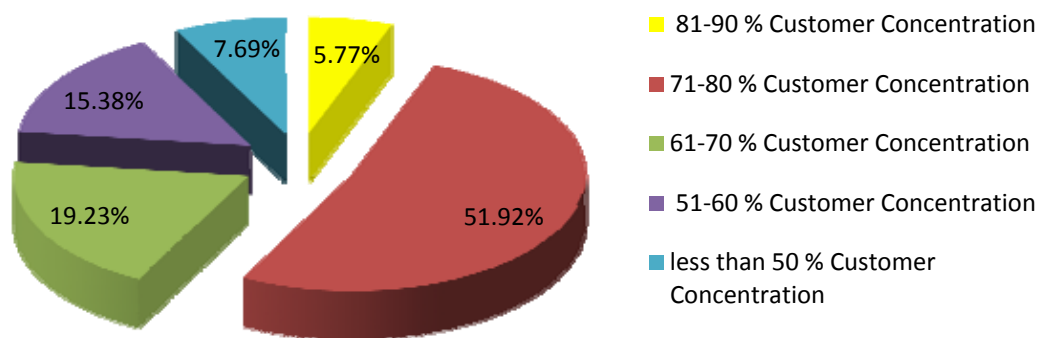
This dissertation illustrates the descriptive data by drawing figures for each of the eleven variables which extends from Table 4.1. Figure 4.1 represents average customer concentration rates of each firm in the sample. Figure 4.2 presents the percentage of companies (%) of varied customer concentration which is based on top

20% customers' monetary value. Figure 4.3 represents average Tobin's q of each firm in the sample. Figure 4.4 shows the percentage of companies (%) of varied Tobin's q. Figure 4.5 represents the percentage of companies of firm characteristics which show channel, website's product type, firm size, and parent company's age. Figure 4.6 shows the year the company started an online business. Figure 4.7 illustrates the percentage of companies of firm type in the sample. Figure 4.8 depicts the average page views of each company per visit for visitors and buyers. Figure 4.9 represents average duration of each company per visit for visitors and buyers.



**Figure 4.1: Average customer concentration rates of each firm in sample**

Figure 4.1 illustrated average of customer concentration rate of each firm, which the average customer concentration rate is approximately 75/25. Therefore, this study still adopt 80/20 laws in this analysis based on a customer concentration rate at 20%.



**Figure 4.2: The Percentage of Companies (%) of Varied Customer Concentration (based on top 20% customers' monetary value)**

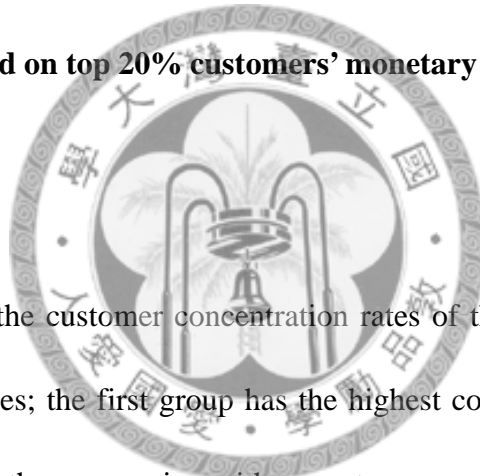
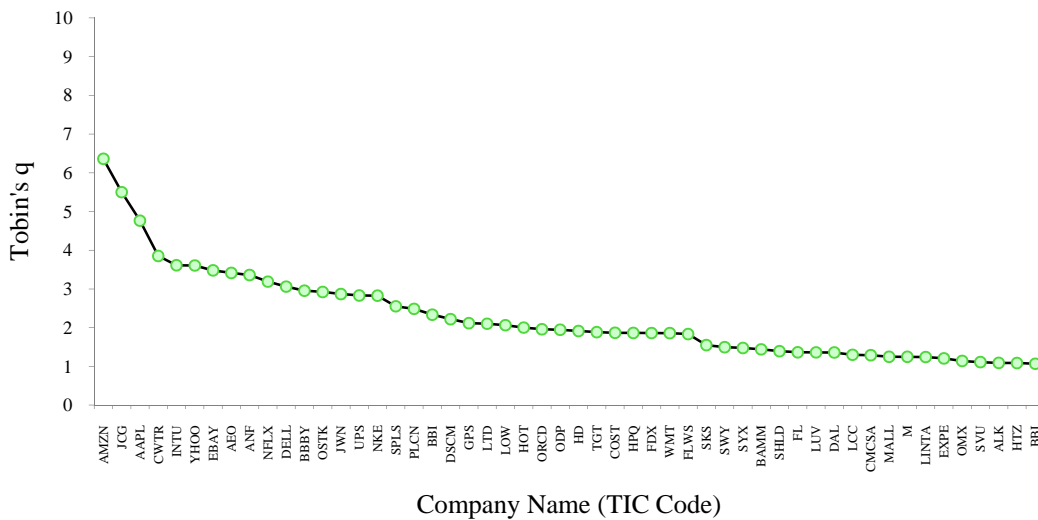


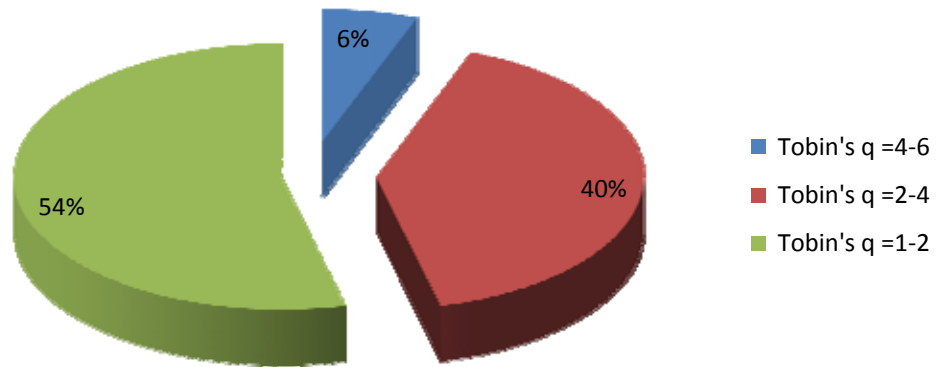
Figure 4.2 shows the customer concentration rates of the companies. There are five groups of companies; the first group has the highest concentration rate, but this represents only 6% of the companies with a customer concentration rate between 81-90%. The second group is the largest at 52% of firms; these firms have a customer concentration rate between 71-80%. The third group contains 19% of firms and these have a customer concentration rate between 61-70%. The fourth group, 15% of firms, which have customer concentration rate between 51-60%. The last group is 8% of firms and these have a customer concentration rate below 50%. It can be clearly seen in the chart that the proportion of companies' that achieve a customer concentration of 71-90% is more than 70% of all the firms.



**Figure 4.3: Average Tobin's q of each firm in the sample**

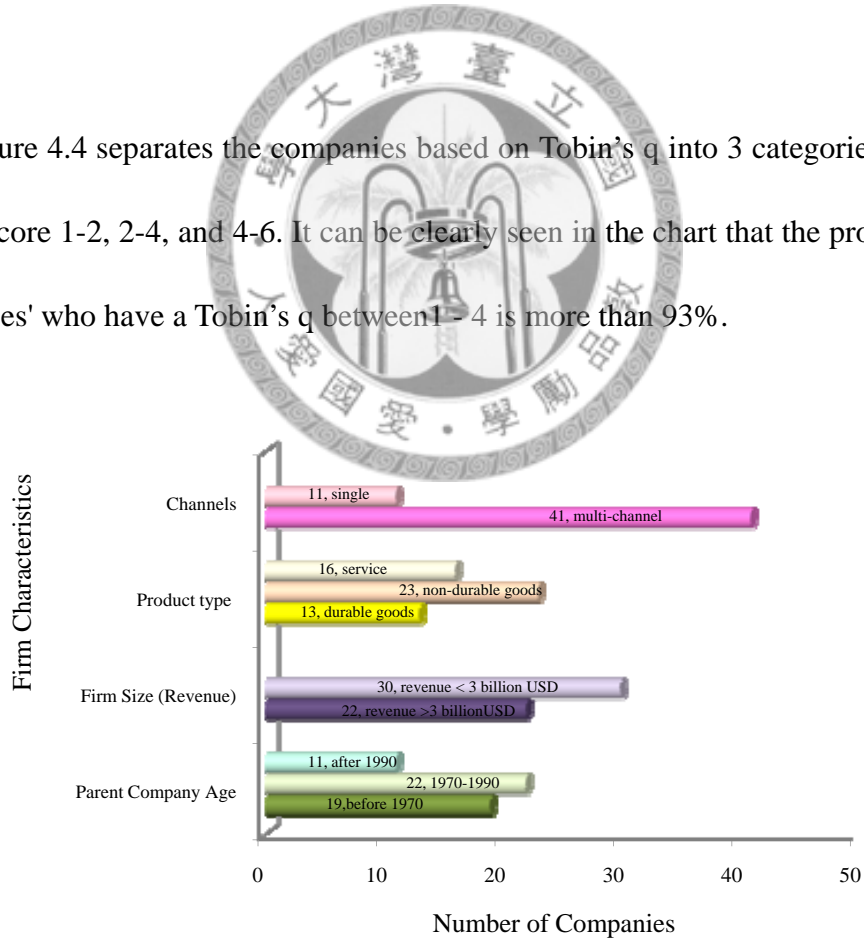
Figure 4.3 illustrates Tobin's q for each firm. It can be seen from the chart that all the firms are greater than 1, and most of the firms have a Tobin's q in the range of 1.5 -2.5. It means the market value is greater than the value of the company's recorded assets (excess profits are being earned). Klock and Megna (2000) indicated that a q value greater than 1 identified a firm that has intangible assets. These assets enable a firm to create earnings in excess of the return on its tangible assets and to achieve an abnormal return on invested capital relative to its competitors.





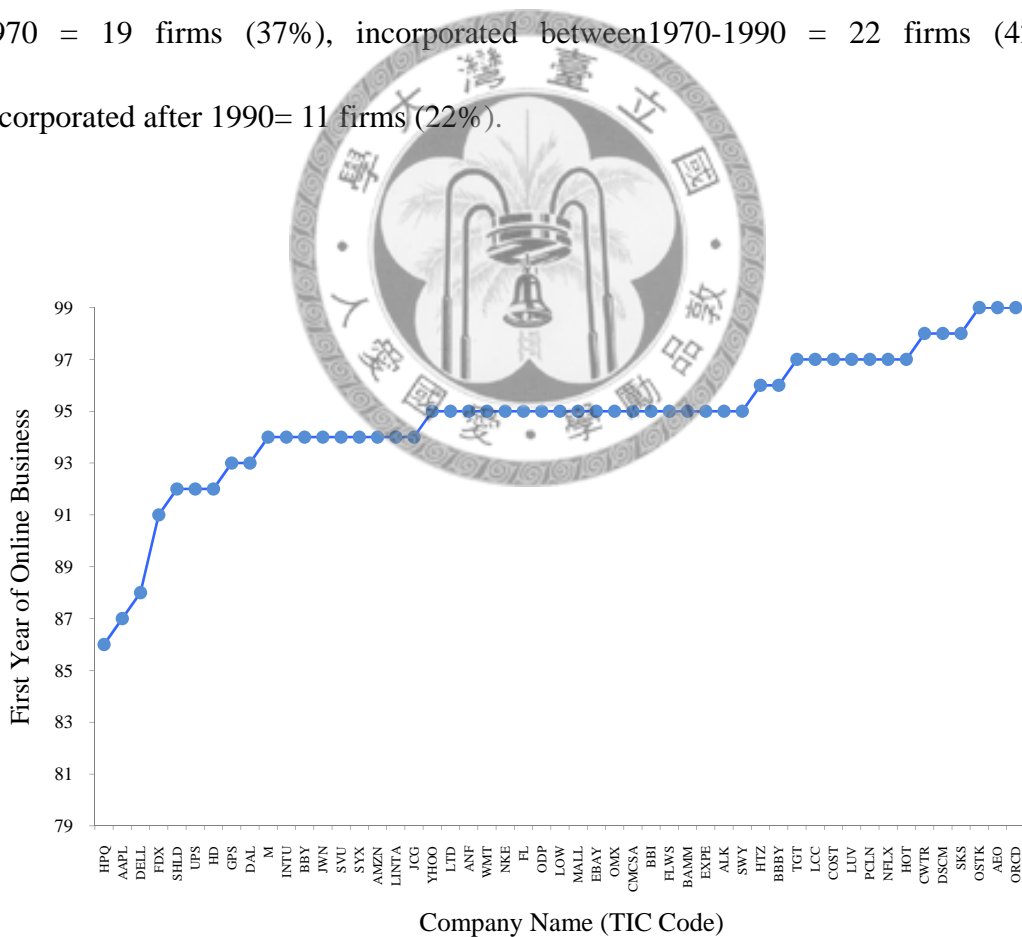
**Figure 4.4: Categorization of Tobin's q for each firm**

Figure 4.4 separates the companies based on Tobin's q into 3 categories; ranging from a score 1-2, 2-4, and 4-6. It can be clearly seen in the chart that the proportion of companies' who have a Tobin's q between 1 - 4 is more than 93%.



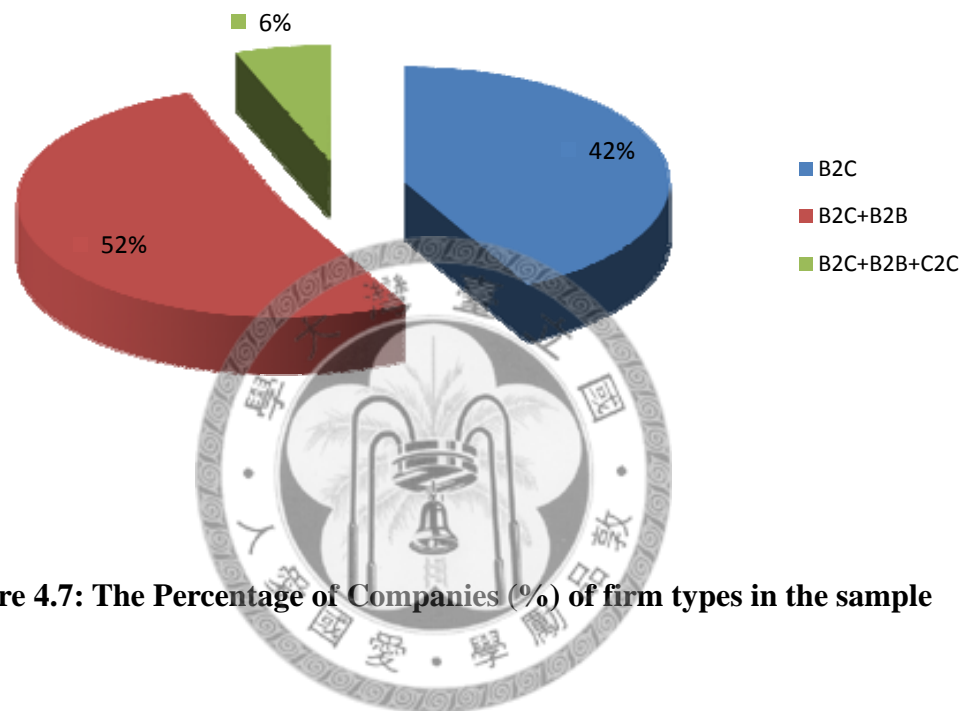
**Figure 4.5: The firm characteristics of the companies**

Figure 4.5 uses a bar graph to illustrate the firm characteristics of each company as follows: channel, website's product types, firm sizes, and firm age respectively. The channel variable has two categories, which are multi channel =41 firms (79%), and single channel =11 firms (21%). Product types are categorized in three groups, these are durable goods = 13 firms (25%), Non-durable goods (tangibles) = 23 firms (42%), Services =16 firms (31%). Firm size is categorized into two groups, these are revenue more than and equal to three billion = 22 firms (42%), revenue less than three billion = 30 firms (58%). Firm ages are categorized in three periods, incorporated before 1970 = 19 firms (37%), incorporated between 1970-1990 = 22 firms (42%), incorporated after 1990= 11 firms (22%).



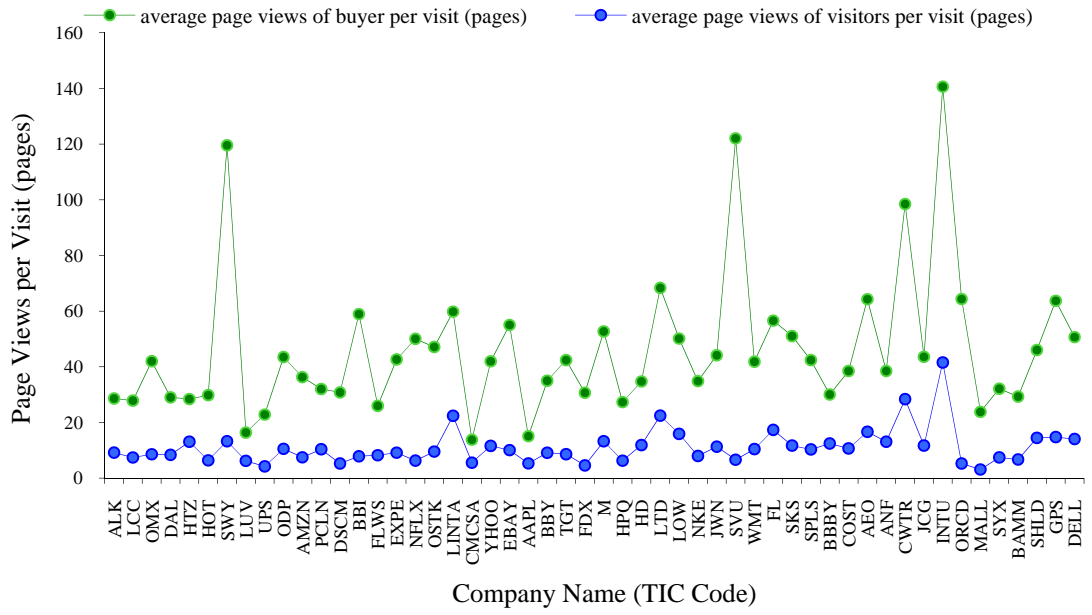
**Figure 4.6: First Year of each E-commerce firm**

Figure 4.6 shows the introduction of online service for each company. It can be seen that most companies started online service between 1994 and 1997. The first online firm is hp.com, while the latest starting online firms were overstock.com, ae.com, and emusic.com.



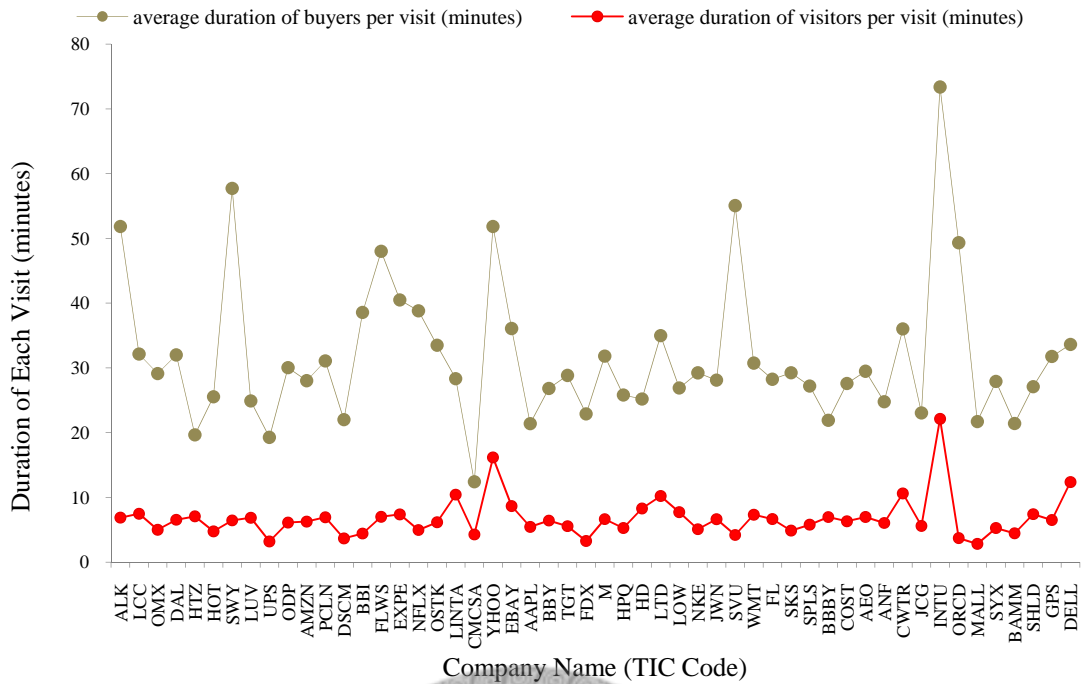
**Figure 4.7: The Percentage of Companies (%) of firm types in the sample**

Figure 4.7 graphically represents the three different firm types depending on online transaction between buyer and seller. Business to Customer (B2C) only = 42%, Business to Customer (B2C) and Business to Business (B2B) = 50% and Business to Customer (B2C) and Business to Business (B2B) and Customer to Customer (C2C) = 8%. It is interesting to note that 90% of the selected sample is focused in two models: the B2C and B2B business models.



**Figure 4.8: Average page views of each company per visit for visitors & buyers**

The graph in Figure 4.8 illustrates the average page views of visitors and buyers per each visit of each firm. The mean number of page views of buyers (green line) is about 4 times greater than that of visitors (blue line).



**Figure 4.9: Average duration of each visit for visitors & buyers per company**

Figure 4.9 provides an illustration of the average duration of visitors and buyers per each visit of each firm. Average duration of buyers per each visit (gold line) is about four times longer than the visitors' time spending on each firm website (red line).

## 4.2) Customer Concentration and Financial Performance

In order to verify the relationship between CC and financial performance, this thesis employed a simple linear ANOVA regression to test this relationship of 52 online firm samples in firm level analysis. In this analysis, the author applied classical approaches to modeling heterogeneity which yielded only aggregate summaries of heterogeneity. The independent variable is CC 20%. The dependent variable is Tobin's q. The result for the relationship between CC 20% and Tobin's q was significant and positive ( $\beta = 2.357$ ); these results are presented in Table 4.2. The relationship of CC 20% (X) and ROA and ROE was not found to be significant; therefore, the author will indicate only Tobin's q as this thesis's dependent variable. Table 4.2's result means the higher customer concentration, the higher financial performance. The overall result demonstrates that firms should concentrate more on customer variables to increase their value of the customer concentration rate. However, this linear regression result is general. This result is not a measure of the data's support for the null hypothesis relative to an alternative hypothesis.

**Table 4.2: The Impact of CC on Financial Performance (Tobin's q)**

Model	Coefficients	Std. Error	t	Sig
Constant	0.68	0.294	2.314	0.021
BUYCC20	2.357	0.427	5.521	0.000

Dependent Variable: TOBINQ

**Table 4.3: The Impact of CC on Financial Performance (Tobin's q) of Yahoo**

Model	Coefficients	Std. Error	t	Sig
Constant	10.856	4.204	2.582	.042
BUYCC20	-9.145	5.297	-1.727	.135

Dependent Variable: TOBINQ

The author found out that not for all companies followed this rule when the author ran linear regression for each company in eight quarters. For example, we run linear regression based on Yahoo data only. Although it is not statistically significant (p value = .135), Table 4.3 demonstrates the negative relationship between customer concentration and financial performance. Therefore, one cannot simply draw the conclusion that higher CC will lead to improved financial performance. For this reason, this thesis applied the HB model, since it yielded disaggregate estimates of model parameters. The HB model can provide information to specific firms with specific needs about the relationship between CC and firm performance. In addition, the HB model can investigate what factors caused the difference (positive or negative)

in the relationship between CC and firm performance. In the next section, this thesis describes the result of Bayesian analysis of hierarchical models with Markov Chain Monte Carlo methods.





## 4.3) Hierarchical Bayesian Model and Hypothesis Testing

### Result

This thesis applied two methods of both the Hierarchical Bayesian model and the linear regression model for hypothesis testing. The author intends to illustrate that the HB model can successfully solve real-world empirical problems in marketing while a simple linear regression method could not solve the individual problems of specific firms, since it presents a general result only. Dorfman (1997) posited Bayesian results are conditional on the prior and sample data information, here is the probability support for a particular hypothesis relative to clearly specified alternative hypotheses. Therefore, Bayesians measure the data's support for the hypothesis, while sampling theorists measure the hypothesis's support for the data. To examine the hypothesis, the paper first examines the result of Hierarchical Bayesian Model both individual and aggregate level (moderating effect) by using GAUSS statistical software package Version 4.0. Then the second part hypothesis testing result is presented.

#### *4.3.1) Result of Hierarchical Bayesian Model*

One advantage of HB models of heterogeneity is that they yield disaggregate estimates of model parameters (Allenby and Rossi 1998). Table 4.4 reports the mean values of the empirical Hierarchical Bayesian model estimates including heterogeneity. The results show that 20 sites out of 52 sites have a significant effect from CC for

each online firm. The remaining 32 websites do not show significant effects; that means the CC has no impact on financial performance (Tobin's q).

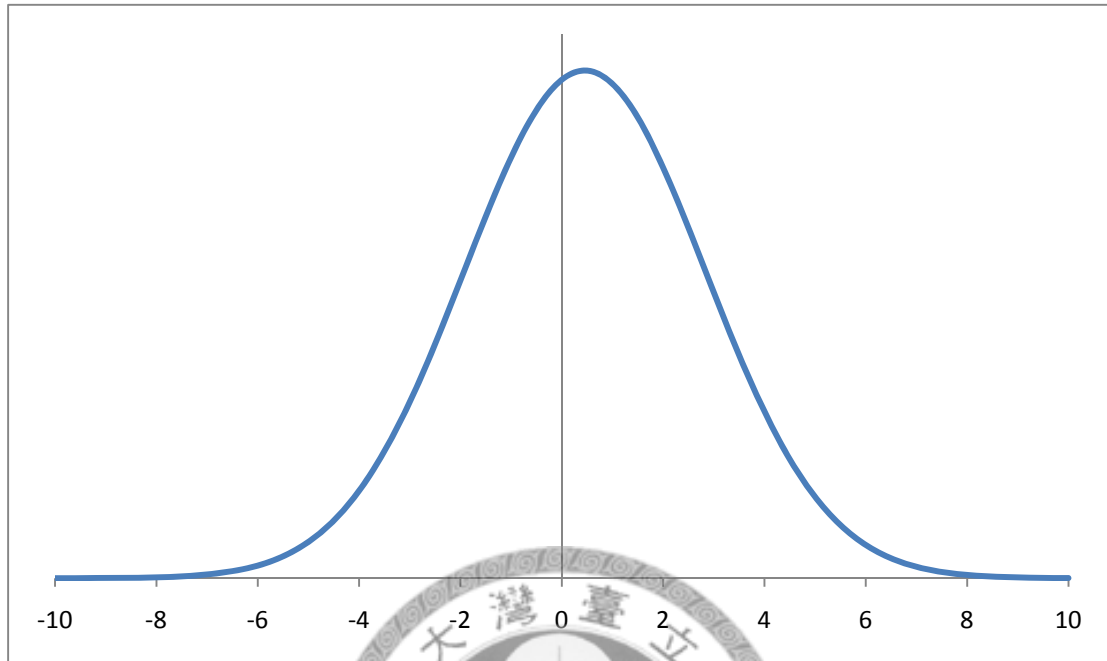
For 13 sites out of 20 sites at the individual-level, estimates are positively significant, including; Coldwater Creek, Orchard Enterprises, Apple, Limited Brands, Comcast, Netflix, Staples, United Parcel Service, Office Depot, Priceline, Gap, Blockbuster, and Foot Locker. For these companies, the higher customer concentration, the higher firm's profitability. Therefore these firms should try to increase the customer concentration rate to get improved financial performance.

With 7 out of 20 websites (yellow highlight), the individual-level estimates are negatively significant, including Yahoo ( $\beta = -10.7690$ ), Wal-Mart Stores ( $\beta = -1.9708$ ), US Airways ( $\beta = -2.9469$ ), Books-A-Million ( $\beta = -2.2840$ ), Dell ( $\beta = -3.2982$ ), Nordstrom ( $\beta = -1.8046$ ), and Southwest Airlines ( $\beta = -2.7575$ ); these results indicate that the lower CC, the higher firm's profitability. It is interesting to note that it appears these firms should try to decrease customer concentration rate; as a result, the financial performance will get higher.

**Table 4.4: The Result of HB model: Individual level**

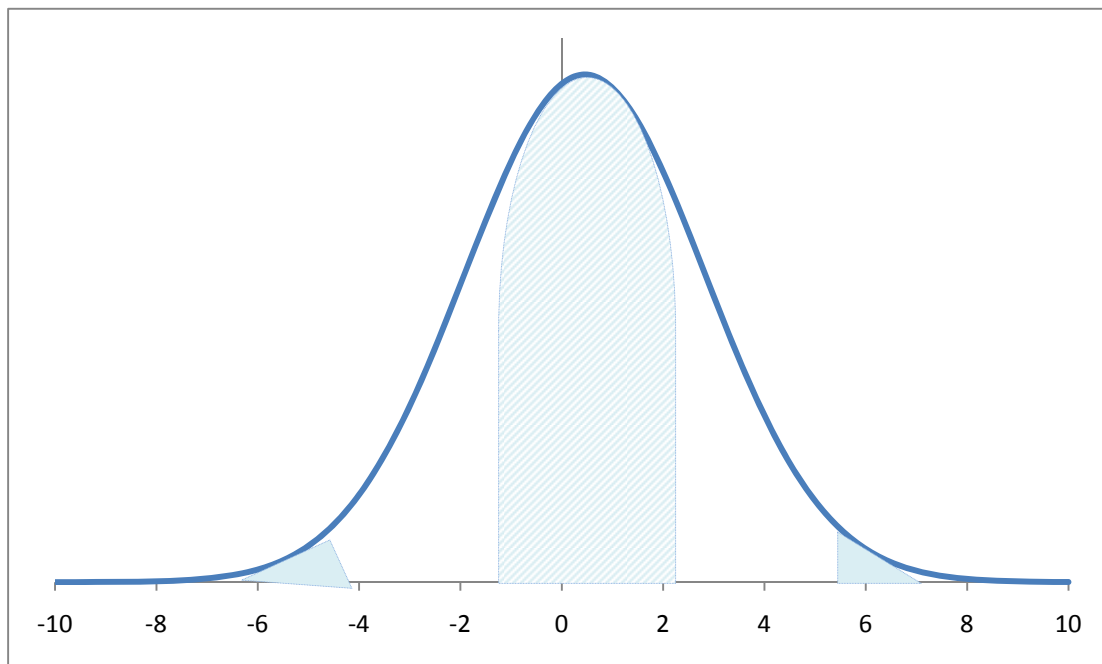
company	Beta					
	Intercept		CC = 20%			P value
	mean	std	mean	std	mean/std	
Yahoo Inc	12.1430	2.9924	-10.7690	3.7720	2.8550	0.00
Coldwater Creek Inc	0.6545	1.4339	4.3814	1.9718	2.2220	0.01
Orchard Enterprises Inc	-0.6316	1.2597	4.2096	2.0101	2.0942	0.02
Apple Inc	1.1742	1.7467	4.1180	2.0120	2.0467	0.02
Limited Brands Inc.	-0.1649	1.2095	3.2680	1.7304	1.8886	0.03
Wal-Mart Stores Inc	3.4186	0.8419	-1.9708	1.0532	1.8712	0.03
Comcast Corp	-0.5483	1.0255	3.7896	2.0742	1.8270	0.03
US Airways Group Inc	2.7769	0.8313	-2.9469	1.6495	1.7865	0.04
Books-A-Million Inc	2.9494	0.8609	-2.2840	1.2942	1.7648	0.04
Netflix Inc	2.2620	0.5484	2.4837	1.5038	1.6516	0.05
Staples Inc.	0.6117	1.1872	2.6556	1.6247	1.6345	0.05
United Parcel Service Inc.	0.9028	1.3030	2.4373	1.6612	1.4672	0.07
Dell Inc.	5.6279	1.7643	-3.2982	2.2605	1.4591	0.07
Nordstrom Inc.	4.2312	0.9794	-1.8046	1.2685	1.4226	0.08
Office Depot Inc	0.3034	1.1883	2.2590	1.6215	1.3932	0.08
Priceline.Com Inc	1.0461	1.0400	2.1142	1.5250	1.3864	0.08
Gap Inc. (The)	0.8295	0.9410	1.7541	1.2673	1.3841	0.08
Southwest Airlines Co.	2.7990	1.0662	-2.7575	2.0778	1.3271	0.09
Blockbuster Inc	0.5685	0.4357	2.0113	1.6112	1.2483	0.11
Foot Locker Inc.	0.4170	0.8010	1.5940	1.2772	1.2480	0.11
American Eagle Outfitters Inc.	2.2773	1.0294	1.6253	1.4955	1.0868	0.14
Liberty Media Interactive Group	-0.9854	2.1315	3.0307	2.8094	1.0788	0.14
Safeway Inc	0.6089	0.9819	1.4141	1.5353	0.9211	0.18
Amazon.com Inc	5.2110	1.4747	1.4000	1.8859	0.7424	0.23
Bed Bath & Beyond Inc.	2.3023	0.8799	0.9239	1.2763	0.7239	0.23
Officemax Inc	0.6521	0.7382	0.7052	1.0179	0.6928	0.24
Lowe's Cos Inc.	1.5291	0.7855	0.7262	1.0551	0.6882	0.25
J Crew Group Inc	5.3028	0.9967	0.8705	1.3922	0.6252	0.27
Target Corp	2.4956	1.0049	-0.8375	1.3514	0.6197	0.27
Hertz Global Holdings Inc	0.7284	0.7813	0.7282	1.5257	0.4773	0.32
1-800-FLOWERS.COM Inc	2.3888	1.1888	-1.0582	2.2828	0.4636	0.32
Best Buy Co. Inc.	1.7874	1.2723	0.6867	1.6399	0.4187	0.34
FedEx Corp.	0.9084	2.3198	1.3116	3.1467	0.4168	0.34
Expedia Inc	0.7539	1.3605	0.7115	1.9576	0.3634	0.36
Systemax Inc.	1.8409	1.0467	-0.5105	1.4318	0.3566	0.36
Starwood Hotels & Resorts Worldwide Inc.	1.7332	0.7735	0.4762	1.3973	0.3408	0.37
Delta Air Lines Inc.	1.0950	0.8171	0.4998	1.5684	0.3186	0.38
Macy's Inc	1.0185	0.7877	0.3245	1.0374	0.3128	0.38
Saks Inc	1.9898	1.3586	-0.5676	1.8799	0.3019	0.38
Alaska Air Group Inc.	1.4884	1.4413	-0.7790	2.7941	0.2788	0.39
drugstore.com Inc	1.9636	1.4941	0.3672	1.9517	0.1882	0.43
Costco Wholesale Corp	2.1025	1.2818	-0.2496	1.4481	0.1723	0.43
eBay Inc.	3.2468	1.6037	0.3024	2.1579	0.1401	0.44
Nike Inc	2.9090	0.7104	-0.1385	1.0761	0.1287	0.45
Home Depot Inc. (The)	1.8279	0.9038	0.1337	1.1691	0.1143	0.45
Hewlett-Packard Co	1.6680	2.0847	0.2497	2.5388	0.0984	0.46
Abercrombie & Fitch Co.	3.4064	0.9540	-0.1154	1.2918	0.0894	0.46
Overstock.com Inc	2.8351	1.3368	0.1199	1.7901	0.0670	0.47
SUPERVALU INC.	1.0920	0.6452	0.0663	1.1719	0.0566	0.48
PC Mall Inc	1.2868	0.5985	-0.0315	0.7507	0.0419	0.48
Sears Holdings Corp	1.3963	1.0568	0.0246	1.3525	0.0182	0.49
Intuit Inc.	3.6046	1.3534	-0.0112	2.7081	0.0041	0.50

:



**Figure 4.10: The distribution of  $\beta$  across firms**

The way that the data is distributed is crucial, because many of the statistical tests make assumptions about how the data are distributed. The normal distribution can be used to describe, at least approximately, any variable that tends to cluster around the mean. Figure 4.10 represents the distribution of  $\beta$  across firms. It illustrated the distribution of relationship of customer concentration and financial performance across all samples (52 companies). The curve is for a data set having a mean of zero.



**Figure 4.11: The impact of CC on financial performance on the distribution of  $\beta$  across firms**

Similar to Figure 4.10 that  $\beta$  infers the whole population, the middle blue highlighted area of Figure 4.11 illustrates the fact that customer concentration has no impact on financial performance for most firms. On the other hand, we still can observe the right tail and the left tail of the distribution. The tails' area represents the impact of customer concentration on firm performance as heterogenous and diverse for a few firms (20 firms). In other words, the impact of customer concentration on firm performance can be either positive or negative for a few firms in the sample.

As mentioned in the discussion of Table 4.4, the 7 sites out of 20 sites are important since they represent around 30% of significant firms. Market theorists and market practitioners should realize that the impact between customer concentration and financial performance could be negative. It is interesting to note that the increase

or decrease of customer concentration rate requires the response of individual units of analysis (firm unit). The author used the HB model technique in order to tailor marketing actions to specific firms. The standard classical approach to the simple regression model does not provide these estimates automatically. An approximate HB model can be a procedure to make inferences of the relationship between customer concentration and financial performance of each firm.

**Table 4.5: Hierarchical Bayesian model in Aggregate Level Result**

	⊖					
	Intercept			CC = 20%		
	mean	std	mean	std	mean/std	P Value
Intercept	-3.0932	3.8614	4.6857	5.0345	0.9307	0.18
AVR_DURATION_COM	1.0275	0.3559	-1.2615	0.5038	2.5041	<b>0.01</b>
AVR_PAGE_COM	-0.4549	0.1754	0.5909	0.2484	2.3782	<b>0.01</b>
Non-durable	2.5792	0.9342	-2.5525	1.3356	1.9111	<b>0.03</b>
Channel	2.0151	1.5431	-3.5155	1.9852	1.7709	<b>0.04</b>
Firm size	-1.1543	0.9465	1.4909	1.2439	1.1986	<b>0.12</b>
Y70_Y89	0.3254	0.7731	0.5869	1.0838	0.5415	0.29
Y90 and later	1.5382	1.6371	-0.7045	2.1644	0.3255	0.37
Durable	0.5073	1.1079	-0.4531	1.6089	0.2816	0.39
AVR_DUR_BUYER_COM	-0.0315	0.0681	0.0135	0.1112	0.1218	0.45
Online days	0.0002	0.0007	0.0001	0.0009	0.0931	0.46
AVR_PAGE_BUY_COM	0.0055	0.0284	0.0038	0.0440	0.0873	0.46

On the basis of the presumed moderator variable's description in the previous chapter, parameter estimates for firm characteristics and web search behavior parameters for the HB model are reported in Table 4.5. The first column indicates aggregate variables. The second column identifies the Gamma result including p value.

The table shows aggregate level analysis (second level analysis) of the Hierarchical Bayesian method which related to the identification of significant variables level (in yellow highlight) including five parameters: 1) AVR\_DURATION\_COM represented average duration (minutes) per customer on each visit. The result showed that longer page views (duration variable) is negatively significant,  $\gamma = -1.2615$  with  $p = 0.01$ ; 2) AVR\_PAGE\_COM demonstrated that average number of page views on each site visit. The result indicated that higher page views is positively significant,  $\gamma = 0.5909$  with  $p = 0.01$ ; 3). Non-durable represented non-durable goods as a tangible product. The result showed that product type is significant with  $p = 0.03$  and non-durable goods as tangible product is negatively significant,  $\gamma = -2.5525$ ; 4) channel represented the channel of the online retailer. The results showed that an online retailer with existing off-line experience (multi-channel) is negatively significant,  $\gamma = -3.5155$  at  $p \leq .05$  level with  $p = 0.04$ ; and 5) firm size means revenue. The results indicate that a larger firm is positively significant,  $\gamma = 1.4909$  with  $p = 0.12$ . These results suggested that the relationship between customer concentration rate and firm performance of E-commerce firms was somewhat strongly affected by durations, page views, product type, channel, and firm size. While other moderators were not significant including four variables: parent company's age (year), firm online dates (days), average number of page views on each site visit of buyers, the length of time (minutes) on each visit of buyers. For these variables it should be noted that the relationship between customer concentration rate and firm performance of E-commerce firm was not affected by parent company's age, firm online dates,

average number of page views on each site visit of buyers, and the length of time (minutes) on each visit of buyers. The hypotheses testing results will be discussed in the next section and illustrated in Table 5 and Table 6.

#### *4.3.2) Hypotheses Testing Result*

As described above in part of 4.3.1, this thesis's theoretical model referred to the empirical result of the Hierarchical Bayesian Model (HB) which illustrated two levels' of results including the individual and aggregate levels. In other words, the result of this HB model part was used as the basis to summarize this thesis's hypotheses. These results were categorized into three parts: Part 1 shows the effect of customer concentration on financial performance. This part proposed the result of hypothesis 1, which is a general result of the model of the relationship between customer concentration and financial performance. Part 2 illustrated the relationship between firm characteristics, customer concentration, and financial performance. This part indicated moderating effects which are related to firm characteristics, including hypothesis 2, 3, 4, 5. Part 3 illustrates the results of the relationship of web search behavior, customer concentration, and financial performance. This part identified the moderators results which are related to web search behavior at the firm level (not individual level), related to hypothesis 6 and 7.



## *The Effect of Customer Concentration on Financial Performance*

Hypothesis testing is based on the results for the full model shown in Table 4.2. H1; ‘When engaging in the e-commerce market, online firms with a higher customer concentration focus will able to gain higher revenues than firms with a lower customer concentration focus’ is supported;. The finding of a positive and significant relationship between customer concentration and financial performance was consistent with the previous studies of Schmittlein et al (1993), who found a positive effect of a customer concentration on the financial performance. Pelham (2000) indicated when organizations established specific activities and behaviors designed to give attention to customers’ needs and fulfill their satisfaction, the gross profit for the company increased.



## *Firm Characteristics, Customer Concentration, Financial Performance*

According to Table 4.5, H2 is supported; E-commerce firms selling non-durable goods (tangible products), will weaken the impact of customer concentration on firm performance than E-commerce firms selling services. In the service environment, the interaction is usually one on one and therefore if a mistake is made and a customer gets frustrated, the consequences are the customer may never return again (Cox and Dale 2001), therefore customer concentration is not as important to firms selling non-durable goods. To support, customers place a great deal of importance on

relationships in service experiences (Parasuraman et al. 1991). H3 is supported. Click and mortar firms will have a weaker impact of customer concentration on firm performance than strictly online firms. This result can be explained because click and mortar firms benefit from adopting different pricing and positioning strategies across the two channels since the costs of integration are very high, instead of providing integrated offerings. It is implied that the customer concentration strongly impacts performance when a firm is online, channel-based propositions independently. H4 is supported: Small E-commerce firms will have weaker impact from customer concentration on firm performance than large online firms. The research of (Poon and Swatman 1999) revealed that the small business Internet commerce (SBIC) phenomenon is still in its infancy, there is almost no integration between the Internet and internal applications, such as order processing which are often not integrated with the Internet application., it can be assumed that customers do not use the Internet for financial transactions because of lack of security. The small online business faces difficulty of focusing on customer concentration which affects firm performance. H5 is not supported: E-commerce firms with more experience in e-tailing do not have stronger impact from customer concentration on firm performance than firms with less experience E-commerce firms., Min and Wolfinbarger (2005) indicated that early movers in e-commerce do not have a significant advantage in market share, profit margin, or marketing efficiency compared with later entrants. This occurred because many early entrants did not understand the key importance of reliable fulfillment and usable websites (Wolfinbarger and Gilly 2003).

*Web Search Behavior, Customer Concentration, Financial Performance*

According to Table 4.5, H6 is supported: E-commerce firms with higher page views per customer on each visit will have stronger impact of customer concentration on firm performance than firms with a lower page views per customer on each visit. H7 is supported. E-commerce firms with longer page views per customer, per visit will weaken the impact of customer concentration on firm performance than firms with shorter page views per customer per visit. Table 4.6 shows summary of outcome of all hypothesis testing.



**Table 4.6: Summary of Results**

Summary of Results			
Nature of Relationship	Hypotheses	Significance of Result	Supported/ Unsupported
<i>A. Main Relationship</i>			
1. When engaging in the e-commerce market, online firms with a higher customer concentration focus will be able to gain higher revenues than firms with a lower customer concentration focus.	H <sub>1</sub>	Positively Significant	Supported
<i>B. Firm Characteristics</i>			
2. E-commerce firms selling non-durable goods (tangible products), will weaken impact of customer concentration on firm performance than E-commerce firms selling services.	H <sub>2</sub>	Negatively Significant	Supported
3. Click and mortar firms will weaken impact of customer concentration on firm performance than strictly online firms.	H <sub>3</sub>	Negatively Significant	Supported
4. Small E-commerce firms will weaken impact from customer concentration on firm performance than large online firms.	H <sub>4</sub>	Positive Significant	Supported
5. E-commerce firms with more experience in e-tailing will have stronger impact from customer concentration on firm performance than firms with less experience E-commerce firms.	H <sub>5</sub>	Insignificant	Not Supported
<i>C. Web Search Behavior</i>			
6. E-commerce firms with higher page views per customer on each visit, will have stronger impact of customer concentration on firm performance than firms with a lower page views per customer on each visit.	H <sub>6</sub>	Positively Significant	Supported
7. E-commerce firms with longer duration per customer, per visit will weaken impact of customer concentration on firm performance than firms with shorter duration per customer per visit.	H <sub>7</sub>	Negatively significant	Supported

## Chapter 5-Discussion and Conclusion

As more E-commerce firms adopt a customer concentration focus to their businesses, it has become increasingly important to understand 1) what the impact of the rate of customer concentration on financial performance of the firm is; and 2) how the moderating factors such as firm characteristics and web search behavior affect customer concentration to promote firm performance. The results of this study reveal that the impact of customer concentration on firm performance can either be positive or negative, depending on moderating effects such as duration, page views, website's product type, channel, and firm size. As seen, the results from Chapter 4 supported Hypotheses 1, 2, 3, 4, 6, and 7. In contrast, firm's age was found to have no significant effect on the relationship between customer concentration and firm performance. Therefore, Hypothesis 5 was not supported. These findings build on previous work examining a modeling approach for estimating the true level of relevant customer concentration (Schmittlein et al, 1993). In conjunction with the earlier findings, the present results contribute to the development of a comprehensive picture of customer concentration and firm performance. The final chapter has two sections; first, the author discusses the empirical results, principally based on the results generated in Chapter 4 and discusses the managerial implications of these

results. Secondly, some conclusions and limitations and suggestions for future research are offered.



## 5.1) Discussion and Managerial Implications

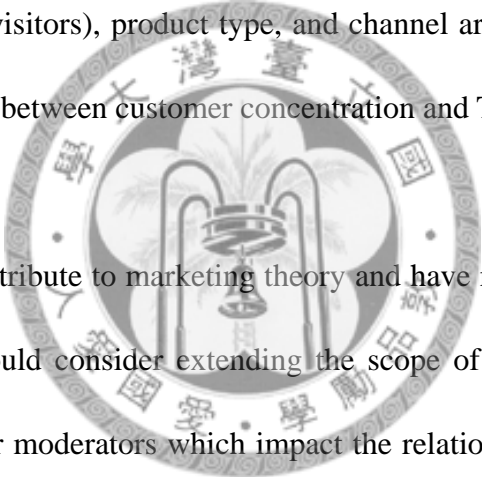
E-commerce becomes an even more serious challenge for existing firms as the Internet land-grabbing war has been replaced by the pursuit of effective strategies and a sustainable competitive advantage on the internet (Evans and Wurster 1999). This thesis focused on customer concentration strategy for E-commerce firms. Previous studies related to the 80/20 marketing principle, concentrated only on profitable marketing and profitable customer centeredness (Schmittlein et al. 1993). Previous studies indicated that customer concentration has a positive effect on firm performance, therefore the first goal of this thesis was to answer the question; “*What is the impact of the rate of customer concentration (CC) on firm performance?*”. The results from Linear Regression analysis showed a positive relationship between customer concentration and firm performance. The findings with regard to the positive impact of customer concentration rate on firm performance extend previous customer concentration literature of the truth in concentration for estimating the true level of relevant concentration among customers (Schmittlein et al. 1993). However, for individual level analysis, when adopting a Hierarchical Bayesian method that accounts for 52 samples, it was revealed that the correlation between customer concentration and firm performance was mixed (i.e., some were positive and others were negative) for E-commerce businesses which depends on each website characteristics. Liu and Arnett (2000) identified characteristics of Web sites that help online retailers differentiate their offerings, including the quality of information and

the level of service provided by the site, perceived quality of products and services, interactive feedback between the retailer and customers and the level of customization offered to individual customers. For this result in view of significantly negative results for, Yahoo, Wal-Mart, US Airways, Books-A-Million, Dell, Nordstrom, and Southwest Airlines which showed that the lower customer concentration, the higher firm performance. One must assume that those companies should further reduce customer concentration rate in order to increase financial performance. Positive results included, Coldwater Creek, Orchard Enterprises, Apple, Limited Brands, Comcast, Netflix, Staples, United Parcel Service, Office Depot, Priceline, Gap, Blockbuster, Foot Locker where higher customer concentration led to higher firm performance. In this case, the author notes that increasing customer concentration has influenced on online firm's decision to increase firm profitability. The approach of promoting customer concentration, Kim et al. (2004) identified web site "playfulness" as one approach that promotes customer concentration and excitement, system design features that offer well organized hyperlinks, customized search functions, high-speed access, ease in correcting server errors, and follow-up services to customers.

A review of previous marketing literature has shown that moderators and the customer concentration-firm performance relationship had not been investigated. This thesis works to build a base of literature in this area; *"How do moderating factors such as firm characteristics and web search behaviors affect customer concentration (CC) to promote business performance?"* This thesis applied a Hierarchical Bayesian



method and tested likely moderating variables including channel, website's product type, firm size, parent company's age, firm online age, average number of page views (visitors), average number of page views (buyers), duration of each visit (visitors), and duration of each visit (buyers). The results showed that there are five significant moderators of the linkage between customer concentration and Tobin's q, which are duration of each visit (visitors), average number of page views (visitors), product type, channel, and firm size. Average page views (visitors) and firm size are moderator that strengthen the relationship between customer concentration and Tobin's q. While, duration of each visit (visitors), product type, and channel are significant moderators weaken the relationship between customer concentration and Tobin's q.



These findings contribute to marketing theory and have managerial implications. Marketing theorists should consider extending the scope of customer concentration and recognize the major moderators which impact the relationship between customer concentration and firm performance. Specifically, for small firms, multi channel, non-durable goods (tangible), less page view, longer duration, Beta ( $\beta$ ) becomes more negative from the result of HB aggregate level analysis. Therefore, firms should decrease customer concentration rate in order to get a higher financial performance. For large firm size, single channel, service industry, higher average page views, shorter duration, Beta ( $\beta$ ) becomes more positive from the result of HB aggregate level analysis. Consequently, firms should increase customer concentration rate in order to get a higher financial performance. The study found that four factors do not

play a moderating role: firm age, firm online age, average duration (buyers), and average page views (buyers). This stream of work also can contribute to marketing theory by building on the long stream of attempts to find out the effects on the relationship of customer concentration and firm performance.

This thesis also offers various managerial implications. Firstly, this result should be of value to managers as an opportunity to benchmark their online firm against other online firms. This thesis also provides examples and practical guidelines for presenting customer concentration rate which is suitable for each firm; for example, Yahoo.com, has a beta  $\beta$  less than 0; they should try to increase duration of each visit, then Beta ( $\beta$ ) will become more negative. Yahoo should further reduce its customer concentration rate in order to increase financial performance. Secondly, E-commerce firms can find more opportunities from a profitable customer group when they consider average duration, and average page views, website's product types, channel, and firm size. Thirdly, e-commerce managers must carefully consider the costs and benefits of pursuing each campaign by focusing on the most profitable target customer group. As a result, they can effectively allocate their marketing resources across activities to target customers which will create greater profitability. Finally, E-commerce managers should utilize their customer data (i.e. customer database) to develop more efficient marketing strategies. The ability of e-commerce managers to differentiate each firm's individual visitors by their purchasing probabilities is important.

## 5.2) Conclusion, Limitations and Future Research Directions

This study extends and departs from prior work using the 80/20 rule on the role of affect of customer concentration in a number of ways. (1) This thesis provided the answer of whether the customer concentration rate has any effect on firm performance by applying both linear regression and the HB model; (2) This thesis used quarterly datasets linking two databases: a customer database and a financial database. It is linking between comScore web behavior and COMPUSTAT financial database between January 2006 and December 2007; (3) The study focused on E-commerce firm's characteristics and online customers' behavior of each firm.

The primary conclusions from this thesis are as follows. Firstly, the study finds the positive affect of customer concentration on firm performance from simple regression; however, the results showed that not all companies followed this pattern when the linear regression for each company was used for eight quarters. Secondly, consistent with the finding from linear regression, the HB model in individual level analysis reveals the relationship between customer concentration and financial performance either positive or negative effect; for 20 sites out of 52 sites there is a significant effect for the online firm. The remaining 32 websites did not experience significant impact;

that means the customer concentration has no impact on financial performance (Tobin's q). Thirdly, the HB model in aggregate level reveals five moderators that have a significant effect including duration, page views, product type, channel, and firm size. These variables influence on the relationship between customer concentration and financial performance either positive or negative effect.

This thesis has several inherent limitations. First limitations of the study relate to classification of businesses as Business to Customer (B2C), Business to Business (B2B), and Customer to Customer (C2C). Therefore, future research could study larger samples of companies of each firm type. Secondly, the data source from two databases was limited to only a two year period, future research should conduct longitudinal studies of historical views using more than two years of data. Thirdly, the study is relevant for publicly traded online firms only because the financial data is also relatively limited. Also, some publicly company's own websites did not reveal specific financial data for the firm. Future research can find other sources of data which can extend the scope of size of firm from this study by focusing on small E-commerce firms. Finally, this study may have overlooked some variables considered relevant and important to the study of the complex and dynamic online market, therefore future studies should consider other moderators such as industry variables (i.e. industry concentration, market concentration) and market characteristics (i.e. market segments). The author hopes that this thesis and these guidelines will stimulate additional efforts in this vital area of research.

## References

Alba, Joseph, John Lynch, Barton Weitz, Christ Janiszewski, Richard Lutz, Alan Sawyer, and Stacy Wood (1997), "Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces," *Journal of Marketing*, 61 (3), 38-53.

Aldrich, Howard E. and Ellen Auster (1986), "Even dwarfs started small: Liabilities of age and size and their strategic implications," *Research in Organizational Behavior* (8), 165-98.

Allenby, Greg M. and Peter J. Lenk (1994), "Modeling Household Purchase Behavior with Logistic Normal Regression," *Journal of the American Statistical Association*, 89 (428), 1218-31.

---- (1995), "Reassessing Brand Loyalty, Price Sensitivity, and Merchandising Effects on Consumer Brand Choice," *Journal of Business & Economic Statistics*, 13 (3), 281-89.

Allenby, Greg M. and Peter E. Rossi (1998), "Marketing models of consumer heterogeneity," *Journal of Econometrics*, 89 (1-2), 57-78.

Allengy, Greg and Peter Rossi (2008), "Teaching Bayesian Statistics to Marketing and Business Students ": Fisher College of Business Working Series, Chicago GSB Research Paper Series\_

Anderson, Eugene W., Claes Fornell, and Sanal K. Mazvancheryl (2004), "Customer Satisfaction and Shareholder Value," *Journal of Marketing*, 68 (4), 172-85.

Anschuetz, Ned (1997a), "Building Brand Popularity: The Myth of Segmenting to Brand Success," *Journal of advertising research*, 37 (1).

---- (1997b), "Profiting from the "80--20 Rule of Thumb," *Journal of Advertising Research*, 37 (6), 51-56.

Arnott, David C. and Susan Bridgewater (2002), "Internet, interaction and implications for marketing," *Marketing Intelligence & Planning*, 20 (2), 86.

Awh, Robert Y. (1998), *Microeconomics: Theory and Applications*. New York: John Wiley & Sons.

Balakrishnan, Ramji, Thomas J. Linsmeier, and Mohan Venkatachalam (1996), "Financial Benefits from JIT Adoption: Effects of Customer Concentration and Cost Structure," *The Accounting Review*, 71 (2), 183-205.

Balasubramanian, Sridhar (1998), "Mail versus Mall: A Strategic Analysis of Competition between Direct Marketers and Conventional Retailers," *Marketing Science*, 17 (3), 181-95.

Bank, David (1999), "A Site-Eat-Site World," *Wall Street Journal* (July 12), R30.

Benjamin, Robert and Rolf Wigand (1995), "Electronic markets and virtual value chains on the information superhighway," *Sloan Management Review*, 32 (2), 62.

Berger, James O. (1985), *Statistical decision theory and Bayesian analysis*. New York: Springer-Verlag.

Bhat, Subodh, Micheal Bevans, and Sanjit Sengupta (2002), "Measuring Users' Web Activity to Evaluate and Enhance Advertising Effectiveness," *Journal of Advertising*, 31 (3), 97-106.

Bhatnagar, Amit and Sanjoy Ghose (2004), "An Analysis of Frequency and Duration of Search on the Internet," in *Journal of Business* Vol. 77: University of Chicago Press.

Bhatnagar, Amit, Sanjog Misra, and H. Raghav Rao (2000), "On risk, convenience, and Internet shopping behavior," *Commun. ACM*, 43 (11), 98-105.

Birley, Sue and Paul Westhead (1990), "Growth and Performance Contrasts between 'Types' of Small Firms," *Strategic Management Journal*, 11 (7), 535-57.

Bloom, Paul N. and James E. Pailin (1995), "Information content and consumer readership of print ads: a comparison of search and experience products," *Journal of the Academy of Marketing Science*, 32 (1), 20.

Bruce, Norris, Preyas Desai, and Richard Staelin (2006), "Enabling the Willing: Consumer Rebates for Durable Goods," *Marketing Science*, 25 (4), 350-66.

Bucklin, Louis P., Venkatram Ramaswamy, and Sumit K. Majumdar (1996), "Analyzing channel structures of business markets via the structure-output paradigm," *International Journal of Research in Marketing*, 13 (1), 73-87.

Bucklin, Randolph E. and Catarina Sismeiro (2003), "A Model of Web Site Browsing Behavior Estimated on Clickstream Data," in *Journal of Marketing Research (JMR)* Vol. 40: American Marketing Association.

---- (2000), "A model of website browsing behavior estimated on clickstream data," in *Marketing Science Conference UCLA*.

Carpenter, Gregory S. and Kent Nakamoto (1989), "Consumer Preference Formation and Pioneering Advantage," in *Journal of Marketing Research (JMR)* Vol. 26: American Marketing Association.

Chu, Junhong, Pradeep K. Chintagunta, and Javier Cebollada (2008), "Research Note--A Comparison of Within-Household Price Sensitivity Across Online and Offline Channels," *Marketing Science*, 27 (2), 283-99.

Coffey, Steven (1999), "Media matrix methodology," *Media Matrix*

Cognitative (1999), "Building maintaining & repairing web brand loyalty ", 1-16 [available at [www.cognitative.com](http://www.cognitative.com)].

Colombo, Richard and Weina Jiang (1999), "A stochastic RFM model," *Journal of Interactive Marketing*, 13 (3), 2-12.

Cowell, Frank A. (1977), *Measuring Inequality: Techniques for the Social Sciences*. New York: Halsted Press (Wiley).

Cox, Jennifer L. and Barrie G. Dale (2001), "Service quality and e-commerce: An exploratory analysis," *Managing Service Quality*, 11 (2), 121-31.

CyberAtlas (2001), "Small business use net for customer service," (accessed 15 Dec 2009),[<http://cyberatlas.internet.com/markets/smallbiz/article/0,10098921821,00.htm>]

Danaher, Peter J., Isaac W. Wilson, and Robert A. Davis (2003), "A Comparison of Online and Offline Consumer Brand Loyalty," *Marketing Science*, 22 (4), 461-76.

Day, George S. and Robin Wensley (1983), "Marketing Theory with a Strategic Orientation," *The Journal of Marketing*, 47 (4), 79-89.

Day, Ralph L. and Laird E. Landon (1977), *Toward a theory of consumer complaining behaviour*. New York: North Holland Publishing Company Press

De Figueiredo, John M. (2000), "Finding Sustainable Profitability in Electronic Commerce," *Sloan Management Review*, 41 (4), 41-52.

Degeratu, Alexandru M., Arvind Rangaswamy, and Jianan Wu (2000), "Consumer choice behavior in online and traditional supermarkets: The effects of brand name, price, and other search attributes," *International Journal of Research in Marketing*, 17 (1), 55-78.

Deitel, Harvey M. (2001), *E-business & E-commerce for managers*. Upper Saddle River, New Jersey: Prentice Hall.

Demers, Elizabeth and Baruch Lev (2001), "A Rude Awakening: Internet Shakeout in 2000," *Review of Accounting Studies*, 6 (2-3), 331-59.

Denise, D. Schoenbachler and Geoffrey L. Gordon (2002), "Multi-channel shopping: Understanding what drives channel choice," *The Journal of Consumer Marketing*, 19 (1), 42.

Dennis, Pitta, Franzak Frank, and Fowler Danielle (2006), "A strategic approach to building online customer loyalty: integrating customer profitability tiers," *The Journal of Consumer Marketing*, 23 (7), 421.



Doney, Patricia M. and Joseph P. Cannon (1997), "An Examination of the Nature of Trust in Buyer-Seller Relationships," *The Journal of Marketing*, 61 (2), 35-51.

Dorfman, Jeffrey H. (1997), *Bayesian economics through numerical methods*. New York :: Springer.

Dreze, Xavier and Fred Zufryden (1998), "Testing Web Site Design and Promotional Content," *Journal of Advertising Research*, 37 (2), 77-91.

Durand, Rodolphe and Regis Coeurderoy (2001), "Age, order of entry, strategic orientation, and organizational performance," *Journal of Business Venturing*, 16 (5), 471-94.

Elmaghraby, Wedad and Pinar Keskinocak (2003), "Dynamic Pricing in the Presence of Inventory Considerations: Research Overview, Current Practices, and Future Directions," *Management Science*, 49 (10), 1287-309.

Esmeralda, Garbi (2002), "Alternative measures of performance for E-companies: A comparison of approaches," *Journal of Business Strategies*, 19 (1), 1.

Evans, Philip and Thomas S. Wurster (1999), "Getting Real About Virtual Commerce. (cover story)," *Harvard Business Review*, 77 (6), 84-94.

Feindt, Sylvie, Judith Jeffcoate, and Caroline Chappell (2002), "Identifying Success Factors for Rapid Growth in SME E-commerce," *Small Business Economics*, 19 (1), 51-62.

Ford, Gary T., Darelene B. Smith, and John L. Swasy (1990), "Consumer Skepticism Of Advertising Claims: Testing Hypothes," *Journal of Consumer Research*, 16 (4), 433.

Forrester, Report (2001), "Turning Web traffic into store sales," Vol. August.

Fox, Edward, Alan L. Montgomery, and Leonard M. Lodish (2004), "Consumer Shopping and Spending Across Retail Formats," *Journal of Business & Economic Statistics*, 77 (2), S25-S60.

Franke, George R., Bruce A. Huhmann, and David L. Mothersbaugh (2004), "Information Content and Consumer Readership of Print Ads: A Comparison of Search and Experience Products," *Journal of the Academy of Marketing Science*, 32 (1), 20-31.

Geyskens, Inge, Katrijn Gielens, and Marnik G. Dekimpe (2002), "The Market Valuation of Internet Channel Additions," in *Journal of Marketing* Vol. 66: American Marketing Association.

Goode, Mark M.H. and Lloyd C. Harris. (2007), "Online behavioural intentions: an empirical investigation of antecedents and moderators," *European Journal of Marketing*, 41 (5/6), 512.

Green, Paul E. and Ronald E. Frank (1966), "Bayesian Statistics and Marketing Research," *Journal of the Royal Statistical Society. Series C (Applied Statistics)*, 15 (3), 173-90.

Han, Jin K., Namwoon Kim, and Rajendra K. Srivastava (1998), "Market Orientation and Organizational Performance: Is Innovation a Missing Link?," in *Journal of Marketing* Vol. 62: American Marketing Association.

Harrison, J. Richard, David L. Torres, and Sal Kukalis (1988), "The Changing of the Guard: Turnover and Structural Change in the Top-Management Positions," *Administrative Science Quarterly*, 33 (2), 211-32.

Hill, Bruce M. (1965), "Inference about Variance Components in the One-Way Model," *Journal of the American Statistical Association*, 60 (311), 806-25.

Hoffman, Donna L. and Thomas P. Novak (1996), "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations," *The Journal of Marketing*, 60 (3), 50-68.

Howard, Ronald A. (1965), "Dynamic Inference," *Operational Research* (13), 712-33.

Huang, Peng, Nicholas H. Lurie, and Sabyasachi Mitra (2009), "Searching for Experience on the Web: An Empirical Examination of Consumer Behavior for Search and Experience Goods," in *Journal of Marketing* Vol. 73: American Marketing

Association.

Huberman, Bernardo A., Peter Pirolli, James E. Pitkow, and Rajan M. Lukose (1998), "Strong Regularities in World Wide Web Surfing," *Science*, 280 (3), 95-97.

Internet Systems Consortium, Inc. (ISC) (2009), "Internet Host Count History," [available at <https://www.isc.org>].

Ittner, Christopher D. and David F. Larcker (1998), "Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction," *Journal of Accounting Research*, 36, 1-35.

Javalgi, Rajshekhar G., Lori P. Radulovich, Glenna Pendleton, and Robert F. Scherer (2005), "Sustainable competitive advantage of internet firms: a strategic framework and implications for global marketers," *International Marketing Review*, 22 (6), 658-72.

Johnson, Eric J., Steven Bellman, and Gerald L. Lohse (2003), "Cognitive Lock-In and the Power Law of Practice," *The Journal of Marketing*, 67 (2), 62-75.

Johnson, Eric J., Wendy W. Moe, Peter S. Fader, Steven Bellman, and Gerald L. Lohse (2004), "On the Depth and Dynamics of Online Search Behavior," *Management Science*, 50 (3), 299-308.

Kandampully, Jay (2003), "B2B relationships and networks in the Internet age," Vol. 41.

Kerin, Roger A. and William L. Cron (1987), "Assessing Trade Show Functions and Performance: An Exploratory Study," *The Journal of Marketing*, 51 (3), 87-94.

Kim, Eonsoo, Dae-il Nam, and J.L.Stimpert (2004), "The Applicability of Porter's Generic Strategies in the Digital Age: Assumptions, Conjectures, and Suggestions," *Journal of Management*, 30 (5), 569-89.

Klock, Mark and Pamela Megna (2000), "Measuring and valuing intangible capital in the wireless communications industry," *The Quarterly Review of Economics and Finance*, 40 (4), 519-32.

Koch, Paul D. and Robert H. Rasche (1988), "An Examination of the Commerce Department Leading-Indicator Approach," *Journal of Business & Economic Statistics*, 6 (2), 167-87.

Kollock, Peter (1999), "The Production of Trust in Online Markets," in *Advances in Group Processes* (Vol 16).

Kotha, Suresh (1998), "Competing on the Internet: How Amazon.com is rewriting the rules of competition," *Advances in Strategic Management* (15), 239-65.

Kotha, Suresh, Shivaram Rajgopal, and Violina Rindova (2001), "Reputation Building and Performance: An Empirical Analysis of the Top-50 Pure Internet Firms," *European Management Journal*, 19 (6), 571-86.

Kotler, Philip (2003), *Marketing management*. Upper Saddle River, N.J. : Prentice Hall.

Lenk, Peter J. (1992), "Hierarchical bayes forecasts of multinomial dirichlet data applied to coupon redemptions," *Journal of Forecasting*, 11 (7), 603-19.

Lenk, Peter J. and Wayne S. DeSarbo (2000), "Bayesian inference for finite mixtures of generalized linear models with random effects," *Psychometrika*, 65 (1), 93-119.

Lenk, Peter J. and Ambar G. Rao (1990), "New Models from Old: Forecasting Product Adoption by Hierarchical Bayes Procedures," *Marketing Science*, 9 (1), 42-53.

Lewellen; and Badrinath (1997), "On the measurement of Tobin's q," *Journal of financial economics*, 44 (1), 77.

Li, T. and Roger J. Calantone (1998), "The impact of market knowledge competence on new product advantage: Conceptualization and empirical examination," *Journal of Marketing*, 62 (4), 13.

Liang, Ting-Peng and Jin-Shiang Huang (1998), "An empirical study on consumer acceptance of products in electronic markets: a transaction cost model," *Decision Support Systems*, 24 (1), 29-43.

Liao, Ziqi and Micheal T. Cheung (2001), "Internet-based e-shopping and consumer attitudes: an empirical study," *Information & Management*, 38 (5), 299-306.

Lilien, Gary L. (1979), "Advisor 2: Modeling the Marketing Mix Decision for Industrial Products," *Management Science*, 25 (2), 191-204.

Lindley, Danis V. and Adrian F.M. Smith (1972), "Bayes Estimates for the Linear Model," *Journal of the Royal Statistical Society. Series B (Methodological)*, 34 (1), 1-41.

Liu, Chang and Kirk P. Arnett (2000), "Exploring the factors associated with Web site success in the context of electronic commerce," *Information & Management*, 38 (1), 23-33.

Liu, Xiao and Kwok Kee Wei (2003), "An empirical study of product differences in consumers' E-commerce adoption behavior," *Electronic Commerce Research and Applications*, 2 (3), 229-39.

Lohse, Gerald L., Steven Bellman, and Eric J. Johnson (2000), "Consumer buying behavior on the Internet: Findings from panel data," *Journal of Interactive Marketing*, 14 (1), 15-29.

Lohse, Gerald L. and Peter Spiller (1998), "Electronic shopping: The effect of customer interfaces on traffic and sales," *Communications of the ACM*, 41 (7), 81-87.

Lynch, John G. and Dan Ariely (1998), "Interactive Home Shopping: Effects of Search Cost for Price and Quality Information on Consumer Price Sensitivity: Satisfaction with Merchandise and Retention." Durham, N.C.: Duke University

Mahajan, Vijay, Raji Srinivasan, and Jerry Wind (2002), "The Dot.com Retail Failures of 2000: Were There Any Winners?," *Journal of the Academy of Marketing Science*, 30 (4), 474-86.

Mandel, Naomi and Eric J. Johnson (2002), "When Web Pages Influence Choice: Effects of Visual Primes on Experts and Novices," in *Journal of Consumer Research* Vol. 29: Journal of Consumer Research, Inc.

March, James G. and Herbert A. Simon (1958), *Organizations*. New York: Wiley.

Melian-Alzola; and Padron-Robaina (2007), "Measuring the results in B2C e-commerce," Vol. 24.

Merrilees, Bill (2001), "Do traditional strategic concepts apply in the E-marketing context?," *Journal of Business Strategies*, 18 (2), 177.

Min, Sungwook and Mary Wolfenbarger (2005), "Market share, profit margin, and marketing efficiency of early movers, bricks and clicks, and specialists in e-commerce," *Journal of Business Research*, 58 (8), 1030-39.

Mitchell, Will (1994), "The Dynamics of Evolving Markets: The Effects of Business Sales and Age on Dissolutions and Divestitures," *Administrative Science Quarterly*, 39 (4), 575-602.

Moe, Wendy W. and Peter S. Fader (2001), "Uncovering Patterns in Cybershopping," in *California Management Review* Vol. 43: California Management Review.

Morgan, Neil A. and Lopo L. Rego (2006), "The Value of Different Customer Satisfaction and Loyalty Metrics in Predicting Business Performance," *Marketing Science* 25 (5), 426-39.

Mulhern, Francis J. (1999), "Customer profitability analysis: Measurement, concentration, and research directions," *Journal of Interactive Marketing*, 13 (1), 25-40.

Nelson, Phillip (1970a), "Information and Consumer Behavior," *Journal of Political Economy*, 78 (2), 311.

---- (1970b), "Information and Consumer Behavior," *The Journal of Political Economy*, 78 (2), 311-29.

Nikolaeva, Ralitzia (2005), "Strategic Determinants of Web Site Traffic in On-Line Retailing," *International Journal of Electronic Commerce*, 9 (4), 113-32.

Orme, Bryan and John Howell (2009), "Application of Covariates Within Sawtooth Software's CBC/HB Program: Theory and Practical Example." WA.: Sawtooth Software, Inc.

Palepu, Krishna G., Paul M. Healy, and Victor L. Bernard (2004), *Business Analysis and Valuation: Using Financial Statement*. Mason, OH.: Thomson South-Western.

Parasuraman, A., Leonard L. Berry, and Valarie A. Zeithaml (1991), "Understanding Customer Expectations of Service," *Sloan Management Review*, 32 (3), 39.

Patatoukas, Panos N. (2009), "Implications for market efficiency: Customer concentration, future stock returns and firm fundamentals," Yale University.

Pelham, Alfred M. (2000), "Market Orientation and Other Potential Influences on Performance in Small and Medium-Sized Manufacturing Firms," in *Journal of Small Business Management* Vol. 38: Blackwell Publishing Limited.

Peterson, Robert A., Sridhar Balasubramanian, and Bart J. Bronnenberg (1997b), "Exploring the implications of the internet for consumer marketing," *Journal of the Academy of Marketing Science*, 25 (4), 329-46.

Poon, Simpson and Paula M.C. Swatman (1999), "An exploratory study of small business Internet commerce issues," *Information & Management*, 35 (1), 9-18.

Porter, Michael E. (1980), *Competitive Strategy. Techniques for Analyzing Industries and Competitors*. New York: Free Press

---- (2001), "Strategy and the Internet," in *Harvard Business Review* Vol. 79: Harvard Business School Publication Corp.

Pratt, Joanne H. (2002), "E-biz: Strategies for Small Business Success," 220 (October 2002).

Raaij, Erik M. van, Maarten J. A .Vernooij, and Sander van Triest (2003), "The implementation of customer profitability analysis: A case study," *Industrial Marketing Management*, 32 (7), 573-83.

Rajgopal, Shivaram, Kotha Suresh, and Mohan Venkatachalam (2000), "The

relevance of web traffic for Internet Stock Prices," University of Washington/Stanford University.

Reinartz, Werner J., Manfred Krafft, and Wayne D. Hoyer (2004), "The Customer Relationship Management Process: Its Measurement and Impact on Performance," in *Journal of Marketing Research (JMR)* Vol. 41: American Marketing Association.

Rosenberg, Morris (1968), *The logic of survey analysis*. New York: Basic Books.

Rossi, Peter E. and Greg M. Allenby (2003), "Bayesian Statistics and Marketing," *MARKETING SCIENCE*, 22 (3), 304-28.

Rossi, Peter E., Greg M. Allenby, and Robert E. McCulloch (2005), *Bayesian statistics and marketing*. Hoboken, NJ :: Wiley.

Rust, Roland T. (2000), *Driving customer equity*. New York :: Free Press.

Rust, Roland T. and P. K. Kannan (2003), "E-service: A new paradigm for business in the electronic environment," *Association for Computing Machinery. Communications of the ACM*, 46 (6), 37.

Schmittlein, David C., Lee G. Cooper, and Donald G. Morrison (1993), "Truth In Concentration In The Land Of (80/20) Laws," in *Marketing Science* Vol. 12: INFORMS: Institute for Operations Research.

Schnaars, Steven P. (1998), *Marketing strategy*. New York: Free Press.

Schultz, Don E. and Heidi F. Schultz (1998), "Transitioning marketing communication into the twenty-first century" *Journal of Marketing Communications* 4(1), 9.

Schutz, Robert R. (1951), "On the Measurement of Income Inequality," *The American Economic Review*, 41 (1), 107-22.

Sen, Amartya (1977), *On Economic Inequality*. Oxford: Clarendon Press.

Shankar, Venkatesh, Amy K. Smith, and Arvind Rangaswamy (2003), "Customer



satisfaction and loyalty in online and offline environments," *International Journal of Research in Marketing*, 20 (2), 153-75.

Shrader, Charles B., Charles L. Mulford, and Virginia L. Blackburn (1989), "Strategic And Operational Planning, Uncertainty, And Performance In Small Firms," in *Journal of Small Business Management* Vol. 27: Blackwell Publishing Limited.

Simon, Carol J. and Mary W. Sullivan (1993), "The Measurement and Determinants of Brand Equity: A Financial Approach," *Marketing Science*, 12 (1), 28-52.

Sismeiro, Catarina and Randolph E. Bucklin (2004), "Modeling Purchase Behavior at an E-Commerce Web Site: A Task-Completion Approach," in *Journal of Marketing Research (JMR)* Vol. 41: American Marketing Association.

Smith, Adrain F.M. (1973), "A General Bayesian Linear Model," *Journal of the Royal Statistical Society. Series B (Methodological)*, 35 (1), 67-75.

Srinivasan, Raji and Christine Moorman (2005a), "Strategic Firm Commitments and Rewards for Customer Relationship Management in Online Retailing," *Journal of Marketing*, 69, 193-200.

---- (2005b), "Strategic Firm Commitments and Rewards for Customer Relationship Management in Online Retailing," in *Journal of Marketing* Vol. 69: American Marketing Association.

Stern, Louis W. and Adel I. El-Ansary (1992), *Marketing channels*. NJ: Englewood Cliffs.

Stone, Merlin, Matt Hobbs, and Mahnaz Khaleeli (2002), "Multichannel customer management: The benefits and challenges," in *Journal of Database Marketing* Vol. 10: Palgrave Macmillan Ltd.

Storbacka, Kaj (1997), "Segmentation Based on Customer Profitability--Retrospective Analysis of Retail Bank Customer Bases," *Journal of Marketing Management*, 13, 479-92.

Subramaniam, Chandrasekar, Michael J. Shaw, and David M. Gardner (2000), "Product Marketing and Channel Management in Electronic Commerce," *Information*

*Systems Frontiers*, 1 (4), 363-78.

Tangpong, Chanchai, Muhamad Islam, and Nongkran Lertpittayapoom (2009), "The Emergence of Business-to-Consumer E-Commerce: New Niche Formation, Creative Destruction, and Contingency Perspectives," Vol. 16.

Tobin, James (1969), "A General Equilibrium Approach To Monetary Theory," *Journal of Money, Credit and Banking*, 1 (1), 15-29.

Vijayasarathy, Leo R. (2002), "Product characteristics and Internet shopping intentions" *Internet Research*, 12 (5), 411-26.

Wolfenbarger, Mary and Mary C. Gilly (2003), "eTailQ: dimensionalizing, measuring and predicting etail quality," *Journal of Retailing*, 79 (3), 183-98.

Wright, Alice A. and John G. Lynch (1995), "Communication Effects of Advertising Versus Direct Experience When Both Search and Experience Attributes are Present," *The Journal of Consumer Research*, 21 (4), 708-18.

Yelkur, Rama and Paul Herbig (1997), "Differential pricing for services," *Marketing Intelligence & Planning*, 15 (4), 190-94.

Yoffie, David B. and Michael A. Cusumano (1999), "The competitive dynamic of internet time," *Harvard Business Review* (1), 71-81.

Zeithaml, Valarie A., Roland T. Rust, and Katherine N. Lemon (2001), "The Customer Pyramid: Creating and Serving Profitable Customers," *California Management Review*, 43, 118-42.

## APPENDIX

**Table 3.1: Fifty-two online US companies in different industries over a financial quarter from January 2006 to December 2007.**



**Group 1**

No.	Website	TIC code	Type of Business	Parent Company	Product Type	online date
1	1800flowers.com	FLWS	flowers	1-800-flowers	NDS	09-01-95
2	alaskaair.com	ALK	travel	Alaska airways	NDS	12-06-95
3	amazon.com	AMZN	books	Amazon	NDT	11-01-94
4	apple.com	AAPL	Comp& Electro	APPLE	D	02-19-87
5	blockbuster.com	BBI	Entertainment	blockbuster	NDS	08-15-95
6	delta.com	DAL	travel	Delta Airline	NDS	11-23-93
7	drugstore.com	DSCM	medicine	Drugstore	NDT	09-14-98
8	ebay.com	EBAY	an online auction and shopping	Ebay	NDT	08-04-95
9	expedia.com	EXPE	Travel	Expedia	NDS	11-25-95
10	fanfango.com	CMCSA	dvd rentals	Comcast	NDS	08-07-95
11	hertz.com	HTZ	car rental	Hertz	NDS	07-02-96
12	netflix.com	NFLX	dvd rentals	Netflix	NDS	11-01-97
13	officedepot.com	ODP	office furnitures	Office depot	D	04-26-95
14	officemax.com	OMX	office furnitures	Office max	D	08-07-95
15	overstock.com	OSTK	Department Store	Overstock	NDT	02-11-99
16	priceline.com	PCLN	Travel	Priceline	NDS	06-19-97
17	qvc.com	LINTA	online shopping	Liberty media	NDT	11-16-94
18	safeway.com	SWY	Department Store	Safeway	NDT	12-09-95
19	southwest.com	LUV	Travel	Southwest Airline	NDS	05-01-97
20	starwoodhotels.com	HOT	travel&leisure	Starwood Group	NDS	12-23-97
21	ups.com	UPS	Logistic	UPS	NDS	04-07-92
22	usairways.com	LCC	travel	Us airways	NDS	02-05-97
23	yahoo.com	YHOO	online shopping	Yahoo	NDT	01-18-95

**Remark :** Group 1, all the company ROA,ROE, and Tobin q in the Annual Report are complete,therefore we use totally 8 quarter for each company starting from year 2006 to 2007 and the data input date for first quarter is on 31 March 2006 ,and so on

Product Type (1) D=durable goods; (2) ND=nondurable goods; (2.1) NDT= nondurable tangible; (2.2) NDS=nondurable service

**Group 2**

No.	Website	TIC code	Type of Business	Parent Company	Product Type	online date
1	abercrombie.com	ANF	Clothing	abercrombie	NDT	01-23-95
2	ae.com	AEO	clothing	American Eagle	NDT	03-17-99
3	albertsons.com	SVU	Foods	Super value	NDT	09-21-94
4	bedbathandbeyond.com	BBBY	Furniture and apparels	bedbath & beyond	D	11-17-96
5	bestbuy.com	BBY	Comp& Electro	BEST BUY	D	03-03-94
6	coldwatercreek.com	CWTR	clothing	coldwatercreek	NDT	01-16-98
7	costco.com	COST	Department Store	Costco	NDT	03-17-97
8	dell.com	DELL	Comp& Electro	Dell	D	11-22-88
9	fedex.com	FDX	Logistic	FEDEX	NDS	02-26-91
10	footlocker.com	FL	shoes	Foot Locker	NDT	03-09-95
11	homedepot.com	HD	Furniture and apparels	Home Depot	D	08-04-92
12	hp.com	HPQ	Comp& Electro	Hewlett Packard	D	03-03-86
13	intuit.com	INTU	comp&software	Intuit	D	02-18-94
14	jcrew.com	JCG	Clothing	J .Crew	NDT	12-16-94
15	lowes.com	LOW	Department Store	Lowe's	NDT	06-29-95
16	macys.com	M	Department Store	Macys	NDT	02-07-94
17	nike.com	NKE	shoes	Nike	NDT	03-04-95
18	nordstrom.com	JWN	Department Store	Nordstrom	NDT	07-14-94
19	saksfifthavenue.com	SKS	Clothing	SAKS INC	NDT	11-11-98
20	staples.com	SPLS	office furnitures	Staples	D	03-05-95
21	target.com	TGT	Department Store	Target	NDT	01-02-97
22	victoriassecret.com	LTD	Clothing	Limited Brands	NDT	01-23-95
23	walmart.com	WMT	Department Store	Walmart	NDT	02-23-95
24	booksamillion.com	BAMM	books	Books-a-million	NDT	11-17-95

**Remark :** Group 2, some of the company value such as ROA,ROE, and Tobin q is missing ,some of them the Data date is not started from 1<sup>st</sup> Jan 2006 , so the numbers of quarters are less than 8 quarters ( 2 years period ) .

Product Type (1) D=durable goods; (2) ND=nondurable goods; (2.1) NDT= nondurable tangible; (2.2) NDS=nondurable service

**Group 3**

No.	Website	TIC code	Type of Business	Parent Company	Product Type	online date
1	emusic.com	ORCD	Entertainment	The Orchard	NDS	04-21-99

**Remark :** Group 3, We use the calculation of data in Annual due to our ROA,ROE and TOBINQ is in annual format.

Product Type (1) D=durable goods; (2) ND=nondurable goods; (2.1) NDT= nondurable tangible; (2.2) NDS=nondurable service

**Group 4**

No.	Website	TIC code	Type of Business	Parent Company	Product Type	online date
1	circuitcity.com	SYX	Comp& Electro	SYSTEMAX	D	12-15-94
	compusa.com					12-15-94
	tigerdirect.com					09-29-94
2	macmall.com	MALL	Comp& Electro	PCMALL	D	07-28-95
	pcmall.com					12-09-96
3	sears.com	SHLD	Clothing & Dept	SEARs	NDT	02-19-92
	landsend.com					10-27-94
4	bananarepublic.com	GPS	Clothing	GAPS	NDT	12-29-95
	gap.com					09-13-93

Remark : Group 4, The group of websites are part of the parent company, So we apply weighting method.

Product Type (1) D=durable goods; (2) ND=nondurable goods; (2.1) NDT= nondurable tangible; (2.2) NDS=nondurable service

