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Optimizing the Timing of M&A Decisions—An Analysis of Pro- and Anticyclical M&A Behavior in Germany

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Abstract

If one looks at the market for corporate control from a research perspective, it is especially interesting to analyze whether the decision-makers in the companies take advantage of phases with low asset prices to buy out other companies (behaving anticyclically), or whether they tend to buy during phases with high asset prices—buying procyclically. The aim of this article is to test whether there is a correlation between a company's M&A behavior and the situation in the capital market. Whether M&A success can be seen as dependent on different market valuations and whether differences in terms of the various factors which influence pro- and anticyclical M&A transactions can be determined. The analysis is done with regard to the development of the DAX, the German stock exchange market index. 78 transactions by German purchasing companies during the period 1998 to 2009 were analyzed. The results show that M&A behavior is a procyclical phenomenon and that anticyclical transactions are more successful than procyclical ones in the long term.

Keywords

M&A, Optimal Timing, Anticyclical

1. Introduction

When is the optimum point for M&A transactions? In context this question it is very important, as M&As are a strategy for enhancing a company's value, and are also of central importance in times of increasing volatility in the capital market, particularly as many M&A transactions do not lead to value enhancement [1]. Historically M&As have occurred in waves, of which six completed waves are evident in the last 118 years [2] [3]. Each

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M&A wave was driven by different conditions. Common to every M&A wave, however, was that they were accompanied by sinking interest rates, increasing stock market prices and increasing economic growth, and that each ended with a type of economic shock, such as a recession or a stock market crash [4] [5]. Consequently there is a correlation between the M&A waves and the capital market, as well as the share price [6]-[8].

Brealey/Myers/Allen described the occurrence of M&A waves as one of the ten most important and at the same time unsolved questions in the financial world. "What we need is a general hypothesis to explain merger waves. For example, everybody seemed to be merging in 1998-2000 and again in 2006-2007, but in the intervening years mergers went out of fashion."[9]. "We need better theories to help explain these 'bubbles' of financial activity"[1] [10].

Because of the causal correlation between the share price and M&A activity, a potential hypothesis could be that it makes sense (in terms of success and from a buyer's perspective) to conduct transactions when shares are low. In other words, companies should "go on a shopping spree" during the period when share prices are falling up until the bottom of the cycle, behaving anticyclically in order to generate long-term success. During contraction phases and up until the trough, target companies are valued lower than their value on the capital market, which makes them more likely to become potential objects of purchase.

With this correlation, Brealey/Myers/Marcus therefore asked "[w]hy don't we see just as many firms hunting for bargain acquisitions when the stock market is low" [11]. Tying into this question Müller-Stewens stated that although "the herd" behaves procyclically, very experienced people know how to buy anticyclically [12]. This assertion implies that on one hand the majority of companies behave procyclically in respect to M&A transactions, which inter alia could be an explanation for the high failure rate of M&As; on the other hand it infers that anticyclical trade can be more successful than procyclical trade.

Against a background of theoretical and practical relevance, the aim of this study is to carry out a theory-led hypothesis-testing contribution to the empirical identification and measurement of pro- and anticyclical M&A behavior and its effect on M&A transactions. To this end, three research questions in the form of hypotheses will be examined. Hypothesis 1 will test whether there is actually a positive correlation between the DAX market trend and the number of transactions undertaken by German purchasing companies. One of the most important queries within the empirical study is whether transactions carried out anticyclically are more successful in the long term than procyclical transactions. This will be examined within the scope of hypothesis 2. In addition differences between pro- and anticyclical M&As with respect to potential situational influences will be investigated; this will be hypothesis 3. If particular determining or influencing factors prevail during anticyclical transactions, these can be interpreted as success factors and recommendations for action can be derived from them.

The measurement of pro- and anticyclical M&A behaviors should be conducted in reference to the capital market, *i.e.* in operation to the DAX. Procyclical M&A behavior takes place in the upturn phase of the economy, while anticyclical behavior applies to the downturn phase until the lowest point in the stock market is reached. In both cases the focus is on strategic purchasing companies.

The last two cycles will be analyzed, as well as pro- and anticyclical M&A behavior in Germany. **Figure 1** clarifies the aims of this study.

This article is divided as per the following: in section 2 a characterization of the ideal type of M&A wave and an explanation of the M&A wave theories is undertaken. Building on this, the hypotheses will be formed in section 3. After this theoretical consideration, the methodology and approach to the empirical examination of the hypotheses are presented in section 4. In section 5 the results showing the optimal timing of M&A decisions will be presented. Theoretical implications and concrete recommendations for the optimal timing of future transactions will be derived from these results in section 6.

2. Theoretical Basis: M&As in Temporal Cycles

2.1. M&As as Cyclical Phenomena

The historical development of the M&A market shows that in the past company transactions were subject to significant and plainly systematic variations. This development seems to happen in waves, with regularly alternating periods of high and low M&A activity. As each M&A wave took place in different conditions, each

[1]Check Chapter 2.2 for the most important theories for explaining M&A waves.

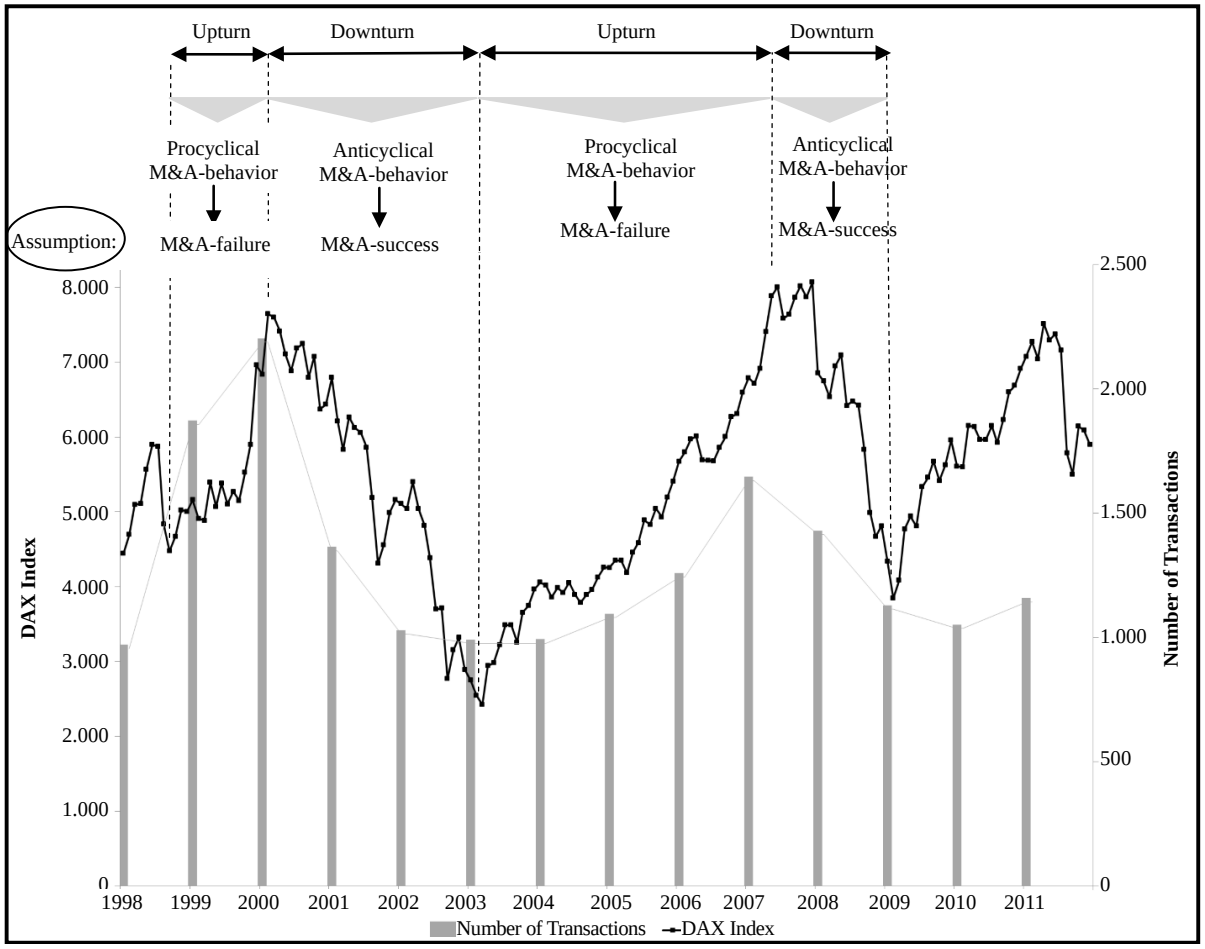

Figure 1. DAX and the number of transactions undertaken by German purchasing companies from 1998 to 2011. Own Graph; Data from Thomsom ONE.

one displays its own individual characteristics and is driven by a different underlying "general management logic"[2] [13].

The typical development of an M&A wave and thus also of a stock market cycle is divided into a low turning point, an upturn phase, a high point and a following downturn phase (**Figure 1**). Each phase of an M&A cycle is indicated by characteristic features and development trends, such as future outlook, liquid assets, and the debt burden on a company level and the share price or the interest on borrowed capital on a macroeconomic level.

An M&A wave can be interpreted as being composed in the following way: during an upturn companies follow an increasingly strong procyclical "herd instinct" [2]. This means that paradoxically, purchase decisions are made at the high point of an M&A wave, which are then value-destroying in the subsequent downturn. This can happen, for example, in order to save bonuses which are tied to annual achievement targets. It is evident that the implications of an M&A decision made during a downturn phase should also be considered in relation to the

[2]For detailed descriptions of M&A waves, see inter alia: Gaughan, Patrick. A. (1996), Mergers, acquisitions, and corporate restructurings, New York. Wirtz, Bernd W. (2003), Mergers & Acquisitions Management—Strategie und Organisation von Unternehmenszusammenschlüssen, Wiesbaden. Kummer, Christoph (2005), Internationale Fusions—und Akquisitionsaktivität—Historische Entwicklung, Verbreitung und strategische Intentionen, Wiesbaden. Hinne, Carsten (2008), Mergers & Acquisitions—Bedeutung und Erfolgsbeitrag unternehmensinterner M&A Dienstleister, Wiesbaden. Jansen, Stephan A. (2008), Mergers & Acquisitions—Unternehmensakquisitionen und—kooperationen—Eine strategische, organisatorische und kapitalmarkttheoretische Einführung, 5th ed., Wiesbaden. Müller-Stewens, Günter (2010), M&A als Wellen-Phänomen: Analyse und Erklärungsansatz, in: Müller-Stewens, Günter/Kunisch, Sven/Binder, Andreas (eds.), Mergers & Acquisitions—Analysen, Trends und Best Practices, Stuttgart, pp. 14-44. Wagner, Steffen (2010), M&A Strategie, in: Schramm, Marianne/Hansmeyer, Ekkehart (eds.), Transaktionen erfolgreich managen—Ein M&A Handbuch für die Praxis, München, pp. 15-29. For an up-to-date assessment: Meckl, Reinhard (2012), Akteure, Marktentwicklung, aktuelle Themen, in: Ballwieser, Wolfgang/Hippe, Alan (eds.), Mergers & Acquisitions: 66. Deutscher Betriebswirtschafter-Tag 2012, Düsseldorf, pp. 1-28.

forthcoming upturn phase, and vice versa [3], which means a complete M&A cycle should be taken into consideration when making an M&A decision. This is particularly crucial when trying to optimize the timing of M&A decisions. As stock market trends are extremely hard to predict an early identification of likely development trends with the help of characteristic indicators is useful (**Figure 2**), so that the current point in the development of the M&A wave can at least be roughly estimated.

		Lowest turning point	Upturn phase	Highest turning point	Downturn phase
From the company's perspective	Future expectations/ Profit outlook	• Positive trend • Increasing	• Positive • High	• Negative trend • Declining	• Negative • Low
	Debt burden	• High	• Declining due to an increasing cashflow (used for debt service) • Increasing due to gearing for transactions	• Constant in comparison to the upturn phase, with a trend towards increasing	• Increasing
	Liquid assets	• Low	• Increasing	• Constant in comparison to the upturn phase, with a tend towards declining	• Declining until low
	Cashflow	• Low	• Positive trend • Increasing	• High • Negative trend	• Declining
	Valuation level	• Low	• Increasing	• High	• Declining
	Purchase price/ Transaction premium	• Low	• Increasing	• High	• Declining
	Capital market/Stock exchange	• Low share prices	• Increasing share prices	• High point of the stock exchange • Declining trend	• Stock market crash • Decreasing share prices
	Economic growth/GDP	• Cyclical trough • trend towards recovery	• Upward tendency • Expansion	• Economic boom • Decreasing tendency	• Economic slowdown • Recession
The macroeconomic perspective	Interest on borrowed capital	• Low	• Increasing	• High	• Decreasing • With a tendency—during the low point as well as during a long-lasting recession—to decrease further
	Risk-free market interest rate	• Low	• Increasing	• High	• Decreasing
	Market risk premium	• Low	• increasing	• High	• Decreasing—under the premise that the return assumptions are negative • increasing because of higher risk premiums caused by the crisis
	Capital liquidity	• Low	• Increasing	• High	• Declining
	Credit conditions	• Cheap	• More restrictive	• Constant in comparison with the upturn period	• Restrictive • With a tendency—during the low point as well as long-lasting recessions —towards improvement

Figure 2. Characteristic features of the composition of an M&A wave. Source: own diagram.

In the literature there are in essence four theories, which aid the understanding of M&A waves[3], these are explained in the following section.

2.2. Theories Describing and Explaining M&A Waves

Neoclassical theory[4] views M&A waves as the results of exogenous shocks, differentiates between the type (e.g. economic, technological or regulatory changes [18]-[21]) and the level of abstraction (industry- versus macro-shocks) [3] [14] [16] [22]-[24]. Real option models [25]-[30], which can also be assigned to neoclassical theories, research M&A behavior on the assumption that there is a learning process and by using game theory concepts[5]. The aim of the real option approach is to identify opportunities for the management in relation to potential future conditions in the business environment and to introduce these possibilities into the equation. What is critical with neoclassical theory's approach is that the fact that M&A waves have a positive correlation with stock markets is disregarded[6]. Neoclassical theory can therefore contribute little to answering the question being examined in this study.

The basic assumption of capital market theory's approach is that transactions or whole M&A waves are triggered due to flawed or over-valuation in the capital market. Capital markets are therefore not assumed to be efficient[7] [14]. The relevant studies here are those by Shleifer/Vishny [7] and Rhodes-Kropf/Viswanathan [33]. Overall these models explain that M&A waves behave procyclically with respect to the stock market, as the managers of overvalued purchasing companies take advantage of the temporary market inefficiency to cheaply acquire undervalued target companies with their own shares[8] [36]. A systematic overestimation of the potential for mergers is apparent due to the lack of information and the uncertainty surrounding the true value of the companies and the possible merger (synergy). This correlation alludes to the "winner's curse" hypothesis, which suggests that purchasing companies often significantly overestimate the worth of a target company during competitive bidding wars [37]-[39]. It is critical to note that according to capital market theory's approach to M&A waves all shares, as well as the purchasing and target companies are overvalued when the share market is booming. Furthermore the assumption that the capital market does not correct this flawed valuation is critical [31].

According to the new institutional economics approach, the market for corporate control[9] in connection with the "principal agent" theory forms the basis[10] [2] [17] [32]. The market for corporate control exerts a correcting function, in the sense that a capital transfer from inefficient to efficient companies is possible and that managers are subject to the efficiency demands of the capital market [16] [40]. First off, it is to criticize that there are only trading markets for companies listed on the stock exchange and secondly that profitable investment, not control rights, is of primary concern when it comes to company takeovers. In addition, the assumption that the market is efficient can be criticized [42].

"Deals are driving deals!"[43]. This headline from the Financial Times illustrates the fundamental ideas of the industrial economics strategy theory's approach to M&A wave theory [1]. This is divided into two parts: industrial economic and strategic explanations. According to the industrial economic approach a transaction between two companies can influence other companies' decisions [15] [16], which in turn can lead to an M&A wave. Therefore M&A waves can be interpreted as the sequential-rational result of a series of M&A decisions. Examples of studies which have researched "herd behavior" in the financial world are those of Scharfstein/Stein, Devenow/Welch and Graham [44]-[46]. The connection between "herd behavior" and M&A waves has been analyzed by Nilssen/Sørgard, Fauli-Ollerand Qui/Zhou [47]-[49]. The Cournot competition model, in which the

[3]For explanations of the M&A wave theories see: [14]-[16].

[4]Neoclassical theory occupies itself primarily with efficient allocation, *i.e*. the rational and efficient handling of scarce capital. For the essential assumptions of neoclassical theory review [17].

[5]So a classification of the real option models using the industrial-economic approach is conceivable on a superficial level. However, real option models show an exogenous change for the catalysts for certain reactions, so the classification in this study is effected using the neoclassical approach.

[6]For a further critical analysis of the neoclassical approach *cf*. [31].

[7]For more details on the forms of information efficiency in the capital market *cf*. [32].

[8]Dong *et al*. and Ang/Cheng demonstrate the procyclical nature of M&A waves in comparison to the stock in their empirical analysis [34] [35].

[9]The M&A theorists Jensen/Ruback define the market for corporate control as follows: "[t]he market for corporate control is best viewed as an arena in which managerial teams compete for the rights to manage corporate resources" [40].

[10]For more details on the principal agent theory *cf*. [17], pp. 103-188; [32], pp. 540-551; [41], pp. 79-82.

Nash equilibrium is the solution for the Cournot game, is the basis for these studies[11] [50]. Considering the success of an M&A transaction during the course of an M&A wave, Bouwman/Fuller/Nain state that "herd behavior" provides an explanation for the failure of procyclical transactions, and as such only the transactions which are completed at the start of an M&A wave are successful, due to the "first-mover" advantage[12] [51] and consequent competition benefits[13] [52].

The strategic approach to the prospective value enhancement logic provides another explanation in the context of industrial-economic strategic theory. The underlying assumption is that M&A waves always develop when a new management logic concerning the increase in a company's value is established, which increasingly begins to influence the mental attitudes of the stakeholders. Examples of this are diversification, shareholder value orientation and the advantages of market dominance in the form of economies of scale and a focus on core capabilities[14]. **Figure 3** gives an overview of the aforementioned approaches of the M&A theories.

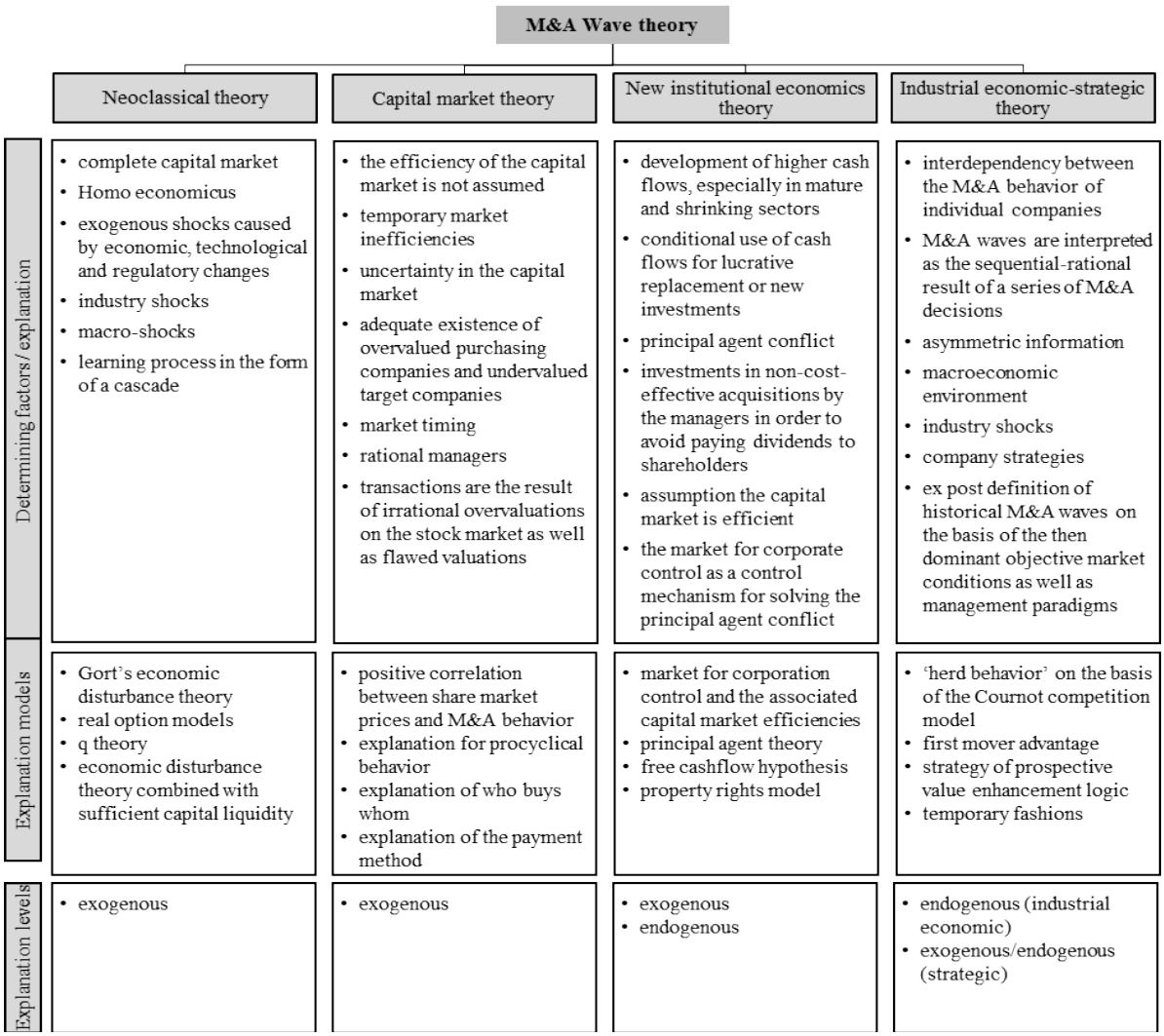

Figure 3. Overview of the different theoretical approaches to M&A Wave theory**.** Source: own diagram.

[11]*Cf.* for more details [50]. In game theory the combination of interchangeable optimal strategies is characterized the Nash equilibrium. *Cf.* [17], p. 72.

[12]The literature on the first mover advantage refers to the concept of asymmetrical information. For more details on the first mover advantage *cf.* [51].

[13]Consistent with the result of Bouwman/Fuller/Nain, the studies from Carow/Heron/Saxton (*cf.* 2004, pp. 569-579), Harford (*cf.* 2005, pp. 552-555), McNamara/Haleblian/Dykes (*cf.* 2008, pp. 119-124), Gebken (*cf.* 2009, pp. 74-75) and BCG (*cf.* 2011, p. 19) , also determined that transactions which are carried out at the start of an M&A wave are more successful than those which are carried out in a later phase.

[14]For the theory on prospective value enhancement logic *cf.* [3], pp. 37-38.

3. Hypotheses

In the following section hypotheses which answer the fundamental questions in this field of research will be formulated and the theoretical context will be specified, based on the aforementioned theories. The fact that M&A activity has a positive correlation with stock markets has been proved by many empirical studies [6] [7] [20] [25] [28] [33]-[35] [53]-[60]. M&A behavior is a procyclical phenomenon, in relation to the state of the stock markets and the economy [2] [3], *i.e.* M&A activity increases when there is an economic upturn and share prices are increasing, and falls during an economic downturn. The fact the M&A waves end with an economic shock, for example a recession or a stock market crash also supports the hypothesis that there is a positive correlation between increasing share prices and M&A activity.

The following arguments can be named as possible theoretical explanations for the positive correlation between the share index and M&A activity.

3.1. Hypothesis 1: The Correlation between the Share Index and M&A Activity

Characteristic traits which accompany an increase in the stock market[15] have a positive effect on M&A activity. Expectations regarding the future (cyclical) development are positive, companies' liquidity and cash flows increase, potential future increases in value are assumed and attempts to realize them occur. Interest rates are still low at the start of an M&A wave or a stock boom, credit is loaned at favorable rates and there are many opportunities for securing finance [2]. From the viewpoint of capital market theory the surplus liquidity, as long as it is not distributed as a dividend, can be invested, for example in M&A transactions.

In reality, however, it cannot be assumed that the capital market is efficient, as companies are often falsely or overvalued on the stock market, especially when share prices are rising. Managers of the purchasing companies attempt to use their overvalued shares as a currency for carrying out M&As. The relative overvaluation of the purchasing company in comparison to the target company is therefore what drives M&As [36]. Within the framework of capital market theory it is assumed that managers behave rationally, although M&A transactions are the result of irrational overvaluations on the stock market. Likewise, managers of target companies tend to overestimate potential synergies in a transaction as a consequence of the general overheating of the stock market, due to uncertainty about the true value of the takeover premium [33].

As the first transactions are completed at the beginning of a rise in share prices, copycat behavior in the form of a herd instinct begins to set in [2]. According to the industrial-economic approach the increasing level of M&A activity can be interpreted as the sequential-rational result of a series of M&A decisions[16]. The theoretical "real-option" model also proves the procyclical nature of M&A behavior using game theory concepts[17]. This theoretically plausible correlation needs to be proved, which is why the following hypothesis has been formulated:

Hypothesis 1: *The higher the value of the DAX, the more M&A activity by German purchasing companies there is.*

A summary of the theoretical background of hypothesis 1 is provided by **Figure 4**.

3.2. Hypothesis 2: The Dependence of M&A Success on the Level of Market Valuation

Anticyclical transactions are more successful in the long term than procyclical transactions. Various theories support this. The influence of the capital market[18] [52] [61]-[64] and economic cycles[19] [62] [65]-[69] on the success of M&A can be explained by the interdependency between the buying price and the value of the company [62]. In downturn or recession phases expectations regarding the future development of the cash flow are negative. As this form the foundation for the valuation of the company the buying price is lower in a downturn, meaning the transaction is cheaper overall, which can have a positive effect on the success of the M&A.

Furthermore, the expectations of the purchasing and target companies regarding any future developments differ in light of the information hypothesis. At the heart of the information theory is the question concerning the efficiency of the capital market? However, because of asymmetries in the data available, information theory

[15]See **Figure 2**.
[16]See section 2.2.
[17]See section 2.2.
[18]The situation in the capital market is measured by the share prices on the stock exchange.
[19]The economic cycles are predominantly put into operation by studies using actual GDP.

Determinants	Interdependency	Theoretical background
DAX and M&A activity	+	Exogenous and endogenous determining factors: • Positive expectations for the future • Increasing cash flows • High liquidity • Favorable credit terms Capital market theory's approach: • Inefficient capital market • Assumption that managers behave rationally • Relative overvaluation of the purchasing companies • Overvaluation of synergies Industrial economic-strategic approach: • "Herd behavior" • M&A activity is the sequential-rational result of a series of M&A decisions • Assumption of future possibilities for value enhancement Neoclassical approach: • Real option model • Game theory

Figure 4. Hypothesis 1 and its theoretical background. Source: own diagram.

assumes that undervaluations exist, and that consequently purchasing companies could take advantage of them in order to generate more value for their shareholders [70]. This manner of generating value using asymmetries in the data is described as transfer or arbitrage profit [71]. In this case, the takeover premium paid by the purchasing company is not only based on the anticipation of potential synergies, but rather represents an arbitrage profit between the valuation in the inefficient capital market and the higher internal valuation (owing to additional information relevant to valuation) of the target company [70] [72] [73]. Additionally, the information theory can be applied on the grounds that, in light of the existence of M&A waves in an economic downturn, purchasing companies can acquire potential target companies "on the cheap"—in terms of low share prices—in the knowledge, that share markets will rise in the following upturn.

The assumption that a transaction cannot be "afforded" is particularly dominant in economic downturns. As the economic situation worsens, managers become more risk averse and focus their attention on a more short term time span. The aim is rather to increase short term profits, reduce costs or enhance current assets after tax [74]. The willingness of potential target companies to go through a transaction persists during an economic downturn, due to the pressure they are under to act against competitors. It can even be higher due to any possible financial difficulties. It is significantly more difficult to carry out restructuring programs in upturn phases than in downturn phases [75]. The need to trade, to implement potential synergies and to outperform rivals is familiar to all transaction participants during a downturn, and as such companies are more willing to accept any potential cuts.

Though recession phases are usually shaped by limited possibilities for accessing finance because of restricted credit lending by banks [76], low rates of interest on borrowed capital predominate in downturn periods until the trough, which, from a buyer's perspective, supports a possible higher level of borrowing. If the enhanced borrowing position leads to an optimum debt to equity ratio and consequently to lower capital costs, the leverage hypothesis[20] can be posited as a motivation for anticyclical M&A behavior.

In boom phases the shares of both the purchasing and the target companies tend to be overvalued, which leads to higher purchase prices being paid. Because of existing information asymmetries the purchase price is usually paid with the company's own shares, which sends a signal to the capital market[21]. The desire to use overvalued shares as a cheap currency for transactions can push the search for synergies and due diligence into the background. The "herd behavior" observed during rising stock markets with respect to M&A transactions promotes this development. Unprofitable acquisitions are the result of this. In times when finance is limited, far more care is taken. 'Herd behavior' means that successful transactions at the beginning of an M&A wave will be followed

[20]For further information on the leverage effect *cf.* [32], pp. 496-500; Coenenberg, Adolf G./Fischer, Thomas M/Günther, Thomas (2009), Kostenrechnung und Kostenanalyse, 7th ed., Stuttgart, pp. 776-777; Glaum, Martin/Hutzenschreuter, Thomas (2010), Mergers & Acquisitions—Management des externen Unternehmenswachstums, Stuttgart, pp. 227-229.

[21]Myers/Mayluf's "signalling hypothesis" assumes that during cases in which information asymmetries between the management and the capital market are evident, purchasing companies use their own shares as a payment method during M&As, as they act on the assumption that their own shares are overvalued. *Cf.* [77].

by fewer successful transactions carried out by companies imitating the trend and acting procyclically[22].

A further advantage of anticyclical transactions, considered against the background of the "winner's curse" hypothesis, is the reduced competition for the target companies, which enhances the bargaining power of the purchasing companies in relation to the pricing, which leads to a lower purchase price.

Building on these explanations, the following hypothesis can be formulated:

Hypothesis 2: *Transactions which are carried out during a downturn phase in the DAX stock exchange* (*anti-cyclical transactions*) *are more successful in the long term than transactions which are undertaken during an upturn phase up until the DAX's highest point* (*procyclical transactions*).

Figure 5 provides a summary of the theoretical background for hypothesis 2.

The aforementioned reflections regarding the advantageousness of anticyclical transactions concur with the question of whether differences between pro- and anticyclical transactions exist in relation to situational factors.

3.3. Hypothesis 3: Differences between Pro- and Anticyclical M&As

In relation to company transactions, there is a hypothesis which states that transactions undertaken by purchasing companies with a high market to book ratio (M/B ratio), *i.e.* so-called "glamour acquirers", are less successful than those carried out by companies with low M/B ratios (so-called "value acquirers")[23]. If a purchasing company has an M/B ratio greater than 1, this indicates that it has been overvalued, which is most likely to be the case in upturn phases, when share prices are high. Overvalued companies tend to invest their surplus liquid assets in unsuccessful transactions, as per the free cash flow hypothesis and the principal-agent problem. The expanded scope for managerial discretion which is a consequence of higher market capitalization also leads to value-destroying transactions. In contrast, value acquirers are not usually affected by hubris[24] and are held by their shareholders to a higher level of prudence and a more exacting due diligence procedure regarding potential acquisitions. Additionally, in light of the lower share prices during a downturn phase the transactions of value acquirers must be more successful than those of the glamour acquirers. Building on these explanations, the following hypothesis can be formulated.

3.3.1. Market to Book Value Ratio

In relation to company transactions, there is a hypothesis which states that transactions undertaken by purchasing companies with a high market to book ratio (M/B ratio), *i.e.* so-called "glamour acquirers", are less successful

Determinants	Interdependency	Theoretical background	
		Advantages of anticyclical behavior	Disadvantages of procyclical behavior
DAX and M&A success	-	• Lower absolute purchase price • Information hypothesis • Low interest on borrowed capital → leverage hypothesis • First mover advantage • Purchasing companies have more bargaining power in relation to the transaction premium because of the lower level of bidding competition → "winner's curse" hypothesis • More pressure on target companies to act because of competition or financial difficulties • Detailed due diligence	• Higher absolute purchase price • "Herd behavior" • Inflated transactions premiums because of higher demand for target companies • Greater use of shares as a transaction currency because of information asymmetries (signaling effect) → information hypothesis • A lack of due diligence

Figure 5. Hypothesis 2 and its theoretical background. Source: own diagram.

[22]See Section 2.2

[23]Tobin's q is synonymous with the market to book value ratio. Forinformation on Tobin's q-theory *cf.* Servatius, Wolfgang (2008), Gläubigereinfluss durch Covenants—Hybride Finanzierungsinstrumente im Spannungsfeld von Fremd-und Eigenfinanzierung, München. Jovanovic, Boyan/Braguinsky, Serguey (2004), Bidder discounts and target premia in takeovers, in: The American Economic Review, Vol. 94, pp. 46-56. Lang, Larry H.P./Stulz, René M. (1994), Tobin's q, corporate diversification, and firm performance, in: The Journal of Political Economy, Vol. 102, pp. 1248-1280. Jovanovic, Boyan/Rousseau, Peter L. (2001), Mergers and technological change: 1885-1998, Working Paper No. 01-W16, URL: http://www.econ.nyu.edu/user/jovanovi/merge23a.pdf, Creation date: 15.05.2001, Retrieval date: 01.03. 2010. Jovanovic, Boyan/Rousseau, Peter L. (2002), The q-theory of mergers, in: The American Economic Review, Vol. 92, pp. 198-204.

[24]For information on the hubris hypothesis *cf.* Roll, Richard (1986), The hubris hypothesis of corporate takeovers, in: The Journal of Business, Vol. 59, pp. 197-216.

than those carried out by companies with low M/B ratios (so-called "value acquirers"). If a purchasing company has an M/B ratio greater than 1, this indicates that it has been overvalued, which is most likely to be the case in upturn phases, when share prices are high. Overvalued companies tend to invest their surplus liquid assets in unsuccessful transactions, as per the free cash flow hypothesis [78] and the principal-agent problem [17] [40] [41]. The expanded scope for managerial discretion which is a consequence of higher market capitalization also leads to value-destroying transactions. In contrast, value acquirers are not usually affected by hubris and are held by their shareholders to a higher level of prudence and a more exacting due diligence procedure regarding potential acquisitions. Additionally, in light of the lower share prices during a downturn phase the transactions of value acquirers must be more successful than those of the glamour acquirers. Building on these explanations, the following hypothesis can be formulated:

Hypothesis 3.1: *Purchasing companies which act anticyclically have a lower M/B ratio than procyclically acting purchasing companies.*

3.3.2. Net Debt to EBITDA Ratio

The ratio of net debt to EBITDA indicates how many years a company would need to pay off its debts with the help of the EBITDA, with the assumption that the EBITDA could be used entirely to repay debts. As the ratio is part of the financial covenant, it is principally applied in the area of acquisition finance [79]. If you consider the two components (net debt and EBITDA), both low net debt, which either originates from a low level of debt per se or a high level of liquid assets, and a high EBITDA are advantageous for an acquisition. A low level of net debt increases the room for maneuver during potential transactions. As a "herd instinct" establishes itself during upturn phases in relation to M&A transactions, debts also increase due to facilitated leverage for transactions. Additionally, a low net debt to EBITDA ratio increases the possibility of getting a loan to finance potential transactions. As there is a particular scarcity of credit-lending in downturn phases due to procyclical behavior by the banks a low net debt to EBITDA ratio is beneficial for purchasing companies behaving anticyclically. From this the following hypothesis can be created:

Hypothesis 3.2: *Purchasing companies which behave anticyclically have lower net debt to EBITDA ratios than purchasing companies which behave procyclically.*

3.3.3. The Relative Size of the Target Company

The relative size of the target company in comparison to its purchasing company is directly related to the purchase price. Normally, the smaller the target company (measured for example by turnover), the lower the absolute purchasing price. As there is a shortage of liquid assets and possibilities for leverage during downturn phases in particular, it is easier to finance the takeover of smaller target companies [80]. In addition it can be argued that relatively large purchasing companies possess the necessary prerequisites for an acquisition, such as potential for securing finance, the necessary management resources or even experience with acquisitions. From the perspective of the target companies, smaller companies run the risk of becoming takeover objects, particularly during a downturn phase, as the pressure to act against rivals' increases. Building on this, the following hypothesis can be formulated:

Hypothesis 3.3: *Significantly smaller target companies are bought during anticyclical transactions than during procyclical transactions.*

3.3.4. Premium Size

Although superficially it appears that a low premium in the purchase price can have a positive effect on the success of an M&A, it has been shown empirically that transactions with higher premiums can also be successful [81]. For example, a relatively high takeover premium can be justified by the potential for individual synergies. In relation to optimizing the timing of M&As, causal connections, which postulate high and low premiums during M&A transactions, appear plausible.

A possible explanation is provided by the debt monitoring hypothesis[25], in which managers under less super-

[25]Therefore a higher level of indebtedness has a positive influence on the success of an M&A. In their theoretical analyses Jensen/Meckling (*cf.* 1976), Jensen (*cf.* [78]; 1989) and Harris/Raviv (*cf.* 1990), come to the conclusion that debts decrease the level of agency conflict between shareholders and managers. Jensen, Michael C./Meckling, William H. (1976), Theory of the firm: managerial behavior, agency costs and ownership structure, in: Journal of Financial Economics, Vol. 3, pp. 305-360. Jensen, Michael C. (1989), The eclipse of the public corporation, in: Harvard Business Review, Heft Sept-Oct. 1989, pp. 61-74. Harris, Milton/Raviv, Artur (1990), Capital structure and the informational role of debt, in: The Journal of Finance, Vol. 45, pp. 321-349.

vision tend to pay higher premiums—something which is more evident in procyclical transactions—while more highly-controlled companies pay lower premiums, especially during downturn phases. Against the background of the hubris and performance extrapolation hypotheses[26] glamour acquirers pay higher premiums in boom phases than value acquirers in downturn phases. Lower premiums during anticyclical transactions are also sustained by the lower level of competition from other bidders, which allows for lower transaction prices in comparison to procyclical transactions in which multiple purchasing companies compete to buy scarcely available target companies[27].

On the other hand, concentrating on potential synergies and strategic fit as well as a thorough examination of the target company can lead to the payment of higher premium during anticyclical transactions. Based on the results from Walkling/Edmister [83] andVaraiya [84], who found a positive correlation between the undervaluation of target companies and the size of takeover premium, it can be argued that anticyclical purchasers anticipate the undervaluation of target companies during phases when the market value is low and therefore pay higher premiums.

As a premium reflects the subjective estimation of the actual worth of a target company by its purchaser and therefore does not give the "right" (*i.e.* "objective") worth of the company, no clear theoretical causal effects can be derived in correlation with the optimization of M&A decisions. From this background comes the following hypothesis:

Hypothesis 3.4: *With respect to the size of premium paid there is no difference between procyclical and anticyclical transactions.*

3.3.5. The Strategic Direction of Acquisitions

The strategic direction of acquisitions, which includes horizontal, vertical and conglomerate transactions[28] [85], is derived from the goals and motives of a company as well as its strategy. As the motivation of achieving synergy [70] [86] has a special significance with respect to M&As, it can be assumed that the attainment of economies of scale and scope comes to the fore in anticyclical transactions, which ultimately also applies to related transactions. The knowledge and information a purchasing company possesses about related fields of activity is far higher than that of an unrelated company, so that any valuation of the potential target company can be well-substantiated. Additionally, a company is more aware of the level of risk in related fields [87] and can therefore manage it more efficiently. It is also conceivable, for example, that suppliers will struggle to survive in downturn phases due to the general lack of demand and their critical size, and will consequently be bought out as purchasing companies have an interest in retaining their suppliers, which results in a related (vertical) transaction.

On the other hand, conglomerate acquisition strategies can be predominantly ascribed to the management's personal motives[29] [62], which means that procyclical transaction are more likely to be carried out in unrelated fields. Thus the following hypothesis can be formulated:

Hypothesis 3.5: *The proportion of related*(*-party*) *transactions is significantly higher among anticyclical transacttions than among procyclical transactions.*

4. Methodology and Approach to the Empirical Verification of the Hypotheses

4.1. The Methodological Basis

The empirical analysis can be divided into three stages of analysis which are analogous to the hypotheses established in section 3. A correlation analysis [88] [89] can be used to assess the dependency of M&A activity on the level of the DAX. The assessment of whether anticyclical transactions are more successful in the long term than procyclical ones can be divided into two phases. Firstly it is necessary to break down the DAX into different market value levels[30]. Secondly success will be measured based on annual financial statements and using differ-

[26]If the M/B ratio is interpreted as an indicator of management performance it can be posited that when gauging the advantages of a potential transaction the market extrapolates the previous performance of the purchasing company's management too much ("performance-extrapolation hypothesis"). *Cf.* [82].

[27]The so-called "winner's curse" hypothesis; *cf.* also section 3.2.

[28]Horizontal and vertical mergers are subsumed by related mergers in due course.

[29]The background to this is that managers prefer to minimize the risk to their own employment by favoring diversifying mergers. *Cf.* [62], p. 252.

[30]The methodology for this is explained in section 4.2.

ent key performance indicators. Success will be measured from the purchasing companies' perspective. Using an intertemporal comparison the mean value of the performance indicators from the purchasing companies from three years before the transaction to three years after will be compared[31] [86] [90]-[93]. A comparison with a control group will be carried out alongside the intertemporalcomparison.[32]

The difference between pro- and anticyclical transaction can be analyzed with interval-scaled variables such as M/B ratios, net debt to EBITDA ratios and the relative size of a company as well as the size of the premium, deviation/differential tests and a comparison of mean values [94] [95]. Contingency analyzes [89] [94] [95] were carried out for nominally scaled variables such as the strategic direction of acquisitions. The M/B and net debt to EBITDA ratios were analyzed for the year before the transaction was announced as well as the year of the announcement. In order to measure the relative size of the target company to the purchasing company the target company's turnover from the year before the announcement of the transaction was divided by that of the purchasing company from the same year. The size of the premium was calculated by finding the difference between the offered price and the target company's share price one day or one month before the disclosure of the transaction. The measurement of the strategic direction of the acquisition was carried out using the SIC code[33]. The empirical analysis differentiated between related and unrelated acquisitions. Transactions were classified as related if they matched according to two points of the SIC code.

The data used comes from the database Thomson ONE and Datastream.

4.2. The Selection and Structure of the Sample Being Analyzed

With the aim of analyzing the optimal timing of M&A transactions in German purchasing companies the criteria for inclusion in the sample have been defined in **Figure 6**[34].

Overall the investigation rests on a sample of 78 transactions.

4.3. Selection and Classification of the Period of Analysis

The basis for classifying the various market valuation phases is the development of the DAX (**Figure 1**). The DAX will be classified into an absolute low point, an upturn phase, an absolute high point and a downturn phase, in a way analogous to the classification of an M&A wave[35]. Consequently, the period will be examined

No.	Selection criterion	In operation	Sample size
1	Geographical restrictions	German purchasing companies (acquirer nation)	32,923
2	Temporal restrictions	Transactions between 28.09.1998 and 02.03.2009	14,544
3	Corporate structure	Purchasing companies must be listed on the stock exchange (acquirer public status: acquirer)	4226
4	Sector restrictions	Purchasing companies from all sectors apart from the financial, real estate, government and public authority sectors	3212
5	Investment restrictions	100% transactions (percentage of shares acquired in/after transactions)	1605
6	Transaction status	Concluded transactions (deal status: completed)	
7	Disclosure of the transaction price	The transaction price must have been published (deal type: disclosed value M&A)	320
8	Transaction price/Volume	Transaction price must amount to at least 100mn US $	115
9	Existence of the purchaser/Availability of the data	Purchasing companies must have existed at least up to 2011, otherwise it is not possible to retrieve their data from Thomson ONE	88
10	Isolation of the event	If a purchasing company carried out more than one transaction in a year, the smaller transactions (measured by the transaction price) are excluded	78

Figure 6. Selection of the sample. Source: own diagram.

[31]The majority of the integration measures should have been completed within these three years.

[32]To adjust the performance trend for influencing factors on a certain sector, this analysis uses Thomson ONE's comparables' function. For each purchasing company a control group made up of ten international companies listed on stock exchanges was created.

[33]The SIC (standard industrial classification) code is a classification system for different sectors.

[34]The descriptions taken from Thomson ONE are in brackets.

[35]For an analysis of the DAX cycle during the period from 1988 to 1995 *cf.* [96], pp. 49-52. For stock market cycles in general *cf.* [97], pp. 207-212.

in this study spans from 28th September 1998 to 2nd March 2009. The starting point for this decision was the end of the observation period, which shows the absolute low point (trough) of the DAX. A measurement of the M&A's success lasting three years after the transaction will be carried out. Looking retrospectively from the absolute low point (or high point) the absolute high point (or low point) is determined within a window of two years (and vice versa)[36]. In addition, a reversal of the economic trend lasting at least a year must take place after the absolute high point (low point) and the difference between the absolute high and low points of the index must be at least 50%. The reason for this is so that small fluctuations in the value of the DAX are not interpreted as upturn or downturn phases while long-lasting developments can be charted. The extreme values (the high and low points) must therefore be easily definable (see **Table 1**). According to the selection criteria the following classification of the particular phases[37] with their specific characteristics has been created:

The classification of the sample being analyzed into the particular market valuation phases is based on the announcement date. For the empirical analysis the first and second upturn phases are consolidated into one upturn phase as the first and second downturn phases are consolidated into one downturn phase. The classification of the study sample found 44 procyclical transactions and 34 anticyclical ones. The closing date[38] was used for measuring success.

5. The Results of the Empirical Test of the Hypotheses

5.1. The Results for Hypothesis 1

In order to put the development of the DAX and German purchasing companies' M&A activity into operation the monthly position of the DAX index and the proportion of completed transactions carried out by German purchasing companies in every sector[39] during the period from September 1998 to March 2009 were used. The calculated coefficient of the level of correlation, following Spearman, amounted to 0.685 and is significant on the 1% level (one-sided test)[40]. To supplement the monthly figures the yearly values for the DAX and the number of transactions undertaken by German purchasing companies were determined. This resulted in a Spearman coefficient of the level of correlation of 0.706, which is also significant on the 1% level (single-sided test).

In relation to the condition of the DAX M&A behavior is a procyclical phenomenon. Hypothesis 1 can therefore be confirmed.

Table 1. The classification of the investigation period into its different phases.

Phases	Index level		Difference of level		Date		Duration (years)
	Low point	High point	Absolute	In %	Low point	High point	
1.Upturn phase	3.963	7.976	4.013	101%	28.09.1998	06.03.2000	1.44
1. Downturn phase	2.403	7.976	−5.573	−70%	10.03.2003	07.03.2000	3.01
2.Upturn phase	2.403	8.093	5.690	237%	11.03.2003	09.07.2007	4.33
2. Downturn phase	3.666	8.093	−4.426	−55%	02.03.2009	10.07.2007	1.65

Dot = start point of each particular phase

[36]In their analysis Carow/Heron/Saxton come to the conclusion that the period between the high and low points of most M&A waves lasts about three years, so a complete M&A wave comprises about six years. *Cf.* [98], pp. 572-573. However, McNamara/Haleblian/Dykes limit the duration of an M&A wave to four to five years. *Cf.* [99], p. 119.

[37]The starting points of the first and second downturn phases as well as of the second upturn phase were chosen to be one day after the high or low point.

[38]If there is a long period between the announcement of a transaction and its effective implementation, a situation may result in which a transaction was announced during a boom phase but was implemented in the following downturn, and vice versa (in terms of this sample it concerns seven transactions). However, as the measurement of success is based on information taken yearly from financial statements there was only one transaction which had a difference between the year of its announcement and the year of its implementation—in this case the announcement date was 24th June 2007 and the closing date was 15th April 2008.

[39]Including the financial, real estate, government and public authority sectors, which were not included in the empirical analysis of hypotheses 2 and 3.

[40]Thanks to the theoretical background used for the creation of hypothesis 1, information was already available regarding a potentially positive correlation between the DAX and M&A activity, so a single-sided test was used. For the difference between single- and double-sided tests *cf.* [88], pp. 524-525.

5.2. The Results for Hypothesis 2

The analysis of the success of M&As depending on the level of market valuation can be determined using seven different performance indicators: the return on equity (ROE), the return on assets (ROA), EBITDA/total assets (TA), EBITDA/turnover, (EBITDA-Δ net working capital (NWC))/TA, (EBITDA-ΔNWC)/turnover and net debt/EBITDA. The procedure takes place in three steps. Initially the individual performance indicators from the purchasing companies for all the M&A transactions, and subsequently those for pro- and anticyclical M&As, are shown. Within these three categories the performance indicators from the purchasers as well as the control group are analyzed within a period from three years before the transaction to three years after it. The mean difference of each respective indicator between the purchasing and control groups gives the adjusted performance indicator.

For the "before and after" comparison the mean value of the performance indicator was determined for each of the three years before (performance indicator "before") and for each of the three years after the transaction (performance indicator "after"). The mean difference between the performance indicators before and after the transaction exhibited a positive indication if the average performance after the transaction had improved in comparison to before it. Only with the indicator net debt/EBITDA can a positive indication be interpreted as deterioration in performance.

The difference in the value enhancement between pro- and anticyclical M&As is particularly interesting, where the comparison of the mean values was accomplished using the adjusted performance indicators as a basis. A negative indicator implies that anticyclical transactions are more successful in relation to the relevant performance indicator than procyclical transactions, and vice versa. The indicator net debt/EBITDA is again an exception, as a positive figure indicates that anticyclical M&As are more successful than procyclical M&As, and vice versa.

The results of the analysis are summarized in **Figure 7**:

Companies which carried out anticyclical transactions exhibited on average a worse performance before the transaction than companies who made their purchases procyclically, according to the figures for ROE, ROA, EBITDA/total sales, (EBITDA-ΔNWC)/total sales and (EBITDA-ΔNWC)/turnover. To that effect, this result can be interpreted as showing that anticyclical M&As are not conducted because of higher profitability, but rather are seen as opportunities for increasing profitability in the long-term. Purchasing companies who carried out anticyclical M&As were only better off before the transaction in relation to the indicators EBITDA/turnover (adjusted) and net debt/EBITDA (adjusted) in comparison to those who acted procyclically. The negative difference of the EBITDA/turnover (adjusted) figure can essentially be traced back to the high EBITDA/turnover ratio amongst the procyclical control group and the lower EBITDA/turnover ratio amongst the anticyclical control group before the transaction. The low net debt/EBITDA ratio evident before the acquisition in anticyclically acting purchasing companies is a sign of anticyclical purchasers' high level of solvency and helps bring a transaction to completion, especially in financially difficult situations with low levels of credit-lending.

The fact that all the performance indicators (with the exception of the indicator net debt/EBITDA) for the anticyclical purchasing companies were on average worse in comparison to the control group before the transaction, but improved during "before and after" comparison, also supports the conclusion, that anticyclical M&A behavior has a positive effect on the success of purchasing companies. In contrast to this, all indicators for the procyclical M&As (with the exception of the indicator (EBITDA-ΔNWC)/turnover, which exhibited a slight and insignificant improvement (p-value: 0.99)) showed a deterioration during the "before and after" comparison. Consequently it can be concluded that anticyclical M&As are more value-creating and more successful in the long term in comparison to procyclical M&As.

In the difference test for the "before and after" comparison negative differences between pro- and anticyclical M&As could be observed in practically all of the adjusted performance indicators. The only exception is the indicator net debt/EBITDA, which is positive; however, this shows an improvement in the ratio of net debt to EBITDA. Even when the differences for each particular indicator are not universally significant, the results show that anticyclical transactions are more successful in the long term than procyclical transactions. Hypothesis 2 can therefore be proved.

5.3. The Results for Hypothesis 3

If the results do not disprove the hypotheses established in section 3.3, the theoretical reasons for each hypothesis

	All M&A						procyclical M&A						anticyclical M&A						Difference (pro − anticycl. M&A)	
	Buyer		control group		difference		Buyer		control group		difference		Buyer		control group		difference			
	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p	AM (in %)	p
ROE																				
before (AM −3 bis −1)	10.44		12.77		−2.33	0.23	12.45		12.74		−0.29	0.77	7.84		12.81		−4.97	0.17	4.69	0.33
after (AM 1 bis 3)	9.09		11.08		−1.99	0.49	10.60		11.58		−0.98	0.89	7.14		10.44		−3.30	0.38	2.32	0.37
difference	−1.35	0.54	−1.69	0.14	0.34	0.62	−1.85	0.67	−1.16	0.68	−0.69	0.94	−0.70	0.67	−2.37	0.14	1.67	0.54	−2.36	
% positive	51%		44%		46%		52%		50%		50%		50%		35%		41%			
ROA																				
before (AM −3 bis −1)	4.31		4.91		−0.59	0.21	4.98		5.09		−0.12	0.45	3.46		4.67		−1.21	0.29	1.09	0.76
after (AM 1 bis 3)	3.35		4.07		−0.71	0.18	4.01		4.56		−0.55	0.47	2.51		3.43		−0.93	0.18	0.38	0.52
difference	−0.96*	0.07	−0.84**	0.01	−0.12	0.53	−0.96	0.14	−0.53	0.19	−0.43	0.42	−0.95	0.27	−1.23**	0.02	0.28	0.99	−0.71	
% positive	46%		31%		46%		45%		34%		43%		47%		26%		50%			
EBITDA/total assets																				
before (AM −3 bis −1)	12.29		12.09		0.20	0.70	13.07		12.56		0.51	0.85	11.28		11.48		−0.20	0.75	0.71	0.64
after (AM 1 bis 3)	11.77		11.83		−0.07	0.19	11.53		12.44		−0.90	0.21	12.06		11.05		1.01	0.57	−1.91	0.38
difference	−0.52*	0.09	−0.25	0.40	−0.27	0.22	−1.54**	0.02	−0.12	0.79	−1.41**	0.02	0.79	0.99	−0.43	0.40	1.21	0.59	−2.63	
% positive	47%		41%		49%		41%		43%		41%		56%		38%		59%			
EBITDA/turnover																				
before (AM −3 bis −1)	12.91		13.62		−0.71	0.24	14.18		15.36		−1.18	0.53	11.28		11.36		−0.09	0.29	−1.09	0.78
after (AM 1 bis 3)	14.43		15.82		−1.39	0.31	14.09		16.75		−2.65	0.18	14.86		14.63		0.23	0.91	−2.84	0.30
difference	1.52	0.50	2.21**	0.02	−0.69	0.48	−0.08	0.94	1.39**	0.04	−1.47	0.13	3.59	0.33	3.27	0.28	0.32	0.56	−1.75	
% positive	62%		64%		46%		59%		66%		39%		65%		62%		56%			
(EBITDA-ΔNWC)/total assets																				
before (AM −3 bis −1)	13.00		14.08		−1.08	0.18	13.39		14.16		−0.76	0.28	12.49		13.97		−1.48	0.40	0.73	0.93
after (AM 1 bis 3)	12.46		12.94		−0.48	0.18	12.28		13.40		−1.13	0.35	12.70		12.34		0.35	0.34	−1.48	0.72
difference	−0.54*	0.10	−1.14**	0.03	0.60	0.95	−1.12	0.12	−0.76	0.12	−0.36	0.61	0.21	0.47	−1.63*	0.10	1.84	0.54	−2.21	
% positive	46%		41%		53%		41%		45%		50%		53%		35%		56%			
(EBITDA-ΔNWC)/turnover																				
before (AM −3 bis −1)	13.83		16.60		−2.77**	0.02	14.55		17.17		−2.62*	0.06	12.91		15.87		−2.97*	0.10	0.36	0.82
after (AM 1 bis 3)	15.43		17.40		−1.96	0.20	15.20		17.59		−2.38	0.28	15.73		17.15		−1.42	0.46	−0.97	0.58
difference	1.60	0.53	0.79	0.89	0.81	0.73	0.65	0.58	0.42	0.83	0.23	0.99	2.83	0.81	1.28	0.97	1.55	0.68	−1.33	
% positive	51%		49%		54%		50%		48%		57%		53%		50%		50%			
net debt/EBITDA																				
before (AM −3 bis −1)	0.69		2.21		−1.51***	0.00	0.92		2.05		−1.14**	0.03	0.40		2.41		−2.01***	0.01	0.87	0.45
after (AM 1 bis 3)	1.72		2.05		−0.27	0.64	2.02		1.79		0.34	0.47	1.34		2.40		−1.06	0.14	1.41***	0.00
difference	1.03***	0.00	−0.15	0.35	1.24***	0.00	1.10***	0.00	−0.27	0.13	1.48***	0.00	0.94**	0.02	−0.01	0.85	0.94*	0.08	0.54	
% positive	74%		45%		73%		82%		41%		80%		65%		50%		65%			

AM = arithmetic mean; p = probability/significance level

p-values resulting from an Mann-Whitney-U-test and the Wilcoxon-test on a significance level of 1% level are marked with ***, on a 5% level ** and on a 10% level with *.

Figure 7. ROE, ROA, EBITDA/TA, EBITDA/turnover, (EBITDA-ΔNWC)/TA, (EBITDA-ΔNWC)/ turnover and net debt/ EBITDA dependent on the level of market valuation.

will not be discussed in the course of the next section, but it will refer back to the explanations in section 3.3. If the results do refute the hypotheses, potential explanations will be presented in due course. **Table 2** shows an overview of the results.

Contrary to expectations the analysis regarding the M/B ratios shows that during the year in which the transaction was announced, anticyclical purchasers exhibited a significantly higher M/B ratio than procyclical purchasing companies. As a result hypothesis 3.1 cannot be confirmed[41].

A possible reason for this result could be that the level of market valuation was still high one year before the announcement of the anticyclical M&A transaction and therefore the purchasing companies still showed a high market capitalization. However, the analysis shows that anticyclical purchasing companies also have a higher M/B ratio than procyclical purchasers in the year that the transaction is announced. This result gives rise to the conjecture that the expectations of the capital market regarding anticyclical purchasing companies' future profits are positive, which is particularly reflected in their high share prices. In this context the M/B ratio can be seen as more of an indicator of the managers' performance and is therefore a good pointer for the future development of a company, especially regarding acquisitions. It can therefore be stated, that companies with high M/B ratios are primarily the ones who undertake anticyclical acquisitions.

The analysis of the purchasing companies' net debt/EBITDA ratios shows that purchasing companies which behave anticyclically have a lower net debt/EBITDA ratio than purchasing companies which behave procyclically. The results are not significant, though they apply to the year before the transaction is announced as well as the year of the announcement. Anticyclical purchasing companies' net debt/EBITDA ratios increased in the year of the announcement in comparison to the year before and the difference between pro- and anticyclical purchasers sunk. The increased net debt/EBITDA ratio of the anticyclically-behaving purchasing companies can essentially be traced back to the higher level of debt in the year of the announcement. Overall it can be stated that within the scope of the present analysis, the results confirm hypothesis 3.2.

The significant difference between pro- and anticyclical M&As in relation to the relative size of the target company supports hypothesis 3.3[42]. Thus it can be assumed that it is simpler to carry out the purchase of a smaller target company during a period of low market valuation because of the lower purchase price and the consequently smaller amount of finance required.

Table 2. The results in respect to the influencing factors between pro- and anticyclical M&As.

Influencing factors	Total	Procyclical M&As	Anticyclical M&As	Difference	p value	Significance[a]
M/B ratio t_{-1}	2.71	2.48	3.01	−0.54	0.10	*
M/B ratio t_0	2.65	2.45	2.92	−0.47	0.75	-
Net debt/EBITDA ratio t_{-1}	0.83	1.24	0.29	0.95	0.88	-
Net debt/EBITDA ratio t_0	1.10	1.17	1.01	0.16	0.53	-
Relative size t_{-1}	17.16%	22.72%	10.07%	12.66%	0.08	*
Premium size (1 day premium)	29.63%	21.78%	39.06%	−17.29%	0.06	*
Premium size (1 month premium)	37.89%	28.59%	52.34%	−23.75%	0.01	***
Strategic direction of acquisition						
related	47	22	25			
in %	60%	50%	74%		0.04	**
unrelated	31	22	9			
in %	40%	50%	26%			

[a]For intervally scaled variables the Mann-Whitney U test was used, while the Chi-squared test was used for nominally scaled variables. t_{-1} = one year before the announcement of the transaction; t_0 = the year of the announcement; "-" = no significance; *, **, *** = significant on the 10% level, the 5% level and the 1% level.

[41]This result is in accordance with those of [100], pp. 145-148; [101], pp. 321-324; [102], p. 1291; and [14], p. 88, which found a positive correlation between a high M/B ratio and M&A success. However this contradicts the result determined by [52], p. 669.

[42]The result concurs with those of [61], p. 159, [90], p. 115, [68], pp. 191-200, [64], pp. 162-163 und [100], pp. 42-43, who found that the purchase of small target companies has a positive influence on the success of an M&A.

The results in **Table 2** regarding the size of premium make it clear that at the 10% level there is a significant difference between pro- and anticyclical M&As regarding one day premiums. Significantly higher one day premiums were paid during anticyclical M&As than during procyclical M&As (39% vs. 22%). The analysis of one month premiums also confirmed this result. It is striking that anticyclical M&As' one month premiums are considerably higher than their one day premiums (52% in comparison to 39%). The difference between pro- and anticyclical M&As in terms of the one month premium is 24% and is significant on the 1% level. Consequently, hypothesis 3.4 cannot be proved[43]. The size of premium mirrors the subjective valuation of the target company. As companies are generally valued lower as well as being undervalued during a downturn period and do not immediately reflect the objectively correct market valuation of the company, anticyclical purchasing companies anticipate that their targets are undervalued and pay a higher premium accordingly. The purchasing companies are aware of the "flawed" valuation of the stock market and are therefore prepared to pay a higher premium. On the other hand target companies also know the "correct" valuation of their company and consequently demand a higher premium. In addition, this result suggests that in terms of anticyclical transactions, purchasing companies are particularly likely to buy target companies which they expect will do well in the future. A relatively high premium can also be justified by individual potential for synergy, for example. Thus the conclusion can be drawn that strategic fit is more important in relation to anticyclical transactions than in procyclical ones. M&As carried out during upturn phases are more the result of "herd behavior", in which the attainment of synergy is not the principal goal of the acquisition.

The significant difference concerning the strategic direction of an acquisition shows that the proportion of related transactions is significantly higher among anticyclical transactions than among procyclical ones. This result proves hypothesis 3.5[44]. Operational synergies can be achieved first and foremost through related transactions; management skills can likewise be applied in an optimal way after such a transaction.

6. Conclusions and Implications for Research and Companies' Practices

The aim of this study was to find guidelines for optimizing the timing of M&A decisions. Therefore an attempt was made to identify a correlation between M&A behavior and stock market prices in the form of the DAX exchange, to analyze M&A success in relation to different levels of market valuation (which was put into operation using the share price level of the DAX) and to determine differences between pro- and anticyclical M&A transactions regarding different influencing factors, in order to determine recommendations for action.

The analysis demonstrated positive correlations between both the monthly and yearly valuations of the DAX and the number of transactions. These implied that the amount of M&A activity increases as the DAX increases. Therefore during the period between September 1998 and March 2009 a procyclical phenomenon in terms of M&A behavior was evident.

Regarding the financial statement-based measurement of M&A success in relation to the level of market valuation it was shown in a "before and after" comparison which anticyclical M&A transactions were more successful in the long term than procyclical transactions, in relation to all seven performance indicators.

The results regarding the influencing factors for optimizing the timing of M&A decisions make it clear that anticyclical purchasing companies exhibit a higher M/B ratio and a lower net debt/EBITDA ratio in comparison with procyclical purchasing companies. In the downturn phase of the DAX, far smaller target companies were acquired than in the upturn phase. In terms of the payment of premiums, both the one-day and one-month premiums were higher during anticyclical M&As than during procyclical M&As. In phases when the market valuation was low, more related transactions than diversifying transactions were carried out, while during phases when the market valuation is high, the proportion of non-related transactions is larger.

The limits of this empirical analysis must be noted, which could give implications for further research. This study used financial statements to measure M&A success. Although this guarantees the measurement of the actual transaction success, future studies could use the capital market orientated method for the short term measurement of the success of an M&A or an expert consultation for an individual assessment of the success of an M&A. For example, different time periods could be determined or alternative performance indicators based on financial statements could be used. The measurement of M&A success was performed according to various

[43]These results are in agreement with those of [52], p. 659 and [100], pp. 13-14 and p. 37.

[44]*Cf.* **Table 2**. The result is consistent with that of *The Boston Consulting Group* (2010), p. 15. The Boston Consulting Group (2010), Accelerating out of the great recession—seize the opportunities in M&A, URL: http://www.bcg.com/documents/file52102.pdf, Creation date: 30.06.2010, Retrieval date: 15.02.2011.

market valuation levels based on the DAX. A classification based on the level of interest, for example using the Euribor rate of interest would also be conceivable. In addition, future studies could further divide the classification of the phases of the market valuation level, so that, for example, the upturn and downturn phases were divided into beginning, middle and end phases.

Certain conditions and recommendations for companies who want to carry out successful anticyclical transactions have resulted from this study. It is important to keep the whole cycle of the DAX, including the high and low turning points as well as the upturn and downturn phases, in mind when making an M&A decision. Because stock market trends are very hard to predict, an early identification of development trends using characteristic indicators is useful[45].

Careful preparation and an individual M&A strategy are therefore indispensable and constitute the necessary conditions for optimizing the timing of an M&A decision. If the economy is already in a downturn, it is normally too late to start looking for a suitable target company. For successful anticyclically-behaving purchasing companies, a transaction is a potential strategic option that is planned months or even years in advance. A downturn phase provides the additional possibility of setting the transaction in motion as soon as the prices for attractive target companies begin to fall [101]. Consequently, a consensus should prevail between the management and the ownership regarding the company's readiness in principle to undertake a transaction. During a downturn phase, the possible windows for a transaction are very small and therefore there is little time for decision-making. In addition, time and resources for completing a transaction quickly should be prepared. It is difficult to take this strategic step in such an unstable and uncertain environment. History tells us that waiting for possible future stability often results in missing the right time for action [75]. With the benefit of hindsight, transactions which seemed to make sense on a microeconomic level but were not carried out due to uncertainty on a macroeconomic level can turn out to be mistakes [76].

Firstly an internal analysis of the company should be conducted. Here the M/B ratio should be taken into consideration, as it is an indicator for the valuation of the company, which reflects future expectations and plays a decisive role in deciding the payment method. As the empirical analysis determined, purchasing companies which act anticyclically have significantly higher M/B ratios in comparison with procyclical purchasing companies. The indicator net debt/EBITDA, which is a benchmark for a company's financial solvency, should be low in anticyclical purchasing companies. Against the backdrop of financing the acquisition and the potential need for borrowing, great importance is attached to the net debt/EBITDA ratio.

Attention should be paid to the relative size of the target company when selecting a target for acquisition, as this has an effect on the size of the purchase price.

The payment of premiums plays an important role in optimizing the timing of M&A decisions. A good understanding of business models and strategies are mandatory for value-maximizing M&As, as the appraisal of the potential for synergy influences the strategic payment of premiums by the purchaser. As the empirical analysis showed, far higher premiums are paid during anticyclical M&As than during procyclical ones. A possible explanation for this is that during downturns, anticyclical purchasing companies anticipate the target company's undervaluation and are consequently more prepared to pay a higher premium. The target companies also demand a high premium in full knowledge of their undervaluation. However this result also shows that purchasing companies must in principle be prepared to take a risk with anticyclical transactions which come with a high premium.

Regarding the strategic direction of acquisitions, companies' knowledge and information about related fields of activity is far higher than their knowledge of unrelated companies. As a consequence, a better evaluation of the potential target company can be carried out if is in a related field, which, especially during a downturn, is an advantage.

The empirical analysis shows that anticyclical M&A behavior is more successful in the long term than procyclical M&A behavior and that anticyclical transactions have a positive effect on a company's performance. As every M&A transaction has its own individual structure, no general formula for successful anticyclical M&As can be given. M&A transactions are always a decision for each individual company and a successful M&A does not just depend on the optimal timing of a transaction, but on a multitude of factors [102].

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[45] *Cf.* **Figure 2**.

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