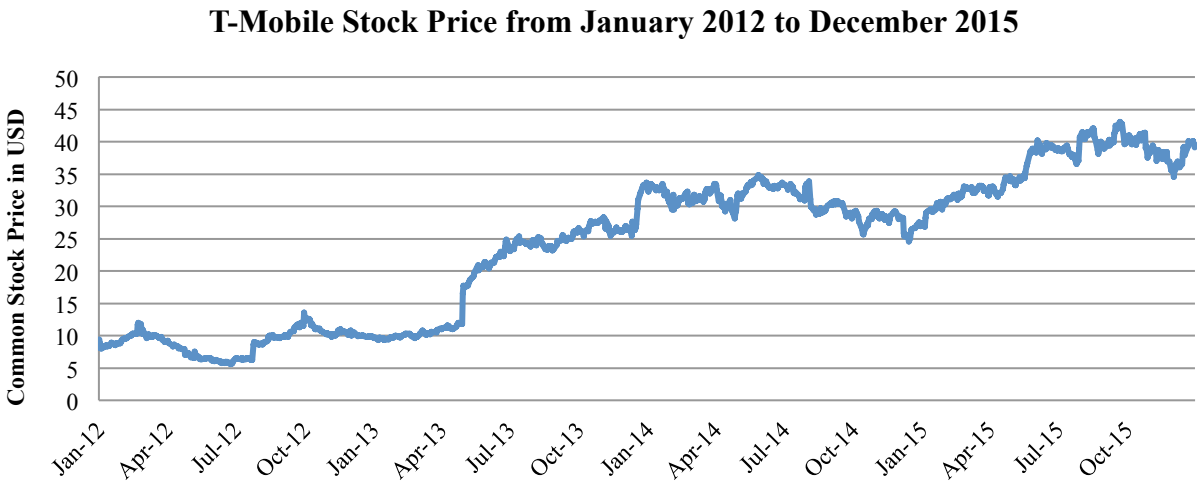
ECONOMICS 620

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STOCK PRICE MOVEMENTS: A CASE STUDY OF T-MOBILE



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April 6, 2016

STOCK PRICE MOVEMENTS: A CASE STUDY OF T-MOBILE

by

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Submitted to The Department of Economics

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Date: April 6th, 2016

I hereby recognize and pledge to fulfill my responsibilities as defined in the Honor Code and to maintain the integrity of both myself and the College as a whole.

Brittany Marie Boben

Acknowledgements

To Professor Martin & Professor Onyeiwu, thank you for all of your encouragement and support throughout this entire process. You both are amazing professors and I will cherish the time we spent together and the lessons you have taught me for years to come.

To the Economics department, thank you for being my home for the past three years. When I transferred to Allegheny College, I was confident that I was going to graduate with a degree in biology and attend medical school after graduation. In my sophomore year my father encouraged me to take an economics course at the college just to be sure I wanted to continue on my current path. To my surprise, I found that economics was where I was supposed to be. I believe this grand realization was not out of an inherent love for economics but rather a strong appreciation and admiration of the economics professors. Never in my life have I had a group of teachers so dedicated to and invested in the success of each and every student. I am extremely grateful that I had the experience to learn from such amazing individuals. I also would like to acknowledge Ms. Tamara Minns for her excellence within the department. I am so excited to start my professional career and have you all to thank for my success and growth.

To my mother and father, thank you for always being my rock. Not only are you the best parents, role models, and mentors a girl could have; you are my best friends. Thank you for always pushing me to do my best while also reminding me not to be too hard on myself. Thank you for the relationship we have and for all of the advice and support you have given me throughout the years. I love you both.

To my best friends on campus Kyle Smith, Nick Deichler, Sunniya Nadeem, and Joe Killian, thank you for keeping me sane throughout my time at Allegheny and reminding me to take a break from studying every once in a while. I could not imagine my Allegheny experience without the four of you. I truly admire you all and cannot wait to see where life takes us.

To Chloe, thank you for keeping me company throughout my four years. I love you and could not have made it through college without you and your friendship. Thank you for always being there and reminding me to "just keep swimming."

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Abstract

The wireless telecommunications market is extremely competitive in the United States, with the largest providers being Verizon, AT&T, Sprint, and T-Mobile. Despite T-Mobile's long-standing image as the poorer quality, less expensive carrier, T-Mobile has recently seen a dramatic turnaround. Over the past four years, T-Mobile's common stock has quadrupled in value from $9.39 on January 3, 2012 to $38.95 on January 4, 2016. One might assume that T-Mobile simply reduced the number of shares in order to boost their share price; however, T-Mobile's number of shares outstanding has increased from 535.00 million to 816.04 million from January 2012 to January 2016. This value creation of over $26.7 billion raises the question, what factors led to the increase in T-Mobile's stock price from January 2012 to January 2016? This study is centered on the theory of shareholder wealth maximization and is undertaken as a regression analysis using panel data on the four wireless carriers. The results suggest that the following variables contributed to this stock price movement; market share, debt to equity ratio, and previous operating revenue. Though the results helped to identify variables associated with an increase in stock price, further research must be conducted in order to investigate some unexpected results.

Introduction

T-Mobile, previously viewed as the U.S. wireless carrier underdog, has experienced a dramatic turnaround in the past few years. In addition to taking the position of the third largest U.S. carrier from Sprint, T-Mobile has experienced an over quadrupling of stock price from January 2012 to January 2016. While many investors were confident T-Mobile would not succeed due to large customer losses, poor network infrastructure, and consecutive quarterly losses, T-Mobile is now shaking up the wireless industry and challenging leaders Verizon and AT&T with their "Un-Carrier" initiatives. This remarkable turnaround is unheard of in today's market and leads to the question: what factors led to the increase in T-Mobile's common stock price from January 2012 to January 2016?

A Brief History of T-Mobile

T-Mobile is currently the third largest operating carrier in the United States, but the telecommunications giant is the product of humble beginnings. Western Wireless Corporation established subsidiary VoiceStream Wireless PCS in 1994 in order to provide digital wireless personal communications services to metropolitan service areas. These service areas included nineteen FCC-defined markets occurring in several western and southwestern states including Hawaii. Five years later, Western Wireless's VoiceStream Wireless division was spun of into a new company, VoiceStream Wireless Corporation, who engaged in two acquisitions in early 2000 leading to significant service expansion. Omnipoint Corporation, a Northeast region GSM carrier, was acquired in February 2000 followed by Aerial Communication Inc., a GSM carrier operating in

scattered major markets across the nation, in May of 2000. VoiceStream retired the Omnipoint and Aerial Communications brands, consolidating them into a single platform under the VoiceStream brand.

In June of the following year, Deutsche Telekom, a German telecommunications company, acquired VoiceStream Wireless Inc. for 35 billion USD. In September of 2001, Deutsche Telekom AG declared VoiceStream Wireless Inc. the U.S. operating entity of Deutsche Telekom's mobile communications subsidiary, T-Mobile International AG under the new name T-Mobile USA, Inc. T-Mobile made its brand name debut in July of 2002 upon launching voice, messaging, and data services to customers in California and Nevada with spectrum licenses to provide service to 95% of the United States population.

Several years later in September of 2007, T-Mobile announced the acquisition of SunCom Wireless Holdings, Inc., a carrier with network coverage in southern Virginia, North Carolina, South Carolina, eastern Tennessee, northeastern Georgia, Puerto Rico, and the U.S. Virgin Islands. This 2.4 billion dollar acquisition closed on February 22, 2008 adding SunCom's 1.1 million customers to T-Mobile's customer base along with the expansion of T-Mobiles service areas.

By 2011 Deutsche Telekom decided it was time to sell T-Mobile as a result of high churn rates and a decrease in contract customers, making investments in network upgrades and additional spectrum purchases too risky from a return perspective. Industry analysts claim that this churn and decrease in customer contracts was attributable to T-Mobile's decision not to make iPhones available to customers. Deutsche Telekom accepted a $39 billion stock and cash purchase offer from AT&T for the company in March 2011 with the acquisition subject to regulatory approval, potential reverse breakup

fees, and other custom closing conditions. While the acquisition had the support of various groups under the premise that the deal would benefit the public by expanding wireless access, opposition groups stated concerns with industry consolidation resulting in the reduction of competition and job cuts. The deal fell through on August 31, 2011 when the United States Department of Justice sued to block the merger on the grounds of decreased competition in the wireless market. Despite the blocked merger, workforce reduction occurred in 2012 with a total of 2,800 job cuts announced by May 16th in an effort to preserve cash for further network investment.

John Legere, a past executive for AT&T as well as Dell and Global Crossing, was named the new outspoken CEO of T-Mobile in September of 2012. Just a month later, MetroPCS Communications, a prepaid wireless service provider, agreed to merge with T-Mobile USA with MetroPCS shareholders retaining a 26% stake in the merged company under the T-Mobile brand. The merger did not propel T-Mobile into the third largest wireless carrier, but it provided additional spectrum and financial resources allowing T-Mobile to expand its LTE network and maintain competitiveness with Verizon, AT&T, and Sprint. Structured as a reverse takeover, the deal was approved on April 24, 2013 and the combined company known as T-Mobile US Inc. went public on the New York Stock Exchange as TMUS on May 1, 2013. Despite being offered the option to sell its 72% stake in the merged company before the end of the 18-month lock-up period, Deutsche Telekom retained its $14.2 billion stake in the new company.

In March of 2013, T-Mobile rebranded themselves as the “Un-Carrier” posing themselves as the good guy of the wireless providers who aimed to break industry standards in an attempt to better serve customers. This rebranding strategy coincided with

a major overhaul of its plan structure with simpler plans and two year financing on phones. Over the years, this branding strategy has grown to include other services such as early upgrades and rollover data while the company has simultaneously improved network quality with spectrum purchases from competitors U.S. Cellular and Verizon Wireless.

In December of 2013, rumors circulated that Sprint Corporation and parent Softbank were aiming to acquire majority stake in T-Mobile for $20 billion resulting in a combined company that could compete with leaders Verizon and AT&T. In April 2014, Bloomberg reported Sprint was in communication with lenders to ensure finances were in order for the now $24 billion bid set to occur in the summer of 2014. In August, Illiad SA publicly announced a $16 billion cash counter-bid to acquire 56% stake in T-Mobile US; analysts felt the bid would not be taken by T-Mobile shareholders due to its lower value than the proposed Sprint bid but could potentially put pressure on Sprint to make an offer. Just days after the Illiad SA bid, Bloomberg reported Sprint abandoned the proposed acquisition of T-Mobile due to the unlikelihood of approval by the U.S. government as well as FCC chairman Tom Wheeler, who aimed to maintain four national carriers in the U.S.

In 2015, T-Mobile continued to roll out new promotions under the Un-Carrier brand as a continuation of their cost-cutting strategy. During the summer of 2015, Dish Network considered purchasing T-Mobile, but ultimately the companies could not come to an agreement. Throughout the year, T-Mobile deployed its Extended Range LTE technology throughout major cities as an improvement to the network by propelling signals both farther and deeper indoors. The first three quarters of 2015 boasted 6.2

million net customer additions for T-Mobile with service revenues up 11 percent year over year.

Chapter 1: A Literature Review

Introduction

For many decades, economists have studied the effects of many factors on stock price. Though many studies have been done, mixed results are often present for many of the factors. In addition, these factors were studied in the context of many companies spanning multiple countries while my study focuses solely on the identified factors effects on an individual corporation's stock price on the NYSE. This generalization of results is used to identify and hypothesize various factors, but does not prove any significant relationship between T-Mobile's common stock price and the identified factor on its own.

Changes in Leadership

Many scholars have studied the impact of the appointment of CEOs on stock price throughout the years with conflicting results. The array of results ranges from positive to negative movement in stock prices as well as a ruling of no movement in either price or volume measures. Nthoesane and Kruger (2014) conducted a study on the JSE yielding conflicting results using volume traded and share price techniques. The volume traded approach showed significantly positive returns while the share price cumulative returns were negative at the 1% significance level.

Lubatkin, Chung, Rogers, and Owers (1989) also reached conflicting results in their study of the market reaction to the announcement of CEO succession in the NYSE. The study concluded that on average, investors revise earning expectations downwards decreasing stock price an average of one percent during the preannouncement period

including a further drop of 3.5 percent during the post-announcement period (Lubatkin, Chung, Rogers, & Owers, 1989). Their findings also suggest that investors view outside appointments more favorably than inside appointments for the CEO position, thus demonstrating the contradictory nature of study results on the subject.

Two other studies echo the sentiment that outsider appointments lead to positive market reactions. According to Bonnier & Bruner (1989), the market reacts positively when a distressed firm appoints an outsider to the CEO position. Bhana (2003) conducted a reverse study on the dismissals of CEOs, similarly concluding that markets react favorably when the replacement executive is an outsider. Though this study proved to be of interest, it is important to note that a weak control of confounding announcements was present as dismissal and announcements sometimes occur on different days. Additionally, Ang, Lauterbach, and Vu (2003) concluded that there is a positive market reaction to CEO appointment only for "better quality" CEOs. In a more general sense, Charitou, Patis, and Vlittis (2010) conclude in their study that the market reacts positively to the appointment of a new CEO while Van Doorn (2011) also observed a positive, but not significant market reaction.

On the opposite end of the spectrum, Lassoued and Attia (2013) studied share price and volume traded post CEO announcement and found there was a significant negative reaction under the volume-traded approach as well as a negative market reaction regardless of whether the appointed CEO was an insider or outsider. Alternatively, Li (2012), Urooj, Zafar, and Khattak (n.d.) conducted studies stating that changes in CEOs elicited no impact on the market and stock prices.

Additionally, two studies concluded that the market reaction to the appointment of CEOs was dependent on the characteristics of the CEO. According the studies, the background and prestige of the appointed CEO acts as a signaling factor to investors that inspire investor confidence or disappointment. In a study conducted by Yermack (2006), share prices were sensitive to variables such as the executive's occupation, independence in action and thought, and professional qualifications. Zhang and Wiersema (2009) studied the role of CEO background using the upper echelon and signaling theories. According to the study, there was a significant positive market response to CEO certifications for firms where CEOs had larger shareholdings extensive external directorships (Zhang & Wiersema, 2009). Theoretically, the background of the CEO was used as a measure to infer the quality of the firm, which therefore influenced investor confidence and stock valuation.

Although there are conflicting results throughout the literature on the subject, evidence exists that changes in leadership may impact stock price. Perhaps the differing findings stem from the differing stock markets, periods of time, sample sizes, sizes and types of firms, and the methods of selection used in the studies.

Marketing and Branding

Though not as much research has been done in the subject, marketing and branding is another factor that could potentially impact the stock price of a firm. Kumar and Shah (2009) conducted a study investigating whether a marketer could drive the stock price of a firm. The authors developed a framework linking customer equity using the customer lifetime value metric to market capitalization as determined by the stock price. Kumar and Shah found that customer equity based frameworks can reliably predict the market

capitalization of the firm and that marketing strategies directed at increasing customer equity not only increase, but beat expectation of the firms stock price (2009). It is important to note that this study only used two Fortune 1000 firms in the business-to-business and business-to-consumer contexts, which could limit the internal and external validity of the results.

Another study conducted by Berger et al. (2002) developed a framework for assessing how marketing actions affected customers' lifetime value to the firm, which is viewed as a dynamic construct. According to the study, a firm can identify the most appropriate marketing actions to acquire, maintain, and enhance customer assets and therefore maximize financial returns by viewing customers as assets and managing them as such (Berger et al., 2002).

Srivastava, Shervani, and Fahey (1998) also explored the subject with a focus on the more direct relationship between marketing and finance. According to the authors, marketing is concerned with developing and managing market-based assets, which include customer, channel, and partner relationships. These market-based assets accelerate and enhance cash flows, lower the volatility and vulnerability of cash flows, and increase the residual value of cash flows therefore increasing shareholder value (Srivastava, Shervani, & Fahey, 1998).

Each study suggests that marketing can lead to financial gains and increases in stock prices if managed and conducted properly. Though the authors offer differing suggestions on how value-creating marketing can be achieved and managed, the general consensus is unanimous. These findings demonstrate an empirical basis that marketing and branding may impact the value of the firm as measured by common stock price.

Acquisition Rumors

Acquisition rumors is another variable that has a more limited field of research, however the few articles available on the subject all noted a run-up in stock price during acquisition rumors followed by a reversal of gains if rumors failed to materialize. Ahern and Sosyura (2014) conducted a study on the relationship between media coverage surrounding merger negotiations and stock price and concluded that information may be biased by firms seeking to manipulate their stock price. The authors found that bidders in mergers originated more news stories after the beginning of negotiations but before the public announcement in order to generate a run-up in the bidders' stock prices during the period in which the stock exchange ratio is determined so as to manipulate the takeover price (Ahern & Sosyura, 2014) It is estimated that active media management reduces average acquirer takeover costs by between $230 million and $558 million and that an increase in media coverage during merger negotiations increases a firm's share of the merger gains.

The same authors published an additional study in the following year focused on the incentive of business newspapers to publish attention grabbing, speculative news and the repercussions of these skewed stories. Their results show that investors ignored material information and tended to overestimate the validity of merger rumors therefore leading to initial inflation of the rumored target's stock price and a later reversal (Ahern & Sosyura, 2015).

A third study by Gao and Oler (2011) tracked trading activity in days preceding acquisition announcements for target firms and found that abnormally high trading volume preceded stock price movement. The authors argue that the significant pre-

announcement volume reflected the market's processing of highly uncertain information and that despite the fact that a materialized merger announcement led to positive returns, shorting stocks involved in acquisition rumors is a rational strategy. According to the sample, only 12.6% of rumors materialized into public announcements within a 70-day window, therefore short sellers produced significantly positive returns by selling the target stocks before the stock price reversal occurred. This finding is evidence of the price run-up during rumors and the subsequent reversal when rumors do not materialize or prove to be false.

The scope of literature is limited surrounding this variable with only two sets of authors producing relevant works to shape the expected stock price reaction to acquisition rumors. The lack of additional sources lends to a degree of uncertainty in the validity of the findings. Specifically, in Gao and Oler's study, the 70-day window is potentially shorter than the time it takes to negotiate and place a serious bid on a firm. From personal experience, I have witnessed the stock run-up in target firms and have observed acquisition talks that extended for multiple months. By creating such a short window, Gao and Oler could have limited the sample size of rumors that actually materialized into an offer. Though the research is limited on this topic, there is evidence that acquisition rumors may have a significant impact on common stock price, if only in the short run.

Dividend Payment

Yilmaz and Gulay (2006) conducted a study on price-volume reactions to cash dividends on the Istanbul Stock Exchange. The results show that stock prices begin to rise days before the cash dividend payments and then fall on the ex-dividend day by less than the amount of the cash dividend and that trading volume increases prior to the

payment date and remains stable thereafter (Yilmaz & Glay, 2006). In a similar study, Alayemi (2013) investigated the relationship between dividend payout and the market price of shares on the Nigerian Stock Exchange. The findings show a positive correlation between dividend payment and share price so that an increase in dividend payment is associated with an increase in share market price (Alayemi, 2013).

A third study conducted by Dawar (2013) on the CNX 100 Index supports the signaling effect of dividend policy stating that earnings distributed as dividends have a greater impact on firm value than earnings retained within the firm. Additionally, Reddy (2014) the relationship between dividend payout and market price across selected pharma companies in India and discovered a positive correlation between dividend payout and market price. Al-Hasan, Asaduzzaman, and Karim (2013) also found the effect of dividend payout to be greater on stock market price than earnings retention at the 1% significance level.

The literature on dividend payment shows a positive relationship between dividend payments and stock price. According to the studies, the effect of dividend payments was stronger on stock prices than on earnings retention. Further literature also suggests that dividends have a positive effect on stock prices because they provide a positive signaling effect to investors. T-Mobile distributes dividends regularly, which may contribute to their stock price climb over the past few years. Due to the consensus of the current literature, dividend payment will be included as a factor in the case study of T-Mobile.

Capital Structure

Masulis (1983) studied the valuation effects of leverage altering capital structure changes and found that changes in stock prices are positively related to leverage changes.

The study also concluded changes in firm values are positively related to changes in firm debt level. Another study conducted by Moghaddam et al. (2015) showed that the ratio of long-term and short-term debt both have a significant negative correlation with return on equity. Artikis and Nifora (2011) investigated the impact of capital structure on stock performance and found that corporate financing decisions are important to stock performance.

Though the literature on capital structure and stock prices is less focused on a single aspect of capital structure, it is clear that capital structure has an impact on stock price by the very definition. Each study contributes a different take on the relationship between capital structure and stock price, but ultimately all authors agree that the firm's capital structure decisions lead to changes in stock price. Perhaps in the case study of T-Mobile, the capital structure variable can be observed simply as a change variable for further clarity in effect.

Capital Expenditures

McConnell and Muscarella (1985) conducted an event-time study of stock prices around the dates of public announcements of future capital expenditures. The findings suggest that managers reveal information relevant to the valuation of their firms through announcements of capital expenditure plans. Additionally, the stock price reaction to capital expenditure announcements is consistent with joint predictions of the market value maximization hypothesis and a traditional model of corporate valuation (McConnell & Muscarella, 1985). Chung, Wright, & Charoenwong (1997) also studied the impact of corporate capital expenditure decisions on share prices and determined the

share price reaction to a firm's capital expenditure announcements is dependent on the market's perception of the quality of the investment.

Another study conducted by Burton, Lonie, and Power (1999) investigates the impact of capital expenditure announcements on the value of the firm. According to the study, investors' response to capital expenditure news is dependent on whether the project is undertaken by an individual firm or undertaken as a joint venture and whether the investment generates cash immediately or after a longer period of time. The results show that only announcements of joint ventures elicited positive market reactions while no significant abnormal returns occurred following the announcement of individual firm capital expenditure news. Also, abnormal returns following the announcement of immediate cash generating expenditures were positively related to the cash vale of the expenditure (Burton, Lonie, & Power, 1999). Finally, a study conducted by Chan, Gau, & Wang (1995) concluded that the market responds positively to investment decisions that lead to an expansion of business or efficiency due to a positive signal of future cash flows and negatively to investment decisions resulting in reduction of facilities or production capacity which is interpreted as unfavorable future performance information.

The literature on capital expenditures and stock price have varying results but are similar in that capex always has an effect on stock price. Collectively, the scholars argue that the stock price reaction is dependent on variables such as size of expenditures, time before anticipated return on investment, individual versus joint ventures, and perceived quality of investment. The studies also suggest that managers announce capital expenditure plans strategically in an attempt to elicit proper stock price valuation adjustments. T-Mobile spent hundreds of thousands of dollars in capital expenditures on

the improvement of their network infrastructure over the past few years. I believe that capital expenditure is an appropriate variable to investigate in light of stock price reactions over time and the infrastructure investment made by T-Mobile over the period.

Leverage

Artikis and Nifora (2011) conducted a study on Greek listed non-financial companies over the period 1998-2009 and concluded that leverage has a negative and statistically significant relationship with return on equity. Alternatively, Murphy (1968) determined the proportion of leverage in a company's capitalization is generally unrelated to its return on common equity, growth of earnings, price appreciation, or market valuation of shares. Another study focused on whether stock value is influenced by a firm's change in leverage ratio relative to the industry norm. In this study, Hull (1999) found that announcement-period stock returns for firms moving away from industry leverage norms are significantly more negative than those moving towards norms.

The literature on leverage provided conflicting insight on the effect of leverage on stock price since results ranged greatly. One limitation of the Artikis and Nifora study is that the study was conducted in Greece rather than on the NYSE. This difference in markets could lead to low external validity when it comes to generalizing results to the United Stated stock market. Common convention is that leverage is an amplifier in that it exaggerates the effects of both poor and good performance. This variable could therefore contribute to the magnitude of the rises and falls of T-Mobile's stock price over the past few years.

New Security Issues

According to a study conducted by Dann and Mikkelson (1984), convertible debt offerings convey unfavorable information to investors about issuing firms therefore decreasing stock price. Another study by Asquith and Mullins (1986) found the announcement of equity offerings reduces stock prices significantly. These findings are consistent with the hypotheses that equity issues are viewed as negative signals to investor and that there is a downward sloping demand for the firm's shares (Asquith & Mullins, 1986). Ebecko (1986) analyzed the effect of corporate debt offerings on stock prices and found that straight debt offerings have non-positive price effects while convertible debt offerings have negative effects on stock price. Mikkelson and Partch (1986) conducted a study on stock price effects of security offerings and determined the type of security is the only significant determinant of price response. The authors also argue that managers issue common stock or convertible debt when they believe the firm's shares are overpriced.

Another study performed by Barclay and Litzenberger (1988) examined the intraday market response to announcements of new equity issues concluding a negative relationship between the announcement and stock price. Hansen & Crutchley (1990) came to a similar conclusion that the issuance of convertible bond sales lead to a negative reaction while common stock sales lead to a negative reaction of even greater magnitude. Finally, according to a study conducted by Pilotte (1992), the stock price decline associated with equity offerings is greater than the decline for debt offerings and stock price response to straight debt offerings is negatively related to the risk level of the debt security offered. As a whole, the literature reveals a negative relationship between

security issues and stock price. T-Mobile has been known to finance operations through security issuances in the past, which could contribute to dips in stock price over the years.

Interim Reporting

May (1971) conducted a study on the effect of earnings announcements on market price changes as well as any differences between reactions to quarterly and annual earnings reports. The author found that price change responses were greater in weeks of earnings announcements than the average price change responses for non-announcement weeks. The study also showed that relative price-change responses to quarterly earnings were less than those of annual earnings reports with the exception of the second quarter, which was not significantly less (May, 1971). A more recent study of Jordanian industrial companies by Qabajeh, Hameedat, Shanti, & Dahmash (2012) showed a significant positive relationship between interim financial report announcements and stock returns as well as between trading volume and stock returns around the announcement date.

An additional study by Foster, Olsen, & Shevlin (1984) demonstrated a positive relationship between unexpected earnings change and post-announcement abnormal returns concluding that the more positive the unexpected earnings change, the more positive the returns and vice versa. Finally, Truong and Tran (2014) conducted a study testing the price momentum and discounting effects on the stock price of a firm following quarterly earnings announcement and found there is evidence of mid-term and long-term momentum extending up to two days after the earnings release followed by a reversal or tempering of momentum. The study showed a net discounting effect of the prior week or month's price movement on the trend following an earnings release (Troung & Tran, 2014). Though the literature differs based on focus and market, the studies all concluded

a significant positive relationship between interim reporting and stock price by some measure therefore validating the use of interim reporting and press releases as a potential factor effecting T-Mobile's common stock price.

External Factors

According to a study conducted by Pastor and Veronesi (2009), technological revolutions lead to a bubble-like pattern for stock prices in which stock prices of adopting firms typically rise in response to the good news of an increase in productivity or efficiency but ultimately fall as the risk of the new technology shifts from idiosyncratic to systematic. Though more articles on changes in technology could not be found at the time of this literature review, I believe the inclusion of technological revolutions as a factor is warranted as technology is constantly transforming the world around us. T-Mobile has experienced a technological revolution along with the other wireless carriers in the technology cycles including 3G, 4G, 4G LTE, and soon to come 5G. Each cycle brings greater efficiency to wireless spectrum and potential changes to infrastructure, which can cause changes in company performance and consequently stock price. Other external factors such as general market and industry trends will also be included as hypothesized factors effecting T-Mobile's common stock price over the four-year period.

Summary

After reviewing over forty articles, it is clear that research on the effect of various factors on stock price is far from limited. Though these studies all produce very interesting results, many of the authors presented conflicting or scattered findings. These conflicts in evidence could be a result of limited sample sizes, differing markets,

selection bias, time frame studied, etc. Though unanimous results are rarely achieved, I plan to use these findings as a starting point for my investigation of T-Mobile's increase in stock price from January 2012 to January 2016. My variables of interest will include but are not limited to the ones listed above, as new variables may be brought to light throughout the research process.

Contributions of this Study

Across the four-year span of this study, T-Mobile generated shareholder wealth of 26.7 billion dollars. This study is intended to identify the decisions by management and the factors that made T-Mobile so successful in such a short period of time. If successful, the findings could be applied and potentially replicated across the broader market for creation of similar wealth that could span trillions of dollars. By identifying the factors that led to the bountiful wealth creation, pension and scholarship funds could use the findings to identify similar firms in an early stage and invest early on in order to create wealth to help retired union members and underprivileged youth.

Chapter 2: A Theoretical Analysis

Introduction

This chapter presents a theoretical basis for the model in an attempt to inform the decisions and actions of T-Mobile (and the other wireless carriers) that led to large increases in common stock price from January 2012 to December 2015. The first section focuses on defining the market the firms operate in as an oligopoly while focusing on the implications of this market on the behavior of the firms. The following section is the fundamental theory to my research, the shareholder wealth maximization model. Through the analysis of this model, key variables are selected for the development of the model, which will be constructed in the following chapter. Finally, the chapter ends with a hypothesis of the key variables of the model.

Defining the Market

Oligopoly Theory

The wireless industry represents an oligopolistic market in which T-Mobile, Sprint, AT&T, and Verizon are the dominant firms that collectively monopolize the market. As an oligopoly, the market has a few defining characteristics that denote it as such. The first of these characteristics is interdependence in which firms cannot act independently of other firms. In order to be successful, an oligopolistic firm must take into consideration the potential reactions of its rivals before making any kind of decision. This interdependence can be further illustrated through the use of game theory and the prisoner's dilemma.

Game theory originated in 1838 with the publication of Augustin Cournot's *Researches into the Mathematical Principles of the Theory of Wealth* but was further developed in 1944 by John von Neumann and Oskar Morgenstern in their work *The Theory of Games and Economic Behavior*. This second work gave rise to the modern principles of game theory and expanded the application from a duopolistic market to oligopolistic markets. In order to dive into game theory, one must first define what a game is. According to game theory, a game has three characteristics: rules, payoffs, and strategies. The rules govern the conduct of the players involved while the payoffs indicate a win, loss, or tie. Finally, strategies refer to behaviors and considerations that influence the decision making process of the players. Firms in game theory make decisions on items ranging from price and output to products and marketing. A range of possible payoffs also exists including but not limited to increasing profits for shareholders, gaining market share, or improving chances of survival. In general, game theory suggests firms are unlikely to trust each other even if collusion exists. This phenomenon can be explained in terms of the prisoner's dilemma.

The prisoner's dilemma in game theory is a situation in which two players each face two options in which the outcome is dependent on the simultaneous decision of the other player. The name comes from an example in which two prisoners separately decide whether to confess to or deny a crime. In this game there is a strong incentive to cheat in order to maximize one's payoffs as opposed to abiding to collusive agreements with other players based on the notion that another player may cheat and reap the reward instead. There are three types of strategy in the prisoner's dilemma; maximax, maximin, and dominant strategy. Maximax strategy is utilized when the player attempts to earn the

maximum possible benefit and therefore cheat on any collusive agreement that may have existed between players. The maximin strategy is utilized when the player chooses the best of the worst payoffs. This strategy is often chosen when the player believes the other player utilized the maximax strategy and is attempting to minimize payoff losses. Finally, the dominant strategy can be defined as the best outcome irrespective of the choice taken by the other player.

Though the prisoner's dilemma is most easily explained in terms of two players, the prisoner's dilemma illustrates the nature of the choices oligopolists face and the environment of interdependence they operate in. Game theory predicts a likelihood of the formation of cartels due to the possibility of high payoffs under cooperation.

The second characteristic of oligopolies is the barrier to entry in which oligopolies maintain their position in a market purely because it is too costly or difficult for additional firms to enter the market. Both natural barriers and artificial barriers may occur therefore limiting the number of firms in the market. Natural barriers include factors such as high set up costs and high research and development costs. In the case of the wireless carriers, accumulating the funds necessary to purchase spectrum licenses, purchase or lease tower space in service areas, develop contracts with handset manufacturers, and establish a desirable brand could act as natural barriers to entry. Artificial barriers may include superior knowledge, predatory acquisitions, advertising, and loyalty incentives. In the wireless market, predatory acquisitions often occur when oligopolists wish to utilize the spectrum reserves or infrastructure of smaller, locally significant carriers in order to increase service quality in a specific basic trading area (BTA).

In a general sense, oligopolies can either be collusive or competitive. In a collusive oligopoly, participants act like a monopoly in order to enjoy higher long-term payoffs than under competition. Types of collusion include overt, covert, and tactic. Overt collusion occurs when there is no attempt to hide agreements while covert collusion involves an attempt to hide collusion in an attempt to avoid attention from regulators. Tactic collusion is another type in which firms act in concert but no formal or informal agreement exists. An example of tactic collusion would be an understood price leader in an industry in which other firms merely follow the lead of the price-leading firm though no agreement exists.

Competitive oligopolies can compete using either price or non-price strategies. In oligopolistic competition, non-price strategies are preferred to price strategies in an attempt to avoid a price war. In the case of price-strategies, a firm may choose to reduce price in an attempt to gain market share, but if rivals respond by subsequent price cuts, the profitability of the industry as a whole will suffer greatly leading to little or no long-term profits. Non-price competition is therefore preferred by oligopolists in order to avoid price wars. Some examples of non-price competition in the wireless industry include attempting to create superior service, both in terms of the product of wireless service quality and customer service, as well as branding through advertisement and sponsorship. Sales promotions and the availability of desired handsets are also examples of non-price competition. A recent trend is to pay switching costs from other carriers in an attempt to encourage customers to violate two-year contracts and switch to another carrier. An example of the availability of handsets can be seen through T-Mobile's late adoption of the iPhone in 2013 while rivals had offered the device for over two years.

The lack of availability of the iPhone to T-Mobile customers served as a deterrent for wireless users who desired the popular Apple product. Though some price competition exists in the wireless carrier market as evidenced by T-Mobile's recent cost-undercutting strategy, I believe the cost-undercutting by T-Mobile is more perceived than real in that in recent quarters the company has reported average revenue per user (ARPU) in line or even greater than industry leaders. I therefore argue that the wireless carrier oligopoly mainly utilizes non-price strategies in attempt to gain market share.

The wireless carrier market is an oligopolistic market in which some collusion exists, but cutthroat competition occurs mainly through non-price attributes. The collusion by AT&T, Verizon, Sprint, and T-Mobile has not only led to extreme profits in the market, but has allowed the carriers to maintain their position in the market and deter new entrants with ever-climbing natural and artificial barriers. The interdependence of the four players leads to price collusion to avoid detrimental price wars and ultimately price stability throughout the past several years. As US consumers continue to increase their insatiable desire for data, competition is sure to manifest in an arms race of infrastructure such as spectrum reserves and small cell sites in an attempt to bulk up networks to accommodate demand and provide faster, more reliable networks for customers.

Shareholder Wealth Maximization Model

The shareholder wealth maximization model of the firm is a model based on the theoretical primary goal of the firm, to maximize the value of the firm for its owners, the shareholders. Shareholder wealth is therefore a measure of the value of the firm and can be defined as the value of the firm's common stock, which is essentially the present value

of all expected future cash returns generated by the firm. Therefore, a firm's management should pursue actions that maximize the present value of expected future earnings in order to achieve the goal of shareholder wealth maximization. To get a little more technical, the value of a firm's stock is equal to the present value of all expected future returns discounted at the shareholders' required rate of return (McGuigan, Moyer, & Harris, 1999). This can be represented below in Equation 1 in which V_0 represents the present value of a share of common stock, π_t represents the expected cash flows in future quarters, and k_e represents the investors' required rate of return.

Equation 1

$$V_0 = \frac{\pi_1}{(1+k_e)^1} + \frac{\pi_2}{(1+k_e)^2} + \frac{\pi_3}{(1+k_e)^3} + \cdots + \frac{\pi_\infty}{(1+k_e)^\infty} = \sum_{t=1}^{\infty} \frac{\pi_t}{(1+k_e)^t}$$

According to the shareholder wealth maximization model, a firm should maximize the return to shareholders for any given level of risk, as measured by capital gains and dividends, as well as minimize the level of risk to shareholders for a particular rate of return (Eiteman, Stonehill, & Moffett, 2012). Therefore, the greater the risk associated with future cash flows, the lower the value to investors thus requiring a higher discount rate to compensate for the that level of risk. Under the model, risk is defined as the additional level of a risk that a firm's shares bring to a diversified portfolio therefore dismissing operational risk and focusing on systematic risk. The model also makes the assumption that the market is efficient and argues that equity share price is always correct because it captures expectations of return and risk perceived by investors while quickly adjusting the share price according to new information. As result, the model states that

share prices are the best allocators of capital in the macro economy (Eiteman, Stonehill, & Moffett, 2012).

A further mathematical breakdown of the components of profit, π, may be useful in further analyzing ways in which a firm can achieve shareholder wealth maximization. Equations 2, 3, and 4 simply decompose profit, total revenue, and total cost into their constituent parts. In the equations, π_t represents profit, TR_t represents total revenue, TC_t represents total cost, P_t represents price per unit, Q_t represents units of output, V_t represents variable cost per unit, and F_t represents fixed costs with all variables with respect to the current period, t. Equation 5 is ultimately a derived equation from Equations 2, 3, and 4 representing the value of a firm. The equation provides insight that the discount rate (k_e) is dependent on perceived risk of the firm as well as capital market conditions while future revenue streams depend on the revenues generated through demand and pricing as well as the costs as determined by the nature of the cost function (McGuigan, Moyer, & Harris, 1999). Put simply, the value of the firm is determined by the volume, timing, and risk of expected future cash flows.

Equation 2

$$\pi_t = TR_t - TC_t$$

Equation 3

$$TR_t = P_t \cdot Q_t$$

Equation 4

$$TC_t = V_t \cdot Q_t + F_t$$

Equation 5

$$V_0 \cdot (Shares\ Outstanding) = \sum_{t=1}^{\infty} \frac{P_t \cdot Q_t - V_t \cdot Q_t - F_t}{(1 + k_e)^t}$$

Though the equations are nice, it is important to consider how these various factors and actions influence the magnitude, timing, and risk of a firm's cash flows thereby affecting the stock price. The first factors to consider are those of the external economic environment such as the level of economic activity, competition, taxes, market specific regulations, etc. Though these factors are largely outside of the control of managers, they must be aware of market conditions in order to make the best decisions for the wealth of the firm. The conditions of financial markets are also key in decision making when it comes to investment strategies and funding with possible considerations being interest rate levels, investor optimism, and expected inflation. Finally, policy decisions such as marketing and distribution, investment, employee compensation, ownership type, capital structure, dividend policies, and mergers and acquisitions affect stock prices (McGuigan, Moyer, & Harris, 1999).

Though the overall goal under the wealth maximization model is to maximize return for shareholders, sometimes short-term and long-term value maximization conflict likely as a result of compensation systems focused on quarterly earnings results. Patient capitalism is a term used to describe a scenario in which management pursues a short-term action that are beneficial in the short run but detrimental in the long run. Though wealth maximization over the long run is preferred, pressure to increase earnings can lead to the addition of investment horizons into decision-making, which is the length of time it takes for the firm's actions to result in earnings. Agency theory therefore exists as the study of how shareholders can motivate management to follow the shareholder wealth maximization model and keep their best interests at heart. One strategy for encouraging management to think more like shareholders is the use of stock options. Through the use

of stock options, management is driven to focus on driving stock price in order to maximize their own wealth.

In addition to considering management compensation, there are some implications of shareholder wealth maximization to be considered. The first is that since shareholder wealth maximization is long-term and environments are constantly changing, managers must have the foresight to manage changes in competition, technology, and regulation ahead of the general trend in order to maximize wealth for shareholders. The model is also a dynamic objective reflecting currently available public information on expected cash flows and risks therefore reflecting strategic investment opportunities and the value of future investments. The goal of wealth maximization leads to a continuum of taking actions in which the marginal benefit outweighs the marginal cost in order to optimize cash flows. Managers therefore seek to be forward-looking, fluid in decision-making, and have a long-term perspective for maximizing wealth through managing change, making strategic investment decisions, and maximizing the value of expected cash flows to stockholders (McGuigan, Moyer, & Harris, 1999).

The shareholder wealth maximization model makes three basic assumptions that have been challenged over the years. The first assumption is that the shareholder value is the best measure of wealth creation for the firm. Critics of the model argue firm value, a measure taking into consideration value to other financial claimants (creditors, debtors, preferred shareholders, etc.), is a more accurate indicator of wealth. Supporters of this argument state that managers and boards have the capability to make decisions that transfer value from debt holders to shareholders as well as decrease and social value while simultaneously increasing shareholder value. The second assumption, that

shareholder value maximization produces the greatest competitiveness, has also been challenged. Critics argue that companies that adopt shareholder value maximization as their primary focus lose sight of producing a product or delivering a service as their central mission. They further add that shareholder wealth maximization acts as poor inspiration for employees despite their shared benefit because shareholders are nameless, faceless, and unsatisfiable. These critics argue companies should simply create moral purpose that provides a clear focus creating competitive edge in purpose to motivate constituents and support corporate actions. Lastly, the third assumption is that shareholder maximization justly serves the interests of other stakeholders. This assumption is most controversial and gives way to stakeholder theory in which value-maximizing firms are concerned with the satisfaction of all involved parties rather than privileging stockholders.

Though criticisms of the stockholder wealth maximization model do exist, I intend to stand by the model as the framework for my research due to its highly accepted nature as well as its ability to lend to quantitative analysis. Though the stakeholder theory could also lend to quantitative data, it would be impossible to attempt to even come up with a comprehensive list of stakeholders let alone measure their satisfaction with each wireless carrier. As a response to the first criticism, a more comprehensive measure of wealth could quite possibly be achieved, but I am interested in the common stock price so the shareholder wealth maximization model is a fine fundamental theory for my research. In response to the second critique of losing sight of the intentions of the firm in terms of product or service quality as well as a lack of motivation for workers, I believe that the two are one in the same. In order to maximize shareholder wealth, a firm must produce

great products and services in order to earn profits as well as keep an enthusiastic and motivated workforce through benefits, company values, mission statements, etc. I believe that the alternative suggested is not an alternative at all but merely a small part of the process in which to maximize shareholder wealth. Thirdly, I believe that keeping stakeholders happy is once again a part of maximizing shareholder wealth rather than an alternative to the theory. If one does not keep stakeholders satisfied, sales will suffer greatly leading to lower shareholder wealth. For these reasons, I intend to support and use the shareholder wealth maximization theory as the fundamental theory to my research on stock prices across the four wireless carriers. This model ultimately suggests that my hypothesis should be that an increase in market share and dividend payments as well as a decrease in the debt to equity ratio will result in an increase in common stock price.

Conclusion

Oligopoly theory, game theory, and the shareholder wealth maximization model all help to inform my research on stock price movements in the wireless carrier industry. The framework for oligopolies demonstrates the special environment in which the four firms compete for customers while game theory helps explain the codependence and behaviors one can expect from firms in an oligopoly. I believe that Verizon, AT&T, Sprint, and T-Mobile engage in tactic collusion in that they do not engage in price wars but act competitively mainly through non-price attributes. Finally, shareholder wealth maximization theory directly connects the actions of the firm to common stock price therefore providing the fundamental relationship for my common stock analysis of the four wireless carriers. The actions discussed have led to the identification of key variables relating to the equations such as total revenue, market share, dividend payments, retained

earnings, net income, debt to equity ratio, and spectrum license quantity as well as macroeconomic control variables including GDP growth, investor sentiment, and the S&P 500 index. The next chapter will include further description of the above variables including descriptive statistics and expected sign, a regression analysis, interpretation of key findings, an analysis of the results, and a conclusion. I hypothesize that the market share, dividend payments, and debt to equity ratio will be statistically significant variables in determining stock price movements across the four wireless carriers.

Chapter 3: An Empirical Analysis

Introduction

The purpose of this study is to identify the factors that led to T-Mobile's unprecedented increase in stock price from January 2012 to December 2015. As the observations for this sample are limited due to the frequency of reporting (on a quarterly basis), panel data consisting of T-Mobile, Sprint, AT&T, and Verizon was used to create a more robust model. While this model may not reveal the direct focus on T-Mobile that were desired, the regression will be stronger and the results may be related back to T-Mobile. The chapter builds upon the independent variables, dependent variables, and theoretical foundations discussed in chapter two in order to determine if the hypothesis on stock price is supported. The overarching hypothesis is that the debt to equity ratio, dividend payments, and market share are significantly and positively related to stock price.

Dependent, Independent, and Control Variables

Dependent Variable

Common Stock Price, measured in USD, is the dependent variable under investigation in this study. All historical common stock prices were collected from Yahoo Finance using adjusted close values, which are preferred in the industry. The dates being examined are January 1, 2012 through December 31, 2015.

Independent Variables

Definitions and explanations of the independent variables in this study are provided to ensure proper interpretation.

Operating Revenue is defined as income derived from the everyday business operations of a company. In this case, operating revenue includes wireless service, equipment, and other revenues. This variable is measured in millions of USD and is always positive.

Net Income is defined as earnings after subtracting operating and other expenses such as interest and tax from total operating revenue. A negative net income value can be interpreted as a net loss in which costs and expenses exceed revenues for that period. This variable is measured in millions of USD and can be either positive or negative.

Retained Earnings is defined as the portion of net income a company retains for future operating or investment activities rather than distributing it to shareholders in the form of dividends. Retained earnings is measured as a summation of historical retained earnings, therefore the retained earnings data points are not simply a reflection of the retained earnings from the reported quarter. This variable was considered as a change variable, however it is important to reflect the current financial state of the company by showing the cumulative retained earnings. Negative retained earnings can be interpreted as accumulated deficits in which accumulated losses have reduced retained earnings to a negative value. This variable is measured in millions of USD and can be either positive or negative.

Debt to Equity Ratio is a financial ratio indicating the financial leverage of a company achieved by dividing total liabilities by stockholder's equity. This value

demonstrates the proportion of debt and equity used to finance a company's assets and therefore reflects risk. This variable is measured as a positive integer in which increasing values represent increasing debt relative to equity.

Spectrum License Value is defined as the current book value of FCC spectrum license holdings. Spectrum licenses are essentially purchased leases of various blocks of frequency issued by the US government in FCC auctions. Purchases of spectrum vary in the size of the block of spectrum, the frequency of the spectrum, and the BTAs in which it is issued. Lower frequency spectrum offers the advantages of better penetration (through objects such as walls of buildings and cars) and farther propagation of signals as compared to higher frequency spectrum. Theoretically, wireless carriers attempt to maximize cellular coverage according to the relative cost of spectrum. If low spectrum is too expensive or not available, high spectrum can be used in combination with an increase in cellular towers. If low spectrum is within budget, it is usually preferable to purchase low spectrum and minimize the number of towers and the costs associated with them. It would be most precise to come up with a model that graded the efficiency of spectrum and use it as the spectrum variable; however, such a model would be almost impossible to derive, as public FCC license databases are incomplete. The spectrum license value will therefore serve as a proxy for the amount and quality of spectrum owned by each carrier. The value is recorded in millions of USD and is always positive. Similarly to retained earnings, this value is cumulative across the history of the company to reflect the company's investment in its network.

Dividend Payment is defined as the per share value of common stock cash dividends declared during the quarter. Dividend payments are distributions of current

period or accumulated earnings that are distributed to stockholders. The value is recorded in USD and is always positive.

Market Share is defined as the percentage of the market's total sales earned by a particular company during a given period. It is important to note that decimal values of the four carriers do not sum to one as two small carriers, Leap Wireless and US Cellular, were operating in the market with a combined market share of approximately three percent. Market share value is recorded in decimal form and is always positive.

Expected Return is defined as the expected rate of return on stockholder's equity and shows how efficiently a company uses investment to generate revenue. This variable is used as a proxy for the discount rate in the model. It is calculated by dividing the net income by the average stockholder's equity (beginning stockholder's equity plus ending stockholder's equity divided by two). The value can be positive or negative depending on whether net income or net losses were achieved in the period.

Control Variables

Macroeconomic Variables

GDP Growth is defined as the percentage growth rate of US gross national product. The value is represented in decimal form in the data and can be either positive or negative.

Investor Sentiment is defined as the percentage of polled investors classified as bullish. The value is represented in decimal form in the data and is always positive.

S&P 500 Value is defined as the average numerical value of the S&P 500 index for the specified quarter. The variable serves as a benchmark for the overall stock market and is always a positive integer.

U.S. Discount Rate is defined as the interest rate charged to commercial banks and other institutions on loans received from the Federal Reserve Bank. This variable serves as a possible proxy for the discount rate in the regression. The value is always positive and equal to or less than 1 for the 2012 to 2016 period.

General Variables

Quarter is defined as a 3-month period and includes January 1st through March 31st, April 1st through June 30th, July 1st through September 30th, and October 1st through December 31st. This variable is used as an indicator of time and is recorded as a whole number ranging from 1 to 16.

Panel ID is defined as the dummy variable indicating which corporation is being described in the data. This variable ranges from 1 to 4 with 1 representing Sprint, 2 representing T-Mobile, 3 representing Verizon, and 4 representing AT&T.

Weighted Average Shares Outstanding (Basic) is defined as the weighted average quantity of shares outstanding, as the value of shares outstanding fluctuates throughout the quarter due to repurchases, issuances, or retirements of shares. This value is reported in millions of USD and is always positive.

Selection of Variables and Sources of Data

As stated in the previous chapter, total operating revenue, market share, dividend payments, retained earnings, net income, debt to equity ratio, spectrum license value, weighted average of shares outstanding (basic), GDP growth, investor sentiment, Discount Rate (proxies include the U.S. discount rate and expected return), and the S&P 500 were chosen as variables through the logic of the shareholder wealth maximization

model. The first eight variables are directly related to the corporations (Sprint, T-Mobile, AT&T, and Verizon) while the final four variables are macroeconomic control variables used to strengthen the analysis. All values for total operating revenue, dividend payments, retained earnings, net income, spectrum license value, and weighted average shares outstanding (basic) were collected from the quarterly (10-Q) and annual (10-K) SEC filings for Sprint, T-Mobile, AT&T, and Verizon. The total liabilities and total equity values were also taken from these documents and were used to calculate the debt to equity ratio by dividing total liabilities by total equity. Expected return was similarly calculated using net income and average stockholder equity values from SEC filings. Market share data was collected from Chetan Sharma Consulting reports, which are frequently used and referenced by the major tower companies and wireless carriers in the industry.

The final four variables, GDP growth, investor sentiment, and S&P 500-index value, were collected through means other than SEC filings. The GDP growth values were taken from the Bureau of Economic Analysis, which serves as a reliable database. Investor sentiment was measured as a percentage of bullish investors per quarter as reported by the American Association of Individual Investors in their AAII Investor Sentiment Survey. This variable is limited in that it does not reflect the overall investor sentiment by not specifying the percentage of neutral or bearish investors, but will function as a proxy for investor optimism. The U.S. discount rate was obtained from the FRED (Federal Reserve Economic Data) website. Finally, the S&P 500 index values were obtained from the S&P indices online and act to serve as a baseline for stock returns and growth. Once again, these variables were chosen under the shareholder wealth

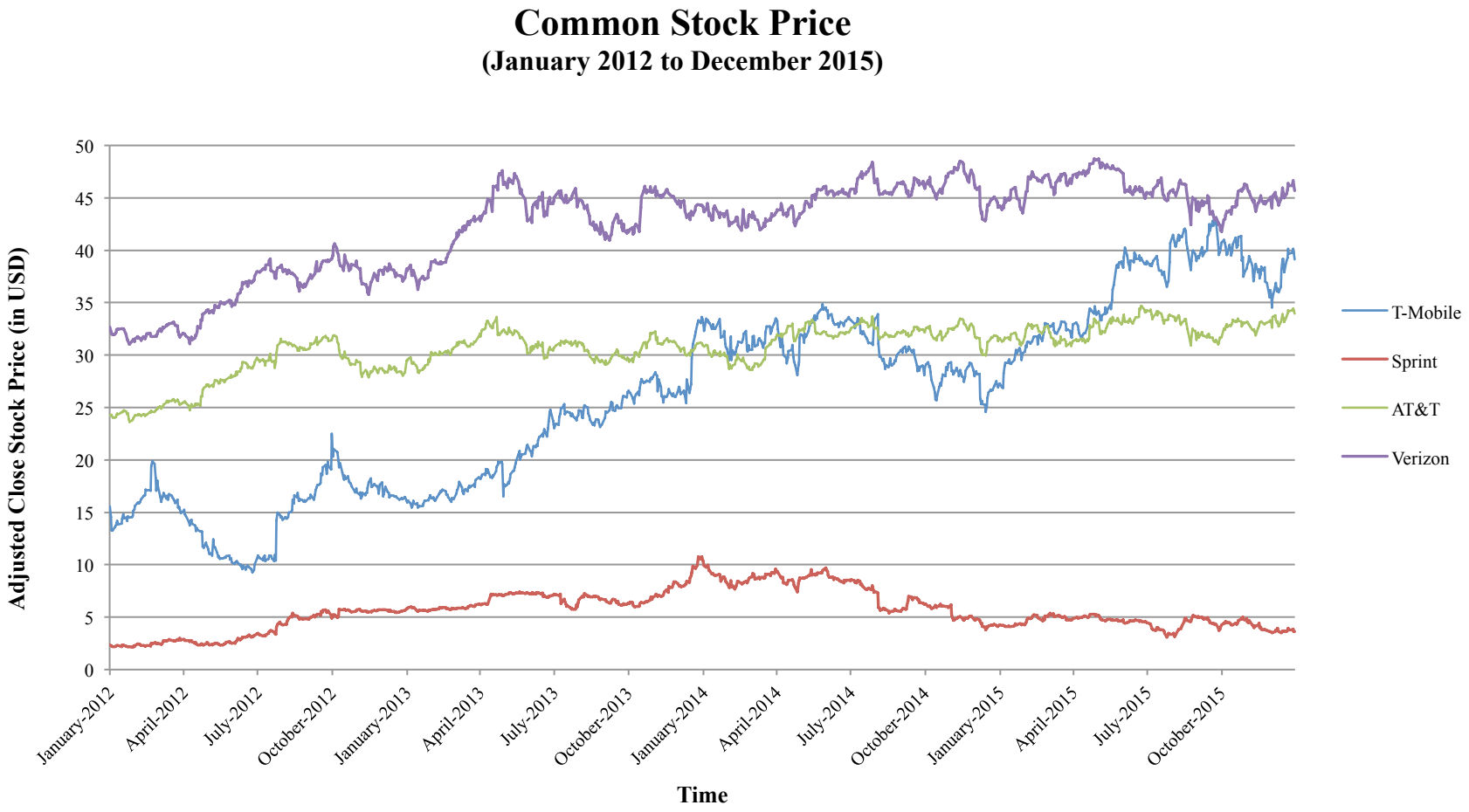
maximization model as macroeconomic control variables to account for overall market effects that are not specific to the direct wealth maximizing actions of the firms. Finally, variables for time and panel identification were included in order to properly specify time and company differences within the model.

Summary Statistics and General Trends

The data set included 60 observations with four groups across 16 time periods. Each time period represents a financial quarter, which runs from January to March, April to June, July to September, and October to December. A chart of the summary statistics is displayed in the appendix. As a brief overview of the hypothesized significant variables, the average debt to equity ratio is 4.3, the average dividend payment is $0.31, and the average market share is 0.24 indicating that on average 4 percent of the wireless market share at any given time is typically held by a company other than T-Mobile, Sprint, AT&T, or Verizon.

The graph below is a visual representation of the overall common stock price of each of the four wireless carriers with T-Mobile in blue, Sprint in red, AT&T in green, and Verizon in purple. The graph shows that T-Mobile's common stock price was approximately ten dollars per share lower than AT&T's in January 2012 but surpassed AT&T around February 2015 at almost $33 and even matching Verizon's stock price briefly around September 2015 at $42. It is apparent that T-Mobile's rise in stock price is significantly different than that of the other carriers throughout the period studied.

Figure 3.1: Common Stock Price Graph



A second summary statistics chart is displayed in the appendix detailing the variables broken down by company. Some notable differences are the weighted average shares outstanding (basic), net income, retained earnings, and debt to equity ratios. T-Mobile has a drastically smaller weighted average shares outstanding (basic) mean than the other three carriers. Additionally, Sprint and T-Mobile have negative mean net income and retained earnings while Verizon and AT&T have positive ones. Finally, Verizon has a significantly higher mean debt to equity ratio (8.489) than the other carrie (3.809, 2.763, and 2.106 respectively).

Regression Results

This section reveals and analyzes the regression results for the stock price model.

Table 3.1: Common Stock Price Model 1

Common Stock Price	Coefficient	Std. Err.	t	P > t
Weighted Average Shares Outstanding (Basic)	0.00576	0.00266	2.16	0.038
S&P 500 Value	0.01745	0.00981	1.78	0.085
GDP Growth	-29.61139	29.43580	-1.01	0.322
Investor Sentiment	-17.22048	9.09312	-1.89	0.067
Operating Revenue	0.00047	0.00053	0.9	0.377
Operating Revenue (Lag 1)	-0.00009	0.00032	-0.29	0.774
Operating Revenue (Lag 2)	0.00091	0.00025	3.56	0.001
Net Income	0.00024	0.00024	0.98	0.333
Net Income (Lag 1)	-0.00039	0.00026	-1.46	0.153
Net Income (Lag 2)	-0.00015	0.00024	-0.62	0.539
Spectrum	-0.00020	0.00012	-1.65	0.109
Spectrum (Lag 1)	0.00007	0.00010	0.78	0.44
Spectrum (Lag 2)	-0.00021	0.00008	-2.52	0.017
Retained Earnings	-0.00005	0.00010	-0.53	0.599
Retained Earnings (Lag 1)	-0.00004	0.00009	-0.53	0.602
Retained Earnings (Lag 2)	-0.00006	0.00007	-0.85	0.399
Debt to Equity Ratio	-0.54341	0.21737	-2.5	0.018
Debt to Equity Ratio (Lag 1)	-0.20020	0.26407	-0.76	0.454
Debt to Equity Ratio (Lag 2)	0.04772	0.18151	0.26	0.794
Market Share	129.83940	49.00927	2.65	0.012
Dividend Payment	-1.33967	0.72199	-1.86	0.072
Dividend Payment (Lag 1)	0.08481	0.71443	0.12	0.906
Dividend Payment (Lag 2)	0.25339	0.70768	0.36	0.723
US Discount Rate	-4.49590	27.11498	-0.17	0.869
Quarter	-0.35934	0.62032	-0.58	0.566
Additional Regression Information				
R-Squared:	Number of Observations = 62			
Within = 0.8582	Number of Groups = 4			
Between = 0.2149	F (25,33) = 7.99			
Overall = 0.2337	Prob > F = 0.0000			

Table 3.2: Common Stock Price Model 2

Common Stock Price	Coefficient	Std. Err.	t	P > t
Weighted Average Shares Outstanding Basic	0.00584	0.00264	2.21	0.034
S&P 500 Value	0.01813	0.00844	2.15	0.039
GDP Growth	-29.55258	29.38757	-1.01	0.322
Investor Sentiment	-17.63274	8.99496	-1.96	0.058
Operating Revenue	0.00044	0.00051	0.87	0.393
Operating Revenue (Lag 1)	-0.00010	0.00032	-0.31	0.757
Operating Revenue (Lag 2)	0.00092	0.00025	3.67	0.001
Net Income	0.00031	0.00042	0.74	0.467
Net Income (Lag 1)	-0.00042	0.00029	-1.45	0.155
Net Income (Lag 2)	-0.00016	0.00024	-0.66	0.514
Spectrum	-0.00019	0.00012	-1.64	0.11
Spectrum (Lag 1)	0.00008	0.00010	0.79	0.436
Spectrum (Lag 2)	-0.00021	0.00008	-2.56	0.015
Retained Earnings	-0.00005	0.00010	-0.53	0.598
Retained Earnings (Lag 1)	-0.00004	0.00009	-0.43	0.667
Retained Earnings (Lag 2)	-0.00006	0.00007	-0.84	0.408
Debt to Equity Ratio	-0.54162	0.21648	-2.5	0.017
Debt to Equity Ratio (Lag 1)	-0.17627	0.29473	-0.6	0.554
Debt to Equity Ratio (Lag 2)	0.04569	0.18200	0.25	0.803
Market Share	135.90160	53.87420	2.52	0.017
Dividend Payment	-1.34896	0.72224	-1.87	0.071
Dividend Payment (Lag 1)	0.11631	0.72452	0.16	0.873
Dividend Payment (Lag 2)	0.26726	0.71091	0.38	0.709
Expected Return	-1.61741	7.46347	-0.22	0.83
Quarter	-0.41794	0.50016	-0.84	0.409
Additional Regression Information				
R-Squared:	Number of Observations = 62			
Within = 0.8583	Number of Groups = 4			
Between = 0.2171	F (25,33) = 7.99			
Overall = 0.2347	Prob > F = 0.0000			

A fixed effects model was used in order to correct for serial correlation existing in previous models. Additionally, all of the variables taken from the SEC filings were lagged by one and two periods to view the effects of past periods on the current period

under the assumption that investors adapt their expectations and stock holdings with the release of new information. The only variable found on the SEC filings that was not lagged was weighted average shares outstanding (basic) because changes in the volume of shares outstanding are usually announced in real time and therefore do not qualify as new information upon the release of SEC filings.

Two models are shown above with the only difference in variables being the proxy variable for the discount rate (or shareholders expected rate of return). The first model uses the U.S. Discount Rate in which the discount rate is uniform across all four companies. The second model uses Expected Return as a proxy for the discount rate where each company in each period has a differing expected return. Though neither proxy variables were statistically significant, I chose to use the expected return proxy (second model) because the between, inbetween, and overall R-squared values were slightly larger than with the U.S. discount rate (first model).

Looking at the second regression results, eight variables are statistically significant at the 90% confidence level. Weighted average shares outstanding (basic) has a coefficient of 0.00584, indicating that an increase in weighted average shares outstanding (basic) by 100 million shares is associated with a $0.584 increase in common stock price. The S&P 500 value has a coefficient of 0.01813 indicating that an increase in the S&P 500 value by one point is associated with a $0.01828 increase in common stock price. Investor sentiment was also statistically significant at the 10% confidence interval with a coefficient of -17.63274 indicating that an increase in the percentage of bullish investors by one percent is associated with a $0.1763274 decrease in common stock price. Operating revenue lagged by two periods was statistically significant, indicating

that an increase of $100 million in operating revenue two periods prior is associated with a $0.092 increase in common stock price in the current period. Similarly, spectrum license value was statistically significant when lagged by two periods indicating that an increase in spectrum license value by $100 million two periods prior is associated with a $0.021 decrease in common stock price in the current period. Debt to equity ratio was significant with a coefficient of -0.54162 indicating that an increase in debt to equity ratio by one is associated with a decrease in common stock price by $0.54162.

Moving forward, market share was statistically significant with a coefficient of 135.90160 indicating that a one percent increase in market share is associated with a $1.3590160 increase in common stock price. Finally, dividend payment was statistically significant with a coefficient of -1.34896 therefore indicating that a one dollar increase in dividend payment is associated with a $1.34896 decrease in common stock price.

Potential Bias in Analysis

One potential bias that could be present in this analysis is multicollinearity. Multicollinearity occurs when two or more explanatory variables in the model are highly correlated to one another. In the case of multicollinearity, the coefficient estimators of the regression may change greatly in response to small changes in the regression itself or in the data set. Multicollinearity does not threaten the predictive power or reliability of the model as a whole but rather may reduce the validity of standard errors of individual explanatory variables. Multicollinearity is present if the value within the correlation matrix between two variables is greater than 0.08. The corresponding correlation matrix of only current period variables can be found in Appendix A.1. Although

multicollinearity does exist in the model based on the matrix, I chose to keep the variables in the model in order to avoid further omitted variable bias.

A second potential bias within the analysis is the possibility of unobserved omitted variables that are determinants of common stock price that are related to the independent variables. An example could be change in leadership, in which a new CEO serves as an enticement for investors and restored confidence in the company therefore leading to an increase in common stock price. Another omitted variable could be acquisition rumors in which a common stock price is temporarily inflated by pre-acquisition announcement investor hype. Investor sentiment is included in this model, but the proposed omitted variable is specific to acquisition talks between one of the wireless carriers and another company. Lastly, customer appreciation of marketing and branding strategy could be another significant variable absent from the current model. The inclusion of omitted variables would strengthen the overall analysis.

A third potential bias within the model is heteroskedasticiy in which there is an inconsistency amongst the variance of error terms. Heteroskedasticiy does not occur in the current model as a result of using Driscoll and Krayy standard errors.

Conclusion

To conclude this chapter on regression analysis, the null hypothesis was supported by the regression. Interestingly, the 5 other variables were also statistically significant. While dividend payment was statistically significant, I believe the sign and coefficient are skewed as a result of an outlying data point in which T-Mobile executed a one for two reverse stock split in which investor holdings were reduced by half. This event occurred

on May 1, 2013 and was accompanied by a one-time dividend payment of 4.06 per share. Stock prices increased following the reverse split but did not increase in proportion to the split, which could be seen as a decrease in market capitalization. I believe this event is responsible for the negative sign as well as the large coefficient for the dividend payment variable. In the absence of this event, I would predict that the coefficient would be a much smaller, positive value.

Another variable, weighted average shares outstanding (basic), was also statistically significant with a positive coefficient. This variable was simply used as a control variable, but logically an increase in weighted average shares outstanding (basic) should produce a decrease in common stock price according to supply and demand. This positive coefficient could be caused by two events. The first event could be the T-Mobile reverse split in which a decrease in shares outstanding led to a relative decrease in share price (considering the common share price did not double following the event). Another possibility is that despite increasing the number of shares outstanding, some companies were able to increase the common stock value at a rate above that of the increase in shares outstanding.

Investor sentiment was similarly a statistically significant variable with an unexpected sign. According to the regression, and increase in the percent of bullish investors was associated with a decrease in common stock price. Again, a few possible explanations exist. The first explanation is that one of the firms performed excessively poorly despite a period of increased investor sentiment therefore associating the two. Another possibility is that bullish investors prefer different assets than wireless service provider stocks and dump these stocks in order to invest in different stocks. A third

possibility is that despite an increase in bullish investors, there could be a polarization in which there is also an increase in bearish investors therefore decreasing the neutral investors and outweighing the bullish investors. Though I am not certain how probable the third scenario is in practice, it is a possibility and therefore reflects the imperfect nature of the variable investor sentiment in the regression.

Finally, spectrum license value was statistically significant when lagged by two quarters but had a negative sign. According to the regression, an increase in spectrum license value two quarters ago is associated with a decrease in common stock price in the current quarter. This relationship is odd but is possibly explained through investor uneasiness with spectrum purchasing decisions. Sprint is famous for purchasing spectrum that it cannot afford and cannot utilize within the specific build out period. The FCC sets specific dates in which the license holder must show specific benchmarks of utilization of current licenses. If these build out stipulations are not met, the license holder often forfeits the rights to the asset and therefore experiences large losses on investment. This negative coefficient could be a reflection of investor doubt that a company can achieve build out requirement to realize the potential of the investment.

In conclusion, the regression boasts a within R-squared value of 0.8583 indicating that over 85% of the change in common stock price within a specific company can be explained by the right hand side variables. The fixed effects model also calculates the R-squared value between factors, and the variation in the independent variables accounts for over 21% of the variation in stock prices across the 4 companies. Though multicollinearity and omitted variable bias exist, heteroskedasticity is not present in the current model. Potential variable additions include changes in leadership and acquisition

rumors. According to the model, weighted average shares outstanding (basic), S&P 500 value, investor sentiment, operating revenue (lag 2), spectrum license value (lag 2), debt to equity ratio, market share, and dividend payment are all statistically significant at the 90% confidence interval. The null hypothesis is supported, but additional variables proved to be statistically significant as well. Some of these statistically significant variables had surprising coefficients and signs in which possible explanations were hypothesized.

Chapter 4

Summary

Chapter one provides a background on prior literature on variables effecting common stock price. Prior literature discusses changes in leadership, marketing and branding, dividend payments, acquisition rumors, capital structure, capital expenditures, leverage, new security issues, interim reporting, and various external factors. Though conclusions on each variable are typically divided, the presence of so much prior research validates consideration of the variable in the model.

Chapter two introduces the theoretical foundations that are necessary to support the empirical findings in chapter three. While oligopoly theory and prisoner's dilemma define the market in which the wireless carriers are operating, the shareholder wealth maximization theory is the cornerstone for the entire analysis. The shareholder wealth maximization theory states that a firm aims to maximize shareholder, as measured by returns on common stock and dividend payments. This theory ultimately lead to and supported the identification of the independent and control variables used in the regression model in chapter three.

After obtaining the regression results, eight variables proved to be statistically significant. The initial hypothesis that market share, dividend payment, and debt to equity ratios would be statistically significant was supported; however, the dividend payment had an unexpected negative sign. The model had a within R-squared value of 0.8583 indicating that the vast majority of change in common stock price could be explained using the current variables.

Application

Panel data was used in this study due to the unavailability of a sufficient number of observations for T-Mobile from January 1, 2012 to December 31st 2015. Though the results can be generalized to T-Mobile, I believe large differences exist between T-Mobile and the other three carriers growth therefore decreasing the validity of generalizing the results to T-Mobile. The intention of the study was to determine the actions taken by T-Mobile that lead to such extreme growth in common stock price and ultimately market capitalization between January 2012 and December 2015. Though I believe the eight statistically significant variables contributed to the rapid growth of T-Mobile, further study would need to be conducted in order to properly identify the factors that amplified T-Mobile's success so largely over the four-year period. After further study, these results could be potentially used to identify companies early on that are making decisions that will lead to large returns in the future. This method of stock selection could be utilized to bolster and scholarship funds for the elderly and underprivileged youth. Similar firms could also apply the results in order to achieve an increased level of wealth creation.

Possible Extensions

This study could be extended in a few ways. The first would be following the current trajectory and adding omitted variables to the model in order to increase the explanatory value. Another extension would be to collect data on T-Mobile going back in time as opposed to using panel data of the wireless carriers. By using purely T-Mobile

data, the model will be more indicative of the actions of T-Mobile and their affects as opposed to the actions of the wireless carriers as a whole.

Conclusion

The wealth creation of T-Mobile over the period of January 2012 to December 2015 is truly unprecedented. Though the model above attempts to identify variables associated with this large increase in common stock price and market capitalization, it is clear that further research must be done in order to uncover exactly why this large volume of wealth creation occurred. If discovered, the methods of wealth creation could be applied to similarly positioned companies therefore leading to large wealth creation on a grander scale and therefore wider economic growth. I would encourage others to continue to study T-Mobile's wealth creation in order to uncover the root of such expansive growth.

Appendix

A.1 Summary Statistics

Variable Name	Minimum	Maximum	Mean	Std. Dev.
Common Stock Price	2.449	47.147	26.178	14.337
WASOB[1]	535.286	6,181.000	3,310.606	1,772.323
S&P 500 Value	1,348.784	2,101.829	1,753.135	272.904
GDP Growth	(0.009)	0.046	0.020	0.016
Investor Sentiment	0.290	0.470	0.371	0.057
Operating Revenue	4,677.000	42,119.000	19,808.550	12,486.390
Net Income	(7,735.000)	7,916.000	1,603.156	2,764.415
Spectrum License Value	12,818.000	93,093.000	47,225.580	25,436.720
Retained Earnings	(47,056.000)	34,758.000	(1,971.000)	23,466.360
Debt to Equity Ratio	1.490	20.920	4.292	4.512
Market Share	0.100	0.350	0.242	0.094
Dividend Payment	0.000	4.060	0.311	0.537
Expected Return	(0.629)	0.368	0.018	0.139
US Discount Rate	0.750	0.830	0.755	0.020
Panel ID	1.000	4.000	2.500	1.127

[1] WASOB is an abbreviation for Weighted Average Shares Outstanding (Basic)

A.2 Summary Statistics (Company Specific)

Variable Name	Company	Minimum	Maximum	Mean	Std. Dev.
Common Stock Price	Sprint	2.449	8.789	5.599	1.835
	T-Mobile	11.471	39.898	26.017	8.698
	Verizon	32.111	47.147	42.370	4.387
	AT&T	24.702	33.090	30.725	2.164
Weighted Average Shares Outstanding (Basic)	Sprint	2,999.000	3,970.000	3,591.000	453.810
	T-Mobile	535.000	816.586	706.407	121.535
	Verizon	2,842.000	4,172.000	3,444.500	607.473
	AT&T	5,196.000	6,181.000	5,500.500	323.302
Operating Revenue	Sprint	7,749.000	9,142.000	8,588.875	412.591
	T-Mobile	4,677.000	8,247.000	6,609.750	1,289.783
	Verizon	28,242.000	34,254.000	30,943.438	1,696.559
	AT&T	31,247.000	42,119.000	33,092.125	2,941.859
Net Income	Sprint	(2,379.000)	23.000	(827.500)	607.367
	T-Mobile	(7,735.000)	391.000	(392.563)	1,902.254
	Verizon	(2,148.000)	7,916.000	4,027.188	2,496.487
	AT&T	3,059.000	4,086.000	3,605.500	306.801
Retained Earnings	Sprint	(47,056.000)	(849.000)	(18,953.000)	19,618.359
	T-Mobile	(23,239.000)	(15,380.000)	(21,956.875)	2,464.082
	Verizon	(3,734.000)	11,246.000	2,783.563	4,137.637
	AT&T	23,787.000	34,758.000	30,242.313	3,473.396
Spectrum License Value	Sprint	20,131.000	36,043.000	30,066.750	7,532.714
	T-Mobile	12,818.000	24,272.000	18,998.938	3,971.444
	Verizon	72,713.000	86,575.000	77,449.938	4,503.058
	AT&T	50,396.000	93,093.000	62,386.688	14,843.747
Debt to Equity Ratio	Sprint	2.320	9.110	3.809	1.937
	T-Mobile	1.490	4.500	2.763	0.761
	Verizon	1.490	20.920	8.489	7.124
	AT&T	1.560	2.730	2.106	0.312
Market Share	Sprint	0.160	0.180	0.164	0.006
	T-Mobile	0.100	0.160	0.135	0.022
	Verizon	0.310	0.350	0.335	0.011
	AT&T	0.320	0.340	0.333	0.009
Dividend Payment	Sprint	-	-	-	-
	T-Mobile	-	4.060	0.254	0.983
	Verizon	0.500	0.565	0.532	0.020
	AT&T	0.440	0.480	0.458	0.012
Expected Return	Sprint	(0.279)	0.001	(0.072)	0.072
	T-Mobile	(0.629)	0.027	(0.033)	0.154
	Verizon	(0.136)	0.368	0.140	0.147
	AT&T	0.029	0.044	0.038	0.004

A.3 Multicollinearity

	Common Stock Price	WASOB	S&P 500 Value	GDP Growth	Investor Sentiment	Operating Revenue	Operating Revenue (Lag 1)	Operating Revenue (Lag 2)	Net Income	Net Income (Lag 1)	Net Income (Lag 2)	Spectrum License Value	Spectrum License Value (Lag 1)	Spectrum License Value (Lag 2)	Retained Earnings	Retained Earnings (Lag 1)	Retained Earnings (Lag 2)	Debt to Equity Ratio	Debt to Equity Ratio (Lag 1)	Debt to Equity Ratio (Lag 2)	Dividend Payment	Dividend Payment (Lag 1)	Dividend Payment (Lag 2)	Market Share	Expected Return	US Discount Rate
Common Stock Price	1																									
WASOB	0.1	1																								
S&P 500 Value	0.2	0.1	1																							
GDP Growth	0.1	0	0.3	1																						
Investor Sentiment	-0.1	-0	-0.1	0.1	1																					
Operating Revenue	0.7	0.7	0	0	-0	1																				
Operating Revenue (Lag 1)	0.7	0.7	0.1	-0	-0	1	1																			
Operating Revenue (Lag 2)	0.7	0.7	0.1	0	-0	0.9	1	1																		
Net Income	0.7	0.5	0	0.1	-0	0.8	0.8	0.7	1																	
Net Income (Lag 1)	0.6	0.5	0	0.1	-0.1	0.8	0.8	0.8	0.6	1																
Net Income (Lag 2)	0.6	0.5	0.1	0	0.1	0.8	0.8	0.8	0.6	0.6	1															
Spectrum License Value	0.7	0.6	0.2	0	-0.1	0.9	0.9	0.8	0.7	0.7	0.7	1														
Spectrum License Value (Lag 1)	0.6	0.6	0.2	0	-0.1	0.9	0.9	0.9	0.7	0.7	0.7	0.9	1													
Spectrum License Value (Lag 2)	0.6	0.6	0.1	0	-0.1	0.9	0.9	0.9	0.7	0.7	0.7	0.9	0.9	1												
Retained Earnings	0.4	0.8	0.1	0.1	-0	0.8	0.8	0.8	0.6	0.6	0.6	0.7	0.7	0.7	1											
Retained Earnings (Lag 1)	0.4	0.8	0.2	0	-0	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.9	1										
Retained Earnings (Lag 2)	0.4	0.7	0.2	0	-0	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.9	1									
Debt to Equity Ratio	0.4	0.1	0.3	-0	-0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	-0.1	-0.1	-0	1								
Debt to Equity Ratio (Lag 1)	0.3	0.2	0.3	0.1	-0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0	-0.1	-0	0.8	1							
Debt to Equity Ratio (Lag 2)	0.2	0.2	0.1	0.1	-0.1	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.4	0.1	0	-0	0.7	0.8	1						
Dividend Payment	0.3	0.1	-0.1	-0.1	-0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1					
Dividend Payment (Lag 1)	0.3	0.1	-0	0.1	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	1				
Dividend Payment (Lag 2)	0.3	0.1	0	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1			
Market Share	0.7	0.7	0	0	-0	1	1	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.2	0.2	0.2	0.3	0.3	0.3	1		
Expected Return	0.6	0.3	0.3	0.2	-0.1	0.5	0.5	0.5	0.7	0.4	0.4	0.6	0.5	0.5	0.4	0.3	0.3	0.5	0.5	0.4	0.2	0.2	0.2	0.5	1	
US Discount Rate	0.1	0.1	0.3	-0.2	-0.2	0.1	0.1	0	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	-0	-0	-0	0	0.1	1

Works Cited

Ahern, K. R., & Sosyura, D. (2014). Who writes the news? corporate press releases during merger negotiations. *The Journal of Finance, 69*(1), 241-291. doi:10.1111/jofi.12109

Ahern, K. R., & Sosyura, D. (2015). Rumor has it: Sensationalism in financial media. *Review of Financial Studies, 28*(7), 2050-2093.

Alayemi, S. A. (2013). Relationship between dividend payout and market price of shares (a case study of selected companies in food and beverages companies in Nigeria). *Indian Journal of Commerce and Management Studies, 4*(1), 116.

Al-Hasan, A., Asaduzzaman, & Karim, R. (2013). The effect of dividend policy on share price: An evaluative study. *Journal of Economics and Finance, 1*(4), 6-11. doi:10.9790/5933-0140611

Ang, J., Lauterbach, B., & Vu, J. (2003). Efficient labor and capital markets: Evidence from CEO appointments. *Financial Management, 32*(2), 27-52. doi:10.2307/3666335

Artikis, P. G., & Nifora, G. (2012). Capital structure, macroeconomic variables & stock returns. Evidence from Greece. *International Advances in Economic Research, 18*(1), 87-101. doi:10.1007/s11294-011-9334-z

Asquith, P., & Mullins, D. W. (1986). Equity issues and offering dilution. *Journal of Financial Economics, 15*(1-2), 61-89, doi: 10.1016/0304-405X(86)90050-4

Barclay, M. J., & Litzenberger, R. H. (1988). Announcement effects of new equity issues and the use of intraday price data. *Journal of Financial Economics, 21*(1), 71-99.

Berger, P. D., Bolton, R. N., Bowman, D., Briggs, E., Kumar, V., Parasuraman, A., & Terry, C. (2002). Marketing actions and the value of customer assets: A framework for customer asset management. *Journal of Service Research, 5*(1), 39-54. doi:10.1177/1094670502005001005

Bhana, N. (2003). The share price reaction to announcements of key executive dismissals by companies listed on the JSE Securities Exchange. *Investment Analysts Journal, 32*(58), 29-40. **doi:**10.1080/10293523.2003.11082451

Bonnier, K., & Bruner, R. F. (1989). An analysis of stock price reaction to management change in distressed firms. *Journal of Accounting and Economics, 11*(1), 95-106.

Burton, B. M., Lonie, A. A., & Power, D. M. (1999). The stock market reaction to investment announcements: The case of individual capital expenditure projects. *Journal of Business Finance & Accounting, 26*(5-6), 681-708. doi:10.1111/1468-5957.00271

Chan, S. H., Gau, G. W., & Wang, K. (1995). Stock market reaction to capital investment decisions: Evidence from business relocations. *Journal of Financial and Quantitative Analysis, 30*(1), 81-100. doi:10.2307/2331254

Charitou, M., Patis, A., & Vlittis, A. (2010). The market reaction to the appointment of an outside CEO: An empirical investigation. *Journal of Economics and International Finance, 2*(11), 272.

Chung, K. H., Wright, P., & Charoenwong, C. (1998). Investment opportunities and market reaction to capital expenditure decisions. *Journal of Banking and Finance, 22*(1), 41-60. doi:10.1016/S0378-4266(97)00021-6

Dann, L. Y., & Mikkelson, W. H. (1984). Convertible debt issuance, capital structure change and financing-related information: Some new evidence. *Journal of Financial Economics, 13*(2), 157-186.

Dawar, V. (2013). Dividends, debt and investment: Impact on stock prices—Evidence from India. *Asia Pacific Journal of Management Research and Innovation, 9*(4), 389-397.

Eckbo, B. E. (1986). Valuation effects of corporate debt offerings. *Journal of Financial Economics, 15*(1-2), 119-151.

Eiteman, D. K., Stonehill, A. I., & Moffett, M. H. (2012). *Multinational business finance* (13th ed.). Upper Saddle River, NJ: Prentice Hall.

Foster, G., Olsen, C., & Shevlin, T.. (1984). Earnings releases, anomalies, and the behavior of security returns. *The Accounting Review, 59*(4), 574-603.

Gao, Y., & Oler, D. (2012). Rumors and pre-announcement trading: Why sell target stocks before acquisition announcements? *Review of Quantitative Finance and Accounting, 39*(4), 485-508. doi:10.1007/s11156-011-0262-z

Hansen, R. S., & Crutchley, C. (1990). Corporate Earnings and Financings: An Empirical Analysis. *The Journal of Business*, *63*(3), 347–371.

Hull, R. M. (1999). Leverage ratios, industry norms, and stock price reaction: An empirical investigation of stock-for-debt transactions. *Financial Management, 28*(2), 32-45. doi:10.2307/3666193

Kumar, V., & Shah, D. (2009). Expanding the role of marketing: From customer equity to market capitalization. *Journal of Marketing, 73*(6), 119-136.

Lassoued N., Attia M.B.R. (2013). The market effects of CEO turnover: The case of post-revolution Tunisia. *Global Review of Accounting and Finance, 4*(1), 85-103.

Li, J. (2012). *The relationship between the announcements of CEO changes and stock prices*. Unpublished master's thesis, Saint Mary's University, San Antonio, Texas.

Lubatkin, M. H., Chung, K. H., Rogers, R. C., & Owers, J. E. (1989). Stockholder reactions to CEO changes in large corporations. *The Academy of Management Journal, 32*(1), 47-68.

Masulis, R. W. (1983). The impact of capital structure change on firm value: some estimates. *The Journal of Finance, 38*(1), 107-126.

May, R. G.. (1971). The influence of quarterly earnings announcements on investor decisions as reflected in common stock price changes. *Journal of Accounting Research*, *9*, 119–163.

McConnell, J. J., & Muscarella, C. J. (1985). Corporate capital expenditure decisions and the market value of the firm. *Journal of Financial Economics,14*(3), 399-422.

McGuigan, J.R., Moyer, R. C., & Harris, E. H. (1999). *Managerial economic: Applications, strategy, and tactics* (8th ed.). Cincinnati, OH: South-Western College Publishing.

Mikkelson, W. H., & Partch, M. M. (1986). Valuation effects of security offerings and the issuance process. *Journal of Financial Economics, 15*(1-2), 31-60.

Moghaddam, A. G., Kashkoueyeh, M. S., Talezadeh, M., Aala, M., Ebrahimpour, M., & Tehranypour, M. (2015). The impact of capital structure on corporate performance. *International Journal of Academic Research in Business and Social Sciences,5*(3), 148. doi:10.6007/IJARBSS/v5-i3/1535

Murphy, J. E. (1968). Effect of leverage on profitability, growth and market valuation of common stock. *Financial Analysts Journal, 24*(4), 121-123.

Nthoesane, M. G., & Kruger, J. W. (2014). Market reaction to chief executive officers (CEOs) appointments on Johannesburg securities exchange (JSE): Stock price and volume approach. *Journal of Economics and International Finance, 6*(5), 91. doi:10.5897/JEIF2014.0569

Pastor, L., & Veronesi, P. (2009). Technological revolutions and stock prices. *The American Economic Review, 99*(4), 1451-1483. doi:10.1257/aer.99.4.1451

Pilotte, E.. (1992). Growth opportunities and the stock price response to new financing. *The Journal of Business*, *65*(3), 371–394.

Qabajeh, M. A. A., Hameedat, M. M., Shanti, A. M. A., & Damash, F. N.. (2012). The effect of interim financial reports announcement on stock returns: empirical study of Jordanian industrial companies. *Interdisciplinary Journal of Contemporary Research In Business, 3*(11), 637-645.

Srivastava, R. K., Shervani, T. A., & Fahey, L. (1998). Market-based assets and shareholder value: A framework for analysis. *Journal of Marketing, 62*(1), 2-18.

Truong, B., & Tran, D. T. (2014). The price momentum and discounting effects on stock prices after earnings announcements: An empirical analysis. *Applied Economics Letters*, 21(6), 417-420, doi: 10.1080/13504851.2013.864024

Urooj, S. F., Zafar, N., & Khattak, M. A. (n.d.). *Impact of CEO succession on stock returns.* (Unpublished doctoral dissertation). Mohammad Ali Jinnah University, Islamabad.

Van Doorn, M. (2011). *Market reaction to CEO and CFO succession announcements for public companies in the Netherlands*. Unpublished master's thesis, Tilburg University, Tilburg, Netherlands.

Yermack, D. (2006). Board members and company value. *Financial Markets and Portfolio Management, 20*(1), 33. doi:10.1007/s11408-006-0003-9

Yilmaz, M. K., & Gulay, G. (2006). Dividend policies and price-volume reactions to cash dividends on the stock market: Evidence from the Istanbul stock exchange. *Emerging Markets Finance & Trade, 42*(4), 19-49. doi:10.2753/REE1540-496X420402

Zhang, Y., & Wiersema, M. F. (2009). Stock market reaction to CEO certification: The signaling role of CEO background. *Strategic Management Journal, 30*(7), 693-710. doi:10.1002/smj.772

About the Author

Brittany Marie Boben was an Economics major and Psychology and Communication double minor at Allegheny College where she was a member of the collegiate cheerleading squad for four years. She grew up in Evans City, Pennsylvania and attended high school at Vincentian Academy. Brittany was a transfer student from Case Western Reserve University and studied Biology at Allegheny College on the pre-med track until she reluctantly took an Economics course at the request of her father and fell in love, eventually changing her major to Economics at the end of her sophomore year. Brittany has a strong passion for music and enjoys playing the guitar and singing in her spare time. Upon graduation, Brittany plans to enjoy the summer and study for the GMAT prior starting work in August 2015 as a Business Analyst for Deloitte Consulting in Cleveland, Ohio. She plans on attending business school in a few years before returning to Deloitte with the ultimate goal of becoming the CFO of a publicly traded company.

