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DETERMINING COMPLEXITY'S ROLE IN THE M&A MARKET

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ABSTRACT

This paper looked at the effect complexity has on a Merger and or Acquisition. The working hypothesis is that during the acquisition of a company, on average "complicated" firms sell for a lower bid premium when compared to their "simple" counterparts. Twenty deals were examined, each being classified as "complex" or "simple" based on the underlying complexity of the target's business. For each deal, deal characteristics, # of SIC codes, bid premium, and acquirer announcement returns were found. These were found by using multiple regression models and data summary tools. This data was then used to compare the effect complexity had on the deal process for the 10 complex deals versus 10 simple deals. The results support the idea that the complexity of a target firm has a direct correlation with a higher beta, bid premium, and acquirer announcement return when compared to "simple" deals. The potential reasons for this vary but are hypothesized to be due to potential larger synergies, poor corporate governance of complicated firms, and lack of available buyers. A larger sample size in the future would have to be used to come up with statistically significant results.

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I would also like to thank my thesis reader, Brian Davis, for taking the time to not only read my thesis but hundreds that have come before me. You are an invaluable part of Schreyer's and Smeal. Without his help in Finance 408 and Finance 494 I can promise you this paper never would have been finished.

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Chapter 1

Introduction

This paper aims to look at traditional ideas of determining complexity and create a new method of defining a “complex” company. The working hypothesis is that during the acquisition of a company, on average, “complicated” firms sell for a lower bid premium when compared to their “simple” counterparts. With this new method of defining a “complex” company, 10 M&A deals were chosen to represent the complicated deal group. Another 10 deals were chosen to represent the “Simple” deal group using a similar methodology. Where a buyer looked to purchase a “Simple” target. These deals were chosen to best represent a “random” selection, companies were chosen with different SIC Codes, different deal sizes, and different locations within the United States. The time chosen was from 1990 to the present due to changing methodologies for M&A acquisitions and laws accompanying them. Using this newly defined idea of complexity, a study was done to calculate the bid window, bid premium, and announcement return for the acquirer for these twenty companies. And the culmination of this data was used to determine the effects of complexity on the “complex” group when compared to the “simple” group.

Historically, according to Loughran, there have been several variables that have been used to determine complexity. Such as the “number of firm segments, readability, diversity of XBRL tags, relative level of intangibles, presence of foreign sales, and firm age have been used when complexity is included as a conditioning variable in accounting and finance”. These variables support different approaches to define complexity within a company. Also, according to Loughran, another potential metric for determining complexity is audit fees. Unfortunately, there is also a large correlation of audit fees with scale of the company, which creates a biased variable.

For this thesis, the number of segments within a company, although proven to have a few faults, is an effective and proven method of proving complexity. Expanding on this idea, the number of SIC codes (which is related to the number of segments) could also be used to determine complexity. For this study, for a company to be considered complex for this paper, it must have at least 5 different SIC codes that have a variation of at least 100.

Chapter 2 is a literature review of determining complexity in the M&A Deal Space, Merger and Acquisition deal activity, and the overall deals market and trends within it. Chapter 3 states the hypothesis going into the paper, which as stated above is that during the acquisition of a company, on average, "complicated" firms sell for a lower bid premium when compared to their "simple" counterparts. Chapter 4 is the data gathering process, which highlights key terms needed to understand the thesis. After the key terms, it describes the data collection process, and the use of that data to calculate bid windows, bid premiums, and acquirer announcement returns. After completing this for each of the twenty companies, Chapter 5 is the analysis of the culmination of this data separated by complex and simple firms. Finally, Chapter 6 is the conclusion of the paper followed by the bibliography and Academic Vita.

Chapter 2 : Literature Review

Introduction:

For this thesis, my working topic is that during the acquisition of a company, on average complicated/opaque firms sell for a lower premium when compared to their counterparts. To understand the literature in this field, I went through topics that revolve around M&A and the current state of academic research. To do this I cited each article and wrote a small summary of why I believe this will be useful for my paper and a summary of the article at hand. I then looked at the culmination of my research and sorted the papers into different "buckets". This way it is easy to grasp the concepts floating around academic research, and it will be easy to find an article when I am in the process of writing my paper.

Initially I began by looking at easy digestible articles that introduced me to current literature, such as the Wall Street Journal, PE HUB, and the New York Times. The next level to finding these sources started with Google Scholar and diving into the most popular papers and then looking at what works were cited within them. I wanted to make sure to find relevant articles that would help with my paper and ones that led to me seeing potential gaps in academic research. After going through a lot of papers that way, I met with my Thesis Advisor, Stefan Lewellan, and he gave me another ten sources that he believed would be helpful in my review overall.

Review of Literature:

This section of the paper is broken down into six different sections that really summarize the work that is going on in M&A academic work. Those six sections are as follows: Examining & Measuring Firm Complexity, ESG in Acquisitions, Variables that Constitute and Contribute to Success in Mergers and Acquisitions, Trends and Informational papers on Mergers and Acquisitions, The Role and Advantages of Investment Banks in M&A transactions, Papers examining Factors that Influence Expected returns within the Stock Market.

Examining & Measuring Firm Complexity:

In this section, we look at papers that examine firm complexity and how to measure it. Along with the major ideas represented in this bucket. Lauren Cohen & Dong Lou's "Complicated firms". This study looks at if the complicated nature of a firm has any impact on how the firm responds to information shocks. They do this by looking at two firms within the same industry, and then look at an information shock that should impact the two firms equally. One is more straightforward while the other is complicated meaning that there are more analyses to impact the same level of information. The study finds that the more complicated firms on average take longer to incorporate the same information when compared to easy-to-analyze firms. What is interesting is that you can use the easy-to-analyze firms to predict what will happen to the more complicated firms later on. This is a great take to confirm there is friction in the market for complicated firms. Loughran & McDonald's "Measuring Firm Complexity".

This paper gives different ways of measuring firm complexity, “Because a firm’s complexity can be considered from many different perspectives and because it is difficult to measure, complexity is usually not a prominent variable in regression specifications”. When they spent time looking at variables, they realized that “Historically, variables such as the number of firm segments, readability, diversity of XBRL tags, relative level of intangibles, presence of foreign sales, and firm age have been used when complexity is included as a conditioning variable in accounting and finance.”(2). A good possible simple measure of firm complexity would be file size or word count of the companies 10-K. The paper tried to choose a list of words and search for them within 10-K reports to show complexity, but it ultimately failed outside of the audit report.

ESG in Acquisitions:

In this section, we look at papers that examine ESG in M&A activity. Along with the major ideas represented in this bucket. Cartwright & Cooper’s “The Impact of Mergers and Acquisitions on People at Work: Existing Research and Issues.”. Gives insights on the actual causal effects on the employees of companies that go through M&A activity. People have cited the emotional bond of employees and their companies. And even gone as far to say when their company is bought it is similar for employees to feel as if they lost a friend (73). This gives a lot of very good information on possible downsides of going through with an acquisition. It made me think of possibly adding an element of “employee” moral in my model. I am not entirely sure how I would go about doing it, in terms of data and observation. But I believe the moral and employee thought process is extremely important during the entire process. Also provides a good amount of background on why an M&A make take place. Kooli, Chokri, & Melanie’s "Impact of COVID-19 on Mergers, Acquisitions & Corporate Restructurings.". This paper studies the changes seen in the M&A market post covid-19, I have seen other papers hinting towards the changes in ESG investing and value creation. It contributes some of the new reasons for M&A activity post Covid-19, such as: Divestitures, Digitalization of M&A Activity, Increased focus on scope, Cross-border M&A,

Consolidation of industries, etc. I think having a paper written within the last year addressing the specific changes we have witness will be extremely helpful to build background information and use this as a lens for my model.

Variables that Constitute and Contribute to Success in Mergers and Acquisitions:

In this section, we look at papers that examine variables that constitute and contribute to success in Mergers and Acquisitions. Along with the major ideas represented in this bucket. Alhenawi, Yasser, & Stilwell's "Value creation and the probability of success in merger and acquisition transactions.". This paper examines the ratios of a company prior to and after an acquisition and uses this pivotal information to predict the success of the purchase. This paper is very interesting as well as it provides the flaws of previous years of research and is relatively newer (2017). This paper also uses models and statistics to predict success and will be very helpful to examine their techniques when creating my own model. It also emerges the idea that lower debt enhances corporate control, bringing to light a new factor (Debt in the transaction) that may be important to study. Marks & Mirvis's "Merge Ahead: A Research Agenda to Increase Merger and Acquisition Success.". One of the most helpful papers I have found so far, as it talks about the previous failures of M&A activity. Such as this quote "Many factors account for the dismal M&A track record, including paying the wrong price, buying the wrong company, or making the deal at the wrong time. Our own 30 year research program nds that the processes used to put companies together are integral to a deals success versus failure (Marks and Mirvis 2010). This encompasses the formation and operations of the buying team (Mirvis and Marks 1992), how the rms are integrated (Marks and Mirvis 2000), and learning from current deals to better manage future ones (Marks and Mirvis 2001)". I believe this paper will hold a strong foundation within my paper as it explores similar ideas of missing information that I have come across.

Pop's "Estimation and Prediction of Acquisition Success". This paper addresses a very similar topic of predicting success through acquisitions, although it is not a cited paper it provides a ton of great

background and is very helpful for understanding. Will have to be careful in citing or using this source, may be more relatable for a background for me then actual use, as it is not actually published. But a ton of different models measuring success are shown, such as the logit model. Marks' "Making Mergers and Acquisitions Work: Strategic and Psychological Preparation [and Executive Commentary]." This paper addresses a lot of the failures seen in the M&A field, and why so many of them fail. I believe this will be extremely helpful as understanding why so much M&A activity may fail will help me pick variables that contribute to success. Also I can possibly add a dummy variable for a negative variable, and if the company has that, it may affect the positivity of the Merger which could be very helpful. It also could be approached from the idea of ESG, as it really looks at the people side of M&A. And how culture and preparation are vital for a successful transaction.

Uysal, Kedia, & Panchapagesan's "Geography and acquirer returns". Researchers look at the correlation of success in a M&A transaction and "the geographic proximity" between the target and the acquirer. "Geographic proximity is associated with knowledge spillovers, resolution of information problems in bank lending, and more accurate earnings forecasts by analysts.1 Information advantages associated with geographic proximity have also been found to explain the "local bias" observed in mutual fund investments as well as in the portfolio decisions of individual investors.2 Geographic proximity between the acquirer and the target is likely to facilitate the transmission of soft information, which is difficult to codify and is often serendipitously recognized, as opposed to hard information that is tangible and can be easily coded, transmitted, and interpreted." The paper goes on to find that acquirers earn significantly higher returns for their local transactions vs their non-local transactions. Another metric for success, and adds on to the literature for predicting success. Servaes' "Tobin's Q and the Gains from Takeovers". The Q ratio, also known as Tobin's Q, equals the market value of a company divided by its assets' replacement cost. Thus, equilibrium is when market value equals replacement cost. At its most basic level, the Q Ratio expresses the relationship between market valuation and intrinsic value. This paper shows that total returns are higher in an acquisition when the targets have low q ratios and the

bidders have high q ratios. It is interesting metric to look at, and another one in the long line of literature that aims to measure success of an M&A deal. A way of looking at success withing M&A transactions, which caps out the wide variety of deals in the working.

Trends and Informational papers on Mergers and Acquisitions:

In this section, we look at papers that examine trends in Mergers and Acquisitions. Along with relevant summaries and takeaways from these contributions. Cartwright & Schoenberg's "Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities." . This paper about M&A over the past 30 years and how the market is changing, gives a very good background to the landscape and has a lot of papers and references that can be used in the future while I am writing my paper. This shows how historical takes have evolved over the years, and the evolution of the M&A market. Great for background and understanding how the market has evolved. Deyoung, Evanoff, & Molyneux's "Mergers and Acquisitions of Financial Institutions: A Review of the Post-2000 Literature.". The paper examines the M&A landscape post 2000, has a lot of insightful observations about how the market is changing which I believe will be extremely helpful in coming up with relevant variables for the model. Also again gives a great background on the M&A market that will help advance my knowledge of the field. Faulkner, Teerikangas, Joseph's "The Handbook of Mergers and Acquisitions". Gives great insights on how M&A activity performs and lists how these impacts can be properly measured. This paper will be great for examining the weighted average of success talked about at the beginning. And inspires a lot of good ideas for measuring the success of a M&A activity. Also, it provides powerful insights and background that will be good for me to learn and expand upon in my paper overall.

The Role and Advantages of Investment Banks in M&A transactions:

In this section, we look at papers that examine the roles and advantages of Investment Banks in Mergers and Acquisitions. Along with relevant summaries and takeaways from these contributions. Bao & Edmans' "Do Investment Banks Matter for M&A Returns?". The paper shows a positive significant

link between Investment Banks being a part of the deal vs not. This is a big deal due to earlier papers finding no apparent connection. This can largely be attributed to the lack of experience of a management team in conducting M&A deals. And that "The skilled advice hypothesis is that banks help clients to identify synergistic targets and negotiate favorable terms. If banks indeed provide valuable advice, it is reasonable to expect that the highest-quality advisors lead to the best outcomes" (2). They also use the metric of announcement returns to test their hypothesis. Sibilkov, Valeriy, & McConnell's "Prior Client Performance and the Choice of Investment Bank Advisors in Corporate Acquisitions.". This is another paper examining the forces that investment banks play within M&A transactions. It addresses the fact that most consumers do not chose their investment bank for the reason of adding the most value, but possibly prioritizing relationships. As many people who have worked with an investment bank tend to use their services again, even if they did not optimize their returns. Since this is a strong supported, they look to examine if the market predicts future cash flows above the deal since recurring deals are more likely. Very interesting perspective of the paper overall. Servaes, Henri, & Zenner's "The Role of Investment Banks in Acquisitions.". This is an older paper that examines the use of investment banks and why some do and do not. Although it proves that investment banks lead to higher premiums on deals vs those who do not use them. The main deterrent can be seen as the transaction costs of using an IB. There are also a variety of reasons a firm would use an investment bank, such as complexity of the deal, type of transaction, previous experience, and the complexity of the target. Overall, a good paper that reflects historical norms within the field.

Papers examining Factors that Influence Expected returns within the Stock Market:

In this section, we look at papers that examine factors that influence expected returns in the stock market. Along with relevant summaries and takeaways from these contributions. Johnson's "Forecast Dispersion and the Cross Section of Expected Returns." Forecast Dispersion and Cross Section of expected returns, a paper that establishes the reasoning for the negative relationship between stock returns and the dispersion of analysts' earnings forecasts. Which is that there are negative returns when

decreasing idiosyncratic risks of a levered firm. A good paper demonstrating market dynamics. Diether's "Differences of Opinion and the Cross Section of Stock Returns.". This paper looks at the actual relationship between the increase in volatility in analyst's earnings and the poor performance when compared to stocks with less dispersion. This is the basis of the paper mentioned above. And is another metric which can be used to look at firm complexity overall. Hong & Stein's "Disagreement and the Stock Market.". Disagreement models and their variables and how the field of behavioral finance is evolving. "Disagreement models have several attractive features. In our view, the most compelling is that they allow us to speak directly to the joint behavior of stock prices and trading volume. Indeed, we find it hard to imagine a fully satisfying asset-pricing model—in either the rational or behavioral genres—that does not give a front-and-center role to volume.". Interesting paper that brings in the new age philosophy of investing.

Conclusion:

While examining the six "buckets": Examining & Measuring Firm Complexity, ESG in Acquisitions, Variables that Constitute and Contribute to Success in Mergers and Acquisitions, Trends and Informational papers on Mergers and Acquisitions, The Role and Advantages of Investment Banks in M&A transactions, Papers examining Factors that Influence Expected returns within the Stock Market. I was able to familiarize myself a lot with the research being done in this field overall. This was a very helpful process and it brought out a ton of very good points that can be helpful in the long run.

Chapter 3

Hypotheses

For this paper, 20 deals were examined with 10 being considered “simple” deals and 10 being considered “complex” deals. To determine if a deal is defined as “complex” or “simple”, the number of SIC codes for the target in the deal had to be examined. After examining the overall average number of SIC codes for a company using previous M&A deals, the number fell around 3-4 SIC codes (Zepyhr). This was used to define simple target companies as any company with less than 3 SIC codes. And a complex target as one with greater than 5 SIC codes. My hypothesis is that there should be a smaller premium paid than in comparison to “simple” deals. The reasons for this are twofold: first, because complicated firms are more difficult to understand and value, potential buyers may discount their bids somewhat to account for the greater uncertainty inherent in purchasing such firms; and second, because there may be that there are a smaller amount of buyers for a “complicated” company which then results in less competition when bidding to purchase the target. This results in a smaller premium overall. Another possible explanation is there may be an exclusive sale with only one potential buyer, as there are not any other companies that would be interested in the company. Also, there may be less confidence in realizing synergies, as the complexity of the company may interfere with potential projections. All these factors are detrimental to the potential bid premium an acquirer may offer a “complicated” target. If this theory stands true, then the announcement returns of a complex deal should be higher than a non-complex deal as they got a “better” deal for the company. Meaning they paid a smaller bid premium than the market expected.

Also, when looking at standardized unexpected earnings and stock return volatility. More complex firms should be associated with higher subsequent absolute earnings shocks and higher stock return volatility (Loughran). This then results in a higher Beta (higher volatility) for more complicated firms, we may see the market respond more positively as there is a higher potential for returns. All these

factors and more may play an important role in explaining bid premium and the market expectations that come with them.

Chapter 4

Data Gathering Process

Key Terms:

For this section, I will be focusing on key terms that will help readers understand the data gathering process, these definitions are supported by Stefan Lewellen's Finance 405 class notes:

Merger and Acquisitions (M&A): The combination of companies or assets through various types of financial transactions. A merger involves the combination of two or more companies into a single entity, while an acquisition involves one company taking over another company's assets or stock. M&A transactions can be executed through a variety of means, including stock purchases, cash payments, and the issuance of new securities. The goal of an M&A deal is typically to create synergies between the merging or acquiring companies, which can result in increased efficiency and profitability.

Bid Window: The time period in which deal rumors and deal speculation start to affect the stock price of the acquirer to the announcement date of the deal, this is used to help calculate the bid premium of an M&A deal.

Bid Premium: The additional amount that a buyer is willing to pay above the current market price of the target company's stock (for a public company). The bid premium can be used as a measure of the value that the buyer places on the target company, and it can be influenced by factors such as the target company's financial performance, growth potential, market position, competitive landscape, etc.

SIC Codes: SIC code stands for Standard Industrial Classification code. It is a system of classifying industries by a four-digit code. The SIC code system is used to group similar companies into industries to facilitate analysis and comparison of economic data. The system also helps investors differentiate companies that have exposure to multiple industries.

Beta: A measure of a stock's volatility in relation to the overall market. It is a measure of the systematic risk of an investment compared to the market. Beta is used in the Capital Asset Pricing Model (CAPM) to determine the expected return of an asset based off its relative risk. A beta of 1 indicates that the stock's price will move with the market, while a beta greater than 1 means the stock is more volatile than the market, and a beta less than 1 means the stock is less volatile than the market.

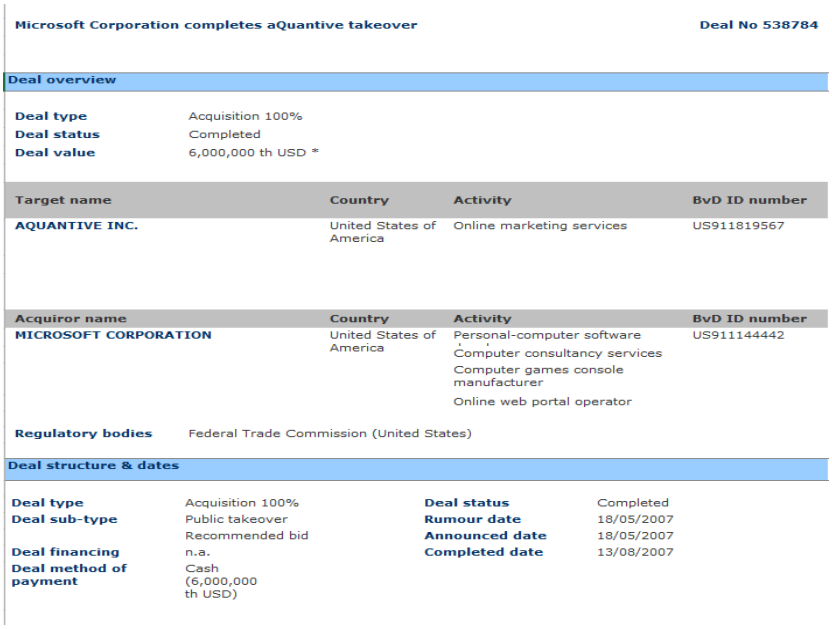
Alpha: A measure of a chosen investment's performance relative to a benchmark index, usually represented by the S&P 500. It represents the difference between an investment's actual returns and its expected returns using the risk and return characteristics of the benchmark index. Positive alpha indicates that the investment has outperformed the benchmark, while negative alpha indicates underperformance.

Announcement Returns: These are defined as the change in a company's stock price immediately after the announcement of an M&A deal. These returns reflect the market's reaction to the deal and can be used to assess whether the market views the deal positively or negatively. Positive announcement returns indicate that the market views the deal as creating value, while negative announcement returns suggest that the market views the deal as destroying value. Announcement returns can be calculated by measuring the difference between the company's stock price on the day of the announcement and the stock price previous to rumors and speculation of the deal.

Filtering Deals:

To begin the process, A large scale Merger and Acquisition Database (Zephyr) was used to gather information on potential deals. Deals were filtered on multiple criteria, such as the United States being involved for standardized data. The method of payment was cash, cash equivalents, or cash assumed. Although not all the deals used are 100% cash deals, Zephyr provided they were under the filter. The filtered deal type was a 100% acquisition of the company, and the deal had to be completed. And lastly, to be able to find the associated data, the target and acquirer had to be public. For each deal, Zephyr provided a multitude of information, such as Deal Size, Offer Price, Pre-Deal Target financials and multiples, Deal Values, Deal Structure and Dates, and Deal Rational. To walk through the data collection process, an example of the Microsoft aQuantive deal will be used in this section.

Figure 1: Example of Zephyr Deal Output



Microsoft Corporation completes aQuantive takeover — **Deal No 538784**

Deal overview

Deal type	Acquisition 100%
Deal status	Completed
Deal value	6,000,000 th USD *

Target name	Country	Activity	BvD ID number
AQUANTIVE INC.	United States of America	Online marketing services	US911819567

Acquiror name	Country	Activity	BvD ID number
MICROSOFT CORPORATION	United States of America	Personal-computer software Computer consultancy services Computer games console manufacturer Online web portal operator	US911144442

Regulatory bodies Federal Trade Commission (United States)

Deal structure & dates

Deal type	Acquisition 100%	**Deal status**	Completed
Deal sub-type	Public takeover Recommended bid	**Rumour date** **Announced date**	18/05/2007 18/05/2007
Deal financing	n.a.	**Completed date**	13/08/2007
Deal method of payment	Cash (6,000,000 th USD)		

Determining Complexity:

After having the filters applied, this left about fifty thousand "relevant" deals that could be used. As stated above, For this paper, 20 deals were examined with 10 being considered "simple" deals and 10 being considered "complex" deals. To determine was made a deal "complex" or "simple", the target had to be examined. After examining the average number of SIC codes for a company, the number fell around 3-4 SIC codes. This was used to define simple target companies as any company with less than 3 SIC codes. And a complex target as one with greater than 5 SIC codes. But to be defined as a complex company, the listed SIC codes had to have a greater range than 100, as some companies can have multiple very similar SIC codes. This can be seen below in aQuantive's SIC code output, where 7311: Advertising agencies and 7312: Outdoor Advertising agencies. Although they are different SIC codes, if there was 5 back to back SIC codes this would not meet the definition of a "complex" target. But when the range is greater than 100 such as 7311: Advertising Agencies and 8742: Management Consulting Services, this would meet the criteria to be defined as a "complex target".

Figure 2: Example SIC Code Distribution

US SIC Codes :
Primary Code :
8742 : Management consulting services
All Codes :
7311 : Advertising agencies
7312 : Outdoor advertising services
7313 : Radio, television, and publishers' advertising representatives
7319 : Advertising, not elsewhere classified
7331 : Direct mail advertising services
7379 : Computer related services, not elsewhere classified
8742 : Management consulting services
8743 : Public relations services

Choosing the Right Companies:

After narrowing filtering down the deals and what defined a simple and complex deal, ten companies had to be chosen that fit the "simple" category and ten had to be chosen to fit the "complex" category. To do get a non-biased selection, companies were chosen with different SIC Codes, different deal sizes, and different locations within the United States. Below are the selected deals.

Figure 3: Selected Deals

Complex Deals(Acquirer,Target):	Simple Deals(Acquirer,Target):
1. AT&T Time Warner	1. Bayer Monsanto
2. IBM Red Hat	2. BritishAmericanTobacco Reynolds
3. Teledyne DALSA	3. Pfizer Wyeth
4. PVH Warnaco	4. Freeport Phelps Dodge
5. Boral Headwaters	5. Convergys Intervoice
6. Aecom URS	6. Crane Merrimac
7. Microsoft Aquantive	7. Avis Zipcar
8. Regency PVR	8. Gramercy American
9. Digitalglobe Geoeye	9. Baxter Hill-Rom
10. Apollo Aptimus	10. Newmont GT Gold

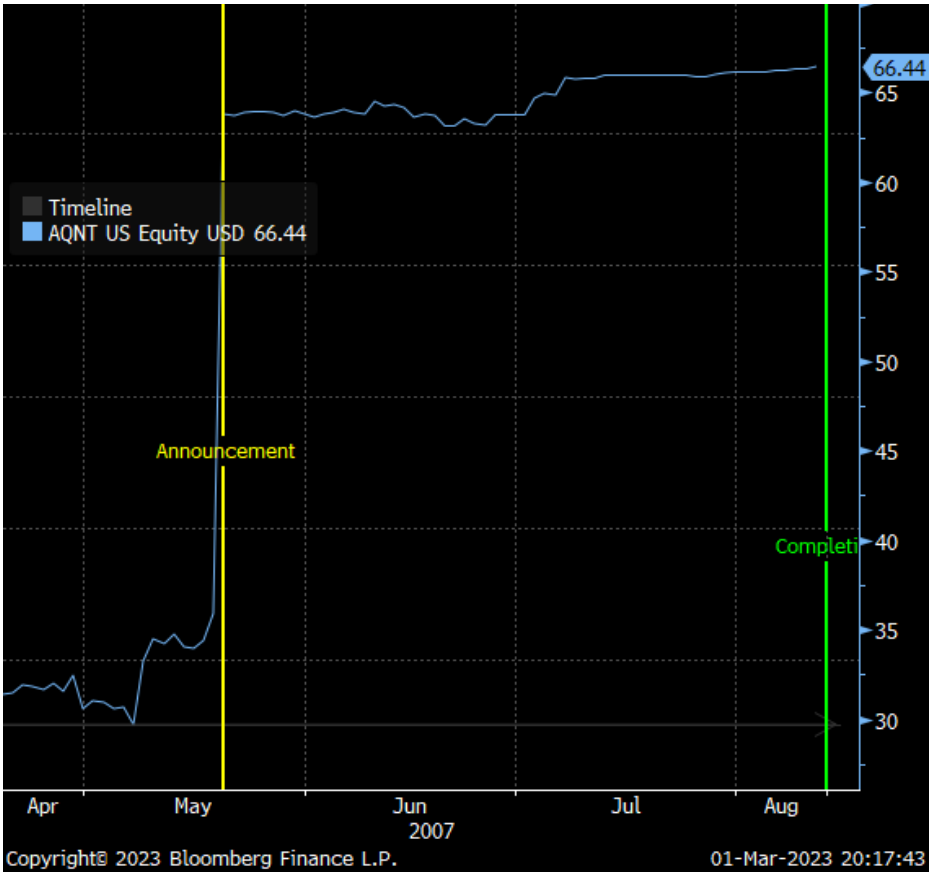
Calculating Bid Premium:

To determine the effect of complexity on M&A activity, for this paper, looking at the stock returns of the Target and the Acquiror yielded the best look at what premiums were paid and how the market rated those premiums. For the target, Bid Premiums were used to examine how much a company was valued at relative to other deals in the marketplace. This was helpful in determining if there was a significant difference in simple bid premiums versus complicated bid premiums. For the acquiror, announcement returns were looked at to see how the market felt about these acquisitions.

To calculate a Bid Premium, the first step is establishing the bid window of the deal. This can be done by researching databases that provide the window (Bloomberg, FactSet or Zephyr were all used as quantitative sources), researching articles and news events of the deal, and examining the stock price and where you start to see an uptick in price. Below is a chart of a typical M&A target, with a subtle increase

before the announcement date usually due to rumors and inside information being speculated on. Followed by the announcement which brings a large increase on the Targets stock.

Figure 4: Target's Stock Chart in a M&A Deal



Although many deals are said to catch the market by "surprise", it is safe to assume that rumors and insider whispers affect the stock price even before the deal in announced. For this paper, the general assumption was that the bid window started about 2 months before the announcement date. And then was adjusted based off of news articles and stock price changes in the weeks before the announcement date.

The next step is choosing the end period for the bid window, there are multiple approaches for this, but for this paper, the end of the announcement week specified the end of the bid window. As seen above, once the announcement is in place the stock price stays relatively constant. This makes it safe to assume the general premium paid is in line with the announcement returns, especially with the narrowing spreads on announcement returns and completion returns.

After determining the bid-window, the next step is to choose a proper benchmark to use for market return. For this paper, this was S&P500 weekly returns, as it represents the bulk of market capitalization in the US market. Below represents an example of S&P500 returns pulled from Bloomberg.

Figure 5: Example S&P500 Returns (11/11/2022-2/10/2023)

Date	PX_LAST	Change	% Change	% Change/100
2/10/2023	4090.46	-46.02	-1.112540131	-0.011125401
2/3/2023	4136.48	65.92	1.619433198	0.016194332
1/27/2023	4070.56	97.95	2.465633425	0.024656334
1/20/2023	3972.61	-26.48	-0.662150639	-0.006621506
1/13/2023	3999.09	104.01	2.670291753	0.026702918
1/6/2023	3895.08	55.58	1.447584321	0.014475843
12/30/2022	3839.5	-5.32	-0.138367986	-0.00138368
12/23/2022	3844.82	-7.54	-0.195724179	-0.001957242
12/16/2022	3852.36	-82.02	-2.084699495	-0.020846995
12/9/2022	3934.38	-137.32	-3.372547093	-0.033725471
12/2/2022	4071.7	45.58	1.132107339	0.011321073
11/25/2022	4026.12	60.78	1.532781552	0.015327816
11/18/2022	3965.34	-27.59	-0.690971292	-0.006909713
11/11/2022	3992.93	222.38	5.897813316	0.058978133

After defining benchmark and the bid window, the next step is to run a regression analysis on the Target's stock price to estimate alpha and beta for the Target 3 years outside of the bid-window. To run the regression, you first need to pull data for the risk free rate, this was obtained from Ken French's website.

Figure 6: Example Ken-French Risk-Free Rates (7/14/1950-10/20/1950)

Date	Mkt-RF	Mkt-RF/100	RF	RF/100	Mkt
7/14/1950	-4	-4.00%	2.50%	0.025%	-3.98%
7/21/1950	4.88	4.88%	2.50%	0.025%	7.38%
7/28/1950	0.42	0.42%	2.50%	0.025%	2.92%
8/4/1950	1.99	1.99%	2.40%	0.024%	4.39%
8/11/1950	1.56	1.56%	2.40%	0.024%	3.96%
8/18/1950	2.29	2.29%	2.40%	0.024%	4.69%
8/25/1950	-0.48	-0.48%	2.40%	0.024%	1.92%
9/1/1950	0.35	0.35%	2.50%	0.025%	2.85%
9/8/1950	1.07	1.07%	2.50%	0.025%	3.57%
9/15/1950	2.37	2.37%	2.50%	0.025%	4.87%
9/22/1950	0.78	0.78%	2.50%	0.025%	3.28%
9/29/1950	0.03	0.03%	2.50%	0.025%	2.53%
10/6/1950	2.72	2.72%	2.90%	0.029%	5.62%
10/13/1950	-1.39	-1.39%	2.90%	0.029%	1.51%
10/20/1950	1.41	1.41%	2.90%	0.029%	4.31%

Lastly, once you pull the stock returns for the bid window, you can calculate excess returns on the S&P500 and the target company. This is done by subtracting the risk free rate from both on the correlating dates. An example of a given date and the calculated excess returns can be seen below in Figure 8.

Figure 7: Historical Data for Bid Window

Deal:	Microsoft aQuantive
3 years prior:	3/15/2004
Rumour Date minus 2 months:	3/15/2007
Rumour Date:	5/15/2007
Announcement Date:	5/15/2007

Historicals									
Type:	Date:	Target Price:	Target Change:	Target Return:	Target Return/100:	S&P 500 Return:	Risk-Free Rate:	Target Excess Return:	S&P 500 Excess Return:
BW	5/18/2007	63.79	29.04	83.56834532	83.57%	1.12%	0.10%	83.47%	1.02%
BW	5/11/2007	34.75	4.04	13.155324	13.16%	0.02%	0.10%	13.05%	-0.09%
BW	5/4/2007	30.71	-1.76	-5.420388051	-5.42%	0.77%	0.10%	-5.52%	0.67%
BW	4/27/2007	32.47	0.57	1.786833856	1.79%	0.65%	0.11%	1.68%	0.55%
BW	4/20/2007	31.9	3.38	11.8513324	11.85%	2.17%	0.11%	11.74%	2.06%
BW	4/13/2007	28.52	0.53	1.893533405	1.89%	0.63%	0.11%	1.78%	0.52%
BW	4/6/2007	27.99	0.08	0.286635614	0.29%	1.61%	0.11%	0.18%	1.50%
BW	3/30/2007	27.91	0.78	2.875046074	2.88%	-1.06%	0.11%	2.77%	-1.17%
BW	3/23/2007	27.13	1.34	5.19581233	5.20%	3.54%	0.11%	5.09%	3.44%
BW	3/16/2007	25.79	-0.49	-1.864535769	-1.86%	-1.13%	0.11%	-1.97%	-1.24%
	3/9/2007	26.28	0.49	1.899961225	1.90%	1.13%	0.11%	1.79%	1.02%
	3/2/2007	25.79	-1.65	-6.013119534	-6.01%	-4.41%	0.11%	-6.12%	-4.52%
	2/23/2007	27.44	-0.48	-1.719197708	-1.72%	-0.30%	0.10%	-1.82%	-0.39%
	2/16/2007	27.92	1.15	4.295853567	4.30%	1.22%	0.10%	4.20%	1.12%
	2/9/2007	26.77	-0.22	-0.81511671	-0.82%	-0.71%	0.10%	-0.91%	-0.81%
	2/2/2007	26.99	0.57	2.157456472	2.16%	1.84%	0.10%	2.06%	1.75%

Once excess returns are calculated, using the "Market Return" regression: Ri-Rf= a+b*(Rm-Rf) to estimate the target's Beta and Alpha before the bid window opens. This can be seen in Figure 9 below, where intercept represents Alpha and X-Variable 1 represents Beta.

Figure 8: Example Regression Output (Microsoft aQuantive)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.352705564
R Square	0.124401215
Adjusted R Square	0.11885945
Standard Error	0.053217693
Observations	160

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.063575334	0.063575334	22.44794332	4.77797E-06
Residual	158	0.447475413	0.002832123		
Total	159	0.511050747			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.006579744	0.004212589	1.561924002	0.120306631	-0.001740507	0.014899994	-0.001740507	0.014899994
X Variable 1	1.401432394	0.295790263	4.737926057	4.77797E-06	0.81721939	1.985645397	0.81721939	1.985645397

With the Alpha and Beta calculated along with the excess returns being calculated, the actual bid premium can now be calculated. This is done by calculating the Expected returns on the target, which is using the equation, alpha + beta(excess return on S&P500). You can then calculate abnormal returns by subtracting the actual returns for that week by the expected returns of that week. The sum of those abnormal returns are what gives us our bid premium. Which can be seen below in Figure 9. This was then calculated for all twenty selected deals.

Figure 9: Example Bid Premium

Microsoft aQuantive Bid Premium						95.49%
Week	**Alpha**	**Beta**	**Excess on S&P500**	**Expected on Target**	**Actual on Target**	**Abnormal Returns**
5/18/2007	0.006592634	1.401579887	1.02%	2.09%	83.47%	**81.38%**
5/11/2007	0.006592634	1.401579887	-0.09%	0.54%	13.05%	**12.52%**
5/4/2007	0.006592634	1.401579887	0.67%	1.60%	-5.52%	**-7.12%**
4/27/2007	0.006592634	1.401579887	0.55%	1.42%	1.68%	**0.25%**
4/20/2007	0.006592634	1.401579887	2.06%	3.55%	11.74%	**8.20%**
4/13/2007	0.006592634	1.401579887	0.52%	1.39%	1.78%	**0.40%**
4/6/2007	0.006592634	1.401579887	1.50%	2.77%	0.18%	**-2.59%**
3/30/2007	0.006592634	1.401579887	-1.17%	-0.98%	2.77%	**3.75%**
3/23/2007	0.006592634	1.401579887	3.44%	5.48%	5.09%	**-0.39%**
3/16/2007	0.006592634	1.401579887	-1.24%	-1.08%	-1.97%	**-0.89%**

With the completed Bid Premiums for each deal, it was then time to calculate the announcement returns for the acquirer. This was a relatively simple change formula using the stock price of the acquiror from 3 months prior of the announcement date and subtracting it by the announcement day stock price and dividing that by the original 3 months prior price. The culmination of this data separated by "simple" and "complex" can be seen in the next section.

Chapter 5

Empirical Results

Summary of Results:

Table 1: Simple Deals Empirical Results

Simple					
Deal Name (Buyer/Target)	Deal Size	Target # of SIC Codes	Target's Beta	Bid Premium	Buyer Stock Price % Change
Pfizer Wyeth	$ 68,000,000,000.00	3	0.680444825	22.63%	2.05%
Bayer Monsanto	$ 63,000,000,000.00	1	0.731543763	11.06%	-0.60%
BritishAmericanTobacco Reynolds	$ 49,400,000,000.00	3	0.564808251	2.54%	-9.10%
Freeport Phelps Dodge	$ 25,900,000,000.00	2	1.78380241	16.22%	8.14%
Gramercy American	$ 3,300,000,000.00	1	0.764090703	9.68%	11.46%
Baxter Hill-Rom	$ 1,250,000,000.00	1	0.828571676	26.58%	-10.79%
Avis Zipcar	$ 500,000,000.00	1	0.641771083	27.91%	26.97%
Newmont GT Gold	$ 376,301,000.00	1	0.403756577	30.58%	-3.26%
Convergys Intervoice	$ 335,000,000.00	2	1.185503641	33.61%	-11.67%
Crane Merrimac	$ 47,872,000.00	1	0.990733647	76.65%	18.57%
Average	**$21,210,917,300.00**	**1.6**	**0.857502658**	**25.74%**	**3.18%**
Median	**$ 2,275,000,000.00**	**1**	**0.747817233**	**24.61%**	**0.72%**

Table 2: Complicated Deals Empirical Results

Complicated					
Deal Name (Buyer/Target)	Deal Size	Target # of SIC Codes	Target's Beta	Bid Premium	Buyer Stock Price % Change
AT&T Time Warner	$ 108,700,000,000.00	9	1.016479373	10.15%	7.36%
IBM Red Hat	$ 34,000,000,000.00	5	1.171917635	32.93%	-14.03%
Microsoft aQuantive	$ 6,000,000,000.00	8	1.401579887	95.49%	7.79%
Aecom URS	$ 6,000,000,000.00	15	1.241933818	19.90%	-1.03%
Regency PVR	$ 5,600,000,000.00	5	0.752234343	11.64%	0.11%
PVC Warnaco	$ 2,900,000,000.00	18	1.626107334	38.79%	15.20%
Boral Headwaters	$ 2,600,000,000.00	5	1.286057601	33.54%	-12.29%
Digitalglobe Geoeye	$ 474,274,000.00	7	1.088917854	33.47%	20.20%
Teledyne Dalsa	$ 341,275,000.00	8	0.717726129	38.68%	17.33%
Apollo Aptimus	$ 48,000,000.00	7	1.436014534	32.73%	34.24%
Average	**$ 16,666,354,900.00**	**8.7**	**1.173896851**	**34.73%**	**7.49%**
Median	**$ 4,250,000,000.00**	**7.5**	**1.206925726**	**33.20%**	**7.58%**

Analysis of Results:

When looking at the comparison of the two sections, there are multiple notable conclusions and observations to be made. For this section, when complicated deals are referenced, this refers to the culmination of data for the ten "complicated" deals and likewise for the simple deals. Results are as follows: The average deal size for the simple deals was about twenty-one billion dollars versus the sixteen billion dollars for the complicated deals. The average number of SIC codes for the simple firms was 1.6 whilst the complicated firms averaged 8.7. This was significant as the threshold for a complicated firm was over 5 SIC codes, whilst a simple firm was said to be under 3 SIC codes. This allows for the comparisons to be between a relatively "simpler" deal set and a relatively more "complicated" deal set.

Target Betas for Simple deals came out to be 0.858 compared to the complicated deals Target Beta of 1.174. Although there are no apparent reasons for this, one potential reason could be due to complicated firms' earnings being harder to estimate, which can cause a wider range of earnings estimates for a given period. This then results in a larger swing of stock prices when earnings are actually announced and the speculation period right before. This contributes to a larger beta for complicated firms. Additional research would have to be done to determine if there is a statistically significant correlation between the number of SIC codes and a higher beta.

Bid premium for simple deals came out to be on average 25.74% while the bid premium for more complicated firms came out to be 34.73%. There are a multitude of possible reasons on why there was an 8.99% increase in bid premium between the two deal sets. The first could be due to the sample size, and there may have been a certain bias within the deals selected. But assuming the results hold true for a larger sample, a potential explanation would be that simple firms have less negotiating power as the value of their firm is more easily calculated. When a firm sells its business, it usually tries to minimize the acquirer returns on the acquisition to maximize the bid premium given to the target on the deal. They do this by trying to give their firm a very healthy valuation and potentially overestimate synergies, which results in a higher relative valuation and with it a higher bid premium. But since the simple firm will not

be able to leverage their inside knowledge of the firm and give a higher than market valuation, this gives the buyer an advantage in negotiations. This could result in a lower bid premium overall. On the other side of that, complicated firms may benefit from a higher bid premium as their company is harder to value. And their knowledge of the business gives them leverage in negotiating a higher bid premium. More research would have to be done in the future to find the correlation between SIC codes and Bid Premiums.

The Buyer's Stock Announcement returns for simple deals yielded an average increase of 3.18% while the complicated deals return yielded an average of 7.49%. There are a variety of reasons that could contribute to the 135% increase in returns when comparing the complicated and simple deal sets. First is that the sample size could be biased, but again assuming this trend stays constant with a larger deal set, there are several possible explanations. One being that potential synergies for complicated firms could be larger when compared to simple firms. As there are more potential segments to generate revenue, and a strategic buyer has a higher potential to capitalize on the various segments. This could then result in the market rewarding the acquisition with a higher announcement return. Another possible reason is that larger firms with a small number of potential buyers have less risk of a hostile takeover than simple firms. The lack of incentive provided by activist investors could lead to poor management, loss of productivity, and risky financial choices that may not be the best for shareholders. The idea that more complicated firms are mismanaged is supported by several studies, such as Raghuram's "The Cost of Diversity: The Diversification Discount and Inefficient Investment" which provides reasoning that more complicated companies with multiple divisions are mismanaged. Assuming this is true, when a complicated firm is purchased, there may be more upside in efficiently managing the company, and the market rewards this. Overall, the market prices the upside for complicated firms higher than a simple firm, more research would have to be performed on a larger data set to find true correlation.

Withing future studies of this topic, there is a variety of topics that can be investigated. Such as the correlation of complexity (determined by SIC codes) and Beta, Bid Premium, and Acquiror

Announcement returns. Another thing that can be more adequately studied is SIC codes effectiveness in rating complexity of a company when compared to other ways of determining complexity. Another area that can be investigated is the impact of the number of SIC codes of the acquirer. Along with the joint summation of the SIC codes of Buyer and Target for a given deal. There is a strong foundation for future research in this study that could have profound effects on how complexity of a firm is evaluated, and the correlation of complexity and deal returns.

Chapter 6

Conclusion

In conclusion, this paper attempts to define a proper measure of complexity within M&A transactions. Starting off with a literature review that encompasses the current body of literature in M&A transactions and determining complexity within a company. For this paper, 20 deals were examined with 10 being considered “simple” deals and 10 being considered “complex” deals. This was used to define simple target companies as any company with less than 3 SIC codes. And a complex target as one with greater than 5 SIC codes. Using this methodology, this paper seeks to look for a correlation of bid premium on the acquirer, beta’s correlation, and announcement returns for the acquirer with complexity. This was done by using Zephyr, Bloomberg, and FactSet to find deal overviews, bid windows, stock returns, etc. This information was used in calculating Beta, Bid Premium, and Acquirer Returns. The results show a correlation of complexity with a higher bid premium, higher beta, and higher acquirer returns on average.

Reasons for this include a complicated company may have less acquisition risk which leads to poor management decisions and an influx of unnecessary spending. Which results in a higher potential for a gain an acquirer, resulting in the market pricing a complicated deal more favorably. A higher bid premium is estimated to be due to ambiguity in pricing, as a simple company has a more transparent price which can keep a bid premium more consistent. Whereas a complicated firm may be able to gain a higher premium by leveraging their knowledge of a company. And the estimated reason for a higher beta goes along with the complexity of estimating a complicated companies earnings. The increase in volatility coming up to earnings announcements results in a relatively higher beta when compared to a simple company.

Further research is needed on this topic as firms continue to become more complex with the improvement of technology and an increase in the number of conglomerates. This paper and the research serve as great groundwork for future researchers to replicate and expand upon. In future studies, there is a

need for a larger sample size to be examined to come up with statistically significant results. The limited number of deals can contribute to more biased results and may lead to inaccurate conclusions from the data. Overall, the idea of using SIC codes to determine complexity I believe is the most significant contribution to the current body of academic research. And a sole piece of research comparing current methods of determining complexity and the effectiveness of SIC codes would yield significant results.

Given the initial results of this paper are accurate, this would be an area for hedge funds and institutional investors to capitalize on excess returns given to companies that meet the definition of complexity. If this relationship holds true, not only can you capitalize on rumors of a complicated firm's buyout by purchasing its stock. You can capitalize on acquirer returns as well by buying their stock on speculation. The relationship of complicated firms with the market also may be attractive for diversifying a portfolio. With promising preliminary results, future research is needed to capitalize on these trends.

Appendix A

Calculated Bid Premiums

Simple Bid Premium:

Table 3: Bayer Monsanto Bid Premium

Bayer Monsanto Bid Premium						11.06%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
5/20/2016	-0.00159273	0.73154376	0.28%	0.04%	1.58%	**1.54%**
5/13/2016	-0.00159273	0.73154376	-0.51%	-0.54%	11.35%	**11.89%**
5/6/2016	-0.00159273	0.73154376	-0.40%	-0.45%	-4.20%	**-3.75%**
4/29/2016	-0.00159273	0.73154376	-1.26%	-1.08%	-0.43%	**0.65%**
4/22/2016	-0.00159273	0.73154376	0.52%	0.22%	6.46%	**6.24%**
4/15/2016	-0.00159273	0.73154376	1.62%	1.02%	2.01%	**0.98%**
4/8/2016	-0.00159273	0.73154376	-1.22%	-1.05%	-1.41%	**-0.36%**
4/1/2016	-0.00159273	0.73154376	1.81%	1.16%	-2.48%	**-3.64%**
3/25/2016	-0.00159273	0.73154376	-0.67%	-0.65%	-3.13%	**-2.48%**

Table 4: BritishAmericanTobacco Reynolds Bid Premium

BritishAmericanTobacco Reynolds Bid Premium						2.54%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
1/20/2017	0.00396052	0.56480825	-0.16%	0.31%	4.89%	**4.58%**
1/13/2017	0.00396052	0.56480825	-0.11%	0.33%	1.09%	**0.76%**
1/6/2017	0.00396052	0.56480825	1.70%	1.35%	-1.22%	**-2.58%**
12/30/2016	0.00396052	0.56480825	-1.11%	-0.23%	0.01%	**0.24%**
12/23/2016	0.00396052	0.56480825	0.25%	0.54%	0.88%	**0.34%**
12/16/2016	0.00396052	0.56480825	-0.07%	0.36%	0.68%	**0.33%**
12/9/2016	0.00396052	0.56480825	3.08%	2.13%	0.87%	**-1.26%**
12/2/2016	0.00396052	0.56480825	-0.97%	-0.15%	0.12%	**0.28%**
11/25/2016	0.00396052	0.56480825	1.44%	1.21%	1.43%	**0.22%**
11/18/2016	0.00396052	0.56480825	0.80%	0.85%	0.48%	**-0.37%**
11/11/2016	0.00396052	0.56480825	3.80%	2.54%	-1.62%	**-4.16%**
11/4/2016	0.00396052	0.56480825	-1.94%	-0.70%	-0.50%	**0.20%**
10/28/2016	0.00396052	0.56480825	-0.69%	0.00%	1.76%	**1.76%**
10/21/2016	0.00396052	0.56480825	0.38%	0.61%	13.77%	**13.16%**
10/14/2016	0.00396052	0.56480825	-0.97%	-0.15%	1.35%	**1.50%**
10/7/2016	0.00396052	0.56480825	-0.67%	0.02%	-1.09%	**-1.10%**
9/30/2016	0.00396052	0.56480825	0.16%	0.49%	-2.95%	**-3.44%**
9/23/2016	0.00396052	0.56480825	1.19%	1.07%	2.68%	**1.61%**
9/16/2016	0.00396052	0.56480825	0.53%	0.69%	0.33%	**-0.36%**
9/9/2016	0.00396052	0.56480825	-2.40%	-0.96%	-6.99%	**-6.03%**
9/2/2016	0.00396052	0.56480825	0.50%	0.68%	1.64%	**0.96%**
8/26/2016	0.00396052	0.56480825	-0.68%	0.01%	-1.56%	**-1.57%**

Table 5: Pfizer Wyeth Bid Premium

Pfizer Wyeth Bid Premium						22.63%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
1/30/2009	-0.000442483	0.680444825	-0.73%	-0.54%	-1.76%	**-1.22%**
1/23/2009	-0.000442483	0.680444825	-2.14%	-1.50%	12.70%	**14.20%**
1/16/2009	-0.000442483	0.680444825	-4.52%	-3.12%	2.21%	**5.33%**
1/9/2009	-0.000442483	0.680444825	-4.45%	-3.07%	-1.09%	**1.98%**
1/2/2009	-0.000442483	0.680444825	6.76%	4.56%	6.23%	**1.67%**
12/26/2008	-0.000442483	0.680444825	-1.70%	-1.20%	-2.77%	**-1.57%**
12/19/2008	-0.000442483	0.680444825	0.93%	0.59%	3.25%	**2.66%**
12/12/2008	-0.000442483	0.680444825	0.42%	0.24%	4.74%	**4.50%**
12/5/2008	-0.000442483	0.680444825	-2.25%	-1.58%	-4.55%	**-2.98%**
11/28/2008	-0.000442483	0.680444825	12.02%	8.13%	6.19%	**-1.95%**
11/21/2008	-0.000442483	0.680444825	-8.40%	-5.76%	-0.68%	**5.08%**
11/14/2008	-0.000442483	0.680444825	-6.20%	-4.27%	3.73%	**8.00%**
11/7/2008	-0.000442483	0.680444825	-3.90%	-2.70%	2.26%	**4.96%**
10/31/2008	-0.000442483	0.680444825	10.47%	7.08%	-0.67%	**-7.75%**
10/24/2008	-0.000442483	0.680444825	-6.80%	-4.67%	-1.51%	**3.16%**
10/17/2008	-0.000442483	0.680444825	4.58%	3.07%	9.98%	**6.91%**
10/10/2008	-0.000442483	0.680444825	-18.22%	-12.44%	-20.90%	**-8.47%**
10/3/2008	-0.000442483	0.680444825	-9.40%	-6.44%	-1.84%	**4.60%**
9/26/2008	-0.000442483	0.680444825	-3.39%	-2.35%	0.12%	**2.47%**
9/19/2008	-0.000442483	0.680444825	0.23%	0.11%	-3.63%	**-3.74%**
9/12/2008	-0.000442483	0.680444825	0.72%	0.44%	-2.39%	**-2.83%**
9/5/2008	-0.000442483	0.680444825	-3.20%	-2.22%	-5.75%	**-3.53%**
8/29/2008	-0.000442483	0.680444825	-0.76%	-0.56%	1.30%	**1.86%**

Table 6: Freeport Phelps Dodge Bid Premium

Freeport Phelps Dodge Bid Premium						16.22%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
7/28/2006	0.008058269	1.78380241	2.99%	6.13%	5.47%	-0.66%
8/4/2006	0.008058269	1.78380241	-0.04%	0.73%	5.88%	5.14%
8/11/2006	0.008058269	1.78380241	-1.09%	-1.14%	4.47%	5.61%
8/18/2006	0.008058269	1.78380241	2.70%	5.63%	-0.43%	-6.05%
8/25/2006	0.008058269	1.78380241	-0.66%	-0.37%	-1.79%	-1.42%
9/1/2006	0.008058269	1.78380241	1.13%	2.82%	2.42%	-0.40%
9/8/2006	0.008058269	1.78380241	-1.02%	-1.02%	0.27%	1.29%
9/15/2006	0.008058269	1.78380241	1.51%	3.50%	-8.18%	-11.68%
9/22/2006	0.008058269	1.78380241	-0.49%	-0.06%	-1.33%	-1.27%
9/29/2006	0.008058269	1.78380241	1.50%	3.48%	2.32%	-1.16%
10/6/2006	0.008058269	1.78380241	0.93%	2.46%	-0.27%	-2.73%
10/13/2006	0.008058269	1.78380241	1.09%	2.75%	12.64%	9.89%
10/20/2006	0.008058269	1.78380241	0.12%	1.01%	3.53%	2.51%
10/27/2006	0.008058269	1.78380241	0.54%	1.76%	1.71%	-0.06%
11/3/2006	0.008058269	1.78380241	-1.05%	-1.07%	-1.10%	-0.02%
11/10/2006	0.008058269	1.78380241	1.11%	2.79%	-3.00%	-5.78%
11/17/2006	0.008058269	1.78380241	1.36%	3.24%	-1.85%	-5.09%

Table 7: Convergys Intervoice Bid Premium

Convergys Intervoice Bid Premium						33.61%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
4/18/2008	-0.002483336	1.185503641	4.27%	4.81%	3.48%	-1.33%
4/25/2008	-0.002483336	1.185503641	0.50%	0.34%	-9.55%	-9.89%
5/2/2008	-0.002483336	1.185503641	1.10%	1.06%	-2.87%	-3.93%
5/9/2008	-0.002483336	1.185503641	-1.86%	-2.45%	-2.46%	-0.01%
5/16/2008	-0.002483336	1.185503641	2.63%	2.86%	-2.52%	-5.39%
5/23/2008	-0.002483336	1.185503641	-3.51%	-4.41%	0.97%	5.38%
5/30/2008	-0.002483336	1.185503641	1.73%	1.80%	8.34%	6.54%
6/6/2008	-0.002483336	1.185503641	-2.88%	-3.66%	-3.14%	0.52%
6/13/2008	-0.002483336	1.185503641	-0.09%	-0.36%	1.39%	1.75%
6/20/2008	-0.002483336	1.185503641	-3.14%	-3.97%	-3.35%	0.62%
6/27/2008	-0.002483336	1.185503641	-3.04%	-3.86%	-4.77%	-0.91%
7/4/2008	-0.002483336	1.185503641	-1.25%	-1.73%	-9.10%	-7.37%
7/11/2008	-0.002483336	1.185503641	-1.89%	-2.49%	22.89%	25.39%
7/18/2008	-0.002483336	1.185503641	1.67%	1.73%	23.97%	22.23%

Table 8: Crane Merrimac Bid Premium

Crane Merrimac Bid Premium						76.65%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
10/23/2009	-0.004250747	0.990733647	-0.74%	-1.16%	-0.24%	**0.93%**
10/30/2009	-0.004250747	0.990733647	-4.02%	-4.41%	-7.06%	**-2.65%**
11/6/2009	-0.004250747	0.990733647	3.19%	2.74%	4.18%	**1.44%**
11/13/2009	-0.004250747	0.990733647	2.26%	1.82%	14.70%	**12.89%**
11/20/2009	-0.004250747	0.990733647	-0.19%	-0.62%	-1.27%	**-0.66%**
11/27/2009	-0.004250747	0.990733647	0.01%	-0.42%	-2.68%	**-2.27%**
12/4/2009	-0.004250747	0.990733647	1.33%	0.89%	1.43%	**0.54%**
12/11/2009	-0.004250747	0.990733647	0.04%	-0.39%	-2.17%	**-1.79%**
12/18/2009	-0.004250747	0.990733647	-0.36%	-0.78%	13.44%	**14.22%**
12/25/2009	-0.004250747	0.990733647	2.18%	1.73%	55.73%	**54.00%**

Table 9: Avis Zipcar Bid Premium

Avis Zipcar Bid Premium						27.91%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
9/7/2012	-0.013496397	0.641771083	2.23%	0.08%	0.44%	**0.36%**
9/14/2012	-0.013496397	0.641771083	1.93%	-0.11%	0.19%	**0.29%**
9/21/2012	-0.013496397	0.641771083	-0.39%	-1.60%	-2.14%	**-0.54%**
9/28/2012	-0.013496397	0.641771083	-1.34%	-2.21%	-0.13%	**2.08%**
10/5/2012	-0.013496397	0.641771083	1.40%	-0.45%	-0.39%	**0.06%**
10/12/2012	-0.013496397	0.641771083	-2.22%	-2.77%	-5.17%	**-2.40%**
10/19/2012	-0.013496397	0.641771083	0.32%	-1.14%	-9.81%	**-8.67%**
10/26/2012	-0.013496397	0.641771083	-1.48%	-2.30%	-1.81%	**0.49%**
11/2/2012	-0.013496397	0.641771083	0.16%	-1.25%	0.00%	**1.25%**
11/9/2012	-0.013496397	0.641771083	-2.43%	-2.91%	7.69%	**10.60%**
11/16/2012	-0.013496397	0.641771083	-1.45%	-2.28%	-0.72%	**1.56%**
11/23/2012	-0.013496397	0.641771083	3.62%	0.97%	16.83%	**15.86%**
11/30/2012	-0.013496397	0.641771083	0.50%	-1.03%	0.12%	**1.15%**
12/7/2012	-0.013496397	0.641771083	0.13%	-1.27%	3.56%	**4.83%**
12/14/2012	-0.013496397	0.641771083	-0.32%	-1.55%	-0.12%	**1.43%**
12/21/2012	-0.013496397	0.641771083	1.17%	-0.60%	1.07%	**1.67%**
12/28/2012	-0.013496397	0.641771083	-1.94%	-2.60%	-4.71%	**-2.11%**

Table 10: Gramercy American Bid Premium

Gramercy American Bid Premium						9.68%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
8/10/2007	-0.004313904	0.764090703	1.33%	0.59%	-4.04%	**-4.63%**
8/17/2007	-0.004313904	0.764090703	-0.63%	-0.92%	-11.90%	**-10.98%**
8/24/2007	-0.004313904	0.764090703	2.21%	1.26%	12.69%	**11.43%**
8/31/2007	-0.004313904	0.764090703	-0.47%	-0.79%	6.60%	**7.39%**
9/7/2007	-0.004313904	0.764090703	-1.47%	-1.55%	-3.34%	**-1.79%**
9/14/2007	-0.004313904	0.764090703	2.03%	1.12%	3.91%	**2.79%**
9/21/2007	-0.004313904	0.764090703	2.72%	1.64%	-1.64%	**-3.28%**
9/28/2007	-0.004313904	0.764090703	-0.02%	-0.44%	-1.91%	**-1.47%**
10/5/2007	-0.004313904	0.764090703	1.94%	1.05%	-5.42%	**-6.47%**
10/12/2007	-0.004313904	0.764090703	0.19%	-0.29%	-5.33%	**-5.04%**
10/19/2007	-0.004313904	0.764090703	-4.00%	-3.49%	-9.08%	**-5.60%**
10/26/2007	-0.004313904	0.764090703	2.23%	1.27%	6.16%	**4.89%**
11/2/2007	-0.004313904	0.764090703	-1.75%	-1.77%	-7.68%	**-5.91%**
11/9/2007	-0.004313904	0.764090703	-3.79%	-3.33%	25.03%	**28.36%**

Table 11: Baxter Hill-Rom Bid Premium

Baxter Hill-Rom Bid Premium						26.58%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
6/4/2021	0.000111366	0.828571676	0.61%	0.52%	-0.08%	**-0.60%**
6/11/2021	0.000111366	0.828571676	0.41%	0.35%	2.31%	**1.96%**
6/18/2021	0.000111366	0.828571676	-1.91%	-1.57%	-1.31%	**0.26%**
6/25/2021	0.000111366	0.828571676	2.74%	2.28%	0.55%	**-1.73%**
7/2/2021	0.000111366	0.828571676	1.67%	1.40%	3.50%	**2.10%**
7/9/2021	0.000111366	0.828571676	0.39%	0.34%	0.73%	**0.39%**
7/16/2021	0.000111366	0.828571676	-0.97%	-0.79%	-2.34%	**-1.54%**
7/23/2021	0.000111366	0.828571676	1.95%	1.63%	5.47%	**3.84%**
7/30/2021	0.000111366	0.828571676	-0.38%	-0.30%	14.21%	**14.51%**
8/6/2021	0.000111366	0.828571676	0.94%	0.79%	-2.65%	**-3.44%**
8/13/2021	0.000111366	0.828571676	0.71%	0.60%	-0.62%	**-1.22%**
8/20/2021	0.000111366	0.828571676	-0.59%	-0.48%	0.17%	**0.65%**
8/27/2021	0.000111366	0.828571676	1.52%	1.27%	-0.95%	**-2.23%**
9/3/2021	0.000111366	0.828571676	0.58%	0.49%	14.13%	**13.64%**

Table 12: Newmont GT Gold Bid Premium

Newmont GT Gold Bid Premium						30.58%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
1/15/2021	0.010128	0.403757	-1.48%	0.42%	-5.15%	-5.57%
1/22/2021	0.010128	0.403757	1.94%	1.80%	8.14%	6.34%
1/29/2021	0.010128	0.403757	-3.31%	-0.32%	-5.02%	-4.70%
2/5/2021	0.010128	0.403757	4.65%	2.89%	15.86%	12.97%
2/12/2021	0.010128	0.403757	1.23%	1.51%	-3.04%	-4.55%
2/19/2021	0.010128	0.403757	-0.72%	0.72%	-5.88%	-6.60%
2/26/2021	0.010128	0.403757	-2.45%	0.02%	-2.08%	-2.11%
3/5/2021	0.010128	0.403757	0.81%	1.34%	-3.83%	-5.17%
3/12/2021	0.010128	0.403757	2.64%	2.08%	42.04%	39.96%

Complicated Bid Premium:

Table 13:Microsoft aQuantive Bid Premium

Microsoft aQuantive Bid Premium						95.49%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
5/18/2007	0.006592634	1.401579887	1.02%	2.09%	83.47%	**81.38%**
5/11/2007	0.006592634	1.401579887	-0.09%	0.54%	13.05%	**12.52%**
5/4/2007	0.006592634	1.401579887	0.67%	1.60%	-5.52%	**-7.12%**
4/27/2007	0.006592634	1.401579887	0.55%	1.42%	1.68%	**0.25%**
4/20/2007	0.006592634	1.401579887	2.06%	3.55%	11.74%	**8.20%**
4/13/2007	0.006592634	1.401579887	0.52%	1.39%	1.78%	**0.40%**
4/6/2007	0.006592634	1.401579887	1.50%	2.77%	0.18%	**-2.59%**
3/30/2007	0.006592634	1.401579887	-1.17%	-0.98%	2.77%	**3.75%**
3/23/2007	0.006592634	1.401579887	3.44%	5.48%	5.09%	**-0.39%**
3/16/2007	0.006592634	1.401579887	-1.24%	-1.08%	-1.97%	**-0.89%**

Table 14: Aecom URS Bid Premium

Aecom URS Bid Premium						19.90%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
7/18/2014	-0.002065968	1.241933818	0.54%	0.47%	13.13%	**12.66%**
7/11/2014	-0.002065968	1.241933818	-0.90%	-1.32%	2.56%	**3.89%**
7/4/2014	-0.002065968	1.241933818	1.25%	1.34%	11.67%	**10.33%**
6/27/2014	-0.002065968	1.241933818	-0.10%	-0.33%	0.40%	**0.73%**
6/20/2014	-0.002065968	1.241933818	1.38%	1.51%	-0.27%	**-1.77%**
6/13/2014	-0.002065968	1.241933818	-0.68%	-1.05%	-1.93%	**-0.87%**
6/6/2014	-0.002065968	1.241933818	1.34%	1.46%	2.78%	**1.31%**
5/30/2014	-0.002065968	1.241933818	1.21%	1.30%	1.72%	**0.42%**
5/23/2014	-0.002065968	1.241933818	1.21%	1.29%	1.44%	**0.15%**
5/16/2014	-0.002065968	1.241933818	-0.03%	-0.25%	-7.19%	**-6.95%**
5/9/2014	-0.002065968	1.241933818	-0.14%	-0.38%	0.02%	**0.40%**
5/2/2014	-0.002065968	1.241933818	0.95%	0.98%	-0.04%	**-1.02%**
4/25/2014	-0.002065968	1.241933818	-0.08%	-0.30%	-1.16%	**-0.85%**
4/18/2014	-0.002065968	1.241933818	2.71%	3.16%	1.23%	**-1.92%**
4/11/2014	-0.002065968	1.241933818	-2.65%	-3.50%	-2.85%	**0.64%**
4/4/2014	-0.002065968	1.241933818	0.40%	0.29%	2.50%	**2.21%**
3/28/2014	-0.002065968	1.241933818	-0.48%	-0.80%	0.15%	**0.95%**
3/21/2014	-0.002065968	1.241933818	1.38%	1.50%	3.06%	**1.56%**
3/14/2014	-0.002065968	1.241933818	-1.97%	-2.65%	-2.83%	**-0.18%**

Table 15: Boral Headwaters Bid Premium

Boral Headwaters Bid Premium						33.54%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
11/25/2016	0.002981	1.286058	1.44%	2.15%	18.26%	**16.12%**
11/18/2016	0.002981	1.286058	0.80%	1.33%	-1.43%	**-2.76%**
11/11/2016	0.002981	1.286058	3.80%	5.18%	19.32%	**14.13%**
11/4/2016	0.002981	1.286058	-1.94%	-2.20%	5.75%	**7.96%**
10/28/2016	0.002981	1.286058	-0.69%	-0.59%	-5.00%	**-4.41%**
10/21/2016	0.002981	1.286058	0.38%	0.79%	-1.68%	**-2.47%**
10/14/2016	0.002981	1.286058	-0.97%	-0.95%	4.09%	**5.04%**
10/7/2016	0.002981	1.286058	-0.67%	-0.57%	-1.84%	**-1.27%**
9/30/2016	0.002981	1.286058	0.16%	0.50%	-1.06%	**-1.56%**
9/23/2016	0.002981	1.286058	1.19%	1.83%	4.58%	**2.76%**
9/16/2016	0.002981	1.286058	0.53%	0.98%	-1.81%	**-2.78%**
9/9/2016	0.002981	1.286058	-2.40%	-2.79%	-6.36%	**-3.57%**

Table 16: PVC Warnaco Bid Premium

PVC Warnaco Bid Premium						38.79%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
11/2/2012	-0.0013	1.626107	0.16%	0.13%	39.21%	**39.08%**
10/26/2012	-0.0013	1.626107	-1.48%	-2.54%	-3.11%	**-0.56%**
10/19/2012	-0.0013	1.626107	0.32%	0.39%	4.98%	**4.59%**
10/12/2012	-0.0013	1.626107	-2.22%	-3.73%	-3.48%	**0.26%**
10/5/2012	-0.0013	1.626107	1.40%	2.15%	-0.16%	**-2.31%**
9/28/2012	-0.0013	1.626107	-1.34%	-2.30%	-0.96%	**1.35%**
9/21/2012	-0.0013	1.626107	-0.39%	-0.76%	-5.07%	**-4.32%**
9/14/2012	-0.0013	1.626107	1.93%	3.02%	2.91%	**-0.11%**
9/7/2012	-0.0013	1.626107	2.23%	3.49%	4.32%	**0.83%**

Table 17:Teledyne Dalsa Bid Premium

Teledyne Dalsa Bid Premium						38.68%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
12/24/2010	0.003977274	0.717726129	1.03%	1.14%	24.81%	**23.67%**
12/17/2010	0.003977274	0.717726129	0.28%	0.60%	2.38%	**1.78%**
12/10/2010	0.003977274	0.717726129	1.28%	1.32%	0.35%	**-0.97%**
12/3/2010	0.003977274	0.717726129	2.97%	2.53%	6.52%	**4.00%**
11/26/2010	0.003977274	0.717726129	-0.86%	-0.22%	-2.70%	**-2.48%**
11/19/2010	0.003977274	0.717726129	0.04%	0.43%	14.16%	**13.74%**
11/12/2010	0.003977274	0.717726129	-2.18%	-1.16%	-1.48%	**-0.32%**
11/5/2010	0.003977274	0.717726129	3.60%	2.98%	6.09%	**3.12%**
10/29/2010	0.003977274	0.717726129	0.01%	0.41%	-4.42%	**-4.82%**
10/22/2010	0.003977274	0.717726129	0.58%	0.82%	1.78%	**0.96%**
10/15/2010	0.003977274	0.717726129	0.94%	1.08%	-3.68%	**-4.75%**
10/8/2010	0.003977274	0.717726129	1.65%	1.58%	7.45%	**5.87%**
10/1/2010	0.003977274	0.717726129	-0.21%	0.24%	1.33%	**1.09%**
9/24/2010	0.003977274	0.717726129	2.05%	1.87%	3.21%	**1.34%**
9/17/2010	0.003977274	0.717726129	1.44%	1.43%	3.22%	**1.78%**
9/10/2010	0.003977274	0.717726129	0.45%	0.72%	4.76%	**4.04%**
9/3/2010	0.003977274	0.717726129	3.75%	3.09%	0.80%	**-2.29%**
8/27/2010	0.003977274	0.717726129	-0.67%	-0.08%	-1.96%	**-1.88%**
8/20/2010	0.003977274	0.717726129	-0.70%	-0.11%	-5.12%	**-5.01%**
8/13/2010	0.003977274	0.717726129	-3.78%	-2.32%	-4.02%	**-1.70%**
8/6/2010	0.003977274	0.717726129	1.82%	1.70%	3.41%	**1.71%**
7/30/2010	0.003977274	0.717726129	-0.10%	0.33%	-5.83%	**-6.16%**
7/23/2010	0.003977274	0.717726129	3.54%	2.94%	0.87%	**-2.07%**
7/16/2010	0.003977274	0.717726129	-1.22%	-0.48%	1.33%	**1.81%**
7/9/2010	0.003977274	0.717726129	5.41%	4.28%	1.71%	**-2.57%**

Table 18:IBM Red Hat Bid Premium

IBM Red Hat Bid Premium						32.93%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
11/2/2018	0.002436	1.171918	2.38%	3.03%	47.57%	**44.54%**
10/26/2018	0.002436	1.171918	-3.99%	-4.43%	-2.91%	**1.52%**
10/19/2018	0.002436	1.171918	-0.03%	0.21%	-2.00%	**-2.21%**
10/12/2018	0.002436	1.171918	-4.15%	-4.62%	-3.51%	**1.12%**
10/5/2018	0.002436	1.171918	-1.02%	-0.96%	-6.93%	**-5.98%**
9/28/2018	0.002436	1.171918	-0.57%	-0.43%	1.20%	**1.62%**
9/21/2018	0.002436	1.171918	0.81%	1.20%	-9.60%	**-10.80%**
9/14/2018	0.002436	1.171918	1.12%	1.56%	0.53%	**-1.03%**
9/7/2018	0.002436	1.171918	-1.07%	-1.00%	0.16%	**1.16%**
8/31/2018	0.002436	1.171918	0.89%	1.29%	4.27%	**2.98%**

Table 19:AT&T Time Warner Bid Premium

AT&T Time Warner Bid Premium						10.15%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
10/21/2016	0.003241	1.016479	0.38%	0.71%	12.48%	**11.77%**
10/14/2016	0.003241	1.016479	-0.97%	-0.66%	0.72%	**1.38%**
10/7/2016	0.003241	1.016479	-0.67%	-0.36%	-0.80%	**-0.43%**
9/30/2016	0.003241	1.016479	0.16%	0.49%	3.75%	**3.26%**
9/23/2016	0.003241	1.016479	1.19%	1.53%	2.51%	**0.97%**
9/16/2016	0.003241	1.016479	0.53%	0.86%	-2.81%	**-3.67%**
9/9/2016	0.003241	1.016479	-2.40%	-2.11%	-1.94%	**0.17%**
9/2/2016	0.003241	1.016479	0.50%	0.83%	-0.90%	**-1.73%**
8/26/2016	0.003241	1.016479	-0.68%	-0.37%	-1.94%	**-1.56%**
8/19/2016	0.003241	1.016479	-0.01%	0.31%	0.31%	**-0.01%**
8/12/2016	0.003241	1.016479	0.05%	0.37%	1.82%	**1.44%**
8/5/2016	0.003241	1.016479	0.42%	0.75%	3.20%	**2.45%**
7/29/2016	0.003241	1.016479	-0.07%	0.25%	-2.19%	**-2.44%**
7/22/2016	0.003241	1.016479	0.61%	0.94%	-0.36%	**-1.31%**
7/15/2016	0.003241	1.016479	1.49%	1.84%	0.87%	**-0.97%**
7/8/2016	0.003241	1.016479	1.28%	1.62%	4.91%	**3.29%**
7/1/2016	0.003241	1.016479	3.21%	3.59%	5.07%	**1.48%**
6/24/2016	0.003241	1.016479	-1.64%	-1.34%	-2.28%	**-0.94%**
6/17/2016	0.003241	1.016479	-1.19%	-0.89%	-1.72%	**-0.83%**
6/10/2016	0.003241	1.016479	-0.15%	0.17%	-2.92%	**-3.09%**
6/3/2016	0.003241	1.016479	0.00%	0.32%	0.74%	**0.42%**
5/27/2016	0.003241	1.016479	2.27%	2.64%	3.40%	**0.77%**
5/20/2016	0.003241	1.016479	0.28%	0.60%	-0.59%	**-1.19%**
5/13/2016	0.003241	1.016479	-0.51%	-0.20%	-2.22%	**-2.02%**
5/6/2016	0.003241	1.016479	-0.40%	-0.08%	-0.34%	**-0.26%**
4/29/2016	0.003241	1.016479	-1.26%	-0.96%	-1.97%	**-1.02%**
4/22/2016	0.003241	1.016479	0.52%	0.85%	2.88%	**2.03%**
4/15/2016	0.003241	1.016479	1.62%	1.97%	1.21%	**-0.76%**
4/8/2016	0.003241	1.016479	-1.22%	-0.91%	0.85%	**1.76%**
4/1/2016	0.003241	1.016479	1.81%	2.16%	4.25%	**2.09%**
3/25/2016	0.003241	1.016479	-0.67%	-0.36%	-3.25%	**-2.90%**
3/18/2016	0.003241	1.016479	1.35%	1.70%	2.75%	**1.05%**
3/11/2016	0.003241	1.016479	1.11%	1.45%	2.33%	**0.89%**
3/4/2016	0.003241	1.016479	2.66%	3.03%	3.22%	**0.19%**
2/26/2016	0.003241	1.016479	1.57%	1.92%	3.07%	**1.15%**
2/19/2016	0.003241	1.016479	2.84%	3.21%	3.87%	**0.66%**
2/12/2016	0.003241	1.016479	-0.82%	-0.51%	-9.98%	**-9.48%**
2/5/2016	0.003241	1.016479	-3.11%	-2.83%	-1.82%	**1.01%**
1/29/2016	0.003241	1.016479	1.75%	2.10%	-0.64%	**-2.74%**
1/22/2016	0.003241	1.016479	1.41%	1.76%	1.78%	**0.02%**
1/15/2016	0.003241	1.016479	-2.17%	-1.88%	-2.14%	**-0.25%**

Table 20:Regency PVR Bid Premium

Regency PVR Bid Premium						11.64%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
10/11/2013	1.7101E-05	0.752234343	0.75%	0.57%	14.45%	**13.88%**
10/4/2013	1.7101E-05	0.752234343	-0.07%	-0.05%	0.48%	**0.53%**
9/27/2013	1.7101E-05	0.752234343	-1.06%	-0.80%	-1.12%	**-0.33%**
9/20/2013	1.7101E-05	0.752234343	1.30%	0.98%	-0.09%	**-1.06%**
9/13/2013	1.7101E-05	0.752234343	1.98%	1.49%	-0.17%	**-1.67%**
9/6/2013	1.7101E-05	0.752234343	1.36%	1.02%	-0.09%	**-1.11%**
8/30/2013	1.7101E-05	0.752234343	-1.84%	-1.38%	0.22%	**1.59%**
8/23/2013	1.7101E-05	0.752234343	0.46%	0.35%	0.74%	**0.39%**
8/16/2013	1.7101E-05	0.752234343	-2.10%	-1.58%	-2.17%	**-0.59%**

Table 21:Digitalglobe Geoeye Bid Premium

Digitalglobe Geoeye Bid Premium						33.47%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
7/27/2012	-0.001287896	1.088917854	1.71%	1.73%	60.38%	**58.65%**
7/20/2012	-0.001287896	1.088917854	0.43%	0.34%	-0.53%	**-0.87%**
7/13/2012	-0.001287896	1.088917854	0.15%	0.04%	-4.93%	**-4.97%**
7/6/2012	-0.001287896	1.088917854	-0.55%	-0.73%	3.62%	**4.34%**
6/29/2012	-0.001287896	1.088917854	2.03%	2.08%	-15.60%	**-17.68%**
6/22/2012	-0.001287896	1.088917854	-0.58%	-0.76%	2.57%	**3.34%**
6/15/2012	-0.001287896	1.088917854	1.29%	1.28%	-6.34%	**-7.62%**
6/8/2012	-0.001287896	1.088917854	3.72%	3.93%	5.88%	**1.95%**
6/1/2012	-0.001287896	1.088917854	-3.02%	-3.42%	-11.58%	**-8.16%**
5/25/2012	-0.001287896	1.088917854	1.74%	1.77%	6.25%	**4.48%**

Table 22:Apollo Aptimus Bid Premium

Apollo Aptimus Bid Premium						32.73%
Week	Alpha	Beta	Excess on S&P500	Expected on Target	Actual on Target	Abnormal Returns
8/10/2007	0.002617	1.436015	1.33%	2.17%	-11.50%	**-13.68%**
8/3/2007	0.002617	1.436015	-1.88%	-2.44%	-7.43%	**-4.99%**
7/27/2007	0.002617	1.436015	-5.00%	-6.91%	-6.06%	**0.86%**
7/20/2007	0.002617	1.436015	-1.28%	-1.58%	2.90%	**4.48%**
7/13/2007	0.002617	1.436015	1.34%	2.19%	-1.84%	**-4.03%**
7/6/2007	0.002617	1.436015	1.70%	2.71%	9.77%	**7.06%**
6/29/2007	0.002617	1.436015	-0.05%	0.20%	15.18%	**14.99%**
6/22/2007	0.002617	1.436015	-2.08%	-2.72%	21.34%	**24.07%**
6/15/2007	0.002617	1.436015	1.58%	2.52%	6.49%	**3.97%**

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ACADEMIC VITA

Sean Seibert

EDUCATION

The Pennsylvania State University, Schreyer Honors College **University Park, PA**
Smeal College of Business | Bachelor of Science in Finance May 2023
College of Liberal Arts | Bachelor of Science in Economics

RELEVANT EXPERIENCE

PricewaterhouseCoopers **New York, New York**
Management Consulting/M&A Intern *Jun 2022-Aug 2022*

- Worked in the M&A area of MC, deal types included: carve-outs, acquisitions, spinoffs, and mergers
- Created client-tailored reports to raise red flags, improve efficiencies, & make implementation smoother for employees
- Built out relevant exhibits for clients, including exec comp tables, trial balances, benefit comparisons, 280Gs, etc.
- Performed Due Diligence on target companies by utilizing the data room & public documents and provided analysis
- Wrote out management call agendas, and then participated in the call by taking notes and providing relevant documents

Haberl and Son Construction, LLC. **Philipsburg, NJ**
Business Analyst/Construction Assistant *Mar 2020 – August 2021*

- Enhanced productivity for business staff by 75% by researching and transitioning from a paper service to Quickbooks
- Increased total profit by up to 10% on select projects/services by creating new pricing strategies and services
- Managed client relations by acting as the liaison for payments, scheduling, roadblocks, and complaints from clients
- Drove effective communication, identifying each function's business needs and created cross-functional relationships

Deloitte Undergraduate Case Competition **University Park, PA**
2021 Finalist *Feb 2021*

- Created and collaborated with team to produce a framework for a theoretical merger and acquisition (M&A) situation
- Built a case pitch around the team's M&A working framework and presented it to 15+ senior leaders and competition
- Organized team meetings and practice sessions, acted as liaison between team mentor/organizer and teammates

Penn State Income Association (PSIA) **University Park, PA**
Active Member *Sep 2019 – Present*

- Presented a stock pitch in front of 100+ people, awarded runner-up in the 2020 group stock pitch competition
- Developed a working knowledge of financial markets, equity trading, ETFs, and networking and interviewing skills

ACTIVITIES & LEADERSHIP

Acacia Fraternity **University Park, PA**
Treasurer *Nov 2020 – Nov 2022*

- Provided cost analysis and budget allocation of ~$800k, refined budget spreadsheet finding over $10k savings

- Managed and improved financial dues collection process of over 100+, met with alumni to create financial benchmarks
- Worked with other leaders to help establish alumni relations, organize events, and enforce proper household conduct
- Supported THON fundraising efforts totaling $177k, with that money going to those impacted by childhood cancer

North Hunterdon Varsity Football **Annandale, NJ**
Captain/2017 State Champions *Jan 2016 – Nov 2018*

- Served as a mentor for teammates by demonstrating hard work and emphasizing the football program's culture
- Guided strength & conditioning workouts, captains' practices, inspiring cohesion, and bonding amongst teammates
- Established communication network for any concerns in the program and to update practices/film session times

Jr. Lions Football/Strength & Conditioning **Annandale, NJ**
Coach Aug 2015 – Aug 2018

- Increased participation rates by 10%, recognizing the importance of attendance and advertising the program
- Led practices and took on management role by organizing 50+ athletes into groups by skill and compatibility

Teen P.E.P. (Prevention Education Program) **Annandale, NJ**
Educator/Team Leader *May 2016 – Jun 2017*

- Instructed high school underclassman on important values regarding addiction, consent, and healthy relationships
- Offered guidance on an individual basis through peer mentorship; selected out of 100+ applicants to participate