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An Empirical Investigation on the Economic Consequences of Customer Satisfaction

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ABSTRACT *The relationship between customer satisfaction and economic returns has received growing attention in the customer satisfaction literature. However, there has been limited work linking customer satisfaction to customer profitability. Specifically, most empirical studies conduct firm-wide or business-level tests, but few investigate if individual customers' satisfaction with products or services drives their purchase intentions and economic contributions to the firm. Using panel data from 36 retail branch banks managed by an international financial institution (RBANK), which consists of two customer satisfaction data-points over nine months and monthly-activity based customer profitability data, this study examines how individual customers' satisfaction impacts customer revenue, customer costs, and customer profitability. The results indicate that several dimensions of customer satisfaction are positively associated with individual customers' repurchase intentions and firm reputation. The effect of the responsiveness dimension dominates the effect of other dimensions in most tests. At RBANK, individual-level customer revenue and costs both increase as customer satisfaction improves, but no significant relation exists between customer satisfaction and customer profitability. These findings shed light on several management issues, such as market segmentation, customer retention, and the implementation of a balanced scorecard. Furthermore, this study highlights a way for managers to analyze customer value, which is beneficial for long-term customer relationship management.*

KEY WORDS: Customer satisfaction, customer profitability, activity-based costing, banking industry

Introduction

In response to an increasingly competitive marketplace, a growing number of organizations are actively using customer satisfaction measures in developing, monitoring, and evaluating product and service offerings (Anderson *et al.*, 1994). More and more research

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attention is also being devoted to factors contributing to desirable customer outcome (Liao & Chuang, 2004). It is widely believed that higher customer satisfaction leads to superior economic returns.

To date, however, the empirical evidence is still mixed, although how customer satisfaction measures relate to financial performance has been examined in some studies (e.g. Anderson *et al.*, 1994; Ittner & Larcker, 1998a; Banker *et al.*, 2000; Riley *et al.*, 2003). Most of those studies used traditional accounting performance for a specific aggregated unit, such as firm-wide operating profits or business-level returns on assets to measure financial performance. Thus, the general belief that higher economic returns come from more satisfied customers still remains unproved.

Using panel data from 36 retail branch banks managed by an international financial institution, which consists of two customer satisfaction data-points over nine months and monthly-activity based profit data, this study empirically examines two research questions. (1) How will customer satisfaction affect existing customers' purchase behavior? (2) Does higher customer satisfaction lead to higher customer revenue, costs, and profitability? The evidence indicates that several dimensions of customer satisfaction are positively associated with individual customers' repurchase intentions and firm reputation. The effect of the responsiveness dimension dominates the effect of other dimensions in most tests. Individual customer revenue and costs both increase as customer satisfaction improves. Surprisingly, no significant relation exists between customer satisfaction and customer profitability.

Findings from this study shed light on several management areas. The first is customer relationship management. Understanding how each dimension of customer satisfaction relates to repurchase intentions, customer revenue, costs, and profits can assist managers in finding out those attributes most valued by customers and thus gives them guidance in delivering customer value to existing customers. The second is market segmentation. Cross-analyzing customers along two dimensions, i.e. customer satisfaction and profitability, helps managers segment the market and further target customers. The third management area is a balanced scorecard. While implementing a balanced scorecard, managers have to translate missions and strategy into measurable objectives (Kaplan & Norton, 1997). The finding on the link between customer satisfaction measures and future economic returns is beneficial for managers to select lead indicators in the customer perspective of a balanced scorecard.

The reminder of this study is organized as follows: related literature is reviewed in the next section. Research site and data collection are described in the third section. Estimation models and tests are developed in the fourth section. The results are presented in the fifth section. Conclusions are summarized in the sixth section.

Literature Review

The benefits of customer satisfaction are well recognized both in practice and in the marketing literature. In the academics, consistently providing high customer satisfaction is well acknowledged to be associated with higher customer loyalty and enhanced reputation (Fornell, 1992; Anderson & Sullivan, 1993; Wangnheim & Bayon, 2004). An enhanced reputation can further aid in introducing new products by providing instant awareness and the lowers costs of attracting new customers (Robertson & Gatignon, 1986; Schmalansee, 1978). Customer loyalty can lead to increased purchase intentions, helps

to secure future revenues (Fornell, 1992; Rust & Zahorik, 1993; Rust & Keiningham, 1994), reduces the costs of future transactions (Reichheld & Sasser, 1990), decreases price elasticity (Anderson, 1996), and minimizes the likelihood that customers will defect (Anderson & Sullivan, 1993). With the above fundamental belief, firms strive for higher customer satisfaction. Among 203 firms surveyed in 1996 on the uses, quality, and perceived importance of financial and non-financial performance measures, 85% of them highly valued customer satisfaction information and 37% link customer satisfaction measures to compensation (Ittner & Larcker, 1998b).

Improving customer satisfaction is not costless. In economics, customer satisfaction is defined as the function of product and service attributes. Offering more attributes desired by customers usually increases costs. Anderson *et al.* (1997) further divided quality into customization quality and standardization quality, demonstrating that customer satisfaction should trade off with productivity, while it is more dependent on customization quality. Costs of resources may be spent on activities not valued by customers. In addition, a time lag between when customer investments are done and when revenues are realized may hinder the relation between customer satisfaction and financial performance (Foster & Gupta, 1997).

To examine the causal relation between customer satisfaction and economic returns, several studies have adopted firm level and business unit level tests. Anderson *et al.* (1994) investigated how customer satisfaction is associated with financial returns using a national customer satisfaction index and a traditional accounting measure, ROI (return on investment), and found that firm-wide ROI is positively affected by customer satisfaction, but not immediately realized. However, Anderson *et al.* (1997) saw that the relation is less significant or even negative in service firms. Using a quarterly branch-level customer satisfaction index and four accounting performance variables from 73 retail branch banks, Ittner & Larcker (1998a) demonstrated that the increase in many measures of branch-level financial performances come indirectly through growth in new customers, not directly through increased profits from existing customers.

Banker *et al.* (2000) used operating profits per available room to measure financial performance and verified its lead-lag relation with customer satisfaction (proxy by likelihood of customer return and customer complaints) for 18 hotels managed by one hotel corporation. They also used Akaike's Information Criterion (AIC) to determine the lag length and found that six months are appropriate. Westlund & Lothgren (2001) examined the interactions between quality, productivity, and economic performance in Swedish pharmacies and showed that improving customer satisfaction leads to an increase in productivity and cost efficiency. Using firm-level customer complaints and stock returns, Riley *et al.* (2003) found that customer dissatisfaction is negatively associated with stock returns. Matzler *et al.* (2005) analyzed 9-year data of the American Customer Satisfaction Index and Tobin's Q from 99 companies and suggest that there is a positive relationship between firm-level customer satisfaction and shareholder value.

Although the overall impact of customer satisfaction on financial performance is partly revealed from these studies, we cannot see if individual customers' purchase behaviors are driven by their satisfaction with services and/or products. Firm-wide or business-level analysis is not helpful for us to manage the relationship with individual customers either. However, until now, few studies have examined the link between a customer-level evaluation of a firm's product or service offerings and customer-level profitability. Foster & Gupta (1997) represented the first examination of the relationship. They

developed an activity-based model to evaluate customer profitability and collected satisfaction data from a wholesale beverage distributor company to examine the cross-section relation between customer satisfaction and customer profitability. Using customer-level data from a telecommunications firm, Ittner & Larcker (1998a) discovered that future retention and revenues are positively associated with customer satisfaction, but they did not examine the impact of customer satisfaction on costs and profits.

To complement the above studies, this study not only examines the cross-sectional relation between customer satisfaction and individual customers' purchase behavior as well as contemporaneous economic contributions, but also investigates how customer satisfaction affects future customer revenue, costs, and profits. Furthermore, this study collects data from 36 retail branch banks managed by an international financial institution. Compared with the beverage distributor company in Foster & Gupta (1997), the retail banks examined in this study are relatively more dependent on customization quality. In addition, both Foster & Gupta (1997) and Ittner & Larcker (1998a) investigated business customers, while this study focuses on consumers. Incremental evidence is provided on the link between individual-level customer satisfaction and economic contributions.

Research Site and Data Collection

Research Site

The research site for this study is an international financial institution (hereafter referred to as RBANK) having several lines of businesses such as credit cards, foreign exchange, savings, and loans. RBANK has a long history and high reputation in the market. It had 36 domestic retail branch banks and 10 branch banks abroad during the period of this study. The focus of this study is on those customers having savings accounts in branches located within Taiwan.

RBANK has implemented activity-based costing since 1996. The management consultant has been entrusted with the responsibility for directing an Activity-Based Costing (ABC) team to construct the system since then. Until the present, monthly customer revenue, costs and profits are provided periodically to managers for decision-making.

More and more private banks have been established in Taiwan since 1991, because of deregulation. The high level of competition in the banking industry has made it so that customer satisfaction cannot be overemphasized in Taiwan. Ever since 1996, RBANK has hired an international consulting firm to be responsible for periodical customer surveys and analysis every half year. In order to motivate better service quality, those customer satisfaction measures are also used to evaluate the performance of each bank branch and its employees.

The researcher began to participate in designing the periodical customer survey in 1998. Data used in this study are from two surveys implemented in the beginning and the middle of 1998 respectively (hereafter referred to as the first survey and the second survey). Although we would like to analyze earlier customer satisfaction data as well, we cannot do so, because of data unavailability. During the period of this study, the author worked with the management in RBANK to jointly develop the survey while the marketing consulting firm interviewed customers and collected data. For observing the dynamic change in customer satisfaction, consistency of the survey and subjects is maintained. The same survey was used in the second survey and the same customers were interviewed.

Data Collection

Monthly sales, expenses, and profit data are obtained for a period of up to 9 months (beginning with January 1998) for the 891 customers from 36 branches. Originally, 900 customers interviewed both in the first survey and in the second survey were included in the sample, but some were excluded due to data incompleteness. Hence, the final sample includes only 891 customers. The financial data for individual customers are provided from the department responsible for the Activity-Based Costing system. Other data on customers' characteristics are directly retrieved from the customer database of RBANK. Company documents and interviews with senior managers and corporate staff provides qualitative data on the implementation of the Activity-Based Costing and savings business.

Variable Measurement

Customer Satisfaction Measures

At least two different conceptualizations of customer satisfaction can be distinguished: transaction-specific and cumulative (Boulding *et al.*, 1993). The cumulative perspective is used in this study, because we want to examine how customers' aggregate consumption experiences with services impact their profit contributions to the firm over time.

Kaplan & Norton (1997) indicated that the three important performance drivers of customer satisfaction are price, time, and quality. Using the original SERVQUAL scales designed by Parasuraman *et al.* (1988) as a guide to measure service quality and after making necessary revisions, we group 26–33 questions to form multiple measures for the six dimensions of customer satisfaction. They are price, speed, reliability, responsiveness, empathy, and tangibles. A seven-point scale (from the most satisfied to the most dissatisfied) is used in the design of the survey. The customer satisfaction survey was pre-tested. Ratings on those questions corresponding to the same dimension are averaged. The six average ratings are then obtained to measure each dimension of customer satisfaction.

Repurchase Intentions and Reputation Measures

Two questions relating to customers' willingness to have an ongoing relation with RBANK are used to measure customers' repurchase intentions. As for reputation, one question about how likely is it that customers will recommend the services of RBANK to others is designed.

Customer Profitability Measure

According to Kaplan & Cooper (1998), an activity-based costing system allows companies to measure individual and aggregate customer profitability. Customer revenue, costs, and profit data used in this study are all provided by RBANK's internal cost accounting system. They are all outputs of an activity-based cost system. The computation of customer profitability in the system is described as follows.

Monthly transaction data are downloaded from RBANK's mainframe. Interest revenues and interest costs are then directly traced to each account. No matter if the transactions are traded in front of the counters or through automated teller machines (ATM), activity costs are accrued to each account based on each savings account's consumption of activity drivers. There are more than 30 activities provided, such as cash

deposit, cash withdrawal, and account opening. After deducting each account's interest costs and activity costs from interest revenues, each account's profitability is produced. Finally, customer profitability is determined by summing all of the individual customer-related accounts' profitability.

In this study, activity cost and customer profit data from the activity-based costing system are used to estimate the relation between customer satisfaction and customer costs and profits. The average account balance, not interest revenue, is used to evaluate the relation between customer satisfaction and customer revenue, because we want to investigate the direct effect of customer satisfaction on customers' changes in their purchases. Thus, this removes the effect of a varying yield rate in different kinds of savings businesses. The variables of this study are shown in Table 1.

Control Variables

Individual customer's preferences and purchase powers vary. Dummy variables for demographic variables, such as sex and education degree, are used to capture individual effects on financial performance.

Estimation Models and Tests

The Impact of Customer Satisfaction on Repurchase Intentions and Reputation

Figure 1 summarizes the hypothesized link relating customer satisfaction to repurchase intentions, reputation, and economic returns in this study. First of all, the relation between overall customer satisfaction and each dimension of customer satisfaction measures is estimated in the following specification:

$$\begin{aligned} TSAT_{im} = {} & \alpha_0^T + \delta_1^T F_i + \eta_2^T AGE02_i + \eta_3^T AGE03_i + \eta_4^T AGE04_i + \gamma_2^T EDU02_i \\ & + \gamma_3^T EDU03_i + \gamma_4^T EDU04_i + \gamma_5^T EDU05_i + \beta_1^T PRI_{im} + \beta_2^T SPE_{im} \\ & + \beta_3^T EMP_{im} + \beta_4^T REL_{im} + \beta_5^T RES_{im} + \beta_6^T TAN_{im} + \mu_m^T + \varepsilon_{im}^T \end{aligned} \quad (1)$$

Table 1. Definitions of variables

Variable	Definitions
(*L*)*RES*	(Lagged) Customer rating on customer satisfaction dimension: responsiveness.
(*L*)*SPE*	(Lagged) Customer rating on customer satisfaction dimension: speed.
(*L*)*EMP*	(Lagged) Customer rating on customer satisfaction dimension: empathy.
(*L*)*REL*	(Lagged) Customer rating on customer satisfaction dimension: reliability.
(*L*)*TAN*	(Lagged) Customer rating on customer satisfaction dimension: tangibles.
(*L*)*PRI*	(Lagged) Customer rating on customer satisfaction dimension: price.
TSAT	Current rating on total customer satisfaction.
CONT	Current rating on individual customer's willingness to continually trade with RBANK.
REC	Current ratings on individual customer's willingness to recommend the service of RBANK to others.
(*F*)*PROFIT*	(Future) Current profits per customer.
(*F*)*REV*	(Future) Current revenues per customer.
(*F*)*COST*	(Future) Current activity costs per customer.

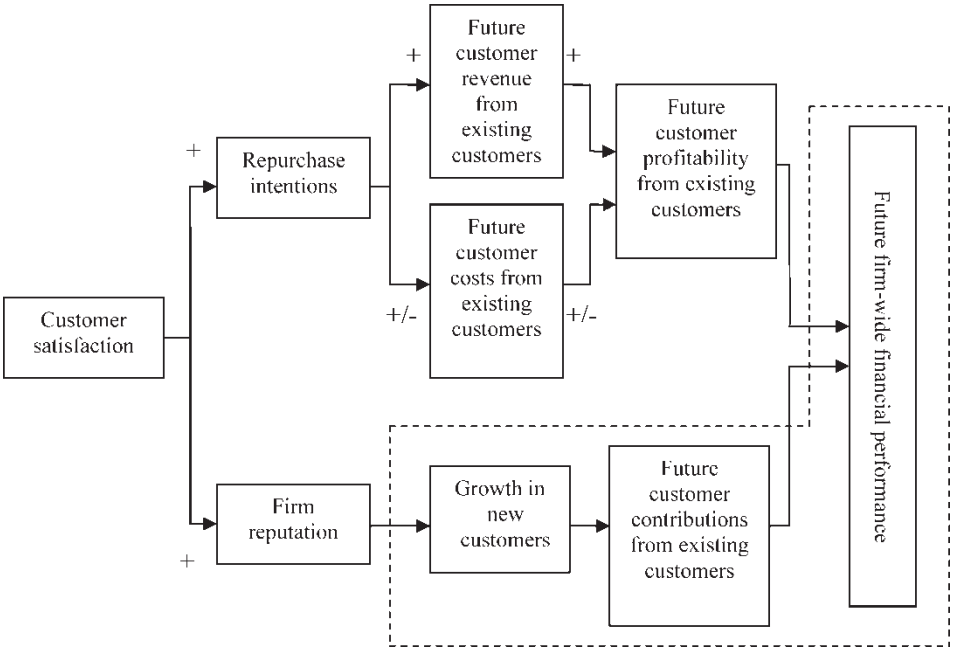

Figure 1. Relation between customer satisfaction, repurchase intentions, enhanced reputation, and financial performance. (The area surrounded by dotted lines is beyond the scope of this research. It is shown to present the overall conceptual framework and to highlight the differences between this study and prior related studies.)

Model (1) specifies total customer satisfaction as a function of the six customer satisfaction measures. Demographic dummies are also included to control for the impact of the individual effect on customer satisfaction measures. Because the customers in our sample are from 36 different branches, the varying differences between those branches in location, service, size, and functions may impact those relations we want to investigate. Thus, μ_m^T, the random disturbances characterizing branch m, is used to capture the impact of those factors specific to each branch (Greene, 1997). Actually, the fixed effect model is another approach in controlling for group effects, which is an appropriate model specification only when we are confident that the differences between units can be viewed as parametric shifts of the regression function. According to Greene (1997), the Hausman test is used in this study to test which model fits the data better. Most results accept the null hypothesis that the random effect model is correct. Hence, the random effect model is adopted.

We next focus on the first research question. How customer satisfaction affects repurchase intentions is evaluated by estimating the relation between the six customer satisfaction measures and customers' willingness to have an ongoing relation with RBANK. Furthermore, we regress customers' willingness to recommend services on each customer satisfaction measures to evaluate the reputation impact. The following models are specified for estimation using panel data for 891 customers

from 36 branches:

$$CONT_{im} = \alpha_0^C + \delta_1^C F_i + \eta_2^C AGE02_i + \eta_3^C AGE03_i + \eta_4^C AGE04_i + \gamma_2^C EDU02_i + \gamma_3^C EDU03_i + \gamma_4^C EDU04_i + \gamma_5^C EDU05_i + \beta_1^C PRI_{im} + \beta_2^C SPE_{im} + \beta_3^C EMP_{im} + \beta_4^C REL_{im} + \beta_5^C RES_{im} + \beta_6^C TAN_{im} + \mu_m^C + \varepsilon_{im}^C \quad (2)$$

$$REC_{im} = \alpha_0^R + \delta_1^R F_i + \eta_2^R AGE02_i + \eta_3^R AGE03_i + \eta_4^R AGE04_i + \gamma_2^R EDU02_i + \gamma_3^R EDU03_i + \gamma_4^R EDU04_i + \gamma_5^R EDU05_i + \beta_1^R PRI_{im} + \beta_2^R SPE_{im} + \beta_3^R EMP_{im} + \beta_4^R REL_{im} + \beta_5^R RES_{im} + \beta_6^R TAN_{im} + \mu_m^R + \varepsilon_{im}^R \quad (3)$$

The Impact of Customer Satisfaction on Customer Revenue

The first test of the second research question concerns how customer satisfaction measures affect current customer revenue and future customer revenue. We model the relation as equation (4). Since the formation of customer satisfaction is a dynamic process, Bolton & Drew (1991) examined the impact of service changes on customer attitudes using longitudinal data and found that current attitudes are influenced by prior attitudes. We regress current customer revenue, one-period ahead customer revenue, and two-period ahead customer revenue on six dimensions of current customer satisfaction (in the second survey) while controlling for the impact of past customer satisfaction measures (in the first survey).

$$(F)REV_{im} = \alpha_0^F + \delta_1^F F_i + \eta_2^F AGE02_i + \eta_3^F AGE03_i + \eta_4^F AGE04_i + \gamma_2^F EDU02_i + \gamma_3^F EDU03_i + \gamma_4^F EDU04_i + \gamma_5^F EDU05_i + \beta_1^F LPRI_{im} + \beta_2^F LSPE_{im} + \beta_3^F LEMP_{im} + \beta_4^F LREL_{im} + \beta_5^F LRES_{im} + \beta_6^F LTAN_{im} + \beta_7^F PRI_{im} + \beta_8^F SPE_{im} + \beta_9^F EMP_{im} + \beta_{10}^F REL_{im} + \beta_{11}^F RES_{im} + \beta_{12}^F TAN_{im} + \mu_m^F + \varepsilon_{im}^F \quad (4)$$

The Impact of Customer Satisfaction on Customer Costs

We test the relation between customer satisfaction and customer costs in this subsection to investigate further the second research question. Anderson *et al.* (1997) showed that the association between changes in customer satisfaction and changes in productivity is positive for goods, but negative for services. Using our data in the service sector, we would like to gain further implications about whether higher satisfaction leads to higher costs. The specification is as follows:

$$(F)COST_{im} = \alpha_0^O + \delta_1^O F_i + \eta_2^O AGE02_i + \eta_3^O AGE03_i + \eta_4^O AGE04_i + \gamma_2^O EDU02_i + \gamma_3^O EDU03_i + \gamma_4^O EDU04_i + \gamma_5^O EDU05_i + \beta_1^O LPRI_{im} + \beta_2^O LSPE_{im} + \beta_3^O LEMP_{im} + \beta_4^O LREL_{im} + \beta_5^O LRES_{im} + \beta_6^O LTAN_{im} + \beta_7^O PRI_{im} + \beta_8^O SPE_{im} + \beta_9^O EMP_{im} + \beta_{10}^O REL_{im} + \beta_{11}^O RES_{im} + \beta_{12}^O TAN_{im} + \mu_m^O + \varepsilon_m^O \quad (5)$$

The Impact of Customer Satisfaction on Customer Profitability

For the final test of the second research question, model (6) is specified. The relation between customer satisfaction and profitability is estimated by regressing current customer profits, one-period ahead customer profits, and two-period ahead customer profits on six dimensions of current customer satisfaction (in the second survey) while controlling for the impact of past customer satisfaction measures (in the first survey) in model (6).

$$\begin{aligned}(F)PROFIT_{im} = {} & \alpha_0^I + \delta_1^I F_i + \eta_2^I AGE02_i + \eta_3^I AGE03_i + \eta_4^I AGE04_i + \gamma_2^I EDU02_i \\ & + \gamma_3^I EDU03_i + \gamma_4^I EDU04_i + \gamma_5^I EDU05_i + \beta_1^I LPRI_{im} + \beta_2^I LSPE_{im} \\ & + \beta_3^I LEMP_{im} + \beta_4^I LREL_{im} + \beta_5^I LRES_{im} + \beta_6^I LTAN_{im} + \beta_7^I PRI_{im} \\ & + \beta_8^I SPE_{im} + \beta_9^I EMP_{im} + \beta_{10}^I REL_{im} + \beta_{11}^I RES_{im} \\ & + \beta_{12}^I TAN_{im} + \mu_m^I + \varepsilon_m^I \end{aligned} \tag{6}$$

Empirical Results

Descriptive Statistics

Table 2 presents descriptive statistics for all 891 customers. On average, the ratings in six customer satisfaction dimensions fall within the range of four to six points, indicating acceptable to very satisfied degrees. The standard deviations of the ratings in those dimensions are mostly smaller than one, which shows a small rating variation.

Table 3 presents the correlation matrix. Total customer satisfaction is 1% significantly positively associated with each satisfaction dimension and the responsiveness (*RES*) dimension has the highest correlation ($r = 0.69$) coefficient. All of the six customer satisfaction measures are positively correlated with customers' willingness to have an ongoing relation with RBANK and customers' willingness to recommend services to others, which is consistent with our hypothesized relation between customer satisfaction measures and repurchase intentions as well as firm reputation. As for the correlation between satisfaction measures and customer revenue and costs, most dimensions of customer satisfaction are

Table 2. Summary statistics on customer satisfaction measures

Variable	N	Mean	Std Dev.
RES	891	5.75	0.70
SPE	891	5.37	0.83
EMP	891	5.47	0.84
REL	890	5.95	0.63
TAN	891	5.64	0.62
PRI	878	4.92	0.91
TSAT	891	5.84	0.72
CON	891	5.95	0.64
REC	891	5.33	1.08

(See Table 1 for definitions of variables).

Table 3. Correlation matrix

Variable	*S*1	*S*2	*S*3	*S*4	*S*5	*S*6	TS	CT	RC	PR	RE	AC
RES (*S*1)		0.61**	0.62**	0.65**	0.52**	0.34**	0.65**	0.24**	0.30**	0.08*	0.09**	0.07*
SPE (*S*2)	0.63**		0.60**	0.49**	0.46**	0.38**	0.55**	0.15**	0.22**	-0.01	0.01	0.02
EMP (*S*3)	0.66**	0.62**		0.49**	0.44**	0.37**	0.58**	0.18**	0.27**	-0.00	0.01	0.02
REL (*S*4)	0.68**	0.51**	0.54**		0.48**	0.30**	0.55**	0.17**	0.25**	0.01	0.01	0.02
TAN (*S*5)	0.49**	0.43**	0.45**	0.47**		0.39**	0.51**	0.24**	0.26**	0.07*	0.07+	0.03
PRI (*S*6)	0.32**	0.35**	0.36**	0.31**	0.40**		0.39**	0.06+	0.19**	-0.08*	-0.11**	-0.11**
TSAT (*TS*)	0.69**	0.56**	0.59**	0.58**	0.48**	0.37**		0.18**	0.34**	0.03	0.03	0.04
CONT (*CT*)	0.30**	0.22**	0.22**	0.21**	0.26**	0.07*	0.24**		0.42**	0.09**	0.13**	0.14**
REC (*RC*)	0.33**	0.24**	0.29**	0.25**	0.25**	0.19**	0.39**	0.42**		0.11**	0.14**	0.09**
PROFIT (*PR*)	0.01	0.01	-0.01	-0.00	0.02	-0.06+	-0.02	-0.01	0.02		0.79**	0.32**
REV (*RE*)	0.06+	0.06+	0.00	0.04	0.01	-0.06+	0.03	0.00	0.04	0.65**		0.62**
COST (*AC*)	0.07*	0.07*	0.02	0.01	0.01	-0.03	0.05	0.07*	0.08*	0.23**	0.34**	

Spearman coefficients in the upper triangle and Pearson coefficients in the lower triangle.
**, * and + indicate significance at 1%, 5%, and 10% two-tails, respectively.
All correlations are based on the polled data and should be interpreted with caution.
(See Table 1 for definitions of variables).

positively correlated with revenues and costs, except for the price dimension. However, no significant and consistent relation exists between customer satisfaction measures and customer profits. Given that, all correlations are based on pooled data and should not provide direct persuasive evidence for the tests in this study.

Relation between Customer Satisfaction and Repurchase Intentions

Table 4 shows that overall customer satisfaction depends more on the responsiveness dimension while reliability and the price dimension have the least impact on overall evaluation. Table 4 presents GLS estimates of the relation between customer satisfaction and customers' repurchase intentions. Customer satisfaction dimensions, responsiveness (*RES*) and tangible (*TAN*), are both 1% significantly positively associated with customers' willingness for an ongoing business relationship. The result supports that customer satisfaction positively impacts customers' repurchase intentions. This is consistent with the hypothesized relation.

Relation between Customer Satisfaction and Reputation

As shown in Table 4, responsiveness (*RES*), tangible (*TAN*), and empathy dimension (*EMP*) all significantly and positively impact customers' likelihood of recommending the services to others and the responsiveness (*RES*) dimension has the greatest impact. Hence, the hypothesis that customer satisfaction has a positive effect on reputation is strongly supported.

Relation between Customer Satisfaction and Financial Performance

From Table 5, we find that the impact of current customer satisfaction on current revenues, one-period ahead revenues, and two-period ahead revenues is significantly

Table 4. Regression results relating six dimensions of customer satisfaction to total customer satisfaction, repurchase intentions, and reputation

Variables	Coefficient (Predicted sign)	Total customer satisfaction	Repurchase intentions	Reputation
Intercept	α_0	2.599** (0.009)	10.163** (0.000)	3.013** (0.003)
F	δ_1	−0.342 (0.732)	0.532 (0.594)	1.411 (0.158)
*AGE*02	η_1	0.479 (0.632)	1.020 (0.308)	0.697 (0.486)
*AGE*03	η_2	−0.117 (0.907)	0.591 (0.555)	1.393 (0.164)
*AGE*04	η_3	−0.255 (0.799)	−0.270 (0.787)	1.423 (0.155)
*EDU*02	γ_1	0.117 (0.907)	0.170 (0.865)	−0.969 (0.333)
*EDU*03	γ_2	0.059 (0.953)	−0.466 (0.641)	−0.036 (0.971)
*EDU*04	γ_3	0.560 (0.575)	0.630 (0.528)	0.535 (0.593)
*EDU*05	γ_4	0.838 (0.402)	0.460 (0.645)	0.642 (0.521)
PRI	β_1 (+)	1.148 (0.251)	−1.985 (0.047)	1.630 (0.103)
SPE	β_2 (+)	4.585** (0.000)	0.562 (0.574)	0.371 (0.710)
EMP	β_3 (+)	2.497* (0.013)	−0.694 (0.488)	2.269* (0.023)
REL	β_4 (+)	1.553 (0.121)	0.877 (0.380)	−1.104 (0.270)
RES	β_5 (+)	6.948** (0.000)	4.516** (0.000)	4.156** (0.000)
TAN	β_6 (+)	5.595** (0.000)	3.607** (0.000)	2.777** (0.006)
R^2		0.387	0.110	0.127

p-value in parentheses.

**, * and + indicate significance at 1%, 5%, and 10% two-tails, respectively.

F is a dummy variable representing the sex of customers, = 1 for female, and = 0 for male customers.

AGE is a dummy variable representing the age classifications of customers:

*AGE*02 = 1 for ages 30–39, and = 0 otherwise.

*AGE*03 = 1for ages 40–49, and = 0 otherwise.

*AGE*04 = 1 for ages 50 and above, and = 0 otherwise.

EDU is a dummy variable representing the education classifications of customer:

*EDU*02 = 1 for university degree, and = 0 otherwise.

*EDU*03 = 1 for college degree, and = 0 otherwise.

*EDU*04 = 1 for senior high school degree, and = 0 otherwise.

*EDU*05 = 1 for junior high school degree and under, and = 0 otherwise.(See Table 1 for definitions of other variables).

positive in the responsiveness dimension (*RES*) after controlling for the effect of past customer satisfaction measures. This finding supports the fact that improving customer satisfaction has a positive effect on customer revenue. As for the cost side, a significant positive relation exists between the speed dimension (*SPE*), current customer costs, one-period ahead customer costs, and two-period ahead customer costs after controlling for the past customer satisfaction measures. However, the impact of the empathy dimension (*EMP*) is negative. It is shown that different economic impacts have been realized along different dimensions of customer satisfaction. However, from Table 6 there is no significant relation between current customer satisfaction and profits, one-period-ahead profits, and two-period-ahead profits after controlling for the lagged customer satisfaction. Furthermore, the responsiveness dimension of customer satisfaction explained most variances in repurchase intentions and customer revenue. This implies that multi-dimensional customer satisfaction measures are necessary for managers to investigate what customers value most. Single customer satisfaction offers limited implications.

Table 5. Regression results relating six dimensions of customer satisfaction to current and future customer revenue/costs

Variables	Coefficients (Predicted sign)	Revenue			Costs		
		Current	One-period ahead	Two-period ahead	Current	One-period ahead	Two-period ahead
Intercept	α_0	1.122 (0.262)	0.660 (0.510)	0.385 (0.701)	0.252 (0.801)	−0.1041 (0.298)	1.164 (0.244)
F	δ_1	0.517 (0.605)	0.550 (0.583)	0.836 (0.403)	0.809 (0.419)	0.494 (0.613)	0.161 (0.538)
*AGE*02	η_1	2.856** (0.004)	3.094** (0.002)	2.998** (0.003)	0.944 (0.345)	1.477 (0.140)	1.568 (0.117)
*AGE*03	η_2	4.178** (0.000)	4.447** (0.000)	4.572** (0.000)	1.255 (0.209)	1.801+ (0.072)	1.211 (0.226)
*AGE*04	η_3	2.530* (0.011)	2.251* (0.024)	1.929+ (0.054)	0.839 (0.402)	2.229* (0.026)	0.386 (0.700)
*EDU*02	γ_1	−1.027 (0.305)	−1.184 (0.236)	−1.358 (0.174)	1.108 (0.268)	0.191 (0.848)	0.467 (0.640)
*EDU*03	γ_2	−0.599 (0.549)	−0.763 (0.446)	−0.957 (0.339)	0.924 (0.355)	0.094 (0.925)	−0.157 (0.875)
*EDU*04	γ_3	−1.504 (0.133)	−1.816+ (0.070)	−2.113* (0.035)	1.031 (0.303)	0.431 (0.666)	0.812 (0.417)
*EDU*05	γ_4	0.052 (0.959)	−0.043 (0.966)	−0.210 (0.834)	−0.312 (0.755)	−0.651 (0.515)	0.087 (0.930)
LPRI	β_1 (+)	0.736 (0.462)	0.759 (0.448)	0.706 (0.480)	0.149 (0.882)	0.192 (0.847)	0.838 (0.402)
LSPE	β_2 (+)	−1.027 (0.305)	−0.666 (0.506)	−0.162 (0.871)	0.580 (0.562)	−1.348 (0.178)	−0.950 (0.342)
LEMP	β_3 (+)	0.756 (0.450)	0.457 (0.647)	0.103 (0.918)	−0.714 (0.476)	0.291 (0.771)	−0.540 (0.589)
LREL	β_4 (+)	0.128 (0.898)	−0.116 (0.907)	−0.301 (0.763)	−1.058 (0.290)	−0.217 (0.828)	−0.526 (0.599)
LRES	β_5 (+)	−1.332 (0.183)	−1.052 (0.293)	−0.905 (0.366)	0.109 (0.913)	0.400 (0.689)	0.421 (0.674)
LTAN	β_6 (+)	−0.610 (0.542)	−0.376 (0.707)	−0.248 (0.804)	−0.703 (0.482)	1.235 (0.217)	−0.689 (0.491)
PRI	β_7 (+)	−0.971 (0.332)	−0.902 (0.367)	−0.765 (0.444)	0.000 (0.999)	−0.083 (0.934)	0.350 (0.727)
SPE	β_8 (+)	1.502 (0.133)	1.460 (0.144)	1.376 (0.169)	2.648* (0.008)	2.318* (0.021)	1.944+ (0.052)
EMP	β_9 (+)	−1.347 (0.178)	−1.127 (0.260)	−0.918 (0.359)	−1.670+ (0.095)	−3.177* (0.002)	−0.535 (0.593)
REL	β_{10} (+)	−0.211 (0.833)	−0.094 (0.925)	0.204 (0.838)	0.322 (0.747)	1.256 (0.209)	−1.359 (0.174)
RES	β_{11} (+)	1.925+ (0.054)	1.901+ (0.057)	1.837+ (0.066)	1.458 (0.145)	0.343 (0.732)	0.955 (0.340)
TAN	β_{12} (+)	0.428 (0.669)	0.367 (0.713)	0.049 (0.961)	−0.060 (0.953)	0.474 (0.636)	−0.326 (0.744)
R^2		0.456	0.590	0.616	0.317	0.345	0.232

p-value in parentheses.

**, * and + indicate significance at 1%, 5%, and 10% two-tails, respectively.

F is a dummy variable representing the sex of customers, = 1 for female, and = 0 for male customers.

AGE is a dummy variable representing the age classifications of customers:

*AGE*02 = 1 for ages 30-39, and = 0 otherwise.

*AGE*03 = 1for ages 40-49, and = 0 otherwise.

*AGE*04 = 1 for ages 50 and above, and = 0 otherwise.

EDU is a dummy variable representing the education classifications of customer:

*EDU*02 = 1 for university degree, and = 0 otherwise.

*EDU*03 = 1 for college degree, and = 0 otherwise.

*EDU*04 = 1 for senior high school degree, and = 0 otherwise.

*EDU*05 = 1 for junior high school degree and under, and = 0 otherwise.

(See Table 1 for definitions of other variables).

Table 6. Regression results relating six dimensions of customer satisfaction to current and future customer profitability

Variables	Coefficient (Predicted sign)	Profits		
		Current	One-period ahead	Two-period ahead
Intercept	α_0	1.760^{+}(0.078)	0.755 (0.450)	0.038 (0.970)
F	δ_1	−1.112 (0.266)	−0.525 (0.600)	−0.504 (0.614)
*AGE*02	η_1	2.966** (0.006)	2.885** (0.004)	2.429* (0.015)
*AGE*03	η_2	4.454** (0.000)	4.102** (0.000)	4.098** (0.000)
*AGE*04	η_3	2.091* (0.037)	10.172 (0.241)	0.980 (0.327)
*EDU*02	γ_1	−0.744 (0.457)	−0.917 (0.360)	−1.239 (0.215)
*EDU*03	γ_2	−0.858 (0.391)	−1.171 (0.241)	−1.236 (0.216)
*EDU*04	γ_3	−1.015 (0.310)	−1.577 (0.115)	−1.889^{+} (0.059)
*EDU*05	γ_4	−0.113 (0.910)	−0.798 (0.425)	−1.189 (0.235)
LPRI	β_1 (+)	0.171 (0.864)	0.443 (0.656)	−0.007 (0.994)
LSPE	β_2 (+)	−2.488* (0.013)	−1.152 (0.249)	0.391 (0.696)
LEMP	β_3 (+)	1.518 (0.129)	1.478 (0.139)	0.944 (0.345)
LREL	β_4 (+)	−0.468 (0.640)	−0.905 (0.366)	−0.871 (0.384)
LRES	β_5 (+)	−0.508 (0.612)	−0.281 (0.779)	−0.387 (0.699)
LTAN	β_6 (+)	0.969 (0.332)	0.956 (0.340)	1.334 (0.182)
PRI	β_7 (+)	−0.970 (0.332)	−0.905 (0.365)	−0.801 (0.423)
SPE	β_8 (+)	0.888 (0.375)	1.364 (0.173)	1.382 (0.167)
EMP	β_9 (+)	−1.262 (0.207)	−0.647 (0.518)	−0.810 (0.418)
REL	β_{10} (+)	−0.699 (0.485)	−0.850 (0.395)	−0.167 (0.867)
RES	β_{11} (+)	1.132 (0.258)	1.019 (0.308)	0.732 (0.464)
TAN	β_{12} (+)	−0.015 (0.988)	−0.237 (0.813)	−0.674 (0.501)
R^2		0.600	0.507	0.490

p-value in parentheses.
**, * and + indicate significance at 1%, 5%, and 10% two-tails, respectively.
F is a dummy variable representing the sex of customers, = 1 for female, and = 0 for male customers.
AGE is a dummy variable representing the age classifications of customers:
*AGE*02 = 1 for ages 30–39, and = 0 otherwise.
*AGE*03 = 1for ages 40–49, and = 0 otherwise.
*AGE*04 = 1 for ages 50 and above, and = 0 otherwise.
EDU is a dummy variable representing the education classifications of customer:
*EDU*02 = 1 for university degree, and = 0 otherwise.
*EDU*03 = 1 for college degree, and = 0 otherwise.
*EDU*04 = 1 for senior high school degree, and = 0 otherwise.
*EDU*05 = 1 for junior high school degree and under, and = 0 otherwise.
(See Table 1 for definitions of other variables).

Conclusions

Given the belief of practitioners on customer satisfaction and its importance for customer management decisions, some studies have empirically examined its relation with financial performance and provided mixed evidence. However, most of these studies conduct firm-wide or business-level tests while few have investigated customer-level economic consequences. Although all three tests belong to the test of the financial outcome of customer satisfaction, the implications behind them are quite different.

This study examines how individual customers' satisfaction with services impacts their purchases and profit contributions to the firm. From our empirical results, customer satisfaction is found to be positively associated with customers' repurchase intentions and the firms' reputation. The impact of overall customer satisfaction is largely attributable to the impact of the responsiveness dimension. While there is no significant and positive relation between customer satisfaction and customer profitability, customer satisfaction does have a positive impact on customer revenue and costs. This finding reveals that higher customer satisfaction leads to higher customer revenue and higher customer costs at the same time, and thus customer profits remain unaffected.

From the interviews with customers, we have found that customers feel safe depositing their money into RBANK and they believe interest rates are similar among different banks. This implies that service quality plays a more important role affecting customers' satisfaction with RBANK. Looking back on the empirical results in this study, the effect of the responsiveness dimension is found to dominate the effect of the other dimensions in various tests. This dimension measures the front-end employees' attitudes toward customers. Combining this evidence altogether, the responsiveness dimension is demonstrated to be a key determinant of customer value and thus it significantly affects customer' purchases at RBANK.

In summary, our study makes two contributions to the literature. First, it provides evidence on the outcome of customer satisfaction in consumer research. The impacts of customer satisfaction on firm reputation and customers' repurchase intentions are empirically validated. Second, using data from an activity-based system, we have documented the direct link between customer satisfaction and customer profitability. The surprising findings provide a different insight for the claim that higher customer satisfaction always comes with higher profit contributions. Consistent with Anderson *et al.* (1997), a trade-off between customer satisfaction and productivity does exist in the service sector. Practically, this study also highlights a way for managers to analyze customer value and its relation with customers' purchase behavior. This is beneficial for long-term customer relationship management.

There are a number of limitations to this study. First of all, the results are derived based on data from a specific research site and thus may be generalized to other corporations with caution. Second, the interaction between six dimensions of customer satisfaction is not considered in this study. Taking those factors into account can offer a deeper understanding of customer value and its relation with customers' purchase behavior. In addition, future studies can extend to investigate more firms in the same industry or to examine firms from different industries for a better comparison. Another extension is to use more datapoints over time to observe the longitudinal relation between the change in individual customer satisfaction and future profitability. A more challenging extension is to measure individual customers' lifelong economic contributions and to examine whether more satisfied customers have higher lifetime values.

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