THE INDEX EFFECT: ABNORMAL RETURNS FOLLOWING AN ADDITION TO THE
S&P 500

A THESIS

Presented to

The Faculty and Department of Economics and Business

The Colorado College

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Arts

By

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December 2017
THE INDEX EFFECT: ABNORMAL RETURNS FOLLOWING AN ADDITION TO THE S&P 500

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December 2017
Economics and Business

Abstract

Using additions to the S&P 500 between 2000 and 2003, I explore the price and volume effects that the securities face on their respective addition announcement day. Attempts to identify price pressures surrounding an addition to the S&P 500 by focusing on opening and closing stock/index prices and trading volumes. The results are more consistent with the efficient market hypothesis than the price pressure hypothesis. Observed are large increases in trading activity leading to a shift in demand for the added security. However, positive abnormal returns are not concluded from this study.

KEYWORDS: Finance, Stock Markets, Securities, Index

JEL CODES: D4, D53, G12, G17, G30
ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED UNAUTHORIZED AID ON THIS THESIS

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Erte Houska

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1. Introduction

The S&P 500 index consists of 500 large cap stocks and is the most prominent index in capital markets. The Index includes 500 leading companies which are selected by Standard and Poor’s, a subsidiary of The McGraw-Hill Companies Inc. Over $5.5 trillion is benchmarked to the S&P 500 and the index captures approximately 80% of market capitalization of public companies. Previous studies have shown that a simple change in the constituents of the index is widely associated with abnormal returns in the added or deleted firm’s stock price. This expected change is due to the trading of portfolio managers or normal investors trying to capture the yield. The S&P U.S. Index Committee states in their index methodology\(^1\), that the change to the index does not indicate a change in fundamentals of the firm and does not imply investment advice on their part. Prior to October 1989 the S&P U.S. Indexes Committee made changes without making announcements. In this study, I attempt to answer the question: Does the announcement date alone have an effect on trading volume and stock price of the added company? This study extends our knowledge in the field of indexing but may also lead to investors better navigating changes to the S&P 500.

The remainder of the paper is organized as follows: Section 2 discusses previous literature and studies of the kind. Section 3 examines the relevant theory. Section 4 describes the data and methodology used in the study. Finally, Section 5 presents the results of the study and Section 6 offers a conclusion and recommendations based on the analysis of the previous sections.

\(^{1}\) S&P index methodology available at http://www.standardandpoors.com
2. Literature Review

The S&P 500 is widely regarded as the most accurate gauge of the performance of large-cap American equities (Lynch and Mendenhall, 1997). Changes in index composition are mainly caused by member companies effectively ceasing to exist in their current form through mergers, takeovers, restructuring or bankruptcies. These changes are typically announced one to five days before the stocks are either added or dropped from the list. All of the stocks in the index trade on the two largest U.S. stock markets, the New York Stock Exchange and the Nasdaq. The Index Committee does not usually reveal the specific reasons when it adds or drops a company. The guidelines require that companies in the index be industry leaders, widely held, representative of a variety of industries, liquid\(^2\) and fundamentally sound. Less than one-fifth of the original components of the S&P 500 Index (instituted on March 4, 1957) continue to be members of the index today (Hrazdil, 2007). Each year about 20 to 25 stocks leave the S&P 500 and are replaced with other stocks that meet the guidelines for index membership (Blitzer, 2015). In 2017, Urban Outfitters, Frontier and First Solar were replaced by chip company Advanced Micro Devices, Raymond James Financial and Alexandria Real Estate Equities.

To be considered for inclusion in the S&P 500, a firm needs to meet certain criteria. Some of the criteria include share price, level of liquidity, level of market capitalization and earnings (Allen and Thompson, 1991). Changes to index constituents are usually announced one to five days in advance (Standard and Poor’s, 2017). Announcements for S&P 500 additions are made after the markets close, and the stock price predictably varies sharply in after-hours trading in response to the announcement. Since the index committee attempts to minimize unnecessary

\(^2\) The degree to which an asset or security can be quickly bought or sold in the market without affecting the asset's price
turnover in index membership, existing companies do not have to maintain these conditions to remain in the index. However, companies that substantially violate one or more of these criteria are removed from the index and replaced by a new company.

Currently, the S&P 500 has become a preferred index and benchmark for U.S. stocks, dethroning the Dow Jones Industrial Average (DJIA). This is due to the S&P 500 being composed of 500 North American stocks, while the DJIA is comprised of just 30 North American stocks. The S&P 500 uses a market cap methodology, giving a higher weighting to larger companies (based on market cap.), whereas the DJIA uses a price weighting methodology which gives more expensive stocks a higher weight (Standard and Poor’s, 2017). As of October 2017, Apple, Microsoft, Amazon, Facebook (Class A), and Johnson & Johnson have the five largest market capitalizations in the S&P 500. Lennar Corporation (Class B) has the lowest market cap in the S&P 500 sitting at $13.68 billion. Many index funds and exchange-traded funds³ track the performance of the S&P 500 by holding the same stocks as the index, in the same proportions, and thus attempt to match its performance (before fees and expenses). The difficulty investors face is exactly replicating the composition of the S&P 500 in their own personal portfolio. This is because a portfolio needs stocks of 500 companies in specific quantities to replicate the index’s market cap methodology. Most investors often buy one of the S&P 500 investment products such as the Vanguard S&P 500 ETF, the SPDR S&P 500 ETF or iShares S&P 500 Index ETF. The reason investors strive to replicate the composition of the S&P 500 is that in the past year, mainly since President Donald Trump’s election, the S&P 500 has consistently beaten its daily records. As the S&P 500 climbs to record highs, investors are

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³ ETF: a marketable security that tracks an index, a commodity, bonds, or a basket of assets like an index fund.
eagerly trying to put together a portfolio of the companies to match the S&P 500 returns. Their main goal is to stay away from the fees and expenses of actively managed index funds. Changes in composition of indexes have developed a phenomenon which is referred to as the “index effect”.

The “index effect” describes the change in stock price that is observed when a stock is added to or deleted from an index. The more money that is tied to the index, the more index portfolio managers will be involved in trading the underlying stocks around index re-composition (Bajkowski, 2009). Indexing has become an increasingly popular way of investing in equities over the past 20 years. This is due to the rising fees of actively managed funds as well as increasing returns indexes such as the S&P 500 have provided. It is estimated that more than 10% of the U.S. stock market is held in index funds (Quinn and Wang, 2003). Stocks that are added to the S&P 500 index have in the past exhibited significant positive abnormal returns immediately after the announcement and continued to earn abnormal returns through the effective date of the index change as shown by Quinn and Wang (2003), Beneish and Whaley (1997), and Harris and Gurel (1986). Abnormal returns are the returns generated by a given security over a period of time that is different from the market rate of return. When a change is announced, investors typically purchase shares in the soon to be added company before the S&P adds the company to its index. Beneish and Whaley (1996) refer to this as the “S&P Game.” It is very common that speculators purchase an addition to the S&P while selling the deletion. This action indicates trust that the S&P did extensive research on the future performance of the stocks’ earnings. However, the Efficient Market Hypothesis (EMH), states that all information about a company is already reflected in the stock price. Cragg and Malkiel (1982) produced a study based on how securities are priced and how the EMH affects them. They found that the
valuation depends on the projection of long-term cash flows as well as dividends and that information about the company is reflected in the stock price.

Efficient market theory suggests that the market prices of added securities should not have changed because the addition would have no effect on their expected future returns (Goetzmann and Garry, 1986). Denis et al. (2003) examined additions to the S&P 500 index and provided evidence of improved performance by these firms; meaning the added stock exhibited positive returns and contained a high growth rate, thus hinting at the EMH being false. This evidence supports the information hypothesis of the price pressure to index additions. Hrazdil (2009, 2010) also examines S&P 500 index additions and provides further evidence in support of the price pressure hypothesis. This hypothesis is defined as the change in stock price when large quantities of a security are traded.

The aforementioned literature has shown that this upward price swing results in a positive abnormal return for stocks when they are first added to the S&P 500. The previous authors have examined the degree to which the S&P effect still exists. Nearly all of the price change for a newly added stock occurs prior to the opening of the market on the day immediately following the announcement. Afterward, the authors observe that the prices of newly added stocks actually tend to drift downward following the announcement date (Kim et al, 2017).

However, it is also possible that no abnormal results will be observed. This is possible due to the inability to correctly “time the market”. Critics of market timing contend that it is nearly impossible to time the market successfully compared to staying fully invested over the same period. This basic rejection of timing has also been confirmed by various studies reported in the *Financial Analyst Journal, Journal of Financial Research* and other respectable sources. Attempting to use the information of an addition to effectively add to ones’ portfolio is a risky
move. As shown later in this paper, additions to the S&P 500 do not always carry abnormal returns, so accurately trying to buy an equity before it is added to the index could backfire. Investors have become aware of this timing game and have changed some of their investment strategies. One safe solution to this polarized dilemma is simply to abandon timing altogether and put your money in a tracker (ETF), which goes up and down with the market. Similarly, most investment funds do more less the same thing. If you leave your money in such funds for long enough, you should do fairly well, given that equity markets generally rise over the long run. Market timing tends to have a bad reputation and some evidence suggests that it does not beat the buy-and-hold strategy over time. However, the investment process should always be an active one and investors should not misinterpret the negative research and opinions on market timing as implying that you can just put your money into an acceptable mix of assets. Furthermore, intuition, common sense and a bit of luck may make timing work for these investors, at least on some occasions. It is crucial to be aware of the dangers, the statistics and the experiences of all those who have tried and failed.

Similarly, recent research from Dalbar Inc. found that the average investor earned a 5.19 percent return while the S&P 500 provided a 9.85 percent return over the same period. Investors underperform compared to the market thanks to emotional investing behavior, like buying when a stock price is high and overreacting to bad news. This concept can be directly applied to the new information of a stock being added to the S&P 500. The normal active investor might see this news and immediately equate it with an increase in yield, while there are often times more to the information. For example, if an investor expects the market to move up on economic news next week (such as additions to the S&P 500), that investor might want to buy a broad market index fund, an industry focused ETF, or single stocks that he or she expects to go up, leading to a
profit. Similarly, an investor can buy options, short positions, or take advantage of other investor tools to capture profits from market movements. There are countless ways that investors can actively attempt to time the market, although there is no entirely accurate way to do so. By comparing these investment techniques to the addition of a stock to the S&P 500, we can see why there would be a massive increase in volume of shares traded. The speculation and investor eagerness to capture yields makes these addition announcements a great time to attempt to increase a portfolio. On the contrary, no one is firmly able to predict what happens in the markets, so it is seemingly fool’s gold to buy a stock simply on the information of an addition. In this day and age, the S&P 500 returns commonly outperform individual’s portfolios (Malic, n.d.). This leads investors to associate tremendous positive returns with a stock that is in the S&P 500. Through the next sections of my paper, I will aim to confirm my hypothesis of large trading activity increases as well as potentially see if there are abnormal returns for the stocks added.

This study examines the impact of potential overnight price adjustment after the announcement of an S&P 500 index addition, as well as the impact on the trading volume of the stocks. The abnormal returns surrounding an announcement can allow any investor to profit if they purchase the added stock. Focusing on the stock price of the company on the day of the addition and the day immediately following will aim to prove if there really is an index effect. Event studies are conducted on the (roughly 150-200) additions to the S&P 500 during 2000-2003. A simple addition to the S&P 500 with no corresponding deletion, as well as restructurings, bankruptcies, or mergers, will not be examined. This study extends our knowledge in the field of indexing and also raises questions that will hopefully lead to changes for the market to become more efficient.
3. Theory

The Efficient Market Hypothesis (EMH) states that all public information is reflected in the securities price. The EMH is at the root of this study as the announcements of additions to the S&P 500 is reflected in each company’s stock price. An important point made by Philip A. Cusic (2001) was that abnormal returns, surrounding the announcement and change dates of additions to the S&P 500, violate the assumptions of market efficiency. Over the years, the abnormal returns have been decreasing, however, they still exist and violate the EMH. This study aims to find a cause for these abnormal returns. Based off of past literature, there are four accepted hypotheses used to explain the increase in stock price surrounding an addition to the index. They are downward sloping demand curve, information, liquidity, and price-pressure hypotheses.

The price-pressure hypothesis says that the price movement caused by an index change is due to heavy trading by index funds, which temporarily moves stock prices away from equilibrium. There are many past studies showing that additions to the S&P 500 index are associated with a positive abnormal price reaction. Previous research offers three explanations: 1) a permanent price increase associated with a permanent shift in the demand for the stock, 2) a permanent price increase associated with improved liquidity, and 3) a temporary price increase associated with the market’s inability to immediately absorb the large demand shock from rebalancing index funds. Wurgler and Zhuravskaya (2002) examine pre-1989 additions, when there was no difference in the announcement and listing day, to find whether yield was able to be captured from the price impact of additions. Erwin and Miller (1998), using the spread as a measure, find a liquidity improvement for stocks added to the S&P 500.

Lynch and Mendenhall (2001) studied the reaction to stocks added and developed the downward sloping demand curve hypothesis. As firms are added to the S&P 500, index funds
buy the stock and remove a fraction of the firm’s shares from circulation. Due to this nature, trading volume tends to increase when Standard and Poor’s announces a new addition to the S&P 500 list. This index fund demand reduces the stock’s supply in the market, which causes the price to increase. This hypothesis is shown below in Figure 1.

Chen et al. also explain the liquidity and information hypotheses. The liquidity hypothesis says that an added stock’s trading volume (liquidity) increases around the change date (Chen et. al, 2004). An increase in liquidity boosts the attention the stock receives, which leads to further investment in the stock. The information hypothesis says that price movements of changed stocks are due to S&P’s knowledge of non-public information. This information that S&P obtains must be reflected in the change of stock price for an addition. For example, if the S&P found out that Apple was about to release the cheapest iPhone ever, they would likely know that Apple’s stock price would rise, so the S&P would announce the addition before the expected stock price increase. Sui (2003) explains that if there is a price reversal after the addition, there is clearly evidence of the price-pressure hypothesis. The price reversal shows that the trading done by index funds prior to the addition slows down after the addition and the stock price moves closer to its previous level. Another argument Sui (2003) makes is if there is no price reversal, meaning a permanent change in price, this is evidence of the downward sloping demand curve hypothesis. The inability of the market to absorb a sudden demand shock should be found in an
immediate price reaction that dissipates over the following days. This temporary price pressure is consistent with index funds rebalancing their portfolios to incorporate the new additions to the S&P 500.

Improved liquidity\(^4\) may also result in a positive price effect (Amihud and Mendelson, 1986). Using the spread\(^5\) as a measure, they found a liquidity improvement for stocks added to the S&P 500. In fact, it was found to be more applicable for stocks that do not have listed options\(^6\). A study by Gosnell and Krehbei (2000) also finds support for improved liquidity surrounding announcement dates. They argue that we would expect liquidity to decline following an addition because a majority is bought by index funds on the day of the announcement.

The Capital Asset Pricing Model (CAPM), developed in the early 1960’s, is a model that predicts the relationship between the risk and equilibrium required for returns on assets. The CAPM is built on the theory that the appropriate risk premium on an asset will be determined by its contribution to the risk of an investor’s overall portfolio. That is, if an investor holds a large portfolio of stocks, some of the stocks in the portfolio will go up in value because of positive company-specific events, such as an addition to the S&P 500. On the other hand, some stocks will go down in value because of similar negative events. This concept of asset allocation helps diversify an investor’s portfolio, with the goal of offsetting any negative events with the positive ones. However, not all risk can be diversified away using this portfolio strategy. For example, speculation over interest rates and inflation affect nearly all stock values to some degree. The specific measure used in CAPM to determine the level of risk for different investments is called

\(^4\) The degree to which an asset or security can be quickly bought or sold in the market.
\(^5\) Difference between the bid and ask price of an asset or security.
\(^6\) A financial derivative that represents a contract that offers the buyer the right, but not obligation, to buy or sell a security at an agreed-upon price.
the beta coefficient, or beta. A beta measures the amount of systematic risk a stock has relative to an average stock in the market (e.g. the S&P 500). This model helps both investors and portfolio managers make asset allocation decisions, as it compares the risk of individual investments.

Harris and Gurel (1986), looked at NYSE-listed stocks that were added to the S&P 500 and found an immediate price increase of 3% associated with the announcement date. Much of this price change dissipated over the following days. Beneish and Whaley (1996) find that the average abnormal returns from the announcement day until the close of the effective day, exhibit a 4.38 percent increase. They also find a 2.2% price reversal in the days following an index addition, which they attributed to the price pressure hypothesis. They interpreted these results as evidence of temporary price pressure for stocks. Beneish and Whaley (1996) find a 2.2% reversal in the days following an addition, which they credit to price pressure due to index funds and arbitrage.

In this study, I will focus on the temporary effects of the price pressure hypothesis and the efficient market hypothesis. I am unable to collect enough data to focus on whether the information and liquidity hypothesis explains abnormal returns. Using opening and closing stock prices of additions from 2000-2003, I predict that there will be a significant increase in trading volume of the added stock compared to the average volume two weeks prior. By examining the stock price on the day of the announcement as well as the following day, I am able to isolate price pressure effects from other hypotheses. If the price pressure theory explains the abnormal returns, I expect to observe the price of an addition increase on the day of the change. Since changes in the composition of the S&P 500 index cause demands to shift, and since it is unlikely that the addition announcements convey new information to the market about future returns, a
study of their effects on prices and volume may identify price pressures surrounding the announcement date.

4. Data and Methods

For the purpose of this study, I examine 110 additions to the S&P 500 list during the 2000-2003 time period. These additions were pulled from the Standard & Poor’s Announcement website. Since some of the additions were new companies replacing old companies, mergers or tender offers, attention is focused on 110 companies added to the S&P 500. I obtained opening and closing stock prices as well as daily volume for all added securities and the S&P 500 on the day of the announcement and the day following, via MergentOnline and Yahoo Finance. Using the opening and closing prices of the security and market (S&P 500), I calculated the stock return. This will allow for a comparison between the stocks return on the announcement date and the market (S&P 500) return, which is the calculation for abnormal returns. In order to measure the change in trading volume, the average stock and S&P 500 volumes were collected for two weeks (10 open market days) prior to the announcement. By comparing the two-week average volume of both the stock and S&P 500 with announcement day volumes, I am able to examine the volume pressure that surrounds an addition announcement.

The price pressure hypothesis is best measured when examining an overnight change, so the exact day that Standard and Poor’s announced the addition must be known. On September 22, 1976, S&P began a notification service which announced changes in the S&P 500 index to

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7 This site contains every addition and deletion in the index’s history
8 On 12/13/2000, Aetna. Inc., a healthcare company, replaced itself in the S&P 500 due to a corporate restructuring. This event could not be examined as the company was previously in the S&P 500.
subscribers, after the close of trading. To study the index effect and to determine if the price pressure hypothesis holds true, I use the first public announcement date. A limitation of this data is that the stock prices are only studied over a two-day span, rather than a larger time period. Previous studies have looked at an extended time period to discover long term price pressure effects. Another limitation to this study is that by using the period 2000-2003, there is some volatility due to the “Dot Com” bubble, although direct implications do not appear evident.

I will be splitting the 110 observations into eight industries based off of the company that was being added to the index. The industries include: Communications, Energy, Financial Services, Healthcare, Pharmaceutical, Products, Real Estate and Technology. These categories are derived from Yahoo Finance, where the site assigns an industry to each company in the stock market. Since there were very few retail companies added from 2000-2003, I coupled them into the Products sector. The Technology industry contains the largest number of additions with 36, with most of the additions being semiconductor, electronics, or software companies. There are also six real estate companies added, which shows the markets adaptation to new and potentially alternative companies that may have led to the 2008 Financial Crisis. When looking at the results by industry, I aim to discover if abnormal returns are favorable to one sector specifically.

4.1 Empirical Methodology

The model to be tested aims to check that there is a mean abnormal positive return for additions to the S&P 500 index. This mean is found for each addition by comparing the daily percent return of the added company, with the daily percent return of the S&P 500 (the market).

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9 The worst economic disaster since the Great Depression of 1929. Began with a crisis in the subprime mortgage market in the US and developed into a full-blown international banking crisis with the collapse of several investment banks.
This model allows us to see whether added companies exhibit abnormal returns on the day of the announcement and the day immediately following. To find the mean abnormal return for each stock, I first find the return of the stock on the day of the announcement. Abnormal return for a specific day is simply the return of a stock minus the return of the market (S&P 500) on that day. This model is pulled from a previous study by James Malic (n.d) in which he examined market reactions by industry to changes in the S&P 500 index.

\[
AR = SR - MR
\]

(1)

In this model, SR is the stock’s return on the day of the announcement, and MR is the market’s return on the day of the announcement. This will yield the abnormal returns for each company’s stock on the day of the addition to the index. Next, I use a similar model to calculate the abnormal returns for the day immediately following the announcement day. This will prove to be useful in evaluating the accuracy of both the price pressure hypothesis and EMH.

\[
AR_{+1} = SR_{+1} - MR_{+1}
\]

(2)

In this model, \(SR_{+1}\) is the stock’s return 1 day after the announcement day, and \(MR_{+1}\) is the market’s return (S&P 500) 1 day following the announcement of the addition.

Assuming the price pressure hypothesis holds, I expect there to be positive abnormal returns on the day of the announcement. A standard Z-test will be used to compare the mean abnormal returns of the added stock to the mean abnormal returns of the market (S&P 500). The corresponding sign of the z-statistic indicates whether the abnormal returns are positive or negative.

To determine whether trading activity increases after a stock is added to the S&P 500 list, trading volumes, adjusted for market volume, are analyzed. This model, originally used by
Harris and Gurel (1986), incorporates the ratio of the market volume in addition to the ratio of the individual security volume. Cross-sectional means are computed as follows:

\[
MVR_t = \frac{1}{N} \sum_i VR_{it}
\]

where

\[
VR_{it} = \frac{V_{it}}{V_{mt}} \times \frac{V_m}{V_i}
\]

In this example, \(V_{it}\) and \(V_{mt}\) are the trading volumes of the security \(i\) and the market (S&P 500) during the announcement day \(t\), respectively, and \(V_i\) and \(V_m\) are the volumes of the security and the market in the 2 weeks preceding the announcement. The volume ratio, \(VR_{it}\), is a standardized measure of period \(t\) trading volume in security \(i\). Its expected value is 1 if there is no change in volume during the announcement date relative to the prior 2 weeks. For all additions, I use the total S&P 500 volume as the market volume. A Volume Ratio of unity (1) indicates no abnormal volume, while a Volume Ratio greater than unity represents abnormally high volume. Further studies could incorporate the bid/ask spread in order to determine the increase or decrease of liquidity with respect to an addition to the S&P 500.

I suspect that stocks added will exhibit both abnormal returns as well as abnormal trading volumes. Although being included in the Index does not mean superior investment potential, Standard and Poor’s does in fact screen additions to ensure that the stocks are not facing probable financial issues.

4.2 Summary Statistics

In Table 1, I provide the summary statistics of abnormal returns, which include; the returns on the day of the announcement, the returns the day after the announcement, the MVR (Mean Volume Ratio) for all added stocks, as well as opening and closing stock price. By
focusing on these variables, I aim to gain an understanding of how investors and portfolio managers behave during these announcement time periods. As discussed earlier, I exclude deletions to the S&P 500 list from my data to yield concentrated results on additions. Immunex Corporation, a subsidiary of Amgen, was announced to join the S&P 500 in 2001. The company experienced the largest abnormal returns out of all observations in this study with a 15.5% increase on the announcement day. Symbol Technologies, added in 2000, saw a negative 14% change on its announcement day. The summary statistics given below provide an early insight as to what the results will look like. Table 1 shows summary statistics for the 2000-2003 time period as a whole, regardless of industry.

<table>
<thead>
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<th>VARIABLE</th>
<th>OBS.</th>
<th>MEAN</th>
<th>STD. DEV.</th>
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<th>MAX.</th>
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<td>Open&lt;sub&gt;st&lt;/sub&gt;</td>
<td>110</td>
<td>114.48</td>
<td>723.78</td>
<td>4.66</td>
<td>7,621.8</td>
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<td>763.91</td>
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<tr>
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<td>.519</td>
<td>-.13</td>
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<tr>
<td>MVR</td>
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<tr>
<td>Volume&lt;sub&gt;st&lt;/sub&gt;</td>
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<td>Volume&lt;sub&gt;S(2weeks)&lt;/sub&gt;</td>
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Table 1. Additions to the S&P 500 Summary Statistics 2000-2003
Looking at Table 1 above, a few statistics immediately jump out. The mean volume ratio is 22.666, which is much greater than 1, meaning there is likely an abnormal volume of shares being traded on the day of the announcement. The variable Volume\(_{(\text{2weeks})}\) shows the average volume traded for the stocks over a 2-week span (10 market days) prior to the announcement date. There is a very large standard deviation for opening and closing stock price during the event. This could be attributed to the past success of the stock, or in some cases, if the company recently had an IPO\(^{10}\). It is common for a newly public company to have a lower stock price than more established companies. Turning attention to the possible abnormal returns on the announcement date and the day following, we see a mean return of -.006 and -.0053, respectively.

These results initially differ from my hypothesis as the stocks do not appear to exhibit abnormal returns on the announcement day or the day following. There is little difference between the return of the stock and the return of the market on these respective days. This lack of spread between specified returns starts to point out that I may be unable to reject the null hypothesis. Next, I provide summary statistics for the two highest weighted\(^{11}\) industries in the S&P; financial services and technology.

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\(^{10}\) Avaya Inc. had their IPO (initial public offering) nine days before the announcement of being added to the S&P 500.

\(^{11}\) Historically, the financial services and technology industries have combined for over 30% of all S&P 500 stocks.
### Table 2. Financial Services Industry Summary Statistics 2000-2003

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OBS.</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open&lt;sub&gt;ST&lt;/sub&gt;</td>
<td>20</td>
<td>39.126</td>
<td>17.899</td>
<td>13.06</td>
<td>81.5</td>
</tr>
<tr>
<td>Close&lt;sub&gt;ST&lt;/sub&gt;</td>
<td>20</td>
<td>39.493</td>
<td>18.431</td>
<td>13.63</td>
<td>83</td>
</tr>
<tr>
<td>Return&lt;sub&gt;ST&lt;/sub&gt;</td>
<td>20</td>
<td>.0075</td>
<td>.0456</td>
<td>-.06</td>
<td>.12</td>
</tr>
<tr>
<td>Return&lt;sup&gt;t+1&lt;/sup&gt;</td>
<td>20</td>
<td>.00185</td>
<td>.0214</td>
<td>-.034</td>
<td>.072</td>
</tr>
<tr>
<td>MVR</td>
<td>20</td>
<td>27.744</td>
<td>30.54</td>
<td>6.39</td>
<td>146.15</td>
</tr>
<tr>
<td>Volume&lt;sub&gt;ST&lt;/sub&gt;</td>
<td>20</td>
<td>27,500</td>
<td>21,100</td>
<td>2,472</td>
<td>82,200</td>
</tr>
<tr>
<td>Volume&lt;sub&gt;(2 weeks)&lt;/sub&gt;</td>
<td>20</td>
<td>1,843</td>
<td>1,914</td>
<td>186</td>
<td>6,336</td>
</tr>
</tbody>
</table>

Notes:

i. Volume measurements are in thousands due to large quantity of shares traded.

ii. S&P 500 statistics not listed as the returns and volume traded are the same as in Table 1.

A large MVR value here indicates that on the day of the announcement, trading volume was roughly 27 times larger than the average trading volume over a previous two week (10 open market days) span. The mean opening stock price was $39.126 and closing was $39.493, which shows that on average, Financial Services stocks that were added to the S&P 500 saw an increase in stock price, however small, on the day of the announcement. Below I provide summary statistics similar to Table 2 above, for the Technology industry.
### Table 3. Technology Industry Summary Statistics 2000-2003

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OBS.</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open$_{ST}$</td>
<td>36</td>
<td>268.164</td>
<td>1261.98</td>
<td>6.12</td>
<td>7621.88</td>
</tr>
<tr>
<td>Close$_{ST}$</td>
<td>36</td>
<td>279.203</td>
<td>1332.342</td>
<td>6.27</td>
<td>8043.75</td>
</tr>
<tr>
<td>Return$_{ST}$</td>
<td>36</td>
<td>-.015</td>
<td>.058</td>
<td>-.13</td>
<td>.16</td>
</tr>
<tr>
<td>Return$_{t+1}$</td>
<td>36</td>
<td>-.015</td>
<td>.88</td>
<td>-.388</td>
<td>.135</td>
</tr>
<tr>
<td>MVR</td>
<td>36</td>
<td>12.33</td>
<td>8.58</td>
<td>.87</td>
<td>34.29</td>
</tr>
<tr>
<td>Volume$_{ST}$</td>
<td>36</td>
<td>54,500</td>
<td>84,600</td>
<td>119</td>
<td>502,000</td>
</tr>
<tr>
<td>Volume$(2 \text{ weeks})$</td>
<td>36</td>
<td>8,688</td>
<td>1,7800</td>
<td>48</td>
<td>99,800</td>
</tr>
</tbody>
</table>

Notes:

i. Volume measurements are in thousands due to large quantity of shares traded.

ii. S&P 500 statistics not listed as the returns and volume traded are the same as in Table 1.

With respect to the stocks added to the S&P 500 in the Financial Services and Technology industries, the volume of shares traded on the day of the announcement greatly outweighs the average volume of the security for the two-weeks prior. This tells us that investors and portfolio managers are aware of the announcement and are actively trading on the announcement day in order to maximize yield. In 2017, financial services and technology are the two sectors carrying the most weight in the S&P 500$^{12}$. In the charts below, one can see the historical dominance that both the financial and technology industries have exhibited in the S&P 500.

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$^{12}$ In June of 2017, 14.5% of the S&P 500 was made up of financial services companies, while 22.25% was technology stocks.
Chart 1. Financial Service Industry percentage of all S&P 500 stocks

Chart 2. Technology Industry percentage of all S&P 500 stocks.

Since the data examined in this study focuses on the 2000-2003 time period, understanding the makeup of the S&P 500 at that time is crucial. With the Dot Com bubble having just burst, technology stocks started dropping out of the S&P, while financials were added. These charts both clearly show the effect that the Dot Com bubble and Financial Crisis of ’08 had on the S&P 500.
While it appears that the stocks in all three tables have not experienced abnormal returns on the day of the announcement and the day immediately following, stocks experienced abnormal volume of shares traded. In the next section, I will further analyze the results of my study, including a look at how industries as a whole performed on these announcement days. I will run a simple t-test for abnormal return as well as trading activity on the announcement day. These summary statistics provide a great initial observation of what to expect as I dive deeper into my results. It is difficult to determine if other global events, such as 9/11 and the Dot Com bubble, affected the potential abnormal returns of stocks added to the S&P 500. With the Dot Com bubble having come to an end in 2001, we might be seeing some investor drawback. This means that investors saw lots of fluctuation in the markets over the past five years, and they may be wary of trying to act on the day of an addition announcement. According to Honghui et. al. (2004), who looked at both additions and deletions from the S&P 500, every window of deletions had a larger absolute abnormal return than additions. This fact may similarly be attributed to investor awareness. In previous studies, it appears that investors are more aware of deletions to the S&P 500 than additions. Which leads to the conclusion that investors are more concerned with losing money than making money. A way to expand on this study would be to incorporate the deletions to determine if investors are as risk averse as they appear to be.

5. Results and Analysis

Table 4 below shows the results for abnormal returns. The first row looks at the entire time period from 2000-2003, then, it is broken up into individual years. These results are not consistent with past studies on the topic by Harris and Gurel (1986), Lynch (1997), Beneish (2002) and Sui (2003). However, the trading volume change examined agrees with studies by
Sui(2003), Harris and Gurel (1986) and Malic (n.d). The following table divides the time period into single years. It is important to note that there were only eight additions during 2003.

Table 4. Mean Return Following an Announcement of an Addition to the S&P 500 List by Time Period

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>OBS.</th>
<th>AR</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
<th>AR+1</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2003</td>
<td>110</td>
<td>-.3</td>
<td>.0538</td>
<td>-0.609</td>
<td>-.4</td>
<td>.0559</td>
<td>-0.765</td>
</tr>
<tr>
<td>2000</td>
<td>51</td>
<td>-.4</td>
<td>.0618</td>
<td>-.4645</td>
<td>-1.36</td>
<td>.077</td>
<td>-1.255</td>
</tr>
<tr>
<td>2001</td>
<td>29</td>
<td>-.8</td>
<td>.051</td>
<td>-.938</td>
<td>.43</td>
<td>.0228</td>
<td>1.0185</td>
</tr>
<tr>
<td>2002</td>
<td>22</td>
<td>1.39</td>
<td>.0424</td>
<td>1.544</td>
<td>.51</td>
<td>.0307</td>
<td>.785</td>
</tr>
<tr>
<td>2003</td>
<td>8</td>
<td>-2.3**</td>
<td>.0176</td>
<td>-3.777</td>
<td>.05</td>
<td>.0113</td>
<td>.1249</td>
</tr>
</tbody>
</table>

Notes:

i. t statistic testing for whether the mean returns on the day of an announcement are different from zero.
ii. AR=Abnormal Returns
iii. AR and AR+1 values are percentages % (.003x100= .3)
iv. ** shows statistical significance at the 5% level

Running a simple t-test for each year as well as the overall period will tell us whether these results are statistically significant or not. It appears that in 2000, both returns for the security on the day of the announcement and the day following are negative. This means that the stocks, on average, exhibited negative returns on both days. A t-test statistic of -.609 yields a p-value of .543, which means we cannot reject the null hypothesis. Announcement day returns during 2002 yields a t-test statistic of 1.544 and a p-value of .138, which again means we cannot reject the null hypothesis. The null hypothesis in this case is that the stocks added to the S&P 500 list do not see abnormal returns on either day studied. While both mean returns are positive in 2002, these results are still not statistically significant and do not confirm abnormal returns. It is
important to point out the small standard deviation results, as this shows that there is not much
difference between the returns of the added stocks surrounding these announcements. Lastly, the
2003 period of additions to the S&P 500 had a t-test statistic of -3.777 and a p-value of .0073,
which is significant at the 1 percent level, leading to a rejection of the null hypothesis. These
statistics show that negative abnormal returns were present. However, every p-value for the stock
returns one day after the announcement date are greater than .231, indicating that abnormal
returns are not present on the day after an addition announcement. Therefore, the analysis shows
that there are no effects to abnormal returns for stocks due to an addition to the S&P 500. An
explanation for this finding could be that the announcement day is not as important as the first
day the stock is actually in the S&P 500. This is because investors who buy ETFs that track the
S&P 500 would not see gains until the stock is officially in the index. The results here are
strongly in favor of the efficient market hypothesis rather than the price pressure hypothesis.
Since abnormal returns are not present, the information of an addition to the S&P 500 is seen to
be reflected in the stock price on the day of the announcement. The semi-strong form of the
EMH states that all public information is calculated into a stock’s current share price. This class
of the EMH suggests that only non-publically available information can benefit investors seeking
to earn abnormal returns. While investors are aware of the announcement, they appear to not
cause a large shift in the securities price. This is confirmation that the information of the addition
was public knowledge and was immediately reflected in the stock price. Another explanation for
these results could be that due to the recent implosion of the Dot Com bubble, investors are wary
of making big bets on the announcement information alone.

To comprehend this post-announcement price change it is crucial to understand the no-
information assertion. Although Standard and Poor’s states that the selection of new additions
does not depend on any information about the future profitability of the stock, to confirm the price pressure hypothesis, it must be examined. This assertion plays a large role in the Efficient Market Hypothesis (EMH) as well. If additional information was valuable, investors would likely attempt to obtain it as soon as possible. Standard and Poor’s notification service began in 1976, but prior to this date, you could call Ron Anderson (The Director of Index Services) and simply request information. In a closed conversation, Mr. Anderson disclosed that he only got five to ten calls a year, mainly from index fund managers, not the common investor (Standard and Poor’s, 2004). If the addition information revealed more about future returns of listed stocks, more interest may have been expressed. If the announcement of the addition conveys new information about the future earnings of the stock, post-announcement prices should increase. However, referring to Table 4, it is clear that on average, the stocks exhibited neither positive nor negative returns. A longer window of stock prices and returns might suggest that the stock does eventually experience a price change as Harris and Gurel (1986) discuss. It appears that the day of announcement results provide a truth behind the EMH. Since no new information about the stock’s future returns is made available, the stock price changes slightly. Again, a longer time span, as examined in Harris and Gurel, describes how prices tend to return to their pre-announcement levels after about three weeks. However, in this study, the prices do not deviate with the addition announcement. These results favor the EMH rather than the price pressure hypothesis.

Next, I divide my results into eight industries. They are as follows: Communications, Energy, Financial Services, Healthcare, Pharmaceuticals, Products, Real Estate and Technology. The reason behind separating the added stocks into their respective industry is to determine if one industry outperformed the other on the announcement day and the immediate next open market
day. Altera Corp, whose parent company is Intel, had a positive 16% return on the day of the announcement. The stock was added to the S&P 500 in 2000, and its positive return was the largest out of the stocks in this study. On the other hand, Veritas Software, which was added in 2000, experienced an announcement day negative return of 13%, the largest single-day decline of any stock added to the S&P 500 from 2000-2003. Below in Table 5, all additions are broken up into eight industries, in hopes of determining which, if any, industry had positive abnormal returns.

Table 5. Mean Return Following an Announcement of an Addition to the S&P 500 List by Industry

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>OBS.</th>
<th>AR</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
<th>1 Day After Announcement</th>
<th>AR+1</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>7</td>
<td>-.37</td>
<td>.047</td>
<td>-.207</td>
<td>-1.17</td>
<td>.023</td>
<td>.023</td>
<td>-1.33</td>
</tr>
<tr>
<td>Energy</td>
<td>11</td>
<td>-1.28</td>
<td>.05</td>
<td>-.844</td>
<td>-.36</td>
<td>.029</td>
<td>.029</td>
<td>-.385</td>
</tr>
<tr>
<td>Financial Services</td>
<td>20</td>
<td>1.57</td>
<td>.0481</td>
<td>1.45</td>
<td>.24</td>
<td>.026</td>
<td>.026</td>
<td>.394</td>
</tr>
<tr>
<td>Healthcare</td>
<td>8</td>
<td>.61</td>
<td>.05</td>
<td>.346</td>
<td>-.6</td>
<td>.021</td>
<td>.021</td>
<td>-.833</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>6</td>
<td>4***</td>
<td>.061</td>
<td>1.62</td>
<td>3.16**</td>
<td>.028</td>
<td>.028</td>
<td>2.69</td>
</tr>
<tr>
<td>Products</td>
<td>16</td>
<td>-1.44</td>
<td>.054</td>
<td>-1.03</td>
<td>.08</td>
<td>.019</td>
<td>.019</td>
<td>.168</td>
</tr>
<tr>
<td>Real Estate</td>
<td>6</td>
<td>.1</td>
<td>.016</td>
<td>.152</td>
<td>-.3</td>
<td>.016</td>
<td>.016</td>
<td>-.469</td>
</tr>
<tr>
<td>Technology</td>
<td>36</td>
<td>-1.55</td>
<td>.059</td>
<td>-1.57</td>
<td>-1.4</td>
<td>.091</td>
<td>.091</td>
<td>-.938</td>
</tr>
</tbody>
</table>

Notes:

i. t statistic testing for whether the mean returns on the day of an announcement are different from zero.
ii. AR=Abnormal Returns
iii. AR and AR+1 values are percentages % (-.0037x100= -.37)
iv. ** shows statistical significance at the 5% level
v. *** shows statistical significance at the 1% level

Financial Services and Pharmaceuticals were the only two industries that exhibited positive mean returns on both the announcement day and the following open market day. The
announcement day average abnormal return for Financial Services was 1.5%. The respective t-statistic of 1.45 included a p-value of .162 for financials which means this is not statistically significant. Pharmaceuticals return, with a t-statistic of 1.62 on the announcement day included another statistically insignificant p-value of .167. However, one day after the announcement, Pharmaceuticals had a p-value of .043 which leads to a rejection of the null hypothesis as this is statistically significant at the 5 percent level. Technology stocks, which contained the highest number of additions to the S&P 500 list, on average, saw negative returns on both days examined. While having mean negative returns for both days examined, the technology industry had p-values of .125 and .355 respectively. A future study on only the technology industry alone could determine if there was a direct link between the Dot Com bubble and the returns of stocks added. Positive abnormal returns are seen in pharmaceutical stocks that are added to the S&P 500 list one day after the announcement. Technology, Financials and Pharmaceuticals see the most abnormal returns over the two-day span, however, there is not enough statistical evidence to reject the null hypothesis and conclude that addition announcements are linked with abnormal returns for all industries.

Next, I will look at trading volume activity surrounding the addition announcement date. Table 6 breaks up the additions into their respective years. Based on the summary statistics alone, this is where I expect to see the highest statistical significance of the entire study.
Table 6. Mean Trading Volume on Announcement date of Additions to the S&P 500 list

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>OBS.</th>
<th>MVR</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2003</td>
<td>110</td>
<td>23.563**</td>
<td>30.06</td>
<td>7.873</td>
</tr>
<tr>
<td>2000</td>
<td>51</td>
<td>32.647**</td>
<td>40.84</td>
<td>5.534</td>
</tr>
<tr>
<td>2001</td>
<td>29</td>
<td>15.392**</td>
<td>10.28</td>
<td>7.536</td>
</tr>
<tr>
<td>2002</td>
<td>22</td>
<td>16.566**</td>
<td>11.61</td>
<td>6.289</td>
</tr>
<tr>
<td>2003</td>
<td>8</td>
<td>14.538***</td>
<td>14.25</td>
<td>2.687</td>
</tr>
</tbody>
</table>

Notes:

i. MVR= Mean Volume Ratio. The cross-security mean of the ratio of volume in security i to the average volume in that security in the 2 weeks preceding the announcement day. The expected value of this ratio will be equal to 1 if the announcement has no effect on volume.

ii. T-statistic for testing whether the mean of the volume ratios is different from 1

iii. ** shows statistical significance at the 5% level

iv. *** shows statistical significance at the 1% level

The results in Table 6 are consistent with the price pressure hypothesis. There were no abnormal returns for stock price, but significant abnormal returns for trading volume were present. Included in the price pressure hypothesis is the change in volume of shares traded. The results in Table 6 confirm that along with an addition announcement, volume experiences abnormal trading activity. Trading volume increased drastically on the addition announcement dates, which suggests a shift in demand. This data indicates that the announcement of an addition to the S&P 500 list increases a security’s trading volume. A mean volume ratio of 1 signals that there is no change in the volume of shares traded. The MVR value indicates the difference between announcement day trading volume and the average trading volume of the security for the two weeks (10 market days) prior. It is clear that as a whole, as well as year by year, stocks that had were announced to join the S&P 500 saw an increase in trading activity. The total period of 2000-2003 had a t-statistic of 7.873 and p-value of 0, expressing the statistical significance of the test. In fact, every period except for 2003, which had a p-value of .0312 (also statistically significant), yielded a p-
value of 0, proving to be statistically significant. These statistics allow us to reject the null hypothesis and concludes that with announcements of additions to the S&P 500 list, trading volume will increase. This could imply that investors are attempting to short the stock. Investors trying to short the additions would sell the security, which would increase the volume. These results also confirm that investors are aware of the addition and actively trade the security on the announcement day. We can conclude that while an abnormal volume of shares is traded on the announcement day, this result does not come with abnormal returns for the stocks. What is very interesting is the sheer number of shares traded on the announcement day compared to previous trading activity. For example, in 2002, eBay had 502,011,556 shares of stock traded on the day it was announced to join the S&P 500, whereas, on the preceding day, there were only 116,598,800 shares traded. The entire S&P 500 had 2,654,100,000 shares traded that same day. These results clearly show that investors are not only aware of the announcement, actively buy and sell the stock on this day. Investors are always looking for insight that will lead to increased yield. The information that a company is going to be included in arguably the most respected index in the market causes a trading frenzy. Adding in knowledge of ‘timing the market’, addition announcements are likely to cause investors to throw money into the added stock. By comparing the MVR of each security to the average volume of the security over two weeks (10 market days) prior, it is clear that with an announcement of an addition to the S&P 500, comes increased trading

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13 The sale of a security that is not owned by the seller, or that the seller has borrowed. Short selling is motivated by the belief that a security's price will decline, enabling it to be bought back at a lower price to make a profit.
activity. The final table I will construct shows the MVR of each individual industry when the respective stocks were added to the S&P 500 list.

### Table 7. Mean Trading Volume on Announcement date of Additions to the S&P 500 List by Industry

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>OBS.</th>
<th>MVR</th>
<th>STD. DEV.</th>
<th>T-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>7</td>
<td>16.002</td>
<td>14.685</td>
<td>2.703</td>
</tr>
<tr>
<td>Energy</td>
<td>11</td>
<td>50.381**</td>
<td>37.878</td>
<td>4.324</td>
</tr>
<tr>
<td>Financial Services</td>
<td>20</td>
<td>27.744**</td>
<td>30.540</td>
<td>3.916</td>
</tr>
<tr>
<td>Healthcare</td>
<td>8</td>
<td>10.37</td>
<td>6.555</td>
<td>4.043</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>6</td>
<td>19.102</td>
<td>12.496</td>
<td>3.548</td>
</tr>
<tr>
<td>Products</td>
<td>16</td>
<td>38.843</td>
<td>53.015</td>
<td>2.855</td>
</tr>
<tr>
<td>Real Estate</td>
<td>6</td>
<td>18.007</td>
<td>11.585</td>
<td>3.596</td>
</tr>
<tr>
<td>Technology</td>
<td>36</td>
<td>12.333*</td>
<td>8.584</td>
<td>7.921</td>
</tr>
</tbody>
</table>

i. MVR= Mean Volume Ratio. The cross-security mean of the ratio of volume in security $i$ to the average volume in that security in the 2 weeks preceding the announcement day. The expected value of this ratio will be equal to 1 if the announcement has no effect on volume.

ii. $T$-statistic for testing whether the mean of the volume ratios is different from 1

iii. ** shows statistical significance at the 5% level

iv. * shows statistical significance at the 0% level

Every industry in Table 7 exhibited a mean volume ratio greater than 1. Energy stocks that were announced to be added to the S&P 500 had an average mean volume ratio of 50.381. This points to the massive increase in trading activity that occurs when a stock, specifically an energy stock, is added to the S&P 500. One explanation for the large MVR for the Energy Sector can be attributed to the new technologies and emerging energy corporations that started taking off in the early 2000s. For example, there were major advances in hybrid vehicles such as the Toyota Prius, Ford Escape and others. Also, there was a great interest taken in future energy development due to increased warning of global warming. Lastly, the popularity of mobile
phones and text messaging experienced a massive surge in the early 2000’s. The high MVR values correspond with the upward trend in technology, energy and software development. Energy and Financial Services had p-values of .0015 and .0009, both significant at the 1 percent level. Technology stocks, with a large t-test statistic of 7.921, had a p-value of 0, which in turn means we can reject the null hypothesis. The pre-announcement data indicates that announcements are not anticipated by the market. Looking back to Table 1, the average volume of the security on the announcement date was 40,600 while the average volume two weeks prior was only 4,680. This increase can be explained simply by the announcement of the upcoming addition. As an alternate explanation, the price pressure hypothesis is likely to hold true only when the trading activity is above average. Although the results did not completely yield abnormal results, it is clear that an announcement of an addition to the S&P 500 greatly alters the trading activity. Interestingly enough, we see huge increases in volume of shares traded. For example, on the announcement day Energy industry stocks saw trading activity that was 50 times greater than pre-announcement. Investor awareness and the speculative nature of the stock market shortly after the Dot Com bubble could explain why we see such an enormous trading increase, but no corresponding price increase. These results also have a link to the CAPM model, as investors are always highly concerned with the risk of investing. A reason investors typically sell the deletion while purchasing the addition is due to their perception of the risk of each stock. The two sets of results indicate that large shifts in demand can affect the prices of stocks added, even though the announcement does not provide new information about future expected returns. In this study, positive abnormal returns were not seen while a large increase in trading volume was observed. While the demand shifted for the stocks on the announcement day, positive

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\(^{14}\) Volume measurements are listed in thousands.
abnormal returns (price increase) were not present. We can attribute this rise in trading activity to investors desire to better position themselves and their portfolios. Using the new information that has been made available, investors attempt to time the market and make sure to capture any upside, while preparing themselves for a down swing in the market. Since the S&P 500 is widely seen as the most accurate gauge of the American economy, investors see an addition to this index as a stock that is worth investing in. Given the statistical significance that was evident when studying trading volume activity, it is concluded that there is an increase in shares traded surrounding the addition announcement date.

6. Conclusions

This study examines prices and volumes surrounding the announcement of S&P 500 list additions. Because the additions cause investors of all kind to trade the security and since the announcements do not appear to contain new information about the future securities profitability, this study provides an excellent opportunity to examine price pressures. The results support the efficient market hypothesis more so than the price pressure hypothesis. There are no abnormal returns seen on the announcement day, however, there was abnormal trading activity. The fact that no abnormal returns were found favors the EMH, while the fact that abnormal trading volume was evident, partially agrees with the price pressure hypothesis. On the day of the announcement of an addition there is a large increase in volume, which implies a shift in demand. This shift in demand is due to new information that is publically available. Investors are attempting to capture a profit by acting on the information of a new addition. As previously mentioned, investors likely care more about losing money than making money, so abnormal returns may surround deletions rather than additions. It is also possible that the “average”
investor is attempting to time the market, using the S&P 500 additions as a point of entry. In general, it's been found that while news releases result in a rapid increase in volatility, the majority of the effect is relatively short-lived and subsides within the first day or two following the announcement. The idea that one could profit from buying a stock as soon as possible after an addition is announced and then selling it when it enters the index is tempting, albeit hard to do. The results of this paper strongly agree with the EMH, in that markets react quickly to information being publically available. On the announcement day, there was no significant evidence that lead to abnormal positive or negative price changes. While the lack of concrete evidence that the announcements of additions to the S&P 500 list are linked with abnormal stock returns, large abnormal trading volumes are recorded and prove to be in favor of the index effect. The fact that abnormal returns were not found, favors the efficient market hypothesis, as all public information is reflected in the securities stock price.

A future study may have the time and data to find the reasons a stock was added or deleted by looking for unique characteristics of each company. One could group additions and deletions into companies that have merged or companies that have different growth rates or risk levels. There is much room for future study in the area of additions and deletions to indexes. To expand on this project, one could incorporate the bid/ask spread, in hopes of finding a measurement of liquidity surrounding the announcement date. Furthermore, a future study could compare the abnormal returns of stocks in relation to their specific industry’s index return.
Bibliography


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