

ANALYZING RETAIL BANKING INDUSTRY: KEY METRICS AND STOCK PERFORMANCE

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ABSTRACT:

Retail banking is becoming a trend for commercial banks all over the world. In addition, recent competitive pressures have progressively driven retail banks to strategically focus on generating returns to shareholders. This study aims to analyze and provide a summary about the impacts of featured and standard metrics on the effectiveness and efficiency of retail banking operating results which reflects on the shareholder return of these banks in different regions around the world. This study examines some key metrics for retail banks, and analyzes annual financial and operating data of some biggest retail banks around the world to find out whether there is positive or negative linear relationship between stock returns and each key metric of these banks. This study also finds out some useful multiple regression models between stock returns and key metrics.

Keywords: retail banking, metric, correlation, multiple regression.

1. Introduction

The US State Board of Administration (SBA) sponsored an executive compensation research study by Farient Advisors LLC, covering 1,800 US companies, 24 Industry groups, and fourteen years of data (from 1998-2011). The research project identifies the primary metrics used in executive compensation plans, overall and by industry, company size and valuation premiums, and then tests these metrics to determine whether the metrics used have the highest impact on total stock returns (or total shareholder returns - TSR). The study found that, in aggregate, performance metrics are generally well-aligned with shareowner value. Earnings growth, followed by returns and revenue growth, has the greatest impact on stock prices. This review also found that many industries have a number of metrics to choose from; with half of the 24 industrial groups studied having at least three metric categories with strong correlations to TSR. However, the optimal use of measures differs considerably by industry ([1]).

The limitation of Farient's research: They only study standard metrics in corporate finance; They only study US companies; They only consider correlations between key metrics and stock returns which are positive, hence does not provide a complete picture.

Also there is a plenty of research which intends to enlighten the relationship between capital structure and performance of listed firms. For examples: Fama and French ([2]) analyzed stock return average on market risk, company size, finance leverage, stock holders' salary bond value to market value, stockholders' salary and profit to price ratio by regression; Hobarth ([3]) examined the relationship between financial indicators and firm's performance of listed firms in USA for 19 years period by using 17 financial indicators and three variables to measure firm's performance, namely market performance (stock market value), cash flow performance (dividend per share), and profitability (Return on Investment - ROI).

Retail banking, also known as consumer

banking, is the provision of services by a bank to the general public, rather than to companies, corporations or other banks, which are often described as wholesale banking. Banking services which are regarded as retail include provision of savings and transactional accounts, mortgages, personal loans, debit cards, and credit cards. Retail banking is also distinguished from investment banking or commercial banking. Nowadays, to limit risk and develop in a sustainable way, banks tend to develop services for individual customer groups, households, small and medium enterprises. As a result, retail banking operation is becoming the trend for commercial banks all over the world. Furthermore, recent competitive pressures have progressively driven retail banks to strategically focus on generating returns to shareholders ([4]). This is the main reason why researches on financial analyses of retail banks to make a rational decision of investment have become increasingly important.

In this paper, we study some key metrics for retail banking industry and analyze annual financial and operating data of some biggest retail banks around the world to find out whether there is positive/negative linear relationship between stock returns and each key metric of these banks. We also find out a multiple regression model between stock returns and key metrics.

2. Research questions, methodology and scope of research

We answer three main questions: 1) What are key financial metrics for retail banking industry; 2) What metrics have a positive/negative linear relationship with total shareholder returns (TSR) for some biggest retail banks in the world; 3) Find out different linear multiple regression models between TSR and key metrics based on a studied sample of companies over a certain period of time.

Methodology & scope of analysis:

Qualitative: study key metrics for retail banking industry such as Net Interest Income/Average Assets, Net Loan and Lease/Assets, Growth rate of Net Loan and Leases, etc.

Quantitative: analyze data of 22 biggest largest banks all over the world ([4]). We obtain 13 years of data (2009-2021) from official annual reports of these banks and their stock prices from Yahoo Finance ([5, 7, 8]).

3. Total shareholder returns and key financial metrics of retail banking industry

3.1. Total shareholder returns (TSR) ([1])

TSR is the total return of a stock for a given period, or the capital gain plus dividends. The annual TSR is calculated by the following formula:

$$= \frac{\left(\begin{array}{l} \text{Price at end of year} \\ - \text{Price at beginning of year} \end{array} \right) + \text{Dividends}}{\text{Price at beginning of year}} \\ = \frac{\text{Adjusted closing price at end of year} - \text{Adjusted closing price at beginning of year}}{\text{Adjusted closing price at beginning of year}}$$

The stock price used in this study is the adjusted closing price that already includes dividend. We obtain this stock price from Yahoo Finance ([8]).

3.2. Earnings and Profitability Metrics ([5, 6])

3.2.1. Net income to Average Assets (ROA)

This ratio is also known as the Return on Assets (ROA) ratio and includes the bottom line after tax (net income), consisting of securities gains/losses and extraordinary items, as a percentage of average assets. The ROA is a common starting point for analyzing earnings because it gives an indication of the return on the bank's overall activities.

$$ROA = \frac{\text{Net income}}{\text{Average Assets}}$$

3.2.2. Net Interest Income to Average Assets (NII/AA)

The ratio of Net Interest Income (NII) to Average Assets is also known as the NII ratio and measures annualized total interest income, plus the tax benefit on tax-exempt income, less total interest expense, divided by average assets.

$$NII/AA = \frac{\text{Interest Income} - \text{Interest Expense}}{\text{Average Assets}}$$

3.2.3. Non-interest income to Average Assets (Non NII/AA)

Non-interest income to Average Assets is calculated as income derived from bank services and sources other than interest-bearing assets, divided by average assets.

$$Non\ NII/AA = \frac{\text{NonInterest Income}}{\text{Average Assets}}$$

3.3. Loan & Lease Metric(s) ([5, 6])

a) Net Loss to Average Total Loans and Leases (NL/ALL)

Net Loss to Average Total Loans and Leases is known as Gross loan and lease charge-off, less

gross recoveries (includes allocated transfer risk reserve charge-off and recoveries), divided by average total loans and leases.

$$NL/All = \frac{Net\ Loss}{Average\ Total\ Loans\ and\ Leases}$$

A high net loss rate indicates that a company believes it will never collect much of its debt, and lead investors or analysts to believe it has a very risky portfolio.

3.4. *Liquidity Metric(s) ([5, 6])*

a) Net Loans and Leases to Total Assets (NLL/TA)

Loans and lease-financing receivables net of unearned income and the allowance for possible loan and lease financing receivable losses divided by total assets.

$$NLL/TA = \frac{Net\ Loans\ and\ Leases}{Total\ Assets}$$

3.5. *Capitalization Metric(s) ([5, 6])*

Tier One Leverage Capital

The ratio uses Tier 1 capital to evaluate how leveraged a bank is in relation to its overall assets. The higher the Tier 1 leverage ratio is, the higher the likelihood that the bank could withstand a negative shock to its balance sheet.

3.6. *Growth Rate Metrics ([5, 6])*

Growth rates are calculated for a 12-month period. The percentage is determined by subtracting the account balance as of the corresponding reporting period in the previous year from the current period account balance and dividing the result by the previous year balance. The following growth rates are studied:

- a) Total Assets - annual change
- b) Tier One Capital 12-month growth rate
- c) Net Loans and Leases 12-month growth rate

4. Main results

4.1. *Correlations between TSR and key metrics*

We analyze annual financial and operating data in a 13-year period (2009-2021) of 22 biggest retail banks around the world, which includes ([5, 7, 8]):

Eleven (11) banks in the United States: Citibank, Bank of America, Wells Fargo, Bank of New York Mellon Corp., Capital One Financial Corp., Charles Schwab Corp., JP Morgan Chase & Co., US Bancorp, PNC Financial Services Group, Ally Financial, Truist Bank (formerly BB&T);

Three (03) banks in China: Industrial & Commercial Bank of China (ICBC), Agricultural

Bank of China Financial, Bank of Communication;

Two (02) banks in Japan: Mizuho Financial Group (MFG), Mitsubishi UFJ Financial Group (MUFG);

Six (06) banks in Europe: HSBC Holding plc (Britain), Societe Generale (France), Deutsche Bank DB (Germany), Barclays PLC (Britain), Lloyds Banking Group (Britain).

We find out the correlation between TSR and each key metric. We also run the Pearson test to see if the sample data supports a positive/negative linear relationship between two populations.

We summarize the finding of correlations in the following table, note that we only list entries which are statistically significant (p-value < 0.1):

Here we can conclude that investors may want to pay attention to key metrics which have a strong enough positive/negative linear relationship with TSR (p-value < 5%).

4.2. *Multiple regression models*

4.2.1. *Multiple regression models for TSR*

Regression analysis helps to understand how the value of the dependent variable changes when independent variables are varied. We consider:

Dependent variable: $\text{Log_TSR} = \ln(1 + \text{TSR})$. That is, we consider logarithm of returns rather than simple returns.

Independent variables: Nine (09) key metrics: M1 = Net Interest income / Average Assets; M2 = Net income / Average Assets; M3 = Non-interest income / Average assets; M4 = Net loss to Average total Loans & Leases; M5 = Net Loans & Leases to Total Assets; M6 = Tier One Leverage Capital; M7 = Total Assets-annual change; M8 = Tier One Capital 12-month growth rate; M9 = Net Loans and Leases 12-month growth rate.

In this study, we use the Bayesian Model Averaging (BMA) package in R to analyze regression models. BMA helps us to quickly determine models, or more specifically sets of explanatory variables, which possess high likelihoods. Each model, aka a set of variables, receives a weight, which is a posterior probability from the Bayes' Theorem, and the final estimates are constructed as a weighted average of the parameter estimates from each of the models.

We use the sample containing 238 records from all 22 banks listed in the previous section. By using BMA, we find out that three metrics M2, M8, M9

Table 1: List of banks in the sample data which have statistically significant metrics in both directions

Bank name	Best metric showing positive relationship with TSR	Correlation	P-value	Best metric showing negative relationship with TSR	Correlation	P-value
Charles Schwab Corporation	Net Loans and Leases 12-month growth rate	0.5549	0.0605	Net Income/Average Assets	-0.599	0.0336
Truist Bank	Net Loans and Leases 12-month growth rate	0.3968	0.0897	Net Interest Income/Average Assets	-0.4189	0.0771
Industrial & Commercial Bank of China	Net Loans and Leases/Total Assets	0.5303	0.0381	Net Loans and Leases 12-month growth rate	-0.7755	0.0015
Barclays PLC	Net Income/Average Assets	0.4391	0.0667	Total Assets-annual change	-0.7034	0.0037
Bank of Communication	Tier One Leverage Capital	-0.6939	0.0419	Net Loans and Leases 12-month growth rate	0.4125	0.0913
Lloyds Banking Group	Non-interest Income/Average Assets	0.4327	0.0699	Net Interest Income/Average Assets	0.4862	0.046
Commonwealth Bank of Australia	Total Assets-annual change	0.862	0.0001	Net Income/Average Assets	-0.6119	0.0131

Source: our own calculation

Table 2: List of banks in the sample data which have statistically significant metrics in one direction only

Bank name	Best metric showing positive relationship with TSR	Correlation	P-value	Best metric showing negative relationship with TSR	Correlation	P-value
Citibank				Tier One Capital 12-month growth rate	-0.7083	0.0034
Wells Fargo	Net Income/Average Assets	0.4245	0.0741			
Bank of New York Mellon Corporation				Tier One Capital 12-month growth rate	-0.3869	0.0958
US Bancorp	Net Loans and Leases 12-month growth rate	0.4623	0.0559			
Ally Financial	Net Income/Average Assets	0.6366	0.0448			
Deutsche Bank				Net Interest Income/Average Assets	-0.664	0.0067
Lloyds Banking Group	Total Assets - annual change	0.6924	0.0044			
Commonwealth Bank of Australia	Net Loans and Leases 12-month growth rate	0.8364	0.0002			

Source: our own calculation

have high probability of appearing in a regression model, all other 6 metrics have very low probabilities (not matter much). The BMA package gives best 5 models among 20 valid models with cumulative posterior probability = 0.6263. For example, the first two models are:

Model 1: $\text{Log_TSR} = 2.3588 - 0.1498M8 + 0.2577M9$;
 $R^2 = 0.060$; Posterior probability = 0.249.

Model 2: $\text{Log_TSR} = 0.6287 + 2.6037M2 - 0.1441M8$
 $+ 0.2344M9$; $R^2 = 0.078$; Posterior probability = 0.163.

We can see that metrics M2 (Net income / Average Assets) and M9 (Net Loans and Leases 12-month growth rate) have a positive linear relationship with Log_TSR, which should be reasonable to understand. On the other hand, M8 (Tier One Capital 12-month growth rate) has a negative linear relationship with Log_TSR. The limitation is that these models have very low coefficient of determination R^2 .

4.2.2. Multiple regression models for Return on Asset (ROA)

In this study, we consider metric M2 (Net income / Average Assets) as Return on Asset ROA. We provide another type of multiple regression to find out whether bank-specific metrics have impact on ROA, which is an important standard metric used to evaluate the profitability of every company. That is, we consider ROA as the dependent variable and the following 5 key metrics as independent variables: M4, M5, M6, M8, M9.

We again use the sample containing 238 records from all 22 banks and rerun BMA package in R.

The BMA package shows that two metrics M4 and M6 have very high probability of appearing in a regression model, the other 3 metrics have very low probabilities (not matter much). The BMA package gives best 5 models among 6 valid models

with cumulative posterior probability = 0.9696. For example, the first two models are:

Model 1: $\text{ROA} = -0.030668 - 0.158229M4 + 0.120751M6$;
 $R^2 = 0.335$; Posterior probability = 0.564;

Model 2: $\text{ROA} = -0.130900 - 0.168732M4 + 0.003685M5$
 $+ 0.111811M6$; $R^2 = 0.345$; Posterior probability = 0.252.

We can see that metric M4 (Net loss to Average Total Loans & Leases) has negative relationship with ROA, while M6 (Tier One Leverage Capital) has positive relationship with ROA. We can see that there is no surprise here.

5. Conclusion

We analyzed annual data of 22 largest retail banks in North America, Europe, Asia in a thirteen-year period (2009 - 2021) to see if there are positive/negative linear relationships between total shareholder returns and five key metrics for the retail banking segment. We find out that in some cases, the correlation between total shareholder returns and some key metrics are statistically significant ($p\text{-value} < 0.1$).

We also figured out some multiple regression models to test the impact of key metrics on total shareholder returns and ROA ratio. Results show that Net income / Average Assets and Net Loans and Leases 12-month growth rate have a positive linear relationship with total stock return, while Tier One Capital 12-month growth rate has a negative linear relationship. With regard to Net Income/Average Assets, a.k.a Return on Assets ratio, Net loss to Average Total Loans & Leases has a negative relationship while Tier One Leverage Capital has a positive impact.

But we still need to analyze more retail banks to get a better picture of correlation between key metrics and stock returns and also to get better multiple regression models ■

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Received date: Oct 5, 2022

Reviewed date: Oct 12, 2022

Accepted date: Oct 17, 2022

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PHÂN TÍCH NGÀNH NGÂN HÀNG BÁN LẺ: CÁC CHỈ SỐ ĐÁNH GIÁ ĐẶC TRƯNG VÀ MỐI LIÊN HỆ VỚI HIỆU SUẤT CỔ PHIẾU

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TÓM TẮT:

Phát triển mảng ngân hàng bán lẻ đang là xu hướng của các ngân hàng thương mại trên khắp thế giới. Hơn nữa, áp lực từ việc cạnh tranh đã ngày càng thúc đẩy các ngân hàng bán lẻ phải tập trung vào việc tạo ra thêm nhiều lợi nhuận cho cổ đông. Mục đích của nghiên cứu này là phân tích và cung cấp cho độc giả một kết luận về những ảnh hưởng của một số chỉ số chủ chốt lên hiệu quả và hiệu suất hoạt động mà về sau cùng sẽ phản ánh về khả năng sinh lời cho cổ đông của một số ngân hàng bán lẻ trên thế giới. Trong bài báo này, nhóm tác giả nghiên cứu một số chỉ số tài chính then chốt của lĩnh vực ngân hàng bán lẻ và phân tích dữ liệu tài chính hàng năm của một số ngân hàng bán lẻ lớn nhất ở khắp nơi trên thế giới để tìm hiểu xem có mối liên hệ tuyến tính cùng chiều/ngược chiều giữa hiệu suất lợi nhuận cổ phiếu với mỗi chỉ số tài chính then chốt của các ngân hàng này. Nhóm tác giả cũng tìm ra một số mô hình hồi quy tuyến tính đa biến giữa hiệu suất nhuận lợi cổ phiếu và các chỉ số tài chính then chốt.

Từ khoá: ngân hàng bán lẻ, đo lường, tương quan, hồi quy bội số.