

**DETERMINANTS OF B2C EC SUCCESS ON MARKET PERFORMANCE
OF DIFFERENT SIZES OF FIRMS IN TAIWAN'S E-BROKERAGE SECTOR**

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ABSTRACT

Guided by a financial model, this study is the first to integrate Miles and Snow's (1978) strategic typology as an external industry effect and the resource-based view of the firm as an internal effect to explain market performance of different firm sizes in business-to-consumer e-commerce firms. Factors such as strategy types, CEO commitment to e-commerce, Web site design, and IT system integration capabilities were empirically investigated. Findings showed that prospector strategy utilized by large e-brokers significantly outperformed analyzer, defender, and reactor strategies in online market share. Top managers of small-to-medium enterprises (SMEs) should choose defender or analyzer strategies to gain market performance. Large firms indeed outperformed SMEs in online market share. In addition, large firm's CEO commitment to e-commerce, Web site design and IT system integration capabilities and Web age were explanatory factors for online market share but had no effect on both market performances for SMEs. Managerial implications and future study are recommended.

Keywords: Keywords: B2C EC, Strategic typology, Web site design, IT System Integration Capability, Market Performance

INTRODUCTION

Is electronic commerce (EC) the way for business to succeed? Some business-to-consumer (B2C) firms have failed but others have prospered. Despite the bursting of the 2000 "e-bubble," B2C EC online shopping has demonstrated continued growth (Braddock, 2001). When the number of U.S. broadband users reached 49 million in 2005, EC

experienced a 29% increase in growth (OECD Broadband Statistics, 2005). Consumers, especially the younger generation, are moving into a virtual world; thus, they are demanding more online products and services. Retail e-commerce Christmas holiday sales rose to US \$22.9 billion, up 23% in the fourth quarter of 2005 from the fourth quarter of 2004 (U.S. Census Bureau, 2006). Forrester Research predicts that online

shopping in the United States will enjoy an annual growth rate of 19% until 2008 (Rush, 2003).

Online sales growth can also be seen outside the United States. In Taiwan, the B2C EC market surged to US \$1.1 billion (NT\$34.72 billion), up 57.2% in 2004 (Find, 2005). Further, the market was predicted to triple to nearly US\$3 billion (NT\$95.22 billion) by 2008 (Find, 2005). Clearly, EC is expected to continue to grow and develop not only in the United States, but also in Taiwan.

In spite of EC growth and advantages, 31.47% of online stores in Taiwan lost money (Institute for Information Industry, 2005). Researchers also provided evidence demonstrating that EC has no influence on financial performance (Epstein, 2004; Kamssu, Reithel, & Ziegelmayr, 2003). Dynamic changes in EC have made online retailers struggle with the question of how to generate revenues (Wang, Head, & Archer, 2002). Hence, there are conflicting results of EC's impact on firm performance.

What is the difference between those online stores who succeeded and those that failed? Is Internet technology the answer to online success? What distinguishes one online store from another in its ability (internal firm-effect) to attract customers or a traditional business strategy (external industry-effect) also critical for success in EC? Does firm size play a role in a firm's performance? Do large and small-to-medium enterprises (SMEs) utilize different strategies and perform differently? Porter pointed out that "it is more important than ever for companies to distinguish themselves through strategy" (Porter, 2001, p. 63) and the winners will be those that leverage the Internet to help a firm do what it does best to gain the competitive advantage.

The Internet can complement and enhance value by integrating information technology to the value chain, "the set of activities through which a product or service is created and delivered to customers" (Porter, 2001, p 74). To answer these questions, this study:

- investigated whether different strategy types resulted in different levels of market performance for Taiwan's large and SMEs in e-brokerage sector, and
- examined the influence of B2C factors, Web age, CEO commitment to EC, strategy types, Web site design, and IT system integration capabilities on Taiwan's large and SMEs in e-brokerage sector.

LITERATURE REVIEW

Schendel and Patton's (1978) financial model provided a clear framework and showed that financial results are affected by strategic management decisions of goal setting, resources allocation, and by external environmental constraints. In general, a firm's goal setting is profit-oriented. Further, "financial performance is in the form of measures of individual relationships in models linking various hypothesized causal variables to various performance measures" (Capon, Farley, & Hoening, 1990, p. 1143). In other words, the financial model can be explained by linking those causal variables from a firm's internal resources and capabilities to a firm's external environment. Concurrently, Rumelt (1991) attributed performance variation across firms to both internal and external factors. Hence, this financial model provides logic by which to integrate the strategic typology framework as an external factor with the resource-based view as an internal factor in order to explain market performance.

Strategic Typology

Many strategy theories appeared in the late 1970s and 1980s. Generic strategies built by Miles and Snow (1978) and Porter (1980) are representative of the work being done in the strategic management field (Gibbons, Kennealy, & Lavin, 2003; Grover & Saeed, 2004; Kim, Nam, & Stimpert, 2004; Parnell & Hershey, 2005). Strategic groups are “groups of organizations that exhibit patterns of consistency in strategic orientation” (Grover & Saeed, 2004, p. 25). Both Miles and Snow’s (1978) and Porter’s (1980) typologies are based on the belief that strategic processes can be simplified by seeking patterns of organizational behaviors. As strategic groups help identify clusters of businesses with similar strategies, scholars have utilized strategy typologies as a theoretical basis to categorize and examine strategic groups in relation to the performance of traditional firms (Aragon-Sanchez & Sanchez-Martin, 2005; Garrigos-Smith, Marques, & Narangajavana, 2005; Gibbons et al., 2003; Matsuno & Mentzer, 2000; Parnell & Hershey, 2005; Parnell & Wright, 1993). In addition, scholars assumed that traditional strategies would be applicable in the “New Economy.” The results supported the belief that traditional strategy types can be useful and influential on firm performance in a virtual world (Grover & Saeed, 2004; Kim et al., 2004; Saini & Johnson, 2002).

Strategic group theory analyzes the competitive structure of industries (Barney & Hoskisson, 1990). Miles and Snow (1978) offered a theoretical framework, an integrated dynamic system that relates organizational strategy, structure, and process, to align with organizational environment. In particular, the framework emphasizes an adaptive cycle, dealing with and solving

entrepreneurial, engineering, and administrative problems. First, an entrepreneurial problem centers on how managers define and commit resources into their organizational domain in specific products and services (a target market). Second, an engineering problem can be solved by creating a system in which managers choose a technology to produce and distribute the organization’s products and services. Such a system can further integrate information, communication, and control for internal operations. Third, an administrative problem reduces uncertainty primarily by rationalizing, formulating, and implementing the system that enables an organization to innovate. Such an innovative system, according to Miles and Snow, is distinguished by its ability to utilize technology (such as EC) to produce or distribute products and services and has an adaptive cycle to deal with EC’s rapidly changing environment (Saini & Johnson, 2002). Therefore, Miles and Snow’s strategic typology is more suitable as a theoretical basis to explain B2C EC firm performance.

Miles and Snow (1978) identify four strategy types: the defender, the reactor, the analyzer, and the prospector. Each type has its own strategy coordinating with its organization’s technology, structure, process and environment. First, defenders serve in a narrow product-market environment and focus on improving operational efficiency. As a result, defenders rarely change their strategy, structure, technology, and operation in their environment. Second, prospectors are the opposite of defenders. They are pioneers in search of market opportunities and usually the first to respond to an emerging market. Consequently, prospectors are sometimes the market creators of change that competitors can only follow. Third,

analyzers try to balance defenders (stable market) and prospectors (changing market). Thus, they are concerned with both operational efficiency and rapid responses to competitors and the environment. Fourth, reactors are unable to respond to environmental changes. They adapt their strategy and structure only because environmental pressures force them to do so (Miles & Snow, 1978).

This theoretical framework has traditionally proposed that prospectors, analyzers, and defenders are likely to outperform reactors. Several empirical studies tested Miles and Snow's (1978) typology and provided reliable and valid support for the typology in traditional organizations (Aragon-Sanchez & Sanchez-Martin, 2005; Garrigos-Smith, et al., 2005; Gibbons et al., 2003; Matsuno & Mentzer, 2000; Parnell & Hershey, 2005; Parnell & Wright, 1993). Studies found significant differences among prospectors, defenders, and analyzers, all of whom outperformed reactors in traditional markets (Aragon-Sanchez & Sanchez-Martin, 2005; Garrigos-Smith et al., 2005; Gibbons et al., 2003). EC firms operate in an environment that specifically requires adaptive capabilities in dealing with rapid technological advancement (McKee, Varadarajan, & Pride, 1989; Saini & Johnson, 2002). Among the four strategy types, prospector firms tend to have the highest level of adaptive capabilities (McKee et al., 1989; Saini & Johnson, 2002). As a result, Saini & Johnson (2002) empirically tested the Miles and Snow strategic typology framework but found that prospectors had higher performance levels than did analyzers, defenders, and reactors in B2C EC firms. Thus, strategies chosen by large e-brokers and SMEs can have different results on market performance.

Resource-Based View of the Firm

Parnell and Hershey (2005) stated that scholars were aware of their inability to elucidate performance variances within an industry. Further, critiques of strategy typologies have focused on their relative neglect of the unique idiosyncratic resources at the individual firm level (Barney & Hoskisson, 1990). As a result, strategists have moved their attention to firm-level resources, such as the resource-based view (RBV). Penrose (1959) contributed to the resource-based view of the firm by arguing that a firm is more than an administrative function; it is a collection of productive (both physical and human) resources that are determined by managerial decisions on how to use productive resources to ensure a firm's profit and growth. Accordingly, human resources are one of the productive resources that determine a firm's profitability. In other words, firms with more human resources are likely to perform better financially than smaller firms because of economics of scale and market power. Organizational size has been recognized as one of the significant factors affecting firm performance (Hatfield & Kohn, 2001; Smith, Guthrie, & Chen, 1989). Empirical studies of firm sizes indicated that firms of different sizes showed different levels of financial performance (Collis, Young, & Goold, 2003; Osteryoung, Constand, & Nast, 1992). As a result, this study explored market performance differences between large firms and SMEs.

Scholars considered that Barney (1991) provided a complete idea of the modern resource-based view (RBV) of the firm. Barney built on the prior assumptions that strategic resources are heterogeneous and immobile among firms in an industry (or group) and that the unique assets and capabilities some firms have allow those firms to sustain competitive advantage. As

a result, the RBV accentuates strategic choices by a firm's top management to identify, develop (or create), and deploy a firm's unique resources to maximize and attain above-average returns. The resource-based perspective emphasizes strategic exploitation of firm assets and capabilities (Teece, Pisano, & Shuen, 1997). Firms looking to create performance advantages can attain above-average returns by bundling or assembling resources to create greater organizational capabilities (Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984; Zhu & Kraemer, 2002).

The RBV theory provides promising research direction for future study because researchers can easily construct and test a firm's resources and capabilities. Empirical studies have utilized the theory to understand the value of EC firms. Most EC studies used this model to understand and assess B2B net-enabled business value (Barua, Konana, & Whinston, 2005; Barua, Konana, Whinston, & Yin, 2004; Zhu & Kraemer, 2002). Researchers who have used this model to assess B2C business value include Auger (2003), Colton (2004), and Saeed, Grover, and Hwang (2005). Their findings showed a positive relationship between EC resources and capabilities and firm performance.

The RBV of the firm posits that integrating a firm's resources and capabilities creates competitive advantages that lead to superior returns. Scholars have perceived EC as a new capability to gain a competitive advantage through value creation (Ravichandran & Lertwongsatien, 2005; Rayport & Sviokla, 1995; Saeed et al., 2005; Yeung & Lu, 2004; Zhu & Kraemer, 2002). Value creation is based on the Internet's ability to provide value to online shoppers, through online trading, new products and services, and information (Amit & Zott, 2001; Oetzel, 2004) that is made possible by IT system integration

throughout the value chain (Ravichandran & Lertwongsatien, 2005; Zhu & Kraemer, 2002).

Rooted in an RBV, several variables of IT resources and capabilities (or competencies) have been proposed. As Information System (IS) researchers adopted this theory, some EC scholars have begun to apply a resource-based view by linking firm resources (chief executive officer's commitment to EC) and capabilities (Web site design and information technology [IT] capabilities) to firm performance (business value) in e-businesses (Barua et al., 2004; Saeed et al., 2005; Zhu & Kraemer, 2002). Scholars are trying to understand the impact of IT system integration on firm performance (Barua et al., 2004; Ravichandran & Lertwongsatien, 2005; Saeed et al., 2005) and the results are encouraging. In addition, Web site design features are perceived as a process that constantly upgrades its design capabilities to add value for customers (Auger, 2005). By exploiting the Internet, companies are able to integrate systems internally and to create value externally in the value chain. Employing an RBV, these scholars proposed a model of how a firm's ability to combine and coordinate its resources to create online information capabilities enhances operational and financial performance.

Previous empirical studies found that CEO commitment to EC as a firm resource and Web site design and IT system integration as EC capabilities were the major contributors to firm performance (Auger, 2005; Graham, Cannice, & Sayre, 2002; Huizingh, 2002; Karayanni & Baltas, 2003; Lee & Kim, 2002; Liang, Lin, & Chen, 2004; Lohse & Spiller, 1999; Oetzel, 2004; Ranganathan & Grandon, 2002; Saeed et al., 2005; Saini & Johnson, 2002; Saini & Johnson, 2005; Sung & Gibson, 2005; Zhuang & Lederer,

2004). However, these B2C EC factors were all investigated separately to explain their effects on firm (or market) performance from either internal (firm-level) or external (industry-level) analyses. Consequently, this study is the first to integrate all of these B2C EC factors from internal firm effect and external industry effect to explain B2C EC market performance.

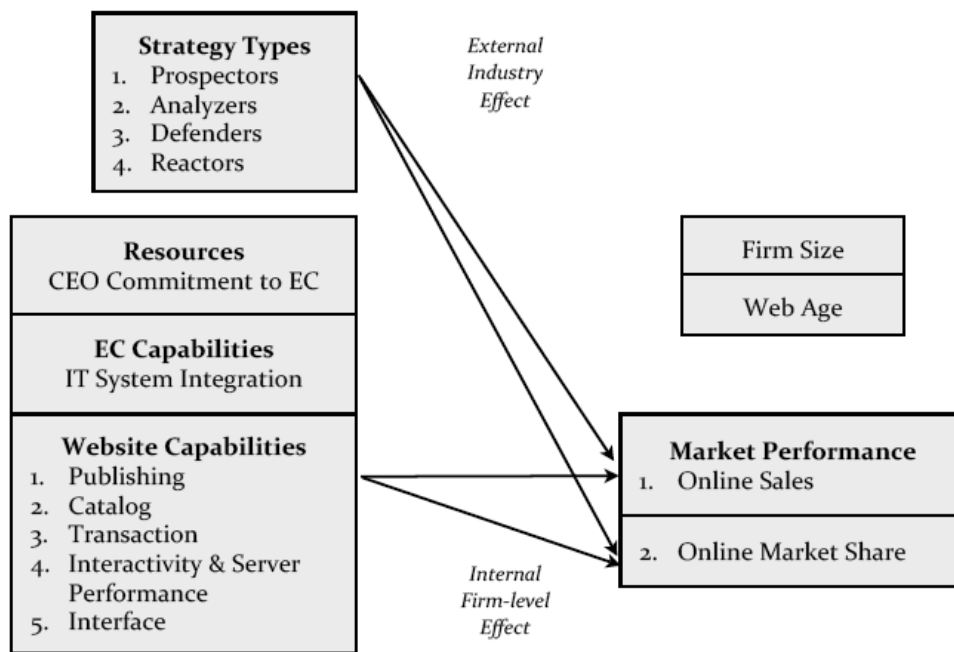
In addition, this study included Web age. Strategic management and EC research have suggested that Web age has been an important B2C factor in the strategy-performance relationship (Auger, 2005; Saini & Johnson, 2002). Firms that launched their Web sites earlier are likely to enjoy first-mover advantage (Auger, 2005; Saini & Johnson, 2002). By combining all of these B2C EC factors, this study explored their relationship with market performance in large e-brokers and SMEs.

Theories of strategic management concur with Schendel and Patton's (1978) financial model of the firm that reflects three strategic decisions: the goals of the firm (generally profit-oriented), the available means or a firm's resources allocations (internal variables) that relate to RBV, and environmental constraints (external variables) that are associated with the strategic typology framework. In addition, Rumelt (1991) attributed performance variation across firms to both internal and external factors. Hence, this financial model provides logic to integrate the strategic typology framework and the RBV to explain firm (market) performance.

METHODOLOGY

The rationale for choosing the online brokerage sector was that its industry offers financial products and information that can be digitalized and sold online instantly (Dubelaar, Tsarenko, & Gabbott, 2003; Lee & Kim, 2002; Lin, 2002; Oetzel,

Figure 1
An Integrated Model of B2C EC Factors in Explaining Market Performance



2004). The online brokerage sector is an indicator of the Internet's success in the United States and Taiwan (Chang, 2004; Saini & Johnson, 2005). In addition, online brokerage is Taiwan's second-largest sector in terms of online market scale and the only sector that has enjoyed significant growth in Taiwan (Department of Commerce, 2005). Taiwan's e-brokers conduct their brokerage services (buying and selling financial products) over the Internet.

Sample

A complete target population list was downloaded from the Taiwan Stock Exchange and Taiwan Securities Association Web sites. In September 2006, there were approximately 61 online securities brokerage firms (Trading Department of Taiwan Stock Exchange, 2006). Additionally, they provided the basis for market performance data, obtained through secondary analysis.

In addition, top managers from these 61 e-brokerage firms were a target population. Top managers, one and two levels below the CEOs, have frequent contact with CEOs and were recruited for this study because of their thoughts on CEO commitment to EC, corporate strategy types, Web site design, and IT system integration capabilities. Surveys were sent to 440 identified division heads and assistant managers. Data were collected using a combination of phone calls and mail surveys in order to have the highest possible response rate.

Of the 440 managers, 187 participated, but only 166 returned the mailed survey. Seven of these surveys were either incomplete or invalid. This resulted in a total of 159 usable responses for data analysis, representing a response rate of 36.14%. As for the firm performance data, a total of 61 e-brokerage firms comprised the accessible population. Only 52 e-

brokerage firms' financial data (online sales and market share) out of the 61 firms in the sector were used in this study, representing 85% of the population.

Measurement

A six-part questionnaire with a total of 33 items was used in this study. These parts dealt with, respectively, organizational characteristics, top managers' profile, CEO commitment, strategy types, Web site design, and IT system integration capabilities. Top managers have the authority to lead and set strategic directions for organizations and "work toward the organization's goals using its resources in an effective and efficient manner" (McNamara, 1999, p. 3). The profile of top managers contained four items—gender, age, education level, and tenure—all of which were developed by the researcher. Miles and Snow (1978) defined strategy as a pattern of an organization's critical decisions and actions. Further, Miles and Snow identified a typology that consists of four strategy types: prospectors, defenders, analyzers, and reactors.

An instrument of Miles and Snow (1978) strategy types was developed by Snow and Hrebiniak (1980). Different strategy types respond differently to the external environment. According to Miles and Snow (1978), prospectors constantly search for market opportunities. Prospectors are usually the first to respond to emerging markets and thus they create the change (set the tone) that their competitors can only follow. In contrast, defenders serve in a narrow product-market environment and focus on improving operational efficiency. Analyzers prefer a hybrid strategy that balances defenders and prospectors in the interests of operational efficiency and effective response to environmental changes. Finally, reactors do little more

than respond to environmental changes. The instrument took a categorical approach—four descriptive paragraphs that represent the four strategy types. Top managers were asked to select the descriptive paragraph (unlabeled strategic types) that seemed closest to their firm's strategy.

CEO commitment to EC refers to the level of committing passion and resources in EC. This part of the questionnaire included three items to measure CEO commitment to EC, developed by Powell and Dent-Wicallief (1997) and revised by Zhuang and Lederer (2004). A 5-point Likert scale with three items was used and the answers ranged from "strongly agree" (5) to "strongly disagree" (1).

A comprehensive Web site design that incorporates the features Internet technology uses to create Web site capabilities is defined as possessing EC capabilities (Zhu & Kraemer, 2002; Zhuang & Lederer, 2004). The Web site design capabilities questionnaire that was developed by Zhuang and Lederer (2004) consisted of six dimensions. The first dimension is interactivity: an interactive site is user-friendly (fast responses to customers). The second dimension, transaction application capability, allows online customers to conduct transactions with security and order tracking. The third, catalog application capability, provides up-to-date information about products and services that meet customers' needs. The fourth is the interface, which refers to the ease of navigation and customization. Fifth is publishing application capability, which provides the company policy and information to create customer trust. The sixth dimension is server performance, which is a site's download speed and frequent system crash.

IT system integration refers to IT systems, such as ERP, SCM, and CRM, that are coordinated to allow online information sharing and transaction execution across the value chain. The construct, developed by the researcher, has one item, measured by a 7-point scale, ranging from "no system integration at all" (1) to "completely integrated" (7).

In addition, one control variable of Web age was also included. Web age is the number of years that B2C EC online firms have been in operation (Saini & Johnson, 2002). Web age was measured by the time that e-brokers have been in operation. Firm size indicates its level of operational resources (Auger, 2005). It was measured by the number of employees. This study adopts the U.S. definition of a company with more than 500 employees' number as large, and those with fewer than 500 employees as small SMEs in this study (Holmes & Gibson, 2001).

Market performance (the dependent variable) was measured by online sales; this is a widely applied financial measure (Auger, 2005; Garbi, 2002; Motiwalla, Khan, & Xu, 2005; Rajgopal, Venkatachalam, & Kotha, 2001; Saini & Johnson, 2005). Online market share has been applied in research of e-brokerage firms (Saini & Johnson, 2005). An annual growth rate was calculated for online sales from the period of July 2005 to June 2006 and online market share (OMS) only used the June 2006 figure (an accumulated financial measure). Data for both measures were obtained from Taiwan Stock Exchange's trading department.

Convergent and divergent validity of the instrument was established using factor correlation matrix ($r < .6$). In addition, construct validity using exploratory factor analysis was established for Web site design features with factor loading higher than .4. Reliability for other instruments

was also assessed by internal consistency and inter-rater reliability estimates and all had met the minimum requirement ($\alpha > .7$ and kappa $> .7$).

RESULTS

Descriptive analyses of the final data-producing sample are presented first. Characteristics of top managers (gender,

age, education level, and tenure) are presented. As shown in Table 1, most of the managers (65%) were males. Fifty-three percent of them had bachelor's degrees and 43% had master's degrees. The mean age of the managers was 38.96 years, ranging from 32 to 48 years of age with a standard deviation of 2.63. The largest age group (45.9%) was between 38 and 40 years old, and the smallest age

Table 1
Sociodemographic Characteristics of Top Managers by Gender, Age, Education Level, and Tenure

| Demographic Variables | Frequency | Percent | Mean | Standard Deviation |
|-----------------------|-----------|---------|-------|--------------------|
| Gender | | | | |
| Female | 56 | 35.2% | | |
| Male | 103 | 64.8% | | |
| Total | 159 | 100% | | |
| Education | | | | |
| Associate's Degree | 6 | 3.8% | | |
| Bachelor's Degree | 84 | 52.8% | | |
| Master's Degree | 69 | 43.4% | | |
| Total | 159 | 100% | 2.4 | 0.56 |
| Age | | | | |
| 32-34 | 12 | 7.6% | | |
| 35-37 | 40 | 25.2% | | |
| 38-40 | 73 | 45.9% | | |
| 41-43 | 28 | 17.6% | | |
| 44-48 | 6 | 3.8% | | |
| Total | 159 | 100% | 38.96 | 2.63 |
| Tenure | | | | |
| 1-3 | 24 | 15.1% | | |
| 4-6 | 69 | 43.4% | | |
| 7-9 | 47 | 29.6% | | |
| 10-12 | 12 | 7.6% | | |
| 13-15 | 5 | 3.1% | | |
| 16-20 | 2 | 1.3% | | |
| Total | 159 | 100% | 6.32 | 3.08 |

group (3.8%) was between 44 and 48 years of age. The majority (88.6%) were between 35 and 43 years old. The mean of managers' tenure was 6.32 years with a standard deviation of 3.08. Most top managers had been with the same company for 4-6 years (43.4%), followed by 7-9 years (29.6%), 1-3 years (15.1%), and 10-12 years (7.6%).

Means and standard deviations of Web age and market performance for both large firms and SMEs are presented in Table 2. According to firm size (cut point of less than or exceeding 500 employees), 95 e-brokers were identified as large and 64 designated as SMEs. Taiwanese large e-brokerage firms had a mean of 89.47 months (approximately 7.5 years) to generate online sales, ranging from 46 to 108 months with a standard deviation of 12.58 months. Among SMEs, Web age had a mean of 70.27 months (5.9 years) with a standard deviation of 19.19 months, ranged from 22 to 104 months operating online. Large e-brokers entered the EC earlier than SMEs. In terms of online sales growth rate (OSGR), large companies had a mean of 4.11 with a standard deviation of 2.21. As for SMEs, their mean and standard deviation were 4.27 and 2.45, respectively. Not much difference was

found between large and SMEs for OSGR. In terms of OMS as in June 2006, large companies had a much higher mean of 6.15 than SMEs' 2.47 with a standard deviation of 2.32 and 1.43, respectively.

Participating managers were asked to select the paragraph that best represented their firm's strategy from among four descriptive paragraphs (representing four unlabeled strategy types). Table 3 showed means and standard deviations of large e-brokers and SMEs in terms of market performance. Comparing large and SMEs, 22 and 6 top managers, respectively, perceived their company's strategic type as prospector. Thirty-six (large) and 33 (SMEs) managers identified their strategic type as defenders. Thirty (large) and 12 (SMEs) recognized their corporate strategy to be analyzers. The smallest group identified was the reactors, which made up 7 large and 13 SMEs. In general, SMEs with prospectors, defenders, and analyzers had higher means than large e-brokers in terms of OSGR. In contrast, large firms had much higher means of OMS than SMEs across all four strategy types.

Participating managers were asked to respond to three items about their top executives' commitment to EC. Each item

Table 2
Means and Standard Deviations of Web Age and Market Performance
for Large e-Brokers and SMEs

| Descriptive Analyses | Web Age (Month) | | OSGR (in %) | | OMS (in %) | |
|----------------------|-----------------|-------|-------------|------|------------|-----------|
| | Large | SMEs | Large | SMEs | Large | SMEs |
| N (Valid) | 95 | 64 | 95 | 64 | 95 | 64 |
| Mean | 89.47 | 70.27 | 4.11 | 4.27 | 6.15 | 2.47 |
| Std. Deviation | 12.59 | 19.19 | 2.21 | 2.45 | 2.32 | 1.43 |
| Minimum | 46 | 22 | -41.90 ~12% | | 0~0.1% | |
| Maximum | 108 | 104 | above 100% | | 0.55~1.5% | 10.01~18% |

Table 3
Means and Standard Deviations of Strategy Types for Large Firms and SMEs

| Strategy Types | N | | Mean | | Std. Deviation | | Mean | | Std. Deviation | |
|----------------|-------------|------|-------|------|----------------|------|-------|------|----------------|------|
| | Large | SMEs | Large | SMEs | Large | SMEs | Large | SMEs | Large | SMEs |
| | OSGR | | | | OMS | | | | | |
| Prospector | 22 | 6 | 3.55 | 4.67 | 1.90 | 2.07 | 7.36 | 2.67 | 1.84 | 1.37 |
| Defender | 36 | 33 | 4.33 | 4.45 | 2.51 | 2.41 | 6.00 | 2.85 | 2.16 | 1.50 |
| Analyzer | 30 | 12 | 4.03 | 5.50 | 1.94 | 2.78 | 6.17 | 2.08 | 2.15 | 1.24 |
| Reactor | 7 | 13 | 5.00 | 2.46 | 2.58 | 1.39 | 3.00 | 1.77 | 2.31 | 1.17 |
| Total | 95 | 64 | 4.11 | 4.27 | 2.21 | 2.45 | 6.15 | 2.47 | 2.32 | 1.43 |

Table 4
Percent Distribution of Top Managers' Perceptions of CEO Commitment

| Item | Response Categories (Percent Distribution) | | | | | Mean | Std. Dev. |
|--|---|----------|---------|--------|----------------|-------|-----------|
| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | | |
| CEO Commitment | 1 | 2 | 3 | 4 | 5 | 3.61 | 0. |
| 1. Our top executives have clearly indicated their commitment to EC | 1.89% | 25.79% | 35.22% | 32.70% | 4.40% | 3.12 | 0.91 |
| 2. Our top executives have supported EC within the company | 1.89% | 10.69% | 25.16% | 49.69% | 12.58% | 3.60 | 0.91 |
| 3. Our top executives have shown that EC is important to the company | 0.63% | 1.89% | 12.58% | 55.97% | 28.93% | 4.11 | 0.73 |
| Dimension Score (Range 3-15) | | | | | | 10.83 | |

was rated on a 5-point Likert scale from “strongly disagree” (1) to “strongly agree” (5). Table 4 shows the percent distribution of response categories, item means, standard deviations, and dimension scores for CEO commitment. The measurement of CEO commitment had a mean score of 3.61, ranging from item one at 3.12 (the lowest), to item three at 4.11 (the highest), with a standard deviation of 0.73. Top managers perceived

item one as the most neutral (35.22%), followed by agree (32.70%), and disagree (25.9%). For items two and three, the degree of CEO commitment perception was elevated. Most top managers agreed that CEOs had either supported EC (49.69%) or shown that EC was important (55.97%). The mean for item three was the highest at 4.11 (between agree and strongly agree). Overall, the measurement had a mean dimension score of 10.83.

For the Web site design construct, which has 6 dimensions, the average mean score of the instrument was 3.79 (between “neutral” and “agree”). The highest rated dimension was publishing application, which had a mean of 3.99 (close to agree) and the lowest rated dimension was catalog application, which had a mean of 3.38 (close to neutral). Further, the dimensions of interactivity and transaction application had the same mean of 3.97 (close to agree). Interface dimension had a mean of 3.73 and the server performance dimension had a mean of 3.70.

Top managers in the e-brokerage firms were asked to rate the effectiveness of their IT system integration capability. IT system integration had a mean of 3.65 (between 31% and 70% of system integration) with a standard deviation of .47. Thirty-nine top managers perceived their IT system integration to be 31% to 50%, representing 24.5% of the total sample. Another 33 top managers believed that their IT system integration had reached 51% to 70%, making up 20.8% of the total sample. Additionally, 14 top managers perceived no IT system integration at all, while two top managers believed their IT system to be completely integrated.

For all the above independent variables, means and standard deviations were further grouped into large firms and SMEs in (Table 5). Those scale measures ranged from 2.94 to 4.13 (“neutral” to “agree”). In general, variables of large e-brokers had higher means than SMEs.

Market performance (the dependent variable) was assessed by secondary data using online transaction value (online sales) and market share. An annual OSGR had a mean of 4.16 and standard deviation of 2.30. In addition, online market share had a mean of 4.67 with a standard deviation of 2.70. The skewness of the dependent variables was under +1 or -1, meaning that the sample was normally distributed (Leech, Barrett, & Morgan, 2005).

Strategy Types and Market Performance

One-way ANOVA test with post hoc multiple comparisons using LSD was conducted (Table 6). In terms of annual OSGR, no significant differences were found among strategy types in large firms but defender and analyzer strategies significantly outperformed reactors in SMEs. In contrast, prospectors of large e-brokers had a significantly higher mean of OMS than analyzers, defenders, and

Table 5
Means and Standard Deviations of B2C EC Variables for Large Firms and SMEs

| | CEO Commit. | IT System Integ. | Web site Design | | | | |
|-------------------|----------------|---------------------|-----------------|------------|---------|-------------|-------------|
| | | | Interface | Publishing | Catalog | Intera&Serv | Transaction |
| Large Firm (N=95) | | | | | | | |
| Mean | 3.76 | 4.13 | 3.74 | 4.05 | 3.48 | 4 | 4.05 |
| Std. Dev. | 0.69 | 1.31 | 0.59 | 0.66 | 0.66 | 0.47 | 0.5 |
| SMEs (N=64) | | | | | | | |
| Mean | 3.39 | 2.94 | 3.34 | 3.84 | 3.02 | 3.79 | 3.87 |
| Std. Dev. | 0.72 | 1.48 | 0.63 | 0.59 | 0.71 | 0.45 | 0.41 |

Table 6
Significant Differences of Strategy Types for Large Firms and SMEs in OSGR and OMS: LSD Test

| Strategy Types | OSGR | | OMS | |
|----------------|-------|------|---------|------|
| | Large | SMEs | Large | SMEs |
| Prospector | | | P>A>D>R | |
| Defender | | D>R | D>R | D>R |
| Analyzer | | A>R | A>R | |
| Reactor | | | R<D<A<P | |

reactors. Defenders and analyzers had significantly higher means of OMS than reactors, but significantly lower mean than prospectors for large firms. Moreover, no significant mean difference was found between defenders and analyzers of large e-brokers. As for SMEs, defenders significantly outperformed reactors in terms of OMS.

B2C EC Factors and Market Performance of Large Firms versus SMEs

One-way ANOVA (*F* test) showed no significant difference between large firms and SMEs in terms of an annual OSGR. In contrast, large firms indeed had a significantly higher OMS than SMEs. Additionally, hierarchical multiple regression models were further investigated to see what B2C EC factors contributed to market performance in different firm sizes. Among large e-brokers, the result showed the adjusted *R*² value in model 1 was .07, meaning that 7% of variances in OSGR was explained but the model was not significant (*p* < 0.14). However, when Web age was added, the adjusted *R*² increased to .15 (*F* = 2.14, *p* < .015) in Model 2, meaning that 15% of variances in OSGR were predicted. Among all independent variables, the beta weight of catalog capability ($\beta = .37$) of Web site design was positively significant but IT system integration capability ($\beta = -.38$) and Web age ($\beta = -.$

34) were negatively significant and contributed to OSGR in model 2. For SMEs, the adjusted *R*² for both models were .15 and .14, so adding Web age had no effect on Model 2. Even though both predication models were significant, no independent variable contributed significantly to OSGR. Overall, the effect size of these models in predicting OSGR was rather small.

The OMS was another financial indicator used as the dependent variable. For large firms, the results of hierarchical multiple regression models demonstrated that the combination of all independent variables (*F*=4.83, *p*<.000) significantly predicted with the adjusted *R*² value at .36, meaning that 36% of the variances in OMS were explained in Model 1. Again, catalog capability ($\beta = .32$ in Model 1 and $\beta = .31$ in Model 2) of Web site design contributed positively and significantly. In Model 2 adding Web age, the adjusted *R*² increased from .36 to .60 (*F* = 10.32, *p* < .000), meaning that 60% of the variance in OMS in large firms was predicted. The increase in the adjusted *R*² in Model 2 indicated that the Web age (a positive and significant contributor) explained 24% of the additional variances in the OMS. IT system integration capability became a positive factor (*p* < .07) but had no significance in predicting OMS. Overall, the effect size of this model (in predicting OMS) was considered to be

large. As for SMEs, neither model (OSGR or OMS) was significant.

DISCUSSION

Based on the financial model, this study combined the resource-based view to explain firm-specific effect (firm resources and capabilities) with Miles and Snow's (1978) strategic typology as the industry effect to respond to external environment for firms of different sizes. Dramatic differences were shown in the results of strategic choices and B2C EC factors in OSGR and OMS between Taiwan's large e-brokers and its SMEs.

Top managers of SMEs should adopt defender and analyzer strategies if their purpose is to increase online sales within a year and should choose defender strategies if their intention is to increase long-term accumulated online market share. It is easier for SMEs to sell new products and services online in a niche market that can be built using limited funds and result in a quick return. However, it is harder for SMEs to reach higher market penetration that might require continuous heavy investments in advanced technologies or Internet-related technologies. Overall, SMEs should first strive for a defender strategy that works on improving cost efficiency as a long-term goal to gain market penetration; at the same time they might also try to be an analyzer in creating a niche market to gain online sales in the short run.

For OMS, the prospector strategy significantly outperformed analyzer, defender, and reactor strategy types in the e-brokerage sector. The result coincided with Saini and Johnson's findings in 2002. In addition, prospector, defender, and analyzer all outperformed reactor strategy type, consistent with theoretical proposition (Miles & Snow, 1987) and prior empirical studies (Aragon-Sanchez & Sanchez-Martin, 2005; Gibbons,

Kennealy, & Lavin, 2003). To be a winner, top managers of large e-brokers should first choose to be prospectors, which have the most adaptive capabilities and market competence (McKee et al., 1989; Saini & Johnson, 2002), to deal with a constantly changing environment. To survive in the virtual reality created by ever-evolving information technology, adaptability (innovation) and market competence become two of the most influential factors in determining long-term success (Saini & Johnson, 2002). Large e-brokers have needed funds that afford them the opportunity to make risky investments in evolving high-technology and if they succeed, the winner takes all. As a result, followers are likely to have a hard time catching up with the leader who has already penetrated the market.

Firms of different sizes had different levels of market performance. On the one hand, large firms outperformed SMEs because they have more to invest in productive human resources, to reach economies of scale, and to have market power. On the other hand, SMEs have less capital to invest, find it harder to attract talented human resources, and have weaker bargaining market power than large firms. Thus, large firms are likely to have a higher market penetration rate (accumulated OMS in this study) than SMEs.

A further investigation looked into B2C EC factors in relation to market performance among firms of different sizes and found that the catalog application capability of Web site design was the only factor that contributed positively and significantly to the two regression models (annual OSGR and OMS). This indicated that providing updated information about services and products that match customers' need through the Internet is critical in Taiwan's e-brokerage sector. Investors (customers)

are likely to perceive updated investment information as creating added value for them. As a result, top managers should focus on building and strengthening catalog application capability.

Organizational characteristics of Web age had significant and positive contributions to OMS in large e-brokers. The earlier and longer the firm operates online, the higher the OMS, indicating that first movers enjoy a certain advantage for large firms. This is consistent with current literature (Auger, 2005; Saini & Johnson, 2002). In contrast, Web age had a significant and negative impact on an annual OSGR. This might be because constant high-tech investment in Web age might erode short-term online sales, but as market penetration increases, costs are spread, and as time passes, Web age takes effect (on OMS).

In the short run, all of the variables investigated in this study could explain annual OSGR but with limited effect for SMEs. Additionally, no variables were found to explain OMS for SMEs. This might be because the theories used in this study were suitable for large firms. Researchers should look for a theory to explain market performance of SMEs (Gilinsky, Stanny, McCline, & Eyster, 2001).

Overall, prospector strategy, CEO commitment to EC, and Web site design and IT system integration were all positive explanatory factors for OMS in large firms. This supported the belief that value creation is based on the Internet's ability to provide value to online shoppers through online trading, new products and services, and information (Oetzel, 2004), all of which are made possible by IT system integration throughout the value chain (Barua et al., 2004; Ravichandran & Lertwongsatien, 2005; Zhu & Kraemer, 2002). E-brokerage firms in Taiwan need to be able to do all things in order to have

higher online market share. Doing only one thing well is not enough to succeed in the virtual world. In order to succeed in the rapidly changing EC environment, top managers of Taiwan's e-brokers should consider prospector strategy and invest firm resources into EC, bundle and leverage EC Web site design, and IT system integration capabilities to create value for customers and build a sustainable competitive advantage over competitors.

This study was the first to integrate strategy types with resources (CEO commitment to EC) and capabilities (Web site design and IT system integration), in addition to the Web age, to explain the performance of firms of different sizes. The results indicated that the regression model (OMS) was largely explained by these factors (adjusted $R^2 = .60$) in large firms but not in SMEs. The reason might be that theories in strategy are mainly built for large firms. Therefore, it might be interesting for a future study to construct a theory that specifically explains SME's firm performance.

No study is without its limitations. Due to cost and time constraints, the study applied a "one-time survey," whereas a longitudinal approach might be better for a study of firm performance. The findings in this study cannot be generalized beyond e-brokerage firms, due to the different characteristics of each sector. Specific online firm performance in e-brokerage firms was difficult to obtain beyond online sales and market share in Taiwan. As a result, perceptual indicators such as unique visitors to the site, average site traffic, and conversion rate could not be tested in this study. Top managers were the only participants from Taiwan's e-brokers and their perceptions of strategy types, CEO commitment to EC, and Web site design and IT system

integration capabilities may not be representative of all e-brokers.

Recommendations for future study are intended to extend the scope of this study. The perceptions of top managers might be biased in favor of their company. Thus, a study using customer perception should be considered as a follow-up to this study as it might link customer loyalty to market performance. Additional perceptual indicators of EC performance such as average site traffic, unique site visitors, and conversion rate, should be added to financial indicators to measure B2C EC performance more accurately.

Different methods of data analyses, such as structural equation modeling (SEM), should be conducted to examine mediating factors such as strategy type or CEO commitment to EC to see how they affect or interact with Web site design and IT system integration capabilities as well as firm performance. Other influential factors such as knowledge management can be added to explain firm performance better. Finally, a cross-country comparison of the e-brokerage sector can be conducted to see how different factors affect firm performance in different countries.

The findings of this study contribute to the understanding of B2C EC market performance for both large and small-to-medium enterprises and provide practical insights for top managers to gain sustainable competitive advantages in pursuit of superior performance. In addition, study results may also be applied to the fields of marketing and strategic management.

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