

THE ANTECEDENTS AND CONSEQUENCE OF CUSTOMER RELATIONSHIP MANAGEMENT PERFORMANCE: A PRELIMINARY FOR STRUCTURAL EQUATION MODELING

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Abstract

Nowadays, customer relationship management is an important marketing strategy to retain the customer. Many literatures proved that by maintaining a good relationship with the customers, they will come back to our premise for give more businesses. This empirical paper investigates the antecedent factors of customer relationship management performance and its impact on electronic banking adoption. This background scales were developed from extensive reviews of literature and focus group analyses. This is subjected to a thorough validation process from a valid sample of 325 electronic banking customers in Malaysia via exploratory factor analysis, reliability test, data normalization, and mahalnobis for outliers detect. A total of 74 original items were tested in this preliminary analysis. The results indicate 39 constructs measuring social values, ease of use, delivery performance, economic value, usefulness, privacy, customer relationship management performance and electronic banking adoption satisfied the rigorous validation process of construct validity and reliability. This paper ends with the completed original hypothesized model ready for confirmatory factor analysis (CFA). However, all construct for online security were unidentified and dropped out from the list. Structural equation modeling was used since it has the ability to examine a series of dependence relationships simultaneously.

Key Words: Customer relationship management, delivery performance, social and economic values, electronic banking adoption

Introduction

With the innovation in technology bringing numerous opportunities to the banking industry, as example OCBC Malaysia decided to take advantage of technology to carve new value-added services for their customers with the implementation of customer relationship management initiative (Yeoh, 2006). The drastic changes in their environment have forced financial institutions to revise their marketing strategies and to stress long-lasting relationships with customer (Perrien et al., 1992).

According to Wang (2004) there are two types of benefits to be captured by a company for establishing and maintaining customers relationship; tangible benefits and intangible benefits, Tangibly, customer will figure out a positive relationship length, relationship depth and breadth behaviors as a result of a good management of customer relationship by the firm. Intangibly, customer will figure out a positive relationship quality behavior as one of the benefits of firm

customer relationship activities. Therefore, the operational definition of CRM performance in this study is “the intention of customers to figure out their positive relationship length, depth, and breadth behavior and positive relationship quality behavior along their contacts with the firms”. In other way behavior-based CRM performance means “the tangible and intangible benefit arises from the activities of maintaining and establishing customer relationship by a firm such as relationship depth and breadth and relationship quality”

Many literatures have discussed the importance of maintaining relationship as strategies to make the customers return. Maintaining a long relationship with the customers will make them feel more confident and increase their sense of belonging towards the service providers. When a company is committed to their relationship, there is a tendency for the company to listen to customer complaints and dissatisfaction regarding the services offered. By maintaining a long relationship with the customers, the service providers will also gain many of benefits. The service providers can also deliver the most current information about their products or services and at the same time they can influence customers to make cross selling. An electronic banking service is the critical services that needs a higher sense of confident, security and privacy along the process of receiving the services. Therefore, it is a necessity for the banks especially toward electronic banking service to equip the service with the above mentioned characteristics so that customer will have more confident in them.

Since there are so many other factors that might influence CRM performance such as customer value (Jenson, 2001; Day, 1994; Slater, 1997; Wang et al., 2004), customer equity and customer asset (Rust et al.,2000; Blattberg et al., 2001), customer focus, company wide, cross functional and business process (Chen & Popovich, 2003), it would be useful and practical if we investigate the consequences of customer relationship management performance. Since the context of this study is electronic banking services, it is appropriate to propose a variety of technology factors such as online security, online privacy, ease of use, usefulness and other value factors such as customer value. Previous research confirmed the importance of customer value factors as the antecedents for customer relationship management performance in security industry (Wang *et al.*, 2004).

This paper also investigates the relationship between customer relationship management performance and customer decision to adopt the electronic banking services. The empirical survey by Floh and Treiblmaier (2006) found that satisfaction is an important antecedent of customer loyalty towards electronic banking services. His finding was supported by the idea from Griffin (1995), who stresses that loyalty is geared more on behavior and when a customer is loyal, he or she exhibits purchase behavior. However, in e-service scenario, loyalty towards the services is enough to be defined as electronic technology adoption such in electronic banking services. The study by Methlie and Nysveen (1999) investigated the ways of how banks in Norway retain their electronic banking customers. Their finding indicated that the adoption behavior or loyalties in online banking environment are similar to those in the physical market-place. However, customer satisfaction is found to have the most significant impact, followed by brand reputation, while switching costs and search costs, although significant, have minor explanatory power (Methlie & Nysveen, 1999). This study also proves that customer satisfaction which represents CRM performance is a very important attribute for adopting e-banking.

Having the intertwined relationship that CRM technology has on CRM performance and the later on customer retention as its basis, this research then seeks to address the consequences of customer relationship management performance on electronic banking adoption. An empirical survey was carried out to augment the theory regarding antecedents and consequences of customer

relationship management performance in the electronic banking services. This paper will highlight the preliminary analysis regarding the scale development for all the factors considered as the main antecedents for customer relationship management performance and also validate the measurement scale for electronic banking adoption. The following chapter includes the detail items for each factor involved in this empirical survey.

Scale Development

Technology acceptance model (TAM) is the theory behind the proposed model. Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM) are probably the most used theories for modeling user adoption of new technology. Technology Acceptance Model (TAM) was initially suggested by Fred Davis (1989). It is one of the most studied and used models in the investigation of user acceptance of information technology. The model is adapted from Theory of Reasoned Action (TRA), which was originally proposed by Fishbein and Ajzen in 1975. Technology Acceptance Model is an information system theory, which purpose is simply to predict and explain the user acceptance of information technology. The revised model by Davis et al., (1989) is constructed from external variables (external stimulus), perceived usefulness and perceived ease of use (cognitive response), behavioral intention, and actual usage (behavior). As mentioned in the introduction section, customer relationship management performance was constructed for customer's intention to have a long term relationship with the banks and also represents intentional behavior in the TAM models. According to the concept, the customer tends to figure out a positive behavior of "relationship quality" and tends to have a positive behavior of "relationship length, width and breadth". This concept clearly justified that customer relationship management performance is a form of behavior intention among the customers. The actual usage (behavior) for TAM model refers to adoption of electronic banking decisions' of the customers.

The paragraph below gives details of the sources of the item and scale used in this empirical survey.

Table 1: Sources of item and scale used

| Variables | Scale(Items) | Previous Reliability Test | Sources |
|---|--------------------------------|---------------------------|---------------------------|
| Electronic banking adoption: <i>The behaviors of customers to regularly and continuity of the usage of ATMs, Internet Banking, Telephone banking or mobile banking services.</i> | Likert scale 1-5 (6 items) | 0.92 | Karahanaa, et al., (1999) |
| Customer Relationship Management performance: <i>Behavior-based CRM Performance, Brand Loyalty, Customer Satisfaction</i> | Likert scale 1-5 (9 items) | 0.84 – 0.92 | Wang (2004) |
| Customer perceived value: <i>Functional value, Social value, Emotional value and Customer perceived sacrifices.</i> | Likert scale 1-5 (18 items) | 0.91 – 0.95 | Wang (2004) |

| | | | |
|---|--------------------------------|-------------|-----------------------------|
| Online Privacy : <i>Providers concern, data protection, user's respect, user's consent</i> | Likert scale 1-5 (7 items) | 0.926 | Flavian and Guinaliu (2006) |
| Perceived ease of use: <i>Flexibility, clear and understandable, easy to become skillful</i> | Likert scale 1-5 (7 items) | 0.92 | Moore and Benbasat (1991). |
| Electronic service delivery performance: <i>Reliability, accuracy, customer service, personalization and accurate records</i> | Likert scale 1-5 (12 items) | 0.61 – 0.86 | Joseph et al., (2005) |
| Online Security: <i>Ensure the integrity, confidentiality, authentication and non-recognition of transactions.</i> | Likert scale 1-5 (8 items) | 0.953 | Flavian and Guinaliu (2006) |
| Perceived Usefulness: <i>The degree to which user views of advantages of performing the banking transaction.</i> | Likert scale 1-5 (7 items) | 0.924 | Chan and Lu (2004) |

Methodology

Based on these eight theoretical dimensions of the customer relationship management performance variables, its antecedent and consequences an initial questionnaire measured on five-point Likert scales anchored from “strongly disagree” (1) to “strongly agree” (5) was developed and subjected to a pilot survey involving 100 academic communities of University Utara Malaysia by convenience sampling.

Results of reliability test Cronbach's alpha values for the pilot survey were as follows, Customer Perceived Value 0.928, Online Privacy 0.812, Online Security) 0.929, Ease of use 0.957, Usefulness 0.928 and Delivery Performance 0.928. Reliability results for Customer Relationship Management Performance 0.943 and 0.763 for Electronic Banking Adoption. To validate dimensions, correlations among all independent variable items were conducted to discover groups of related items as suggested by Lewis (2002) and Netemeyer, Bearden & Sharma (2003), using Exploratory Factor Analysis (EFA), by a Principal Component Factoring (PCF). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA); and Varimax rotation facilitated interpretation. Initial runs showed, about eleven factors on the basis of initial eigen values, however when items with a maximum loading of less or with significant cross-loadings on two or more factors were dropped in line with Anderson, Pearoand Widener (2005), coupled with scree plot, a 7-factor explaining about 60% of the total variance was accepted in line with Gilbert & Kendall (2003). The six antecedent factors are perceived security, perceived useful and perceived delivery performance. These 7 factors formed the basis for final questionnaire structure as the antecedents for customer relationship management performance and electronic banking adoption.

On the basis of the seven antecedent factors dimensions, customer relationship management performance and electronic banking adoption dimension, a total of 600 structured

questionnaires were distributed via stratified sampling to the academic staff of three Malaysian public universities: Universiti Utara Malaysia (UUM), Universiti Sains Malaysia (USM) and Universiti Malaysia Perlis (UniMAP). The previous study by Melian-Azola and Padron-Robaina (2007) investigated the role of and importance of results in B2C e-commerce from the customer's perspective, together with impact on overall perceived quality and customer attitudes have chosen the university lecturers as population because of few reasons: they matched the profile of the average internet purchaser in terms of education, income and age, as well as product purchased; the most commonly purchased items on the internet- books, IT products and travel.

A total of questionnaires were retrieved, however after removing unfilled response and morbidity cases, only 325 were considered fit for further analysis. Data collected was subjected to Principle Axis Factoring (PAF), correlation of constructs and reliability analysis in order to assess constructs validity, after assessing the normality of the data set. The research exclusively relied on SPSS 12 for preliminary data analyses.

Discussion and Analysis

In assessing constructs validity the following statistical and theoretical analysis were conducted; normality test, assessing suitability for FA, assessing convergent, discriminant, nomological and content validity and reliability analysis in this order.

(a) Normality Test

All the items that pass the EFA are now ready for normality test. The first step of testing data normality is by dividing the skewness and standard error for each item. The scores below 2.58 are considered as normal. The scores above 2.58 will be transform to achieve normality. Data transformations provide the principal means of correcting nonnormality and heteroscedasticity (Hair et al., 2006). According to Hair et al., (2006), skewed distributions can be transformed by taking the square root, logarithms, squared or cubed (X² or X³) terms or even the inverse of the variables.

| | Mean | Std. Deviation | Skewness | Skewness | Normal if score <2.58 | |
|--------|-----------|----------------|-----------|------------|-----------------------|--------|
| | Statistic | Statistic | Statistic | Std. Error | Skewness /S.E | Remark |
| CPV 8 | 3.986425 | 0.684103 | -0.84253 | 0.163667 | -5.14786 | NN |
| CPV 7 | 3.877828 | 0.706146 | -0.60431 | 0.163667 | -3.69235 | NN |
| CPV 9 | 4.036199 | 0.731469 | -0.61875 | 0.163667 | -3.78057 | NN |
| CPV 6 | 3.877828 | 0.767823 | -0.88218 | 0.163667 | -5.39011 | NN |
| CPV 3 | 3.81448 | 0.742825 | -0.3584 | 0.163667 | -2.18981 | OK |
| CPV 15 | 3.877828 | 0.77372 | -0.32013 | 0.163667 | -1.95601 | OK |
| CPV 16 | 3.809955 | 0.786298 | -0.32962 | 0.163667 | -2.01398 | OK |
| CPV 17 | 3.841629 | 0.749112 | -0.38699 | 0.163667 | -2.3645 | OK |
| CPV 18 | 4.049774 | 0.758145 | -0.58851 | 0.163667 | -3.59577 | NN |
| POS3 | -0.16742 | 0.139123 | 0.285663 | 0.277365 | -1.20338 | OK |
| POS4 | -0.10495 | 0.139123 | -0.23856 | 0.277365 | -0.75436 | OK |
| POS5 | -0.28351 | 0.139123 | -0.12623 | 0.277365 | -2.03783 | OK |
| POS6 | 0.344601 | 0.139123 | -0.04734 | 0.277365 | 2.476952 | OK |
| POS7 | 0.029748 | 0.139123 | -0.37008 | 0.277365 | 0.213822 | OK |
| POS8 | 0.15481 | 0.139123 | -0.29332 | 0.277365 | 1.112756 | OK |

| | | | | | | |
|-----------------------|----------|----------|----------|----------|----------|----|
| POP_4 | 4.022624 | 0.621168 | -0.01462 | 0.163667 | -0.08935 | OK |
| POP_5 | 3.778281 | 0.707543 | -0.27627 | 0.163667 | -1.68798 | OK |
| POP_6 | 3.660633 | 0.862205 | -0.91498 | 0.163667 | -5.59049 | NN |
| POP_7 | 3.723982 | 0.919889 | -0.76724 | 0.163667 | -4.6878 | NN |
| PEOU1 | 4.004525 | 0.703871 | -0.40092 | 0.163667 | -2.4496 | OK |
| PEOU2 | 4.0181 | 0.706874 | -0.64895 | 0.163667 | -3.96506 | NN |
| PEOU3 | 3.954751 | 0.749386 | -0.44915 | 0.163667 | -2.74431 | NN |
| PEOU4 | 3.918552 | 0.727805 | -0.51646 | 0.163667 | -3.15553 | NN |
| PEOU5 | 3.877828 | 0.743766 | -0.26747 | 0.163667 | -1.63423 | OK |
| PEOU6 | 3.828054 | 0.736904 | -0.67919 | 0.163667 | -4.14984 | NN |
| PEOU7 | 3.846154 | 0.670038 | -0.36001 | 0.163667 | -2.19965 | OK |
| PU_2 | 3.859729 | 0.655923 | 0.153452 | 0.163667 | 0.937588 | OK |
| PU_3 | 3.773756 | 0.752836 | -0.05172 | 0.163667 | -0.31601 | OK |
| PU_4 | 3.733032 | 0.711109 | -0.09816 | 0.163667 | -0.59976 | OK |
| PU_5 | 3.936652 | 0.671204 | -0.01681 | 0.163667 | -0.10268 | OK |
| SDP_4 | 3.755656 | 0.854947 | -0.47638 | 0.163667 | -2.91069 | NN |
| SDP_5 | 3.556561 | 0.839801 | -0.37648 | 0.163667 | -2.3003 | OK |
| SDP_6 | 3.597285 | 0.839801 | -0.38035 | 0.163667 | -2.32395 | OK |
| SDP_8 | 3.515837 | 0.817965 | -0.50389 | 0.163667 | -3.07875 | NN |
| CRMP_1 | 4.167421 | 0.62087 | -0.35709 | 0.163667 | -2.1818 | OK |
| CRMP_3 | 4.099548 | 0.56331 | -0.13001 | 0.163667 | -0.79434 | OK |
| CRMP_7 | 3.873303 | 0.702115 | -0.77301 | 0.163667 | -4.72305 | NN |
| EBA_1 | 4.140271 | 0.55042 | -0.10062 | 0.163667 | 0.61478 | OK |
| EBA_2 | 4.104072 | 0.566514 | 0.017821 | 0.163667 | 0.108885 | OK |
| EBA_3 | 4.19457 | 0.728116 | -1.17294 | 0.163667 | -7.16666 | NN |
| Valid N (listwise) | 247 | | | | | |

Source: Survey Data (2007)

Notes: NN= Not Normal; OK= Normal

Five Items for customer perceived (CPV_8, CPV_7, CPV_9, CPV_6, CPV_18), two items for privacy (POP_6, POP_&), four items for perceived ease of use (PEOU2, PEOU3, PEOU6, PEOU4), two items for delivery performance (SDP4, SDP8) consists of negative skewed distribution so that there are best transformed by employing a squared transformation. The similar process was also taken to item CRMP_7 but one item for electronic banking adoption (EBA_3) had to go through logarithm transformation since it failed during the squared transformation.

| | Skewness Statistic | Std. Error | SQRT- Skewness /S.E | | Skewness Statistic | Std. Error | Log Ten- Skewness /S.E | |
|-------|-----------------------|---------------|---------------------------|----|-----------------------|---------------|------------------------------|--|
| CPV8 | 0.164 | 0.164 | 1 | OK | | | | |
| CPV7 | 0.025 | 0.164 | 1 | OK | | | | |
| CPV9 | 0.099 | 0.164 | 1 | OK | | | | |
| CPV6 | 0.292 | 0.164 | 1 | OK | | | | |
| CPV18 | 0.123 | 0.164 | 0.75 | OK | | | | |

| | | | | | | | | |
|-------|--------|-------|------|----|-------|------|--------|----|
| POP6 | 0.269 | 0.164 | 1.64 | OK | | | | |
| POP 7 | 0.174 | 0.164 | 1.64 | OK | | | | |
| PEOU2 | 0.077 | 0.16 | 0.47 | OK | | | | |
| PEOU3 | -0.021 | 0.164 | 0.47 | OK | | | | |
| PEOU4 | -0.012 | 0.164 | 0.47 | OK | | | | |
| PEOU6 | 0.034 | 0.164 | 0.21 | OK | | | | |
| SDP 4 | 0.03 | 0.164 | 0.18 | OK | | | | |
| SDP 8 | 0.112 | 0.164 | 0.68 | OK | | | | |
| SDP 7 | 0.15 | 0.164 | 0.91 | OK | | | | |
| EBA 3 | 0.448 | 0.164 | 2.73 | NN | 0.164 | 0.25 | -0.041 | OK |

Source: Survey Data (2007)

(b) Exploratory Factor Analysis

Table 1: Reliability, Factor Loading, Eigenvalue, Variance and Mean

| Factor ^a | Factor Loading | Communalities | EV ^b | Variance (percent) ^c | Factor mean ^d |
|--|----------------|---------------|-----------------|---------------------------------|--------------------------|
| Social Value ($\alpha=0.918$) ^e | | | | | |
| CPV_8 | .847 | 0.844 | 32.248 | 12.241 | 3.92 |
| CPV_5 | .795 | 0.744 | | | |
| CPV_7 | .734 | 0.715 | | | |
| CPV_11 | .721 | 0.663 | | | |
| CPV_10 | .713 | 0.739 | | | |
| CPV_9 | .673 | 0.735 | | | |
| CPV_12 | .636 | 0.681 | | | |
| CPV_6 | .639 | 0.724 | | | |
| CPV_1 | .623 | 0.735 | | | |
| (9 items to 5 items) | | | | | |
| Security ($\alpha=0.929$) | | | | | |
| POS6 | .861 | .857 | 10.741 | 11.737 | 3.65 |
| POS8 | .844 | .820 | | | |
| POS5 | .843 | .784 | | | |
| POS7 | .839 | .834 | | | |
| POS4 | .757 | .733 | | | |
| POS3 | .696 | .656 | | | |
| (6 items – retain) | | | | | |
| Ease of Use ($\alpha=0.943$) | | | | | |
| PEOU5 | .872 | .849 | 6.783 | 10.025 | 3.92 |
| PEOU6 | .849 | .784 | | | |
| PEOU3 | .845 | .816 | | | |
| PEOU2 | .834 | .796 | | | |
| PEOU4 | .828 | .746 | | | |
| PEOU1 | .813 | .767 | | | |
| PEOU7 | .764 | .695 | | | |
| (7 items-retain) | | | | | |
| Delivery Performance ($\alpha=0.864$) | | | | | |

| | | | | | |
|---|------|------|-------|-------|------|
| SDP_10 | .719 | .658 | 5.445 | 9.538 | 3.61 |
| SDP_5 | .706 | .772 | | | |
| SDP_4 | .681 | .655 | | | |
| SDP_9 | .670 | .636 | | | |
| SDP_8 | .626 | .739 | | | |
| SDP_11 | .613 | .795 | | | |
| SDP_6 | .597 | .685 | | | |
| (7 items to 4 items) | | | | | |
| Economic Value ($\alpha=0.895$) | | | | | |
| CPV_17 | .706 | .816 | 3.498 | 6.362 | 3.89 |
| CPV_16 | .690 | .776 | | | |
| CPV_14 | .670 | .712 | | | |
| CPV_18 | .660 | .737 | | | |
| CPV_13 | .630 | .610 | | | |
| CPV_15 | .597 | .728 | | | |
| (6 items to 4 items) | | | | | |
| Usefulness ($\alpha=0.895$) | | | | | |
| PU_4 | .757 | .814 | 3.211 | 5.757 | 3.83 |
| PU_3 | .747 | .861 | | | |
| PU_2 | .737 | .771 | | | |
| PU_5 | .513 | .758 | | | |
| (4 items- retain) | | | | | |
| Privacy ($\alpha=0.815$) | | | | | |
| POP_6 | .749 | .736 | 3.099 | 5.046 | 3.80 |
| POP_4 | .677 | .764 | | | |
| POP_7 | .636 | .695 | | | |
| (3 items- retain) | | | | | |

Source: Survey Data (2007)

Notes:

^a42 attributes captured in seven antecedents factors

^bEV: Eigenvalue

^c60.7 percent of cumulative variance explained

^dMean scale: 5= strongly agree; 1 = strongly disagree

^eCronbach's alpha

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) =0.891

From the original six antecedent factors for customer relationship management performance tested in EFA, eleven components were constructed by Varimax rotation method. However there were only seven components properly loaded in a meaningful way. The items which were loaded in more than three components were omitted from the analysis. Perceived value factors were split to two components which were social value and economic value. Other factors remained with the original names. As summary, out of nine items for measuring CRM performance and six items for measuring Electronic Banking Adoption, there were only three items left for each variables to further the analysis and from the original 59 items for the antecedents factors there were only 42 items remaining to measure the six antecedent factors.

The Anti-image Correlation table showed that some of the selected items have the score below the Kaiser-Meyer-Olkin Measures of Sampling Adequacy (MSA) at 0.891. Thus, some

items with the lower score compare to KMO was omitted from the final list (The italic items in Table 1 are deleted from the analysis). Therefore, the final list of the items are 39 items, which is 33 items for the antecedent factors, three items for measuring customer relationship management performance and three items for electronic banking adoption.

(c) Constructs Reliability

The results of the reliability analysis presented in Table indicate that the constructs internal consistency exceeds the 0.60 (Bagozzi & Yi 1988) and the stricter 0.70 (Nunnally,1978) as acceptable cut-off point. Constructs reliability for customer relationship management and electronic banking adoption also exceed the minimum (0.922 for CRMP and 0.728 for EBA).

(d) Convergent Validity

Convergent validity was assessed by factor loading, reliability and factor structure (Garson 2006; Hair *et al.*, 2006). On the basis of factor loading all the constructs exceed the minimum cut-off load of 0.30 required for 350 samples and above, hence there exist statistical significance. Although statistically significant, not all the factors meet the 0.50 stringent cut-off recommended (Hair *et al.*, 2006) for convergent validity. This fact coupled with the importance of practical significance further justify the need for other considerations, as observed 'lower loading (lower than 0.5) considered significant (can be) added to the interpretation based on other (favorable) considerations' (Hair *et al.*, 2006). Table 1 showed that the factor loading score was in the range of 0.513-0.872, exceeding the minimum.

(e) Mahalanobis Test

To identify the outlier's cases, mahalanobis test was done by comparing the Chi-square value with Mahal Distance Maximum score. The Residual Statistic table below shows the value for Maximum Mahal. Distance is 195.693. For the total 40 items involves in this analysis, the Chi-square value sates from the χ^2 distribution table was 73.402. Therefore, cases with higher Mahalanobis Score above 73.402 were deleted from the analysis. By checking all the score for all the items, it was found that 78 cases were deleted since there were outliers. The total cases left for the analysis were 247 cases.

Distance Max = 195 > χ^2 (40, 0.001)195 > 73.402

Residuals Statistics (a)

| | Minimum | Maximum | Mean | Std. Deviation |
|-----------------------------------|-------------------|------------------|-----------------|-----------------------|
| Predicted Value | -21.1621 | 358.1498 | 164.1723 | 75.53584 |
| Std. Predicted Value | -2.454 | 2.568 | .000 | 1.0000 |
| Standard Error of Predicted Value | 8.32 | 52.784 | 31.613 | 7.739 |
| Adjusted Predicted Value | -144.5603 | 387.0864 | 160.7832 | 82.44242 |
| Residual | -150.11861 | 185.16211 | .00000 | 59.50842 |
| Std. Residual | -2.216 | 2.733 | .000 | .878 |
| Stud. Residual | 2.522 | 3.528 | .021 | 1.012 |
| Deleted Residual | -206.36369 | 308.56027 | .022 | 1.016 |
| Mahal. Distance | 4.635 | 195.693 | 73.772 | 35.799 |
| Cook's Distance | .000 | .141 | .005 | .012 |
| Centered Leverage Value | .014 | .604 | .228 | .110 |

Source: Survey Data (2007)

(f) Discriminant and Nomological Validity

In addition to factor structure aforementioned, discriminant validity was evident (see Table below) as the correlations between constructs were all lower than benchmark of 0.85 (Garson 2006) and the stringent 0.70 (Sekaran 2003). Not only are the seven factors constructs positively related among one another but they also are all positively correlated with customer relationship management performance and electronic banking adoption, demonstrating evidence of nomological validity.

Correlations

| | SV | EV | POS | POP | PEOU | SDP | PU | CRMP | EBA |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| SV | 1 | .698(**) | .011 | .243(**) | .173(**) | .198(**) | .315(**) | .413(**) | .471(**) |
| EV | .698(**) | 1 | .252(**) | .415(**) | .154(**) | .219(**) | .285(**) | .470(**) | .482(**) |
| POS | .001 | .252(**) | 1 | .670(**) | .131 | .504(**) | .396(**) | .200(**) | .043 |
| POP | .243(**) | .415(**) | .670(**) | 1 | .147(*) | .396(**) | .445(**) | .475(**) | .242(**) |
| PEOU | .173(**) | .154(*) | .131 | .147(*) | 1 | .199(**) | .263(**) | .302(**) | .278(**) |
| SDP | .198(**) | .219(**) | .504(**) | .396(**) | .199(**) | 1 | .560(**) | .434(**) | .088 |
| PU | .315(**) | .285(**) | .396(**) | .445(**) | .263(**) | .560(**) | 1 | .373(**) | .326(**) |
| CRMP | .431(**) | .470(**) | .200(**) | .475(**) | .302(**) | .434(**) | .373(**) | 1 | .681(**) |
| EBA | .471(**) | .482(**) | .043 | .242(**) | .278(**) | .088 | .326(**) | .686(**) | 1 |

** Correlation is significant at the 0.01 level (2-tailed)

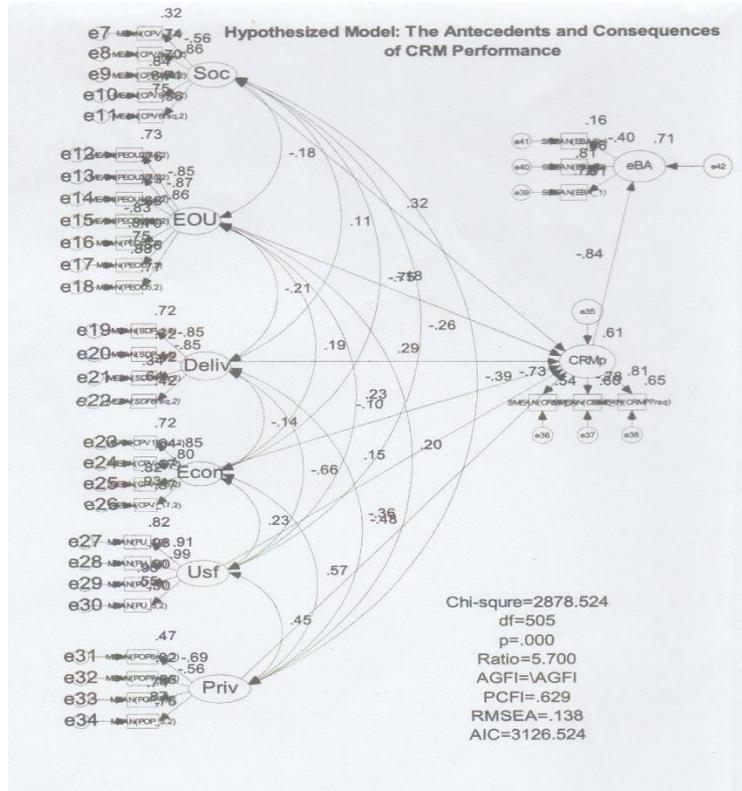
*Correlation is significant at the 0.05 level (2-tailed)

Conclusion

The findings from the this study provide preliminary evidence to support the meaningfulness and appropriateness for using the seven antecedent factors' dimension, three customer relationship management performance items and three electronic banking adoption items which is very useful in investigating the causal relationship between the variables. As normality test, sampling adequacy and assessment of data factorability strongly indicate goodness of the data set for factor analysis. Consequently both statistical and theoretical analysis of unidimensionality, convergent, discriminant, nomological and content validity as well as reliability supports the validity of the constructs. Practically, the scales will go along way helping service providers and regulatory agencies in measuring customer's relationship management performance, determining its antecedent and service adoption. Academically, the scales need to be re-tested with larger samples and confirmatory factor analysis.

Hypothesized Model for Structural Equation Modeling

After completing the preliminary test, the draft of research models was design through AMOS. However, the first model is probably unidentified. In order to achieve identified model, it will probably be necessary to impose 1 additional constraint. The (probably) unidentified parameters are marked. The Regression Weight table shows the remarks that there is unidentified relationship between security factor and other factors such as CRM performance and other observed variables such as POS_4, POS_5, POS_6, POS_7 and POS_8. Therefore AMOS has recommended deleting these factors from further analysis. Hence, the new model achieving a minimum was developed. This hypothesized model record the RMSEA at 0.138 and Ratio at 5.700. According to Hair et al. (2006) the fit model must have RMSEA score below 0.08 and Ratio score below than 2. To acquire the fit model the next process involves confirmatory factor analysis (CFA).



References

- Anderson, S. W., Pearo, L. K. & Widner, S. K. (2005). Different Strokes for Different Folks: Linking Customer Satisfaction to the Service Concept and Customer Characteristics. *Social Science Research Network*. (On-line) available: <http://ssrn.com/abstract=798964>
- Bagozzi, R.P. & Yi, Y. (1998). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94
- Blattberg, R.C., Getz, G., Thomas, J.S. (2001), *Customer Equity: Building and Managing Relationships as Valuable Assets*, Harvard Business School Press, Boston, MA.
- Chan, I. J., & Popovich, K. (2003). Understanding CRM: People, *Process and Technology Business Process Management Journal*, 9(5), 672-688.
- Chan, S. & Lu, M. (2004), Understanding Internet Banking Adoption and Use Behavior: A Hong Kong Perspective, *Journal of Global Information Management*, 12(3), 21-35.
- Davis, F.D. (1989), Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MS Quarterly*, 13(3), 319.
- Fishbein, M & Ajzen, I. (1975), *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

- Flaviann, C. and Guinaliu, M. (2006), Consumer trust, perceived security and privacy policy: Three basic elements of loyalty to a web site, *Industrial Management & Data Systems*, 106(5), 601-620.
- Floh, A. & Treiblmaier, H., 2006 What Keeps The E-Banking Customer Loyal?: A Multigroup Analysis Of The Moderating Role Of Consumer Characteristic On E-Loyalty In The Financial Service Industry, *Journal of Electronic Commerce Research*, 7(2).10-25.
- Garson, G. D. (2006). Validity. (On-line) available <http://www2.chass.ncsu.edu/garson/PA756/validity>
- Gilbert, A. Lee, & Kendall, J. D. (2003). A Marketing Model for Mobile Wireless Services. *Proceedings of the 36th Hawaii International Conference on System Sciences*
- Griffin, J. (1995), *Customer Loyalty: How to Earn It, How to Keep It*, Lexington Books, New York, NY.
- Hair, J. F. Jr., Black, W.C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (2006). *Multivariate Data Analysis*. Sixth edition, Prentice Hall, NJ
- Joseph M, Sekhon Y, Stone G, and Tinson J. (2005), "An exploratory study on the use of banking technology in the UK: A ranking of importance of selected technology on consumer perception of service delivery performance", *International Journal of Bank Marketing*, 23(5)., 25-49
- Karahanna, E., Straub, D.W. & Chervany, N.L. (1999), Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs, *MIS Quarterly*, 23(2), 1-22.
- Lewis, J. R. (2002). Psychometric Evaluation of the PSSUQ Using Data from Five Years of Usability Studies. *International Journal of Human-Computer Interaction*, 14(3/4), 463-488.
- Melian-Alzola L., & Padron-Robaina V., (2007), *Measuring results in B2C e-commerce*, *International Journal of Quality & Reliability Management*, 24(3), 279-293.
- Methlie, L.B. & H. Nysveen (1999), Loyalty of on-line bank customers, *Journal of Information Technology*, 14(1), 375-386.
- Moore, G.C. & Benbasat, I. (1991), Development of an instrument to measure the perceptions of adopting an information technology innovation, *Information System Research*, 2(3), 192-222.
- Netemeyer, R. G., Bearden, W. O. & Sharma, S. (2003). *Scaling Procedures: Issues and Applications*, Thousand Oaks, CA: Sage Publications

Nunnally, J.L. (1978). *Psychometric Theory*, 2nd ed. NY: McGraw-Hill.

Perrien, Jean, Filiatrault, Pierre, Ricard, Line (1992), "Relationship marketing and commercial banking: A critical analysis", *The International Journal of Bank Marketing*, 10(7), 25-29.

Rust, R.T., Zeithaml, V.A., Lemon, K.N. (2000), *Driving Customer Equity: How Customer Lifetime Value Is Reshaping Corporate Strategy*, The Free Press, New York, NY.

Sekaran, U. (2003). *Research Methods for Business. A Skill-Building Approach* 4th Edition, Singapore, John Wiley & Sons.

Wang, Y., Lo, H. P., Chi, R., & Yang, Y. (2004). An integrated framework for customer value and customer relationship management performance: a customer-based perspective from China. *Managing Service Quality*, 14(2/3), 169-182.

Yeoh, A. (2006), *OCBC Bank Rolls Out CRM Solution*. Kuala Lumpur