

# The effect of M&As on the Financial Valuation of the acquiring firm for the Telecom Industry

Author: Dwayn Roelink  
University of Twente  
P.O. Box 217, 7500AE Enschede  
The Netherlands

## ABSTRACT,

*Mergers and acquisitions result in many varying consequences for both the buying and target firm. This thesis takes a focus specifically on the financial consequences for the buying firm. It aims to determine what effect mergers or acquisitions have on the intrinsic evaluation done by company executives and the perceived evaluation of shareholders for the acquiring firm. An empirical cycle is used to systematically create a process of evaluation that is effective for mergers and acquisitions as well as the ten case Telecom sample on hand, to apply this process of evaluation on the sample and finally analysing the results. This research concludes that for this sample of ten firms within the Telecom industry, there is a strong positive relationship between going through a merger or acquisition and an increase in financial value for the buying firm. More specifically, in all ten cases the Enterprise Value, which is the type of valuation used in this thesis, increases from before to after the merger or acquisition. This type of analysis can be used as a guideline for complementary research in other industries to eventually create predictive models regarding the financial consequences of a merger or acquisition on the firms involved.*

## Graduation Committee members:

1. A. Abhishta
  2. W. van Heeswijk
- External: Q. Lone

## Keywords

Mergers, Acquisitions, Telecom Industry, Financial, Empirical Cycle, Enterprise Valuation, Relationship

# 1. INTRODUCTION

## 1.1 General Introduction

Mergers and acquisitions have a wide variety of different consequences for the two firms involved. Therefore, there are several reasons why firms generally decide to merge or acquire. These reasons include but are not limited to: “acquiring undervalued assets, gaining synergy, building shareholder growth, remaining competitive, growth, achieving counter cyclical, achieving a dominant size and so on” [11]. Many of these reasons are in some way connected to overall growth. Growth for most companies means to grow in size but also consequently financially. Most firms expect to benefit financially when acquiring or merging with another firm. Thus, it would be interesting to analyse whether there is a financial benefit for the acquiring company.

This thesis is set up to observe and analyse the financial consequences of a merger or acquisition on the acquiring firm and to determine whether there is a relationship and examine why there is one or there is none. This analysis will be performed on a data set including only mergers and acquisitions within the worldwide telecom industry.

## 1.2 Research Objective

I want to determine whether mergers and acquisitions skew the inside evaluation by the board of directors of telecom companies in comparison to outside evaluation by analysts. Comparing these evaluations might then give us an idea as to why the merger or acquisition occurs in the first place and whether hypotheses on the financial consequences of a merger and acquisition on partaking firms are validated.

My research can then hopefully aid the way into further fields of study regarding the financial evaluation of companies and specifically the consequences of mergers and acquisitions on the valuation of a firm. Since my research will be limited to the market of Internet Service Providers (ISPs) my findings might not apply to other markets or even be market specific. I aim to create a framework for similar research to be applied to other markets and a pathway for deeper research into the connection between company valuation and mergers and acquisitions. Furthermore, my research should provide a first look into the differences and similarities between valuations and expectations from people within a firm and those with an outside perspective.

Lastly, combining my research with other research and literature in the field of mergers and acquisitions might help create predictive models to determine the financial effects of a merger or acquisition on the firms involved. Seeing as financial evaluations are likely not the only determining factor and other variables probably play a role, it is likely that my study cannot provide such a model by itself for this exact reason.

## 1.3 Research Question

Based on the outline of this research and subsequent objective as stated above, my research question with supporting sub-questions are as follows.

### 1.3.1 Main Question

**For the Telecom Industry, what effect do mergers and acquisitions have on the intrinsic evaluation by company executives and the perceived evaluation of shareholders?**

### 1.3.2 Sub-questions

According to previous literature how do company executives evaluate firms compared to shareholders?

Company valuation by shareholders, for publicly traded companies, is generally reflected in the share price of a firm combined with the shares available [8]. Valuation from an inside perspective can be observed through the balance sheet of a firm [9].

How are companies to be valued and how can the differences in valuation pre- and post- merger be interpreted?

Companies will be valued not only through analysis of their balance sheets, but through market analysis also. A total enterprise valuation will be performed for the buying company pre- and post- merger or acquisition. A total enterprise valuation consists of a market cap-based valuation, which represents the valuation by shareholders, and a balance sheet-based valuation, which represents the valuation by the company itself.

What does this study provide for research into the relationship between mergers and acquisitions and the valuation of the firms involved?

It is to provide an additional insight into the connection between company valuation and M&As. Moreover, it might provide a framework for similar research to be conducted in alternative sectors or for further research into the ISPs sector.

How will information resulting from the database analysis and financial reports be evaluated?

The starting hypothesis will either be confirmed or negated depending on the outcome of the analysis. This will determine whether mergers or acquisitions have a positive or negative influence on the value of the involved firms.

## 2. THEORETICAL FRAMEWORK

Mergers and acquisitions are a term used to describe consolidation of firms or assets through financial transaction(s). The goal of a merger or acquisition can vary greatly from transaction to transaction. However, generally, “the primary goal of a company interested in a merger or acquisition is to secure an opportunity that will either achieve the objective of growth or provide an area of expansion that will add to the product/service line in a market that is currently not served by the company” [13]. Regardless, it is important to note that a merger or acquisition does not necessarily only provide a financial benefit [16]. By combining resources, whether those be tangible (e.g. manpower) or intangible (e.g. business processes) the combined firm can hope to achieve a higher level of productivity than they could achieve separately.

General research into M&As regarding motives for M&As occurring and the phases companies go through during a merger or acquisition has created a basic overview of the risks and relevant success factors for the process of a merger or acquisition and provides a foundation for a better understanding of the overall process [5].

Research has been done on determinants for mergers and acquisitions (e.g. in a cross-country setting) [17]. Their paper explains that “M&A activity is significantly higher in countries with better accounting standards and stronger shareholder protection”. Investor protection aids investors should things go astray for the firm they have invested in, mostly by guaranteeing some of their money is returned to them [21]. They conclude that

investor protection is a strong determinant for the competitiveness of a market and, to a certain degree, dictates the likelihood for a merger or acquisition to occur.

A further paper on the causes and consequences of takeovers details the way company stock valuation tends to positively fluctuate prior to acquiring another firm according to free cash flow theory [11]. Free cash flow theory states that takeovers through exchange of stock create less financial benefit than those financed with cash and debt. "Stock acquisitions do nothing to take up the organizations financial slack and are therefore unlikely to motivate managers to use resources more efficiently" [20].

Various hypotheses have been formed on the relation between mergers and acquisitions and their effect on the evaluation of a firm. However, there is currently hardly any empirical data with subsequent analysis regarding the impact of mergers and acquisitions on these evaluations. Furthermore, the assessments done by company executives on the inside and stock owners on the outside have never been extensively compared. To test whether previous assumptions regarding the relation between mergers and acquisitions and the value of a firm are valid, empirical evidence can provide a more definitive outcome.

In 2013 an analysis was done on the impact of mergers and acquisitions specifically on the U.S. ethanol-based biofuel industry to determine whether mergers and acquisitions had a positive influence on the stock price and value of the firms involved [18]. This body of research concluded that there is a positive correlation between M&As occurring and the rise in value of the publicly traded biofuel firms. Consequently, the overall market shows a positive reaction to the M&As also.

## 3. METHODOLOGY

### 3.1 Background

#### 3.1.1 Worldwide Telecoms M&A Timeline

I have a database available to me that contains data regarding the mergers and acquisitions and IPOs of ISPS during the last 23 years (1997 - 2020). Besides simply listing five hundred and one mergers and acquisitions the data also provides a financial estimation of the value of the merger or acquisition. Moreover, some information is given on what happened during the merger, acquisition, or IPO.

The data is in the format of an excel table that consists of six columns for each occurrence of a merger, acquisition, or an IPO during the last 23 years within the worldwide Telecom Industry. Pre-2008 only selected, major deals are shown since information was limited and the Telecom market was not as well defined and diversified as it is in present time. The first column (A) lists the quarter in which the merger, acquisition, or IPO was announced publicly. It is structured like Qx, with Q being the abbreviation for quarter and x the quarter of a given year, ranging from 1 to 4. Within this first column the year of the announcement is also stated, with all mergers, acquisitions or IPOs from that year listed underneath that year with their respective quarter, starting in the latest year (2020) and ending in the first (1997). The second column (B) is structured identically to column A but lists the quarter in which the merger, acquisition, or IPO occurred instead. Moreover, it might either say 'pending' if it has yet to happen and in some situations it lists a year in brackets behind the quarter if it differs from the year it was announced, to ensure the timeframe cannot be confused. The third column (C) gives information on what occurred, confined to one sentence. Meaning it either states that a firm was acquired by another, that it merged with another or that it went public. Examples:

"Company x merges with Company y" or "Company X increases stake in Company Y from 35% to 50%" etc. The fourth column (D) lists the country of the buyer. This column is in some cases left blank (like for IPOs which have no buyer or seller). In rare cases cells in this column are also stated as "multiple" if the firm does not have a single defined home-country. The fifth column (E) is structured identically to column D but instead lists the target country. For the same reason as in column D, cells in this column are also sometimes filled in as "multiple". The last column (F) lists the value of the transaction in USD billions. In some rows this column is also left blank, presumably if no data about the value of the transaction is available.

Since the data only lists the quarter in which the merger or acquisition was announced, and in which it occurred, the exact dates are not given. I will determine when the merger or acquisition was completed. Dates will be retrieved by searching google for the description of the occurrence as described in the database to determine when it was first announced. News reports then provide me with an announcement date. Some further research should in most cases also give the actual date of completion. It is important to note that this method is not entirely fail proof since announcements might be reported publicly at a slightly later date and in case of mergers and acquisitions that occurred relatively longer ago reports showing an earlier completion date might be missing. Determining the completion date is very relevant for this research since the completion date cannot be too close to the end of the quarter, otherwise the timeframe around the completion needs to be adjusted. This is because if the completion date is at the very end of a quarter, the market will have no time to adjust to the completion, and it might show no reaction in the valuation of the firm.

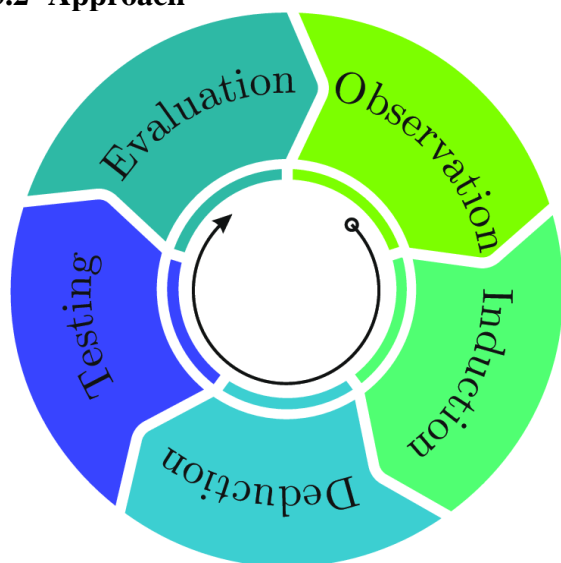
#### 3.1.2 Finance Websites and Balance Sheets

Besides the database what I have available to me is analyst reports as well as some historical data on stock evaluation of the different stocks from financial websites like Yahoo Finance and MarketWatch. Moreover, Macrotrends will be used to view the quarterly balance sheets of the acquiring firms. A limitation here clearly is that some firms, especially smaller firms, are not necessarily publicly traded companies and thus have no stock evaluation. However, in the case of an acquisition, I can still observe how it affected the stock evaluation of the acquiring firm. Bigger firms tend to take over increasingly larger portions of the market by acquiring smaller competitors. This has also been the case in the ISPs market (e.g. AT&T and Comcast controlling increasingly larger portions of the US market) [19]. Most of the bigger acquiring firms are traded publicly and therefore have a stock evaluation that can be analysed.

Another approach is to instead analyse the financial reports (balance sheets) of the two companies involved to determine the valuation of the merger or acquisition. Publicly traded firms are required by law to publish financial statements periodically (mostly quarterly). Since private companies do not need to please their shareholders, they have no incentive to release their financial performance publicly. Overall, this practically limits the available data on a private company to the valuation of the merger or acquisition as given in the database, rendering a comparison to other data impossible. As a result, only publicly traded companies will be included in the sample.

Lastly, I can connect the data I gather from the database with the data from financial websites and financial statements of the buying company to see if they tell a sensible story. Moreover, the data should determine whether mergers or acquisitions generally have a positive or negative influence on the valuation of the acquiring company, at least for the Telecom Market.

## 3.2 Approach



**Figure 1: Groot's Cycle of empirical scientific enquiry [1].**

My study will be structured around the cycle of empirical scientific enquiry as suggested by Groot. This approach consists of five phases [2]:

**Phase 1:** The observation phase. In the first phase empirical materials are collected and grouped, and tentative hypotheses are formulated.

**Phase 2:** The induction phase. In the second phase hypotheses are formulated.

**Phase 3:** The deduction phase. Here specific consequences are derived from the hypotheses in the form of testable predictions.

**Phase 4:** The testing phase. In this phase the hypotheses are tested against the empirical materials to determine whether the predictions are fulfilled.

**Phase 5:** The evaluation phase. Finally, in the last phase, the outcomes of the enquiry are evaluated regarding the hypotheses and theories stated. Furthermore, we look towards subsequent, continued, and related investigations.

In line with this empirical cycle I will be formulating my own hypothesis to test against the empirical findings. This hypothesis will be based on already existing research.

By testing the hypothesis against the empirical findings in the data available to me, I will draw conclusions as to whether historical deductions regarding the relation between the effect of mergers and acquisitions on the valuation of firms are warranted. Hopefully, a link in the data becomes apparent between the timing of a merger or acquisition and the valuation of the firm, whether that be the evaluation by company executives on the inside, shareholders on the outside or a mix between the two. Moreover, it should provide a deeper insight into the relation between the evaluations from outside and inside perspectives and how they tend to differentiate (if they do).

To definitively test the hypothesis against empirical data I will be determining the value of the acquiring company before and after the merger or acquisition to work out whether there is a financial gain.

## 3.3 Data Analysis

### 3.3.1 Restriction of Events

To create a reasonable number of events to be analysed within the time available, I will be limiting the dataset to a specific timeframe. Since I have data available to me all the way up to present time (2020), it seems best to make use of data that is most current. Using the most current data hopefully increases the probability that statistical findings within the chosen market segment are still presently relevant. Analysing only data from 2020 is not an option however since only 7 occurrences of a merger or acquisition within the Telecom industry are listed so far this year. Consequently, I will be including the M&As up until 2015 into the sample. First, I will eliminate all occurrences of IPOs during this timeframe from the sample since these cannot be put on equal footing with M&As as they are a different concept entirely. For the same reason, financial buyouts will also be removed from the sample. Lastly, cases in which the merger or acquisition has only been announced and the completed column is filled in as "pending" need to be left out of the sample. I want to observe the value of the firm pre- and post-merger, requiring the merger or acquisition to be completed fully. Ultimately, this means the sample consists solely of mergers and acquisitions that were announced and have since been completed within the worldwide Telecom market between the 31<sup>st</sup> of March 2015 up until the occurrence of the latest event on the 5<sup>th</sup> of April 2019. Many of the mergers and acquisitions within this timeframe will be missing from the sample due to lack of available financial data, in most cases resulting from the acquiring company being private.

### 3.3.2 Determining the Financial Value of a Firm

#### 3.3.2.1 Choice of valuation method

There is a variety of methods to determine the value of a company that vary greatly in their approach [6]. For this report, I will be strictly applying an equity-based valuation method. Equity evaluations should provide a clear and structured indication whether firms that merge with or acquire another firm tend to benefit from this process positively financially. One other main form of firm evaluation is comparing key financial indicators like enterprise value (EV), price per earning (P/E) or earnings per share (EPS) with similar firms, to determine whether these values are appropriate for a specific firm in a specific market segment. The problem however arises in the availability of similar firms, which requires them to be in the same market segment, and most importantly, be of a similar size. Moreover, enterprise value is not a value that is readily given in balance sheets or other financial reports, requiring them to be calculated individually. If these values were to be compared to similar firms, this would result in many times the number of research and calculations, which is an unfeasible amount of work for the constraints of this thesis. Another solution would be to decrease the number of cases and instead perform the comparison process on a smaller number of firms. However, having a larger number of firms to observe and analyse not only creates a more convincing case for or against the hypothesis, it also does a better job at painting an overall picture of the situation. Lastly, enterprise value calculation requires the total number of available shares at specific points of time in the past, which is data that is not easily accessible. Historical share prices are easily determined by looking at share price lists and graphs on financial websites. These websites do not always list the number of available shares at every moment time, which is critical in determining the market cap of a firm exactly at the point of a merger or acquisition. The market cap then in turn is necessary to calculate the total enterprise value.

Therefore, a smoother and more effective process is to determine the value of only the firms involved, resulting in more cases and a more comprehensive understanding of the bigger picture.

### 3.3.2.2 Enterprise Valuation

Total enterprise valuation is not a bulletproof form of determining the total value of an enterprise. However, Enterprise Value (EV) is a more all-inclusive form of company evaluation than taking just the firms' market capitalization [15]. The main disadvantage of an evaluation that is restricted to only market capitalization is that financial markets tend to fluctuate a lot. Changes in market capitalization can often not be attributed solely to the occurrence of an event (like a merger) that is specific to that company. Instead, changes in the overall market, like a market-wide recession or boom, can have a big influence on the share price of a firm, and thus on its market capitalization. This is because **market capitalization is calculated as the number of outstanding shares multiplied by the share price**. EV tries to eliminate this issue by also considering the change in debt (both long term and short term) and cash on hand of a specific firm. Debt and cash on hand are generally two values that tend to change directly because of a merger or acquisition. Cash on hand often increases before the process of a merger or acquisition and then drops steeply once the merger or acquisition has been completed. Logically, this is because the firm needs cash to go through with the merger or acquisition. This money is spent directly on acquiring a part of or the entirety of another firm. Debt, conversely, should increase steeply directly due to a merger or acquisition being completed. The parts of a company that are not bought through a direct form of financing like cash, are usually instead paid for by indebting the buying firm. Therefore, changes in these two values should be a strong indicator for whether the merger or acquisition has a positive financial influence on the buying firm. In combination with the market cap they should provide a more comprehensive picture of the value of a firm and the effect of a merger or acquisition on this value.

Since EV consists of three separate values it is easiest to present it as a formula:

$$EV = MC + \text{Total Debt} - C$$

Where:

MC = Market capitalization

Total debt = Sum of short-term and long-term debt

C = Cash and cash equivalents; the liquid assets of a company, but may not include marketable securities

As evident from this formula, the EV of a firm is calculated by adding up all debt, both long term and short term, on a company's balance sheet, adding the market cap and subtracting any cash and cash equivalents from the total.

### 3.3.3 Determining the Financial Value of a Merger or Acquisition

It is important to note that company valuation is not an exact practice, in the sense that there are multiple ways to evaluate a business and not one specific method can be considered the perfect way to do so. Furthermore, business valuations are often inaccurate because certain factors are not considered. Not all economic circumstances around the time of the evaluation can be truly accounted for in the form of a number, since the number provides no context. Moreover, it is intrinsically difficult to determine the value of the technology of a company and thus – largely connected – the firm's future value. Technology implemented today might only show improvements in productivity over the course of the following years. A stock price, which is one form of business evaluation, is only a

moment-in-time estimation of the value of a company that does not necessarily reflect the true future value of the business.

In principle, there is an economic gain if the value of the combined firm is higher than the sum of the individual values of the firms. I am dealing with moment-in-time valuations of companies and since the theory takes the values of the firms involved in the merger or acquisition as a present value function, the formula must be rewritten slightly. Namely, present value becomes enterprise value. **In this concept, company A is the acquiring company, while company B is the acquired company.**

As a formula, this concept looks like this [4]:

$$\text{Gain} = EV_{AB} - (EV_A + EV_B) = \Delta EV_{AB}$$

With...

$EV_A$  = enterprise value of firm A

$EV_B$  = enterprise value of firm B

$EV_{AB}$  = enterprise value of the combined firm AB

Now to determine the NPV (net present value) we need to deduct the cost from the gain.

$$NPV = \text{gain} - \text{cost}$$

$$\text{Cost} = \text{cash paid} - EV_B$$

therefore...

$$NPV = \Delta EV_{AB} - (\text{cash paid} - EV_B)$$

In this formula the assumption is that company B is entirely bought up by company A, resulting in a subtraction of the entire value of company B ( $PV_B$ ) from the cash paid. In a lot of mergers or acquisitions this is however not the case, since smaller parts of a firm can change ownership. In cases like this the percentage of company B that is handed over to company A needs to be multiplied with the present value of company B ( $PV_B$ ). This way only the part of company B that is bought by company A is part of the calculation.

Next, to have a sample size available at all, I will be using the value of the transaction as listed in the database as the value of the percentage of company B that is bought by company A. The dataset does not include enough cases in which both the buying and selling company are public companies. Consequently, regular financial statements to determine the change in value of the firm are unavailable. As previously explained, public firms are required by law, in a great number of countries and territories, to disclose their financial performance (most often quarterly) in financial statements. Requiring only the buying company to be public allows for a larger number of cases to be analysed. The difficulty with analysing the change in value in this way is that the formula as proposed above cannot be applied correctly, since the value of the company that is bought (Company B) is unavailable. To solve this issue, I will assume that the financial benefit of acquiring a company is equal to zero, since the money paid should be equal to the value of (the part of) company B that is bought by company A. With this assumption, if the value of company A increases pre- to post- merger or acquisition, it can be assumed, to a certain extent, that the merger or acquisition causes a financial gain for company A. If the value of company A decreases from pre- to post- merger or acquisition however, the opposite could be true.

To put this concept into formula terms, it would look something like the following:

Assumption:

$$EV_{AB} = EV_A + EV_B - \text{cost}$$

If, however

$$EV_{AB} > EV_A + EV_B - \text{cost}$$

...the merger or acquisition had a positive financial influence on company A.

And if,

$$EV_{AB} < EV_A + EV_B - \text{cost}$$

...the merger or acquisition had a negative financial influence on company A.

Since only the buying company's value will be analysed, which is presented as  $EV_A$ , it can be said that:

$$EV_A = \text{EV before the merger or acquisition}$$

$$EV_{AB} = \text{EV after the merger or acquisition}$$

## 4. EMPIRICAL CYCLE

### 4.1 Phase 1: The Observation Phase

#### 4.1.1 Observation and tentative hypotheses

In the first phase a finalised version of the data collected from balance sheets and the database, both of which are described in section 3, are presented. Tentative hypotheses will be formulated based on existing knowledge regarding the effect of mergers and acquisitions on the financials of the companies involved.

There are a few aspects that can be analysed with regards to the data collected here. Hypotheses could be focused on the past and current situation, to determine whether the data shows a connection between the value of a firm and a merger or acquisition. They could also be future focused, and question whether certain changes in company value can predict the likelihood of a merger or acquisition occurring within a specific timeframe. Moreover, one could also delve deeper into the relationship between the transaction value of the merger or acquisition (as a percentage of the company's values) and changes in company structure.

As explained in the methodology section of this report, the dataset needs to be filtered significantly to arrive at cases that can be both analysed through numerical data as well as news reports. To confirm or reject the hypothesis numerical data is critical. To find a reasoning for why the numbers turn out a specific way, background information in the form of journalistic reports and news articles is necessary. These articles are supposed to provide context to findings within the data. This is especially important in cases of statistical anomalies.

#### 4.1.2 Finalised Dataset

After carefully selecting cases from the dataset that can be thoroughly analysed, I am left with data that looks like what can be found tables 1 and 2.

First, it is important to note that the Case IDs in each table correspond to each other (table 1, table 2 and the appendix) to make it easier to identify which case is which.

Table 1 consists of three values both pre- and post- merger or acquisition (6 in total) for ten different instances of a merger or acquisition occurring in the Telecom Industry worldwide between 2015 and 2019. These three values are the values that are required to create an EV valuation: market cap (calculated as share price times number of outstanding shares), total debt and cash or cash equivalents. Essentially, the market cap covers the outside valuation as done by shareholders, while the debt and cash on hand cover inside valuation from the perspective of the firm itself.

Table 2 provides a variety of information surrounding the cases along with the finalised calculated EV values pre- and post-

merger or acquisition. The year written in the first column states the year in which the merger or acquisition was announced and therefor corresponds with the quarter in the "announced" column. "Pre- and post- quarter" refer to the quarters in which the EVs were calculated for that specific firm. In many cases the year is also given since the pre- and post- quarter surround the quarter in which the merger or acquisition was completed (also listed in the "completed" column), not the quarter in which it was announced. In all but one case, the pre- quarter is 1 quarter before the completion quarter, and the post quarter is the exact same quarter as the completion quarter. In case 3, the pre quarter is 2

Case ID	Market Cap Pre	Market Cap Post	Debt Pre	Debt Post	Cash Pre	Cash Post
1	7.52	8.93	1.29	1.73	0.46	0.13
2	3.52	3.42	2.97	2.97	0.59	0.47
3	15.58	15.87	10.82	10.65	2	1.17
4	48.72	52.21	52.95	72.07	26.64	12.98
5	157.25	162.94	69.71	107.35	10.62	3.81
6	42.33	45.05	15.09	16.04	6.84	0.44
7	254.04	233.01	133.72	168.50	48.87	13.52
8	22	18.7	24.85	37.28	0.16	0.56
9	7.11	5.33	45.831	49.5	0.98	1.29
10	47.44	55.55	37.124	60.132	1.278	0.01

**Table 1: Market Cap, Total Debt and Cash on hand pre- and post-Merger or Acquisition**

Case ID	Pre quarter	Post quarter	Announced	Completed	Buyer Country	Target Country	Transaction Value	Buyer Value Pre	Buyer Value Post
2019									
1	Q3	Q4	Q2	Q4	United States	United States	0.5	8.673	10.527
2	Q2	Q3	Q2	Q3	United Kingdom	United Kingdom	0.7	5.901	6.392
2018									
3	Q1 (2019)	Q2 (2019)	Q4	Q2 (2019)	Sweden	Netherlands	0.4	27.337	28.397
4	Q1 (2019)	Q3 (2019)	Q2	Q3 (2019)	United Kingdom	Multiple	22.6	75.032	111.293
5	Q3	Q4	Q2	Q4	United States	United Kingdom	39.7	216.343	266.467
2017									
6	Q3	Q4	Q3	Q4	United States	United States	7.1	50.589	60.658
2016									
7	Q1 (2018)	Q2 (2018)	Q4	Q2 (2018)	United States	United States	85.0	338.894	383.980
8	Q3 (2017)	Q4 (2017)	Q4	Q4 (2017)	United States	United States	34.0	46.694	56.539
2015									
9	Q1 (2016)	Q2 (2016)	Q4	Q2 (2016)	United Kingdom	United States	5.3	51.961	53.54
10	Q1 (2016)	Q2 (2016)	Q1	Q2 (2016)	United States	United States	10.4	83.29	115.68

Table 2: Timeline, Buyer and Target Country, Transaction Value and EV Calculation

quarters before the completion quarter because there was no data available for the second quarter. Next, both the country of the buying firm and the target firm are listed under “buyer country” and “target country” respectively. Transaction value refers to the funds that needed to be paid by the buying company to complete the merger or acquisition. Lastly, the “buyer value pre” and “buyer value post” columns state the calculated EV value for the buying firm pre- and post- merger or acquisition.

## 4.2 Phase 2: The Induction Phase

In this phase, a hypothesis will be formed that fits best the data that was collected from the database and balance sheets.

The most logical hypothesis to test is the following: **Mergers and acquisitions have a positive financial influence on the value of the acquiring firm.**

The data collected should and can confirm or deny this hypothesis to a certain degree of confidence. As explained in the observation phase, it is also possible and important to look forward upon confirming or denying this hypothesis. The data collected does not allow for the creation of predictive models, but it can help pave the way. It does not allow for predictive models because in this form of data collection the changes in valuation are, if the hypothesis is correct, a consequence of the merger or acquisition. If a significant connection is shown between valuation and mergers or acquisitions, further research is most certainly worth exploring, not only around the completion date of a merger or acquisition, but with a broader timeframe - including the date of announcement.

## 4.3 Phase 3: The Deduction Phase

Here I will deduct assumed consequences from the hypothesis.

There are a multitude of different consequences that can logically be derived from a merger or acquisition positively influencing the value of a firm.

(1) A first assumption could be that the market cap of a firm rises due to the merger or acquisition being completed. A merger or acquisition is often a big event and, in most cases, creates excitement around the buying firm. If the public gets excited about the prospects of a company, it is likely company shares will be bought more, resulting in an increase in share price. The share price then in turn directly affects the market cap.

(2) A second assumption is that the available cash of the buying company decreases from pre- to post- merger or acquisition. This is because the company needs to make funds available to complete the buying process. In almost all cases of mergers or acquisitions, at least some form of cash or cash equivalent is transferred from the buying firm to the target firm. In case of bigger transactions significant portions of the sum to be paid is likely to be paid through borrowed money (bonds or loans).

(3) Largely connected to the assumption in (2), if mergers or acquisitions are often paid for by indebteding the buying firm, the total debt of the buying

firm should increase from pre- to post merger or acquisition. In enterprise valuation, debt increases the value of the firm at that moment in time because an acquiring firm takes over that debt. “A leveraged buyout (LBO) is the acquisition of another company using a significant amount of borrowed money to meet the cost of the acquisition” [14]. LBOs happen so the buying company can make bigger acquisitions without having to commit a large amount of capital. Often, the capital necessary is not even readily available.

- (4) Another assumption that can be derived from the hypothesis is that the size of the transaction has an influence on the change in value from pre- to post merger. More specifically, if the transaction is a bigger percentage of the overall value (in this case the EV) of the buying firm, it should show a bigger percentage change in the value of the buying firm from pre to post merger or acquisition. This assumption could, to some extent, tell us whether the merger or acquisition is a driving influence for the increase or decrease in value. If the two values are vastly different in all cases, it

Case ID	Transaction value/EV pre	EV increase
1	5.76%	21.38%
2	11.86%	8.32%
3	1.46%	3.88%
4	30.12%	48.33%
5	18.35%	23.17%
6	14.03%	19.90%
7	25.08%	13.30%
8	72.81%	21.08%
9	10.20%	3.04%
10	12.49%	38.89%

**Table 3: Transaction value as share of EV and EV % increase from pre to post**

could be assumed other forces are driving the change in EV from pre- to post- merger or acquisition, not the merger or acquisition itself.

- (5) Finally, the main consequence that should result from the hypothesis being confirmed is that the EV increases from before to after the merger or acquisition. This can directly be checked by seeing what percentage of the ten firms has an increase of value from before to after the merger or acquisition.

#### 4.4 Phase 4: The Testing Phase

In this phase I will be testing the assumptions in phase 3 by exploring the finalised collected data.

First let us look at assumption (1). The market cap of a firm that goes through a merger or acquisition should rise upon completion. In table 1 we find the market caps pre- and post-merger or acquisition. **In 6 out of 10 cases the market cap of the buying firm increases (Cases: 1, 3, 4, 5, 6, 10).** This means, in this sample, 60% of the time market capitalization increases from before to after the merger or acquisition.

Next, for assumption (2), we again look at table 1 to determine whether cash or cash equivalents decrease from before to after a

merger or acquisition. **In 8 out of 10 cases the cash available to the buying firm decreases from before to after the merger or acquisition (Cases: 1, 2, 3, 4, 5, 6, 7, 10).** Therefore, in this sample, cash or cash equivalents decrease from pre- to post merger acquisition 80% of the time.

Thirdly, assumption (3) can be empirically confirmed or denied again by looking at table 1. According to the assumption, debt should increase from before to after the merger or acquisition. **In 8 out of 10 cases the debt increased from pre- to post- merger or acquisition (Cases: 1, 4, 5, 6, 7, 8, 9, 10), and in 1 case it stayed the same (Case: 2).** For this sample, the debt therefore increased from before to after the merger or acquisition at least 80% of the time.

The fourth assumption (4) states that there is a connection between the percentage size of the transaction value relative to the total value of the buying firm and the percentage increase in value from pre- to post- merger or acquisition. For this I created a table that shows these two exact values for all cases (Table 3).

For the assumption to be correct, the percentage values in both columns should be similar. If that is the case, it means smaller transactions (in relation to the buying company’s value) create a smaller increase in value, and bigger transactions create a bigger increase. There is no way to definitively make a statement accordingly, however. That is because there is not a single definition for what is to be considered “close” in value. With the assumption that the transaction value as a share of the EV pre is within 20% of the EV increase from pre- to post- merger or acquisition, **eight out of ten cases can be considered confirmed (cases: 1, 2, 3, 4, 5, 6, 7, 9).**

Lastly, the final and most important assumption (5) entails that the value, in this case the EV, of the buying firms increases from before to after the merger or acquisition. For this we must look at the EV calculations in table 2. **This assumption is confirmed in all 10 cases (Cases: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10).** Consequently, for this sample, the enterprise value of a firm increases from before to after a merger or acquisition 100% of the time.

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	90.4714	109.3473
Variance	11185.18	15038.40274
Observations	10	10
Hypothesized Mean Difference	0	
df	18	
t Stat	-0.36861	
P(T<=t) one-tail	0.358361	
t Critical one-tail	1.734064	
P(T<=t) two-tail	0.716722	
t Critical two-tail	2.100922	

**Table 4: two-sided t-test for enterprise value**

To test whether the sample is large enough to provide a statistically significant outcome, a two-sided t-test was performed. For the t-test  $\alpha = 0.05$  and a null hypothesis assuming no difference between the values before and after the merger or acquisition (variable 1 = pre-merger or acquisition, variable 2 = post-merger or acquisition). Since  $-2.101 < -0.369 < 2.101$ , we do not reject the null hypothesis.

## 5. RESULTS AND DISCUSSION

### 5.1 Phase 5: The Evaluation Phase (Results)

The first assumption, which states market capitalization should rise due to a merger or acquisition, cannot be confirmed with much confidence. 60% of the cases coming out positively with a sample size of 10 can simply be the result of selecting the right cases. In fact, the completion date of a merger or acquisition is



likely not what influences the market cap the most. Instead, the announcement date could be much more prevalent here. This is because stock markets tend to fluctuate heavily once important news is released. Share prices in some cases even jump up or down before the release of that news, which is the result of inside investors and shareholders having more knowledge of the situation than the public [12]. Share prices generally react early and speculatively. This means once the actual event happens, the share price has already long reached a new equilibrium. In the case of a merger or acquisition, the share price of the affected firm is likely to fluctuate due to the announcement of the merger or acquisition, or even slightly beforehand. At the date of completion, the share price will already be adjusted or showing only minor corrections. It is most likely already reacting to “newer” news.

The second assumption, which states that cash or cash equivalents should go down from pre- to post merger or acquisition, seems fairly confirmed. 80% confirmation within a dataset of 10 cases can by no means provide a definitive conclusion, but it seems to suggest that there is a connection. The reason for this connection is obvious, as stated previously, the buying company needs direct funds available to go through with a merger or acquisition. Once the merger or acquisition has been completed, those funds are (partially) depleted. If the cash or cash equivalents of a company are affected by going through a merger or acquisition, this means the total EV is also affected. As previously explained, cash on hand is 1 of the 3 values that makes up the total EV of a company.

Assumption three affirms that the overall debt of a company increases from before to after the merger or acquisition. This is largely interconnected with the assumption that cash on hand decreases from before to after a merger or acquisition. Like assumption two, this prediction also seems largely confirmed with an 80% confirmation and one further case (10%) in which the total debt stayed the same. As explained in the deduction phase, this is the result of firms often incurring themselves to complete a merger or acquisition. What is also worth noting is that in the one case in which debt did not increase – case 3 – the transaction value is only a very small percentage of the total EV of that company. By looking at the table in Appendix 1, we find that the company in question is Telia Company. They acquired the stake of Turkcell in Fintur Holdings B.V., which made them the sole owner of Fintur. The value of the transaction was a mere 0.4 billion USD, while the EV of Telia Company is 27.3 billion USD (pre acquisition). This means the transaction represents only 1.47% of the total enterprise value of Telia Company. In other words, the acquisition does not have a big effect on the overall financial situation of Telia Company. Moreover, it means Telia Company does likely not have to incur itself to complete this acquisition. This is further confirmed by the change in cash available from before to after the acquisition. Their cash decreases from 2 billion USD to 1.17 billion USD on hand from before to after. This decrease by 0.83 billion USD more than covers the 0.4 billion USD value of the transaction, suggesting that this is a cash-only acquisition. Ultimately, this means there is a logical reason for debt not increasing from before to after this acquisition in this specific case. Therefore, to a certain extent, all cases seem to support that the total debt of a company is directly affected by the completion of a merger or acquisition. If the total debt of a company is affected by the completion of a merger or acquisition, the EV of a company should also be influenced. Like cash on hand, total debt acts as one of the three values that makes up the total EV.

The fourth assumption is concerned with the connection between the percentage share of the transaction value to the EV of the buying firm in relation to the increase in value from pre- to post-

merger or acquisition. If the cut-off for what is close in value be changed slightly, the cases that are confirmed would be different. E.g. a cut off at 15% would eliminate case 4, a cut off at 5% would eliminate all cases but 2, 3 and 5. The one massive outlier seems to be case 8, in which the transaction value represents 72.81% of the EV of the buying company but there is only a 21% increase in value. Appendix 1 reveals that this is the acquisition of Level 3 Communications by CenturyLink. A bit of further research reveals that this is more of a merger instead of an acquisition, which is why the transaction value is such a large percentage of the EV of CenturyLink [6]. CenturyLink after the merger has a 51% stake in the company while Level 3 has a 49% stake. This makes it the only true merger in the sample. Because the cost of the merger is already included within the change in EV, this does not mean the merger generated a loss. Rather, it caused a 21.08% increase in value for the combined firm. The transaction value is such a large percentage of the EV because this case is a merger, meaning the transaction value is the real outlier here, not the difference in percentages. It also means that for true mergers, where there is approximately a fifty/fifty stake for both companies involved, this metric is not very useful. This is because if all cases are mergers, with about a fifty/fifty split, there is no difference between cases where the transaction value is a bigger or smaller percentage of the EV of the buying firm (they are all close to or equal to 100%).

The final assumption, which is essentially a direct representation of the hypothesis, is concerned with the influence of a merger or acquisition on the EV of a company. Since assumptions two and three, as well as to some extent assumption one, can all be confirmed for this sample, it is likely the overarching assumption five will also be confirmed. This is because assumptions one to three cover all three dimensions of an EV calculation.

Since we find that EV increased from pre- to post- merger or acquisition in all ten cases, we conclude that mergers and acquisitions have a positive effect on the financial state of the buying firm. While the dimensions of an EV calculation do not show a 100% confirmation rate individually, they balance each other out. As a result, the final calculation shows a positive connection throughout the entire sample. However, the sample has shown to be statistically insignificant at an  $\alpha$  of 0.05. A larger sample would perhaps be able to draw conclusions with statistical significance.

## 5.2 Limitations

There are a few limitations with the way this study was conducted.

First, the original dataset, that included all cases of mergers and acquisitions in the Telecom industry from 1997-2020, was severely reduced to include only a fraction of the cases. This is a natural consequence of not having enough background information on a lot of the individual, often smaller, cases. In some cases, financial information was missing, which made it impossible to correctly evaluate the company and the merger or acquisition. In other rare cases, there was insufficient journalistic background information in the form of news reports to draw conclusions from. Moreover, the most recent cases (those in 2020) had to be left out due to the coronavirus pandemic affecting share prices significantly, resulting in the 2020 stock market crash [3]. This crash would have had too big of an impact on the EV valuation since market cap is a very significant portion of this type of valuation. Consequently, numbers from this time-period would have to be considered unreliable.

Next, the sample size of this research is limited, as it presents an analysis of only 10 cases within the telecom industry. To confirm

statements with a higher level of confidence the sample sized would have to be increased to tens if not hundreds of cases. Furthermore, because the sample is limited to only the telecom industry, no definitive statements can be made for other markets. It is likely these results are replicable in other industries, but no such statements can be made with 100% certainty.

Lastly, in some cases the transaction value is only a very small percentage of the EV of a firm, (see Table 3). E.g. in cases 1 and 3 its less than 10%, in these cases the merger or acquisition is likely to show less of an impact on the financial state of the buying firm. Preferably, you want cases where the merger or acquisition has a bigger influence on the financial state of the firm.

### 5.3 Future Research

There is a lot of room for future research that is closely linked to the work done in this thesis.

First, as mentioned in the limitations section, I would suggest performing this type of analysis on a larger sample. An analysis with a larger sample could again be limited to just one industry but it could also span multiple industries to come to a more general conclusion. This step is very important since taking the ten cases as presented in this work, no statistical significance between a merger or acquisition and an increase in EV could be determined. This type of study could be copied and applied in the same manner to a much larger sample. That way, a connection between mergers and acquisitions and an increase in EV could also be statistically proven.

Second, this type of analysis could be extended to include multiple forms of company valuation. The EV calculation used in this thesis gives information about the financial position of a firm both from an outside as well as in inside perspective. An outside perspective of shareholders, covered by the market cap, and an inside look into the balance sheet in the form of debt and cash on hand. However, if performed with care and attention to detail, the more types of valuations the better. Taking averages from a multitude of different valuations will limit statistical bias and outliers. Furthermore, this thesis does not take into consideration the target firm. It would also be interesting to observe the financial effects of a merger or acquisition on the firm that is being acquired.

Thirdly, as mentioned at the very beginning of this report, this type of research can be extended further. If combined with further analyses, predictive models might be possible regarding the consequences of a merger or acquisition on the financial situation of a firm. As of now only "loose" statements and predictions are possible, but if more empirical evidence is collected more definitive conclusion and predictions for the future can be made.

## 6. CONCLUSION

For the conclusion, lets return to the original research question:

**For the Telecom Industry, what effect do mergers and acquisitions have on the intrinsic evaluation by company executives and the perceived evaluation of shareholders?**

As described throughout this report, company valuation in this thesis was done through an equity-based enterprise valuation. A dataset consisting of hundreds of cases of mergers and acquisitions was limited to a set of 10 cases ranging from 2015 to 2019. Cases were eliminated mostly based on limited financial information resulting from the buying company being private.

Based on the research question and existing literature and assumptions, a hypothesis was formed:

**Mergers and acquisitions have a positive financial influence on the value of the acquiring firm.**

From this hypothesis, multiple assumptions were derived to tackle all aspects of the original research question. The first 3 assumptions cover all 3 values relevant to the calculation of the EV of a company: market capitalisation, total debt, and cash on hand. Moreover, the EV covers both an intrinsic valuation through debt and cash on hand as well as an outside, shareholder valuation through the market cap. The fourth assumption regarding the relationship between the percentage share of the transaction value to the EV of a company and the increase in EV from pre- to post- merger or acquisition is to determine whether the merger or acquisition is the driving force behind the change in value. Lastly, the culminating assumption 5 gives us a definitive confirmation or negation of the hypothesis.

Analysis of the dataset for assumption 4 seems to suggest the merger or acquisition is the main driving force for the change in value from before to after the merger or acquisition. Moreover, assumption 5 finds that the starting hypothesis can be confirmed, based on the sample used. All ten cases find an increase in EV from before to after the merger or acquisition.

For the research question this means that the effect of a merger or acquisition on the valuation of a company is that the value of the acquiring company increases. There is not a very strong relationship between the merger or acquisition and the increase in valuation by shareholders, as by assumption 1. This thesis suggests this might be a consequence of the pre-emptive nature of equity-based valuations. Consequently, I assume there is likely a stronger relationship between the announcement date, rather than the date of completion, of a merger or acquisition and a change in valuation by shareholders. Assumptions 2 and 3 show a massive increase in intrinsic valuation. The increase in total debt and decrease in cash on hand are the main driving forces behind the positive financial relationship suggested by the hypothesis.

All ten cases coming out as positive in the end is a rather unfortunate circumstance. A positive relationship between the completion of a merger or acquisition and an increase in financial value for the buying firm is the expected outcome. If there had been cases in the sample that rejected this hypothesis, they would have been interesting to analyse. Consequently, I would have had to find out why specifically those cases rejected the hypothesis, or if the hypothesis is wrong to begin with. Instead, the cases confirm precious suspicions. Identical research with a different sample. even in the same market segment, might find cases that in which the EV does not increase from pre- to post- merger or acquisition.

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Case ID	Case Description
1	Cable ONE signs definitive agreement to acquire Fidelity Communications' data, video and voice business
2	Macquarie Infrastructure subsidiary MEIF 6 Fibre confirmed as winner in auction for Hull-based KCOM Group
3	Telia Company strikes deal to acquire Turkcell's 41.45% stake in Fintur Holdings; deal expected to close in early 2019
4	Liberty Global agrees to sell its operations in Germany, Hungary, Romania and the Czech Republic to Vodafone Group
5	Comcast makes offer for Sky; beat rival bid from 21st Century Fox in Sep-18 auction, after which Fox agreed to sell its existing stake in Sky to Comcast
6	Crown Castle International inks definitive agreement to purchase LTS Group Holdings (Lighttower)
7	AT&T reaches deal to buy media and entertainment conglomerate Time Warner Inc.
8	<b>CenturyLink strikes to deal to acquire and merge with Level 3 Communications</b>
9	Liberty Global strikes deal to acquire all shares in Cable & Wireless Communications
10	Charter Communications reaches definitive agreement to buy Bright House Networks

## 9. APPENDIX

### 9.1 Appendix (1) Case Descriptions