Research on the measurement of customer equity of corporate banking business

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Abstract

After joining WTO, especially after 2006, Chinese government gradually opened the financial market and many foreign banks came in, which accelerated the competition for customers. In such situations, the survival and development of commercial bank depends on its valid and rational management of customer equity. However, there is still no relevant research about customer equity of commercial bank. So, this paper improves the customer equity measurement model of Gupta and Lehmais on the basis of comparing and analyzing the existing measurement models of customer equity and then applies survey data and company reports data to calculate corporate banking business’ customer equity of Harbin Branch of China Construction Bank, which is the basis of customer equity management and of great significance in theory and practice.

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1. Introduction

With the development of customer-centered theory, customer equity (CE) gradually becomes an important criteria to evaluate enterprises’ core competence. In order to maximize customer equity, the first thing is to measure and assess customer equity which is the total present value of all customer lifetime

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value (CLV) by definition. It is apparent that customer equity measurement is based on the calculating of customer lifetime value. So scholars have established many models to describe problems related in this field [1-4]. However, there is still no measurement model that can directly apply to the measurement of commercial banks, which is the basis of customer equity management for commercial banks. On the other hand, after joining WTO, especially after 2006, with the increasing opening of financial market, the competition between commercial banks for customers in China is becoming more and more serious. In such situations, the survival and development of banking industry depends on its valid and rational customer equity management. Therefore, this paper improves the customer equity measurement model of Gupta and Lehmais and applies this model to study that of corporate banking business, which is of great significance to customer equity management theory and banking practice.

2. Measuring method

In order to measure the customer equity of commercial bank, we need to classify banks’ business firstly. Since the main body of customer equity is customer, we choose the method of customer classification, from which banking business can be divided as personal banking business, corporate banking business and financial markets business. Due to time and length constraints, we mainly research on the measurement of corporate banking business’ customer equity which includes the measurement of corporate loans and corporate deposits.

By definition, customer equity is the total discounted present value of all customer lifetime value which includes not only that of current customers but also that of potential customers. However, any commercial bank or its corporate customer would not open the specific transaction information of banking business (corporate deposits and corporate loans) to the public, which makes the method of questionnaire to get the data of corporate customers’ purchasing information infeasible. Therefore, this paper can only use commercial banks’ report data which is open to the public. Based on the comparison and analysis of traditional measurement model, and combining with the sources of data, this article chooses the measurement of Gupta and Lehman (2003) [5] to measure the corporate banking business’ customer equity, which is described as follows:

\[
CLV = m \left( \frac{r}{1 + i - r(1 + g)} \right)
\]

In formula (1): \( m \) is expected contribution, while each customer's contribution simply equals to annual revenue minus the cost of sales; \( g \) is the average growth rate of \( m \), the model assumes that the value of \( g \) is constant, so \( g \) can only reflect the average trends of customer’ expected contribution, in other words, the CLV value calculated by this model can reflect the general changes of customer purchases.

\( r \) is the annual customer retention rate, some studies have evaluated that the average annual customer retention rate is about 80%, although there are great differences between enterprises in different industries and within the same industry [6]. \( i \) is discount rate which reflects the fact that current money is more valuable than tomorrow's money and the value of discount rate is related to the nature of enterprises [7], for most mature enterprises, the discount rate is between 8% to 16%, for high-risk enterprises, such as Internet companies, the discount rate may be between 20% to 30%.

Obviously, customer 'expected contribution is determined by his retention rate. For example, if customer' annual retention rate is 90%, then by the end of first year, 90% of the customers will remain in the enterprise, if the retention rate is constant, 81% of the customers will remain in the enterprise at the end of second year. In this model, we do not need to assume the retention time between customers and enterprises, because the customer retention rate has reflected the reality that the possibility of retention relationship between customers and enterprises is becoming smaller and smaller.

It is worth mentioning that, the initial formula of Gupta and Lehman is as follows:
However, the premise of formula (2) is the assumption that customers' expected contribution retention rate is constant and there is no customers changed from potential customers. Obviously, this assumption will make their theories and calculations easy to understand, but this is quite different from the reality. Therefore, we choose formula (1) to measure the corporate banking business' customer equity which includes average growth rate of expected contribution which can be gained from the direct calculation through the bank's financial statements in the past few years. In other words, this reflects all changes of corporate clients' actual contribution, including the changes of purchases and the number of customers, that is to say, reflects the changes in market demand.

In addition, for corporate banking business, different customer groups in different sectors or different industries create different contribution for the bank, which is fully reflected in bank's financial statements. So, this paper classify bank's corporate customers to calculate according to business (demand deposits and time deposits) or industries. Therefore, the value of corporate bank's customer equity of customers group \( i \) is calculated by formula (3):

\[
CE_i = M_i \left( \frac{r}{1+i-r} \right) \quad (3)
\]

In formula (3), \( M_i \) is the expected contribution of customers group \( i \), \( g_i \) is average growth rate of \( M_i \). Then the value of corporate bank's customer equity can be calculated as formula (4):

\[
CE = \sum_{i=1}^{n} CE_i \quad (4)
\]

In formula (4), \( n \) is the number of the bank's customer groups.

All data used by this paper is available from the annual financial statements of China Construction Bank, since there is no specific data of Harbin branch in its financial statements, this paper can estimate it from Harbin branch's share in the entire northeast region and northeast region's share in China. The data used in the process of calculation is shown in Table 1 to Table 3.

| Northeast region | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------|------|------|------|------|------|
| Deposit Amount (million yuan) | 322,758 | 369,657 | 405,490 | 483,733 | 600,838 |
| Percentage of nation (%) | 8.06 | 7.83 | 7.59 | 7.59 | 7.51 |
| Loans amount (million yuan) | 151,191 | 177,771 | 199,106 | 233,468 | 299,385 |
| Percentage of nation (%) | 6.15 | 6.19 | 6.08 | 6.15 | 6.21 |

| National corporate deposits(million yuan) | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------------------------------|------|------|------|------|------|
| Demand deposits | 1,474,483 | 1,778,715 | 2,084,193 | 2,229,910 | 2,960,155 |
| Percentage of national corporate deposits(%) | 36.81 | 37.67 | 39.03 | 34.97 | 37.00 |
| Time deposits | 619,564 | 687,569 | 861,112 | 1,107,136 | 1,343,354 |
| Percentage of national corporate deposits(%) | 15.46 | 14.56 | 16.12 | 17.36 | 16.79 |
| National total corporate deposits | 2,094,047 | 2,466,284 | 2,945,305 | 3,337,046 | 4,303,509 |
| The net interest income of corporate deposits | 64,506 | 78,033 | 109,412 | 126,010 | 124,389 |
Since all the data is from the annual report of China Construction Bank Corporation, there is no need for data reliability analysis, validity analysis and standardization process. In addition, in the corporate loan business of China Construction Bank from 2005 to 2009, the percentage of manufacturing, electricity and transportation in nationwide loans (including personal loans and corporate loans) is more than 40%. Therefore, in the company's customer equity loan process, in accordance with the manufacturing, electricity, transportation and other sectors of the corporate lending business, customer base has been divided. Based on the above data, the corporate deposits and corporate loans of China Construction Bank from 2005 to 2009 in Northeast area can be directly calculated. The overall performance of Harbin City accounts for about 15.38% of Northeast areas' total revenue, so each individual customer base 'contribution to Harbin branch can be estimated value, and the value of customer equity can be calculated

### 3. Measuring of Corporate Bank's Customer Equity

According to table 1 and table 2, corporate customers' contribution to the deposits business of Harbin Branch of China Construction Bank from 2005 to 2009 are calculated, as shown in table 4.

| Net interest income (million) | 2005  | 2006  | 2007  | 2008  | 2009  |
|------------------------------|-------|-------|-------|-------|-------|
| Demand deposits              | 563.0472 | 683.2756 | 903.7967 | 982.9428 | 988.2572 |
| Time deposits                 | 236.5872 | 264.1228 | 373.4156 | 488.0248 | 448.4830 |

From table 4, the average annual growth rate of customer 'expected contribution from 2005 to 2009 can be obtained, and g of demand deposits, time deposits is 15.73% and 18.90% respectively.

Some studies have evaluated the average customer retention rate in US is about 80% [8], but customer's brand inertia of commercial banks is large, customers will not easily switch brands, so this article assumes that the corporate customer's annual retention rate of commercial banks is 90%. Meanwhile, assumes that the discount rate is 12% , according to previous calculation results and formula (3), we can get the customer equity of Harbin branch of China Construction Bank' corporate demand deposits business is 11.34207 billion and that of time deposits business is 8.09177 billion. Then, the customer equity of corporate deposits can be gained by formula (4) which equals to 19.43384 billion. In other words, the customer equity of Harbin branch is about 19.43384 billion.

According to table 3 and table 4, corporate customer' contribution to the loans business of Harbin Branch in different industries can be calculated respectively from 2005 to 2009, as shown in table 5.
Table 5. The loan income of Harbin Branch by industry

| Interest income (million yuan) | 2005     | 2006     | 2007     | 2008     | 2009     |
|--------------------------------|----------|----------|----------|----------|----------|
| Manufacturing industry        | 223.0303 | 273.9794 | 347.8950 | 431.0739 | 422.2013 |
| Electric Power Industry       | 136.7970 | 170.9871 | 221.5276 | 294.0361 | 255.4824 |
| Transportation Industry       | 143.4323 | 175.4012 | 217.6800 | 277.3553 | 272.8182 |
| Other Industry                | 411.1980 | 484.4253 | 589.6510 | 745.4741 | 810.8899 |
| The total interest income     | 914.4577 | 1104.7930| 1376.7536| 1747.9393| 1761.3917|

According to the data of table 5, g of manufacturing industry, g of electric power industry, g of transportation industry, g of other industry from 2005 to 2009 is 17.92%, 18.54%, 18.04% and 18.68% respectively. We also assume that the annual customer retention rate is 90%, the discount rate is 12%. According to formula (3), the customer equity of Harbin Branch's loan business in manufacturing, electricity, transportation and other industries can be obtained as 6.46944 billion, 4.32889 billion, 4.26165 billion and 14.07406 billion. Then, use formula (4) to get the customer equity of Harbin Branch's corporate loans business which is 29.13406 billion.

Therefore, the customer equity of Harbin Branch' corporate banking business can be calculated by adding the customer equity of loan business and that of deposits business, which is 48.5679 billion yuan.

Conclusions

In summary, this paper improves the customer equity measurement model of Gupta and Lehman and applies survey data and company reports data to calculate corporate banking business 'customer equity of Harbin Branch of China Construction Bank. Study result shows that this model can make more accurate measurement of CE and guide practice more effectively.

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