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Unethical Opportunities in Business Valuation: A Case Study on Value Manipulation

Daniel Szumilas
University of Redlands

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Daniel Szumilas
April 22, 2014

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Daniel Szumilas
March 24, 2014

I. Introduction

Whether a business is attempting to go public, private, or make a major change in capital structure, experts must use various models and evaluate multiple factors to arrive at a value of the business. The factors evaluated to value a business differ based on the approach used but each aims to establish a current value for the business by assessing a company's risk, growth, and earnings to determine a value for its future earnings potential. Valuation experts must consider factors such as the condition of the economy and industry, as well as measures of the company's past performance, such as income and cost of financing using the income approach. Business valuation has widespread applications for companies ranging from establishing an appropriate stock investment to determining the total number that will be paid to acquire another company. While an appropriate valuation can be calculated in theory, valuation transactions leave a lot of grey area that require negotiation and offers before a price is set for the sale of a business. It is difficult to determine the concrete value of a business because a large portion of value is based on speculation and multiple parties need to agree on a value. Companies that are attempting to acquire another company or go private look at indicators of past performance and place a value on future operations based on the company's growth opportunities. A large number of capital transactions are conducted because companies believe they can operate more efficiently with another company or under different ownership. Thousands of transactions occur every year that require companies to take significant risks based on the value of a business in the attempt to increase the owners' and shareholders' wealth. It is important that valuations are accurate and not manipulated because of possible losses for the parties involved.

Looking specifically at mergers and going private transactions (GPTs), the thesis is that management has the incentives and opportunity to make business specific decisions leading up to major capital transactions that result in an overstated or understated value for the company. The research will evaluate the possibility of influencing the factors used in valuation by examining two case studies for signs of manipulation that led to an over or under valuation of the company. The case studies will examine the acquisition of Autonomy by HP in October 2011 and the decision for Dell to revert to

private ownership in November 2013. These are both enormous transactions that were worth billions of dollars and provided strong incentives for exploitation by managers. This possibility is based on the difficulty in obtaining a concrete value in a valuation transaction and monetary size of capital transactions. The discussion will also examine the motivation and reasoning a company might consider when deciding to change its capital or ownership structure through events such as GPTs and mergers. Section II will discuss the different valuation methods used in practice, current valuation standards, and the relevant ethical dilemmas and considerations that management must address in these situations. The standards on valuation methods do not mandate a specific method, leaving a large amount of judgment room in deciding which method to apply. In addition, companies face a large amount of risk of incorrectly valuing the company when deciding to go through major changes. A valuation must consider not only value based on past operations, but also on the predicted impact of uncertain future changes in future operations. However, companies would only be willing to accept these risks if the benefits that companies can obtain outweigh the costs and risks. In many cases these risks pay off by providing benefits such as more control over company decisions and higher profits. Section III will address the effect that value manipulation can have on auditors, investors, and the major companies involved, as well as the role of valuation experts in the process. This issue has become more relevant lately due the increased number of companies that are deciding to become publicly owned or reverting back to private ownership.

The case studies will attempt to determine if the valuation process can be manipulated to achieve a different end value than the true worth of the company by looking at the methods used to calculate value in two specific valuation transactions. In Section IV, I will analyze the acquisition of Autonomy by Hewlett-Packard (HP), which resulted in huge losses for HP from misjudging the value of Autonomy. This first case study will focus on an acquisition that led to a drastic overvaluation to attempt to find evidence if management was able to manipulate the value of the company. In 2010, HP paid \$11.1 billion for the British software company Autonomy, twelve times the company's revenues, because it believed that it would benefit from expanding its market opportunities. Shortly after, HP had to write off \$8.8 billion of the newly acquired company once it realized that the acquisition would not lead to the expected results. The case study will examine the reasoning that led HP to overvalue Autonomy at that amount and what exactly went wrong in the valuation process. Section V will examine the recent decision by Dell to go private and the role that valuation played in determining the price that the company bought back its stock from investors. This second case study will focus on a different kind of acquisition of Dell by its founder and chief executive officer (CEO), Michael Dell.

This transaction to return the company to private ownership was completed on October 28, 2013 for a total transaction value of \$24.9 billion.¹ Section VI will reexamine the thesis and use all the preceding information, including specific examples from the case study, to determine if business managers can directly influence the valuation of their business through strategic decisions.

II. Background

Business Valuation Methods

There are several methods currently used to value businesses that incorporate historical and current information on the company and market to arrive at a value. Experts evaluate factors such as the nature of the business and industry, macroeconomic conditions, the value of outstanding company stock, the financial position, earnings capacity, dividend payment capacity, whether the company has intangible assets such as goodwill and patents, and size of the company.² Based on the results and availability of these factors, one valuation approach might be more relevant than another. The different methods used in practice fall into three broad categories: the income approach (also known as the discounted cash flow method), the market approach, and the asset approach. In June 2007, the American Institute of Certified Public Accountants issued the first standard related to business valuation that provided guidance to experts performing valuations for determining an estimated value. The Statement on Standards for Valuations Service No. 1 (SSVS1) states that professionals must use professional judgment and consider the results of all three approaches when performing a valuation.³ However, despite these three being the main ones used in practice, academics are constantly exploring new methods to arrive at a more accurate value. A visual demonstration of the factors used in the standard valuation model Figure 1.⁴

¹ Dell Corp. "Dell Completes Go-Private Transaction." Financial News. October 29, 2013. Web

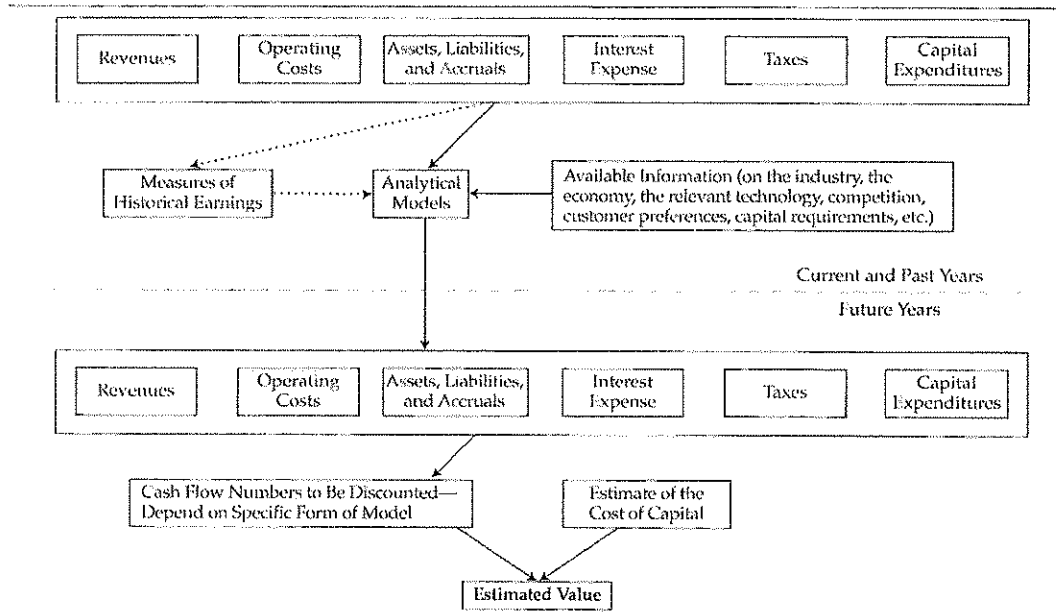
² Ibbotson SBBI 2012 Valuation Yearbook. Chicago: Morningstar, 2012. s.v. "Chapter 1: Business Valuation."

³ Robert F. Reily and John R. Gilbert. "Professional Guidance in Business Valuation: Applying SSVS1." *Journal of Accountancy*. No. 9 (2007): 33, 36.

⁴ Samuel C. Weaver, Robert S. Harris, Daniel W. Bielinski, and Kenneth F. MacKenzie. "Merger and Acquisition Valuation." *Journal of Financial Management and Analysis*. no. 2. (1991): 85-96.

Figure 1 (Cornell and Landsman)

Figure 1. Accounting Information and Valuation



The most widely used method is the discounted cash flow method because of its reliability and widespread acceptance among specialists.⁵ A valuation expert will typically use historical financial information, as well as other macroeconomic, industry and company information to predict expected financial results for several years into the future. The purpose of this approach is to attempt to predict future free cash flows of the business based on current cash flows, an appropriate discount rate, and cost of borrowing for debt and equity. The first factor used in the income approach is the discounted cash flows. As shown in Appendix I, the discounted cash flows is calculated by adjusting net income for non-cash adjustments by subtracting out deferred taxes, capital expenditures, and interest expense while adding back non-cash adjustments such as depreciation and amortization.⁶ Discounted cash flows represents the risk adjusted cash flows and “the total cash that can potentially flow to shareholders and long term debt holders.”⁷ The discounted cash flows are then used in combination with a weighted cost of capital rate to predict cash flows for in future years. The sum of all future cash flows in the predicted years is equal to the discounted present value, which is the total value of the company of the company using this method. Refer to Appendix I for the formulas used in the income approach.

The other approaches valuation experts must consider before deciding on a value are the market approach and the asset based approach. The market approach determines a company’s overall value by

⁵ Ibbotson 2012.

⁶ Ibid.

⁷ Ibid.

comparing the company's ratios with industry ratios and values. The main ratios used are price to earnings, price to cash flows, price to equity, etc. A five year average of all ratios is usually used to avoid short term fluctuations in the industry or business. This approach can only be used if the company is publically traded and there is reliable public information available. The asset-based approach is the most rarely used method because its difficulty and cost. Using this approach, a value is derived from valuing all of the company's assets independently, including both real and intangible assets. This requires the work of multiple experts and appraisers to produce a total value. This method is used only on valuations of smaller companies with few assets, such as holding companies, family limited partnerships, or on bankruptcy proceedings.⁸

An alternate valuation method introduced by researchers is the Financial and Economic Approach to Valuation (FEVA). This method is similar to the income approach and attempts to capture the additional value a company has based on growth opportunities. The researchers that developed this method noticed that different valuation methods theoretically should come up with the same value, but this is rarely accomplished in practice.⁹ Their model relies on one main assumption: the growth rate of a company will be constant. By combining the discounted cash flows model with other models, the FEVA approach provides a more thorough valuation because it considers both the value of the existing business and the value of growth opportunities. The inputs are the leveraged equity value, the present value of tax shield from existing debt and growth opportunities, any bankruptcy costs from unleveraged debt, the current value of debt, and the amount invested in the business.¹⁰ In order for a firm to increase its value it must have a higher return on investments than its cost of borrowing. The FEVA approach could be helpful for valuations because it attempts to explain the different components that generate value. Although this method seems effective in theory, it has not caught on in practice because of its complexity and lack of use by other experts. The authors argue that this method will be especially effective on the valuation of smaller private companies because of predicting the value of growth opportunities without relying on the traded value of equity.

In addition to the value derived from a valuation calculation, a buyer must consider the amount that they are willing to pay for synergies between the buyer and seller and the effect that a capital transaction will have on market capitalization.¹¹ Usually a buyer will place a bid on a company above the valued price because he/she believes that they can generate income more efficiently together than

⁸ Ibid.

⁹ Xavier Adsera and Pre Vonila. "FEVA: A Financial and Economic Approach to Valuation."

¹⁰ Ibid.

¹¹ "Merger and Acquisition Valuation."

apart by increasing operating margins of the acquired subsidiary. Companies should base acquisition decisions on evaluation of whether they have unique compatibilities that will lead to higher profits. The discounted cash flow method is the most popular method used in mergers and acquisitions due to the buyers need to predict the capitalized value of future operating cash flows.¹² The buyer expects to generate at least that much revenue, while increasing profitability by taking advantage of synergies. This is the reason that buyers are willing to pay an average of 40% premium over estimated value to shareholders on acquisitions.¹³ In many cases buyers can be too optimistic about future synergies and their ability to make better management decisions. This can lead to the buyer paying too much to acquire a business and future losses when it is evident that the acquired business will not live up to expectations.

Researchers Bradford Cornell and Wayne Landsman investigate whether company disclosure using different measurement of income, or pro forma income, can manipulate the valuation of a company. The difference in value between revenue required under Generally Accepted Accounting Principles (GAAP) and company reported pro forma income can vary significantly and mislead investor decision making.¹⁴ The issue in valuation is that no meaningful way exists to condense all historical and forecasting data into one measure.¹⁵ Valuation requires forecasting future cash flows by evaluating recent income to determine the earnings power of a company. Certain companies claim that pro forma earnings give better insight into operations of a company, while the SEC claims it is to put a company's financial information into a better light.¹⁶ Pro forma income of many companies often deducts items related to equity related losses, such as amortization, long term interest expense, investment costs, and stock-based compensation, while including the revenues from non-operating revenues, such as non-cash exchanges. Another problem with pro forma income is that companies can change what is included in their reported custom income, which eliminates comparability between different years and competitors. Proponents of pro-forma income argue that GAAP income measurement can obscure the value of a business because of large one time charges of write-offs due to merger or restructuring.¹⁷ The authors conclude that from a valuation perspective, it does not matter which measurement of income is used because the different valuation methods break down income into

¹² Ibid.

¹³ Ibid.

¹⁴ Bradford Cornell and Wayne R. Landsman. "Accounting Valuation: Is Earnings Quality an Issue?" *Financial Analysts Journal*. no. 6 (2003): 20-27.

¹⁵ Ibid.

¹⁶ Jonathan G. Katz, "Release Nos. 33-8039, 34-45124, FR-59." US Securities and Exchange Commission December 4, 2001 <http://www.sec.gov/rules/other/33-8039.htm>

¹⁷ Bradford Cornell and Wayne R. Landsman. "Accounting Valuation: Is Earnings Quality an Issue?"

component data and only use the factors that are useful in predicting value. Component financial information is more useful than any single measure of income for valuation purposes.

Mergers and Going Private Transactions (GPT)

A large number of considerations are involved in a company decision to go private or merge with another company. Examining the benefits and downsides of making significant changes in capital structure provides insight into the decision making process. Houston and Howe argue that the owners that initiate going private transactions are not inherently exploitative or unethical.¹⁸ The main reason is that different forms of ownership can be more efficient at directing the company's resources and obtaining financing. The benefits that come from one form of organization can change over time and a company might need to adapt in order to stay efficient. The reason we have so many large public companies that dominate the economy is because benefits, such as issuing public stock and more financing options, outweigh costs, such as reduced management control, regulatory costs, and outside pressure to meet shareholder expectations. Some of the major benefits that a company can gain from deciding to go private are an increased concentration of capital and less regulation. Although some may argue that GPT's might be unfair because managers have access to insider information, this is balanced by the fact that managers take all the risk associated with such a transaction.¹⁹ Shareholders were paid an estimate of 22% premium on stock above the share price before the decision to go private was announced.²⁰ Shareholders also have the ability to counter being exploited by undertaking private litigation or minority vetoes. By going private, a company can significantly reduce the amount of outside influence by other companies and groups. A private company can have more effective control over management decision making and can be more reactive to changing consumer demands. Houston and Howe conclude that management is actually acting in the shareholder's best interest in GPTs because it results in increased shareholder wealth from participating in the premiums but not the risk of losses if it turns out to be a bad decision.²¹

Despite all of the risk involved in changing a company's capital structure, managers undertake this risk for various reasons. In most cases, a company can substantially increase its capital investment and reduce cost of capital after an Initial Public Offering (IPO).²² In addition to a larger number of

¹⁸ Houston, Douglas A. and John S. Howe. "The Ethics of Going Private." *Journal of Business Ethics*. no. 7 (1987): pp. 519-525

¹⁹ Ibid.

²⁰ Ibid, 521.

²¹ Ibid.

²² Hadiye Asian and Praveen Kumar. "Lemons or Cherries? Growth Opportunities and Market Temptations in Going

investors, a public company benefits from easier access to other forms of financing. Asian and Kumar observe that private firms that are profitable and have access to internal equity financing and low cost of borrowing are unlikely to go public.²³ The likelihood that any given firm will go public increases the larger it gets. In addition, many managers decide to take a company private to avoid strict government oversight. However, Professor Robert Barlett III of University of Georgia argues that in many cases going private does not release a company from Sarbanes-Oxley Act (SOX) regulation.²⁴ This happens because in a typical leveraged buyout, the company intending to go private will hire a private equity firm to obtain cash contributions and long terms loans necessary for the transaction. In most cases, the company is not able to raise enough financing to buy back its own stock on its own and will need to issue high yield notes because they of the increased risk associated with them. At this point the company becomes subject to Section 2 of SOX, which requires that a company must file audited financial statements annually if it has 300 or more note-holders. These notes are then traded on the open market and usually end up with less than 300 note-holders because large institutions buy up the securities. However, at this point the issuing company becomes a voluntary SOX filer because almost all companies make the decision to keep providing information to their debt holders. Since SOX, the quantity and value of GPTs have increased. Although financing is available that does not require regulatory oversight, many firms use high-yield notes to obtain financing that makes them subject to SOX regulation because of increased ability to attract financiers. The increased SOX compliance even among large private companies might indicate that companies benefit from greater disclosure by adding shareholder value and reducing the likelihood of fraud.²⁵

Another important consideration in the decision and value placed in mergers is the notion of scarcity. Each firm is unique and companies must consider what they would lose if they do not merge with another company. One of the reasons for many mergers is that they create unique synergies that will allow the company to generate earnings more efficiently. If a potential buyer decides not to merge, it loses that opportunity and allows another company to gain these synergies. Additionally, some companies that are being bought have exclusive patents on unique products. Buyers usually place additional value on a company to prevent competitors in the same industry from being in an advantageous position by gaining exclusive patents and operating synergies.

Public and Private." *Journal of Financial and Quantitative Analysis*. no. 2 (2011): 489-526.

²³ Ibid.

²⁴ Robert P. Barlett III, "Going Private but Staying Public: Reexamining the Effect of Sarbanes-Oxley on Firms' Going Private Decisions." *The University of Chicago Law Review*. no. 1 (2009): 7-44.

²⁵ Ibid.

III. Perspectives

The issue of management influence on the valuation of businesses can be substantially influential in mergers and going private transactions, as well as other large capital transactions. In an ideal situation, value should reflect a reasonable estimate of what a buyer or investor expects to get from purchasing a company. Buyers want a price that minimizes risk, while sellers want to know the highest price they could obtain.²⁶ However, this is not always the case and businesses must exercise due diligence when performing a valuation to ensure that neither party is getting an unfair advantage. An acquiring company should base the price they are willing to pay on reasonable expectations of merging with another company. In some cases, a valuation may be too high because a company may underestimate the expenses and capital investment required to run an acquired business themselves.²⁷ In addition, mergers provide strong incentives for the company being acquired to manipulate earnings and be able to get away with this. Once the transaction is complete and control of the company is transferred to the buyer, it is almost impossible for the buying company to be able to recover damages caused by misstatements by the seller. Unless there is clear evidence of fraud, the buyer must accept any risk of loss that comes with buying another company. In many cases the buying company is willing to overpay to acquire another company because it must compete with other buyers to purchase the company. Companies in a position to be acquired are considered scarce because no two companies are the same and each provides unique synergies and products to the buyer. This causes buyers to place extra value on the unique opportunities that they would receive in the acquisition in order to prevent other companies, usually a competitor, to benefit from the acquisition. A buyer must determine if the extra value is reasonable and is priced appropriately to reflect future expectations.

Public companies that decide to go public must also closely evaluate their value in order to buy back a controlling portion of stock from the public for a reasonable price. In most cases, the companies must pay a large premium of about 22% over market value to investors in order to be able to do this.²⁸ Despite the significant costs, a company might still decide to go private because they believe the benefits will outweigh the costs. A company can increase its long term profitability by going private because it will have less outside influence, better ability to manage its own resources, and less government regulation.^{29/30} Similar to IPOs, in order to finance such a large transaction a company

²⁶ Samuel C. Weaver, Robert S. Harris, Daniel W. Bielinski, and Kenneth F. MacKenzie. "Merger and Acquisition Valuation." *Journal of Financial Management and Analysis*. no. 2. (1991): 85-96.

²⁷ *Ibid.*

²⁸ Samuel C. Weaver, Robert S. Harris, Daniel W. Bielinski, and Kenneth F. MacKenzie. "Merger and Acquisition Valuation." *Journal of Financial Management and Analysis*. no. 2. (1991): 85-96.

²⁹ "Going Private but Staying Public: Reexamining the Effect of Sarbanes-Oxley on Firms' Going Private Decisions."

must enlist the help of investment banks typically in the form of a leveraged buyout. Although this can be a significant risk for both the investment banks and the company, a conservative valuation can reduce the risk. In addition, private companies posts GPT are able to deduct the interest on their financing and have less pressure to distribute earnings.³¹ Due to the substantial cost of going private, management might face a lot of pressure to manipulate information to arrive a lower value that must be paid to shareholders. This possibility is reduced by the fact that public company stock prices have little room for manipulation due to existing government regulation and highly efficient stock markets. Shareholders are unlikely to accept a buyout offer if the price offered per share is not higher than what the stock is currently trading for. In addition, shareholders have the option of delaying a GPT by the ability of a minority veto and litigation.³² Management would only be willing take such an expensive risk if they believe that they can drastically improve the company's performance by going private. An important aspect of a merger or GPT is to consider how the financing deal is structured. In order to go public, a company must consider how much debt they can take on before determining the amount of investor equity they need to raise. Obtaining the correct amount of financing can be beneficial for companies because of receiving future deductions on interest for tax purposes.³³

In order to perform due diligence on a business valuation, experts need to test if all of the data presented by the company being valued is accurate. It is more likely that businesses will make their final year look better to arrive at a higher value by employing various earnings management and aggressive revenue recognition techniques. For example, a company might increase earnings by non-recognition of certain expenses to increase their operating income and profit margins. An acquiring interest should analyze the different cash flows and compare them to historical data in order to detect if something is out of place. This can also be the case with private companies that decide to become publicly owned by initiating an IPO. The owners of a private company might have additional opportunities to make their company look better in the process of switching to GAAP accounting standards. In performing their due diligence, valuation experts must be skeptical about any significant changes in the years leading up to a capital transaction.

From speaking with a business valuation expert who is a managing partner at CBIZ Mayer Hoffman McCann, LLC it is clear that owners have the ability to materially affect the value of a

³⁰ Houston, Douglas A. and John S. Howe. "The Ethics of Going Private." *Journal of Business Ethics*. no. 7 (1987): pp. 519-525

³¹ Ibid.

³² Robert P. Barlett III, "Going Private but Staying Public: Reexamining the Effect of Sarbanes-Oxley on Firms' Going Private Decisions." *The University of Chicago Law Review*. no. 1 (2009): 7-44.

³³ Ibid.

company. In the valuation process experts use some of the previously mentioned methods such as the income approach and market approach, but also consider the values based on the company's market capitalization and comparison to similar companies. Once the values from the different methods are determined experts apply discounts for factors such as lack of marketability in a situation where there is not a large amount of willing buyers, and discounts for lack of control, which occurs when less than a controlling share is being valued. The expert also stated it is important to consider the company's risk when applying the discount rate in the companies discounted cash flows measure. If a company has a stable history or offers unique products it is less risky than companies that do not have these factors. Company risk and as a result value are highly dependent on the current situations surrounding the business and is why timing and decisions of managers can have a significant effect on company value. Despite this, business valuations experts are able to detect and correct errors in the valuation through a process known as a forensic review. A forensic review is an audit of a company's financial information considering historical performance and current economic conditions to determine if something is amiss. Although there is the possibility that managers can manipulate business value, valuation experts and companies can gain some assurance that value is accurate by exercising additional due diligence.

When auditing a company that is about to participate in a major capital transaction, auditors should focus on fluctuations in the year before a company is sold and the year in which it was announced. The important areas to investigate are the factors used in the valuation calculation, such as total debt, cost of borrowing, and operating profit margins. In addition to standard audit procedures, auditors should look at any significant transactions during the year and compare them with previous years to test for reasonableness. If income is either lower or higher than usual, auditors should examine what caused these fluctuations and if any of it is due to earnings management techniques. The use of earnings management to influence a valuation can be an issue for GPTs, IPOs, acquisitions and, any other substantial change in capital structure that might allow for certain transactions to slip through the cracks. In a GPT, management might be motivated to obtain a lower valuation so that they do not have to pay investors as much to buy back stock. In contrast, a company might try to overstate its value for an acquisition so that the sellers can receive more money. Since valuation is such a complex and subjective process, auditors should increase the amount of testing and confidence required in the year that a company is going through this kind of major change because of the large monetary value and the amount of individuals and companies involved.

Shareholders and other users of financial information should also be concerned with the value of a business because it can drastically change their position with the company. In an IPO and merger,

previous shareholders will usually profit greatly from the company going public or being bought because it means that their percentage interest in the company will be worth significantly more. In IPOs a small initial investment can be worth millions or billions once the shares become publicly traded. In addition, banks and other financiers of the company will have a much more likely chance to collect due to growth of available funds. Users should be concerned about manipulated valuations because it can lead to significant losses if the company does not live up to expectations and investment drops before the involved parties can cash out. Similar risks exist within a GPT because shareholders can be misled about the value of their stock and creditors can lose their ability to collect. A lower value can result in a lower price paid to current shareholders for their investments in the company. This can also affect institutional investors that could lose large portions of their investments and never realize expected returns.

Acquisitions and GPTs create a unique opportunities for investors to profit from premiums paid on stock price at the time of the deal. An investor should consider whether the price offered sufficiently compensates them for their investment and loss of future returns. Some transactions even offer exchanges where an investor can convert their stock ownership in a company that is being acquired into stock of the acquiring company. An investor should consider what result that the capital transaction will have on their investment in the future by deciding if the company will remain profitable and if the stock price will increase. In many situation, the stock price will increase due to larger market capitalization and increased efficiency, unless the value of the acquired company does not reflect what it is actually worth. An investor should examine the details of any capital change and determine for themselves whether the valuation accurately reflects the value of the business.

IV. Research Methodology

The research to determine whether a company can manipulate its valuation to mislead investors and other users will examine a case study on both a large merger and a GPT. The sample will include two deals that have a large monetary value and made financial information available to the public at the time of the transaction. The first case study will focus on the acquisition of Autonomy by HP for \$11.1 billion. This first case involves an instance of gross miscalculation of value and discussion on the fallout that occurred. The second case study will focus on a different kind of acquisition of Dell by its founder and CEO, Michael Dell. This transaction to return the company to private ownership was completed on October 28, 2013 for a total transaction value of \$24.9 billion, or \$13.88 a share in

cash.³⁴ These transactions represent examples where business valuations are used to determine the monetary amount that was paid to gain control of a company.

Using the key financial information, financial reports of both companies, and news articles surrounding the transactions the research will evaluate how the value of the transaction was determined and if value could be manipulated in any way. Specifically, it will look into the internal and external factors that led to these companies to be acquired at that specific price. The case studies will follow a format that begins by discussing the business and role of the company, while focusing on areas that distinguish it from its competitors and make it an attractive target for acquisition. The next topic will discuss financial performance and key ratios in the years leading up the acquisition, while comparing ratios to industry averages. Next, the research will then examine the calculation of value using the income approach in an attempt to replicate how value was calculated. Although the information that went into the actual valuation calculation at the time of the transactions is confidential, it is possible to attempt to recreate the income approach to valuation by using a couple key assumptions. When applying the income approach, the research will assume a forecast timeframe of free cash flows of 5 years, growth in cash flows was constant, and a terminal value beyond 5 years using a certain growth rate. Finally, we will discuss the details of the capital transaction and the resulting fallout. This will examine what happened to the company following the transaction by examining whether the value of the company changed and if the results from the media deviated from expectations. The hypothesis that will be tested is that managers have unique opportunities to manipulate the valuation of their company leading up to major capital transactions that result in an over or under valuation. This research will assume that the hypothesis is incorrect unless there is clear evidence in either case study that the factors used in the valuations could have been manipulated to achieve a grossly miscalculated value.

V. Case Study I: Autonomy Corp.

The first case study will be an in depth analysis of the acquisition of Autonomy Corporation by Dell Corporation for a total of \$11.1 billion. Since its founding in 1996, Autonomy has continued to grow due to its specialized approach to information systems, improving profit margins, and growing user base. Autonomy focuses its operations on selling and developing its signature product, Intelligent Data Operating Layer (IDOL), and a variety of products to support it. IDOL is an information infrastructure that can analyze vast amounts of information from all sources coming into the business such as emails, web pages, social media, documents, and video files to extract simplified meaningful

³⁴ Dell Corp. "Dell Completes Go-Private Transaction." Financial News. October 29, 2013. Web

data for the user. This product has set Autonomy apart from its competitors and continues to attract new customers, as well as continued sales from existing customers. In Autonomy's own words, "Autonomy makes technology which allows computers to understand information that is still in human-friendly form, like emails, webpages, and documents. This technology is useful in almost every industry and software sector. We make technology for use by others."³⁵ Some notable users of Autonomy's IDOL technology are CNN, FedEx, Coca-Cola, Bank of America, US Securities Exchange Commission, NASA, Ford, and many others. The reason that these and many other large organizations buy products from Autonomy is because it is the best information management system available and significantly increases efficiency when applied. Every year, Autonomy invests a large amount of money and effort for research and development to find new ways to improve IDOL and create additional products. The company has been recently successful at spreading the IDOL technology to include cloud computing, which allows users to access information from mobile sources. The exclusive patents owned on this technology create significant demand for Autonomy's products with limited competition and annual revenue streams from its committed customers. In addition, Autonomy has performed multiple horizontal acquisitions to increase their customer base and grow the size of the company. From 2005 to 2009, Autonomy has acquired three major competitors for a combined value of \$1.3 billion, increasing its market capitalization by 20%, along with yearly acquisitions of smaller companies.³⁶ As a public company, Autonomy has based all of their decisions on increasing shareholder returns. This business model has resulted in Autonomy being one the largest three technology companies in Europe and a market capitalization of about \$6 billion at the end of 2010.³⁷ Autonomy's large market share and unique products has made it a very desirable company for HP to acquire.

³⁵ Autonomy Corporation. "Annual Report and Accounts For the Year Ended 31 December 2010." 1.

³⁶ Ibid, 6-7.

³⁷ Ibid, 8.

Table 1: Autonomy Key Financial Data (in thousands)

	2007	% change	2008	% change	2009	% change	2010
Revenues	343,409	47%	503,229	47%	739,688	18%	870,366
R&D Expense	(62,341)	26%	(78,410)	26%	(98,785)	16%	(114,752)
Profit From Ops	88,649	134%	207,482	59%	328,905	14%	376,566
Profit Before Taxes	91,447	128%	208,892	55%	323,066	17%	378,921
Net Profit	62,465	137%	148,001	57%	232,798	26%	292,219
Fully Diluted EPS (IFRS)	0.30	127%	0.68	43%	0.97	24%	1.20
Total Assets	1,216,404	9%	1,320,323	73%	2,279,555	44%	3,280,522
Total Liabilities	218,091	-8%	200,423	188%	577,776	110%	1,213,273
Net Assets	998,313	12%	1,119,900	52%	1,701,779	21%	2,067,249
Cash From Ops	82,459	77%	146,336	71%	250,021	21%	302,328

Table 2: Autonomy Key Financial Ratios

	2007	2008	2009	2010	Industry ³⁸
Current Ratio	2.34	1.74	1.56	3.87	1.11
Return on Assets	0.05	0.11	0.10	0.09	0.05
Net Profit Margin	0.18	0.29	0.31	0.34	0.05
Asset Turnover	0.28	0.38	0.32	0.27	1.04
Return on Equity	0.06	0.13	0.14	0.14	0.20
Debt to Equity	0.22	0.18	0.34	0.59	0.60

In addition, Autonomy has a history of exceptional performance, especially in recent years. The company has continued to grow and provide strong returns to their investors by increasing revenues and profits. The company is able to maintain high revenues by having an established customer base that annually update their products, while continuing to attract new users. From 2008 to 2009 revenues increased by 47% and by 18% from 2009 to 2010, ending in \$870 million in the year prior to the acquisition by HP. Growth in revenues might have slowed in 2009 due to the global recession, but Autonomy was still able to achieve positive growth. These numbers translate into high returns for the company because it is able to keep its net profit margin high at 34% in 2010, higher than the 5% average in the computer systems industry. This is due to the ability to control operating costs and “turn one-off sales into committed annuity streams.”³⁹ Autonomy has also been highly successful at turning

³⁸ Industry averages are based on the Computer Systems Industry for 2012 from MSN Money.

³⁹ Ibid, 4.

growing research and development expense into more revenues. The continual increases in the number of funds spent on research and development allows the company to develop new products, such as recent IDOL Cloud based products. Its recent acquisitions of major competitors also heavily contribute to increased revenues and company growth. These strategic acquisitions have caused a notable increase in the company's total assets, total liabilities, and net assets in the years 2008 to 2010 and contribute to increasing revenues and profits. Although dividends were not paid, long term investors in Autonomy benefited by seeing high returns on their investments and drastic growth in earnings per share (EPS).

The acquisition of Autonomy by HP is notable because it resulted in the largest write down of an acquired company. HP was very determined to acquire Autonomy because of its unique products and exceptional performance. As one largest multinational computer hardware, software, and service companies, HP has performed a number of acquisitions to increase the variety of products it offers and Autonomy's IDOL technology is the next unique product that it can offer its customers. It makes sense that Autonomy was acquired when it was by HP due to the possibility that HP might be outbid by one of their competitors, which would have been a huge competitive disadvantage. Successful companies with unique products are scares in the market, and it is better for HP to acquire it while it is still possible. After a lengthy negotiations phase, in October 2010 HP announced that it had acquired Autonomy for a total value of \$11 billion. Autonomy was not the first company that HP has over paid for: sales growth has been slowing in the past decade and HP has been relying on a number of large acquisitions to fuel growth, by acquiring other tech companies such as Compaq and Palm.⁴⁰ HP recorded \$6.9 billion in goodwill on the \$11 billion purchase price of Autonomy, totaling to \$36.8 billion dollars in combined goodwill on HP's balance sheet. After four quarters of integrating and running Autonomy, HP announced that it would write off \$8.8 billion of the recently acquired company as an impairment charge because they will be unable to recognize that value in the future. HP's chief executive officer Meg Whitman, who succeeded former CEO Leo Apotheker, claimed that the value of the company was overstated because Autonomy had fraudulently misrepresented its earnings and reported revenue prematurely. HP announced that accounting improprieties in the way that Autonomy reported revenue accounted for about \$5 billion of the \$8.8 billion write down. Recently HP reissued Autonomy's financial statements that reflect performance without the alleged fraudulent revenue. Based on the reissued financial statements, HP claims that Autonomy overstated revenues by 54% and net income by 80%.⁴¹ If these accusations are true it would have a significant impact on company value

⁴⁰ Jonathan Weil. "HP's explanation Still Makes No Sense." Bloomberg. November 11, 2012. Web.

⁴¹ Julie Bort. "HP Unveils Autonomy Accounts, Where \$140 Million Has Allegedly Disappeared." Business Insider. February 3, 2014. <http://www.businessinsider.com/hp-restates-autonomys-2010-financials-2014-2#ixzz2xrMQujBa>

and would justify the write down.

Former Autonomy officers responded by stating that their financial information available to HP was accurate and received perfect audit reports quarterly by Deloitte. At this point, it is uncertain if HP's allegations are correct and if Autonomy fraudulently reported its earnings. However, it is still possible to test the hypothesis by examining how company value was determined. Autonomy claims that one of the reasons behind the write down is that HP did not perform their due diligence when valuing the company. Specifically, Autonomy claims that some of the write off is due to differences between IFRS and GAAP that HP did not evaluate in the valuation. These differences have allowed Autonomy to be slightly more aggressive when recognizing revenue. Specifically, there is one difference that allowed Autonomy to recognize revenue immediately on sale to resellers, something that is not allowed with GAAP.⁴² However, these differences would at most cause 12% overstatement of value, not 80%.⁴³ Also, many believe that since HP had a large team of about 300 experts working on the valuation, it should have known about differences in accounting standards and accounted for those in the valuation.

Based on calculations in Appendix 2, Table 3 shows different results of value based on different constant growth rates in free cash flows and different terminal values after 5 years. Using the income approach, HP would have to have assumed a growth rate of 35% to 40% in the first 5 years of operations, with terminal growth rates of 0% and 4% respectively, in order to value Autonomy at \$11.1 billion. Based on a 4 year average, Autonomy's growth in cash flows was approximately 56% and growth in net profit was about 73%. These growth rates represent the growth that Autonomy has been able to achieve as a fairly new medium sized company and are most likely not sustainable post acquisition. While it is understandable how HP might have achieved the \$11.1 billion price based on Autonomy's industry position and products, it appears that HP was too eager and overvalued the company. Even though Autonomy has had relatively high growth rates in its past, it is incorrect to assume that they will stay high because companies that grow at high rates are bound to slow down at some point. Autonomy has been able to grow its earnings and company size in the past by acquiring other companies, something that will not continue while owned by HP. The first assumption in Table 3 assumes a more conservative growth rate of 25% for the first 5 years and 0% afterwards to arrive at a value of almost \$6 billion. This demonstrates that if HP was more conservative with its growth rate assumptions, it would not be subject to such a large write down. The last two values in Table 3 use the assumption that net income was overstated by 80%, according the HP allegations. Using different free

⁴² Anjuli Davies. "Autonomy Founder Says HP Allegations Don't Add Up." Wall Street Journal. November 23, 2012.

⁴³ Ibid.

cash flows derived from assuming that net income was overstated by 80% and the same assumptions as the second and third values, we arrive at values of \$4.1 billion and \$4.4 billion. These values would actually come close to justifying the \$8 billion write off of the \$11 billion purchase price. However, keep in mind that these are based on financial statements reissued by HP and are biased to support their allegation. In addition, the latter values depict how profound the impact that misstated earnings can have on a business valuation.

Table 3: Assumptions	Company Value (in thousands)
25% Growth Rate for First 5 Years, 0% after	\$5,970,389
40% Growth Rate for First 5 Years, 0% after	\$10,805,110
35% Growth Rate for First 5 Years, 4% after	\$11,408,892
What if Net Income was overstated by 80%?	Company Value
40% Growth Rate for First 5 Years, 0% after	\$4,104,266
35% Growth Rate for First 5 Years, 4% after	\$4,376,795

HP allegations against former Autonomy owners are based on the claim that Autonomy over reported its earnings in the years that it was an independent, publicly owned company.⁴⁴ Manipulated earnings could have a significant impact on valuation under the income approach because of the use of net income and certain cash flows in the most recent year to determine free cash flows, the main factor used to forecast future cash flows using the discount rate. If earnings are manipulated this will also have an impact on expected growth rate used to determine future cash flows. Based on these assertions, the evidence in this case study supports my hypothesis. Although it is unclear if Autonomy actually manipulated its earnings, the possibility exists that if it did manipulate its earnings or earnings were misrepresented to HP Autonomy could have achieved a higher business valuation.

⁴⁴ Reuters, "HP says Autonomy inflated 2010 profits by 81 percent- filing." February 4, 2014. Web.

VI. Case Study II: Dell Corp. GPT

After over a year of negotiations and heavy opposition, in November 2012 Michael Dell, the founder and CEO of Dell Corporation, announced that it would buy back a large amount of its stock in order to revert the company to private ownership. Dell Corp., once the largest multinational computer hardware retailer, has been facing problems in the past decade due to slowing sales and the economic recession. Michael Dell has stated that under private ownership the company will be more responsive to consumer demands without having to worry about the effect that changes in stock price will have on consumers as the reason for taking the company private. This deal combines Michael Dell's 16% ownership⁴⁵, \$750 million in cash, and \$19.4 billion from investment firm Silver Lake and other lenders to increase Michael's personal ownership percentage to 75%.⁴⁶ At a total transaction value at roughly \$24.9 billion this is the largest GPT to date.

Table 4: Dell Key Financial Data (in millions)

	2009 ⁴⁷	% change	2010	% change	2011	% change	2010	% change	2013
Revenues	61,101	-13%	52,902	16%	61,494	1%	62,071	-8%	56,940
R&D Expense	663	-6%	624	6%	661	31%	856	25%	1,072
Operating Income	3,190	-32%	2,172	61%	3,433	26%	4,431	-32%	3,012
Income Before Taxes	3,324	-39%	2,024	66%	3,350	27%	4,240	-33%	2,841
Net Income	2,478	-42%	1,433	84%	2,635	33%	3,492	-32%	2,372
Diluted Normalized EPS	1.25	-42%	0.73	55%	1.35	37%	1.88	-25%	1.52
Total Assets	26,500	27%	33,652	15%	38,599	15%	44,533	7%	47,540
Total Liabilities	22,229	26%	28,011	10%	30,833	16%	35,616	3%	36,860
Net Assets	4,271	32%	5,641	38%	7,766	15%	8,917	20%	10,680
Operating Cash Flows	1,894	106%	3,906	2%	3,969	39%	5,527	-41%	3,283

⁴⁵ Michael Dell's stock valued at more than \$3 billion.

⁴⁶ Connie Guglielmo. "Dell Officially Goes Private: Inside the Nastiest Tech Buyout Ever." *Forbes Magazine*. November 18, 2013.

⁴⁷ All Dell financial years are 12 months ended at the end of January on the stated year.

Table 5: Dell Key Financial Ratios

	2009	2010	2011	2012	2013	Industry ⁴⁸
Current Ratio	1.36	1.28	1.49	1.34	1.19	1.11
Return on Assets	0.09	0.04	0.07	0.08	0.05	0.05
Net Profit Margin	0.04	0.03	0.04	0.06	0.04	0.05
Asset Turnover	2.31	1.57	1.59	1.39	1.20	1.04
Return on Equity	0.58	0.25	0.34	0.39	0.22	0.20
Debt to Equity	5.20	4.97	3.97	3.99	3.45	0.60

Dell Corp. has not seen significant growth in the recent five years and much of its positive performance is due to recovering from the economic recession. Dell Corp. makes over 60% of its revenue from the sale of personal computers (PCs), which are sold at an incredibly low margin in order to remain competitive.⁴⁹ The company's strategy is to use its high quantity of PC sales to attract users that they can upsell to its more profitable software and service lines. As part of restructuring as a private company, the company hopes to increase the sales and market share of its services and software, which is currently less than 1%.⁵⁰ Although Dell Corp. has experienced steady growth in assets and research and development expense, it has been unsuccessful at converting this to higher profits. The main reason for this is due to being unable to increase profit margins, with profit margins in the recent years floating below the industry standard of 5%. The net profit is brought down by the made-to-order PC strategy, which occasionally causes HP to sell PCs at negative operating margins in order to attract customers and compete with competitors. On a positive note, Dell Corp.'s capital structure has simplified the decision to go private. Compared to the industry, it has a higher debt to equity ratio due to a larger share of its financing from debt rather than shareholder equity.

Dell Corp.'s stock has not performed well in the past and stock prices have remained stagnant. As shown, in 2013 it was unable to achieve revenues at least as high as in 2008. Carl Icahn, formerly Dell Corp.'s third largest investor, has raised significant opposition to the decision to go private by claiming that Michael Dell is taking advantage of a period that Dell Corp. is not doing so well.⁵¹ Most previous investors will not benefit if Michael Dell is able to make the company more profitable in the future. In the end, Icahn was unable to convince enough investors of his views but the timing of the transaction has had a significant influence on the value of the company. Most likely taking the company private would have been too expensive if the transaction was executed in more profitable years.

⁴⁸ Industry averages are based on the Computer Systems Industry for 2012 from MSN Money.

⁴⁹ Connie Guglielmo. "Dell Officially Goes Private: Inside the Nastiest Tech Buyout Ever."

⁵⁰ Ibid.

⁵¹ Shira Ovide and David Benoit. "Corporate News: Dell Shareholders Approve Buyout." Wall Street Journal, Sep 13, 2013.

Based on the financial statements for the year ended February 1, 2013 and the past 5 years of financial statements, Appendix 3 and Table 6 show the results of the discounted cash flows approach to valuation. Since Michael Dell paid \$24.9 billion to change his ownership percentage from 16% to 75%, or to buy 59%, the calculations assumed that the total company value was worth \$42.3 billion. As shown, to arrive at around the \$42.3 billion value the growth rate would have to be set at either -3% with -2% terminal value and -5% with -1% terminal value using certain assumptions. Using a 0% growth rate with 1% terminal value would result in a company value of \$54.6 billion. In this case, it makes sense to set the growth rates at negative values because the company has had gradual decline in revenue and net profits in the years before the transaction. Free cash flows used in determining value is based on the financial results of the most recent year of operations and having a low net income and varying other expenses can cause free cash flow to be low and drives down the value of the company significantly. The fourth and fifth values are calculated using free cash flows derived from net income and other financial data from 2008, when Dell was slightly more profitable. Use the same growth rate assumptions used to achieve the \$42 billion transaction price, using 2008 free cash flows yielded values of approximately \$49 billion. Using the assumptions made in this calculation, this shows how timing and the performance in the year used in the valuation can have a huge effect on company value, an increase of \$7 billion in Dell's case if the transaction was done 5 years earlier. In addition, in 2008 Dell was performing well and the valuation would have most likely assumed positive growth rate to achieve an even higher value.

Table 6: Assumptions	Company Value (in millions)
0% Growth Rate for First 5 Years, 1% after	\$54,664
-3% Growth Rate for First 5 Years, -2% after	\$42,003
-5% Growth Rate for First 5 Years, -1% after	\$41,924
Using 2008 Free Cash Flows	Company Value
-3% Growth Rate for First 5 Years, -2% after	\$49,214
-5% Growth Rate for First 5 Years, -1% after	\$49,124

Based on the research, this case study confirms my hypothesis because of management's decision on the timing of the valuation had a large influence on the valuation of the company. If the valuation was performed on any other year, it is likely the value would have been significantly different. This does not mean that Michael Dell acted unethically in his decision, but he saw an opportunity when going private was possible and used it. It does not appear that Michael Dell and other managers acted unethically to lower earnings in order to get a lower valuation. The reason that Dell has not been performing well recently was its large portion of its sales in the desktop and laptop market, which has been declining throughout the industry due to less consumer demand. Dell was unable to shift its business strategy toward areas that were selling well and growing, such as tablets, smart phones, and services. Dell will most likely be more responsive to these kinds of changes in the future because of less control exercised by the shareholders and board of directors. Already, it has stated that it is planning on expanding its more profitable software and service.⁵²

Table 7 shows the first quarter of earnings that Dell Corp. has released since going private. As shown, there has not been improvement in performance, but it might be too early to determine if the GPT will yield positive results. Under previous public control, negative quarterly results like these would have made a large impact on shareholders. However, now Dell can focus on its long term strategies without worrying how the stock market will react. The first quarter results for Dell are expected to be low due to additional expenses it might have incurred in the GPT. Dell's future is still uncertain at this point, but its prospects look good under new control because of its ability to have more control over its future.

Table 7: Dell Corp. post-GPT performance for 1st quarter 2014

<i>(in millions)</i>	First Quarter		
	FY14	FY13	Change
Revenue	\$ 14,074	\$ 14,422	(2)%
Operating Income (GAAP)	\$ 226	\$ 824	(73)%
Net Income (GAAP)	\$ 130	\$ 635	(79)%
EPS (GAAP)	\$ 0.07	\$ 0.36	(81)%
Operating Income (non-GAAP)	\$ 590	\$ 1,010	(42)%
Net Income (non-GAAP)	\$ 372	\$ 761	(51)%
EPS (non-GAAP)	\$ 0.21	\$ 0.43	(51)%

⁵² Connie Guglielmo. "Dell Officially Goes Private: Inside the Nastiest Tech Buyout Ever."

VII. Conclusion

Based on the research from the two case studies, my hypothesis is correct and business valuations provide the opportunities and incentives to manipulate the valuation based on decisions that management makes leading up to a merger or GPT. From examining my case studies, there are indicators that the effect that management can influence earnings and timing of a capital change can have significant influence on the value of a company. Although both case studies use quarterly audited financial information, it is still possible that the quality of earnings can be influenced in the years leading up to a capital change. This leads to the potential for a significant fluctuation in company value because of relying on reported financial data for key assumptions, such as free cash flows and growth rates in the income approach. In addition, the timing of the valuation transaction also has a significant influence on business value. Just like managers at Dell Corp. chose to take the company private during an unprofitable year resulted in a lower business value, it is possible for other managers to buy another company or perform another capital change at a time where company value can be favorable for them. Although neither case has proof of unethical behavior, it is clear that the decisions of management can influence the business value.

Keep in mind that the research is based on certain assumptions based on value that would be arrived at using the income approach. This would only be one of the methods used in value calculations and the inputs actually used could vary significantly than the ones used in the case study because of the confidentiality of the actual valuation process. This calculation could be performed multiple times and results would be different each time if different assumptions are made. Also, the conclusion is based on the results from only a sample of two case studies and the thesis does not apply broadly to all business valuations. Further research should be directed at determining if this conclusion applies to more acquisitions and GPTs, as well as other uses of valuation.

Appendix I

Income Approach to Valuation

$$PV_S = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \dots + \frac{CF_i}{(1+k)^i}$$

where:

PV_S = the present value of the expected cash flows for company s

CF_i = the cash flow expected to be received at the end of year i

k = discount rate, the cost of capital for the company, or WACC

Free Cash Flow

Net Income

+ Depreciation and Amortization

+ Deferred Taxes

– Capital Expenditures

– Changes in Working Capital

+ (Interest Expense * (1 – Effective Tax Rate))

= **Free Cash Flows**

Weighted Average Cost of Capital (WACC)

$$WACC = W_D k_D (1 - t) + W_E k_E$$

$$W_D = \frac{D}{D+E}, \quad W_E = \frac{E}{D+E}$$

where:

W_D = Weigh of Debt in Capital Structure

k_D = Cost of Debt Capital

t = Effective Tax Rate

W_E = Weigh of Equity in Capital Structure

k_E = Cost of Equity Capital

D = the market value (or book value) of debt outstanding

E = the market value of equity outstanding

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Dell Market Capitalization: <http://www.quandl.com/stocks/dell>

Appendix II

Free Cash Flows (in thousands)

	Actual	80% Overstated	
Net Income	217,293	43,459	Marginal tax rate = 0.28 (UK rate)
Depreciation and Amortization	156,890	156,890	Cost of debt borrowing = 0.0484
Deferred Taxes	(8,434)	(8,434)	Cost of equity borrowing = 0.17666
Capital Expenditures	(59,624)	(59,624)	
Changes in Working Capital	(55,896)	(55,896)	
Interest Exp * (1- t)	31,800	31,800	
	282,029	108,195	

Cost of Equity (CAPM) = $.0254 + 1.46 (.129-.0254) = 0.17666$

2.54% Risk free rate for 10 year T-note on 10/31/11 (Treasury.gov)

12.90% Market rate of return for S&P for 2011

1.46 Beta for HP post merger

WACC = $0.27 * 0.0484 * (1-0.23) + 0.73 * 0.17666 = 0.1390$

Wd = $\frac{2233744}{2,233,744+5,900,000} = 0.27$ We = $\frac{5900000}{2233744+5900000} = 0.73$

5,900,000 Market Value of Equity on October 2011

2,233,744 Book Value of Liabilities on June 30 2011 BS

Income Approach (in thousands)

Free CF	WACC
282,029	13.90%

Growth Rate	Year							
	1	2	3	4	5	6+	Value	
25%	352,536	440,670	550,838	688,547	860,684	1,075,855	\$ 5,970,389	
Discounted	309,507	339,663	372,756	409,074	448,931	7,738,621	Zero terminal growth rate 4,090,458	

Two growth patterns consistent with \$11 B: 40% for 5 yrs, none thereafter; or 35% for 5 yrs, 4% thereafter

	Year							
	1	2	3	4	5	6+	Value	
40%	394,841	552,777	773,888	1,083,443	1,516,820	2,123,548	\$ 10,805,110	
Discounted	346,648	426,073	523,696	643,686	791,169	15,274,665	Zero terminal growth rate 8,073,838	

	Year							
	1	2	3	4	5	6+	Value	
35%	380,739	513,998	693,897	936,761	1,264,627	1,707,247	\$ 11,408,892	
Discounted	334,268	396,183	469,566	556,541	659,626	17,240,713	Terminal growth at 4% 8,992,709	

If NI was overstated by 80% in year before acquisition, how much extra was paid in error?

	Year							
	1	2	3	4	5	6+	Value	
40%	151,473	212,062	296,887	415,641	581,898	814,657	\$ 4,104,266	
Discounted	132,985	163,454	200,905	246,937	303,516	5,859,822	Zero terminal growth rate 3,056,467	

If NI was overstated by 80% in year before acquisition, then what growth would it take to support the \$11 B price?

	Year							
	1	2	3	4	5	6+	Value	
35%	146,063	197,185	266,200	359,370	485,149	654,951	\$ 4,376,795	
Discounted	128,235	151,988	180,140	213,506	253,053	6,614,057	Terminal growth at 4% 3,449,874	

Appendix III

Free Cash Flows (in millions)

	YE 2013	YE 2008		
Net Income	2,372	2,478	Marginal tax rate =	0.20
Depreciation and Amortization	1,144	769	Cost of debt borrowing =	0.0326
Deferred Taxes	(428)	(86)	Cost of equity borrowing =	0.2212
Capital Expenditures	513	440		
Changes in Working Capital	(447)	(1,673)		
Interest Exp * (1- t)	137	1,928		
	<u>3,291</u>	<u>3,856</u>		

Cost of Equity (CAPM) = $.0256 + 0.95 (.129 - .0256) = 0.1238$

2.56% Risk free rate for 10 year T-note on 10/29/13 (Treasury.gov)
 12.90% Market rate of return for S&P 500 for 2013 (Nasdaq.com)
 0.95 Beta for Dell Oct. 29, 2013 (Value Line)

WACC = $0.68 * 0.0326 * (1 - 0.40) + 0.32 * 0.1238 = 0.0529$ 59

Wd = $\frac{36839}{36839 + 17690} = 0.68$ We = $\frac{17690}{36839 + 17690} = 0.32$

17,690 Market Capitalization for Dell Inc. on 10/29/13
 36,839 Book Value of Liabilities on 2013 FS

Income Approach (in millions)

Free CF WACC Dell: bought 59% of company for \$25 B; value if 100% worth 42.3B
 3,291 0.0529

Growth Rate	Year						Value
	1	2	3	4	5	6+	
0%	3,291	3,291	3,291	3,291	3,291	3,291	\$ 54,664
Discounted	3,125	2,968	2,819	2,677	2,543	76,679	Terminal growth at 1% 40,531

Two growth patterns consistent with \$42.3 B

Growth Rate	Year						Value
	1	2	3	4	5	6+	
-3%	3,192	3,096	3,003	2,913	2,826	2,741	\$ 42,003
Discounted	3,032	2,793	2,573	2,370	2,184	37,593	Terminal growth at -2% 29,052

Growth Rate	Year						Value
	1	2	3	4	5	6+	
-5%	3,126	2,970	2,821	2,680	2,546	2,419	\$ 41,924
Discounted	2,969	2,679	2,417	2,181	1,968	38,448	Terminal growth at -1% 29,710

Using 2008 Financial Statements to determine Free Cash Flows

Growth Rate	Year						Value
	1	2	3	4	5	6+	
-3%	3,740	3,628	3,519	3,414	3,311	3,212	\$ 49,214
Discounted	3,552	3,273	3,015	2,777	2,559	44,049	Terminal growth at -2% 34,038

Growth Rate	Year						Value
	1	2	3	4	5	6+	
-5%	3,663	3,480	3,306	3,141	2,984	2,835	\$ 49,124
Discounted	3,479	3,139	2,832	2,555	2,306	45,052	Terminal growth at -1% 34,813