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***Mergers and Acquisitions: A Consolidation Strategy and  
Analysis of its Impact on Nasdaq-100 Technology Index  
During 2009 To 2019***

***(Case Study on Top 10 Technology Companies of Nasdaq-100 Index)***



**DISSERTATION**

**Submitted to  
National College of Ireland  
for the Degree of M.Sc. in Finance**

**Under the Supervision of  
Dr Gaia Barone**

**By Surbhi Rikhi  
(Student ID: 19115989)  
Year of Study: 2019-2020**

**Submitted on:  
27<sup>th</sup> January 2020**

## **ABSTRACT**

Technology being an ever-evolving industry, challenges its top players to keep up with their market share, making Mergers and acquisitions (M&As) a prominent consolidation strategy. This study addresses peer reviews and literatures done on this trend over the past few years and the aim of the research is to analyse the impact of this consolidation strategy on the Nasdaq-100 Index over the span of 10 years. Methodology includes the case studies on top 10 technology companies of the index (i.e. those companies which are classified into technology sector on Nasdaq-100 index) which includes Apple Inc., Adobe Inc., Autodesk Inc., Ansys Inc., Cisco Systems Inc., Cognizant Technology Solutions Corporation, Citrix Systems Inc., Alphabet Inc Class A, Intel Corporation and Microsoft Corporation (Nasdaq, Inc, 2020). The data is sourced from Nasdaq-100 website for stock price as well index change, S&P capital IQ database for M&A data and company press releases for synergy effect. For the research analysis, each company is profiled to highlight their detailed business description, ten-year analysis through daily stock price and daily stock return charts, and table of selected merger and acquisitions. The table of selected merger and acquisition highlights the market reaction on the day of announcement as well as on the next day of the announcement along with M&A statistics. Further, the benchmark index i.e. Nasdaq-100 is also profiled by including its description, ten-year analysis through daily index value and daily index return charts. Also, index profiling chart also highlights the consolidated daily stock price chart of selected ten companies along with overall M&A statistics of market reaction. Multiple regression analysis is used to understand and compare each stock movement (x or independent variable) with the benchmark index (y or dependant variable). Finally, empirical study is conducted for each M&A by researching the reasons and how that reasons affects the market reaction, both on stock prices as well as index value. This study contributes to the empirical gap related to how M&A as a consolidation strategy in technology industry has affected one of the major stock indices in the US through the study of impact of each M&A on share prices of each stock and index as total, during the period of 2009 to 2019.

***Keywords:*** *Merger and Acquisition; Technology industry; consolidation strategy; Nasdaq-100; synergy effect;*

# Submission of Thesis and Dissertation

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**Name:** Surbhi Rikhi

**Student Number:** 19115989

**Degree for which thesis is submitted:** M.Sc. in Finance

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## **LIST OF ABBREVIATIONS**

M&A	Mergers and Acquisitions
IBM	International Business Machines Corporation
CEO	Chief Executive Officer
TMT	Technology, Media and Telecommunications
US	United States of America
i.e.	That is
tech	Technology
D <sub>0</sub>	M&A Announcement Day
D <sub>1</sub>	Next Day of the M&A Announcement
NDX	Nasdaq-100 Index
NDXT	Technology Sector of Nasdaq-100 Index
ICB	Industry Classification Benchmark
SaaS	Software-as-a-Service
USD	United States Dollar
CAGR	Compound Annual Growth Rate
AI	Artificial Intelligence

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## **SECTION 1: INTRODUCTION**

### **1.1 Background**

Technology being an ever-evolving industry, challenges its top players to keep up with their market share, making Mergers and acquisitions (M&As) a prominent consolidation strategy. In recent years, it has become one of the restructuring strategies for the technology companies to acquire and expand its product portfolio and market. For Instance, IBM went into restructuring in 2012 after its newly appointed CEO Ginni Rometty decided to reshape the company by heavily investing through M&As to expand its products and market. Year after year, distinction between software and hardware companies is diminishing, resulting customers receiving all the products, including hardware, software as well as leveraged technology services from same company. According to Forbes, this consolidation will slow down only after few pure technology players are left in the market, before disappearing purely altogether (Forbes, 2017). By 2030, only 30 technology companies will be left and approximately 10 by 2050 (Forbes, 2017). According to Deloitte, in 2017 TMT sector (Technology, Media and Telecommunications) recorded all-time high 3,389 M&A transactions globally, worth a total of \$498.2 billion (Deloitte, 2018).

### **1.2 Problem Statement**

A limited number of studies have been conducted over the impact of technology consolidation and M&As over an index. This gives a gap to study and analyse the pattern of M&A strategy in technology over a stock index. It highlights how a stock market reacts when M&A becomes a prominent consolidation strategy. This study also understands and indicates the synergy effect and market reactions towards an M&A and acquirer (company which is acquiring the target company). The structure of the press release involving the announcement of an acquisition reflects not just its importance but also the future outlook for the company which makes it necessary to understand how these different press release structures and information display affects the market reactions on both individual and overall benchmark index level.

### **1.3 Research Question and Objectives**

#### **1.3.1 Research Question**

How consolidation strategy of Merger and Acquisitions used in Technology industry impacting Nasdaq-100 Index for the period of 2009 to 2019?

- Analysing case studies of top 10 technology companies of Nasdaq-100 index and how each company's share price is affected with every M&A?
- Understanding and researching the market reaction on each M&A and how it is affected by the synergy announcement by the acquirer?
- How change in the top 10 share prices affected the stock Index? Is Nasdaq-100 index more impacted with the technology companies or not?

#### **1.3.2 Research Objectives**

The research objectives of the study are as follows:

- To analyse the impact of M&As in the Technology industry.
- Check whether each of the selected companies is following this consolidation strategy and how different M&A motives has impacted on their individual share prices.
- To evaluate impact of selected 10 company's share prices on the US stock exchange 'Nasdaq-100'.

### **1.4 Methodology**

Technological innovation performance can be defined as the comprehensive income which is obtained after the certain amount of technological innovation is inputted (Jin, 2019). This performance can be measured by the revenue results after the acquisition of new technology or product or impact of the acquisition on share price reflecting the confidence of shareholders on the innovation addition in the company. The empirical study is performed and analysed on top 10 technology companies in the given index, wherein M&A with disclosed values for each stock is incorporated in the stock as well as index prices. The data is sourced from Capital IQ, company websites, news articles, and Nasdaq-100 index.

### **1.5 Theoretical Framework for the Research**

The main driving factor for the M&As in technology industry is small enterprises with new technologies and innovations, which help big frame companies to upgrade their technological capabilities along with acquiring market share of those companies (Jin, 2019). This helps the main players of the industry to acquire and maintain its market share and pace up with the technological development. In the literature review, there are two M&A motives for an acquirer highlighted in the literature review i.e. value-increasing and non-value-increasing motives.

M&As with value-increasing motives are primarily driven by synergy benefit involved while combining the involved operations of acquirer and target, this is also known as synergistic acquisitions (Bradley, et al., 1988). Various factors are involved while pursuing a synergistic acquisition, including industry shock response, capturing and increasing market power, economies of scale, information exploitation and synergy of financial resources (Nguyen, et al., 2012). On the other hand, non-value-increasing or value-decreasing motives are recognised in three types i.e. agency, hubris and market timing. However, except these two main motives, there are also several other motives suggested by various researchers which are involved during the whole process of M&A.

### **1.6 Dissertation Structure**

This dissertation is categorised into five main sections. Section one focuses on the introduction of the study providing a background and overview of the coming sections. Section two critically analyse the literature reviews in the given area, which includes mergers and acquisitions, motivations around merger and acquisitions, share price analysis and index price comparison. Section three explains the methodology which is used to study the research question and research objectives i.e. analysing the impact of the M&A as consolidation strategy on Nasdaq-100. Section four discusses the results from the analysis and presents the data in a statistical and graphical manner to highlight the answers to the research question. Lastly, section five of this dissertation focuses on the recommendation and implication of this research along with the research conclusion.

## **SECTION 2: LITERATURE REVIEW**

### **2.1 Introduction**

Mergers and acquisitions are one of the famous ways of achieving the business objectives and corporate strategies. To face challenges brought by increased globalisation, the corporate sector around the world is opting different types of consolidation strategies like M&As to restructure its operations, leading to greater integration of national and international markets (Saraswathy, 2018). The emergence of new technologies and increased pace of science and technological development forced enterprises to improve their technological innovation capabilities by acquiring external technologies along with their internal technological research and development (Jin, 2019).

### **2.2 Mergers and Acquisitions**

Managers and firms perceive mergers and acquisitions as an essential mechanism for cost realisation, savings and growth opportunities (Schoenberg, 2006). M&A enables firms to achieve cost-based and revenue-based synergies through economies of scale and by leveraging core capabilities (Capron, 1999). Mergers and acquisitions have been identified as a process in which two firms collectively achieve a planned business purpose (Sudarsanam, 2003).

### **2.3 Theories around Merger and Acquisitions**

Various theories around M&A performance have been outlined by Jensen and Ruback, which includes efficiency theory, market power theory, agency theory and arrogance hypothesis (Jensen & Ruback, 1983). The traditional efficiency theory states that M&As improves the overall efficiency of the acquirer, rapidly expands the scale of the company, enhance the visibility of the company, shorten the construction period and obtain scale of effects (Granstrand & Sjölander, 1990). The main motivators for M&As are control of business environment by reducing competition, increasing its hold on the market share, enable companies to create some form of monopoly or oligopoly, increasing long term profits (Jin, 2019).



## **2.4 Technology Mergers and Acquisitions**

Firms face increased innovation pressure with rapid technological changes and diverse customer needs. Even the biggest and most technologically self-sufficient companies do not always enhance their innovative capabilities from scratch, making acquisition of external technology resources as a preferred choice (Huang, et al., 2015). Achieving technological synergy is the main effect of the Tech M&A. In recent years, mergers and acquisitions in the technology industry is increasing at a rapid rate and realizing performance out of these acquisitions is also becoming difficult. According to Christensen, failure rate is quite high, between 70% to 90%, for M&A in the technology industry (Christensen, et al., 2011).

## **2.5 Research Stages in Technology M&A**

The research on the tech M&A can be concluded into three stages: at first stage it is found that firms could develop rapidly after acquiring small tech firms, at second stage researchers explored the motivations around tech M&A and evaluating its financial performance, and lastly on third stage research diversified into its integration, mode and target selection (Huang, et al., 2015).

### **2.5.1 First Stage**

Scholars researched and analysed around the years 1990's that firms are developing significantly through inorganic growth strategies which majorly included acquiring small technology firms. On the basis of 13 M&A events in the high tech industries, Granstrand and other scholars concluded the key factors to success of technology M&A (Granstrand & Sjölander, 1990).

### **2.5.2 Second Stage**

Around 2000s, researchers started to explore motivations around Tech M&As and evaluating its financial performance. They evaluated acquisition performance by using multi-dimensional indexes and between various time frames (Loughran & Vijn, 1997) (Kohers & Kohers, 2000).

### **2.5.3 Third Stage**

Diversified research is conducted on Tech M&A in recent years, including its integration, mode and target selection. Paruchuri evaluated the relationship between innovation output and research personnel during Tech M&A integration (Paruchuri, et al., 2006). After identifying target companies' attributes, Tian and Xin proposed a decision making theory of M&A via four in-depth case studies across three main technology sectors in the medical industry (Wei &

Tian, 2011). An acquisition learning innovation framework was tested by Lin with conclusion that unrelated acquisitions also enhance technology fermentation (Lin, 2015). This stage mainly focuses on the research after the tech M&A and evaluating its performance.

## **2.6 Studies on effect of M&As on Stock Returns and implication on Overall Index**

As discussed above, the importance of M&A on a firm's growth strategy has led many scholars to perform various studies over the years. Some of these aimed at understanding and measuring the effect of M&A on stock returns as well as its overall impact on benchmark index. For instance, it was found in a study that positive abnormal returns are significantly driving the M&As in the European banking industry (Cybo-Ottone & Murgia, 2000). While, another study highlighted different wealth effects based on the pre- and post-announcement parameters (Kiymaz & Mukherjee, 2001). Panayides and Gong (2002), conducted an event study focusing on stock reaction in relation to M&As in liner shipping, which concluded that on the announcement day the stock prices increased rapidly owing to the fact that it was long anticipated by the industry. Lastly, an event study was conducted by Anand and Singh (2008) which analysed Indian bank mergers and its effects on short term shareholder wealth for the period from 1999-2005. The results highlighted significant increase in the shareholder value of the acquirer banks, target banks and their combined portfolio.

## **2.7 Conclusion**

The research related to the M&A in technology industry mainly focuses on the effect of the M&A on company's innovation ability, decision making and model selection process. Some empirical studies are also conducted on a geographical level and in different industries also. However, in today's scenario economies are becoming more and more technology and innovation focused and with increase in the number of M&As in this industry year after year, makes it an area of huge interest. At present, academics are conducting researches on the technology M&As performance and financial impact. However, very limited study has been conducted on the impact of these technological M&A on stock index.

## **SECTION 3: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This section provides a detailed explanation in regard to research design and methodology used for this study. It covers the details of the selected ten companies and benchmark index, data collection and methods used for analysing the data. This study aims at finding the motives of the M&A and how these motives affect the stock as well index reaction. Stock price analysis and multiple regression analysis is conducted to see how the selected stocks affect the index on individual and group level. However, the research is more inclined towards qualitative aspect by studying the press releases on the event day (which is the M&A announcement date) and corresponding reaction of the market. The data sources include S&P Capital IQ, Nasdaq.com, company websites and news articles.

### **3.2 Research Problem**

Mergers and acquisitions have started becoming a prominent consolidation strategy in technology industry. However, there are limited studies conducted on the impact evaluation of M&A on stock index. This gives an opportunity to cover a gap in the Tech M&A research area and identify whether it effects the stock index at the same level as it effects a stock price.

### **3.3 Research Question**

How consolidation strategy of mergers and acquisitions in technology industry impacted nasdaq-100 index during 2009 to 2019?

### **3.4 Research Objectives**

The research objectives are as follows:

- To analyse the impact of M&As in the Technology industry.
- Check whether each of the selected companies is following this consolidation strategy and impact of M&A's on their share prices
- To evaluate impact of selected 10 company's share prices on the US stock exchange 'Nasdaq-100'.
- Evaluate the features of the M&As which have major impact on the index.

### **3.5 Data Selection and Data Sources**

The study evaluates a sample of US based technology companies which are selected as top 10 technology focused companies on Nasdaq-100 index. These ten companies include Apple Inc., Adobe Inc., Autodesk Inc., Ansys Inc., Cisco Systems Inc., Cognizant Technology Solutions Corporation, Citrix Systems Inc., Alphabet Inc Class A, Intel Corporation and Microsoft Corporation. As discussed in the literature this study is conducted to fill the gap of analysing the impact of technology M&A on stock indices. The time frame for this study includes M&As announced between 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2019. Data is sourced from the following sources:

- S&P Capital IQ: data for all the 10 company's M&As is sourced from S&P Capital IQ. Total of 193 transactions are sourced for the given time frame based on the criteria that the acquirer is one of the selected ten companies and transaction value is disclosed.
- Nasdaq.com: Historical stock price data and stock index data is sourced from (<https://www.nasdaq.com/market-activity/stocks>). Total of 2,767 observations per stock and index is sourced.
- Company Websites and Articles: Sourced the press releases surrounding the M&A on the announcement day with details and comments from the acquirer.

### **3.6 Event Study Methodology**

For this research event study methodology will be used. This methodology evaluates the impact of an event on a variable term. It measures and analyse the response of the stock price to the announcement of an event, which can include M&A or profit assertions (Tellis, 1997). The main assumption behind this methodology is that market processes event information and concludes in impartial and efficient way (Tellis, 1997). The first published study using this methodology was conducted by James Dolly on stock splits (MacKinlay, 1997). A lot of modifications were introduced in this study over the past few years. One of the prominent studies was done by Brown and Warner which included intervals of daily and monthly (Brown & Warner, 1985).

### 3.7 Data Analysis Structure

This study considers M&A announcement dates as event i.e.  $D_0$  and next day as  $D_1$ , and on these two days the market reaction i.e. the change in the share price as well as index value is measured. Percentage of positive and negative reaction on both days for each stock price as well as index value is calculated to understand how frequently and significantly market responds to the event. Each reaction is studied on a subjective manner by going through articles and press releases which defines motives for each M&A as well as what points from acquirer's comments might be the factors for a market reaction.

### 3.8 Research Design

Being a more of a qualitative research, the research design follows a pattern of profiling, starting with the index and then each stock. Each profile covers basic information such as detailed business description, price and returns charts, multiple regression analysis of selected stocks with benchmark index, M&A table highlighting the basic transaction information along with the market reaction of both stock as well as index on  $D_0$  and  $D_1$ , M&A statistics table and M&A charts. Finally, the empirical study is conducted wherein for acquirer's comment is studied for each M&A and factors are highlighted i.e. what lack of information leads market to react negatively or what synergy information leads market to react positively.

The stock price return is calculated to understand the change in the market from previous day considering the M&A event. It is calculated as the percentage change in the stock price between two days by using the below formula:

$$\text{Stock Return} = \frac{\text{Ending or closing stock price } (P_1) - \text{Initial Stock price } (P_0)}{\text{Initial Stock price } (P_0)}$$

So, on the day of event i.e. on the day of M&A announcement, if the stock return is negative then it means it reacted negatively or if stock return is positive then stock reacted positively. Similar reaction for next day is observed.

Multiple regression analysis between selected ten stocks and index are calculated by taking the stock returns as independent variables and index returns as dependent variable. Multiple regression analysis is usually used to visually show the behaviour and strength of the dependent variable. The coefficient of determination or  $R^2$  value indicates how proportionate is the dependent variable from the independent. Also, the P-value indicates the significance of the test.

## **SECTION 4: DATA ANALYSIS AND RESULTS**

### **4.1 Benchmark Index (Nasdaq-100):**

#### **4.1.1 Nasdaq-100 Index Overview:**

Founded in 1985, the Nasdaq-100 (NDX) index is one of the world's preeminent large-cap growth indexes which includes 100 largest non-financial companies (both domestic as well as international) listed on the index based on market capitalization (Nasdaq, Inc, 2020). The technology sector of the Nasdaq-100 index (NDXT) began on 22<sup>nd</sup> February 2006 with a base value of 1000.00, is an equal-weighted index which includes technology companies classified by the classification system based on the Industry Classification Benchmark (ICB) (The Nasdaq Group, Inc. , 2020).

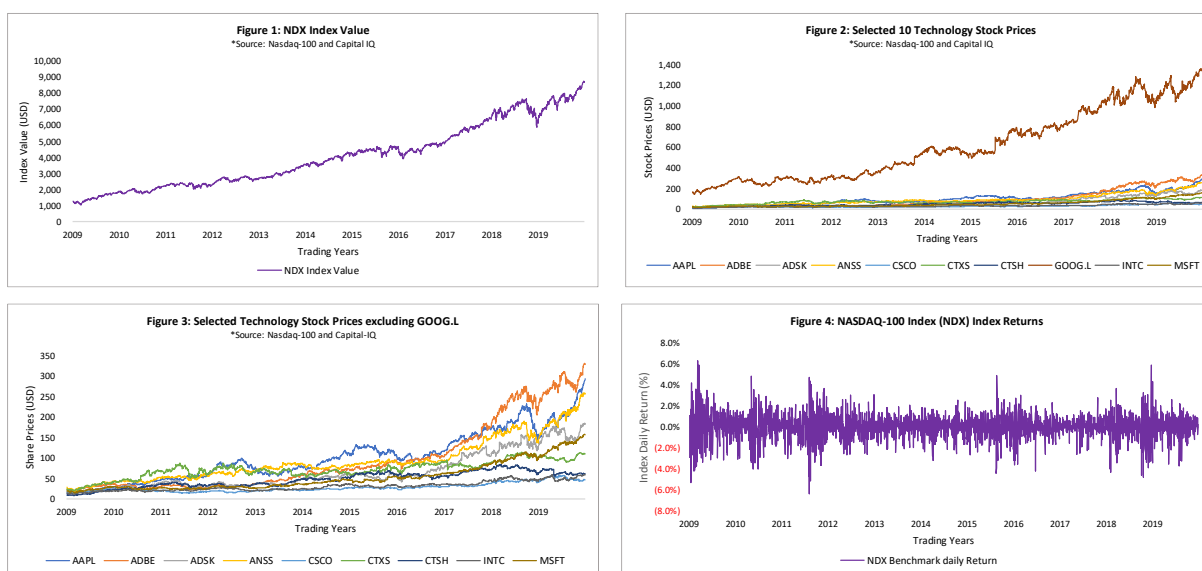
An equal-weighted index refers to the stock market index which invests an equal amount of money in each stock consolidating the index i.e. each company's stock performance equally affects the total value of the index. An equal weighted index is usually based on values i.e. to restore the balance, the index must buy more shares of a declining share price company by selling shares of the company with increasing share price. (CFI Education Inc., 2020)

The NDXT follows a constituent weighting process, wherein the index is quarterly rebalanced in such a way that all issuers have an equal market capitalization within the index. When multiple share classes of an issuer are included in the index, then the index equally divides the market capitalisation of that issuer among its represented securities. To calculate index shares, each index security's market capitalization is divided by its last closing price on the third Friday in March, June, September and December. (NDXT, 2020)

#### **4.1.2 Ten-Year Analysis of NDX:**

This study analyses index performance of Nasdaq-100 for the given ten-years (Jan 2009 to Dec 2019). Below three figures depicts daily performance of NDX (figure 1) and selected ten technology companies (figure 2) over the span of selected ten years. It is observed that the index as well the selected ten technology companies has seen a steady growth over the years. Moreover, the share price performance of Alphabet Inc. (GOOG.L) is visually very much similar to the index value performance (figure 2). Since, GOOG.L is trading quiet high from the rest of the companies, therefore an additional chart (figure 3) is also included to graphically show the performance of 9 stock prices excluding GOOG.L, highlighting a similar trend of steadily increasing over the years. Further, Figure 4 graphically depicts the daily return of the

benchmark index over the span of ten years. Through this chart it can be understood how the index have changed on a daily basis, such as the highest positive change was observed on 9<sup>th</sup> March 2009 at 6.36% while the lowest change was observed on the 5<sup>th</sup> August 2011 at -6.31%. In conclusion, overall the index value has been increasing over the years without few dips in recent years and with volatility of the index being more inclined towards the initial years (2009 to 2011) and again increasing in 2018.



## 4.2 Overall M&A Statistics:

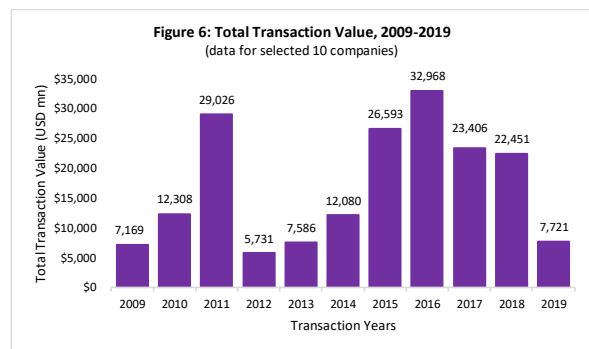
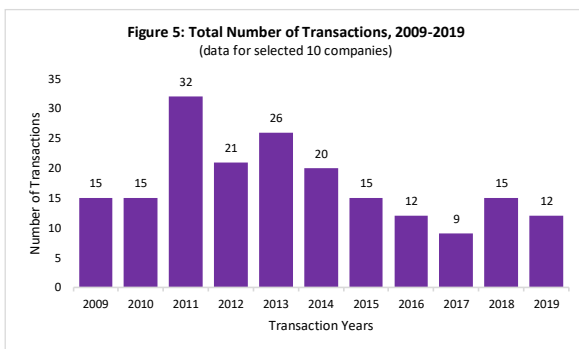
This study is carried out for 193 transactions deemed as merger and acquisitions over the span of ten years (1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2019) with acquirer being one of the selected ten companies. Further, only those transactions are considered for which the transaction value was given in the database S&P Capital IQ. Also, for the days where the M&A was announced on a non-trading day, that day is considered closed and only the market reaction on the next day is observed.

Table 1: Overall M&A Statistics	Total Number of Transactions	193			
	Total Transaction Value (USD mn)	\$187,163.54			
		Stock Price Reaction		Index Value Reaction	
	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>	
% Positive Reactions	47.67%	44.56%	51.81%	47.15%	
% Negative Reactions	45.08%	55.44%	40.93%	52.85%	

Above Table 1 shows the overall M&A statistics including the total transaction value of 193 transactions being \$187,163.54 million along with the market reactions (stock price as well as index value) in terms of positive and negative on the day of M&A announcement (D<sub>0</sub>) and next day of the announcement (D<sub>1</sub>). It can be observed that on an average 47.67% times stock price

reacted positively to the M&A on  $D_0$  and it fell to 44.56% the next day. Similarly, index value also positively reacted 51.81% times on  $D_0$  while dropping to 47.15% next day.

Below two figures graphically shows the transaction statistics according to each year. Figure 5 indicates total number of transactions by year for the span of selected ten years while figure 6 indicates total transaction value recorded per year for the selected 10 companies. In the year of 2011, 32 transactions were reported from selected 10 companies, however, year 2016 saw most of the transaction value recording to \$32,968 million. On the other hand, lowest number of transactions was observed in the year 2017 recording only 9 transactions while lowest total transaction value was observed in the year of 2012 recording at \$5,731 million.

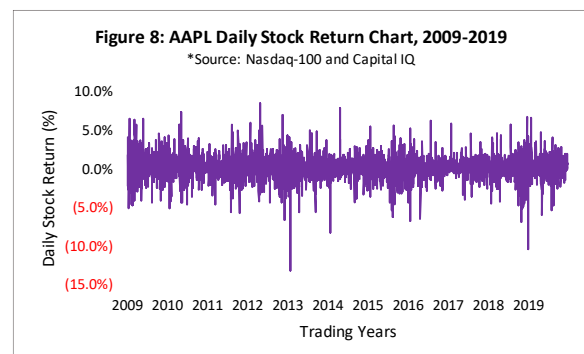
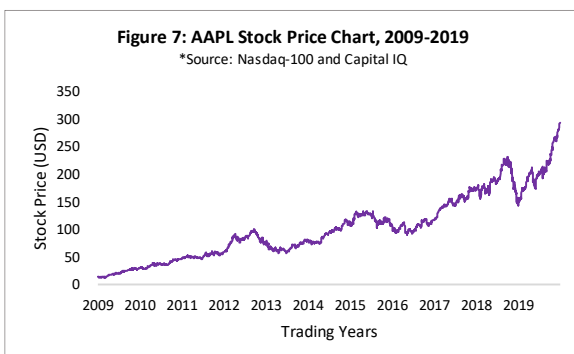


### 4.3 Overview and Ten-Year Analysis of Selected Ten Companies:

#### 4.3.1 Apple Inc. (Nasdaq: AAPL):

Established in 1977, Apple Inc. designs, manufactures and markets personal computers, smartphones, wearables, tablets, accessories and various related services. The company’s main products include iPhone, Mac, iPad, AirPods, Apple Watch, Apple Tv and Beats. (Apple Inc., Form 10-K, 2019)

Below two figures analyses the company’s stock price (figure 7) and daily returns (figure 8) for the span of ten years. It can be observed that Apple has been a less volatile over the span of ten years, although share prices have steadily increased over the years starting from \$12.96 on 2<sup>nd</sup> January 2009 to \$293.65 on 31<sup>st</sup> December 2019 with a CAGR of 36.62% for 10 years.

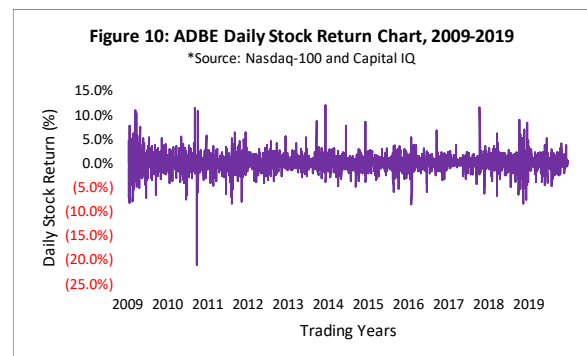
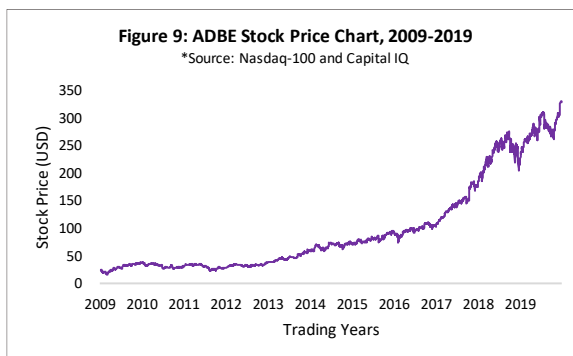




#### 4.3.2 Adobe Inc. (Nasdaq: ADBE):

Founded in 1982, Adobe Inc. operates as one of the most diversified software company by offering a line of products and services through (SaaS) and managed services model. The company focuses on two strategic areas i.e. digital media and digital experience. (Adobe Inc., Form-10K, 2019)

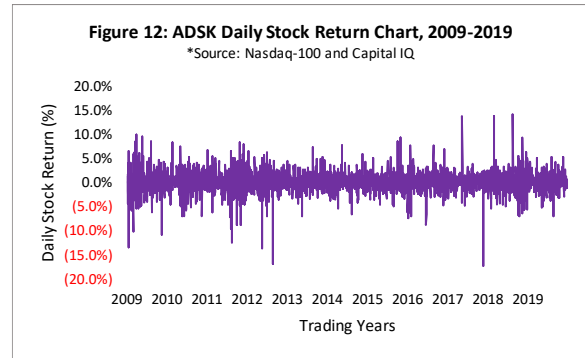
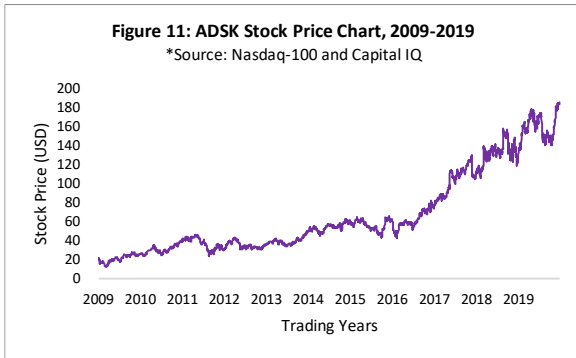
Below two figures analyses the company's stock price (figure 9) and daily returns (figure 10) for the span of ten years. It can be observed that similar to Apple, Adobe has also been less volatile over the span of ten years, although share prices have steadily increased over the years starting from \$23.02 on 2<sup>nd</sup> January 2009 to \$329.81 on 31<sup>st</sup> December 2019 with a CAGR of 30.50% for 10 years. However, in figure 10 a big dip can be observed on 21<sup>st</sup> September 2010, where company recorded a -21.11% fall in the share price.



#### 4.3.3 Autodesk, Inc. (Nasdaq: ADSK):

Founded in 1982, Autodesk, Inc. develops and designs software solutions for various industries including engineering, architecture, construction, manufacturing, media and entertainment. Some of the company's services includes artificial intelligence, additive manufacturing, generative design, robotics and 3D printing. (Autodesk, 2020)

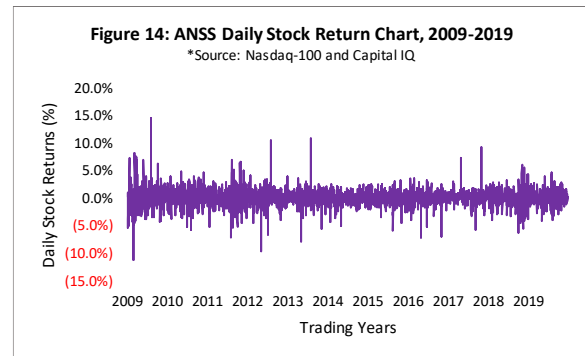
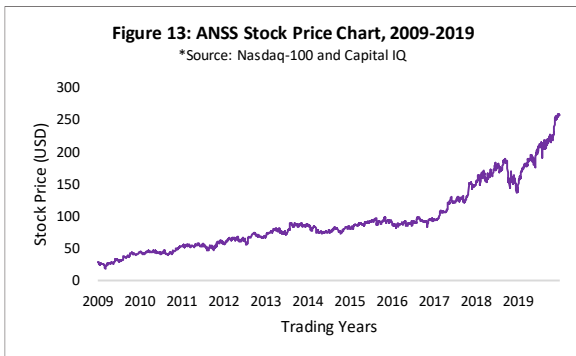
Below two figures analyses the company's stock price (figure 11) and daily returns (figure 12) for the span of ten years. It can be observed that Autodesk has been volatile over the span of ten years, although share prices have steadily increased over the years starting from \$20.68 on 2<sup>nd</sup> January 2009 to \$183.46 on 31<sup>st</sup> December 2019 with a CAGR of 24.39% for 10 years. However, in figure 12 indicates the volatility of the share price specially with eight big dips in the returns over the years (on 28 November 2017, the share price fell by -17.27%).



#### 4.3.4 ANSYS, Inc. (Nasdaq: ANSS):

Founded in 1970, Ansys operates in the areas of finite element analysis, electronics, semiconductors, computational fluid dynamics, design optimization and embedded software. The company focuses on developing, marketing and supporting engineering simulation software which is used for predicting real world behaviour of the product designs. (Ansys, 2020)

Below two figures analyses the company's stock price (figure 13) and daily returns (figure 14) for the span of ten years. It can be observed that Ansys has been less volatile over the span of ten years, although share prices have steadily increased over the years starting from \$28.74 on 2<sup>nd</sup> January 2009 to \$257.41 on 31<sup>st</sup> December 2019 with a CAGR of 24.51% for 10 years.

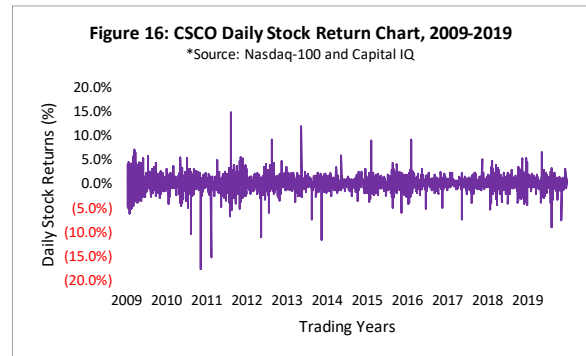
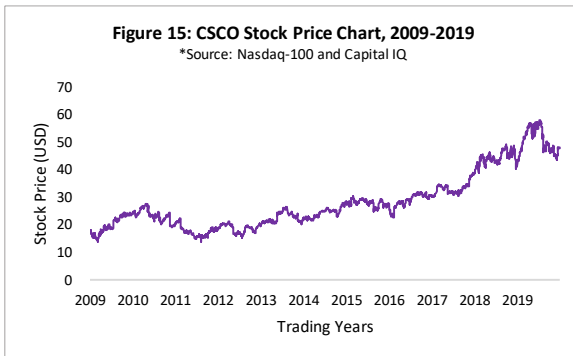


#### 4.3.5 Cisco Systems, Inc. (Nasdaq: CSCO):

Founded in 1984, Cisco Systems designs and markets internet intent-based technologies across various sectors including security, networking, applications, cloud and collaboration. Its products and services are segmented into four groups i.e. applications, security, infrastructure platforms, and other products. (Cisco, Form-10K, 2019)

Below two figures analyses the company's stock price (figure 15) and daily returns (figure 16) for the span of ten years. It can be observed that Cisco has been quite volatile over the span of ten years, although share prices have steadily increased over the years but it quite evident that company has saw its share of low points to reach growth rate of 10.95% CAGR. In figure

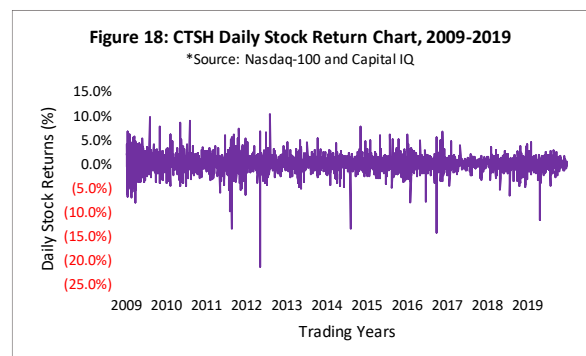
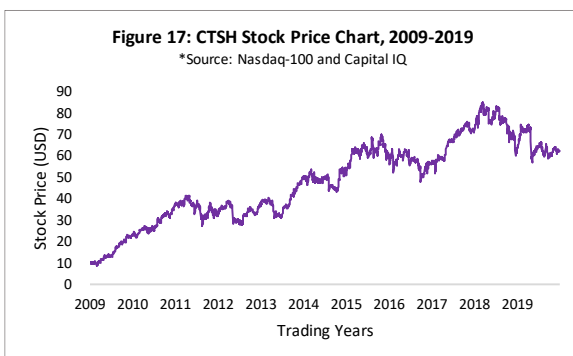
16 indicates the volatility of the share price specially with nine big dips in the returns over the years (on 10 November 2010, the share price fell by -17.69%).



#### 4.3.6 Cognizant Technology Solutions Corporation (Nasdaq: CTSH):

Cognizant operates as one of the leading professional services companies providing various technology services including digital solutions, consulting, system integration, application development, testing and maintenance, and infrastructure services. The company serves four main industries including financial services, healthcare, retail products and communications. (Cognizant, Form-10K, 2019)

Below two figures analyses the company's stock price (figure 17) and daily returns (figure 18) for the span of ten years. It can be observed that similar to Cisco, Cognizant has been volatile over the span of ten years, although share prices have steadily increased over the years but the company has seen quite a downfalls to reach \$62.02 on 31<sup>st</sup> December 2019 from \$9.56 on 2<sup>nd</sup> January 2009, with a CAGR of 20.56% for 10 years.

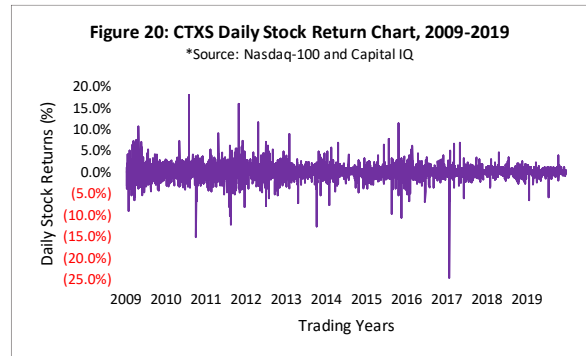
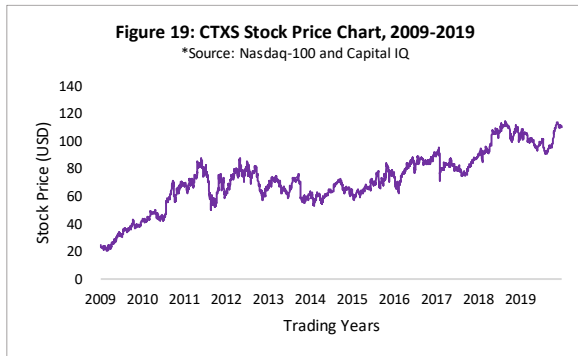


#### 4.3.7 Citrix Systems, Inc. (Nasdaq: CTXS):

Founded in 1989, Citrix Systems develops and markets Software-as-a-Service (SaaS)-based applications, workspace and networking solutions. The company is evolving its business in by following three business models including 'On-Premise to Cloud' model, 'Perpetual to Subscription' model and 'Point Products to Platform' model. (Citrix Systems, Form-10K, 2019)

Below two figures analyses the company's stock price (figure 19) and daily returns (figure 20) for the span of ten years. It can be observed that Citrix systems has been significantly volatile

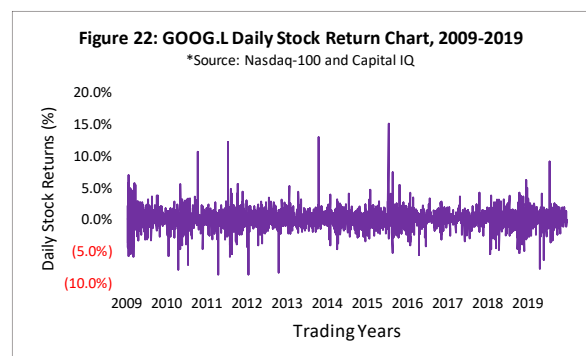
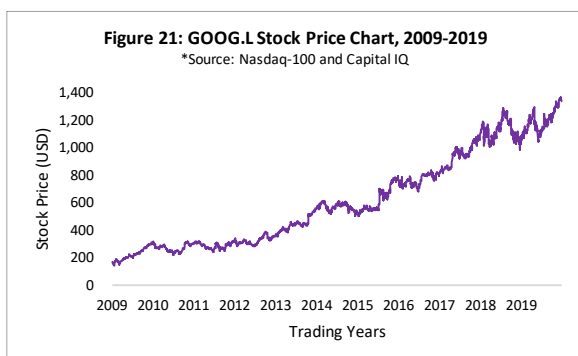
over the span of ten years, although share prices have increased from \$24.36 on 2<sup>nd</sup> January 2009 to \$110.90 on 31<sup>st</sup> December 2019 with a CAGR of 16.37% for 10 years, but the company has seen quite dips in the daily returns. One of the highest falls in the return was observed on 31<sup>st</sup> January 2017 with a dip of -24.69% in daily return.



#### 4.3.8 Alphabet Inc. (Nasdaq: GOOG.L):

Alphabet Inc. operates as a collection of businesses of which Google is the largest and all other businesses being reported as Other Bets. The other Bets segment include early stage technology companies which are afield from its core business of Google. The company also works and invests in the areas of security, infrastructure, AI, data management and analytics. (Alphabet, Form-10K, 2019)

Below two figures analyses the company’s stock price (figure 21) and daily returns (figure 22) for the span of ten years. During the span of ten years, Alphabet has been quite volatile which can be observed through its daily returns graph. It is very evident that the stock price of the Alphabet changed drastically from 2012 to 2016 which might be owned to the fact that the company was on a growth and investing spree. The company observed 15.06% positive return as the highest return in ten years on 16<sup>th</sup> July 2015.

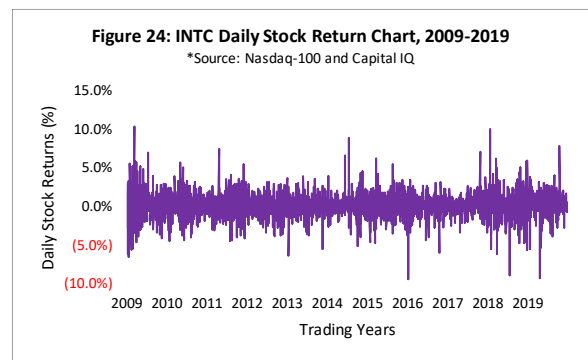
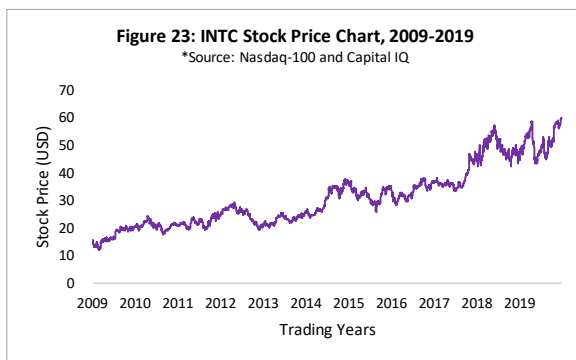


#### 4.3.9 Intel Corporation (Nasdaq: INTC):

Founded in 1968, Intel designs and manufactures cloud and networking technologies. The company has transformed from PC-centric to data-centric company through workload-optimization solutions in data analytics sector. The company is investing in data technology

solutions, AI solutions, network transformation solutions, intelligent edge, and autonomous driving. (Intel, Form-10K, 2019)

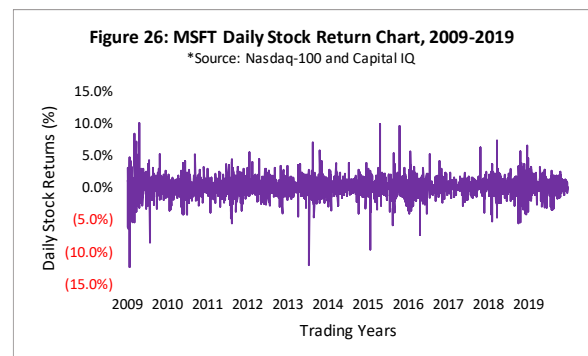
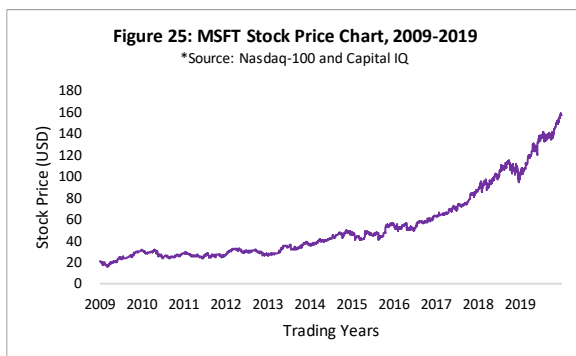
Below two figures analyses the company’s stock price (figure 23) and daily returns (figure 24) for the span of ten years. Similar to Alphabet, Intel has also been significantly volatile during the past ten year. Although the share prices of the company Intel have increased from \$15.20 on 2<sup>nd</sup> January 2009 to \$59.85 on 31<sup>st</sup> December 2019, but with a CAGR of 14.69% for 10 years it recorded the lowest growth rate among the selected ten technology companies. This becomes more evident by observing its daily returns chart, which depicts how the company has seen a quite a lot of fall in the daily return.



#### 4.3.10 Microsoft Corporation (Nasdaq: MSFT):

Founded in 1975, Microsoft Corporation develops and supports software, devices, services and solutions to create new values for its customers to fully realize its potential. The company offers various services including cloud-based solutions, consulting services, solution support, and relevant online advertising. Moreover, the product portfolio of the company includes operating systems, productivity applications, business solution applications, software development tools, and video games. (Microsoft, Form-10K, 2020)

Below two figures analyses the company’s stock price (figure 25) and daily returns (figure 26) for the span of ten years. The company has seen a steady growth from \$20.33 on 2<sup>nd</sup> January 2009 to \$157.70 on 31<sup>st</sup> December 2019, with a CAGR of 22.74% for 10 years. However, the company saw two lowest dips in daily returns, one of -12.46% and other of -12.10%.



#### 4.4 Multiple Regression Analysis against Benchmark Index:

The multiple regression analysis refers to the extension of linear regression analysis, wherein value of dependent variable is based on more than one independent variables. The dependent variable (also known as target or criterion variable) is the variable we want to predict or test while independent variables (also known as regressor or explanatory variable) is the one which is used as basis for the test. (Laerd Statistics, 2020)

The multiple linear regression is calculated through below formula:

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + \epsilon$$

Where, for i = n observations:

$y_i$  = dependent variable

$x_i$  = explanatory variables

$\beta_0$  = y-intercept (constant term)

$\beta_p$  = slope coefficients for each explanatory variable

$\epsilon$  = the model's error term (also known as the residuals)

For this study, the multiple regression model is analyzed by taking the dependent variable as benchmark index daily returns for 10 years and daily returns for all selected 10 companies as independent variables. Below Table 2, provides the summary output of the multiple regression analysis performed through the excel data function.

**Table 2: Multiple Regression Analysis Summary Output**

<i>Regression Statistics</i>								
Multiple R	0.961508992							
R Square	0.924499543							
Adjusted R Squ	0.924225593							
Standard Error	0.003176516							
Observations	2767							

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	10	0.340516683	0.034051668	3374.709011	0
Residual	2756	0.027808738	1.00903E-05		
Total	2766	0.368325421			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	2.52137E-06	6.05754E-05	0.041623738	0.966801664	-0.000116256	0.000121	-0.000116	0.000121
AAPL	0.185104548	0.004520985	40.94341419	1.0812E-286	0.176239688	0.193969	0.17624	0.193969
ADBE	0.05889704	0.004543528	12.96284149	2.40012E-37	0.049987975	0.067806	0.049988	0.067806
ADSK	0.038686801	0.003768572	10.26563867	2.73909E-24	0.03129729	0.046076	0.031297	0.046076
ANSS	0.060722701	0.00518158	11.71895495	5.47031E-31	0.050562529	0.070883	0.050563	0.070883
CSCO	0.069377453	0.004859455	14.27679655	1.1493E-44	0.059848911	0.078906	0.059849	0.078906
CTXS	0.035250896	0.003788901	9.30372576	2.67977E-20	0.027821523	0.04268	0.027822	0.04268
CTSH	0.060466731	0.004159109	14.53838543	3.39649E-46	0.052311445	0.068622	0.052311	0.068622
GOOG.L	0.162636752	0.005114126	31.8014743	2.4927E-189	0.152608845	0.172665	0.152609	0.172665
INTC	0.106181859	0.004967127	21.37691831	6.18298E-94	0.096442192	0.115922	0.096442	0.115922
MSFT	0.119656468	0.005653283	21.1658361	2.95031E-92	0.108571368	0.130742	0.108571	0.130742

The regression statistics data in the above table 2 provides the data points including multiple R,  $R^2$ , adjusted  $R^2$  and standard error estimate to determine fitness of the regression model in terms of the given data. The multiple R or multiple correlation coefficient measures the prediction quality of the dependent variable i.e. in this case the benchmark index (NDX) daily returns gives a value of 0.962 indicating almost perfect level of prediction. On the other hand,  $R^2$  and adjusted  $R^2$  value represents the determination coefficients i.e. what proportion of dependent variable's variance can be explained by the independent variables. In this scenario, 0.925 or 92.5% of the variability of the NDX daily returns can be explained through the selected ten companies' daily returns for the span ten years.

Under the ANOVA table, F-ratio tests the overall fitness of the regression model i.e. statistically, the independent variables significantly predict the dependent variable with  $F(10, 2756) = 3374.71$ .

The estimated model coefficients or the unstandardized coefficients helps indicate the level of variation of dependent variable with each independent variable (keeping all other independent variable as constant). For instance, keeping all other independent variables constant, a 1% change in the AAPL daily returns will bring 18.5% increase or decrease to the NDX index value return. Similarly, a 1% change in the GOOG.L returns (keeping all other independent variables constant), will bring 16.3% associated change in NDX index value return. Further the t-stat and corresponding P-value column tests the significance of the independent variables in a statistical manner i.e. in the population, if the coefficients are equal to zero.

#### **4.5 M&A Overview and Market Reaction for Each Stock:**

##### **4.5.1 Apple Inc. (Nasdaq: AAPL):**

Over the span of selected ten years, the company has recorded 18 transactions with disclosed total value of \$3,611.18 million. Below table 3 graphically shows the market reaction on  $D_0$  and  $D_1$  for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 4 it can be observed for the company Apple, stock prices tend to shift its reaction to positive from 38.89% on  $D_0$  to 72.22% on  $D_1$ , which is a significant increase in the number. While index reaction doesn't change much between the two days.

After studying the press releases and articles for each announcement, it became very evident that on the day of announcement Apple gave very less information about the motive or of any indication related to its future course of action, which made market to react negatively initially. However, the company possess a level of goodwill among its shareholders, which only gives and overlook advantage to the company (which becomes evident when market start to react positively the next day).

Table 3: Transactions by Apple Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
12/05/2009	Apple Inc.	La La Media Inc.	\$80.00	Closed	↓	Closed	↓
09/02/2010	Apple Inc.	Polar Rose AB	\$29.00	↑	↑	↑	↑
07/14/2011	Apple Inc.	C3 Technologies AB	\$154.98	↓	↑	↓	↑
12/20/2011	Apple Inc.	Anobit Technologies Ltd.	\$400.00	↑	↑	↑	↓
02/23/2012	Apple Inc.	Chomp Inc.	\$50.00	↑	↑	↑	↑
07/27/2012	Apple Inc.	AuthenTec, Inc.	\$399.61	↑	↑	↑	↓
03/24/2013	Apple Inc.	Wifislam, Inc.	\$20.00	Closed	↑	Closed	↓
12/02/2013	Apple Inc.	Topsy Labs, Inc.	\$200.00	↓	↑	↓	↓
07/30/2014	Apple Inc.	Concept.io, Inc.	\$30.00	↓	↓	↑	↓
04/14/2015	Apple Inc.	LinX Computational Imaging Ltd.	\$20.00	↓	↑	↓	↑
05/28/2015	Apple Inc.	metaio GmbH	\$32.00	↓	↓	↓	↑
08/05/2016	Apple Inc.	Turi Inc.	\$200.00	↑	↑	↑	↓
12/07/2016	Apple Inc.	30% Stake in Four Energy Companies	\$26.88	↑	↑	↑	↑
05/13/2017	Apple Inc.	Lattice Data, Inc.	\$200.00	Closed	↓	Closed	↑
10/25/2017	Apple Inc.	PowerbyProxi Limited	\$68.71	↓	↑	↓	↓
12/11/2017	Apple Inc.	Shazam Entertainment Limited	\$400.00	↑	↓	↑	↓
10/11/2018	Apple Inc.	Certain Assets of Dialog Semiconductor Plc	\$300.00	↓	↑	↓	↑
07/25/2019	Apple Inc.	Smartphone Modem Business of Intel Corporation	\$1,000.00	↓	↑	↓	↑
<b>Total Number of Transactions</b>			<b>18</b>				
<b>Total Transaction Value</b>			<b>\$3,611.18</b>				
<b>% Positive Reactions</b>				<b>38.89%</b>	<b>72.22%</b>	<b>44.44%</b>	<b>44.44%</b>
<b>% Negative Reactions</b>				<b>44.44%</b>	<b>27.78%</b>	<b>38.89%</b>	<b>55.56%</b>

#### 4.5.2 Adobe Inc. (Nasdaq: ADBE):

Adobe has recorded 11 transactions over the span of selected ten years, with a disclosed total value of \$10,850.28 million. Below table 5 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 6 it can be observed the stock prices of the company tends to react positively on D<sub>0</sub> (with 54.55% of the announcements got positive reaction on the day of announcement) while this trend shifted drastically next day, by 81.82% of the announcements getting a negative reaction. A similar trend can be read for the index value, on D<sub>0</sub> 81.82% of the announcements got positive reaction but this number drastically dropped the next day to 36.36%.

All the press releases and articles indicated to the fact that the company is trying to position itself in the market by investing through M&A in areas different from its core primary business. This strategy gives an advantage to the company initially on the day of announcement;



however, it tends to change the next day when shareholders try to understand how a new market or product different from its core business can bring profits to the company.

Table 5: Transactions by Adobe Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
09/15/2009	Adobe Inc.	Omniure, Inc.	\$1,675.72	↑	↓	↑	↑
07/17/2011	Adobe Inc.	EchoSign, Inc.	\$80.00	Closed	↓	Closed	↓
09/08/2011	Adobe Inc.	Iridas, Certain Assets	\$9.50	↓	↓	↓	↓
11/30/2011	Adobe Inc.	Efficient Frontier, Inc.	\$374.80	↑	↓	↑	↑
12/20/2012	Adobe Inc.	Behance, Inc.	\$130.00	↓	↓	↑	↓
06/27/2013	Adobe Inc.	Adobe Campaign, SAS	\$616.50	↑	↓	↑	↑
12/11/2014	Adobe Inc.	Fotolia LLC	\$800.00	↓	↑	↑	↓
11/09/2016	Adobe Inc.	TubeMogul, Inc.	\$628.76	↓	↓	↑	↓
05/21/2018	Adobe Inc.	Magento, Inc.	\$1,680.00	↑	↑	↑	↓
09/20/2018	Adobe Inc.	Marketo, Inc.	\$4,750.00	↑	↓	↑	↓
01/23/2019	Adobe Inc.	Allegorithmic SAS	\$105.00	↑	↓	↑	↑

Table 6: Adobe M&A Statistics		Total Number of Transactions	11				
		Total Transaction Value	\$10,850.28				
		% Positive Reactions	54.55%	18.18%	81.82%	36.36%	
		% Negative Reactions	36.36%	81.82%	9.09%	63.64%	

#### 4.5.3 Autodesk, Inc. (Nasdaq: ADSK):

17 transactions with a disclosed total value of \$1,818.56 million has been recorded by the company 'Autodesk' over the span of selected ten years. Below table 7 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 8 a trend can be observed in the market reaction for this company, as share price reaction and index value reaction is walking hand in hand in this case, they also tend to increase or bend towards reacting more positively the next day. For instance, in terms of share price, 47.06% of the transactions got positive reaction on D<sub>0</sub> while it increased to 52.94% the next day. A similar trend was followed by the index value reaction, on D<sub>0</sub> 35.29% of the announcements received a positive reaction while this number increasing to 58.82% the next day.

Autodesk's press release statement and the level of information provided in the statement, impacted highly on its overall market reaction. It was observed whenever, the company provided a detailed account on why the company has selected a particular acquisition and what synergy effect it is expecting from the acquisition, the acquisition received a positive reaction (if not on D<sub>0</sub> then definitely on D<sub>1</sub>). Similarly, if the company remained hush-hush or disclosed very little about the transaction motive or synergy effect, then the transaction received negative reaction altogether.

Table 7: Transactions by Autodesk Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
12/08/2009	Autodesk Inc.	PlanPlatform Ltd.	\$19.70	↓	↓	↓	↑
12/31/2009	Autodesk Inc.	Dynamite VSP and Dynamite SIM	\$2.75	↓	↑	↓	↑
02/15/2011	Autodesk Inc.	Scaleform Corporation	\$36.20	↑	↑	↓	↑
02/17/2011	Autodesk Inc.	Blue Ridge Numerics, Inc.	\$41.20	↓	↓	↓	↓
08/01/2011	Autodesk Inc.	Instructables, Inc.	\$30.20	↑	↓	↓	↓
10/20/2011	Autodesk Inc.	Micro Application Packages Limited	\$23.00	↑	↑	↓	↑
12/22/2011	Autodesk Inc.	T-Splines Inc., Certain Technology Related Assets	\$23.00	↑	↑	↑	↑
07/17/2012	Autodesk Inc.	Socialcam Inc.	\$60.00	↑	↑	↑	↑
10/04/2012	Autodesk Inc.	Qontext Inc.	\$26.00	↓	↓	↑	↓
01/08/2013	Autodesk Inc.	PI-VR GmbH	\$48.60	↑	↑	↓	↓
10/02/2013	Autodesk Inc.	GRAITEC S.A., Certain Technology Assets	\$87.00	↑	↓	↑	↑
06/03/2014	Autodesk Inc.	Within Technologies Limited	\$88.00	↑	↓	↓	↑
06/25/2014	Autodesk Inc.	Shotgun Software Inc.	\$54.50	↓	↑	↑	↓
09/23/2015	Autodesk Inc.	netfabb GmbH	\$44.17	↓	↑	↓	↓
07/09/2018	Autodesk Inc.	Assemble Systems, Inc.	\$84.24	↓	↓	↑	↑
11/20/2018	Autodesk Inc.	PlanGrid, Inc.	\$875.00	↓	↑	↓	↑
12/20/2018	Autodesk Inc.	BuildingConnected, Inc.	\$275.00	↓	↓	↓	↓
<b>Total Number of Transactions</b>			<b>17</b>				
<b>Total Transaction Value</b>			<b>\$1,818.56</b>				
<b>% Positive Reactions</b>				<b>47.06%</b>	<b>52.94%</b>	<b>35.29%</b>	<b>58.82%</b>
<b>% Negative Reactions</b>				<b>52.94%</b>	<b>47.06%</b>	<b>64.71%</b>	<b>41.18%</b>

#### 4.5.4 ANSYS, Inc. (Nasdaq: ANSS):

Total of 12 transactions were disclosed by Ansys with a disclosed total value of \$1,940.17 million over the span of selected ten years. Below table 9 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Although table 10 shows the market reaction being more inclined towards negative rather than positive for the company i.e. 58.33% on D<sub>0</sub> and 75.00% on D<sub>1</sub> of the transactions received negative reactions in terms of the share price return, and a similar trend was also followed by the index value return.

Through press releases and articles, it was noted that Ansys tends to keep its M&A announcement very short i.e. it only gives details regarding the integration of target company's products that to be in just few lines. As shareholders tend to understand and crave for more insight in terms of acquisition, it became obvious to why market reacted negatively.

Table 9: Transactions by Ansys Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
06/30/2011	Ansys Inc.	Apache Design, Inc.	\$316.40	↓	↑	↑	↓
05/29/2012	Ansys Inc.	Esterel Technologies S.A.S.	\$52.62	↑	↓	↑	↑
04/02/2013	Ansys Inc.	ANSYS Switzerland GmbH	\$8.70	↓	↓	↑	↓
12/04/2013	Ansys Inc.	Reaction Design, Inc.	\$19.10	↑	↓	↑	↓
05/01/2014	Ansys Inc.	SpaceClaim Corporation	\$84.90	↑	↑	↑	↓
02/04/2015	Ansys Inc.	Newmerical Technologies International Inc.	\$10.50	↓	↑	↓	↓
06/08/2015	Ansys Inc.	Gear Design Solutions, Inc.	\$30.00	↓	↓	↓	↓
03/22/2018	Ansys Inc.	Optis SAS	\$300.00	↓	↓	↓	↓
01/21/2019	Ansys Inc.	Helic, Inc.	\$62.09	Closed	↓	Closed	↓
01/22/2019	Ansys Inc.	Granta Design Limited	\$257.44	↑	↓	↓	↑
09/11/2019	Ansys Inc.	Livermore Software Technology Corporation	\$765.13	↑	↓	↑	↑
10/24/2019	Ansys Inc.	DYNARDO (Dynamic Software and Engineering) GmbH	\$33.29	↑	↓	↑	↑
<b>Total Number of Transactions</b>			<b>12</b>				
<b>Total Transaction Value</b>			<b>\$1,940.17</b>				
<b>% Positive Reactions</b>				<b>33.33%</b>	<b>25.00%</b>	<b>58.33%</b>	<b>33.33%</b>
<b>% Negative Reactions</b>				<b>58.33%</b>	<b>75.00%</b>	<b>33.33%</b>	<b>66.67%</b>

#### **4.5.5 Cisco Systems, Inc. (Nasdaq: CSCO):**

Cisco systems recorded one the highest number of total disclosed transactions over the span of selected ten years, with 34 transactions of disclosed total value of \$27,035.62 million. Below table 11 graphically shows the market reaction on  $D_0$  and  $D_1$  for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 12 it can be observed that majority of the transactions received positive reactions on  $D_0$  as well as  $D_1$ , both in terms of share price as well as index price. In terms of share price reaction, 55.88% of the M&A received positive reactions on  $D_0$  which increased to 67.65% on next day, and a similar trend was followed by index value reaction.

Similar to Autodesk, Cisco's press release statement and the level of information provided in the statement, impacted highly on its overall market reaction. It was observed whenever, the company provided a detailed account on why the company has selected a particular acquisition and what synergy effect it is expecting from the acquisition, the acquisition received a positive reaction (if not on  $D_0$  then definitely on  $D_1$ ). Similarly, if the company disclosed very little about the transaction motive or synergy effect or even if it couldn't justify its transactions, then the M&A received negative reaction altogether (which in this case very limited to few acquisitions).

Table 11: Transactions by Cisco Systems Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
03/19/2009	Cisco Systems Inc.	Pure Digital Technologies LLC	\$446.91	↓	↓	↓	↓
04/09/2009	Cisco Systems Inc.	Tidal Software LLC	\$92.00	↑	↑	↑	↑
10/13/2009	Cisco Systems Inc.	Starent Networks LLC	\$2,827.83	↑	↑	↑	↑
10/27/2009	Cisco Systems Inc.	ScanSafe Limited	\$154.00	↓	↓	↓	↓
05/20/2010	Cisco Systems Inc.	CoreOptics GmbH	\$99.00	↓	↑	↓	↑
02/04/2011	Cisco Systems Inc.	Inlet Technologies LLC	\$95.00	↑	↓	↑	↑
08/21/2011	Cisco Systems Inc.	Axiom Systems Limited	\$30.65	Closed	↓	Closed	↑
10/20/2011	Cisco Systems Inc.	Beaumaris Networks, Inc.	\$99.00	↑	↑	↑	↑
02/24/2012	Cisco Systems Inc.	Lightwire, Inc.	\$254.00	↓	↑	↑	↑
11/15/2012	Cisco Systems Inc.	Cloupia, Inc.	\$125.00	↑	↑	↑	↑
11/18/2012	Cisco Systems Inc.	Meraki, LLC	\$1,200.00	Closed	↑	Closed	↑
11/29/2012	Cisco Systems Inc.	Cariden Technologies, Inc.	\$141.00	↑	↓	↑	↓
01/23/2013	Cisco Systems Inc.	Intucell Ltd.	\$475.00	↓	↑	↑	↓
05/29/2013	Cisco Systems Inc.	JouleX LLC	\$107.00	↑	↑	↓	↓
06/20/2013	Cisco Systems Inc.	Composite Software LLC	\$180.00	↑	↑	↓	↓
07/23/2013	Cisco Systems Inc.	Sourcefire, Inc.	\$2,394.82	↓	↑	↓	↓
09/10/2013	Cisco Systems Inc.	WhipTail Technologies, Inc.	\$415.00	↑	↑	↑	↑
11/06/2013	Cisco Systems Inc.	Insieme Networks, Inc.	\$863.00	↑	↓	↓	↓
06/17/2014	Cisco Systems Inc.	Tail-f Systems AB	\$175.00	↓	↑	↑	↑
09/17/2014	Cisco Systems Inc.	Metacloud, Inc.	\$156.00	↓	↑	↑	↑
06/30/2015	Cisco Systems Inc.	OpenDNS, Inc.	\$635.00	↓	↓	↑	↑
07/07/2015	Cisco Systems Inc.	MaintenanceNet, Inc.	\$139.00	↑	↓	↑	↓
10/27/2015	Cisco Systems Inc.	Lancope, Inc.	\$452.50	↑	↑	↓	↓
02/03/2016	Cisco Systems Inc.	Jasper Technologies, Inc.	\$1,400.00	↑	↑	↑	↑
03/02/2016	Cisco Systems Inc.	Leaba Semiconductor Ltd.	\$320.00	↑	↓	↑	↓
06/28/2016	Cisco Systems Inc.	CloudLock LLC	\$293.00	↑	↑	↑	↑
01/24/2017	Cisco Systems Inc.	AppDynamics LLC	\$4,032.75	↑	↑	↑	↑
05/01/2017	Cisco Systems Inc.	viPtela Inc	\$610.00	↓	↑	↑	↑
05/11/2017	Cisco Systems Inc.	MindMeld, Inc.	\$125.00	↓	↓	↓	↑
08/21/2017	Cisco Systems Inc.	Springpath Inc.	\$320.00	↑	↑	↓	↑
10/23/2017	Cisco Systems Inc.	BroadSoft, Inc.	\$2,288.02	↑	↑	↓	↑
08/02/2018	Cisco Systems Inc.	Duo Security, Inc.	\$2,350.00	↓	↑	↑	↑
12/18/2018	Cisco Systems Inc.	Luxtera, Inc.	\$660.00	↓	↓	↑	↓
07/09/2019	Cisco Systems Inc.	Acacia Communications, Inc. (NasdaqGS:ACIA)	\$3,080.14	↑	↑	↑	↑
<b>Total Number of Transactions</b>			<b>34</b>				
<b>Total Transaction Value</b>			<b>\$27,035.62</b>				
<b>% Positive Reactions</b>				<b>55.88%</b>	<b>67.65%</b>	<b>55.88%</b>	<b>64.71%</b>
<b>% Negative Reactions</b>				<b>38.24%</b>	<b>32.35%</b>	<b>38.24%</b>	<b>35.29%</b>

#### 4.5.6 Cognizant Technology Solutions Corporation (Nasdaq: CTSH):

Over the span of selected ten years, the company has recorded 12 transactions with disclosed total value of \$4,811.72 million. Below table 13 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 14 it can be observed for the company cognizant, stock prices tends to shift from positive to negative reaction in a matter of one day. For instance, in terms of stock price reaction, 58.33% of the M&As received positive reaction on D<sub>0</sub>, however, this shifted on D<sub>1</sub> as 91.67% transactions received negative reaction.

Although, the company provided significant details regarding each acquisition in its press releases or statements, but it became very blur to why market tend to fall or lost trust in the company's transactions spree.

Table 13: Transactions by Cognizant Technology Solutions Corporation from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
10/15/2009	Cognizant Corp.	UBS Service Centre (India) Private Limited	\$62.80	↓	↓	↓	↓
07/26/2011	Cognizant Corp.	CoreLogic Global Services Private Limited	\$50.00	↓	↓	↑	↓
09/27/2011	Cognizant Corp.	Zaffera LLC	\$10.41	↑	↓	↑	↓
12/21/2012	Cognizant Corp.	btconsult And C:1 Solution And psc Management An	\$140.00	↑	↓	↓	↓
05/09/2013	Cognizant Corp.	SourceNet Solutions, Inc.	\$11.00	↑	↓	↓	↑
09/14/2014	Cognizant Corp.	TZ US Parent, Inc.	\$2,700.00	Closed	↓	Closed	↓
10/03/2016	Cognizant Corp.	Frontica Business Solutions AS	\$128.40	↑	↓	↓	↓
03/12/2018	Cognizant Corp.	Bolder Healthcare Solutions LLC	\$477.00	↓	↓	↑	↓
10/04/2018	Cognizant Corp.	Softvision, LLC	\$541.00	↓	↓	↓	↓
03/05/2019	Cognizant Corp.	Meritsoft	\$228.00	↓	↑	↑	↓
06/18/2019	Cognizant Corp.	Zenith Technologies Limited	\$161.52	↑	↓	↑	↑
10/16/2019	Cognizant Corp.	Contino Solutions Limited	\$301.59	↑	↓	↓	↑
<b>Total Number of Transactions</b>			<b>12</b>				
<b>Total Transaction Value</b>			<b>\$4,811.72</b>				
<b>% Positive Reactions</b>				<b>58.33%</b>	<b>8.33%</b>	<b>41.67%</b>	<b>25.00%</b>
<b>% Negative Reactions</b>				<b>33.33%</b>	<b>91.67%</b>	<b>50.00%</b>	<b>75.00%</b>

#### 4.5.7 Citrix Systems, Inc. (Nasdaq: CTXS):

Citrix Systems has recorded 16 transactions over the span of selected ten years, with a disclosed total value of \$1,413.91 million. Below table 15 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 16 it can be observed that the company's transactions got overall neutral reactions over the years, i.e. it remained to almost 50% of the transactions receiving positive reactions on both days.

All the press releases and articles indicated to the fact that the company is trying to position itself in the market by investing through M&A to expand its primary products and services. This strategy and keeping things simple might have given the company an advantage of receiving a neutral reaction.

Table 15: Transactions by Citrix Systems Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
08/30/2010	Citrix Systems, Inc.	VMLogix, Inc.	\$18.30	↓	↓	↓	↓
05/23/2011	Citrix Systems, Inc.	Kaviza, Inc.	\$20.20	↓	↓	↓	↓
07/12/2011	Citrix Systems, Inc.	Cloud.com, Inc.	\$164.40	↓	↓	↓	↑
08/10/2011	Citrix Systems, Inc.	RingCube Technologies, Inc.	\$32.70	↓	↑	↓	↑
10/13/2011	Citrix Systems, Inc.	novel labs, Inc.	\$56.20	↑	↑	↑	↑
10/26/2011	Citrix Systems, Inc.	App-DNA Limited	\$91.30	↑	↑	↓	↑
04/11/2012	Citrix Systems, Inc.	Podio ApS	\$45.30	↑	↑	↑	↑
12/05/2012	Citrix Systems, Inc.	Zenprise, Inc.	\$327.10	↓	↑	↓	↑
01/08/2014	Citrix Systems, Inc.	Framehawk, Inc.	\$24.50	↑	↓	↑	↓
10/20/2014	Citrix Systems, Inc.	RightSignature LLC	\$37.50	↑	↑	↑	↑
01/12/2015	Citrix Systems, Inc.	Sanbolic, Inc.	\$89.60	↑	↓	↓	↓
04/06/2015	Citrix Systems, Inc.	Grasshopper Group, LLC	\$172.50	↑	↑	↑	↓
09/08/2016	Citrix Systems, Inc.	VirtuAll Solutions Ltd.	\$15.31	↓	↓	↓	↓
01/09/2017	Citrix Systems, Inc.	Unidesk Corporation	\$60.40	↓	↓	↑	↑
02/12/2018	Citrix Systems, Inc.	Cedexis Inc.	\$72.00	↑	↑	↑	↑
11/15/2018	Citrix Systems, Inc.	Sapho, Inc.	\$186.60	↑	↑	↑	↓
<b>Total Number of Transactions</b>			<b>16</b>				
<b>Total Transaction Value</b>			<b>\$1,413.91</b>				
<b>% Positive Reactions</b>				<b>50.00%</b>	<b>56.25%</b>	<b>50.00%</b>	<b>56.25%</b>
<b>% Negative Reactions</b>				<b>50.00%</b>	<b>43.75%</b>	<b>50.00%</b>	<b>43.75%</b>

#### 4.5.8 Alphabet Inc. (Nasdaq: GOOG.L):

Alphabet Inc. has recorded the highest number of total disclosed transactions over the span of selected ten years, with 37 transactions of disclosed total value of \$25,964.27 million. Below table 17 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Through table 18 it can be observed that majority of the transactions received positive reactions on D<sub>0</sub> however, this trend shifted on D<sub>1</sub> by most of the transactions receiving negative reaction, both in terms of share price as well as index price.

Alphabets press releases and articles surrounding the given press releases highlighted to the fact that the company is trying to acquire the market in terms of patents or products without making extra effort on understanding the future synergy effect. It was speculated that this strategy was being followed by GOOG.L in effort to overcome the increasing competition from Facebook.

Table 17: Transactions by Alphabet Inc. from 2009 to 2019, and Market Reaction							
Date	M&A Details		TTV (US\$ mn)	Stock Price Reaction		Index Value Reaction	
	Acquirer	Target		D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
02/12/2009	Alphabet Inc.	Stora Enso Corp., Buildings and most of the Summa I	\$51.35	↑	↓	↑	↓
08/05/2009	Alphabet Inc.	On2 Technologies Inc.	\$139.47	↑	↓	↓	↓
09/16/2009	Alphabet Inc.	reCAPTCHA Inc.	\$22.00	↓	↑	↑	↓
11/09/2009	Alphabet Inc.	AdMob, Inc.	\$674.76	↑	↑	↑	↑
02/11/2010	Alphabet Inc.	Aardvark	\$50.00	↑	↓	↑	↑
05/18/2010	Alphabet Inc.	Global IP Solutions, Inc.	\$67.87	↑	↓	↓	↑
07/01/2010	Alphabet Inc.	ITA Software, Inc.	\$700.00	↓	↓	↓	↓
08/06/2010	Alphabet Inc.	Slide, Inc.	\$179.00	↑	↑	↓	↑
08/09/2010	Alphabet Inc.	Jambool, Inc.	\$70.00	↑	↓	↑	↑
09/13/2010	Alphabet Inc.	MentorWave Technologies Ltd.	\$10.00	↑	↓	↑	↑
12/03/2010	Alphabet Inc.	Widevine Technologies, Inc.	\$158.00	↑	↑	↑	↓
12/06/2010	Alphabet Inc.	18 Story Building in New York	\$1,800.00	↑	↑	↓	↓
03/07/2011	Alphabet Inc.	BeatThatQuote.com Limited	\$61.15	↓	↑	↓	↑
04/10/2011	Alphabet Inc.	PushLife Inc.	\$25.00	Closed	↓	Closed	↓
04/18/2011	Alphabet Inc.	845 Megawatt Shepherds Flat Wind Project	\$500.00	↓	↓	↓	↑
08/15/2011	Alphabet Inc.	Motorola Mobility Holdings, Inc.	\$12,033.16	↓	↓	↑	↓
09/08/2011	Alphabet Inc.	Zagat Survey, LLC	\$151.00	↑	↓	↓	↓
09/19/2011	Alphabet Inc.	Daily Deal GmbH	\$114.00	↑	↓	↑	↓
10/18/2011	Alphabet Inc.	The Landmark at Shoreline	\$100.00	↓	↓	↑	↓
06/04/2012	Alphabet Inc.	Meebo, Inc.	\$100.00	↑	↓	↑	↑
08/13/2012	Alphabet Inc.	John Wiley & Sons Inc., Travel Assets	\$22.00	↑	↑	↑	↓
11/30/2012	Alphabet Inc.	BufferBox Inc.	\$17.00	↑	↓	↑	↓
01/17/2013	Alphabet Inc.	SVMK Inc. (NasdaqGS:SVMK)	\$794.00	↓	↓	↑	↓
02/06/2013	Alphabet Inc.	Channel Intelligence, Inc.	\$125.00	↑	↑	↓	↑
04/23/2013	Alphabet Inc.	Wavii, Inc.	\$30.00	↑	↑	↓	↓
06/11/2013	Alphabet Inc.	Waze Mobile Limited	\$966.00	↓	↓	↓	↓
07/15/2013	Alphabet Inc.	200,000 Square Foot Portfolio of Manufacturing & O	\$66.70	↑	↓	↑	↓
09/16/2013	Alphabet Inc.	Two R&D Buildings in Mountain View	\$16.00	↓	↓	↓	↑
10/02/2013	Alphabet Inc.	Flutter, Inc.	\$40.00	↑	↓	↑	↓
10/07/2013	Alphabet Inc.	1010 Corporation Way	\$9.48	↓	↓	↓	↓
10/22/2013	Alphabet Inc.	FlexyCore SAS	\$22.04	↑	↑	↓	↓
01/13/2014	Alphabet Inc.	Nest Labs, Inc.	\$3,200.00	↓	↑	↓	↑
01/27/2014	Alphabet Inc.	Deepmind Technologies Limited	\$401.29	↓	↑	↓	↓
05/19/2014	Alphabet Inc.	Divide	\$120.00	↑	↑	↑	↓
06/02/2014	Alphabet Inc.	400,000 Square Foot Campus at 700 E. Middlefield	\$250.00	↓	↓	↓	↓
06/09/2014	Alphabet Inc.	Terra Bella Technologies Inc.	\$478.00	↑	↓	↑	↑
03/20/2018	Alphabet Inc.	Chelsea Market in New York	\$2,400.00	↓	↓	↑	↓
<b>Total Number of Transactions</b>			<b>37</b>				
<b>Total Transaction Value</b>			<b>\$25,964.27</b>				
<b>% Positive Reactions</b>				<b>54.05%</b>	<b>35.14%</b>	<b>54.05%</b>	<b>29.73%</b>
<b>% Negative Reactions</b>				<b>43.24%</b>	<b>64.86%</b>	<b>43.24%</b>	<b>70.27%</b>

#### 4.5.9 Intel Corporation (Nasdaq: INTC):

Total of 20 transactions were disclosed by Intel with a disclosed total value of \$47,654.77 million over the span of selected ten years. Below table 19 graphically shows the market reaction on D0 and D1 for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a negative change (i.e. when market reacted negatively for the related M&A). Although table 20 shows the market reaction being more inclined towards negative rather than positive for the company i.e. 58.33% on D0 and 75.00% on D1 of the transactions received negative reactions in terms of the share price return. However, an opposite trend was recorded with the index price reaction as it was more inclined towards the positive reaction.

Through press releases and articles, it was noted that Intel tends to keep its M&A announcement very short i.e. it only gives details regarding the integration of target company's products that to be in just few lines. As shareholders tend to understand and crave for more insight in terms of acquisition, it became obvious to why market reacted negatively.

Table 19: Transactions by Intel Corporation from 2009 to 2019, and Market Reaction							
Date	M&A Details			Stock Price Reaction		Index Value Reaction	
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>
06/04/2009	Intel Corp.	Wind River Systems, Inc.	\$884.39	↑	↓	↑	↑
05/24/2010	Intel Corp.	Comsys Communications and Signal Processing Ltd.	\$30.00	↓	↑	↓	↑
08/19/2010	Intel Corp.	McAfee LLC	\$7,696.08	↓	↑	↓	↑
08/29/2010	Intel Corp.	Wireless Solutions Business from Infineon Technolog	\$1,400.00	Closed	↓	Closed	↓
09/05/2010	Intel Corp.	Neocelus, Inc.	\$1.00	Closed	↓	Closed	↓
01/23/2012	Intel Corp.	QLogic Corp., Product Lines And Certain Assets Of Inf	\$125.00	↑	↑	↑	↓
01/26/2012	Intel Corp.	RealNetworks Inc., Certain Patent and Codec Assets	\$120.00	↑	↓	↓	↑
04/24/2012	Intel Corp.	Cray Inc., Interconnect Hardware Assets	\$140.00	↑	↑	↓	↑
07/16/2013	Intel Corp.	Omek Interactive Ltd.	\$40.00	↑	↓	↓	↑
09/30/2013	Intel Corp.	Sensory Networks, Inc.	\$20.00	↓	↓	↓	↑
03/25/2014	Intel Corp.	Basis Science, Inc.	\$100.00	↓	↓	↑	↓
05/09/2014	Intel Corp.	Ginger Software, Inc., Personal Assistants Platform	\$30.00	↓	↑	↑	↑
08/13/2014	Intel Corp.	LSI Corporation, Axia Networking Business and Rela	\$650.00	↑	↓	↑	↑
02/02/2015	Intel Corp.	Lantiq Deutschland GmbH	\$383.00	↓	↑	↑	↑
06/01/2015	Intel Corp.	Altera Corp.	\$18,216.18	↓	↑	↑	↓
09/05/2016	Intel Corp.	Movidius, Inc.	\$395.74	Closed	↑	Closed	↑
09/23/2016	Intel Corp.	Soft Machines, Inc.	\$270.00	↓	↓	↓	↓
03/13/2017	Intel Corp.	Mobileye N.V.	\$15,426.38	↓	↑	↑	↓
10/15/2019	Intel Corp.	Smart Edge Software Business of Smart-Edge.com, In	\$27.00	↑	↓	↑	↓
12/16/2019	Intel Corp.	Habana Labs Ltd.	\$1,700.00	↓	↓	↑	↑

Table 20: Intel M&A Statistics		Total Number of Transactions	20				
		Total Transaction Value	\$47,654.77				
		% Positive Reactions		35.00%	40.00%	50.00%	60.00%
		% Negative Reactions		50.00%	60.00%	35.00%	40.00%

#### 4.5.10 Microsoft Corporation (Nasdaq: MSFT):

16 transactions with the highest disclosed total value among the selected ten companies, of \$62,063.06 million has been recorded by the company 'Microsoft' over the span of selected ten years. Below table 21 graphically shows the market reaction on D<sub>0</sub> and D<sub>1</sub> for both stock market as well as index value in terms of green up arrows indicating a positive change (i.e. when market reacted positively on M&A announcement) while red down arrows indicating a

negative change (i.e. when market reacted negatively for the related M&A). Through table 22 a trend can be observed that market is reacting negatively in terms if share price reaction but index value is reacting on a neutral way with keeping 50% of the reactions as positive. Through Microsoft press releases and articles it became clear that the company was not keen on disclosing the synergy factors and motives while making an acquisitions, which only gave push to the shareholders to react negatively most of the time.

Table 21: Transactions by Microsoft Corporation from 2009 to 2019, and Market Reaction								
Date	M&A Details			Stock Price Reaction		Index Value Reaction		
	Acquirer	Target	TTV (US\$ mn)	D <sub>0</sub>	D <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>	
03/29/2009	Microsoft Corp.	3DV Systems Ltd.	\$35.00	Closed	↓	Closed	↓	
03/21/2011	Microsoft Corp.	Nortel Networks Inc., IPv4 Number Block	\$7.50	↑	↓	↑	↓	
05/10/2011	Microsoft Corp.	Skype Global S.à r.l.	\$9,324.86	↓	↓	↑	↓	
06/30/2011	Microsoft Corp.	Nortel Networks Corp., Patent Portfolio	\$4,500.00	↑	↑	↑	↑	
11/22/2011	Microsoft Corp.	VideoSurf Inc.	\$70.00	↓	↓	↑	↓	
04/09/2012	Microsoft Corp.	AOL Inc., Patents and License to Retained Patent Por	\$1,056.00	↓	↓	↓	↓	
06/25/2012	Microsoft Corp.	Yammer, Inc.	\$1,200.00	↑	↑	↓	↑	
03/14/2013	Microsoft Corp.	PandoMedia Inc.	\$11.00	↑	↓	↑	↓	
09/15/2014	Microsoft Corp.	Mojang AB	\$2,500.00	↓	↑	↓	↑	
11/13/2014	Microsoft Corp.	Aorato Ltd.	\$200.00	↑	↓	↑	↑	
01/19/2015	Microsoft Corp.	Equivio Ltd.	\$200.00	Closed	↑	Closed	↑	
04/07/2015	Microsoft Corp.	Informatica LLC	\$5,848.87	↓	↓	↓	↑	
09/08/2015	Microsoft Corp.	Adallom, Inc.	\$320.00	↑	↓	↑	↓	
02/03/2016	Microsoft Corp.	TouchType Limited	\$250.00	↓	↓	↓	↓	
06/13/2016	Microsoft Corp.	LinkedIn Corporation	\$29,039.83	↓	↓	↓	↑	
06/04/2018	Microsoft Corp.	GitHub, Inc.	\$7,500.00	↑	↑	↑	↑	
<b>Total Number of Transactions</b>			<b>16</b>					
<b>Total Transaction Value</b>			<b>\$62,063.06</b>					
<b>Table 22: Microsoft M&amp;A Statistics</b>				<b>% Positive Reactions</b>	<b>37.50%</b>	<b>31.25%</b>	<b>50.00%</b>	<b>50.00%</b>
				<b>% Negative Reactions</b>	<b>50.00%</b>	<b>68.75%</b>	<b>37.50%</b>	<b>50.00%</b>



## **SECTION 5: CONCLUSION AND LIMITATIONS**

### **5.1 Conclusion**

Given the sample of 193 transactions spreading over the given ten years (2009 to 2019) which were analysed, it became evident that technology companies have shifted its strategy focus to investing. It can be said that this not only provided as a basic growth strategy but also as market consolidation strategy for the big players. For instance, Alphabet Inc. and Cisco Systems were the largest players following this strategy. As, it is becoming difficult for the companies to spend more and more on in house research and development, they have started to acquire companies who in future might pose as a competitor.

Going through press releases and articles for each of the 193 transaction provided a consensus that a company's goodwill just not enough to satisfy the shareholders, but they also demand a detailed version of the know-how of each transaction. Whenever, the companies tried to keep an acquisition under wraps the market has reacted negatively, not only the share prices but the index values. Moreover, it was observed that most of the times index value has walked hand in hand with the stock price return and reacted in a similar trend as stock price reaction. Moreover, it was also analysed through ten-year return analysis and multiple regression analysis that NDX index was highly impacted by the M&A announcements.

### **5.2 Limitations**

This study, due to the time constraint, was only able to focus on the returns and synergy impact for two days (i.e. the day of announcement and next day of the announcement). However, other aspects can also be factorised in this study to further justify the each reaction of share price as well index value. These influence factors can be deal size of the M&As, target country, payment method (cash, debt or mix), product mix and economic factors. Multiple regression analysis can also be performed with each of the factors to understand its individual impact.

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