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Impact of the CEO Effect on Premiums in Mergers and Acquisitions

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I… Introduction and Overview:

Mergers and Acquisitions (M&As) are a useful tool to expand into new markets, combine powerful companies, create economies of scale, and increase overall growth potential. There are many benefits that M&As create, including tax shield savings for the acquiring firm as well as synergy. Additionally, there are the benefits of diversification that lead to stable earnings and reduced risk. Benefits such as these lead to improvements in industries worldwide, reducing overhead and overall costs of the acquiring firm (Brigham & Daves 2010). In the past, M&As served as the foundation for many of the most successful companies of our time, both nationally and internationally. Evidence of M&As have been around since the nineteenth century, suggesting that the expansion of companies has always been a driving force of business (Brigham & Daves 2010).

The first resemblance of a M&A began with the East India Company. The East India Company chose to merge with a competitor to maintain its monopoly over the Indian spice trade. In order to secure its place in a highly lucrative market, both companies decided it would be best to merge to dominate the market and keep other competitors out. Other mergers in different industries, such as the Hudson Bay Company and North West Company, joined together pre-1895 as well. Not all of these mergers involved friendly takeovers in order to ensure profits. In fact, the British government intervened and merged together the Hudson Bay Company and North West Company, wishing to put an end to the sometimes-violent competition. After the merger, the total number of jobs decreased and changes in daily management and operations occurred for both companies. However, the total territory covered by the two companies was more than enough to compensate for these losses (Brigham & Daves 2010).

The first notable "movement", however, started in 1895, in the tobacco, steel, and oil industries. The driving rationale was that many small firms could join together to gain larger market share and lower costs (Brigham & Daves 2010). This early idea of joining two large companies to dominate an industry is still prevalent in recent M&As. The second wave occurred in 1916, which focused more on vertical mergers. These M&As created larger companies capable of controlling different steps of production, further cutting costs and leading to greater monopolies. The third wave in the 1960s brought more diversified mergers, turning more attention to market share while the following wave in the 1980s focused on cross-borders and corporate takeovers. The most recent wave, in 2003, began the current trend of shareholder activism, where the focus of mergers was to create exceptional post-merger performance that would lead to higher returns. Whereas before mergers focused more on reducing competition, these recent mergers have taken a turn to relying upon the strengths of both companies to create a stronger entity (Brigham & Daves 2010).

In short, M&As advance companies' growth strategies. When two companies enter into a M&A, discussion between upper management initiates, often lasting many months. Amongst the many topics is the idea and magnitude of a premium. A premium is defined as the difference between the current market value of the target firm and the actual price paid to acquire that firm. Therefore, these premiums rely heavily on the valuation of the target firm. Valuing the target company is oftentimes done by discounting expected future cash flows by the weighted average cost of capital, adjusting for appropriate risks and growth. Often the price paid and the market value of the company is the same and no premium exists, as is the case with many of the companies Google has acquired in the past ten years. Other times, the acquiring company may receive a discount and pay less than the market value.

For example, in 2012, the friendly acquisition of European Goldfields Limited by Eldorado Gold cost $2.5 billion dollars. This acquisition resulted in Eldorado purchasing all of European's shares, both outstanding and issued. This recent merger is important to note, as it shows movement away from the traditional payment method of cash for target companies. Now, it is typical that acquiring companies pay premiums consisting of both cash and shares. The largest mergers in the past decade include AOL's purchase of Time Warner and Microsoft's acquisition of Skype. The technology trend follows M&As, leading to spiking premiums paid. With business relying more on technology each day, it pays to be on the cutting edge. These mergers demonstrate a need for combined strengths in order to gain more market share in the industry. Furthermore, Betton, Eckbo, and Thorburn (2008) show that between 1980 and 2002 the average premium paid in a M&A equals 48% of the market value of the target. With the need to remain competitive, some extremes even exceed 100%.

Yet, premiums ranging into the billions have been paid for companies that possess less than a third of that total value in assets and cash flows. The process of calculating a premium is more complex and involved than simply looking at a balance sheet or income statement. Consequently, there are many factors that go into valuating a firm that lead to these discrepancies. These factors are not visible on an income statement and often play a crucial role in proper corporate valuation.

This paper will explore the impacts the Chief Executive Officer (CEO) has on the financial performance of a company. First, power of the CEO will be defined. Power will then be used to draw parallels between differing communication styles and leadership styles. Then, this CEO style, coined the CEO effect by recent research, will be linked to variance in financial performance across firms. After this connection has been proven to exist, the CEO effect will

then be posed into a M&A context to see if the CEO influences the premium paid. Quantitative and qualitative measures will be used to look at the CEO effect on recent M&As, as both play a large role in M&A valuation. For simplicity, this paper will focus only on friendly mergers.

In order to properly discuss the premiums in recent mergers, I will look at different approaches to valuing a firm. These approaches will be defined, analyzed, and then considered for the use of breaking down a premium into smaller, easier to understand components. Weaknesses and strengths will be outlined, involving Tobin's Q, ROA, and MPNV. The advantages and limitations of these quantitative measures will be looked at in efforts to choose a proper valuation technique for M&As that consider CEO effect on the premium paid.

II… Power Defined in Relation to Firm Performance

In this paper, power is defined as the consistent degree to which a person faces resistance when making and influencing key decisions. Usually in a large company the CEO is both the face and the source of power. Decisions made by the CEO can lead to either the success or the downfall of a company. This power, therefore, is extremely important for the life of the company and consequently is in the interest of the shareholders of the company (Finkelstein, 1992). Power, while important, is a broad term in management and needs to be further defined in order to properly investigate its implications on a firm.

Therefore, power can further break down into four key sources: structural power, ownership power, expert power, and prestige power (Finkelstein, 1992). Structural power consists of the formal organizational structure and hierarchy of the company. It is also the most commonly cited form of power. Those wielding this power have legislative authority and influence over others' actions, thereby influencing major decisions of the company (Finkelstein,

1992). Ownership power relates back to the amount of control a CEO has over the company. This control comes from the number of shares the CEO possess and if the CEO is the founder of the company. Research done by Zaid lays the groundwork for the idea that all else held equal, those top managers with a higher amount of ownership in a company will become more powerful (Zaid, 1969). Expert power relates to the ability of the CEO to handle contingencies in the task environment. A CEO exhibiting the ability to overcome and handle kinks along the way therefore has more power than does a CEO without a background in the task. Lastly, prestige power also impacts the total power of the CEO. Prestige power relies upon the CEO's own status and personal lineage. A CEO's background will shape the perceptions of lower management and thereby affect the degree of perceived power (Finkelstein, 1992). For the purpose of this paper, I will focus primarily on the structural power of the CEO, as it relates most closely to the connection I am attempting to draw.

I then move on to suggest that this structural power is linked to the communication style and leadership style of the CEO. In order to draw this connection, these terms must be further defined for the purpose of this paper. There are two mainstream, common communication approaches that a majority of companies fall under.

The first is where the CEO holds all the power and solely makes the key decisions. In this situation, lower management does not partake in the decision-making process. Information is primarily spread downward through the levels of management, from CEO to Director to Manager and so on. This transfer of information is costly, especially as more channels are added (Brass, 1984). The risk of miscommunication grows as information passes through more and more people. In addition, the way in which people perceive information varies greatly, adding to the probability of miscommunication. It makes sense, then, that many CEOs limit the number

of people involved in decisions, especially when time is a factor. There still exists the risk of miscommunication of post-decision, but by involving less in the decision-making process, the overall risk during the decision is reduced, and could save the company thousands of dollars (Brass, 1984).

The second style is a more active process. Information flows upward to the CEO, involving lower management in the decision making process. The CEO consults Directors and Managers for information and input before making a key decision. Different departments often add valuable insight and improve the decision making process. This difference in style often arises from the formal organization and hierarchical authority of the company and is difficult to change (Brass, 1984).

Following this trend, the leadership styles of CEOs share a similar breakdown, granting more power to those that have greater control of the company. In total, this can be called the "CEO effect" also defined as "the proportion of variance in a firm-level outcome variable that is statistically associated with, or can be attributed to, the presence of individual CEOs in the sample" (Crossland & Hambrick, 2007: 769–770). This effect attempts to measure the degree to which the power of the CEO impacts the financial performance of a firm. I will use this working definition throughout the paper, keeping in the mind the conclusions drawn above.

In order to validate the existence of CEO effect, I looked towards more recent studies. Since I am concerned with the impact CEO effect has on firm performance and ultimately firm valuation, I looked towards studies that investigated the variation of firm performance correlated with the CEO effect. Clark, Singer, and Murphy's research builds upon past empirical research by Bertrand in 2003, showing that CEO effect impacts financial performance anywhere between 5% and 20%, and in rare cases up to 45%. Their research in 2013 on hospitals suggests the

degree to which the CEO leadership style impacts financial performance beyond measurable macro-factors. Return on Assets (ROA) was used as the dependent variable in the experiment. In situations where CEOs have a larger discretion, most often in private-equity firms, CEO effect is more prevalent and CEOs have a greater impact on financials. This research provides insight into the leadership effect and the impact of CEO's on the financial performance of the firm based on the ownership.

Table 2.

Partitioning of variance in return on assets: multi-level random effects.

	Public-autonomous (PA)		Public-direct (PD)		Non-profit (NP)		For-profit (FP)	
n	381		217		1489		1046	
	Variance	% Total variance*	Variance	% Total variance*	Variance	% Total variance*	Variance	% Total variance*
Year	< 0.1	< 0.01%	188.20	39.07%	< 0.1	< 0.01%	37.80	7.59%
Market	4.78	3.13%	141.18	29.31%	8.93	3.77%	26.45	5.31%
System	< 0.1	< 0.01%	< 0.1	< 0.01%	10.13	4.27%	77.57	15.58%
Facility	< 0.1	< 0.01%	< 0.1	< 0.01%	99.49	41.94%	114.75	23.05%
CEO	53.47	35.04%	121.38	25.20%	39.53	16.67%	75.88	15.24%
Residual	94.36	61.80%	30.90	6.42%	79.12	33.35%	165.41	33.22%

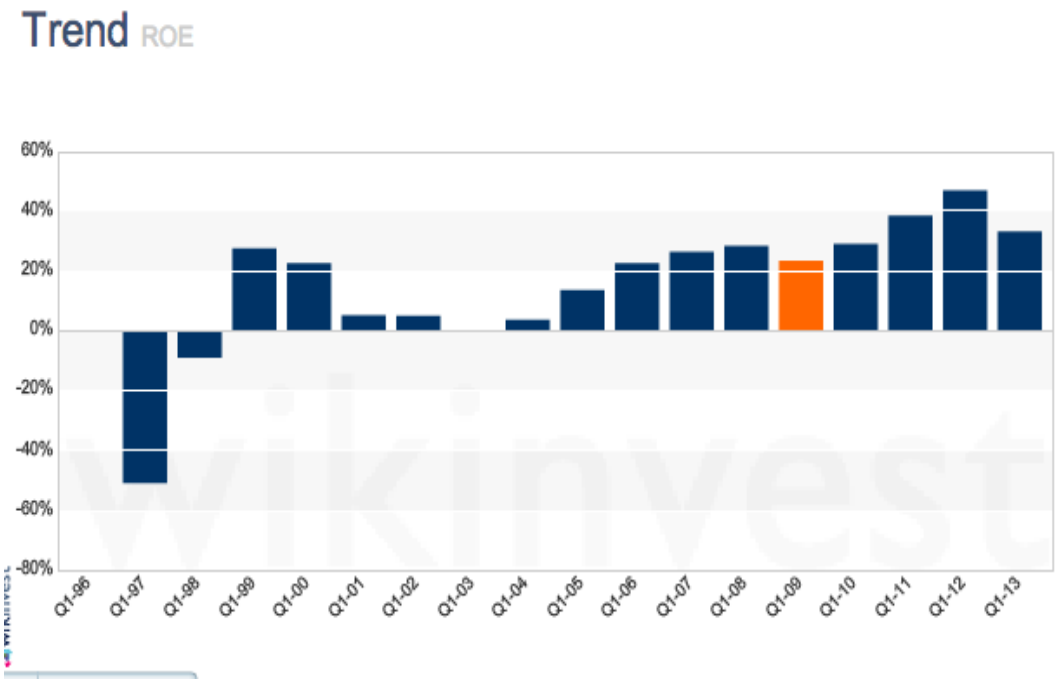
* Denotes the estimated % of total variance in return on assets attributable to each effect class.

The table above taken from Clark and Murphy's research indicates that the CEO effect explains a degree of variance in these firms. This supports the claim that a decent degree of total variance found in firm performance is attributable to the CEO effect. In fact, this percentage is larger than previously assumed (5%) and therefore is a notable turning point in research behind this effect. While not the greatest factor for variance, as is the case with Facility and Residual,

CEO effect does account for an amount of variance that is not negligible. This suggests that CEO effect, including power, plays a role in the performance of a firm.

In order to attempt to further validate this claim, I turned to a mixed quantitative and qualitative look at a current company. To see if this trend is still prevalent in successful companies today, I began an analysis of Apple. The numbers used in this analysis were taken from investment websites. These numbers were then used to compare the ROE of the company before and after the passing of founder and previous CEO Steve Jobs. ROE is defined as Return on Equity and is a very important consideration for shareholders. Maximizing shareholder wealth is the top objective for most companies, so ROE therefore is a useful measure of how well a company is doing to meet and fulfill this objective.

In order to remain on top in this industry, and maintain a high ROE, continuous improvements and innovation are necessary. These changes and decisions rest largely on the shoulders of the CEO in power at the time. Since the technology industry is always changing, I found it to be the most useful industry to analyze for the sake of understanding and finding evidence of the CEO effect.



The numbers above are the ROE trend since 1995. I focused on the timeframe closest to the death of Steve Jobs, former CEO, and then the timeframe after where his successor, Cook, took over. While at first the returns decreased after Job's death in 2011 (in the quarters immediately following), they stabilized quickly in Q1 of 2012. While some of this is attributable to the processes and initiatives Jobs had in place before his death, one can argue that the rest lies on the shoulders of the new CEO. As seen above, ROE is still greatly positive and is projected to continue to grow in the coming years, as society continues to grow more dependent on the use of technology.

This information does not come as a surprise given that new CEO, Tim Cook, leads Apple with comparable style and power that Jobs did. Both CEOs lead with extreme decisiveness and focus, employees and analysts have said in interviews and journals. Both CEOs, in addition, excel in marketing and creating their products to best match customers' needs, keeping Apple competitive and successful.

The most important thing to take from this look at Apple is that Cook has kept ROE positive in the past two years. Furthermore, he has managed to keep revenues for the iPad and iPhone lines stable in the past two years, keeping similar profit margins that Jobs did. It is reasonable to say that a CEO without the same tenacity as Jobs and Cook would have, after the initial transition period, suffered negative returns and fallen behind in the technology war. Cook, however, with the introduction of the iPad Air, has kept in mind the vision Jobs had for the product and has brought it to a new level to keep Apple growing.

The small drop in ROE seen in Q1 of 2013 may be a result of a lack of a new, cutting edge product line, as Jobs was famous for. In the past, when the iPad and iPhone were first introduced, ROE skyrocketed for many consecutive quarters following. The innovation was the driving force for the increase in returns, and it can be argued that it took a decisive leader to implement such a revolutionary product line. If Cook can create a product line that generated the amount of demand that the iPad and iPhone have in the past, he will be well on the way to following in Jobs footsteps. If Cook leads Apple in the way Jobs has in the past, it will aid in keeping Apple one of the largest companies in the world. This quick look at ROE and product revenues supports the idea that CEO effect exists and is visible in the most popular companies today.

Still, ROE and ROA are just two of the possible ways to determine and quantify CEO effect. In order to fully understand this phenomenon, I began looking at other quantitative approaches to try and see if evidence of CEO effect exists in other measurements. If it does, then perhaps CEO effect is more prevalent than assumed in previous, early studies and is now playing a larger role in firm performance.

III… Previous Research on CEO Effect on Firm Performance

Unsurprisingly, there are many measures of a firm's financial performance that could be used for the purpose of this paper. Most commonly, ROA, ROE, Tobin's Q, and stock returns are used as quick quantitative measures to judge a firm's performance. Depending on the method, the CEO Effect can more readily be seen.

ROA

As previously seen in Murphy and Clark's research, ROA was used as a dependent variable to estimate the CEO effect. These measurements are used to try and get at the heart of the value of the firm in question, so that the acquiring firm does not overpay. Looking at the firm's total value, therefore, is most useful for M&As to determine a numerical value of the target firm that is also inclusive of intrinsic qualities.

According to Peterson (1990), there are three components crucial for the valuation of any firm. These include: assets, earning power, and uniqueness. While the first two are easier to put a numerical value to, uniqueness is difficult to quantify. While difficult to put a number to, uniqueness is important as it makes it more difficult for competitors to replicate a company's product or services. If that company has a competitive edge not common in its industry, it becomes more unique and harder to emulate. When there exists an advantage, oftentimes the riskiness of the business decreases, as earnings tend to stabilize as competition is staved off Peterson (1990). Therefore, risk and durability of the firm is lumped into this category, making it easier to measure uniqueness.

Previous popular and influential work on the correlation between CEO power and firm performance focuses on variance decomposition models (O'Reilly, Cadwell, Chatmann 2005).

Papers published in 1972 by Liberson and O'Conner used 167 firms in thirteen industries over the span of twenty years. Sales, profit margins, and earnings were chosen as firm performance metrics. Results suggested that outside factors (such as firm and industry effects) accounted for more of the variance in performance than did CEO effects.

Follow-up studies occurred in 1978 and 2001 enlarging the sample size of both industries and companies. These newer studies suggest CEO effect having a 14.7% impact on the companies studied. While criticized, they provide the groundwork for measuring CEO effects on performance, lending credence to the earlier mentioned ROA study by Murphy and Clark. These new studies tend to suggest that CEOs are having more of an impact on the success of company's than previously thought. Still, it has been difficult to divorce the CEO effect on performance from other factors, such as those dealing with the market segment and industry. This could account for the discrepancy in studies and the new trend towards acknowledging CEO effect. This compounds with earlier mentioned research in this paper on ROA and ROE and moves to reaffirm the existence of CEO effect.

I began searching for a strong, quantitative method to show the impact of CEO effect on ROA. To further show that CEO effect presents itself even in cases of ROA, recent research done by Mackey in 2007 suggests the following model:

$$r_{i,j,k,t} = \alpha_i + \beta_j + \delta_k + \gamma_t + \varphi_{i,j} + \varepsilon_{i,j,k,t}$$

Mackey poses $r_{i,j,k,t}$ to represent the ROA in year *t* of company *j*'s industry, where *k* represents company *j*'s CEO. α_i represents industry effect, β_j, corporate effect; γ_t the year effect, δ_k, the CEO effect, $\varphi_{i,j}$ the segment effect, and $\varepsilon_{i,j,k,t}$the residual. This model focuses on accounting profits (ROA) and has known weaknesses (Fisher and McGown, 1983). This

model is used to show that CEO effects on corporate performance are more prevalent than previously thought (29.2% as opposed to merely 14.7%).

Other effects, such as industry effect and corporate effect, account for only 6.2% and 7.9% respectively. This inflation of impact is primarily due to the elimination of the effects of nesting, which was overlooked by past studies. Mackey's research and formula provides us with a useful equation to measure CEO effect that properly accounts for internal and external influences. As stated above, CEO effect is more prevalent than previously assumed and as methods are refined to reflect this, it will be easier in the future to determine just what magnitude of an impact a CEO has on his or her company. ROA is a useful measure, as seen thus far, but it may not be the best when placed into a M&A context. Still, Mackey's equation provides us with evidence that there exist quantitative efforts to quantify the CEO effect. This relates back to the idea of power of the CEO and the financial performance of a firm. In addition, it makes strides in explaining the connection between the CEO and the firm, as well as the importance of the CEO and how that role will play a part in M&A later on in the paper.

Tobin's Q

Wanting to look at all popular measurements of firm performance that involve research on the CEO effect, I turned to Tobin's Q. Tobin's Q is a useful measure of value in companies as it uses the market value of the firm and the replacement value of assets. This takes ROA a step further and looks at the intrinsic value of assets and the company. Tobin's Q is often calculated as follows:

$$Tobin's\ Q = \frac{Total\ Market\ Value\ of\ Assets}{Total\ Book\ Value\ of\ Assets}$$

Tobin's Q can also be calculated as follows when useful:

$$Tobin's\ Q = \frac{(Market\ Value\ of\ Equity + Market\ Value\ of\ Liabilities)}{(Book\ Value\ of\ Equity + \ Book\ Value\ of\ Liabilities)}$$

Tobin's Q is popular when trying to see if the worth of a company is greater than the book value of its assets. If the equation produces a ratio greater than one, the stock is overvalued, and conversely, a number below one signals an undervalued stock. This is extremely useful in M&A contexts. For example, a company could acquire a firm that was valued lower than its sum of assets and then proceed to sell of the assets to make a quick profit. While not highly likely in the marketplace today, the example provides a practical reason to use Tobin's Q when dealing with M&As over simple ROA.

Research done by Bebchuk, Cremes, and Peyer (2007) suggests a reasonable approach to adjusting Tobin Q for CEO performance. Through regression analysis, a numerical value is calculated to closely reflect the CEO impact on value. This number then adjusts the ratio Tobin's Q produces, providing the acquiring firm with a more holistic value of the target company. This takes into account the impact of the CEO and what that means for the acquiring firm. This brings us closer to the main question posed at the beginning of the paper regarding M&As.

Still, these methods focus more on accounting profits and not the total value of the firm. While useful for industry analysis and for the firm itself, it is difficult to use these methods solely for a M&A situation. These methods make it difficult to properly value a firm for a M&A. Therefore, a method that is holistic of all factors of value is needed to properly value M&As.

Furthermore, these methods have not properly taken into account the existence of synergy between the two firms. This makes sense, since this paper has looked solely at the

performance of singular firms. In order to draw a connection between merging companies, I turn to synergy, as it plays a very important role in the success of a M&A.

IV… Impacts of Synergy

As I turn to looking at M&As, the idea of synergy presents itself as a necessary component of this M&A study. The central goal of a M&A is to add value to the combined firm. Some of this value comes from the combined assets and financial success of the target company. Other sources of value come from the synergy created between the two companies. The idea behind synergy is that combined, the sum of the values of the two firms is greater than the parts alone. Research done by Orsag, Silvjie, and McClure suggest a simple formula to demonstrate this effect of synergy on the firms pre-acquisition and post-acquisition.

$$V_{AB} = V_A + V_B + V_S$$

Due to its nature of creating value, synergy has become a popular motive for M&As. The additional created value from synergy seen above comes from improved capital structure, tax savings, and cost reductions. However, this synergy has been quantified in the past solely in the future incremental cash flows resulting from the merger (Ross 2005). Evidence suggests that this synergy impacts more than just free cash flows and a better measurement of firm value, still, is needed when dealing with M&As.

As I continued my investigation into synergy research, I came across studies by Fich, Rice, and Tran (2011). These studies suggests the existence of the *low-synergy hypothesis*. When two companies merger and low-synergy is the result the premium will effectively be lower. A bonus is provided to the target CEO to cooperate with the merged firm and not to compete, attempting to dissuade the target company from further competition. Regressions

were run similar, to the empirical studies conducted by Wang and Xie in 2009 that aim to quantify the synergy gains in acquisitions.

A three-day cumulative abnormal return (CAR) was used as the indicator of synergy gain. The results showed that the relationship between a bonus incentive and synergy gain was inverse. Their findings proved that in the presence of a bonus, synergy-gained declined by 1.4%. These findings, while small, suggest that CAR is a useful means of measuring synergy-gained during a M&A.

The importance of synergy is also easily visible in the media, especially when the focus is on CEOs. During the merger of Safeway and Albertsons in early 2014, emphasis was placed on the idea of working together. Once the companies merge, current CEO of Safeway will reside as new CEO of the combined company. The CEO of Albertsons will assume the role of executive chairman, staying within company walls. The merger aims to cut costs that will lead to price reductions for the customer. These reduced costs will also increase ability to adapt to changing customer preferences. Albertsons plans to purchase Safeway for $9 billion, which is financed both with debt and equity.

These two approaches, one quantitative and one qualitative, suggest that synergy affects the outcome and success of a M&A and is related to the CEO. The Safeway example begins to show us that the dynamics of upper management of companies plays a role in the success of a M&A that will later be discussed in more detail. For now, I return to finding a quantitative measurement of a M&A (inclusive of CEO effect) that also takes into account synergy.

V… Modified Net Present Value

MPNV, like APV, are adjusted methods of the popular NPV valuation of a firm or company. Orsag, Silvjie, and McClure go on to suggest that the modified net present value (MPNV) created by McClure and Girma (2004) is the most useful and accurate measure of value of an acquisition. This MPNV includes important assumptions outlined by the researchers:

1) Total initial outlay (It) is the present value of all net cash flows discounted at the firm's financing rate, which is different than the WACC (WAcc- ka)
2) The appropriate reinvestment rate for net cash flows is the firm's *kr.*
3) The risk adjusted discount rate for high (low) risk project (k) is ka + y
4) Firm maintains its target capital structure
5) Accepted project(s) do not affect the firm's risk characteristics

These assumptions lead to the following formula:

$$MPNV = \frac{V_t(1+k_r)^{T-t}}{1+k} - \frac{I_t}{(1+k_a)^t}$$

Synergy, in this case, also includes the synergy created between the two CEOs which was not previously accounted for in the FCF model. The combined resources of the firms are important but the charisma and ability of the two CEOs to cooperate and generate new ideas is crucial. The merge of the two firms also has several implications for future management and operations. Whereas before one CEO had complete power, now a second may have input in critical decisions. In that scenario of a M&A, power is ultimately shared between the two. Often if there is promise that the two CEOS cooperating will lead to additional value, the target company CEO's will retain a great deal of power and influence over the company.

This Modified Net Present Value is the closest valuation technique found thus far that takes into account CEO effect and macro-factors that can impact a M&A price. As discussed previously, this method is more holistic than ROA and Tobin's Q and can be more useful when deciding whether or not to pursue a M&A.

Now that evidence has been shown regarding the existence of the CEO effect and how it impacts companies (both quantitative and qualitative methods), I can begin to analyze recent M&As. I can use this information to apply to recent mergers to draw unique conclusions that relate back to the research mentioned above. This closer look will hopefully lead credence to the studies aforementioned and the existence of the CEO effect, both on a singular firm as well as a M&A and the premium paid.

VI… Analysis on Recent Mergers

Facebook and WhatsApp (a qualitative approach)

So far in 2014, the most notable M&A to sweep the news is Facebook's acquisition of WhatsApp for $19 billion. With this purchase comes 55 employees and a company showing revenues of $300 million. With such a large premium paid it has become a great talking point amongst researchers in the field of M&As. What is especially notable about this M&A is that $19 billion is over 13 times Facebook's Net Income and makes the list of top premiums ever paid during an acquisition (New York Times). According to market research, WhatsApp processes almost as many messages as the entire telecom industry (Forbes).

With 450 million users, WhatsApp comes with quite the reputation, spanning over the United States, Europe, and Asia. This will allow Facebook to continue expanding its global reach. Facebook already exists in multiple languages and is prevalent in many countries, but

with a company that reaches 450 million users, it is possible that Facebook can reach even more users than before. Linking WhatsApp to Facebook, just as Instagram allows a user to directly post a picture from the program onto Facebook on a phone, could expand Facebook's already impressive user base of 1.31 billion. This M&A seems like a logical next step for the growing company that prospers based on the size of its user base.

In a thriving industry, Facebook has been the leader in social media for years. Unlike its predecessor MySpace, Facebook is taking strides to stay relevant and in the hands of consumers. This acquisition of the popular phone application is a step in the right direction.

Whatsapp is being valued for more than its net worth in assets and revenues. Instead, a lot more factors are at play. Facebook used a mix of cash and shares to pay for the acquisition: $4 billion in cash, $12 billion in common shares, and $3 billion in restricted stock. By selling these shares, Facebook management is not only financing their purchase but also aligning new management with Facebook goals. Managers of WhatsApp, now Facebook shareholders, are invested in the success of Facebook. Not only are they working for Facebook but the privately seek the success of their acquiring company. This creates a synergy between the two companies, just as Facebook has managed to do with the purchase of Instagram. Facebook's growth strategy focuses on uniting popular technology together to generate users.

The acquisition was a friendly takeover, involving several meetings between the two CEOs, as described in the New York Times. Previous owner, Jan Koum, joins the board of directors at Facebook and WhatsApp is aimed to remain its own entity.

Since WhatsApp is a newer company that is not publicly traded, it is harder to value. Still, even without these financial statements, it is easy to draw a connection between the price of the company and the CEO. The value of the two companies when taken alone is smaller than the

value of the two companies combined, as Orsag, Silvjie, and McClure's research on synergy suggests. In the future, these combined companies could dominant the social media market and keep Facebook trending for years to come. Valuable insight from WhatsApp creators could lead to innovative changes in Facebook that could keep the website as popular as it is today, if not more so in the years to come.

Microsoft and Nokia (a quantitative approach)

With competitors Apple and Samsung stealing away market share globally, the Finnish camera company, Nokia, was losing a large number of sales. When Microsoft purchased Nokia many were left confused. Microsoft and Nokia have worked alongside each other in the past. The Lumia 1020, a phone that runs Microsoft's processors and core, comes equipped with a camera designed by Nokia. As one of the leaders in the photography industry, Nokia is a powerful ally and aided in the success of the Lumia 1020. As suggested by leading analysts, this cooperation benefited both parties but still had its downsides. Transaction costs between the two companies were too great and were eating considerably into profits. Something more had to be done to ensure the success of this partnership.

With the purchase of Nokia these costs will be reduced, leading to more profits. Synergy will also come into play, as retiring CEO of Nokia once sat on the board for Microsoft. Nokia's CEO is familiar with the inner workings of Microsoft and has maintained a friendly relationship with the company, which looks promising for future combined endeavors. Reports indicate that Nokia's senior executives will join Microsoft shortly after the deal is finalized, which means additional synergy between the two merged companies.

In 2007 Nokia held 40% of the handset market. In 2013, that number dropped to 15%. While the share price of Nokia has recovered in the past seven years it still is down from a record-high of 65 euros back in 2000. Placing a price on the Finnish company, therefore, consists of many factors. Microsoft decided upon paying $7 billion USD for Nokia, a discount of $7 billion USD from the total market value of the company.

In efforts to figure out why the discount occurred, I will attempt to replicate the pricing methodology used by Microsoft, using the CEO effect to reach comparable results.

The first important step is to calculate the company's weighted average cost of capital. To do this, the cost of debt and cost of equity as well as their weights needed to be calculated from the SEC filings (**Exhibit 2**). Using the daily stock returns from NOK from the past five years, a regression was run against the return of the market, the S&P500. These numbers were drawn before the time of the acquisition and are displayed below:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.019082143
R Square	0.000364128
Adjusted R Square	-0.000399536
Standard Error	0.033489673
Observations	1311

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000534778	0.000535	0.476817	0.489989868
Residual	1309	1.468119674	0.001122		
Total	1310	1.468654452			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
ALPHA	-6.28955E-05	0.002005351	-0.03136	0.974984	-0.003996949	0.0038712	-0.003996949	0.003871158
Correlation Coefficient	0.753041634	1.090543366	0.69052	0.48999	-1.386362252	2.8924455	-1.386362252	2.892445521

Standard Deviation NOK	12.78
Standard Deviation S&P	5.5
Covariance	52.71
Variance	30.26
β	1.741903503

Computing beta requires standard deviation of returns as well as variance and covariance. These numbers were found using five years worth of daily data on stock returns. This regression gives us a beta of 1.74, showing how Nokia is correlated with the market return. A beta closer to 1 yields returns identical to the market, where a beta higher than 1 indicates volatility and more movement than the market. Regardless, this beta of 1.74 is relatively close to the beta given from available investment reports of 1.64. The possible discrepancy could have arisen from the fact that the beta above was calculated pre-acquisition and the beta online is post-acquisition.

This beta was then used in CAPM to find the Cost of Equity, estimated below:

$$8.98\% \ = \ 1.74\ (.0367) + (.026)$$

Using the SEC filings, a Debt-to-Equity ratio of .45 was calculated, giving a .30946 weight of debt and a .69054 weight of equity. Cost of Debt was calculated at 13.7% (an average of BB+ bond rating). These numbers were then used to find a WACC of 10.44%. This number matches with the SEC filing of the after-tax discount rate of 10.4% **(Exhibit 3)**.

This WACC is then used in the discounted cash flow (DCF model with constant growth) to find the market value of Nokia:

$$\boldsymbol{V} = \frac{884 - 597}{10.44\% - 10.00\%} = 6.522\ billion\ (USD)$$

In the dominator we have the calculation for EBIT (Earnings Before Interest and Taxes), by subtracting out relevant expenses from the operating profit. In the denominator, we use the WACC minus the expected, sustained growth rate of 10%.

Still, there exists a discrepancy of roughly 500 million dollars. This number is a reasonable amount to put on various intrinsic factors, including synergy, patents, and also the CEO effect. To properly evaluate this impact, I turn to macro factors first.

While considering a M&A, macro-factors play an important role. If the outlook for the economy is grim, for insistence, merging may be more realistic in order to cut costs as opposed to merging for the sake of dominating an already failing industry. While these forward-looking numbers are never known for certain, it is reasonable to forecast them with recent sustained growth rates, adjusting for risk and other uncertainties. These macro factors can make or break a M&A decision and can even impact the price paid for a company.

Exhibit 1 projects the changes in Real GDP and Unemployment rates in the United States. These numbers were calculated using the expected growth of these rates compiled from the Global Economic Outlook. In the next four years Real GDP looks to grow to 2.94% from its current level as Unemployment decreases to 6.22%. This is consistent with historical trends of post-recession periods in history.

Since Microsoft has trended in the past with Real GDP rates it is reasonable to conclude that these forecasts impacted the decision to purchase Nokia. The smart phone market looks to grow and releasing phones with better cameras and faster processors can aid in putting Microsoft at a competitive edge against Apple and other leading competitors.

With two powerful companies, one centralized in the United States and one European, a lot of factors weigh into the decision and continued success of this M&A. As previously mentioned, there is established synergy between the two companies that will keep returns positive for the first few years.

The Dupont Analysis also is helpful in evaluating a firm, as seen below:

	Net Income / Sales	x	Sales / Total Assets	x	Total Assets / Total Common Equity	=	Return on Equity
2011	-3.849%		106.78%		260.17%		-10.69%
2010	3.164%		108.49%		241.04%		8.27%
2009	0.634%		110.40%		244.19%		1.71%

ROE has fluctuated in the past but more recently shows a downward trend. Using the DuPont Analysis, I found that this comes from a negative Profit Margin. This makes sense, as Nokia has faced falling stock prices and returns in the past few years. Thus, this decrease in ROE likely impacted the price paid for Nokia and the consequential discount.

Since Microsoft received a discounted price for Nokia, it is logical to assume that the overall profitability of the company, as currently is, played a major role. Since ROE has been largely negative for the past few years, it would take a considerable amount of capital and time to turn Nokia profitable again. This time and effort would also be spent on combining the two companies to maximize the synergy. It would then be reasonable to assume that, despite the negative profit margin, the promise of synergy caused by the CEO effect lead to part of the additional $500 million USD.

This M&A looks to be just as successful as the Facebook and WhatsApp merger.

Recent Mergers Conclusions

Both these mergers have been in part to reduce competition, but have also focused on keeping the acquiring company on the top of the market. It was interesting to look at both Facebook and Microsoft, focusing in on what they were purchasing and for what price, as they, to some degree, compete for market share. Perhaps a company acquired by Apple would be better suited juxtaposed to the Microsoft merger, to see how the two competitors are choosing business strategies to remain dominant in the market. Using the SEC filings to run the qualitative approach to the M&A showed evidence of the existence of outside factors than simple free cash flows, giving further credence to the idea of effects such as the CEO effect.

In the coming years, I feel that with continued purchasing of companies for additional users, resources, or reduced competition, these two companies will remain highly prevalent in the market and continue to have M&As such as the two described above.

VII… Summary & Conclusions

Summary of Key Points and Connections

Valuing the worth of a company is difficult, as studies have shown, especially when there exists so many different factors. CEO effect, for example, is a difficult but important factor that impacts firm performance but has been difficult to quantify in the past. While useful for looking at a company quickly, ROA and Tobin's Q do not fit the mold for a holistic valuation method for M&As. Deciding whether or not to acquire a company could be the largest and most important decision a firm will ever make. This decision can lead to its success or its downfall, as seen in the past. Because of this, M&As are a classic case of multiple factors acting together to create a numerical representation of both monetary and intrinsic value.

While early research has suggested a small percentage of variance associated with the CEO effect, newer studies are showing a larger focus on the impact of CEOs. These CEOs can greatly impact a company's financials and, if placed in a M&A context, can alter the price paid for the target company. Synergy is key, and it is the ability of the two CEOs to work together, despite differences in style, that can drive a price up or down. While not explicitly proven, it is seen in both quantitative and qualitative analyses on recent M&As. When the price paid for a target company varies drastically from the market value of the company, it is partially due to the CEOs themselves.

When valuing these M&As, taking into account the growing presence of CEO effect, it is best to use a variation of the Modified Net Present Value (as well as the DCF) that takes into consideration macro factors, internal and external factors, and synergy. While synergy is difficult to quantify, its presence can be estimated and used to explain discrepancies in prices. We can see this more visibly in recent mergers, especially with those in the social media and

technology industries, such as Facebook and Microsoft. With so much on the line, determinant on the success of the M&A, we begin to see a larger focus on the holistic value of a company rather than its book value. The CEO effect is part of this bigger picture and can be a powerful tool when attempting to create sustainable, thriving companies.

Conclusions and Possibilities for Future Research

My conclusions, therefore, draw on all the research I have taken a look at, as well as a few unique assumptions of my own. Firstly, I support the existence of CEO effect, both when dealing with a singular company and when looking at M&As. Secondly, I am in support of valuation techniques that take into consideration synergy, as, I feel, it takes into consideration the CEO effect. Through my research on existing studies of the CEO effect and M&A literature, I have been able to form these conclusions. Further analysis on Facebook and Microsoft show that the chemistry between upper management can affect the price paid by a target firm. I feel that, after looking at these two M&As, both will be successful and will lead their acquiring companies to continued success.

Other factors, such as regulation of companies and M&As, age of a company, and international restrictions also could impact the M&A. I do not feel that CEO effect is the only insistence of a difficult to measure phenomenon affecting premiums. If this study were to be run again, it would be of interest to take into consideration those factors, as well as other valuation techniques.

There is no easy way to measure the exact variables that go into a premium, and the true rationale lies with those partaking in the M&A bidding and negotiation. These individuals know

the details of the companies in question intimately, and it was my effort in this paper to try and take a peek into that rationale as it relates to the role of the CEO.

If any M&As are to be successful in the future, especially those in the technology industry (and specifically social media), both the target and acquiring company must be mindful of the CEO effect and how it can impact the success of the merger. It would be interesting if a study was run on a theoretical M&A between two large companies in today's marketplace, pointing out the impacts of the two companies upper management and how that could lead to the success or downfall of the proposed M&A.

In short, I feel that M&As will continue to play a large role in the creation and survival of the biggest and most successful companies of our times. While not the most successful business maneuver in the past, with globalization growing daily, they are becoming more necessary to thrive in an international mark

Exhibit 1 (Macro-Analysis Factors)

INFLATION

Historical		Forecast	
	Value		Value
2008 Q1	4.1000	2013 Q3	1.9000
2008 Q2	4.3600	2013 Q4	1.9019
2008 Q3	5.3300	2014 Q1	1.9038
2008 Q4	1.6330	2014 Q2	1.9057
2009 Q1	-0.0667	2014 Q3	1.9076
2009 Q2	-1.1333	2014 Q4	1.9095
2009 Q3	-1.6333	2015 Q1	1.9114
2009 Q4	1.4333	2015 Q2	1.9133
2010 Q1	2.3333	2015 Q3	1.9153
2010 Q2	1.7667	2015 Q4	1.9172
2010 Q3	1.1333	2016 Q1	1.9191
2010 Q4	1.2667	2016 Q2	1.9210
2011 Q1	2.1333	2016 Q3	1.9229
2011 Q2	3.4667	2016 Q4	1.9248
2011 Q3	3.7667	2017 Q1	1.9268
2011 Q4	3.3000	2017 Q2	1.9287
2012 Q1	2.8333	2017 Q3	1.9306
2012 Q2	1.9000	2017 Q4	1.9326
2012 Q3	1.7000	2018 Q1	1.9345
2012 Q4	1.9000	2018 Q2	1.9364

CURRENT VALUE:	1.5	Predicated Change:	1.92%

1 YEAR TREASURY RATE

Historical		Forecast	
	Value		Value
2008 Q1	1.8	2013 Q3	0.15
2008 Q2	2.07	2013 Q4	0.15
2008 Q3	2.12	2014 Q1	0.16
2008 Q4	0.99	2014 Q2	0.16
2009 Q1	0.57	2014 Q3	0.16
2009 Q2	0.52	2014 Q4	0.17
2009 Q3	0.45	2015 Q1	0.17
2009 Q4	0.35	2015 Q2	0.17
2010 Q1	0.37	2015 Q3	0.18
2010 Q2	0.38	2015 Q4	0.18
2010 Q3	0.27	2016 Q1	0.18
2010 Q4	0.26	2016 Q2	0.19
2011 Q1	0.27	2016 Q3	0.19
2011 Q2	0.21	2016 Q4	0.19
2011 Q3	0.13	2017 Q1	0.20
2011 Q4	0.11	2017 Q2	0.20
2012 Q1	0.16	2017 Q3	0.21
2012 Q2	0.19	2017 Q4	0.21
2012 Q3	0.18	2018 Q1	0.21
2012 Q4	0.17	2018 Q2	0.22

CURRENT VALUE:	0.15	Predicted Change:	45.68%

REAL GDP

Historical Values			Forecast	
	Value	Change in % per Quarter		Value
2008 Q1	13266.8		2013 Q3	13679.07
2008 Q2	13310.5	0.33%	2013 Q4	13692.74
2008 Q3	13186.9	-0.93%	2014 Q1	13706.44
2008 Q4	12883.5	-2.30%	2014 Q2	13720.14
2009 Q1	12711	-1.34%	2014 Q3	13733.86
2009 Q2	12701	-0.08%	2014 Q4	13747.60
2009 Q3	12746.7	0.36%	2015 Q1	13761.35
2009 Q4	12873.1	0.99%	2015 Q2	13775.11
2010 Q1	12947.6	0.58%	2015 Q3	13788.88
2010 Q2	13019.6	0.56%	2015 Q4	13802.67
2010 Q3	13103.5	0.64%	2016 Q1	13830.28
2010 Q4	13181.2	0.59%	2016 Q2	13857.94
2011 Q1	13183.8	0.02%	2016 Q3	13885.65
2011 Q2	13264.7	0.61%	2016 Q4	13913.42
2011 Q3	13306.9	0.32%	2017 Q1	13941.25
2011 Q4	13441	1.01%	2017 Q2	13969.13
2012 Q1	13506.4	0.49%	2017 Q3	13997.07
2012 Q2	13548.5	0.31%	2017 Q4	14025.07
2012 Q3	13652.5	0.77%	2018 Q1	14053.12
2012 Q4	13665.4	0.09%	2018 Q2	14081.22
	Overall Change	3.03%		

CURRENT VALUE:	13705.1	Predicted Change:	2.94%

UNEMPLOYMENT

Historical Values			Forecast	
Quarter	Value	Change in % per quarter		
2008 Q1	5		2013 Q3	7.52
2008 Q2	5.17	3.40%	2013 Q4	7.45
2008 Q3	6	16.05%	2014 Q1	7.37
2008 Q4	6.9	15.00%	2014 Q2	7.30
2009 Q1	8.27	19.86%	2014 Q3	7.23
2009 Q2	9.03	9.19%	2014 Q4	7.16
2009 Q3	9.6	6.31%	2015 Q1	7.08
2009 Q4	9.9	3.13%	2015 Q2	7.01
2010 Q1	9.83	-0.71%	2015 Q3	6.94
2010 Q2	9.8	-0.31%	2015 Q4	6.87
2010 Q3	9.5	-3.06%	2016 Q1	6.80
2010 Q4	9.5	0.00%	2016 Q2	6.74
2011 Q1	9	-5.26%	2016 Q3	6.67
2011 Q2	8.97	-0.33%	2016 Q4	6.60
2011 Q3	9	0.33%	2017 Q1	6.54
2011 Q4	8.7	-3.33%	2017 Q2	6.47
2012 Q1	8.27	-4.94%	2017 Q3	6.41
2012 Q2	8.17	-1.21%	2017 Q4	6.34
2012 Q3	8	-2.08%	2018 Q1	6.28
2012 Q4	7.8	-2.50%	2018 Q2	6.22
	Overall Change	56.00%		

CURRENT VALUE:	7.6	Predicted Change:	-17.29%

Exhibit 2 (SEC Filing for NOKIA)

	Notes	Financial year ended December 31 2011 EURm	2010 EURm	2009 EURm
Cash flow from operating activities				
(Loss) profit attributable to equity holders of the parent		**(1 164)**	1 850	891
Adjustments, total	**32**	**3 486**	2 112	3 390
Change in net working capital	**32**	**(638)**	2 349	140
Cash generated from operations		**1 684**	6 311	4 421
Interest received		**190**	110	125
Interest paid		**(283)**	(235)	(256)
Other financial income and expenses, net		**264**	(507)	(128)
Income taxes paid, net		**(718)**	(905)	(915)
Net cash from operating activities		**1 137**	4 774	3 247
Cash flow from investing activities				
Acquisition of Group companies, net of acquired cash		**(817)**	(110)	(29)
Purchase of current available-for-sale investments, liquid assets		**(3 676)**	(8 573)	(2 800)
Purchase of investments at fair value through profit and loss, liquid assets		**(607)**	(646)	(695)
Purchase of non-current available-for-sale investments		**(111)**	(124)	(95)
Purchase of shares in associated companies		**(2)**	(33)	(30)
Additions to capitalized development costs		**—**	—	(27)
Proceeds from (+) / payment of (-) other long-term receivables		**(14)**	2	2
Proceeds from (+) / payment of (-) short-term loans receivable		**(31)**	(2)	2
Capital expenditures		**(597)**	(679)	(531)
Proceeds from disposal of shares in Group companies, net of disposed cash		**(5)**	(21)	—
Proceeds from disposal of shares in associated companies		**4**	5	40
Proceeds from disposal of businesses		**3**	141	61
Proceeds from maturities and sale of current available-for-sale investments, liquid assets		**6 090**	7 181	1 730
Proceeds from maturities and sale of investments at fair value through profit and loss, liquid assets		**1 156**	333	108
Proceeds from sale of non-current available-for-sale investments		**57**	83	14
Proceeds from sale of fixed assets		**48**	21	100
Dividends received		**1**	1	2
Net cash from / used in investing activities		**1 499**	(2 421)	(2 148)

Exhibit 3

	Cash generating units										
	Smart Devices %	Mobile Phones %	Devices & Services %			Nokia Siemens Networks %			Location & Commerce %		
	2011	2011	2011	2010	2009	2011	2010	2009	2011	2010	2009
Terminal growth rate	1.9	1.5	—	2.0	2.0	1.0	—	1.0	3.1	4.0	5.0
Post-tax discount rate	9.0	9.0	—	8.7	—	10.4	—	—	9.7	9.6	—
Pre-tax discount rate	12.2	13.1	—	11.1	11.5	13.8	—	13.2	13.1	12.8	12.6

	Year Ended December 31, 2011	Percentage of Net Sales	Year Ended December 31, 2010	Percentage of Net Sales	Percentage Increase/ (Decrease)
	(EUR millions, except percentage data)				
Net sales[1]	23 943	100.0%	29 134	100.0%	(18)%
Cost of sales	(17 303)	(72.3)%	(20 412)	(70.1)%	(15)%
Gross profit	6 640	27.7%	8 722	29.9%	(24)%
Research and development expenses	(2 441)	(10.2)%	(2 694)	(9.2)%	(9)%
Selling and marketing expenses	(2 180)	(9.1)%	(2 270)	(7.8)%	(4)%
Administrative and general expenses	(362)	(1.5)%	(388)	(1.3)%	(7)%
Other operating income and expenses	(773)	(3.2)%	170	0.6%	
Operating profit	884	3.7%	3 540	12.2%	(75)%

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