

Preliminary Master Thesis

Wealth Creation in Mergers and Acquisitions in the U.S.

“This thesis is a part of the MSc programme at BI Norwegian Business School. The school takes no responsibility for the methods used, results found, and conclusions drawn.”

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Introduction

During the last two decades, mergers and acquisitions (M&As), as well as their wealth creation has been extensively researched in the field of finance. M&As have become important strategic tools used by companies to achieve certain goal. Firms have various reasons for engaging in the merger/acquisition, such as revenue enhancement, cost reduction, tax gains or reduced capital requirements. However, many wonder if mergers actually add value. While some research focus on short term value creation and use event studies to measure the performance, other look at the 1 to 5-year post-transaction periods. Different research came to the different conclusions when it comes to the performance of the combined entity or the bidder alone, however, all studies showed positive premiums for targets, concluding that mergers create value for the target shareholders. This implies that premium acquiring company pays creates a hurdle for that company and that the shareholders of the acquiring company will lose if this premium exceeds the value of the synergies (Hillier et al., 2013). Various papers that focused on the long-term performance concluded that bidding firms face negative abnormal returns over a one to three-year post transaction period. However, Fama (1998) and Mitchell and Stafford (2000) draw attention to the fact that different studies employed different methods (event-time vs. calendar-time approach) and various factors (such as payment methods, merger, or tender offer) which may affect the findings of these papers. This has motivated us to undertake this comprehensive study using wide-ranging data on the U.S. acquiring firms to provide a study, and to test the results with more robust methodologies and statistical techniques (inspired by Dutta & Jog, 2009).

The remainder of the paper is organized as follows: Section 2 presents the literature review, Section 3 presents data and methodology, Section 4 presents results and discussions, and lastly, Section 5 presents a summary and conclusions¹.

The main goal of this paper is to reach a conclusion on the question if there is, on average, wealth created during the M&A transaction, both in the short- and the long-run.

¹ Sections 4 & 5 are not part of the preliminary thesis, but will be included in the final version of the thesis.

Literature Review

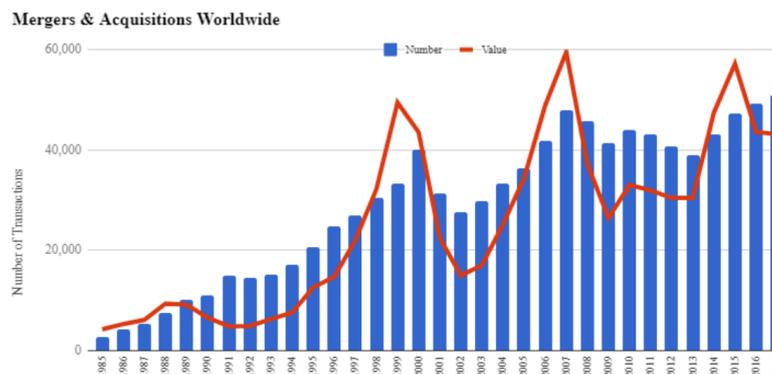
In the following section, we review relevant existing research and provide a theoretical framework in order to set the foundation to our analysis. We first briefly define the concept and recent activity of M&A, discuss main reasons behind it and then address academic findings regarding the added value M&A provides in both short and long term.

Theoretical background and recent activity

M&A is a general term, connected to transactions of two companies, which result in a formation of one legal entity. Referring firstly to acquisition, the parties involved are typically a buyer or the acquirer on one side and a seller or the target firm on the other side. The buyer acquires the target firm by purchasing its stock or existing assets with cash or its shares, which is referred to as a takeover. With transaction in place, the acquirer has an absolute control over all of target's assets. Contrary to acquisition, merger is less hostile. Meaning, it involves two similar size firms, which freely integrate all of their assets in order to form a new legal entity with a new stock. (Berk & DeMarzo, 2017; Schoenberg, 2009)

In past decades, we have on the global scale witnessed to a growing number of companies pursuing M&A transactions (Figure 1). Reviewing the worldwide numerical data over the past years, the transactions averaged to more than 1 trillion USD annually. And referring to previous year 2017 only, the global value of transactions amounted to more than 3.5 trillion USD, among which, 50% (1.8 trillion USD) occurred solely in the North America. (IMMA, 2018) Some of the biggest deals of the year include United Technologies takeover of Rockwell Collins (140 USD per share), Amazon's acquisition of Whole Foods (42 USD per share) and Gilead's purchase of Kite Pharma (180 USD per share).

Figure 1: Number and value of M&A globally



Source: The Institute for Mergers, Acquisitions and Alliances, 26.02.2018, retrieved from <https://imaa-institute.org/mergers-and-acquisitions-statistics/>

According to Berk and DeMarzo (2017), the reasons behind an active M&A market include potential economies of scale, cost reduction, tax advantage, diversification, increased liquidity and decreased risk by lowering the probability of bankruptcy. In general, M&A is company's strategic source of added value and growth.

The value creation was put under a test by numerous authors researching the post-effects of M&A activity, which we describe in the following section.

Effect on shareholder's wealth

We divide previous research based on the length of event window into short- and long-term horizon.

Short-term horizon

When considering the short-term results of M&A activity, authors agree and provide evidence of value loss for acquiring company. They identify denoting positive abnormal returns – however, predominantly in favour of target's stockholders. Bradley, Desai and Kim (1988) analyse a sample of 236 tender offer contests between 1958 and 1984, within 5-day event window surrounding the announcement date. They find positive abnormal return for 95% of targets and significantly lower average abnormal return for only 0.97% of acquiring firms. Andrade, Mitchell and Stafford (2001) similarly review 1990s data within 3-day event window surrounding the announcement date and identify a negative -0.7% return for the buying firms. Barnes Paul (1984) monitors 1974 -1976 post-merger share price movements immediately after, at the end of each of 10 months, and thenceforth at the end of every fifth month after the announcement has been made. He finds evidence of short-lived gain in form of share price increase in the time of the merger, and significant price decrease over the long term. Barnes estimates the share price adjustment to lower level at 6 months. We continue with analysis of long-term M&A effects in the following subsection.

Long-term horizon

Reviewing the past research of long term effects, the results appear to indicate poor performance of acquiring companies. However, this also depends on many sources.

Loughran and Vijh (1997) examine the post-acquisition returns of 947 firms and measure abnormal returns as the difference between five-year holding period returns of sample stocks and matching stocks (chosen to control for size and book-

to-market effects). In five years post the acquisition, research results deliver an average negative long-term return of -6.5%. The authors proceed and discover that post-acquisition returns of acquirer's stock are affected by the mode of acquisition, as well as by the form of payment. In their sample, acquirers that make merger bids earn on average 15.9% less than matching firms, whereas acquirers that make tender offers earn 43.0% more than matching firms during a five-year period after acquisition. Similarly, stock acquirers earn 24.2% less than matching firms, while cash acquirers earn 18.5% more than matching firms. By combining both - the mode of acquisition and the form of payment - the authors discover that while stock mergers earn significantly negative excess returns of -25%, the cash tender offers earn significantly positive excess returns of 61.7%. They conclude therefore that the post-acquisition wealth gains are greater for tender offers which are usually hostile to incumbent managers as compared with mergers, and that managers of the acquiring company are more inclined to choose equity as a form of payment if their stock is overvalued and cash when the stock is undervalued. Savor and Lu (2009), similarly investigate value creation for the shareholders of the bidding company, when equity is used as a payment means. They, however, find that overvalued companies tend to create value for their shareholders when using stocks to pay for the acquisition. They also find that unsuccessful equity bidders significantly underperform successful ones and that failure of the transaction is costlier for richly priced companies. They similarly conclude that none of these findings are relevant for cash bids.

Agrawal et al. (1992) examine post-merger performance of acquiring firms and find that shareholders of the acquiring companies face a significant loss of approximately 10 percent over the 5-year post-transaction period. They, however, fail to explain the source of the negative returns after the merger transaction.

Industry specific effect

In addition to two time dimensions, we should also mention the industry specific synergy potentials that arise from M&A activity. An example is seen in Laabs and Schiereck (2010) research, which investigates long-term performance of mergers and acquisitions in the automotive supply industry. Authors analyse 1981 – 2007 horizontal takeovers, using both event-time and calendar-time approach. Contrary to existing unanimous research, the empirical results prove positive short-term returns to acquirers. Nevertheless, long-term performance models show a value

destruction of approximately 16% to 20%, over the three-year period, which is consistent with Loughran and Vijh (1997) research. Authors conclude that international diversification negatively affects the long-term performance, but that larger transactions are more likely to have positive long-term effect due to higher probability of benefiting from economies of scale.

Data and Methodology

Data

Our sample comprises of M&A transactions that took place between January 1997 and December 2012. We use Securities Data Company (SDC) database, Center for Research in Security Prices (CRSP), Datastream and Bloomberg as data sources.

We require that (1) the transaction is completed, (2) the acquiring company controls less than 50% of the target company prior the announcement, and (3) bidding company is listed on CRSP and Compustat during the event window. We exclude firms in the financial industry (SIC 6000-6999) and regulated utilities (SIC 4900-4999) as their decisions and strategies might be affected by regulations (Alhenawi & Krishnaswami, 2015). We also exclude transactions which relative transaction size is less than 1%. Moeller et al. (2003), defines the relative transaction size as the value of the consideration paid by the bidder (without fees and expenses) as reported by SDC, relative to the market value of assets of the bidder.

We examine the trends in the M&A transactions by year both in the absolute terms and on an industry level. We divide transactions based on the type of the transaction (merger or tender offer) and based on the payment type (all cash, all equity, mix) to investigate the pattern of the M&A transactions.

Methodology

In this section we make two types of evaluation. First, we evaluate short-term cumulative abnormal returns using the event study and examining the variance in CARs. Next, we make a long-term evaluation based on the 5-year post transaction period using BHAR methodology and calendar-time portfolio approach.

Short-term Valuation – The Event Study

We measure acquirer announcement effects using the market model (MacKinlay, 1997). From SDC's U.S. Mergers and Acquisition database we obtain the announcement dates and use the data to calculate cumulative abnormal returns (CARs) during the 3-day event window (-1, +1), which is, according to Andrade, Mitchell, and Stafford (2001), one of the two most commonly used event windows

for M&A studies to minimise the probability of any other events affecting the stock price. Day 0 is taken as the acquisition announcement date. CRSP equal-weighted return is taken as the market return, and as in Masulis et al., 2007 we use an 200-day estimation window from the day -230 to day -30 prior the announcement date. We calculate cumulative abnormal returns (CARs) for the whole sample, for acquisitions financed with all cash, those financed with pure equity, and those financed with some combination of both.

Regression Analysis

As we expect variation in cumulative abnormal returns (CARs), we further proceed to attempt to explain the source of variation and consider two factor groups: *bidder characteristics* and *deal characteristics*. Here we follow the procedure from Masulis et al. (2007). For *bidder characteristics* group, we control for the size of the firm, Tobin's q, leverage, free cash flow (all are assessed at the end of the fiscal year just before the announcement date) and pre-announcement stock price runup (assessed on the 200-day window, starting with the event date -230 and ending with the event date -30). Evidence (Moeller, Schlingemann, Stulz, 2004) suggests that larger bidders, on average, pay larger premiums, in comparison to the smaller acquirers, and tend to involve with transactions that yield negative dollar synergies. It is, therefore, to be expected that acquirers of a larger size will more probably pursue value-decreasing transactions. Firm size is, according to Masulis et al. (2007), defined as the log transformation of the bidder's total assets.

Research (Lang, Stulz, Walking (1991); Servaes (1991); Moeller Schlingemann, Stulz (2004)) found an inconclusive effect of Tobin's q on the cumulative abnormal return. We include Tobin's q in our analysis defined as a bidder's market value of assets divided by its book value of assets.

In theory, leverage and FCF are often interconnected. Referring to the Jensen's free cash flow hypothesis (Jensen, 1986), leverage affects the level of FCF available to managers and limits their ability to spend on perks, invest in projects with negative NPV (including acquisitions) and incentivises managers to improve their performance due to the threat of takeover. Therefore, we include leverage as our control variable and expect its positive impact on the dependent variable (CAR). According to the mentioned hypothesis, higher level of FCF would, on the other hand, imply that managers have more opportunities for overinvestments and perks. It follows then that the FCF would have negative effect on cumulative abnormal returns. However, as high level of FCF may be a consequence of manager's good

performance, it can also have a positive impact on the CAR. We define leverage as the ratio between book value of total debt over the market value of total assets, and FCF as OIBDA reduced by the interest expense, income tax and CAPEX and scaled by book value of total assets as in Masulis et al. (2007).

The expectation of a M&A transaction attracts informed trading, that can lead to a higher run-up in the target stock price before an announced acquisition bid. According to the research, acquirers do not decrease their bid price to compensate for a higher run-up, so a larger run-up increases the cost of the acquisition to bidders (Brigida & Madura, 2012). This is why we include pre-announcement stock price runup as our control variable.

In the *deal characteristics* group we control for the ownership status of the target company, method of payment, relative size of the transaction, activity in the target's industry before the acquisition, industry relatedness of the M&A, and belonging of the acquirer and the target to the high-tech industries (Masulis et al., 2007)

Research by Fuller, Netter, and Stegemoller (2002) demonstrated significantly negative abnormal returns faced by acquirers when buying public companies and significantly positive abnormal returns when targets are private firms. They explain their findings by stating that acquiring companies get a liquidity discount when buying private firms. Therefore, we include two variables indicating private and public target companies.

Previous research also found that acquiring firms face significantly negative abnormal returns when they use pure stocks as a payment mean for the transaction, mostly due to the adverse selection problem related to the equity issuance, however, those returns tend to be positive or slightly negative if the target is a private company (Myers & Majluf (1984); Chang (1998); Fuller, Netter, Stegemoller (2002)). Hence, we combine the payment methods with the ownership type of the target company and get six categories: private-pure cash, private-pure equity, private-mix, public-pure cash, public-pure equity, public-mix.

Following further the paper by Masulis et al. (2007), we measure the M&A activity in the industry of a target company one year before the announcement of every transaction and include dummy variable, high tech, that will equal 1 for the companies in high tech industry and zero otherwise. As human capital and intellectual property are of a high importance in this industry, this makes evaluation more complex and leads to often cost understatement and synergy overstatement in those M&A deals.

Lastly, we add an additional dummy variable that takes the value of one if the transaction is a diversifying deal and zero otherwise. Because there are many studies done on to the valuations of the firms that pursue diversification strategy where some found evidence for increase and some for the decrease of the firm value, we are unable to predict its effect on the dependent variable (Masulis et al., 2007).

Long-term Valuation

To evaluate performance of companies after the M&A transaction we look at their long-term abnormal returns. However, different methodologies have been argued to be suitable for these computations. Fama (1998) supports usage of averages or sums of short-term abnormal returns (AARs/CARs) – calendar-time portfolio approach - when making formal inferences about long-run returns, instead of using buy-and-hold abnormal returns (BHARs) – event-time portfolio approach. Fama (1998) claims that the bad-model problems are most severe with long-term BHARs because the model multiplies those problems and neglects possible cross-sectional correlation of event-firm abnormal returns (Savor et al., 2009). Barber and Lyon (1997), on the other hand, advocate using buy-and-hold abnormal returns, as they claim cumulative abnormal returns to be biased predictors. Additionally, Loughran and Ritter (2000) claim the calendar-time methodology to be inappropriate when calculating abnormal returns of events clustered across time, including M&A announcements. For these reasons, we employ both methods in our analysis.

BHAR

We follow the method applied in papers by Savor et al. (2009), Barber & Lyon (1997), and Dutta & Jog (2009), and construct 2 benchmarks in order to calculate five-year buy-and-hold abnormal returns. As a first benchmark we use CRSP value weighted index return (reference portfolio approach). For second benchmark we construct portfolios consisting of matching firms (control firm return approach). Here we adjust our buy-and-hold abnormal returns for firm size, book-to-market ratio and industry. According to findings of previously mentioned researches, we are of the opinion that the control firm return approach will provide a better benchmark as it removes number of biases, namely, rebalancing, skewness and new listing biases (Barber & Lyon,1997). Following Savor et al. (2009), apart from controlling for firm size and book-to-market ratio, two commonly used predictors of the cross-section of stock returns (Fama and French, 1992), we also control for

an industry, as research showed that mergers tend to be clustered by industry and that transactions have higher failure probability in some industries. We also start by “*identifying firms with the same 2-digit SIC code and market value of equity between 50% and 150% of the market value of equity of the sample firm and then choose the firm with the book-to-market ratio closest of that of the sample firm. We obtain 10 control firms. The matching portfolio is an equally weighted portfolio of these 10 control firms*” (Savor et al., 2009). The buy-and-hold abnormal return (BHAR) for firm i equals the buy-and-hold return for firm i (sample firm) over a period minus the corresponding return for firm i 's industry-matched, size-matched, and book-to-market-matched portfolio.

To test the null hypothesis that the average BHARs equal zero ($H_0 = 0$) use following t-statistics (Barber & Lyon, 1997):

$$t = \text{AverageBHAR}_{it} / (\sigma(\text{BHAR}_{it}) / \sqrt{n})$$

where AverageBHAR_{it} represents the sample average buy-and-hold abnormal returns, while $\sigma(\text{BHAR}_{it})$ is the cross-sectional sample standard deviation of buy-and-hold abnormal returns for the sample of n firms. Here, based on the Central Limit Theorem, the t-statistics follows a Student's t-distribution under the H_0 (Barber & Lyon, 1997).

Calendar-time portfolio approach

When applying the calendar-time approach, we construct portfolios of firms that are involved in the transaction event every month, and we rebalance those portfolios monthly, as well. We then use the three factor Fama-French model to calculate portfolio's average monthly abnormal return. We estimate the intercept (α^i) by regressing portfolio's excess return on the Fama-French three factors:

$$R_t^i - R_t^f = \alpha^i + \beta^i (R_t^{\text{mar}} - R_t^f) + \gamma^i \text{SMB}_t + \delta^i \text{HML}_t + \epsilon_t^i$$

R^i represents the equal-weighted portfolio i return, R^f is the risk-free rate, R^{mar} is the return of the CRSP value-weighted market portfolio, SMB is a size factor representing the difference between the return of a portfolio of small stocks and the return of a portfolio of large stocks, while HML represents a book-to-market factor calculated as the difference between the return of a portfolio of high book-to-market stocks and the return of a portfolio of low book-to-market stocks (Savor et al. 2009). We use 1-to-3year US treasury rate as an approximation for the risk-free-rate. Factors α^i , β^i , γ^i , δ^i , ϵ_t^i are the results of the regression analysis; the intercept

α^i represents the average monthly abnormal return to the observed acquirers over the 60 months following an acquisition (Laabs & Schiereck, 2008).

To test the null hypothesis that the average monthly abnormal return of sample firms equals zero, we use a parametric t-statistic which is calculated by dividing the average intercept term by the cross-sectional sample standard deviation of the intercept terms and multiplying by the square root of n:

$$t = AAR_{it} / (\sigma(AAR_{it}) / \sqrt{n})$$

where AAR_{it} represents the sample average monthly abnormal returns, while $\sigma(BHAR_{it})$ is the cross-sectional sample standard deviation of average abnormal returns for the sample of n firms (Barber & Lyon, 1997).

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