

## *Customer Satisfaction Assessment in Banks*

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**Abstract:** The Chinese banking industry's physical services have been severely impacted recently. The service model of major types of banks in China has undergone relatively significant changes. This study aims to assess customer satisfaction for various kinds of banks in China in recent years. Based on the data from the China Banking and Insurance Regulatory Commission for the past three years, we conducted a spss analysis on these data. Specifically, the factors affecting bank customer satisfaction were mined through comparative analysis, factor analysis, and ANOVA. A data set study demonstrated that customer satisfaction of different bank categories was not merely about deposits and loans but more about service experience and quality wealth asset allocation. The results indicate that to maintain their banking edge in the current economic downturn, all categories of banks must keep up with the social environment and pay sufficient attention to finance business.

**Keywords:** customer satisfaction, large state-owned commercial banks, credit cards

### **1. Introduction**

This field of study is the level of customer satisfaction with different categories of banks. This seems to be a common problem in service satisfaction. There has been less previous evidence for customer satisfaction. We use three analytical methods to assess service satisfaction. It is interesting to know whether service satisfaction has a significant and far-reaching impact on banks. This project aims to develop an overarching framework to formulate the company's development strategy. The main achievements, including contributions to the field, can be summarized as follows: many companies can assess service satisfaction as an essential evaluation method.

### **2. Comparative Analysis**

SPSS Statistics was used to compare the relationship between complaints of different business activities of varying banking categories in other years.

## 2.1. Comparing the Different Banking Categories

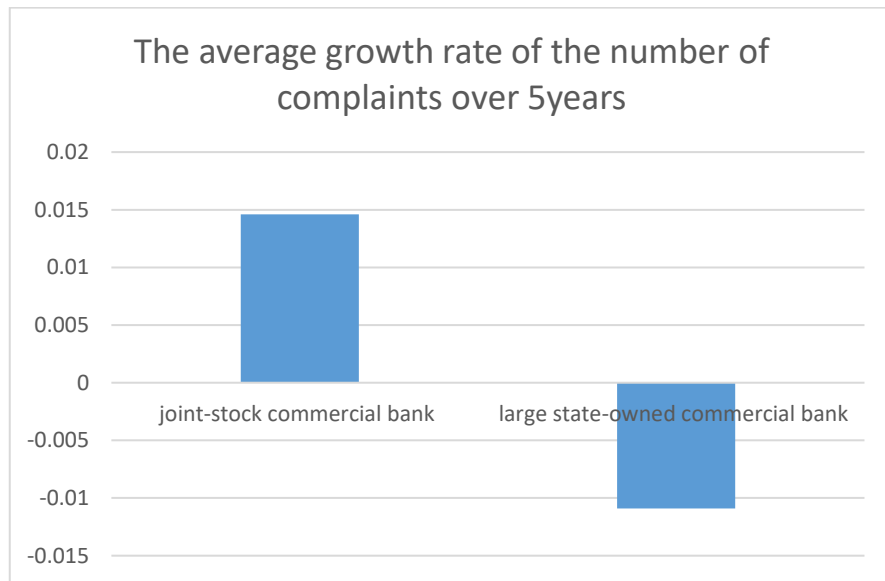


Figure 1: The average growth rate of the number of complaints over 5 years.

Figure 1 above compares these two average growth rates (AGR) of the number of complaints. It's seen that the AGR of complaints of large state-owned commercial banks tends to have negative growth and is lower than that for the joint-stock commercial bank over five years. Customers are more satisfied with LSOCB (Large state-owned commercial banks), which has a better reputation, and are more willing to do business. The Median growth rate of complaints for JSCB (joint-stock commercial bank) is 0.02115, and it's higher than the AGR of 0.0146 for the JSCB. Therefore, this analysis shows that many customers are dissatisfied with the JSCB.

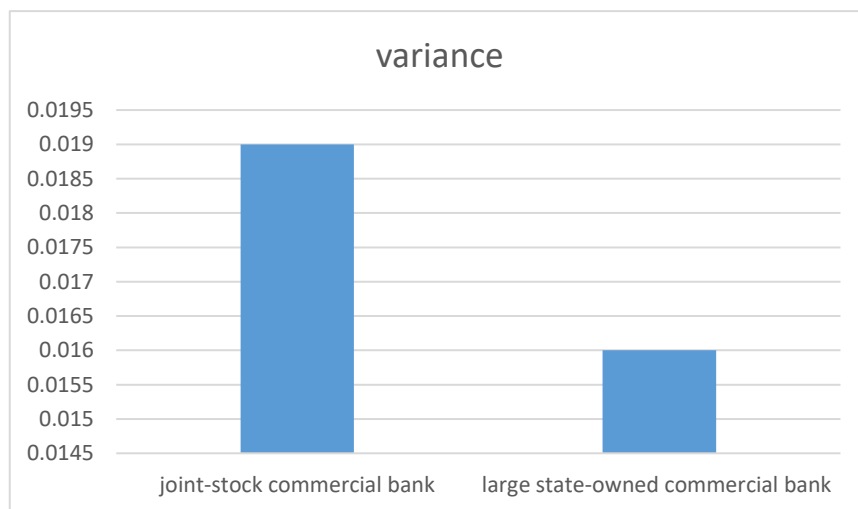


Figure 2: The variance of the complaints growth rate in different banking categories.

Comparing these two variances in Figure 2, it's known that the data distribution of customer satisfaction is almost no different. But the variance of the growth rate of the LSOCB is smaller than that of the JSCB, indicating the customer satisfaction of the LSOCB is less volatile and more stable than that of the JSCB. It can also be concluded that the LSOCB has higher customer satisfaction, higher status, and a better reputation.

Table 1: Descriptive analysis of complaints growth rate in different banking categories.

	JSCB (growth rate)	LSOCB (growth rate)
Standard deviation	0.139	0.125
Minimum value	-0.150	-0.271
Maximum value	0.306	0.161
Scope	0.456	0.432
Interquartile range	0.188	0.143

As can be seen in Table 1, the standard deviation, maximum and minimum value, scope, and interquartile range are also used to judge the degree of dispersion of data. Comparing the five data sets of the two categories of banks, we can still reach the same conclusion: the credit, reputation, and customer satisfaction of LSOCB are better.

## 2.2. Comparing the Different Banking Businesses in the Same Bank

The percentage of complaints about the three main banking activities - credit cards, personal loans, and wealth management - also varies between different types of banks.

In JSCB, the personal debit business has the worst customer satisfaction, with an average growth rate of 0.07705. This is a sign that more and more people are reluctant to borrow from JSCB, and then JSCB's banks' cash flows are likely to increase. At the same time, the level of profits is strongly affected. "In recent years, personal loans have risen dramatically in China, and the revenue generated by the demand for credit has become the key to the profitability of banks' retail financing. According to statistics, out of 1,000 customers, payment demand accounts for 98%, and credit demand accounts for 2%, generating twice as much revenue as the former" [1]. This means that personal debt is central to banks' profitability in their profit model. However, the credit card business has the most excellent customer satisfaction mark, with an average growth rate of 0.00836. The credit card business may become more critical as more new customers are added, more new credit cards are issued, and more value will be created.

Observing the difference between the average growth rate and the median of these three businesses, we can find that the median growth rate of the credit card is 0.00071, which is much less than the AGR of 0.00836. This data means that JSCB has a considerable proportion of customers dissatisfied with the credit card business. The AGR of 0.07705 is nearly the same as the median of 0.04039 in personal debit business satisfaction. However, in financial business, the AGR of 0.01735 is lower than that of the median of 0.67950, which presents the bank may have some highly satisfactory evaluations.

Like the JSCB, customer satisfaction with personal debit is also the lowest among LSOCB, with an AGR of 0.0679. Customers in the banking industry are dissatisfied with the personal debit business. But on the other hand, the best customer satisfaction is the financial business with an AGR of -0.0312. The average growth rate of complaints has a negative growth trend expressing customer satisfaction over the past five years has increased yearly. People are more willing to invest their savings in financial business products. In recent years, although the central bank has been raising interest rates to raise the one-year deposit interest rate, the liability ratio is still severe with the continuous rise of the consumer price index of our country [2]. According to the National Bureau of Statistics, China's CPI index has maintained a stable growth trend in the past five years. Only during the early stage of COVID-19, from November 2020 to February 2021, the CPI showed a downward trend. Figure 4

below shows the monthly change in CPI growth over five years as released by the National Bureau of Statistics [3].

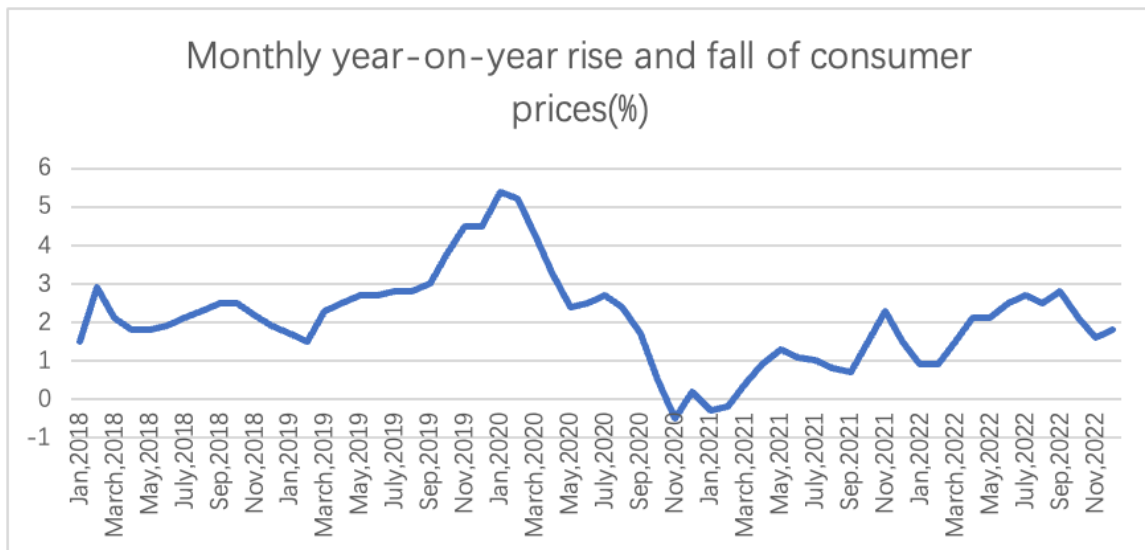


Figure 3: Monthly year-on-year rise and fall of CPI.

Also, look at the difference between the median and average rates of these three businesses in LSOCB. The lowest customer satisfaction in LSOCB is personal debit business; however, the MGR in personal debt is higher than the AGR. It's easy to know that most customers of LSOCB are not satisfied with personal debt, but a few users are delighted with personal debt.

### 2.3. Comparing the Periodicity of Customer Satisfaction

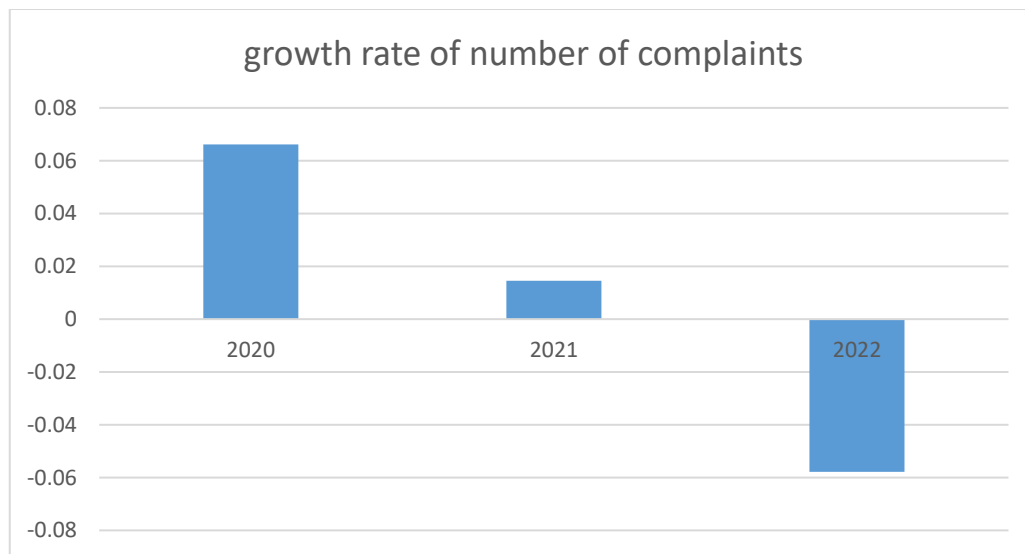


Figure 4: Complaints growth rate in a different year in the whole banking industry.

According to Figure 4, it's clear that the growth rate of the number of complaints is decreasing yearly. Customer satisfaction is getting higher and higher.

The same result adopts customer satisfaction with credit card and personal debt businesses. The graphs of the growth rate of credit card and personal debt complaints are shown below.

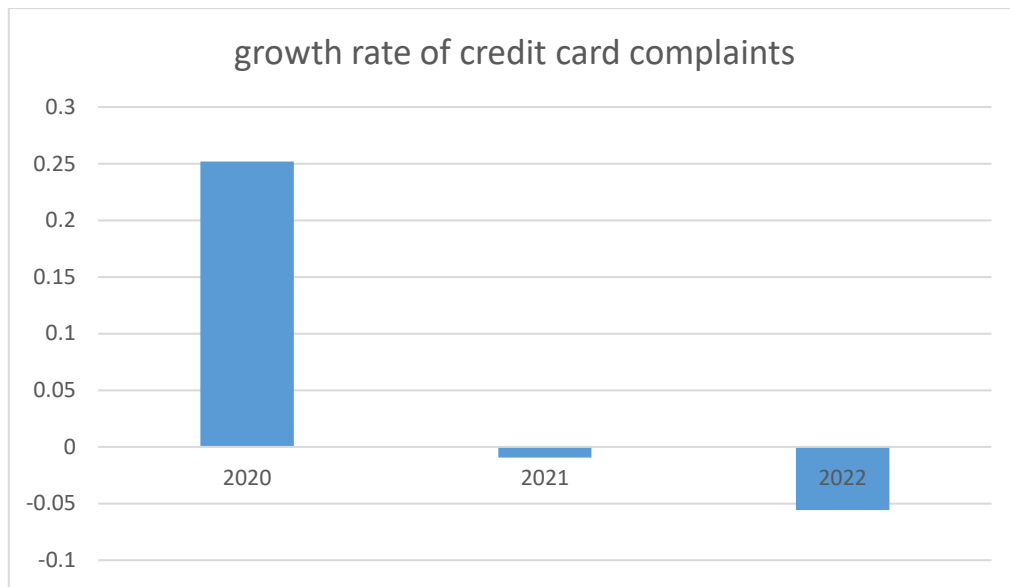


Figure 5: Complaints growth rate of credit card business in different year.

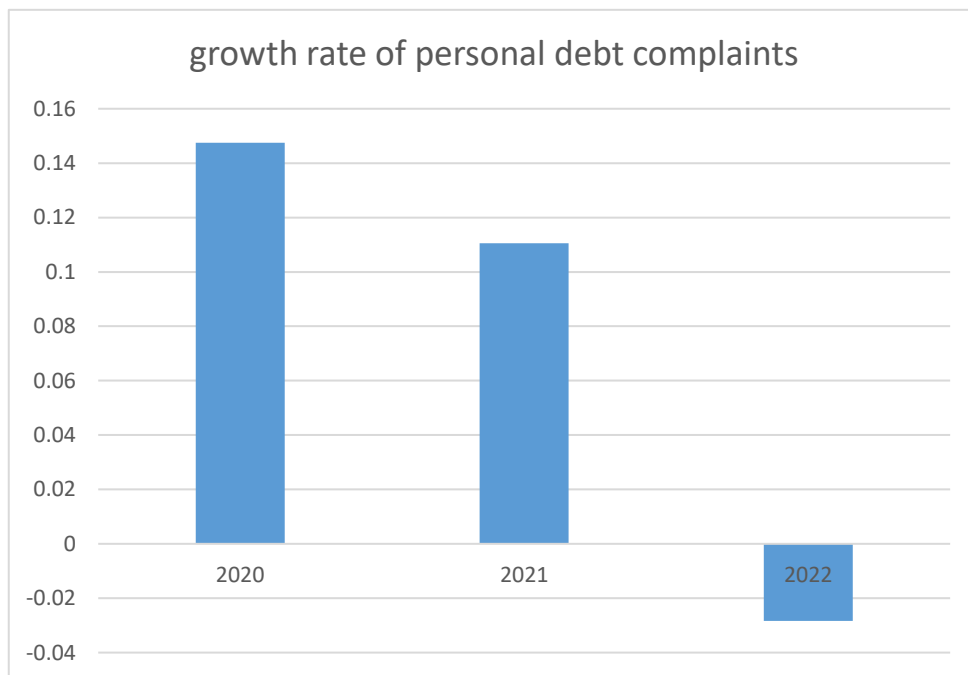


Figure 6: Complaints growth rate of personal debt in different year.

They both tend to the decreasing trend year by year, and in the final year, 2022, all of them turned around their customer satisfaction evaluation.

However, only customer satisfaction with financial business activity has been declining yearly, from a -0.2828 growth rate of complaints in 2020 to a 0.0865 that of complaints. More and more people complain about the financial business. The banking system needs to pay more attention to the financial business. Here is a huge profit point in operating the bank.

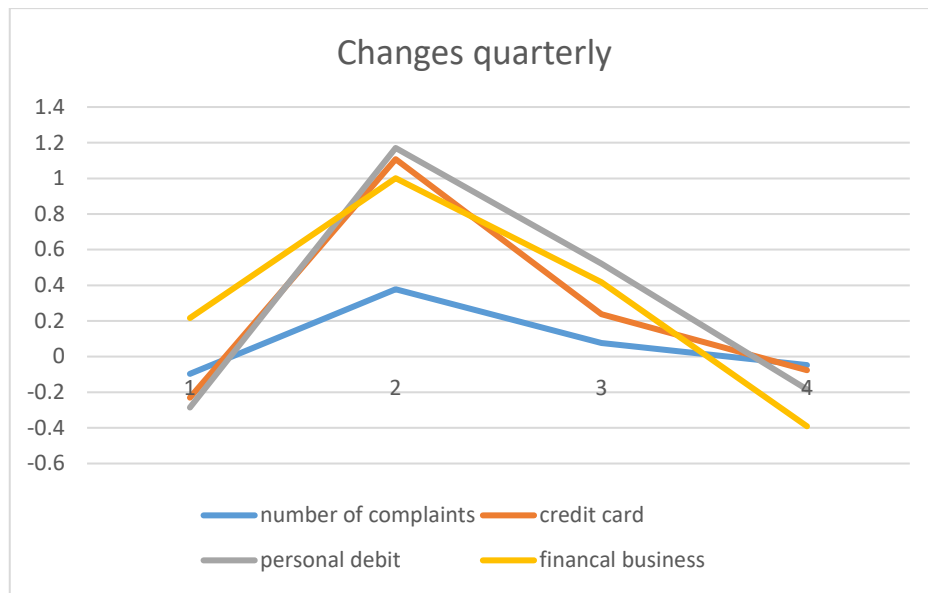


Figure 7: Different banking business changes from quarter to quarter.

The most apparent thing in the Figure 7 is that all banking businesses have the highest customer satisfaction in the second quarter of each year, and the first and fourth quarters are always the lowest in annual customer satisfaction ratings. Perhaps when a New Year begins, the banking industry staff has not fully integrated into the work, which may impact customer satisfaction. Perhaps in the fourth quarter, bank staff are looking forward to the Chinese New Year holiday, which may indirectly lead to productivity.

### 3. Factor Analysis

Factor analysis is the practice of reducing the dimension of the data into latent variables so that the data is easier to work with. And the prerequisite of factor analysis is the intercorrelation between variables.

#### 3.1. Bartlett's Test

Bartlett's test of sphericity is a statistical test for the presence of correlations among variables, providing the statistical probability that the correlation matrix has significant correlations among at least some of the variables. Thus, an important Bartlett's test of sphericity is required, say  $p < .005$ .

Table 2: Bartlett's test.

Bartlett's test for sphericity	Approximate chi-square	149.734
	degrees of freedom	21
	significant	.000

Table 2 shows that the p-value equals 0.000, so there is a strong correlation between the variables, leading to the null hypothesis that the variables are independent is rejected. Therefore, the dataset is appropriate for factor analysis.

### 3.2. Total Variance Explained

Then, we conduct the factor analysis to analyze the endogeneity of the data set and have the following observations.

Table 3: Total variance explained.

Total variance explained									
element	initial eigenvalue			Extract Loading Sum of Squares			rotational load sum of squares		
	total	percent variance	accumulation%	total	percent variance	accumulation%	total	percent variance	accumulation%
1	3.315	47.356	47.356	3.315	47.356	47.356	3.259	46.550	46.550
2	1.449	20.698	68.054	1.449	20.698	68.054	1.450	20.708	67.259
3	1.393	19.904	87.958	1.393	19.904	87.958	1.449	20.699	87.958
4	.523	7.478	95.436						
5	.281	4.016	99.452						
6	.036	.517	99.969						
7	.002	.031	100.000						

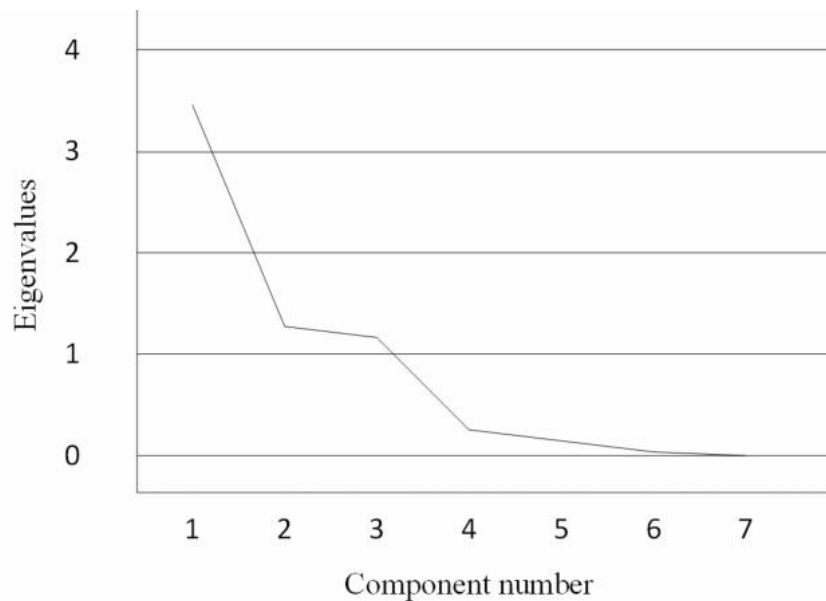


Figure 8: Scree plot.

From Table 3, it can be observed that our 7 variables seem to measure 3 underlying factors. Combined with the scree plot, we can further confirm it.

As Figure 8 shows above, the first 3 components have eigenvalues over 1, which can be considered vital factors. After that-component 4 and onwards-the eigenvalues drop off sharply, being limited to 0.5. The dramatic drop between components 1-3 and components 4-7 strongly suggests that 3 factors underlie the quality of service and customer satisfaction in the banking industry.

### 3.3. Common Factor Variance

Table 4: Common factor variance.

common factor variance		
	initial	extract
Credit card	1.000	.860
Industry	1.000	.922
number of complaints	1.000	.841
wealth management business	1.000	.949
personal loans	1.000	.990
quarterly	1.000	.817
annual	1.000	.778

In Table 3, it is shown that the first 3 components have a cumulative percentage of 87.958%. It means the 3 components explain 87 percent of the variance, confirming the explanatory effectiveness of the 3 components.

In Table 4, all variables have high extraction values ranging from 0.778 to 0.990, illustrating that each extracted component represents the variables well.

### 3.4. Rotated Component Matrix

Table 5: Rotated component matrix.

Rotated component matrix			
	element		
	1	2	3
Credit card	.983		
Industry	.936		
number of complaints	.884		
wealth management business	-.730		
personal loans		.823	
quarterly		.748	-.500
annual			.959

Based on the total variance interpretation and the gravel plot, we select the three components with eigenroots > 1 as factors. Table 5 shows that these three factors have different influences on the number of complaints accepted by banks. As can be seen from the graph, the first malefactor has a significant loading factor on a credit card, industry, number of complaints, and wealth management business, which can be defined as a quantity factor. It is worth noting that the degree of influence of the wealth management business is -0.73, which means that more credit cards are processed. The more branches opened by banks, the more the number of complaints will increase, and the related wealth management business will decrease with a greater degree of inertia. The second male factor's loading coefficient is more significant in personal loans and quarterly, which can be defined as the quarterly personal loans factor. The correlation between the two and the second factor is vital, above 0.74, which shows that quarterly changes positively increase personal loans. The third male factor consists of quarterly and annual, which can be defined as a time factor, and a negative correlation can be found between quarterly and yearly due to the presence of missing values.



## 4. ANOVA

### 4.1. Inter-subject Effects Test

The significance of the categories of banks is 0.000, indicating that there is a significant difference between the categories of banks. The importance between quarters is 0.545, meaning there is no significant difference between quarters. The significance of the crossover between the category of bank and quarter is 0.903, which is not significantly different, indicating that there is no interaction between the category of bank and quarter; the trend in the number of complaints for different bank categories under various quarters is not significantly different.

### 4.2. Multiple Comparisons of Bank Categories

Table 6: Multiple comparisons of bank categories.

(I) category of bank	(J) category of bank	Mean difference(I-J)	Significance
0	1	-8105.7	0.000
	2	23849.9	0.000
1	0	8105.7	0.000
	2	31955.6	0.000
2	0	-23849.9	0.000
	1	-31955.6	0.000

Table 6 shows a two-by-two significance between the three bank categories, with the category of the bank being one of the main reasons for the difference in the number of complaints. The difference in the mean value shows that JSCB has the highest complaints, with LSOCB in second place and FIB having the lowest complaints. The largest share of the total number of complaints was about the credit card business, with the JSCB taking China Merchants Bank as an example. The high number of complaints is behind the increase in the balance of non-performing credit card loans of China Merchants Bank. Affected by the new crown epidemic, the bank's credit card business sees a faster rise in overdue payments and a lot of pressure within the bank. Banks with more prominent credit card issuance volumes faced significant pressure to generate non-performing loans during the epidemic. The amount of newly developed non-performing loans increased year-on-year due to the rapid rise in risk in the credit card business. Both the issuance of credit cards and the scale of credit have risen steadily in recent years. According to data from the People's Bank of China, at the end of 2020, the number of credit cards issued totaled 778 million, and the credit balance of credit cards was 7.91 trillion yuan. With the effects of the COVID-19 pandemic, the quality of credit card assets deteriorated in 2020, and indicators such as overdue scale and nonperforming indicators are trending upward in the short term. The total due credit for the last half year was 83.8 billion yuan, accounting for 1.06% of the outstanding credit card balance, which marked an increase of 0.08% from the end of 2019 [6]. After the credit card business had generated substantial profits for the banks and had gradually matured and stabilized, its subsequent credit problems, installment problems, and collection problems resulting in credit card complaints did not tend to decrease.

## 5. Conclusion

In summary, this thesis examines customer satisfaction with the bank from different categories of banks using three analytical methods, starting from the perspectives of time and the type of business complained about. With the development of internet finance and the rise of small and medium-sized banks such as central village banks and urban development banks, the means of profitability for

traditional commercial banks are no longer just about deposits and loans but more about service experience and quality wealth asset allocation. Traditional retail banks must keep up with the social environment to maintain their banking edge in the current economic downturn. Service is one of the most critical aspects for financial consumers, and service satisfaction has a significant and far-reaching impact on banks [7]. The most direct application of satisfaction survey findings is the direction of service satisfaction improvement and improvement. With the increasing importance of customer satisfaction, many companies have taken the assessment of service satisfaction as an essential basis for evaluation, directly linked to performance assessment. Some companies use service satisfaction results as primary reference data to determine the differences between the company and its competitors and formulate the company's development strategy.

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All the authors contributed equally to this work and should be considered as co-first authors.

## References

- [1] Wang HongYing. "On the Structural Adjustment of Personal Loan Business in Chinese Commercial Banks." *Modern Economic Information* 07X(2012):2.
- [2] Wan Guocai. "Current Situation, Changing Characteristics of bank financial Services and its Impact on traditional deposit and loan Business." *Wuhan Finance* 9(2011):3.
- [3] Data details \_ Data \_ China government net. Available at: <http://www.gov.cn/shuju/hgjyxxqk/detail.html?q=1> (Accessed: February 25, 2023).
- [4] Gaganis, C., Galariotis, E., Pasiouras, F., & Staikouras, C. (2020). Bank profit efficiency and Financial Consumer Protection Policies. *Journal of Business Research*, 118, 98–116. <https://doi.org/10.1016/j.jbusres.2020.06.033>
- [5] Daradkah, D., & Janaideh, R. (2022). The effect of Financial Consumer Protection on Banks' competitiveness and profitability. *Corporate Governance and Organizational Behavior Review*, 6(4), 134–140. <https://doi.org/10.22495/cgobrv6i4p12>
- [6] Gao, J., Sun, W. and Sui, X. (2021) Research on default prediction for credit card users based on XGBoost-LSTM model, *Discrete Dynamics in Nature and Society*. Hindawi. Available at: <https://doi.org/10.1155/2021/5080472> (Accessed: February 23, 2023).
- [7] Chen Ziling. (2022) Research on customer satisfaction of Chengdu branch of M Bank [D]. University of Electronic Science and Technology, DOI: 10.27005/d.cnki.gdzku.2022.005241.