2019

The Fall of the 10-K Report: Measuring the Impact of Accounting Ratios on Financial Performance

Matthew Daruty

Claremont McKenna College

The Fall of the 10-K Report: Measuring the Impact of Accounting Ratios on Financial Performance

Submitted to
Professor Magilke

By
Matt Daruty

For
Senior Thesis
Spring 2019
April 29, 2019

Abstract

The annual 10-K report has historically been the most important aspect in assessing the position of a publicly held company. However, as the flow of information has increased with the dawn of new technologies, less and less attention has been paid to these audited financial statements. In order to assess if investors are still reacting to the information contained in the annual report, this paper examines the relationship between accounting ratios and stock price in banks traded on United States stock exchanges. By examining accounting ratios instead of simply looking at Earnings Per Share, new information was revealed regarding what aspects of the annual report investors react to. Ratios that incorporate information that is difficult to predict, such as leverage or allowance accounts were more likely to affect a stock's performance, while those that contained information that is more readily available from other sources had less of an effect.

Table of Contents

Introduction

In this paper, I study the impact annual financial statements have on a publicly traded stock's performance. By looking at financial ratios, instead of just earnings, I hoped to find deeper meaning in the accounting information. Every year, publicly traded companies are required to spend significant time and money preparing financial statements. External auditors are hired to provide an expert opinion as to whether or not the financial statements are free of material misstatement. The accuracy of these financial statements is crucial; without transparency and trust in the reliability of financial statements, investors would be unwilling to commit their capital. With so much time and energy dedicated to the preparation of these statements, it seems obvious that investors will be curious about their contents.

It is a useful exercise to test this idea empirically. By analyzing the financial statements using accounting ratios, more information can be gleaned about the usefulness of the earnings statements. Identification of ratios to which the market reacts revealed the parts of the company markets care about, allowing investors to focus their efforts on the important aspects of the financial statements.

According to the efficient market hypothesis, asset prices reflect all information. This means that as soon as new information is known, it is instantaneously reflected in the price of the asset: in this case a publicly traded stock. There are three different forms of the efficient market hypothesis, but this thesis examined only the semi-strong form of market efficiency. In this form of market efficiency, no *public* information can be used to help better value a stock; as soon as the market is aware of something, it is immediately priced into the security.

The efficient market hypothesis offers an idea of what will happen when financial statements are released. Because the annual 10-K report contains a significant amount of new information regarding a company, markets should react to reflect this new information.

In order to test this theory I used a sample of 60 banks, and stock price reactions to the information contained in financial statements was identified. By regressing certain accounting ratios on the excess return of each stock, relevant variables were revealed if they impacted the stock price. These important accounting ratios highlighted which parts of the financial statements are important to investors, and which are not. As discussed later, only a few of the ratios that were tested had any significant impact on stock price. Although this is not entirely consistent with the efficient market hypothesis, it does make sense when the information contained in financial statements is compared to all other publicly available information about a firm.

The accounting ratios that are relevant will allow a new investor to see the parts of the firm in which the market has interest. This will help investors better focus their attention to predicting parts of the earnings statements that will actually be helpful in generating a profit. This paper begins with a brief overview of the literature concerning the efficient market hypothesis and other studies regarding accounting ratios. Then the methodology and data will be discussed, followed by a discussion of the results and further areas of study.

Literature Review

The efficient market hypothesis has a long history, and it is difficult to claim who had the greatest role in its development. One of the earliest studies suggesting this line of thinking was the PhD thesis "The Theory of Speculation", published in 1900 by French mathematician Louis Bachelier. Bachelier's thesis was not significant during its time, and was largely forgotten until it was rediscovered by Leonard Savage and translated to English in the 1960s. Since that time, many different scholars have proposed arguments and empirical evidence for and against the hypothesis. Amongst these academics, arguably the most known and influential is Eugene Fama. Fama proposed the first empirical test of the market efficiency along with his peers in the seminal paper "The Adjustment of Stock Prices to New Information". Before this period in the 1960s it was nearly impossible to test whether markets were efficient, but with advances in computing power, it had become practical to conduct the calculations necessary to test the idea.

Starting in the 1960's at the University of Chicago, researchers Ray Ball and Phillip Brown's completed the seminal study, "The Information Value of the Annual Earnings Report", which was the first paper to look empirically at this relationship. Ball and Brown (1967) composed models of what the market "expects" earnings to be, and then looked at the market's response when these models were not correct. The models were incredibly simple, with one merely assuming the current period's earnings would be the same as last period's. Firms were then classified for either beating their prior period's earnings, or missing them, and then the "abnormal" returns for the average firm in each of these two categories were regressed on the new stock price. Ball and Brown concluded that although the earnings number is not incredibly important to the market, the stock price does move

relative to the information contained in the financial statements. It was concluded that the market was able to find other sources of information that would provide some of the same information found in annual earnings reports. Although Brown and Ball consistently refer to the financial statements, they only looked at the very bottom line: net income. By dividing the financial statements into smaller chunks, more information may be revealed about what the market truly reacts to. If the market is reacting to something it is likely that it couldn't predict this information on its own. It may be possible to discover what information in the financial statements investors truly care about.

Following closely behind this study, another group of researchers at the University of Chicago were also interested in how the market reacts to information. In their paper "The Adjustment of Stock Prices to New Information" Jenson and Fama (1969) proposed a new method of studying economic data called the "event study". Drawing on the work of Mandelbrot (1966) and Samuelson (1965), Jenson, et al were familiar with the concept of market efficiency. However, they aimed to determine the empirical reaction speed to "specific kinds" of information, rather than simply "inferring" market efficiency. Instead of looking at the release of annual reports, Jenson, et al looked at the market reaction to stock splits. Stock prices were found to change "rapidly" in response to a split. In a separate study by Bellemore and Blucher (1956), it was found that price movements in response to a split were "over by the day after the split is announced". Again, these findings are consistent with the hypothesis of efficient markets. Although the information contained in a stock split is not exactly the same as an annual report, this study still produced important information regarding market efficiency, and how quickly markets react to new information. In addition, the origination of the event study was an important moment. This

type of study will be the most effective in breaking down the market's reaction to different types of information.

While these two previous studies provide empirical evidence for the efficiency of markets, there are countless other examples of irrational behavior in markets. Jensen (1978) compiled several of these studies in his paper "Some Anomalous Evidence Regarding Market Efficiency". In another study by Ball (1978), Ball found that risk adjusted returns following the announcement of earnings are consistently non-zero, which is not consistent with market efficiency. Ball proposed that the issue may not lie in the inefficiencies of market pricing, but rather the in the two-parameter asset pricing model commonly used in previous studies to adjust for risk. Building off of this study, in the paper "Systemic 'Abnormal' Returns after Quarterly Earnings Announcements", Watts (1978) took steps to address the concerns raised by Ball. After conducting an explicit test to assess whether the abnormal returns are due to market inefficiency or an incorrect asset pricing model, Watts concluded they are due to market inefficiencies. Similarly, Thompson (1978) in the paper "The Information Content of Discounts and Premiums on Closed-End Fund Shares" demonstrated another market anomaly. Over the period from 1940 to 1971, Thompson was able to define a trading rule that "earned statistically significant abnormal returns of 4% per year". Again, he was unable to determine whether these returns are due to inadequacies in the two parameter asset pricing model, or in the efficiency of the market.

Having reviewed different interpretations of the efficiency of markets, there is clearly much room for further research. Ball and Brown (1967) provided an excellent starting point with their analysis that investors react to certain parts of the financial

statements. When considering the breadth of information contained in annual earnings releases, the next logical step would be to attempt to divide this information into different sections. Through the use of financial ratios, it is possible to summarize the Income Statement, Balance Sheet, and Statement of Cash Flows into numbers that can be used to predict changes in stock price. In selecting these ratios, it is important to review the previous literature regarding the use of ratios. Nissim and Penman (1999) identified useful ratios for the valuation of a company. While the goal of this thesis was not to value a company, these ratios are still important because investors use them in their own valuations. This research is also important because it provides historical context on the value of ratios over time, from 1963 to 1999. Nissim and Penman (1999) identified ratios that "reflect economic factors that drive future residual income, so that by forecasting these ratios the analyst builds a forecast of residual income". Knowing how an analyst looks at ratios will help in determining the ratios to which an investor can be expected to react. With more information about what investors are looking for, better assessments and predictions can be made on what aspects of the annual earnings statement they will react to.

Hypothesis and Methodology

As discussed in the literature review section, previous tests looking at market efficiency have only looked at very simple aspects of the financial statements. Variables such as earnings-per-share are useful, as they easily allow for comparison between companies on the most basic level. However, it is important to remember that net income is at the very bottom of the income statement. All other aspects of the company such as

sales, expenses, and investments ultimately impact the net income amount. A company has so many different options at their disposal for manipulating the net income amount. Every aspect of the income statement can be manipulated to make earnings look healthier, which makes solely looking at earnings risky. While the valuation of a company is based off future and current earnings, there are other places to examine in addition to earnings. Looking at accounting ratios can provide a great amount of detail about the overall health of the firm. Balance sheet ratios such as Debt/Equity illustrate how the firm is being funded, and Income Statement ratios such as Gross Margin demonstrate how effectively the firm is managing costs. By regressing returns on these accounting ratios, new information may be found regarding market efficiency, and the aspects of the firm in which investors are interested.

In order to test what features of the income statements investors care about, several regressions were conducted. Because the release of annual earnings statements, or the 10-K, is a good example of new information being released to the market, the markets reaction to this information was studied. For a five year span, whenever one of the companies in the study filed their 10-K, the three days immediately surrounding this date were collected. Then, the accounting ratios computed within that period were regressed on the returns for the period.

To conduct this study, the first step was to select the companies. To control for the differences in accounting ratios based on industry, only banks were selected. The industry that was selected was somewhat arbitrary; what was important was selecting one industry. Every industry faces a unique challenge, and every industry also has unique accounting

ratios. A standard number in Return on Assets for one industry can be very different to what is conventional in another industry, so it was important to control this variance away. Another reason that the industry needed to be controlled for was macroeconomic risks. Firms in the same industry tend to react to market information, such as interest rate changes, in the same manner. Again, this risk was controlled away by only selecting banks. Banking is a useful industry because it has many unique ratios that are generally accepted by investors. After choosing the banking industry, 60 banks traded in the US stock market were selected. This group of 60 was divided into three groups of 20 based on size. Although 60 banks were originally selected, gaps in the data were found for a dozen or so companies, so ultimately only 47 banks were used. Size was determined by market capitalization, as well as the regions in which the bank operated.

Both stock price information and financial statement accounts were collected from Wharton Research Data Services. Stock price information was pulled from the Center for Research in Security Prices, and financial statement information was obtained from Compustat. Filing dates for each 10-K were obtained from the SEC's website manually.

Equation and Variables

For the test of significance of variables, a simple multiple linear regression was used.

$$(1)\ Y = \beta_0 + \beta_{QuasiNetInterestMargin}x_1 + \beta_{ReturnOnAssets}x_2 + \beta_{ReturnOnEquity}x_3 + \beta_{\Delta EquityMultiplier}x_4 + \beta_{\Delta ALL/Assets}x_5 + \beta_{\Delta ALL/Cash}x_6 + \beta_{IntIncomeRatio}x_6 + \varepsilon$$

The simple linear regression was used because the goal of this study was to determine which variables are significant. By evaluating the p-value of each variable, the ratios having a significant impact on the return of the stock were revealed.

The dependent variable in this regression was the three day excess return surrounding the filing date for the 10k. In order to control for the effect of information leakage, the day prior to the release of the financial statements was also included. It has been well documented that prior to significant event, stock prices tend to drift up or down prior to the information becoming publicly available (Brunnermeier 2005). By including this change in the dependent variable, the true effect of the new information can be found. To be certain that markets had fully absorbed the new information reflected in the financial statements, the next day's stock price was also included. In order to adjust for changes in the overall market, the market return for this three day period was subtracted from the individual security's return, giving the excess return. The return on the S&P 500 index was used for the "market return".

In selecting the dependent variables used, it was important to find a variety of ratios that are commonly used by investors. To incorporate different aspects of the financial statements, it was important to find ratios from both the Income Statement and Balance Sheet. The use of ratios was important, because they allowed for scaling by size of the company. A list of each ratio and the components of its calculation follows, as well as a brief discussion of its significance. To control for company size with regards to balance sheet ratios, the change in the ratio over the prior year was calculated, instead of only the balance at the end of the year.

(2) $Quasi\ Net\ Interest\ Margin = \frac{Interest\ Income - Interest\ Expense}{Assets}$

Net Interest Margin is a commonly used ratio that measures the operating efficiency of banks. It is usually calculated with Total Interest Generating Assets as the denominator, but unfortunately Compustat did not provide this data. I created Quasi Net Interest Margin in its place, which is very similar as it only changes Total Interest Generating Assets to all Assets. While slightly different, the basic principle of this ratio still holds. By comparing the interest income to interest expense while also controlling for asset size, this ratio reveals information about how efficiently a bank is using its assets to generate interest income. As interest income is the primary source of income for lending institutions, this ratio is important to understand when assessing the operating efficiency of a bank.

(3) $Return\ on\ Assets = \frac{Net\ Income}{Total\ Assets}$

Return on Assets is a commonly calculated ratio, and can be used to look at the operating health of any company. By dividing Net Income by Total Assets, Return on Assets demonstrates how efficiently a company is utilizing its Assets to create income for its shareholders. Return on Assets naturally favors companies that have fewer assets on their books, so companies are somewhat incentivized to take assets off their books when possible to improve this performance indicator. However, this is still a good measure of how well a company is able to use the assets on their books to produce a profit.

(4) $Return\ on\ Equity = \frac{Net\ Income}{Total\ Equity}$

Similar to Return on Assets, Return on Equity (ROE) looks at how well a company is able to use its stockholders equity to return a profit. This metric is commonly reviewed by financial analysts, and is often broken down. A five part break down constitutes the Advanced Dupont Analysis, which helps analysts understand the health of different parts of a company. A higher number is better for Return on Equity, which means firms can try to raise it by either earning a higher net profit, or lower their shares outstanding.

(5) $Change\ in\ Equity\ Multiplier = \frac{Total\ Assests}{Total\ Equity}$

The Equity Multiplier, also known as a leverage ratio, demonstrates how a company is financing its activities. By comparing total Assets to total Equity, this ratio is not strictly better as it is raised or lower, as the use of debt is useful for a variety of reasons. Finding the right balance of Debt and Equity is different for every firm, and depends on the risk tolerance of both management and shareholders. For lending institutions, there are significant regulations regarding how much debt is allowed to be used. These regulations are different depending on the value of assets for each firm, and will be significant later in our discussion of results.

(6) $Change\ in \frac{ALL}{Assets} = \frac{Allowance\ for\ Loan\ Losses}{Total\ Assets}$

$$Change\ in\ ALL/Cash = \frac{Allowance\ for\ Loan\ Losses}{Total\ Cash}$$

Because these two ratios are very similar, I have grouped them together. ALL, or the Allowance for Loan Losses, is one of the most important accounts for a bank. This account represents the reserve that a bank builds up in expectation of a certain percentage of loans not being collectible. Because this account involves a large amount of prediction

and management discretion, it is considered a very high-risk account for external and internal auditors alike. Although these ratios are not typically calculated by analysts, I believe that because the ALL account is so important for banks, a ratio that incorporates its value will provide insight to the health of a company. Because the allowance is a contra asset, a lower amount will likely be good for this ratio. However, the ALL account is also a function of the amount of loans outstanding, and how risky these loans are. Because of this, these ratios are likely to be unique for each company, so it was interesting to see what kind of coefficient this regressor will have.

(7) $Interest\ Income\ Ratio = \frac{Interest\ Income}{Net\ Income}$

Another ratio that is not typically calculated by investors, the Interest Income Ratio, measures the percentage of Net Income that is due to Interest Income. Since interest income is the primary revenue source for banks, this number should be large, and firms should be trying to raise it as much as possible. By either raising revenue, or lowering expenses, a firm can attempt to raise this ratio. This should be highly correlated with Quasi Net Interest Margin, as they both deal with interest income.

Results

The results of this study are displayed in the tables section at the end of the paper. Figure 1 shows the mean, standard deviation, and median for each financial ratio, and Figures 2 through 5 show the regression results for each of the 4 regressions. The ratios are divided into parts based on the three categories for size, as well as one combined category.

To begin analyzing the results of the regression, it is often helpful to first look at the summary statistics.

What is apparent from looking at these summary statistics is that the value for each ratio differs based on the size of the company. One extreme example of this is the Change in ALL ratios. For each of these ratios, the mean value differs dramatically based on the size of the firm, with banks operating within a single state nearing 1, states operating in a unique region around -1, and large national banks somewhere in the middle. These discrepancies based on size highlight the underlying difference between different sized banks. For banks especially, size has a major impact on financial ratio because different sized firms are subject to different regulations. Upon crossing the $10 Billion in assets threshold, banks are subject to far greater scrutiny under Dodd-Frank, and often change their strategies to address this (Nicoletti et al 2018). This combination of differing regulation, as well as different goals for different sized businesses, leads to a large discrepancy between financial ratios between different sized banks. After calculating these descriptive statistics, it became clear that in order to draw meaningful observations from the data, more than one regression for all of the different firms needed to be calculated. Four total regressions were run for these variables: one for each distinct size and one that combines all the companies.

Combined Regression Results

Combining all 47 companies into a single regression has both benefits and drawbacks. Although the greater sample size is helpful for drawing more significant results, the difference between the different sizes of companies is significant. As discussed, the significant differences between different bank sizes has been captured in this

regression. Because there is a large amount variance captured in the independent variables, the significance of the regression is not high. As seen in Figure 2, the combined regression results, the majority of the coefficients are insignificant, as noted by their very high p-values. In most cases, a p-value below 5% is considered significant, so by conventional standards none of the variables in this regression are significant. However, as predicting a change in stock price is extremely difficult, it may be useful to discuss variables with a higher p-value than what is conventionally discussed. For instance, the p-value for the Change in Equity Multiplier coefficient is 0.0850, meaning that there is a 91.5% chance that the effect of the Equity Multiplier on excess returns is not zero. The Equity Multiplier is an important ratio, as it signals to investors what level of debt is being used to finance the company's activities. It also has an impact on excess returns because it is difficult to predict. Compared to an account like interest expense or tax expense, where management does not have a significant amount of control over the price, leverage is a decision made solely by management and the board. Because of this, it is difficult for investors to predict what level of debt will be used, so this ratio contains information that investors find informative. This likely leads to the significance of this ratio, and why it has an impact on the excess return of a bank's stock.

Large Cap Regression Results

When the regression is broken down by company size, new results are revealed. The first thing to note is the effect of Quasi Net Interest Margin. Again, although this does not fall within the conventional levels of significance, it is worth discussing because of its large coefficient. With a coefficient of more than .08, this ratio has a large impact on excess returns. Although the coefficient seems small, it is important to remember that excess

returns are usually very close to zero, so an additional .08 is a significant amount. This result implies that Quasi Net Interest Margin informs investors on the efficiency of the bank in question.

With a very small p-value, the coefficient for Return on Assets is striking, both because of its size and magnitude. A coefficient of negative 0.45 does not exactly match what is to be expected from this ratio. Return on Assets is judged to be better as it is higher, so it is very surprising that a stock would be so severely punished for having such a high Return on Assets. One possible rationalization of this strange effect is that Return on Assets can be lowered by decreasing total assets. If decreasing assets was the primary driver of a higher Return on Assets, it would make sense that investors would not be pleased with a higher Return on Assets. Despite this possibility, what is more likely is that this is just a statistical anomaly due to small sample size. Because none of the other 3 regressions exhibit any similar results regarding Return on Assets, it is safe to assume that there is not much merit behind this regression coefficient. The remaining financial ratios have such high p-values that they are not worth discussing, as no important conclusions can be drawn from them.

Regional Regression Results

Again, for the majority of the regression coefficients, the p-values are too small to be significant. However, in Figure 3 reveals that the p-value for the Change in Equity Multiplier is very significant, with a value of 3%. This tells us for the regional sized firms, the Equity Multiplier impacts on the firm's excess returns. As discussed in the combined regression, investors are likely interested in the Equity Multiplier because the choice of leverage is a very management driven factor. It is difficult to predict what portion of a

company's assets are going to be financed with debt, so as soon as this new information is released, investors adjust their valuation of the company accordingly. One interesting thing to note about this coefficient is the sign. Because the ratio is calculated by dividing Total Assets by Total Equity, this suggests the investors are valuing banks that use a greater deal of debt higher than those that do not. Banks are very restricted in the amount of leverage they are allowed to use, as this are is closely tied to the amount of fees that must be paid to the FDIC (Congressional Research Service). Since these restrictions are set by the government and not management, it makes sense that investors would reward a bank for increasing leverage. If management believes that they are justified in increasing their leverage, it must be beneficial for the company to do. Being able to increase leverage is a signal to investors that the bank either has room to grow in terms of being fully leveraged, or that it is willing to take on the increased fees from the FDIC.

State Regression Results

Lastly, the regression for smaller banks provided interesting insights. Unsurprisingly, the vast majority of ratios were not significant. However, both ALL ratios did have a statistically significant impact on excess returns. With p-values of about .03 each, both of these coefficients are statistically significant. It is not surprising that these two ratios had very similar results, as they are both closely related. It is surprising to see that the ALL ratios were only significant for the small state banks. This incredibly important account requires significant time from both internal and external auditors of a firm, and is very difficult to estimate correctly. It is also important to note that this account is frequently undergoing regulatory changes. In fact, there will be an entirely new method of calculating loan losses, called CECL (Current Expected Credit Losses), that will come

into effect in January of 2020 (OCC). All of these factors lead to an account that is very hard to estimate correctly. Complying with all of these standards is costly and time-consuming, and small banks may have more difficulty in calculating the correct number for this account due to their more limited resources. If small banks are unable to accurately anticipate this number in one year, then in the following years it will need to be adjusted. These miscalculations and then subsequent changes will lead to large swings in the value of the account, and this may be what is driving the significance of the account. If the bank is unable to predict the value of this account in subsequent years, then investors are surely confused as well. Because of this, investors must be paying close attention to this account as it will be new every year. While the Allowance for Loan Losses is not one of the biggest accounts on the balance sheet in sheer magnitude, its importance cannot be understated.

Limitations and Future Areas of Study

Due to the time constraint that the senior thesis presents, it was impossible to conduct this study as robustly as possible. In order to have more meaningful results, a larger sample is needed. Unfortunately, due to the time-consuming challenge that collecting unique filing dates presented, it was not feasible to collect more data. Having more years would control for any fluctuations caused by macroeconomic changes, as well as a larger sample to provide more concrete results.

There were also large gaps in the data that was collected. As discussed before, the original 60 companies had to be reduced to 47 due to a lack of either certain financial statement accounts, or incomplete trading data. Given more time to pursue data, it would have been possible to construct a greater set of companies that shared all of the same

information, but this was impossible to know until all of the information was already collected.

While the ratios that were chosen provided some meaningful results, it would have been interesting to look at a greater number of results. When pulling the data from Compustat, it appeared that there would be a great deal of information available. However, when certain accounts were pulled from the service such as total expense or total loans, no actual numbers were found. Without knowing which ratios would actually provide information, it was impossible to pull down all of the information that would have been relevant.

One further aspect that would have been interesting to consider is investor expectations. If analyst expectations of earnings could be controlled for, more information may have been gleaned from these ratios. By measuring the earnings surprise, it would have been easier to see exactly how much of a difference there was between what the market expected to see, and what was actually published in earnings.

Discussion

Overall, the results are somewhat surprising. Given that the 10-K is the biggest information release of the year for publicly traded companies, one would have expected more of the financial ratios to have a significant impact on the reactive excess return.

While most of the ratios were not significant, there were still some interesting findings. Investors seemed to react to the ratios that are more difficult to predict, as well as ratios that are not typically calculated. For example, the ALL ratios for smaller banks were important, because of the many complications with that account. The equity

multiplier was important as well, as the amount of leverage a bank can use is a significant question to both investors and regulators. And the slightly adjusted Net Interest Income demonstrated that for large banks, the core business of making loans is still important to the valuations investors make. However, it is important to consider all of the other information that is publicly available before the annual financial statements are released.

Firstly, quarterly statements would have released 3/4 of the data that is expected to be seen in the annual report (SEC). This explains why the annual statement is not as important, as investors are able to draw conclusions from the other 3 parts of the already released financial statements. Also, public companies are releasing more and more guidance on earnings throughout the year. In order to manage the expectations of investors and analysts, management will often release guidance on what they expect earnings to be. If analysts are expecting much higher earnings than management is, management will let investors know early to readjust their earnings models. Because of the tremendous power that analyst expectations have, management always needs to be aware of what they are expected to earn according to the market's expectations.

All of these reasons lead to a lessened importance of the 10-K. Despite the fact that the 10-K is the only earnings release that is audited, investors put a significant amount of trust in quarterly earnings and other information releases. While this is good for the investor in the short term, as they have more information available to them, this can lead to unfortunate situations in the case of restated earnings. Without properly audited quarterly earnings, investors are taking a larger risk by putting faith in these numbers. Nevertheless, investors will always desire to have as much information as

possible, as the efficient market hypothesis illustrates. More information is more power, and whatever information investors can get their hands on will be useful in making money. This desire for constantly new information has devalued the annual report, despite the fact that this report contains the most reliable information available. While investors should always be on the lookout for new information, it is important to always approach information with a reasonable level of doubt, and to understand the risks associated with using unaudited financial statements to guide investing decisions.

Tables

Figure 1 – Summary Statistics

State					
Change in Equity Multiplier		Change in ALL/Cash		Interest Income/Net Income	
Mean	0.0017	Mean	0.8869	Mean	4.2123
Standard Error	0.0080	Standard Error	0.5117	Standard Error	0.2184
Median	-0.0014	Median	-0.1357	Median	4.1190

Regional					
Change in Equity Multiplier		Change in ALL/Cash		Interest Income/Net Income	
Mean	-0.0169	Mean	-1.0356	Mean	4.4977
Standard Error	0.0085	Standard Error	0.9990	Standard Error	0.4585
Median	-0.0091	Median	0.1416	Median	3.6322

Large					
Change in Equity Multiplier		Change in ALL/Cash		Interest Income/Net Income	
Mean	0.0054	Mean	0.2092	Mean	2.6711
Standard Error	0.0072	Standard Error	0.1997	Standard Error	0.1224
Median	0.0035	Median	-0.1194	Median	2.6683

Combined					
Change in Equity Multiplier		Change in ALL/Cash		Interest Income/Net Income	
Mean	0.0017	Mean	0.8869	Mean	4.2123
Standard Error	0.0080	Standard Error	0.5117	Standard Error	0.2184
Median	-0.0014	Median	-0.1357	Median	4.1190

State							
Quasi Net Interest Margin		Return on Assets		ROE		Change in ALL/assets	
Mean	0.0314	Mean	0.0090	Mean	0.0888	Mean	0.6672
Standard Error	0.0006	Standard Error	0.0004	Standard Error	0.0037	Standard Error	0.4653
Median	0.0303	Median	0.0090	Median	0.0901	Median	-0.1712

Regional							
Quasi Net Interest Margin		Return on Assets		ROE		Change in ALL/assets	
Mean	0.0320	Mean	0.0096	Mean	0.0820	Mean	-0.9221
Standard Error	0.0005	Standard Error	0.0003	Standard Error	0.0027	Standard Error	0.8330
Median	0.0323	Median	0.0097	Median	0.0843	Median	0.0199

Large							
Quasi Net Interest Margin		Return on Assets		ROE		Change in ALL/assets	
Mean	0.0236	Mean	0.0107	Mean	0.0983	Mean	0.1854
Standard Error	0.0007	Standard Error	0.0003	Standard Error	0.0029	Standard Error	0.2114
Median	0.0254	Median	0.0105	Median	0.0968	Median	-0.0588

Combined							
Quasi Net Interest Margin		Return on Assets		ROE		Change in ALL/assets	
Mean	0.0314	Mean	0.0090	Mean	0.0090	Mean	0.6672
Standard Error	0.0006	Standard Error	0.0004	Standard Error	0.0004	Standard Error	0.4653
Median	0.0303	Median	0.0090	Median	0.0090	Median	-0.1712

Figure 2 – Combined Regression Results

Financial Ratio	Coefficients	Standard Error	t Stat	P-value
Intercept	0.0011	0.0007	1.5859	0.1142
Quasi Net Interest Margin	0.0012	0.0220	0.0567	0.9549
Return on Assets	-0.0318	0.0885	-0.3593	0.7197
ROE	-0.0033	0.0092	-0.3567	0.7217
Change in Equity Multiplier	0.0031	0.0018	1.7302	0.0850
Change in ALL/assets	0.0000	0.0002	0.0242	0.9807
Change in ALL/Cash	0.0000	0.0002	-0.0673	0.9464
Interest Income/Net Income	-0.0001	0.0001	-0.9954	0.3206

Figure 3 – Large Regression Results

Financial Ratio	Coefficient	Standard Error	t Stat	P-value
Intercept	0.0026	0.0013	1.9693	0.0528
Quasi Net Interest Margin	0.0892	0.0526	1.6946	0.0945
Return on Assets	-0.4500	0.1851	-2.4306	0.0176
ROE	0.0113	0.0153	0.7438	0.4594
Change in Equity Multiplier	-0.0015	0.0029	-0.5112	0.6108
Change in ALL/assets	-0.0005	0.0005	-0.9813	0.3297
Change in ALL/Cash	0.0004	0.0005	0.7551	0.4527
Interest Income/Net Income	-0.0002	0.0003	-0.8930	0.3749

Figure 3 – Regional Regression Results

Financial Ratio	Coefficient	Standard Error	t Stat	P-value
Intercept	0.0013	0.0018	0.6882	0.4935
Quasi Net Interest Margin	-0.0371	0.0685	-0.5408	0.5903
Return on Assets	0.0482	0.1767	0.2728	0.7858
ROE	0.0018	0.0191	0.0929	0.9263
Change in Equity Multiplier	0.0075	0.0034	2.2001	0.0310
Change in ALL/assets	0.0004	0.0003	1.3829	0.1710
Change in ALL/Cash	-0.0003	0.0002	-1.3858	0.1701
Interest Income/Net Income	0.0000	0.0001	-0.4253	0.6719

Figure 4 – State Regression Results

Financial Ratio	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.0002	0.0017	-0.1408	0.8885
Quasi Net Interest Margin	0.0087	0.0508	0.1718	0.8641
Return on Assets	0.0727	0.1872	0.3884	0.6990
ROE	-0.0044	0.0191	-0.2325	0.8168
Change in Equity Multiplier	0.0012	0.0034	0.3552	0.7236
Change in ALL/assets	-0.0009	0.0004	-2.1387	0.0361
Change in ALL/Cash	0.0008	0.0004	2.1829	0.0326
Interest Income/Net Income	0.0000	0.0001	-0.2360	0.8142

References

"Current Expected Credit Losses (CECL) Methodology." *OCC*, 4 Nov. 2016, www.occ.treas.gov/topics/bank-operations/accounting/cecl/current-expected-credit-loss-model.html.

"Form 10-Q." *SEC Emblem*, 2 Sept. 2011, www.sec.gov/fast-answers/answersform10qhtm.html.

Bachelier, Louis, et al. "Louis Bachelier's Theory of Speculation: the Origins of Modern Finance." *Tesis-Université de la Sorbonne*, 2006.

Ball, Ray, and Philip R. Brown. "The Information Value of the Annual Earnings Report." *SSRN Electronic Journal*, 1967.

Ball, Ray. 1978. "Anomalies in Relationships Between Securities' Yields and Yieldsurrogates." Journal of Financial Economics 6, no. 2/3.

Bellemore, Douglas H. and Lillian Blucher (Jaffee). 1956. "A Study of Stock Splits in the Postware Years." Financial Analysts Journal 15: November 1956.

Brunnermeier, Markus K. "Information Leakage and Market Efficiency." *Review of Financial Studies*, vol. 18, no. 2, 2005, pp. 417–457.

Fama, Eugene F., et al. "The Adjustment of Stock Prices to New Information." *International Economic Review*, vol. 10, no. 1, 1969.

Jensen, Michael C. "Some Anomalous Evidence Regarding Market Efficiency." *Journal of Financial Economics*, vol. 6, no. 2-3, 1978.

Mandelbrot, Benoit. 1966. "Forecasts of Future Prices, Unbiased Markets, and 'Martingale' Models." Journal of Business 39, no. Part 2.

Nicoletti, Allison; Iselin, Michael; and Ballew, Hailey, "Bright Lines: How Regulatory Asset Thresholds Change the Banking Industry" (2018). *Penn Wharton Public Policy Initiative*. 51.

Nissim, Doron, and Stephen H. Penman. "Ratio Analysis and Equity Valuation." *SSRN Electronic Journal*, 1999.

Perkens, David W. 2019. "Introduction to Bank Regulation: Leverage and Captial Ratio Requirements." (CRS Report No. IF10809).

Samuelson, Paul A. 1965. "Proof That Property Anticipated Prices Fluctuate Randomly." Industrial Management Review Spring.

Thompson, Rex. 1978. "The Information Content of Discounts and Premiums on Closedend Fund Shares." Journal of Financial Economics 6, no. 2/3.

Watts, Ross L. 1978. "Systematic 'Abnormal' Returns After Quarterly Earnings Announcements." Journal of Financial Economics 6, no. 2/3.