

## Profitable credit card business empirical analysis of factors

SHUAI Qing-hong, SHI Yu-lu

(School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu 610074, China)

**Abstract:** Since 1995, major domestic commercial banks are beginning to have a variety of credit cards issued. However, at present, China's relatively low profitability of the credit card business, it accounts for a smaller proportion of total bank income. By means of credit card revenue\cost structure analysis, the authors found spending and overdraft balances affecting credit card business, an important factor in profitability. At the same time, combined with a commercial bank's existing statistical data, using SPSS software correlation and regression analysis, the authors found that the key to improve the bank card revenue is to raise China's commercial banks, credit card revolving credit utilization, and expand the scale of overdraft balances.

**Key words:** credit card; profit factor; revenue\cost structure; correlation

### 1. Introduction

According to Visa International Credit Card Organizations against the Chinese credit card market research, it shows that at present China has become the world's largest credit card market with growth potential. Since 1995, Guangdong Development Bank issued China's first real sense, and in line with international standards of RMB debit cards and international cards, China's credit card market began to enter a substantive stage of development. Secondly only to individual housing loans, as the second-largest retail credit products, credit card business in recent years become a major domestic bank's main development business. At present, the total quantity of China's credit card has broken 100 million.

Overall, for China's credit card market, there is still large growing room, but for the profitability of banks in accordance with national conditions, its development prospects are not optimistic. The bank's official statistics shows that, at present, only the earliest engaged in credit card business in Guangdong Development Bank and China Merchants Bank are the best retail bank credit card business which began to have made modest profits, and most other banks are suffering losses. In addition, the McKinsey in 2007 the Chinese credit card market research report also shows that the entire credit card industry in China is still at a loss, and currently for China's commercial banks, at least half of credit card customers are not viable.

Based on such a development situation, understand the cost structure of the income of the credit card business, researching the main factors in bank credit card receipts, and becomes very necessary. Combining home and abroad situation on the proceeds of the credit card business, this paper aims to find out numbers of factors in the credit card to obtain the greatest impact factor in the profit, so that the development of China's credit card market more reasonable, and summarize some scientific comments and suggestions.

---

SHUAI Qing-hong, Ph.D., associate professor, School of Economic Information Engineering, Southwestern University of Finance and Economics; research fields: E-commerce and payment, financial network & E-banking.

SHI Yu-lu, graduate student, School of Economic Information Engineering, Southwestern University of Finance and Economics; research fields: financial network & E-banking.

## 2. Credit card profit factor analysis

Based on the current profit model of the credit card industry research, starting with the credit card business revenue and cost structure, the authors started from the theoretical analysis of the main factors affecting credit card profits.

### 2.1 Revenue structure

According to China's current credit card market developments, this article will make the following credit card division of revenue structure:

Interest income is defined as a revolving credit card user to use the interest payable. In general, an annual interest rate might be multiplied by the credit balance of accrued interest rate multiplied by the credit card balance to be liquidated. Since the beginning in a credit balance of interest-bearing, the banks have provided an interest-free repayment period. Therefore, the actual outstanding balance of interest income should be multiplied by the proportion of interest-bearing balances multiplied by the corresponding ratio to be.

Credit card rebate of income refers that the merchant to the card issuer returns a certain percentage of commission. Because the documentation and handling consumer credit card issuers provide consumer credit, the promotion of commodity sales, has brought convenience to tenants, therefore, rebate income in fact is the banking services and money to pay compensation.

Annual fee income is defined as a result of the cardholder to obtain possession and use of the right bank credit card issuer shall pay the costs. According to the characteristics of credit card network externalities, in the early stage of development, for the number of clients to reach a critical size to attract businesses, banks generally do not charge annual fee from the customer base. It is only when banks have a considerable number of customer base, banks will charge an annual fee to serve as a source of income.

Other revenue and income, including late fees, excess overdraft fees, refund checks as well as punitive interest rate of extraction of income and cash income, still other value-added services. Generally speaking, this part of the income share of total income is relatively small.

### 2.2 The cost structure

The main expenses of credit card business include the following components:

The cost of capital is one of the major costs of the credit card business. Bank's funding comes mainly from depositors, deposits and capital market borrowings, deposits and bonds generally have to pay a certain interest, which formed a capital cost of inputs. It was also considered the cost of capital, it is the card-issuing financial behavior of the portfolio, which was in bank credit card outstanding balance of funds it must pay interest on the outstanding balance, and can be multiplied by the average cost of capital rate.

The bad account cost, refer that, because holding the card to be unable return from the bank bad debt and bad account, the credit repayment debt forms. This part of the cost depends on all of our customers the outstanding loan amount and the probability of bad debts. At present, due to the China's relaxation of the eligibility criteria, this loss can only be used by the bank itself to offset profits from other digestion.

Operating and marketing costs, include amortization of various systems and facilities costs, wage costs, develop new customers and maintain existing customer costs, marketing and promotion costs. Generally speaking, this part of the capital is difficult to specify calculated, according to ABC cost distribution method, this paper consider the adoption of statistical bank card credit card business, including the cost of the system, the total cost of operations and marketing and uses of the total number of cost drivers, and then calculates the unit price

dynamics.

Fraud costs, including application fraud, trade loss of fraud, etc. Its computation cost is similar to the way of fraud and bad, in a certain probability under environment of keeping a relatively stable.

### 2.3 Profit function analysis

According to the above analysis, the cost function following income was obtained:

#### 2.3.1 Revenue model

$$\begin{cases} TIF = I_1 + I_2 + I_3 + I_4 \\ I_1 = m_1 r_1 \\ I_2 = m_2 r_2 \\ I_3 = en \\ I_4 = f(m_1, m_2, R_1) \end{cases} \quad (1)$$

Among them, TIF (Total Interests Function) said credit card revenue function;  $I_1, I_2, I_3, I_4$  correspond to the interest income, annual fee income and other income and income;  $m_1$  said repayment of the loan balance;  $m_2$  said total consumption of clients,  $r_1, r_2$  said interest rates and merchants kickbacks rate;  $e$  said the annual fee;  $n$  said the total number of customer;  $R_1$  said the total interest income in this part.

In this model, in the actual operation  $r_1, r_2$ ,  $e$ , and  $R_1$  belong to the setting value, so you can get:

$$TIF = f_1(m_1, m_2, n) \quad (2)$$

#### 2.3.2 Cost model

$$\begin{cases} TCF = C_1 + C_2 + C_3 + C_4 \\ C_1 = w_1 r_3 + w_2 r_4 \\ C_2 = m_1 p \\ C_3 = cN \end{cases} \quad (3)$$

Among them, TCF (Total Costs Function) said the credit card cost functions;  $C_1, C_2, C_3, C_4$  correspond to the aforementioned capital costs, bad debt costs, operating and marketing costs and fraud losses, and the fraud losses for a certain value;  $w_1$  said the total amount of bank deposits;  $w_2$  said the capital market loans; respectively,  $r_3, r_4$  said bank interest rates and capital market lending rates;  $p$  said the probability of bad debts;  $c$  said the cards are all costs (including the system of card marketing costs and operating costs);  $N$  said the total number of bank credit card customers.

Similarly,  $r_3, r_4$ ,  $w_1$ ,  $w_2$ ,  $p$  and  $c$  can be considered as a fixed value, so you can get:

$$TCF = f_2(m_1, N) \quad (4)$$

#### 2.3.3 Profit function analysis

Credit card business profits (Net Gain) Income shall be different between function and cost function, so there are:

$$NG = TIF - TCF = F(m_1, m_2, n, N) \quad (5)$$

Take into account: the relevant annual fee income, only as a small fraction of total revenue in credit card business, has a small impact on the revenue relatively; At the same time, the total number of customers primarily reflects the amount of the card, while currently in the country. And attempting to improve by reducing the credit card industry's income is unrealistic. Therefore, we can continue to exclude factors with the two variables  $n$  and  $N$ .

Through the above analysis, we can eventually get a very clear result: At present, the most affecting factor in

the profits of China's commercial banks credit card business is the outstanding loan amount and customer spending, namely:

$$NG = F_0(m_1, m_2) \quad (6)$$

### 3. Based on empirical analysis of bank data

To make the analysis a more convincing conclusion, this paper will use a bank credit card business about 21 months of the relevant value of statistics after 2007, through the SPSS software, to further analysis the above-mentioned factors and the variables associated with the credit card business profit.

#### 3.1 Statistical treatment of raw data

Based on the above revenue\cost structure analysis, in order to facilitate data access, we calculate the cost of revenue and make the following definition:

Income = spending  $\times$  rebate rate + overdraft balance  $\times$  overdraft interest rate; Issuance costs = the cost of issuing cards  $\times$  card volume; Bad debt cost = overdraft balance  $\times$  bad debts probability; The cost of capital = average outstanding balance of funds (overdraft balance)  $\times$  capital cost rate; Profit = Revenue - issuing costs - bad debt costs - the cost of capital.

Through a variety of data collection, this summed up:

At present, different types of businesses impose a different rebate rates in general, which the general types of businesses generally charge 0.7% rebate; through the statistics, the outstanding balance of the overdraft interest rate can reach 18% annual interest rate; general credit card's whole sale price of 1 Yuan for each credit card, while account marketing costs 5 Yuan. Taking into account other card-based costs, the cost of credit card are assumed to be 10 Yuan; bad probability is always maintained at a stable and relatively a low level, we may assume it as about 0.09%; Through statistical analysis, the cost of funds rate is considered to be 6.5% or so.

Ultimately, combined with the information published on the Internet, we can get a statistical result of bank credit card and business's value of the income in 20 months.

#### 3.2 Various factors and profit of correlation analysis

##### 3.2.1 Correlation analysis

Based on the above formula, the main variables affecting the profits of credit card business are the amount of consumption, overdraft balance and the cost of issuers. Thus, in actual using of SPSS software to analyze the process, we mainly examine these three variables with the relationship between the profits.

According to the results of correlation analysis, respectively, the profit with the other three variables and test the correlation coefficient between the probability values (see Table 1).

**Table 1 The results of correlation analysis**

Research variables	Profits and spending	Profit and overdraft balances	Profits and the cost of issuing
Pearson correlation coefficient	0.7091	0.7522	0.3899
Two-tailed test probability P	0.0005	0.0001	0.0892

From Table 1, we can see: The relation between the amount of profit and consumption, overdraft balance is relatively significant, the corresponding probability of  $p < 0.01$ ; Although between profit and card-issuing costs although there are some correlation, the probability  $p = 0.0892$ , did not pass inspection. Therefore, we can believe that the profits of credit card business depends on spending and overdraft balances, which also confirms this prior

to the profit function analysis.

At the same time, the correlation coefficient between consumption amount and the overdraft balance reached 0.9920, which corresponds to the value of probability  $p$  much less than 0.01. In other words, the balance of spending between the comparison and the overdraft, have a significant correlation. In fact, overdrawn balance of the spending can be seen as a part of a cardholder's temporary loan to the bank, and the total growth in spending will naturally lead to a certain extent, an increase in overdraft balances. We can even say that the banks credit card business profits were mainly dependent on the sum of overdraft balance. Spending is not that part of the overdraft credit card, and basically does not constitute a profit.

### 3.2.2 The weak-related variables in regression analysis

Based on correlation analysis, this paper excludes the cost of issuing the variables; The remaining three continue to study the linear relationship between variables. By using of stepwise (forced to remove law), get the final results of linear regression (see Table 2).

**Table 2 The results of linear regression**

Model		Non-standardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta	B	Std. Error
1	(Constant)	0.080	0.050		1.597	0.028
	Overdraft balance	0.011	0.002	0.752	4.843	0.000

Note: a dependent variable: profit.

The results showed that, as the amount of spending and overdraft balances has a strong correlation relation, finally, SPSS software exclude the effect of spending factors, and the corresponding linear equation is:

$$y = 0.08 + 0.011x \quad (7)$$

$x$  said the overdraft balance;  $y$  said the profit.

Therefore, the profit depends largely on the current balance of the overdraft, which to some extent, also shows that credit card profits depend largely on an overdraft balance of conclusions.

## 4. Conclusion

Credit card business profits were mainly derived from interest income, and only when this part of the revenue reaches to 50% of overall revenue, the bank would have a better bottom line. According to the study of this article on credit card revenue, cost structure, this text found that, at present, to increase in credit card business profits, the primary means is expanding domestic consumer demand, thus increasing the overdraft amount of the cardholder. To improve our country commercial bank credit card business profitability, we must constantly improve our county commercial bank credit card circulation loan utilization, expand the scale of balance overdraw.

Combining with the Chinese market, credit card business has a great profit growth space. According to the forecast, China's retail companies credit market will increase exponentially, and only the credit card, profits will reach 1.3 billion-140 million Yuan in 2013, only the second to the personal housing loan products, China's retail credit card business would become the core business and main banking profits. Therefore, every big commercial bank should grasp the current credit card market in great potential for growth, intensify the enhancement of revolving loan cardholder and improved fundamentally credit card business interest income.

(to be continued on Page 24)