Journal of Internet Banking and Commerce

An open access Internet journal (http://www.arraydev.com/commerce/jibc/)

Journal of Internet Banking and Commerce, August 2007, vol. 12, no.2
(*http://www.arraydev.com/commerce/jibc/*)

The Diffusion of Online Banking: Research Trends from 1998 to 2006

First Author's Name: **Guosong Shao**
First Author's Title/Affiliation: **PhD Student, College of Communication and Information Sciences, University of Alabama, U.S.A.**
Postal Address: **College of Communication and Information Sciences, P.O. Box 870172, 478 Phifer Hall, University of Alabama, Tuscaloosa, AL 35487 U.S.A.**
Author's Personal/Organizational Website: ***www.ccom.ua.edu***
Email: ***gshao@bama.ua.edu***
Brief Biographic Description: Guosong Shao is currently a PhD student majoring in Mass Communication at The University of Alabama. His research interests center around development communication, marketing communication and entertainment marketing strategies.

Abstract

This paper provides a detailed picture of research trends and rigorousness in online banking research. Through content analysis, it examines the frequency, occurrence patterns, research topics, and methodological status of all previous online banking articles (N = 54). The findings of this study reveal a dominance of articles dealing with the attributes of online banking and the characteristics of adopters. The findings also show an obvious unbalance in publication sources, research perspective, research methods, and sampling techniques in online banking research. It is thus concluded that more diversified topical coverage and better methodological rigors are needed in future online banking studies. As the only trend research on online banking, this paper offers useful trend information as well as insightful directions for future research.

Keywords: **online banking, diffusion, content analysis**

When commercial banks are increasingly providing online banking, this new finance service has become an ideal choice upon which to conduct an innovation research. A small but growing number of studies have examined the diffusion of online banking. They are of interest to both academics and bank management. However, there is no paper that reflects on where the research has been. This is my main motivation for conducting this analysis. The purpose here is to investigate what have been studied on online banking and how.

THE DIFFUSION OF ONLINE BANKING

The advent of the Internet has a significant impact on banking service that is traditionally offered by the branches to the customers. With the help of the Internet, customers can do their banking anytime and anywhere as long as Internet access is available. This new type of service has been called "online banking" or "Internet banking." It can be defined as performing financial transactions over the Internet through a bank's website. Customers are not the only beneficiary of this new service. Making use of online banking, commercial banks may greatly increase the market coverage and better track customers as well.

In spite of those advantages, online banking has not been equally adopted in all parts of the world. In the U.S., for example, 44% of all Internet users have been using some forms of online banking services (Fox & Beier, 2006). But in China only 14% of Internet users were reported to be using Internet banking (Fang, 2006). This gives rise to some important questions: to what extend will online banking be adopted around the world? What factors arte driving/inhibiting its adoption? How can we speed up its adoption rate? Not surprisingly, many researchers on online banking have found the diffusion theory very useful in examining these questions.

Diffusion refers to the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1962). In reality, getting a new idea adopted is often difficult even when it has some relative advantages. So a common problem associated with innovation is how to speed up the rate of its adoption. In this regard, Rogers (1962, 1995)'s work is most frequently cited. He states that five traits of an innovation, including relative advantage, compatibility, complexity, trialibility, and observability, determine the speed of its adoption. He also suggests that adopters of any new innovation or idea could be partitioned into five categories, namely, innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%), based on the adopters' innovativeness. In addition, individual adoption generally consists of five stages: knowledge, persuasion, decision, implementation, and confirmation.

While the abovementioned innovation and individual factors influence the diffusion of an innovation, so do the system and societal factors. These may include the organizational aspiration to reduce cost, achieve competitive advantage, or protect the organization's strategic position (Bass, 1969; Johannessen et al., 1999). Marketing and management scholars argue that the more intensive the competition within an industry, the higher is the rate of imitation of innovations and the faster the pace of adoption (see Mansfield, 1968; Romeo, 1977). Regarding the social structure influencing the diffusion of innovations, it often involves social norms, opinion leaders, and change agents. The

impact of the social structure on diffusion is of special interest to sociologists, social psychologies, and communication scholars.

Regard online banking, it is argued to be a disruptive innovation in banking industry. Hensmans et al. (2001) note that online banking is not only a new distribution channel but also a driver of comprehensive industrial change. It thus provides an ideal context in which the diffusion theory could be tested. In the past decade, an increasing number of studies have investigated Internet banking from the diffusion perspective, but there is a lack of research trend study on this cumulative literature. In this regard, the present study attempts to investigate what have been studied on online banking and how. Specifically, it would like to examine the frequency, occurrence patterns, research topics, and methodological status of all previous online banking studies that have been published by academic journals.

METHOD

The author conducted a content analysis because it could identify what has been done, identify categories of frequent inquiry, and, to a limited extent, unearth some basic trends in the research conducted in this area (Reinard & Ortiz, 2005). Research literature for analysis was limited to journal articles, which tend to capture the most recent scholarship from the broadest array of scholars. The author took three steps to identify journal articles that have applied the diffusion theory to online banking. Firstly, three complementary electronic databases, including Business Source Premier, ABI/INFORM Complete, and Social Science Citation Index, were searched for “diffusion” and “online banking” or for “diffusion” and “Internet banking” (Givens the research purpose of this study, the author used the term “online banking” in exchange with “Internet banking” while excluding other electronic banking such as telephone banking, iNet-television banking and WAP-banking). 28 unique articles were obtained by this way. Secondly, bibliographies were checked for all studies that were identified during the first stage. Any uniquely cited study that seemed to apply the diffusion theory to online banking was examined. So the author retrieved 10 more unique articles. Thirdly, it was found that many of the articles obtained during the first and second stages came from the two journals that focus specifically on this issue, i.e., *Journal of Internet Banking and Commerce* and *International Journal of Bank Marketing*. So the author examined these two journals separately and thoroughly, retrieving 16 more unique articles. In total, 54 journal articles were identified, and their publication spanned 9 years with the first article appearing in 1998 and the latest one in 2006 (The data collection was finished in December 2006).

Each article was coded for journal name, publication year, research topics, research methods, research purpose, research perspective, sampling methods, sample size, sampling population, targeted geographic areas, and statistical techniques. The journal name and publication year were coded because they could provide some trend information about which journal published more studies on the diffusion of online banking and how much weight was assigned to this issue over time.

The research topics refer to the main subjects that were investigated in the articles. The author developed the coding framework for the research topics inductively as the analysis proceeded. It was found that the purpose of almost all online banking studies

was to investigate the factors that influenced the speed of online banking adoption. So the author identified four categories of factors as research topics, namely, innovation factors, adopter factors, system factors, and social factors. Each category included several sub-factors, and the total number of sub-factors was 20, most of which were developed from Roger's (1995) diffusion research (see Table 1). Each article was coded in terms of the key factors that it examined.

Table 1: Factors influencing the diffusion of online banking

Innovation factors
1. Relative advantages (the degree to which online banking is perceived as being better than traditional banking; such as convenience, economic benefits, and quick service)
2. Compatibility (be consistent with existing values, past experiences and potential needs of adopters)
3. Complexity (the degree to which online banking is perceived as difficult to understand and use)
4. Trialbility (the degree to which online banking may be experimented with on a limited basis)
5. Observability (the degree to which the results of online banking are visible to others)
6. Risk (security concern, trust, and etc.)
Adopter factors
7. Demographic variables (household income, age, education, and etc.)
8. Personality variables (empathy, rationality, aspiration, and risk tolerance, and etc.)
9. Innovativeness need (self-actualization need for adoption such as for work or pleasure)
10. Self-efficacy (beliefs about one's ability to adopt and use online banking service)
11. Communication behavior (social participation, cosmopoliteness, mass media usage, interpersonal communication channels, and etc.)
System factors
12. Organizational innovativeness (attitude toward change, centralization, formalization, interconnectedness, organizational slack, size, system openness, and etc.)
13. Industry trends (the widespread adoption of Internet, information infrastructure, and etc.)
14. Market competition (adopting online banking to gain competitive advantage or competitive necessity)
15. Government policy/regulations (governmental support or regulation)
Social factors
16. Opinion leadership (individuals who lead in influencing others' opinion about online banking)
17. Change agents (individuals who influence clients' online banking adoption decision in a direction deemed desirable by a change agency)
18. Social norms (the established behavior patterns for the members of a social system)
19. Advertising (advertisement publicized in mass media)
20. Critical mass (the point at which enough individuals have adopted the online banking so that its further rate of adoption becomes self-sustaining)

Each article was also coded for the research methods so that we could understand which method was more frequently used by researchers when examining the phenomena of online banking diffusion. The research methods here included survey, content analysis, experiment, observation, case study, in-depth interview, group study, critique, and secondary data. This information was also helpful for us to understand the research perspectives (i.e., quantitative or qualitative) adopted by each article. If an article used survey, content analysis, or experiment, it would be coded as quantitative research; otherwise it would be coded as qualitative. Additionally, each article was

coded in terms of research purpose. Was it descriptive, exploratory, or explanatory? Descriptive research refers to the study that mainly describes characteristics of a phenomenon. Exploratory research is the one that mainly clarifies the nature of a problem unexamined previously. Explanatory study refers to one that mainly predicts something based on cause-effect investigation. The research purpose was coded by examining the statement and content of hypotheses and/or research questions included in each paper.

To see how the sampling techniques were used in the literature, the author coded each article for three key sampling issues: sampling methods, the representation of a sample to its population, and the adequacy of the sample size. Sampling methods generally consist of non-probability sampling (simple random, systematic random, stratified, and cluster) and probability sampling (convenience, judgment, quota, and snowball). Regarding the representativeness of their samples, the author examined whether a priori determination about generalizability was stated or implied in the articles. An article would be coded to have a priori if it conducted statistical tests of the sample's representativeness, identified the population that the study may generalize to, or acknowledged that a sample lacked representativeness.

The author also coded whether researchers selected a particular sample size based on cost, error reduction, statistical power, or did not specify a reason. Additionally, the adequacy of sample size was roughly assessed based on the statistical tools used. If descriptive statistics such as mean and frequencies were used, any sample size would be coded as adequate. If more complicated tools such as factor analysis and multiple regressions were used, a sample size of 200 or more would be coded as adequate and otherwise inadequate. Accordingly, the author coded the statistical tools (e.g., frequency, difference, AN(C)OVA, MANOVA, correlations, regression, and factor analysis) employed by each article. This information would be useful in assessing the statistical rigor of online banking research.

The sampling population (e.g., bank customer, Internet users, general public, bank managers, etc.) was also coded for each article. This provided information about what sample was more frequently or rarely employed in the online banking research. The sampling country (e.g., U.S., U.K., China, South Africa, etc.) was also coded for the purpose of examining which country was more frequently studied on the issue of online banking diffusion.

Coders were two doctoral students majoring in social science. An inter-coder reliability of a sample of 10 articles (20%) showed 91% agreement (Krippendorf's alpha). The highest agreement was on research perspective (i.e., qualitative versus quantitative) (96%) and the lowest agreement was on research topics (i.e., the factors influencing the rate of online banking adoption) (88%).

RESULTS

As mentioned earlier, a total of 54 articles on Internet banking were identified. Their publication spanned 9 years with the first article appearing in 1998 and the latest one in 2006. Table 2 shows frequencies and percentages of these articles by each journal and time frame. Among a variety of journals, *International Journal of Bank Marketing* (IJBM.

40.7%) and *Journal of Internet Banking and Commerce* (JIBC, 18.5%) had the highest proportion of all online banking research articles, followed by *Journal of Financial Services Marketing* (JFSM, 3.7%), *Internet Research* (IR, 3.7%), and *Electronic Markets* (EM, 3.7%). In addition, the remaining 29.6% came from 16 other journals, each of them contributing one article on Internet banking. Equally dividing the 9 years into three time periods, 1998-2000, 2001-2003, and 2004-2006, we found there was an obvious patter of change in the proportion of online banking research articles: 13.0% were published during the first three years; this number increased to 55.5% for the second three years but decreased to 31.5% for the last three years.

Table 2: Publication trend

	1998-2000	2001-2003	2004-2006	Total
IJBM	3 (5.6%)	8 (14.8%)	11(20.4%)	22 (40.7%)
JIBC	0(0%)	4 (7.4%)	6 (11.1%)	10 (18.5%)
JSFM	0 (0%)	2 (3.7%)	0 (0%)	2 (3.7%)
IR	2 (3.7%)	0 (0%)	0 (0%)	2 (3.7%)
EM	0 (0%)	2 (3.7%)	0 (0%)	2 (3.7%)
Others	2 (3.7%)	14 (25.9%)	0 (0%)	16 (29.6%)
Total	7 (13.0%)	30 (55.5%)	17 (31.5%)	54 (100%)

Table 3: Factors most and least studied

Overall rankings (N = 54)	*Time period*
1. Relative advantages (35) (64.8%)	*1998-2000 (N = 7)*
2. Risk (35) (64.8%)	1. Compatibility (3) (42.9%)
3. Complexity (28) (51.9%)	2. Demographic variables (3) (42.9%)
4. Demographic variables (28) (51.9%)	3. Innovativeness needs (3) (42.9%)
5. Compatibility (26) (48.1%)	4. Relative advantages (2) (28.6%)
6. Innovativeness needs (22) (40.7%)	5. Complexity (2) (28.6%)
7. Self-efficacy (11) (20.4%)	
8. Organizational innovativeness (10) (18.5%)	*2001-2003 (N = 30)*
9. Opinion leadership (9) (16.7%)	1. Relative advantages (20) (66.7%)
10. Triability (8) (14.8%)	2. Risk (19) (63.3%)
11. Personality (7) (13.0%)	3. Complexity (13) (43.3%)
12. Market competition (6) (11.1%)	4. Demographic variables (12) (40.0%)
13. Government policy (6) (11.1%)	5. Compatibility (12) (40.0%)
14. Critical mass (4) (7.4%)	
15. Advertising (4) (7.4%)	*2004-2006 (N = 17)*
16. Observability (4) (7.4%)	1. Relative advantages (13) (76.5%)
17. Communication behavior (4) (7.4%)	2. Risk (13) (76.5)
18. Social norms (1) (1.9%)	3. Complexity (13) (76.5)
19. Industry trends (1) (1.9%)	4. Demographic variables (12) (70.1%)
20. Change agents (0) (0%)	5. Compatibility (11) (64.7%)

Although research on the diffusion of online banking was relatively limited, coverage was apparently unbalanced with many important issues receiving scant attention. As shown in Table 3, relative advantages (64.8%), risk (64.8%), complexity (51.9%), demographic variables (51.9%), and compatibility (48.1%) were overall the most frequently studied factors (the percentage here represented the proportion of the articles that studied certain factor. For example, 64.8% of the articles investigated the relative advantages of

online banking as the determinants of its adoption rate). This was followed by innovativeness needs (40.7%), self-efficacy (20.4%), organizational innovativeness (18.5%), opinion leadership (16.7%), and triability (14.8%). The factors least often studied included change agents (0%), industry trends (1.9%), social norms (1.9%), communication behavior (7.4%), and observability (7.4%), advertising (7.4%), and critical mass (7.4%). During the first 3 years, combining all journals, the top three factors most often examined were compatibility, demographic variables, and innovativeness need. During the second as well as last three years, they were relative advantages, risk, and complexity.

Table 4: Research methods

Research method	1998-2000	2001-2003	2004-2006	Total
Survey	5 (71.4%)	17 (56.7%)	16 (94.1%)	38 (70.4%)
Content analysis	0 (0.0%)	1 (3.3%)	0 (0%)	1 (1.9%)
Experiment	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Secondary data	1 (14.3%)	4 (13.3%)	2 (11.8%)	7 (13.0%)
In-depth interview	0 (0%)	2 (6.7%)	0 (0%)	2 (3.7%)
Group study	0 (0%)	2 (6.7%)	0 (0%)	2 (3.7%)
Observation	1 (14.3%)	0 (0%)	0 (0%)	1 (1.9%)
Critique/essay	0 (0%)	2 (6.7%)	1 (5.9%)	3 (5.6%)
Total	7 (100%)	30 (100%)	17 (100%)	54 (100%)

Table 5: Sampling issues

Sampling issues	Sub-issues	Number of articles
A priori assessed representativeness		34 (76%)
Non-probability sampling		31 (68.9%)
	Quoto	1 (2%)
	Judgment	12 (27%)
	Convenience	18 (40%)
	Snowball	0 (0%)
Probability sampling		14 (31%)
	Simple	0 (0%)
	Stratified	8 (18%)
	Systematic	2 (4%)
	Cluster	4 (9%)
Adequate sample size		36 (80%)
Reasons for sample size		12 (27%)
	Error reduction	5 (11%)
	Cost	6 (13%)
	Statistical power	1 (2%)
No reason for sample size		33(73%)
Total		45 (100%)

Table 4 shows that considering all online banking articles in the past 9 years, surveys (70.4%) was the most frequently employed research method. It was followed by secondary data (13.0%) and critique/essay (5.6%). Experiment (0%) was not used at all. This patter was constant across three time periods. Also, table 5 shows that 76% of all 45 survey-related studies (including those using secondary data) included a priori assessment of representativeness such as a statistical test or a discussion of the

limitation of the sample. In addition, about two third of the studies selected non-probability samples while the remaining one third used probability ones. Specifically, the most frequently used sampling methods were convenience (40%) and judgment (27%). Judged from the statistical tools they selected, this analysis revealed that 80% of these studies obtained adequate sample size, but 73% failed to offer reasons for sample size.

Table 6 shows a comparison of quantitative versus qualitative research perspectives: 85.2% of the articles employed quantitative research methods while 14.8% employed qualitative research methods. This patter was 85.7% for quantitative versus 14.3% for qualitative for the first three years, 73.3% versus 26.7 for the second three years, and 94.1% versus 5.9% for the last three years. With regard to the research purpose, descriptive research (42.6%) consisted of the largest proportion of all Internet banking studies. It was followed by explanatory (33.3%) and exploratory (24.4%). By time frame, during the first three years, the pattern was 57.1% for explanatory, 42.9% for descriptive, and 0% for exploratory; during the second three years, it was 43.3% for exploratory, 36.7% for descriptive, and 20% for explanatory, and during the last three years, it was 53% for descriptive, 47% for explanatory, and 0% for exploratory.

Table 6: Research perspective and research purpose

	1998-2000	2001-2003	2004-2006	Total
Quantitative	6 (85.7%)	22 (73.3%)	18 (94.1%)	46 (85.2%)
Qualitative	1 (14.3%)	6 (26.7%)	1 (5.9%)	8 (14.8%)
Total	7 (100%)	30 (100%)	17 (100%)	54 (100%)
Descriptive	3 (42.9%)	11 (36.7%)	9 (53.0%)	23 (42.6%)
Exploratory	0 (0%)	13 (43.3%)	0 (0%)	13 (24.1%)
Explanatory	4 (57.1%)	6 (20%)	8 (47.0%)	18 (33.3%)

Table 7: Sampling population most often employed

Overall ranking (N = 54)	*2001-2003 (N = 30)*
1. Bank customers (18) (33.3%)	1. Bank customers (10) (33.3%)
2. General public (9) (16.7%)	2. Bank managers (5) (16.7%)
3. Internet users (8) (14.8%)	3. General public (4) (13.3%)
4. Bank managers (7) (13.0%)	4. Internet users (3) (10.0%)
5. Banks (5) (9.3%)	5. Banks (3) (10.0%)
1998-2000 (N = 7)	*2004-2006 (N = 17)*
1. Bank customers (2) (28.6%)	1. Bank customers (6) (35.3%)
2. Banks (2) (28.6%)	2. Internet users (4) (23.5%)
3. General public (1) (14.3%)	3. General public (4) (23.5%)
4. Internet users (1) (14.3%)	4. Student (2) (11.8%)
5. Bank managers (1) (14.3%)	5. Bank managers (1) (5.9%)

Overall, bank customers (33.3%,18 out of 54) was the sampling population that was most often employed by online banking researchers. This was followed by general public (16.7%), Internet users (14.8%), bank managers (13.0%), and banks (9.3%). During the first three years, the sampling populations most often used were bank customers

(28.6%), banks (28.6%), and general public (14.3%). During the second three years, they were bank customers (33.3%), bank managers (16.7%), and general public (13.3%). During the last three years, they were bank customers (35.3%), Internet users (23.5%), and general public (23.5%) (see Table 7).

Overall, 37% of the studies (20 out of 54) focused on European countries regarding the diffusion of online banking, 35.2% on Asian countries, 18.5% on North American countries, 5.5% on Africa countries, 3.7% on Australian countries, and none on South American countries. By period, during the first three years, European countries (57.1%) were studied far more frequently than the countries of other continents; during the second three years, the most often studied countries were in Europe (46.7%), Asia (26.7%), and North America (26.7%), and during the last three years, Asia countries (58.8%) were studied far more frequently than others (see Table 8).

Table 8: Geographic areas

	1998-2000	2001-2003	2004-2006	Total
Asia	1 (14.3%)	8 (26.7%)	10 (58.8%)	19 (35.2%)
Europe	4 (57.1%)	14 (46.7%)	2 (11.8%)	20 (37.0%)
N. America	1 (14.3%)	8 (26.7%)	1 (5.9%)	10 (18.5%)
S. America	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Australia	1 (14.3%)	0 (0%)	1 (5.9%)	2 (3.7%)
Africa	0 (0%)	0 (0%)	3 (17.6%)	3 (5.5%)
Total	7 (100%)	30 (100%)	17 (100%)	54 (100%)

Table 9: Statistical tools most often employed

Overall ranking (N = 54)	*2001-2003 (N = 30)*
1. Frequencies (29) (53.7%)	1. Frequencies (19) (63.3%)
2. Factor analysis (17) (31.5%)	2. Factor analysis (10) (33.3%)
3. Regression (16) (29.6%)	3. Regression (8) (26.7%)
4. Differences (13) (24.1%)	4. Correlations (4) (13.3%)
5. Correlations (7) (13.0%)	5. Differences (4) (13.3%)
1998-2000 (N = 7)	*2004-2006 (N = 17)*
1. Frequencies (3) (42.9%)	1. Differences (8) (47.1%)
2. Correlations (2) (28.6%)	2. Frequencies (7) (41.2%)
3. Regression (2) (28.6%)	3. Regression (6) (35.3%)
4. Factor analysis (2) (28.6%)	4. Factor analysis (5) (29.4%)
5. Differences (1) (14.3%)	5. MANOVA (1) (5.9%)

Table 9 shows that the statistical tool most frequently used in online banking research was frequencies/percentages (53.7%, 29 out of 54), followed by factor analysis (31.5%), regression (29.6%), differences (24.1%), and correlations (13.0%). During the first three years, the most prevalent tools were frequencies (42.9%), correlations (28.6%), regression/factor analysis (both 28.6%); during the second three years, they were frequencies (63.3%), factor analysis (33.3%), and regression (26.7%), and during the last three years, they were differences (47.1%), frequencies (41.2%), and regression (35.3%).

SUMMARY AND DISCUSSION

The present study was the only trend study regarding the diffusion of online banking. The main goal was to provide a detailed picture of research trends and rigorousness in online banking diffusion research, and also to provide insightful directions for future studies that attempt to further our understanding of online banking.

The study found that about 60% of research articles were published by *International Journal of Bank Marketing* and *Journal of Internet Banking and Commerce.* This is consistent with the nature of these two journals. By time frame, this study confirmed a pattern of change in terms of the number of online banking studies: from 1998 to 2000, 13% were published; from 2001 to 2003, 55.5% published, but from 2004 to 2006, the number decreased to 31.5%. This pattern was somewhat similar to a diffusion curve. It is argued that online banking is still in its growth stage so that we may expect the number of online banking research will continue to increase to keep pace with the rate of its adoption around the world.

The findings of topical analyses illustrated a long-familiar pattern in the innovation diffusion research, i.e., the dominance of articles dealing with the attributes of innovations (especially relative advantages, risk, complexity, and compatibility) and the characteristics of adopters (especially the demographic variables) (e.g., Black et al., 2001; Eastin, 2002; Eriksson et al., 2005; Gerrard & Cunningham, 2003; Karjaluoto et al., 2002; Lee et al., 2005; Polatoglu & Ekin, 2001). These factors were argued to be the key determinants on the rate of adopting online banking, and had also been examined by scholars across a number of countries around the world. No doubt other traits of Internet banking remain to be identified, and future studies may need to identify certain traits that are unique to certain countries or cultures.

Many studies analyzed the impact of adopters' demographic variables such as income, education, and age on the rate of online banking diffusion (e.g., Akinci, 2004; Howcroft et al. 2002; Jayawardhena & Foley, 2000; Ostlundt, 1974; Polatoglu & Ekin, 2001; Sathye, 1999). In addition to socioeconomic status, however, there are many important differences between adopters/non-adopters or early adopters/late adopters in personality variables and communication behavior. Rogers (1995) suggests that earlier adopters have greater empathy, less dogmatism, less fatalism, greater rationality, great intelligence, and a more favorable attitude toward change. He also proposes that early adopters have more social participation, are more cosmopolite, engage in more active information seeking, and have greater exposure to mass media as well as interpersonal communication channels. More studies are needed to test such positions or explore further in terms of adopters' personality and communication behavior. Such effort could be of great importance in segmenting customer in practice.

The diffusion of an innovation such as online banking is influenced not only by those innovation and adopter variables but also by some system and social factors, among which organizational innovativeness, government regulation, and opinion leadership had commonly been discussed (e.g., Bradley & Stewart, 2003; Gurau, 2002) whereas industry trends, change agents, and social norms were largely neglected. Such neglect is somewhat unreasonable. Change agents could actually be a key player in, for example, developing a need for change, diagnosing customer's problem, creating intent in the clients for change, and stabilizing adoption and preventing discontinuance. Future

research need to address this important issue. Also, future studies should pay more attention to the social norms/cultures, especially given the fact that many elements in Rogers' diffusion theory may be specific to the culture in which it was derived (i.e. North America) and hence less relevant in Asia, Africa, or Latin America.

Future research may also horizontally compare online banking with other bank services such as branch networks, ATMs, telephone banking. It is noteworthy that such comparison may reveal which combination of these distribution channels are likely to lead to the quickest adoption of online banking as well as the most satisfied customers. Additionally, since most of previous works were conducted with a snapshot research approach, longitudinal evidence would help us further understand the relationship between variables that affect the adoption of online banking by individuals.

In terms of research methods employed by online banking research, this study revealed that survey was far more prevalent than any other methods for each timeframe. It implies that future research needs to diversify the data collecting methods for the purpose of achieving multiple perspectives to study the diffusion of online banking. For survey research, sampling techniques is of great importance. The analyses shows that we may need more probability sampling since 68.9% of overall online banking research used non-probability sampling methods.

Research perspective was obviously unbalanced since 85.2% of all online banking diffusion articles employed quantitative research methods whereas only 14.8% employed qualitative research methods. Furthermore, this patter was consistent over time frames. Regarding the research purpose, this study demonstrated that overall the largest proportion of the online banking studies was descriptive. Surprisingly, this paper found that during the first three years there was no exploratory research, although Internet banking was at its very early stage. Furthermore, the largest proportion of the studies was still descriptive during the last three years, although online banking had been used for more than 6 years.

Regarding the sampling population, the present study found that online banking studies targeted bank customers more frequently than any others. In addition, 90% of the studies overall focused on Europe, Asia, and North America when investigating the diffusion of online banking. Future studies need to pay more attention to South America, Africa, and Australia. By time frame, we found that there was a shift of study focus from European countries to Asian countries since in the first three years the largest proportion of studies focused on European countries, but in the last three years the largest proportion focused on Asian countries.

With regard to the statistical methods employed in the online banking research, we found that the largest proportion of the studies used such basic descriptive statistical tools as frequencies and difference for each timeframe. We thus need to achieve enhanced statistical rigor for Internet banking research by employing more advanced inferential tools such as MANOVA, SEM, and multiple regression.
While this content analysis offered useful information to online banking researchers and practitioners, its limitations must be indicated. Firstly, since the articles were retrieved mainly from three databases (i.e., Business Source Premier, ABI/INFORM Complete, and Social Science Citation Index) and two specific journals (i.e., *International Journal of*

Bank Marketing and *Journal of Internet Banking and Commerce*), they did not stand for the entire body of online banking studies. If the industry reports and online banking papers that appeared in conference proceedings were included, for example, there might be a different picture of the topical and methodological trends. Secondly, like other content analyses, this study too suffered from a "learning" bias to some extent. For example, some topics were originally unexpected, but after appearing several times, it would be regarded as regularity, and thus wrongly given more consideration in the following coding. Finally, when it occurred to topical analysis, the present study focused on the factors that determined the rate of its adoption. They did not by any means represent the entire topical coverage of online banking studies. Therefore, in the future research, it would be valuable to cover more topic issues when conducting the trend study on online banking research.

Reference

Akinci, S., Aksoy, S., & Atilgan, E. (2004). Adoption of Internet banking among sophisticated consumer sements in an advanced developing country. *International Journal of Bank Marketing, 22* (3), 212-232.

Barnet, H. G. (1953). *Innovation: The basis of cultural change.* New York: McGraw-Hill.

Bass, F. (1969). A New Product Growth Model for Consumer Durables. *Management Science Theory*, 15 (5), 215-227.

Black, N. J., Lockett, A., Winklhofer, H., & Ennew, C. (2001). The adoption of Internet financial services: A qualitative study. *International Journal of Retail & Distribution Management, 29* (8), 390-398.

Bradley, L., Stewart, K. (2003). A Delphi study of Internet banking. *Marketing Intelligence & Planning, 21* (5), 272-281.

Eastin, M. (2002). Diffusion of e-commerce: An analysis of the adoption of four e-commerce activities. *Telematics and Informatics, 19,* 251-267.

Eriksson K., Kerem, K., & Nilsson, D. (2005). Customer acceptance of Internet banking in Estonia. *International Journal of Bank Marketing, 23* (2), 200-216.

Fang, Y. (2006). Forecasting the number of online banking users in China. *China Inforworld*, September 20.

Fox, S., & Beier, J. (2006). Online banking 2006: Surfing to the bank. *Pew Internet & American Life Project*. Internet page, available at: www.pewinternet.org/PPF/r/185/report_display.asp

Gerrard, P., & Cunningham, J. B. (2003). The diffusion of Internet banking among Singapore consumers. *International Journal of Bank Marketing, 21* (1), 16-29.

Gurau, C. (2002). Online banking in transition economies: The implementation and development of online banking systems in Romania. *International Journal of Bank Marketing, 20* (6), 285-296.

Hensmans, M., Van den Bosch, F., & Volberda, H. W. (2001). Clicks vs. bricks in the emerging online financial services industry. *Long Range Planning, 34,* 231-247.

Howcroft, B., Hamilton, R., & Hewer, P. (2002). Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *International Journal of Bank Marketing, 20* (3), 111-121.

Jayawardhena, C., & Fole, P. (2000). Changes in the banking sector-the case of Internet banking in the UK. *Internet Research: Electronic Networking Applications and*

Policy, 10 (1), 19-30.

Johannessen, J., Olaisen, J., & Olsen, B. (1999), Managing and organizing innovation in the knowledge economy. *European Journal of Innovation Management, 2* (3), 116-128.

Lee, E., Kwon, K., Schumann, D. W. (2005). Segmenting the non adopter category in the diffusion of internet banking. *International Journal of Bank Marketing,* 23 (5), 414-437.

Mansfield, E. (1968). *Industrial Research and Technological Innovation.* New York: W. W. Norton.

Ostlundt, L.E. (1974), Perceived innovation attributes as predictors of innovativeness. *Journal of Consumer Research*, 1, 23-29.

Polatoglu, V., & Ekin, S. (2001). An Empirical Investigation of the Turkish consumers' acceptance of Internet Banking services. *International Journal of Bank Marketing*, *19* (4/5), 156-165.

Reinard, J., & Ortiz, S. M. (2005). Communication Law and Policy: The state of Research and Theory. *Journal of Communication, 55* (3), 594-631.

Rogers, E. M. (1962). *Diffusion of Innovations*. New York: The Free Press.

Rogers, E. M. (1995). *Diffusion of Innovations,* Fourth Edition. New York, The Free Press.

Romeo, A. (1977). The rate of imitation of a capital-embodied process innovation. *Economica, 44,* 63-69.

Sathye, M. (1999). Adoption of Internet banking by Australian consumers: An empirical investigation. *International Journal of Bank Marketing, 17* (7), 324-334.