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**Sustainable Value Creation by Strategic Divestments: A Capital Market Perspective**

**Dissertation**

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# 1 Introduction

## 1.1 Empirical motivation

Divestment is a process opposed to investment, and involves the selling of an asset, or, more frequently, corporate shares or whole corporations (Brauer & Schimmer, 2000, 84; Madhavan, 2010, 1347). A corporate divestment contract is the result of the completion of a decision process of at least two contractual partners – a seller who disinvests, and a buyer who acquires the corporation or corporate unit involved. From the perspective of the buyer, the deal is a merger or acquisition, from the seller's perspective the transaction is a divestment. Controversial statistics on global divestments suggest low market transparency, and the relevance of diverse factors in divestment decisions:

From 1987 until 2001 divestiture transactions in the European Union were on a continuous increase, and the number of deals almost quintupled over that period (Brauer, 2011, 3). Since the collapse of the World Trade Centre on September 11, 2001, and the burst of the internet bubble in 2002, the world and capital markets have changed (Ederington & Guan, 2010; Wachter, 2008). They are characterized by increased volatility and uncertainty – a trend that also influences the market for corporate divestments. Since 2001, deal volume has been declining, and was down 14 % from 2011 to 2012. On the other hand, deal sizes have been growing steadily. In 2012 alone, they increased by 16 % (from 129 to 149 million US-dollars (Deloitte, 2013, 2)).

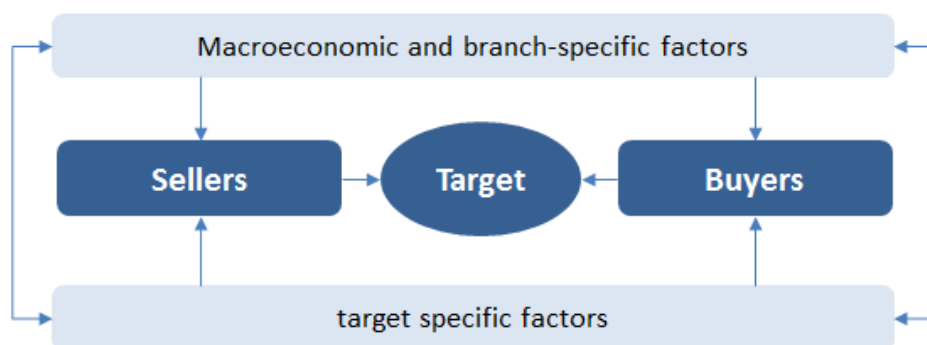
At the same time, deal sizes and volumes differ significantly by branch: According to PWC (2012), deal volumes in the M&A business have been on a slow but continuous decline for media and telecommunications since 2008, while deal volumes in technology corporations have been rising recently, after a brief decline in 2009. The share of divestitures is not specified in this study. Barba analyses the development of the share of divestitures of total global M&A activities in banking, and finds a significant break up after the international banking crisis of 2008: Since then the share of divestitures has almost doubled from 25.6% to 48 % of M&A activity (Barba, 2013). In oil and gas, an inverse trend is observed: In 2013, deal volume decreased by 26 % and deal value by 43 % (PwEnergy, 2013).

What can be read into these at first sight contradictory trends and figures concerning motivations for divestment decisions?

To some extent divestiture volumes and values depend on the macroeconomic climate and branch trends: In situations of economic downturn, investors' inclination to sell and re-buy seems to increase. Deloitte's (2013/I, 9) survey among divesting firms finds that market changes and (resulting) financing needs are important reasons for the selling decision. 81 % indicate that the sold business, in the following called the target, is a "non-core asset". Deloitte (2013/I, 7) finds that the impact of economic conditions is highly significant in only 30 % of divestitures, i.e. there are other important factors:

Extreme macro-economic or branch-specific trends are triggers for long delayed or neglected corporate crises, which unleash partly forced and partly strategic spin-off decisions. Divestments accordingly seem to have an economic purgatory effect, which can be interpreted positively or negatively, depending on the perspective: On the one hand divestitures can compensate for past management mistakes, on the other, they imply a process of focussing on corporate core competencies (Moschieri & Mair, 2008, 399). These observations suggest that any form of divestment is based on a complex inner-firm development process, which is additionally fired by exogenous factors, i.e. broader economic trends (Moschieri & Mair, 2008, 399).

The following chart summarizes these initial considerations:



*Figure 1: Stakeholders and influence factors in divestments (author's draft)*

Divestitures are complex processes, partly initiated by macroeconomic and branch-specific developments, but mainly emerging from strategic considerations of a selling and a buying party, concerning a corporate target:

The consultant analyses discussed thus far speculate on the motivations and expectancies of the deal, but find little on the gains and consequences of divestments from a shareholder perspective. Neither Deloitte (2013) nor PWC (2012) look beyond the immediate process of the transaction; they focus on deal values and transaction motivations. The developments following the transaction remain in the dark. Neither study considers whether sustainable value creation results from the divestment. Brauer (2011, 2), on the other hand, argues that divestment can't be seen as an isolated event; the long-term consequences for the seller should be considered, to assess its efficiency and effectiveness.

This consideration motivates the key question of this dissertation: How can companies augment their market value sustainably by strategic divestments?

Accordingly, the central objective of this dissertation is the evaluation of capital market effects of strategic divestments, and factors enhancing market performance after divestments, sustainably.

## **1.2 Clarification of terms**

The academic delimitation and resolution of this question requires some further clarifications:

- a) What is a strategic divestment, from an academic perspective?
- b) What is understood by value creation, from a capital market perspective?
- c) What is sustainable value creation?

Ad a) Strategic decision making, following Mintzberg et al. (1976, 246) and Eisenhardt & Zbaracki (1992, 17), implies that a decision is “important in terms of the actions taken, the resources committed or the precedents set”, i.e. in contrast to operational decision making, it is unique, and has long-term effects. This definition fits strategic divestments:



The term strategic divestment is used in several contexts: In a private equity context, divestment implies selling shares in corporations, to realize attractive returns and raise new capital (Lerner & Hardyman, 2002, 7; Povaly, 2). Governmental privatizations are another important context of the term divestment in previous literature (Cassel, 2008). Studies using the term strategic divestment are unspecific on the timeframe of the process of disengagement.

The overlapping term divestiture, on the other hand, frequently refers to an abrupt process: Gole and Hilger point out that a divestiture, in contrast to carve-outs, spin-offs and joint ventures, which are gradual processes, is the “outright sale of a business unit” (Gole & Hilger, 4). Equally, raising cash, or strategic disentanglement and rationalization, are principal reasons for selling whole corporations or corporate shares (Cassel, 2008, 5-6). Similarly, Moschieri and Mair (2008, 399) explain that the essence of divestiture is “the disposal and sale of “assets, facilities, product lines, subsidiaries, divisions and business units”. Here the term “disposal” implies getting rid of, or throwing away, without concern for the fate of the sold corporate part, and implies a resolute and rapid process.

Sometimes, the terms divestment and divestiture are employed synonymously: Brauer and Schimmer (2000) refer to divestiture programs, and use the keyword divestment. They point out that divestiture is an umbrella term for a set of divestment approaches comprising sell-offs, spin-offs and equity care-outs, instruments to change the ownership structure and the business portfolio (Brauer & Schimmer, 2000, 84). Madhavan’s meta-analytic review refers to “the divestment literature” (Madhavan, 2010, 1347) but is entitled divestiture and firm performance”. The text uses both terms. Evaluating divestment and divestiture by frequency of use in the context of corporate sales, divestiture seems to be more common. Here, the terms divestiture and divestment are used synonymously.

Ad b) Firm value in divestment, from a capital market perspective, is the market value of the shares of the divesting firm, i.e. for exchange rated companies, the stock price (Banz, 1981; Sullivan, 2000; Jacobs et al., 2010).<sup>1</sup> Most empirical studies refer to exchange traded companies only, since the determination of market values of not publicly traded

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<sup>1</sup> These previous studies have analysed fundamental determinants e.g. returns, R&D activity, environmental performance of stock market value and e refer to the stock price effect.

firms is subject to significant negotiation bias (Moxter, 1983, 11; Jost, 2000, 156). Value creation by divestment implies that the divesting firm's value is expected to be higher after the divestment than before. Transaction cost economics and agency theory provide multiple support for this expectation (Madhavan, 2010, 1349-1350). It is argued that the seller manages to implement a rationalization effect, cost or transaction cost savings, and achieves a more focussed and effective business portfolio (Moschieri & Mair, 2008, 402-403, Fubini, Park & Thoma, 2010, 16). If this expectation is not met, value destruction or negative value creation, i.e. a loss of value the divesting firm's shares, occurs. An analysis of value creation has to consider both, positive and negative value effects.

Ad c): This study is of sustainable value creation, i.e. it focuses on a particular type of value effects: "Sustainable" has become a ubiquitous buzz-phrase, and is connected to a novel holistic consciousness of, and demand for, simultaneous economic growth, social progress and environmental protection (Meins, 2010, 279). The term sustainability actually originated in forestry, and implies a balanced economic development, maintaining natural variety and productivity over generations (Hasel & Schwartz, 2002, 138). This definition is fundamental to the economic understanding of sustainability, according to the three column model: Sustainability refers to an effective economic development, maintaining and augmenting values for the future, without consuming their essence (Ree & van Meel, 2007). Referring this conception to the topic of this study, sustainable market value creation implies future-orientation and long-term value effects, beyond short-term speculative outbreaks.

### **1.3 Previous research in strategic divestments**

A broad range of academic studies have discussed mergers and acquisitions (buyers' perspective) and divestitures (sellers' perspective) and their effects. The following preliminary overview is limited to studies that immediately address to what extent divestments create or destroy value, and which factors determine the success of divestments from a shareholder perspective. Eligible studies consider essentially two timeframes:

a) Short term market value effects on the announcement, or in the immediate aftermath of, the divestment transaction.

b) Long-term effects, felt only after, or in, the process of reorganization and a change of management structures.

Ad a) The following studies analyse short term divestiture effects on market value: Mentz and Schiereck (2008) assess the short term value effects of acquisitions and mergers, on the acquiring company, in cross-border transactions in the automotive business, by comparing the price development one year in advance of completion, and 20 days after it, and calculate positive cumulative abnormal average returns of about 1.2 %, depending on the range. Cross border transactions do not differ significantly from national interactions (Mentz & Schiereck, 2009, 212).

Rieck and Doan (2009) analysed mergers and acquisitions in the global telecommunication business over a period of 10 years, and found positive abnormal returns (as compared to the fair market model) following the announcement (+/-2 days), based on an estimation window of 120 days (Rieck & Doan, 2009, 373). They then compared the success of conglomerate and non-conglomerate mergers, cross-border to domestic M&As and M&A in developed to M&A in emerging markets. Low diversification strategies in international, and particularly emerging, markets promise significantly higher announcement returns.

Rustige and Grote (2008) apply the same method to evaluate announcement effects of mergers and acquisitions, and divestments, of German DAX companies, for the period 1996 to 2006. While M&A activities frequently cause negative abnormal returns, divestment announcements result in significantly positive average cumulated abnormal returns, for all intervals between 1 and 5 days around the announcement. Announcement effects usually reach higher positive abnormal returns for high, as compared to low, diversification (Rustige, Grote, 2008, 20-21).

Brauer & Schimmer (2010, 84) find abnormal returns on divestiture announcements for the global insurance industry, between 1998 and 2007. They find that program divestitures generate higher abnormal returns than single-event divestitures, since programmatic divestment decisions are seen as a strategic development process by capital markets. The timing of divestment announcements is also a significant determinant of stock market reaction.

Brauer and Wiersema (2012) analyse average abnormal returns following the announcement of divestiture decisions, in a social context, i.e. depending on the positioning of the firm in the context of a larger industry-specific divestiture wave. They find an asymmetrical relationship, i.e. announcements at the beginning and at the end of a wave result in positive abnormal returns, while announcements in the middle of a wave deliver negative returns. In low resource-intensive industries, capital market reactions in general are more positive, and symmetrically u-shaped, since the threat of resource shortage after the divestment is lower, while for dynamic industries, average divestiture returns diminish significantly with wave progression (Brauer & Wiersema, 2012, 1484-1485).

Ad b) Long-term market value effects of divestments and M&As have been analysed frequently, for different branches and contexts:

Hanson and Song (2003, 329) analyse the long-term value effects of divestment for a sample of 300 firms that sold non-core assets, comparing their EBITDA two years before, and three years after, the divestiture to a non-divesting control group, i.e. calculating Buy and Hold returns. Divesting firms increasingly outperform the control group in the years after the transaction. Analysing the degree of CEO ownership for divesting firms, the study finds that CEO ownership is positively correlated to abnormal performance for divesting firms (Hanson & Song, 2003, 333). This second experiment says nothing about the comparative impact of CEO ownership on performance for non-divesting firms, and the analysis of a non-divesting control group seems arbitrary.

Cristo and Falk (2006) analyse factors determining the failure rate of divestments, referring to fundamental company data. Success is measured as a composite of accounting and market value key ratios (2006, 335) at the target of the spin-off. Parent size and revenue size of the divestiture have significant positive effects on divestment success. The divestment process seems to need strong parent support to succeed. Cristo and Falk's study is exceptional, since it focuses on the target success. The mixed model of performance measurement is not explained in sufficient detail in the paper.

Kahlert (2008, 22-24) assesses the performance effects of the acquisition and divestment activities of 102 DAX firms, according to participants' perception, in a management survey, and analyses the impact of general and specific managerial experience and analytical

intensity, controlling for company-specific factors. All individual factors are positively related to deal performance. It could be criticized that the study does not differentiate between acquisitions and divestments. The success evaluation is based on management perception only, which is not an objective performance measure. There is a subjective bias since self-convinced managers, judging themselves as experienced and diligent, find deals more successful than self-conscious participants, and success perception refers to overall success after deal completion, while the input factors refer to pre-deal experience only. The study neglects factors after deal completion, e.g. management strategy of the divested firm, which might contribute to perceived success.

Madhavan's comprehensive meta-analysis evaluates the performance effects of divestments, at the divesting parent company, for a sample of 94 existing studies. The study refers to market-based success measures, but includes accounting-based evaluations (Madhavan, 2010, 1355-57). Across all studies, divestiture processes have a positive effect on divesting firms' performance. Transaction intent, transaction process, relatedness, price announcement and resource availability also have additional impact on the value effect (Madhavan, 2010, 1358). Although the study provides a holistic overview, it does not explicitly differentiate between, or compare, short and long term market effects, and does not differentiate between accounting and market-based value measures.

#### **1.4 Summary of achievements and limitations and open core questions**

The businesses, deal types, methods and outputs, moderators, and essential results of the studies evaluated above, on short and long-term market performance effects of M&As and divestments, are summarized in table 1:

1st Author	year	business	deal type	method, output	moderating variables	results	improving moderators
<b>short term market reactions</b>							
Mentz & Schiereck	2008	automot.	M&A	market model, CAAR	internationality	positive	
Rieck & Doan	2008	global telecom	M&A	market model, CAAR	diversification, internationality developed/ emerging markets	positive	little diversified, international, emerging markets
Rustige & Grote	2008	DAX firms	M&A + divestment	market model, CAAR	diversification	M&A: mixed divest: positive	high diversification
Brauer & Schimmer	2010	insurance	divestment	market model, CAAR	program vs single divestment, timing, experience	positive	programming, moderate timing
Brauer & Wiersema	2012	mixed	divestment	market model, CAAR	industry waves	positive	u-shaped wave- dependence
<b>long term market reactions</b>							
Hanson & Song	2003	mixed	divestment	control group, EBITDA	CEO ownership	positive	CEO ownership
Cristo & Falk	2006	mixed	divestment	failure rate, composite measure	parent size, revenue size	positive	parent size, revenue size
Kahlert	2008	DAX firms	M&A + divestment	management success perception	experience, analytical intensity	positive	experience, analytical intensity
Madhaven	2010	meta- analysis	divestment	mixed	intent, transaction process, relatedness, price announcement, resources	positive	diverse

*Table 1: Previous results of short and long-term market performance effects of M&As and divestments (author's elaboration)*

All studies agree that divestments usually have positive short and long-term effects on market performance.

A closer look at this overview reveals that short-term market reactions to divestments and M&As have so far been analysed more frequently and more systematically than long-term market reactions. For short-term market reactions, the market model-based approach, resulting in a comparison of cumulative average abnormal returns (CAAR) (e.g. Rieck & Doan (2008, 375-378), is an established standard. Long-term market reactions, on the other hand, have been analysed with diverse, and sometimes unreliable, methods (Kahlert, 2008, Cristo & Falk, 2006, compare section 1.3). *The CAAR market model was not designed to analyse long-term performance.*

All but one of the studies assess moderating variables which affect the degree and direction of the market reaction to divestments and M&As. Diversification and internationality have been analysed frequently (Mentz & Schiereck (2008), Rieck & Doan (2008) for short term effects, but no further common direction of research for moderators is apparent. The choice of moderating variables so far appears to be to some extent arbitrary.

Only three short-term studies focus on specific business branches (Mentz & Schiereck (2008): M&As in automotive; Rieck & Doan (2008): M&As in telecommunication; Brauer & Schimmer 2010: divestment in insurance). All other studies consider a mixture of industries, so industry-specific divestment research is so far infrequent. Evaluations of particular industries do still appear rewarding, since focussing on individual industries allows a more systematic and reliable analysis of moderating parameters.

To summarize these insights, the current status of research in the market performance effects of divestments leaves some essential questions unanswered:

1. **Research gap 1**: The long-term perspective has not so far been analysed consistently, since previous long-term studies lack reliable and established evaluation standards. The market model and CAAR approach proven for the analysis of short-term market reactions to divestments and M&As has so far not been applied to a long-term perspective: Under which conditions is the application of the CAAR model to long-term market reactions useful, and does its (modified) application confirm the tentative results of previous studies of long-term market reactions?
2. **Research gap 2**: So far no study has combined the short and long-term perspectives, because the methodologies to measure returns for the long and for the short run, have not yet been combined into a single model. The CAR approach has been validated for short-term analysis only. The present study will try to bridge this divide between long and short term analysis, by developing a new integrative methodology based on the CAR approach. The key question is: What is the *relationship* between short and long-term market performance effects of strategic divestments?
3. **Research gap 3**: The parameters moderating co-determining divestment success for particular industries have not yet been systematically explored. Brauer and

Wiersema's (2012) results on the relevance of timing, given the u-shaped impact of trends on performance, underline the relevance of correlations between moderating parameters. The resulting question is: Which industry specific moderating parameters act on long and short-term market performance, respectively, and to what extent do they interact, or reinforce each other?

### **1.5 Relevance of the telecommunications industry**

The global telecommunications business is of particular practical and academic interest for detailed analysis, for several reasons:

- a) Most empirical studies on divestments are cross-sectional. The telecommunication business has hardly been systematically analysed empirically.
- b) Some research in the telecommunications business is available, but has not so far been accomplished by divestment-related studies.
- c) The telecommunications business is among the most dynamic and growing branches globally.
- d) Virtualization has turned the telecommunication industry into one of the most dynamically changing business fields, which as compared to novel internet-industries, however disposes of a long development history.

a) However as compared to other industries accordingly the telecommunication business has hardly been analysed empirically: A broad range of studies have been evaluating mixed samples (e.g. Fama et al., 1969; Madhavan, 2010; Bartsch, 2005; Brauer & Wiersema, 2012; Lambertides, 2009; Braun & Latham, 2009; Rustige & Grote, 2008). Other studies focus on particular branches, however comparatively static and classical businesses have frequently been in the focus of research (e.g. Brauer & Schimmer, 2010 for insurances, Mentz & Schiereck, 2010 for the automotive industry) while businesses subject to intense development have rarely been considered.

b) Rieck and Doan (2008) have analysed short term M&A performance effects in global telecommunications, but the question of the effect of divestments in this business is still unresolved. Similarly to Rustige and Grote's (2008) comparative insights on divestitures and acquisitions in DAX companies, the juxtaposition of divestments and M&A effects in telecommunications promises interesting insights into the possibilities of focussing or



diversification. The short-term effects in telecommunications will be comparable to Bauer and Schimmer's (2010) study of the insurance sector, if moderating variables are chosen appropriately.

c) The telecommunications business has recently been subject to significant structural changes. PWC (2012) points out that the number of high-value deals in telecommunications has been rising significantly since global players have expanded their acquisitions activity, while smaller corporations concentrate on their core competencies. Simultaneously, technological development is dynamic in the smartphone, mobile, wireless web and app markets (Deloitte, 2013/II). Providers are under pressure to adapt to these trends and develop own expert knowledge to remain competitive. The question whether divesting firms benefit from these trends is as yet unresolved. The telecommunications business could be a pioneer and reference for the development of other dynamically evolving high-tech branches.

c) Dynamic branches like telecommunications are of particular interest divestment research: The telecommunications industry has turned out to be highly innovative with the emergence of the internet and mobile communication technologies from the late 1990ies onwards (Fransmann, 2000, 70-74). As compared to other more recent high-tech branches, like the internet business, that look back at much shorter corporate histories, the telecommunications industry has been subject to significant change due to the new mega-trends in virtual space. As a result, telecommunication firms have more frequently than other high tech companies, been involved in privatization, divestment and restructuring activities due to the emergence of virtual technologies in recent years (Domney, 2009, 556; Riek & Doan 2009, 363).

Industries involved with modern technologies are growing strongly and frequently show much more volatile and acute stock price patterns than stable long-established industries (Warren, 1999, 1-3). Stock price movements of high-tech industries tend to be even more overrated in periods of crisis or boom (Kannan, 2001, 63; Yang & Zhang, 2000, 479-480). The reason is that market participants – equity investors and creditors - are more uncertain concerning the long-term development of newly emerging and dynamically evolving industries than concerning long-established branches (Baker & Wurgler, 2006, 1-2). Particularly in times of economic crises and firm-specific instability (e.g. in strategic

divestments) accordingly telecommunication companies could display much more significant price volatility than classical assets. Divestments processes in telecommunications accordingly are connected to extraordinary stock price patterns that could differ from classical industries or the cross-sectional observations (Deloitte, 2013/II, 3).

## **1.6 Empirical research model**

To fill these three research gaps, a *triple approach* which focuses on the telecommunications business is proposed. Three interconnected empirical studies, focussing on a single dataset of *60 divestments* (see Appendix 7.1.1) in the telecommunications business, are planned, as follows:

### **1.6.1 Study 1: Long-term market value development after divestments**

Study 1 closes research gap 1, asking: What is the extent and time-related distribution of long-term market performance effects of strategic divestments in global telecommunications?

To answer this question, study 1 develops and tests a market model of the long-term effects and time-dependence of divestments in the global telecommunications business, which is based on the *CAAR approach*, and classifies the performance results by time of deal completion.

The *event based study* collects divestment events of exchange traded telecommunications providers exceeding 300 million US\$ (this minimum size has been chosen to ensure the stock market-relevance of the transaction). This downside size limit has been chosen in accordance with Huberman and Halka (2001, 166), to ensure that the stocks are sufficiently liquid and their pricing is not influenced by single investors mainly. The study tracks the stock rate of the divesting firms back two years before the event, and three years after contract completion, so the study considers divestments from 2002 to 2011. Adapting the CAAR model applied by previous studies of short-term market reactions to M&As and divestments, study 1 now analyses the divergence of the cumulative average abnormal return, in the two years preceding the divestment to the cumulative average abnormal return in the three post-divestment years. This time range is adopted from Hanson's & Song's (2003, 329) study of Buy and Hold returns and in accordance with that

study, is tested on an annual basis. But the methodology applied is derived from studies using the CAAR approach. To this end the CAAR model has to be modified to use time-varying beta-factors. Corresponding to previous long-term results (achieved by different methods), study 1 postulates that:

**H1:** The CAAR in the two post-divestment years significantly exceeds the CAAR in the two pre-divestment years.

For a long-term analysis, some modifications of the CAAR model are necessary: To eliminate the impact of branch-specific trends on the abnormal return, the branch-specific underlying ETF iShares global telecom<sup>2</sup> is employed as a reference. It is available from Nov, 26, 2001. To exclude little-sustainable speculative effects of the announcement of the divestment, as observed by Rustige & Grote (2008) and Brauer & Schimmer (2010), the period from announcement until deal completion is excluded from evaluation. An empirically-proven waiting period is determined, in accordance with Bartsch (2008) (30 days). To evaluate the significance of abnormal returns, a T-test, as conducted by Bartsch (2008, 142), is applied. For more details see also appendix 7.1.1, 7.2.2-7.2.6.

In a cluster-analysis, study 1 then groups the data by the categories: time of the divestment, and the identified abnormal long-term market performance effects. Referring to Brauer and Wiersema's (2011) study on the u-shaped impact of divestiture waves on market performance, the planned study examines this relationship in the long-term. It postulates:

**H2:** Long-term cumulative average abnormal returns differ significantly, depending on the timing (deal year) of the divestment.

The results of study are of practical and academic value: From an academic perspective, study 1 classifies in the context of previous research, and expands its horizons: It engrosses previous long-term divestment research (Hanson & Song, 2003, Cristo & Falk, 2006) in the dynamic business of telecommunications, and refines methods of long-term

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<sup>2</sup> <http://finance.yahoo.com/q?s=IXP>, access on Jan, 5, 2014

performance analysis. Considering the long-term effects of divestments, it obtains insights for shorter periods by applying comparable strategies (Rustige & Grote (2008), Brauer & Schimmer (2010), Brauer & Wiersema (2012)).

From a managerial perspective, the study quantifies the extent to which divestments in telecommunications create sustainable value. H2 identifies ideal time points in the past for divestments in telecommunications, drawing on a representative global sample to help time future divestiture processes appropriately.

### **1.6.2 Study 2: Relationship of short and long-term stock price reactions to divestment**

Study 2 closes research gap 2 for the telecommunications business, and asks, “What is the relationship between the short and long-term market performance effects of strategic divestments?” Since previous experience of the relationship of short and long-term market performance of divesting firms is lacking, but both short and long-term studies find mainly positive performance effects of divestments (compare table 1 and, in particular, Madhavan’s 2010 meta-analysis), study 2 hypothesises that:

**H3:** Short term CARs in the divestment period significantly exceed CARs in the two pre-divestment years.

To test hypothesis H3, study 2 employs the long-term CAAR data for divestments in global telecommunications, and calculates short-term CAAR values for the same sample. To calculate short-term CAAR values, the study extracts the closing rates 100 days before the event, and 14 days after, eliminating one day before and after the event, and compares and calculates the abnormal returns, using the ETF iShares Global Telecom as a reference, employing the approach applied by Bartsch (2005), Rustige & Grote (2008) and Brauer & Schimmer (2010), to reach comparable results. To test H3, CAAR values for the short and the long-term are correlated, and the significance of the correlation is tested by a Chi<sup>2</sup> test. For correlations with a 95 % significance level, H3 is accepted.

In a second Test using short and long-term CAAR data, study 2 tests Brauer & Schimmer’s (2010) hypothesis (p. 92) that the time elapsed since the divestiture is positively related to CAARs. If this assumption is true for the telecommunications data, the long-

term CAAR values should exceed the short term CAAR values. H4, which is tested by a t-test, follows from this hypothesis, as follows:

**H4:** Long-term CAR values after divestment are significantly higher than short-term CAR values after divestments.

It is expected that few companies diverge from H3 and H4, i.e. show negatively correlated short and long-term CAAR values and lower long-term than short-term CAARs. For these firms, market expectations on divestment announcement are obviously not met in the long-term. We will examine these disappointing outliers as case studies, to examine hypothesis 5 and 6 qualitatively:

**H5:** Short-term CAR values after divestments are indicators of long-term CAR values after divestments, i.e. short-term market performance is significantly positively correlated to long-term market performance.

**H6:** Divestiture processes of outliers displaying significantly lower returns in the divestment phase than in the pre-divestment phase, and significantly lower CARs in the post-divestment phase than in the pre-divestment phase, are characterized by exceptional external developments, or management mistakes, that cause divestment failure.

The results of study 2 make some interesting and novel contributions to divestment research, from a theoretical and practical perspective:

On an academic level, study 2 expands previous methodologies and insights, since short and long-term abnormal returns after divestments are compared for the same dataset, for the first time. Short term results are comparable to previous data for other industries (Mentz & Schiereck, 2008; Rustige, & Grote, 2008), and for M&As in telecommunications (Rieck & Doan, 2008), since a comparable method is applied. The impact of time elapsed after divestitures on abnormal returns is examined in a novel approach which invites further research on the dynamic effects of divestments (as initiated by Brauer & Wiersema, 2012 and Brauer & Schimmer, 2010).

From a management perspective, study 2 allows conclusions about the extent to which market expectations in divestments are fulfilled or disappointed. The qualitative analysis

(H5 and H6) of outliers indicates which management errors and external impacts cause divestment failure, and should be avoided for future divestments.

### 1.6.3 Study 3: Moderating parameters of divestment success

Study 3 analyses the impact of management behaviour, as tentatively explored in the case research in study 2, statistically, and augments the event-based dataset of telecommunication divestiture with a *quantitative management survey* in these companies. This novel combined methodology of market data analysis and survey helps to close research gap 3: *Which firm-specific moderating parameters act on long and short-term market performance respectively, and to what extent do they interact, or reinforce each other?*

To assess the *input parameters*, each of the 52 corporations for which CAR have been calculated, is given a management survey that assesses the items 1 to 24, derived in section 4.3.2, in 24 questions about the divestment event to which the CAR parameters refer. Management executives of the firm are called beforehand, asked for participation, and the issue and reference event are explained.

To examine management-specific impacts on divestment success, the survey draws on Kahlert's (2008) management *survey* on M&A and divestment experience in DAX companies, employs the independent variables proven there (general and specific deal experience, analytical intensity), and develops them further, with reference to further *survey-based studies*. Study 3 amends on Kahlert's dependent variables (perceived management success) by using the short and long-term CAAR values derived in study 1 and 2 as targets. The preliminary hypotheses are:

- **H6a)** Short-term divestment success and **H6b)** long-term divestment success depends on **target-related variables**.
- **H7a)** Short-term divestment success and **H7b)** long-term divestment success depends on **transaction process-related variables**.
- **H8a)** Short-term divestment success and **H8b)** long-term divestment success depends on **capital-related variables**.
- **H9a)** Short-term divestment success and **H9b)** long-term divestment success depends on **mother corporation-related variables**.

- **H10a)** Short-term divestment success and **H10b)** long-term divestment success depends on **resource-related variables**.
- **H11a)** Short-term divestment success and **H11b)** long-term divestment success depends on **management-related variables**.

To test H6 to H11, study 3 employs regression modelling based on OLS analysis, and tests the individual input parameters by t-tests.

To examine telecommunications-specific moderators of divestment success, the study refers to explaining variables that were proven in Madhavan's meta-analysis, and possible further parameters, to be determined in the course of more in-depth literature research. The preliminary hypotheses refer to Kahlert's input parameters: transaction format (Madhavan, 2010, 1346: sell-off, spin-off, carve-out, or other), transaction intent (according to Madhavan, 2010, 1347: strategic or non-strategic), and the firm's resource level (Madhavan, 2010, 1355: low, intermediate, high). These inputs are regressed on short and long-term CAAR values, to test H 8 and H9:

The results of study 3 confirm previous academic research, and are relevant for management practice. From an academic perspective, study 3 improves established methods of measuring moderator impact on divestment success: *Independent variables* are gained from a *survey*, while success is measured objectively by stock market returns. This strategy eliminates positive biases inherent in management success evaluations. By referring to proven input categories, the results are comparable to previous studies, and are appropriate for qualitative cross-sample comparisons.

From a managerial perspective, study 3 allows conclusions about the extent to which management experience and analytical effort are relevant to divestment success. The relevance of transaction process design to long and short-term market performance is quantified, which helps improve the strategic layout of divestment processes, and attain sustainable divestment success systematically.

## **1.7 Comprehensive conclusions on sustainable value creation by divestment**

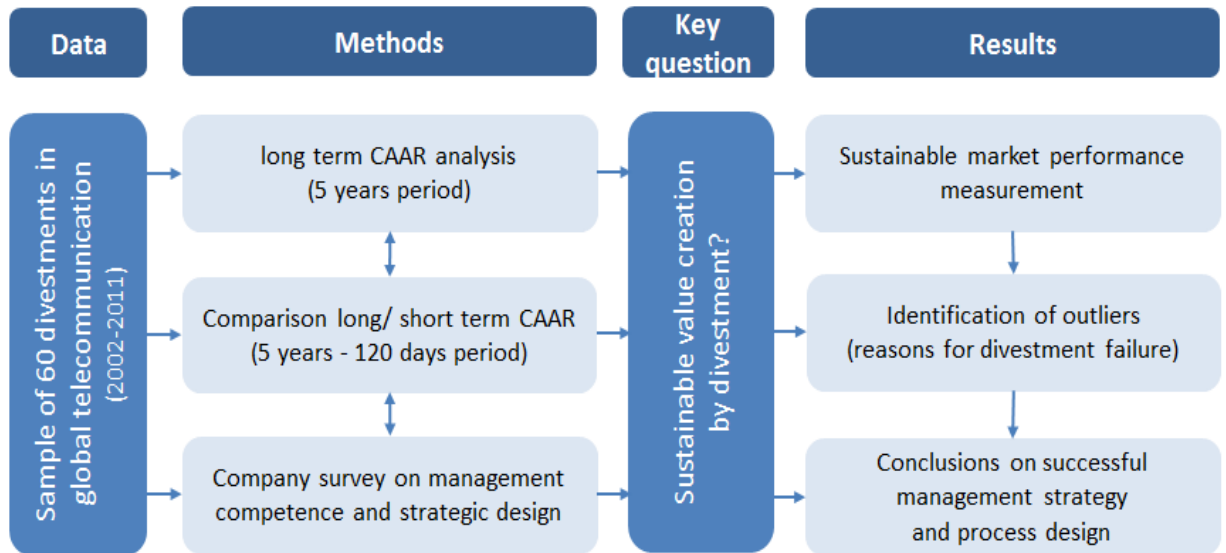
Bringing the results of the three studies together a comprehensive set of insights is reached on the key question of this dissertation, “How can companies augment their market value sustainably by strategic divestments?” The answer results from a novel and integrative approach: A single sample of 60 divestment events in the telecommunications business, from 2002 to 2011, underlies all analyses conducted. The results of the studies thus are fully interconnected.

Study 1 considers long-term market performance only, and proves that divestments usually create positive sustainable value effects (H1), which are clustered depending on the macro-economic and branch-specific timing of the divestment (H2).

Study 2 compares long-term market performance effects to short-term observations of stock market reactions to divestment announcement, to reconnect sustainable value results to previous short-term research (H3). It finds that positive market expectations are usually fulfilled, and that long-term performance effects mostly exceed short-term results (H4). Outliers to this rule are examined case by case, to identify harmful external factors and typical management mistakes and process failures (H5).

To evaluate moderating success factors of divestments statistically, study 3 combines a management survey of management experience and effort, and strategic process design, among the sample of telecommunications firms, with an analysis of market performance success. Study 3 confirms that management experience and diligence (H6, H7 and H10 & H11) and sustainable design of the divestment process (H8 and H9), and resourced and management-related experience, enhance short and long-term market performance after divestments. Bringing together these insights, conclusions on sustainably successful divestment strategies, from the perspective of the shareholders of the divesting firms, are drawn. The following illustration summarizes this comprehensive research approach:





*Figure 2: Comprehensive research model (author's draft)*

## **2 Long-term capital market effects of divestments<sup>3</sup>**

### **2.1 Introduction**

#### **2.1.1 Demand for economically sustainable entrepreneurial development**

The capital market crash in 2008/09 caught financial markets by surprise. Within a few months, the S&P 500 lost almost 50 % of its value. The collapse of the private housing market made the fragility of the global financial system apparent: Global trust in US-based loans plunged rapidly, and the interest rates for inter-banking loans rose sharply, as a consequence of a loss of trust on the international inter-bank market. Severe bank insolvencies brought a prolonged credit shortage (Schweizerische Nationalbank, June, 2008, 12).

As a result, the global economy ran into an unexpected crisis, from which it has been recovering only recently, supported by immense governmental intervention, at the risk of long-term monetary stability (Ruhkamp, 2009). Investors' trust in the global financial system, and the loan-based investment strategies of established industrial and service companies, have suffered severely from this experience. A domino effect, caused by the bankruptcy of a single major financial institution, may bring about the failure of several business partners and a scarcity of loans in real industry (Lo, 2008, 3).

In the aftermath of this global economic break-down, calls for economically sustainable entrepreneurial development are pervasive. Instead of loan-financed, short term economic expansion generating bonuses, option gains, reputation and power for the management elite only, shareholders now expect a business policy holding for future generations, and granting steady entrepreneurial development and independence.

Serious managers and entrepreneurs seek to regain investors' trust by presenting sustainable enterprise programs, designed to last beyond market turbulence, as experienced in

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<sup>3</sup> This chapter is based on the first paper, which has been presented and published in the IBA Conference proceedings on July 16-19<sup>th</sup> 2012 in Istanbul. Authors: Krasniqi, V., Weigand J. (2012): "Long-term capital market effects of strategic divestments", WHU-Otto Beisheim School of Management, Vallendar.

2008. A recent oekom research survey among 199 firms from 30 countries and 34 business branches finds that 58 % consider sustainable development important. About 65% indicate that a changed shareholder conscience has made them reconsider their strategic orientation (Oekom Research, 2013, 24-26). Strategic divestments are part of this strategy, they diminish liabilities and focus on entrepreneurial core competencies (Federico & Lopez, 2012, 12). Instead of expanding on a loan basis, divestments mean focussing on entrepreneurial core competencies, which, it is argued, reduces exposure to economic crises, and ensures sustainable entrepreneurial development (Ostrowski, 2008, 75-79).

But do strategic divestments really create sustainable value for the divesting firm's shareholders? Or are expectations of divestments frequently disappointed? Or more concretely: *What are the long-term capital market effects of strategic divestments?* This is the key question of this study.

### **2.1.2 Clarification of terms**

The academic discussion of this issue presupposes some further delimitation of the terms strategic divestment, value creation and sustainability, in this context:

#### **2.1.2.1 Strategic divestments**

Divestment is generally a process opposed to investment, and implies the selling of an asset and, more frequently, corporate shares or whole corporations (Brauer & Schimmer, 2000, 84; Madhavan, 2010, 1347). A corporate divestment contract is the result of the completion of a decision process between at least two contractual partners – a seller who disinvests, and a buyer who acquires the corporation or corporate unit concerned. From the perspective of the buyer, the deal is a merger or acquisition, from the seller's perspective the transaction is a divestment.

The term divestiture is used to specify divestments, and frequently refers to an abrupt process: Gole and Hilger point out that a divestiture, in contrast to carve-outs, spin-offs and joint ventures, which are gradual processes, is the "outright sale of a business unit" (Gole & Hilger, 4). Similarly, Moschieri and Mair (2008, 399) explain that the essence of divestiture as "the disposal and sale of "assets, facilities, product lines, subsidiaries, divisions and business units". Here, the term "disposal" implies getting rid of, or throwing

away, without concern for the fate of the sold corporate part, in a resolute and rapid process.

Sometimes, the terms divestment and divestiture are employed synonymously: Brauer and Schimmer (2010) refer to divestiture programs, and apply the key word divestment. They point out that divestiture is an umbrella term for a set of divestment approaches, comprising sell-offs, spin-offs and equity care-outs, instruments to change the ownership structure and the business portfolio (Brauer & Schimmer, 2010, 84). Madhavan's meta-analytic review refers to "the divestment literature" (Madhavan, 2010, 1347), but is entitled "divestiture and firm performance". The text uses both terms. Evaluating divestment and divestiture by frequency of use in the context of corporate sales, divestiture seems to be more common. In the following, the terms divestiture and divestment are used synonymously.

Divestments or divestitures, according to Madhavan (1347) and Brauer (2006, 751) comprise sell-offs, spin-offs, carve-outs, split-ups or unit sell-offs. These terms are explained briefly below:

- Sell-off implies that the firm elements to be divested are sold to another investor (Brauer 2006, 751).
- In a spin-off, all the shares of the divesting firm and the target are split up, and the target shares are sold separately, to the existing shareholders. The target becomes an independent company (Krishnaswami & Subramaniam, 1999, 74).
- A carve-out resembles a spin-off, but the shares of the split-off firm are sold on the capital market, as an initial public offering (Pagano et al., 1998, 1).
- In leveraged buy-out, the share of the split-off company is bought by a single investor, usually on the basis of loans. In management buy outs, the former management of the target takes the firm over in this way (Renneboog & Simmons, 2005, 2-3).

This paper focusses on strategic divestments, a particular divestment type, to be specified more precisely: Strategic decision making, following Mintzberg et al. (1976, 246) and Eisenhardt & Zbaracki (1992, 17) implies that a decision is "important in terms of the

actions taken, the resources committed, or the precedents set” i.e. in contrast to operational decision making, it is unique and has long-term effects. Strategy is based on the differentiated analysis of the firm and its environment, and implies future-oriented logical planning (Ansoff, 1988, 163-164).

According to Mintzberg, strategy can comprise future planning, the development of action patterns appropriate to particular prototypical situations, a competitive ploy, an intentional market positioning, and a visionary perspective reflecting inner values (Mintzberg’s 5 Ps for strategy) (Mintzberg, 1997, 23-24). Several authors have applied the term strategy to divestments: Benito (2005, 7) suggests that strategic divestment implies the long-term intention to focus on core activities and enhance the divesting firm’s future profit and market orientation. Brauer (2006, 4) emphasizes the relevance of several strategic planning phases, run through repeatedly, and rational future-oriented reflection before taking the divestment decision. Bartsch explains that strategic divestments are characterised by proactive behaviour, coherence of planning and action, and relevance to long-term entrepreneurial targets (Bartsch, 2005, 16-19). Anslinger et al (2012, 1) point out that strategic divestments are part of a “sound, long-term strategy” comprising a process of continuous revision and improvement.

Bringing these definitions together, in essence, strategic divestment comprises three aspects:

- active divestment behaviour, intended to achieve specified entrepreneurial objectives
- future-directed behaviour, which comprises forecasting, and planning an expected development of competition and demand
- visionary, and at least partly ideal-driven behaviour, intending to stabilize the firm’s long-term development

In the following, this definition is applied to strategic divestments, and distinguishes them from non-strategic divestments, which are occasional, usually driven by immediate urgencies, and do not consider the firm’s future prosperity.

### 2.1.2.2 Sustainable value creation

This paper's title suggests that divestments create sustainable value. This invites two initial questions:

- a) What is understood by value creation, from a capital market perspective?
- b) What is sustainable value creation?

Company value in divestment, from a capital market perspective, is the market value of the shares of the divesting firm. For exchange-rated companies, this is the stock price (Banz, 1981; Sullivan, 2000).<sup>4</sup> Most empirical studies refer to exchange-traded companies only, since the determination of market values of not publicly traded firms is subject to significant negotiation bias (Moxter, 1983, 11; Jost, 2000, 156). Value creation by divestment implies the expectation that the divesting firm's value will be higher after the divestment than before. Transaction cost economics and agency theory support this expectation (Madhavan, 2010, 1349-1350). It is argued that the seller manages to implement a rationalization effect, cost or transaction cost savings, and reaches a more focussed and effective business portfolio (Moschieri & Mair, 2008, 402-403, Fubini, Park & Thoma, 2010, 16). If this expectation is not met, value destruction, or negative value creation, i.e. a loss of value of the divesting firm's shares, occurs. An analysis of value creation has to consider both positive and negative value effects.

This study is of sustainable value creation, i.e. it focuses on a particular type of value effect: "Sustainable" has become a ubiquitous buzz-phrase, related to a novel holistic consciousness of, and demand for, economic growth and simultaneous social progress and environmental protection (Meins, 2010, 279). The term sustainability actually originates in forestry, and implies balanced economic development, maintaining natural variety and productivity over generations (Hasel & Schwartz, 2002, 138). This definition is fundamental to the economic understanding of sustainability, according to the three-column model: Sustainability refers to an effective economic development, maintaining and augmenting values for the future, without consuming their essence (Ree & van Meel,

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<sup>4</sup> These previous studies have analysed fundamental determinants e.g. returns, R&D activity, environmental performance of stock market value and refer to the stock price effect.

2007). Referring this conception to the topic of this study, sustainable market value creation implies future-orientation and long-term value effects beyond short-term speculative outbreaks.

### **2.1.3 Study contextualization and research questions**

The present paper is the first of a series of three contingent studies analysing long-term value creation by strategic divestments. The series approaches the key question, “How can companies augment their market value sustainably by strategic divestments?” and applies an integrative research concept, combining event study, case study and management survey (See also section 1.5). All three papers rely on a single sample of 60 divestment events in the telecommunications business, from 2002 to 2011, so the results of the studies are fully interconnected.

- Paper 1 focusses on long-term empirical observation, to develop an adequate methodology of long-term value analysis after divestment decisions. It is based on a statistically founded event study, and ANOVA analysis to assess time-dependence of success.
- Paper 2 will compare short and long-term market effects of strategic divestments. Study 2 again employs a combined event and case study approach.
- Paper 3 will evaluate management and industry-specific moderating parameters affecting short and long-term stock market performance after strategic divestments. It relies on a management survey which is connected to the quantitative performance assessment in papers 1 and 2.

Returning to paper 1 for the present, the key question (compare section 1.1)

#### **What are the long-term capital market effects of strategic divestments?**

has some further implications. Considering the above cited studies of short-term market valuation effects of divestments, the following part questions are of academic and practical interest:

1. How can models established for short-term divestment research be adapted for the analysis of long-term divestment value creation?
2. Do divestments result in positive abnormal returns in the long-run, and are these results compatible with previous observations?
3. Are long-term capital market effects of strategic divestments time-dependent, i.e. cyclical, as Brauer & Schimmer (2010) and Brauer & Wiersema (2012) find for the short-term?

#### **2.1.4 Course of argumentation**

The remainder of this paper is structured as follows:

Chapter 2 (see section 2.2) is a literature review of previous research on long-term effects of strategic divestments. Section 2.2.1 explains the review method. Section 2.2.2 identifies and categorizes motivations of strategic divestments, and argues from the view point of five economic research strands: the market-based view, the resource-based view, transaction cost theory, principle agent theory and property rights theory. The points are brought together in an overview.

Section 2.2.3 systematizes and critically reflects on previous studies measuring long-term value creation by strategic divestments, empirically. Referring to the measures applied, it differentiates studies conducting management interviews/surveys, evaluating accounting data and market data based event studies. Section 2.2.4 summarizes opportunities and limitations of the observed measures of divestment success.

Chapter 2.3 develops an empirical research method to answer these research questions, explains the empirical dataset (global telecommunications firms), and develops the statistical method by adapting the CAR model and T-test for paired samples, to long-term data, and ANOVA analysis to time series evaluation. Chapter 2.4 evaluates the empirical results answering research questions 1 to 3. Chapter 2.5 discusses the results in an academic context, and explains managerial implications and further research needs.



## 2.2 Literature Review

### 2.2.1 Review method

A systematic literature review analyses a set of research questions by systematic evaluation of previous-empirical literature on the topic (Drinkmann, 1990, 12). Insights discussed by several representative studies are the basis for own, and new, conclusions on the research topic (Petiti 2000, 13). Cooper and Hedges (1994) suggest proceeding in 4 steps:

1. **Definition of research questions:** The conciseness of analytical tasks determines the relevance of results. Questions are the basis of key word extraction in database research. Ideally, research question are defined broadly initially, and narrowed down later (Hedges, 1986, 359).
2. **Delimitation of inclusion and exclusion criteria** for the selection of studies: Criteria are defined with regards to content, or methodologically, and are usually derived from the problem statement.
3. **Extraction of relevant studies from databases:** The selection of several databases, and the employment of adequate keywords derived from research questions, ensure the validity of results and eliminate subjective biases (Moher et al., 1999).
4. **Evaluation of studies** according to consistent criteria: the main criteria derived from the research questions are detailed in the process of analysis. Initial models should be open for the introduction of new criteria (Rosenthal/ DiMatteo, 2001, 61).

These suggestions are implemented as follows. The research questions for the review derive from section 2.1.3. In accordance with Lee and Madhavan (2010, 1348ff), the study questions the theoretical underpinnings of previous research, and the empirical results of long-term post-divestment performance.

1. Which theoretical research strands have contributed to long-term post-divestment performance analysis?

2. Which perspectives on divestment performance have been taken in empirical research, which research methods have been applied, and what are the empirical results?

To identify a contingent range of papers, the following **inclusion and exclusion criteria** have been defined:

- a. To ensure a scientific approach, only articles from academic journals and books, or book contributions employing an academic approach, are selected.
- b. Research is limited to publications in German and English.
- c. Since detailed evaluation is indispensable to answer the research questions, only articles available in full text are employed.
- d. To ensure practical value, the focus is on empirical analyses.
- e. To guarantee the topicality of the contributions, the search is restricted to the period 1980 to 2015.

To comply with criteria a. and b. research is restricted to the following scientific **databases**:

- Emerald full text: containing a large range of studies and articles on business and management,
- Science direct: a comprehensive academic database, containing nearly 2,500 journals and 26,000 books.
- Ebsco Electronic Journals Service: multi-disciplinary access to more than 300 journals,
- Additional papers retrieved from “Scholar Google”, which presents a large selection of free article from diverse databases.

The choice of adequate keyword combinations is essential, to detect relevant studies comprehensively. Drawing on the keywords in Lee’s and Madhavan’s comprehensive meta-analysis (2010), keyword sets, combining the issue of corporate divestitures and success, have been chosen to direct database analysis. The two keyword groups are combined.

<b>Corporate divestiture-related key-words</b>	<b>Success-related keywords</b>
Divestiture divestment M&A, merger & acquisition, strategic alliance, transaction	Long-term Performance synergy effect success long-term outcome

*Table 2: Keywords for literature review (study 1)*

To retrieve the most topical articles the results per data base are sorted by relevance and full text contributions are loaded down in this sequence. Each potentially relevant article is checked manually whether it fits for one of the part questions of the review. This process is necessarily to some extent subjective, although the subjective selection bias is strongly reduced by the initial automated research process. The manual post-selection is stopped as soon as 5 consecutive full-text articles do not fit with the review criteria. Due to the manual post-selection routine equally Wagners (2010) secondary research paper is included in the evaluation, since it fits with the criteria very well. The results now are classified in accordance with established academic divestment theories as follows:

For review question 1, previous divestment-related research can be classified into five main theoretical strands. Initially, following with Lee and Madhavan (2010, 1346-1347), agency cost and transaction cost theory made important contributions, but further relevant theories have also contributed to research in long-term post-divestment performance: the market-based view, the resource-based view, and property rights theory. The results are shown in section 2.2.2.

The analysis of empirical studies delivers research perspectives, methods and results for review question 2. Three key perspectives are found. Studies in each group applied the same methodologies and have the same results type:

- Management research-oriented studies are usually based on surveys of divestment success,
- Accounting-oriented studies conduct balance sheet or inner-firm data analyses.
- Capital market-oriented studies use event studies to evaluate stock returns.

The results of research question 2 are shown in section 2.2.3.

## **2.2.2 Review question 1: Theoretical perspectives on strategic divestments**

The issue of long-term value creation of divestment is frequently addressed from a theoretical perspective, asking, “Why do firms divest, and what do they hope to gain from divestment?” Expected and actual effects of divestments have been analysed from the perspective of diverse research strands. The following sections refer to new industrial economics and new institutional economics. After briefly explaining the underlying theories, the sections explain the arguments made in this divestment literature.

### **2.2.2.1 Market-based view**

Within the framework of new industrial economics, Porter’s market model is central to strategic investment and divestment decisions. According to it, strategic decision making takes place in the force-field of five determinants: rivalry of established firms in a market, the threat of entry of new competitors, bargaining power of suppliers, bargaining power of clients, and the threat of new products. (Porter, 1991, 55-61).

Market-oriented management sees firms’ success or failure as a function of the market environment, branch structure, and the firm’s adaptation to it (behaviour) (Kühn & Grünig, 2000, 119). Inner-company capabilities and values are given less weight (Hoskisson et al. 1999, 426). Coping with competitors, and handling the bargaining power of clients and suppliers, are the central strategic entrepreneurial goals, according to the market-based approach (Porter, 1991, 108).

According to Porter, strategic divestment processes are useful when the divesting firm’s positioning towards suppliers, customers, new market entrants, or concerning substitute products, is improved by the deal. Specialization processes resulting from divestments are of particular interest in that context. When firms sell-off sections that are of little strategic relevance to their core business, they can concentrate on their essential functions, and may find it easier to improve in particular target fields. The competitive positioning of the divesting core company can be improved. Kwoka (1993, 49) proves for the US and UK telecommunications industries, that between 17 and 25 % of the profit gains after privatizations result from increasing economies of scale. Productivity growth due to private ownership is another, but less important, factor.

After divestments, firms can specialize in the customer business. They address and service clients more effectively. Customer services now focus on a reduced product range, so they can be adapted more efficiently to changing needs. Specialization enables firms to develop particular servicing and consulting capabilities, and allow differentiation in broad and homogenous markets (Porter, 1976, 26-28).

Montgomery et al.'s (1984, 830) empirical results on the valuation of strategic divestitures support Porter's perspective. Markets honour strategic divestments characterized by a coherent focus on particular markets or business fields, but value arbitrary sales of unwanted units negatively. Dung evaluates diverse approaches of brand performance analysis, and argues that divestitures augment brand strength. After abandoning weak brands, entrepreneurial resources can be concentrated on less, but rewarding, brands, and a more targeted brand strategy can be developed (Dung, 2012, 107).

The supply-side strategy could equally benefit from concentration on core competencies. According to Porter's concept of strategic groups, proximity of the products and markets in which a firm is engaged are essential to market success. Proximity is assumed between branches with the same competitors. According to Porter, focussing on core competencies augments economies of scale (Hill, 1985, 828). In practice, a firm focussing on a particular business, rather pursuing several business models, concentrates on few suppliers, and buys larger amounts of a particular product or service, which results in economies of scale and increased supply-side power. On the other hand, broad diversification, according to Porter, diminishes possible synergy effects, and increases administrative and management effort, so divestment of unrelated businesses promises rationalization and enhanced profitability (Reinecke, 1989, 7-8).

Competitive strength, established customers, and specialized know-how in a particular market segment, make it difficult for new competitors to enter this market. Established firms might even establish a monopolistic position due to advanced core competencies. Divestment can enable firms to attain this position by shifting from a broad market with narrow margins, to a narrow market allowing high margins, based on specialized skills (Federico & Lopez, 2012, 12). The development of substitute products, covering very specific market needs, is unlikely in highly specialized segments needing significant know-

how, and in narrow market niches, since new competitors have to overcome significant knowledge barriers before establishing profitability.

Summarizing these insights, Porter's market based view explains divestment success as a function of specialization. Divestment allows focussing on core competencies, and the creation of special knowledge, which grants a competitive advantage, customer loyalty and protection against competitive new entrants and products.

#### **2.2.2.2 Resource based view**

The resource-based view draws on the work of Penrose (1958). It analyses the impact of access to unique and specific resources, technology, and knowledge bases, on the diversification decision and performance. (DeSarbo, Benedetto & Song, 2007, 103-104). Penrose focusses on the inner values of a firm. In studies of mergers and acquisitions, the resource-based view is frequently employed to argue for synergetic effects resulting from cooperations and fusions. Synergy, in that context, means that by combining the resources of two previously independent units, economies of scale and scope are achieved (Papprotka, 1996, 42). The accumulation of resources, according to Penrose's fundamental idea, should augment synergetic effects and render firms more competitive in new markets. The resource based view has also frequently been employed to argue the efficiency of divestments:

When expected synergy effects are not attained, divestment can resolve "dis-ergies" and inefficiencies (Krüger, 1996, 74, Ostrowski, 2008, 75). Frequently, synergy potentials are overestimated when M&As are initiated, and it becomes apparent in the course of the merger process that negative effects of the deal, for instance an increase in bureaucracy, and intra-organisational communication problems, outweigh these advantages. In this situation, the break-up value of the conglomerate can create positive effects, also called unbundling synergies (Ostrowski, 2008, 79).

Divestment, from this perspective, allows getting rid of excess resources, for instance capabilities, technologies and financial means, that can't be made use of adequately in a broad conglomerate. After the split-off or sale, these resources can be employed alternatively, and in more profitably. Selling these assets then creates sustainable value for the seller, and the now-independent daughter or buyer. Allocative inefficiencies, resulting

from overestimated economies of scale, are diminished by the split-up and both new firms work more efficiently after the split (Eckardt, 1999, 70-71). Chang (1996) argues that split-ups enable firms to get rid of costly human resources, misplaced within the conglomerate, since they do not fit the company profile. After the divestment, firms can focus on recruiting staff whose know-how supports the divesting firm's key competences, and enables them to enter promising developing markets.

Similarly, divestments diminish financial disergies, particularly when loan burdens in the conglomerate are high. When an inefficiently operating part of the corporation is sold, profits in the divesting part augment. Porter (1996, 286) explains that excess capital availability induces firms to make acquisitions without considering synergy effects. Divestments are a remedy to rising debt burdens, and encourage a strategic realignment. Existing liabilities are now more easily serviced and paid back. Solvency and capital market ratings of the divesting firm improve, which should have positive effects on stock market valuation, and augment the divesting firm's capital basis (Ostrowski, 2008, 83-84). Quoting the example of divestments in the Japanese electronics business, Belderbos and Zou (2006, 1) explain that the reduction of local capacities, and the import of pre-products from cheap foreign markets, are major motivations for divestments. A change of the market environment towards improved resource availability at cheaper prices, causes structural change in the industry.

From the perspective of corporate finance, divestments enhance capital efficiency. Renneboog (2005, 9-10) evaluates motivations for public-to-private transactions, and argues that these deals usually augment debt capital, i.e. the financial leverage. When the leverage effect works out, i.e. insolvency of the divested firm is excluded; debt financing works as long as the return on equity covers the loan payments. Considering this fact from the perspective of a public seller, the target's market value can be higher than its intrinsic value when kept in public ownership without leverage. Krishnaswami and Subramaniam (1999, 76) cite the example of the hotel chain Marriott's divestments to demonstrate that spin-off decisions reduce the collateral on existing debt of the mother corporation, as well as bondholders' claims, which both are transferred to the sold-off unit. Spin-offs can be useful when the benefit from reducing corporate debt exceeds the price discount for the indebted firm part, on the capital market.

Wagner (2010, 604) shows mathematically that the ideal extent of debt capital involved in leveraged buy outs depends on the venture type. High-risk ventures with unsteady and uncertain capital flows, in practice attract venture capital. From the divestor's perspective, this implies that uncertain and risky projects should be divested when the investors' strategy is risk averse. Renneboog (2005, 10) points out that tax benefits from leveraged firms to private shareholders frequently bear additional market value that can only be made use of by divestment.

Summarizing the perspective of the resource-based view, divestments tend to reduce disergies if expected synergetic effects do not occur, and are useful when selling the target improves utilization of capital means or tax benefits.

### **2.2.2.3 Transaction cost perspective**

Transaction cost theory is based on the work of Coase (1937). Transaction costs economics refines the resource-based approach, pointing out that, beyond direct costs of production and physical or mental resources, any value-added process is characterized by indirect and inherent costs, so called transaction costs (Silverman, 1999, 1109) Transaction costs are costs for gathering information, negotiation, decision-taking, surveillance, and the enforcement of claims (Osterheld, 2001, 104), and should be minimized, to enhance organizational efficiency. Institutions should be formed when they diminish transaction costs. Inversely, divestments are useful when they enable organizations to reduce transaction costs.

In general, the transaction atmosphere, which, according to transaction cost theory, is determined by limited rationality, uncertainty, complexity, opportunism and specificity, determines the ideal degree of organizational integration or separation. Particularly high uncertainty, specificity and complexity invite opportunistic behaviour in contractual solutions (Williamson 1991, 269-296). Reporting on the case of Shell, Van den Bogaard and Spekle (2003, 79) argue that given a specific and highly uncertain market environment, divestments are the wrong choice, and hierarchical integration should be preferred. Integration reduces opportunism and information asymmetry. On the other hand, divestment could be useful in unspecific and clearly-defined relationships (Göbel, 2002, 137;



Picot, Reichwald & Wiegand, 1998, 42-43), in which the transaction costs of information asymmetry in a market solution are low.

Jones and Hill (1988, 166) point out that the choice of organizational forms of cooperation is a trade-off between economic benefits and bureaucratic costs of integration. An ideal solution simultaneously minimizes bureaucratic costs and maximizes economic benefits. In the long run, marginal bureaucratic cost and benefits can change, which shifts this equilibrium, and requires a change of organizational forms to reach a new organizational optimum. In case of increasing bureaucratic cost and lowering benefits of integration, divestment can be a rational and sustainable solution. According to Teece (1986, 39), increasing stability in supply chains and the spread and establishment of technologies, make market solutions the better options, and encourage divestments to save transaction costs.

Privatizations invite further discussion from a transaction cost perspective, since, due to lacking market incentives, public ownership is particularly prone to inefficiencies, resulting in excess transactions costs: Evaluating the performance of Australian airports, before and after privatizations, Aulich and Hughes (2013, 176-180) find that returns generally improved, since private owners are more motivated to react to market demands and organize rationalizations and improvements to enhance competitiveness. From the perspective of transaction cost theory, privatizations improve resource utilization and diminish bureaucratic impediments to change.

Summarizing these insights of transaction cost theory, divestment is a strategically useful option when business environment or inner-firm cooperation changes from high to low specificity, high to low uncertainty, and when information asymmetry can be diminished by disintegration, while economies of scale and scope attained by integration do not over-compensate for these costs.

#### **2.2.2.4 Agency perspective**

Principal agent theory analyses the relationship between a principal and an agent in entrepreneurial decision making. The principal finances a venture, but due to his position outside operational business has only partial insight into the activities of the agent, who

takes the role of a manager. The principal-agent relationship is thus characterized by information asymmetry and uncertainty (Jansen, 2000, 49-52). While the principal intends to maximize company value, agents will be tempted to employ their informational edge to draw fringe benefits, and augment their own power, instead of acting in the interest of the firm and its owners (Holström & Milgröm, 1999, 214- 242). Agency costs describe the financial loss between the best solution (symmetric information) and the second best solution, asymmetric information. Principal agent theory attempts to minimize the sum of all the transaction costs incurred, suggesting adequate strategies to reduce information asymmetry (Picot, Reichwald & Wigand, 1998, 48).

From an agency perspective, divestment is useful when it diminishes agency costs. Previous studies discuss two implementations of agency theory in a divestment context:

- a) Internal capital market perspective: The divesting firm is the principal, and the unit intended for sale is the agent. Divestments are discussed as a solution to inner-principal-agent problems.
- b) External capital market perspective: Here the divesting firm's management is the agent, and its shareholders are the principals. It is argued that divestment reduces information asymmetry between these two parties.

The two perspectives are explained in the following:

a) Internal capital market perspective: In a large conglomerate, financial resources are distributed between departments. This process is co-determined by department managers' calls for resources. Inefficient departments and managers drawing fringe benefits will consume higher resources than efficient units. The over-funding of these units weakens the financial power of the conglomerate as a whole (Rajan, Servaes & Zingales, 2000, 36). Meyer, Milgrom and Roberts (1992, 9) point out that the power department managers have on the corporate management to acquire resources influences costs that hamper the efficiency of the conglomerate. When inefficient units are divested, the resources of the core company are strengthened, and conflicts between the management of the mother corporation (principal) and the management of the divested part of the firm (agent) are resolved, since after the divestment the management acts independently, and can no

longer draw fringe benefits or make sub-optimal investments at the cost of the mother corporation (Stienemann, 2003, 102).

Aron (1991) points out that the productivity of multi-product firms can be improved when underperforming units are divested. After the divestment, managerial incentives in the split-off entity depend on corporate success to a larger extent than the in conglomerate. Incentives for managerial performance increase as a consequence of the sale.

b). External capital market perspective: The relationship between the shareholders of a conglomerate and its management is distorted, when managerial hubris and the strife to gain power drive conglomerate expansions (Weston, Chung & Hoag, 1990, 203). Conglomerates that do not work efficiently, but mainly augment management power and prestige, are not in the interest of the firms' shareholders. Managers might favour diversification and the growth of the firm to extend their power, although long-term profitability, from a shareholder perspective, is not guaranteed. Owners might be persuaded to maintain large, inefficient corporations, if the management abuses its informational advantage (Amihud & Lev, 1981, 606). Divestments - particularly management buy-outs - clarify responsibilities, and avoid agency costs, by reducing hierarchy levels and bureaucratic entanglements.

The management entrenchment hypotheses argues that, in large corporations, the holding management is frequently not qualified in the business of the firm, and has little experience at the technical level (Shleifer, Vishny, 1989, 123-125). Bureaucratic and non-expert managers impair the efficiency of the corporation as a whole, since they take decisions without considering their technical effects at the department level. Divestments of conglomerates helps eliminate this bureaucratic management elite, since focussed and technically specialized individual units favour expert managers (Stienemann, 2003, 104, Ostrowski, 2008, 93).

From a capital market perspective, diminishing diversification frees resources and enhances transparency. After divestments, capital markets control entrepreneurial efficiency more effectively: The management of small, focussed firms is easier to supervise, since profit contributions of productive units can be assigned to concrete products and

value-added processes clearly, while in a large conglomerate, the annual surplus is a combination of the value added by all departments (Matusaka & Nanda, 2002, 176). Similarly, Nanda and Narayana (1997) employ a model of asymmetric information to explain mathematically that for smaller corporate units, markets can observe management efficiency directly, while in large conglomerations, good and bad management results are indistinguishable. Divestments enhance informational transparency.

Summarizing the principal agent theory, divestment usually enhances informational efficiency at the firm level, and between firm and capital market, since responsibilities and incentives are allocated more efficiently, and managerial motivation to draw fringe benefits is diminished.

#### **2.2.2.5 Property rights theory**

Property rights theory evaluates the ideal design of property rights in an object (or firm), and considers motivations and opportunities of divestment decisions. A property right is the exclusive authority to determine how a resource is used, whether that resource is owned by government or by individuals (Alchian, 2008). Property rights comprise the use of an economic good and its returns, the right to change it, sell it and to dispose of the proceeds of the sale (Rudolph, 2006, 124). The creation, enforcement and change of property rights cause transaction costs (Tietzel, 1981, 211).

Property rights theory assumes that the design of property rights influences entrepreneurial resource allocation and exploitation (North, 1994, 360). Transaction costs and the efficiency of resource utilization depend on the extent of the dilution of property rights, i.e. their assignment to different legal entities (Picot, Dietl, & Franck, 2002, 56). When property rights are diluted, external effects are unavoidable. The exploitation of property rights by owner A, influences, or even prevents their exploitation by owner B (Rudolph, 2006, 126). The quality of a property rights structure depends on the extent of positive or negative external effects (Picot, Reichwald & Wigand, 1998, 40). A property rights structure is ideal when the extent of negative external effects and transaction costs is minimized. Property rights theory applies these criteria to assess the efficiency of divestments (Picot, 1991, 144). Some studies have explored the efficiency of property rights allocations for divestments:

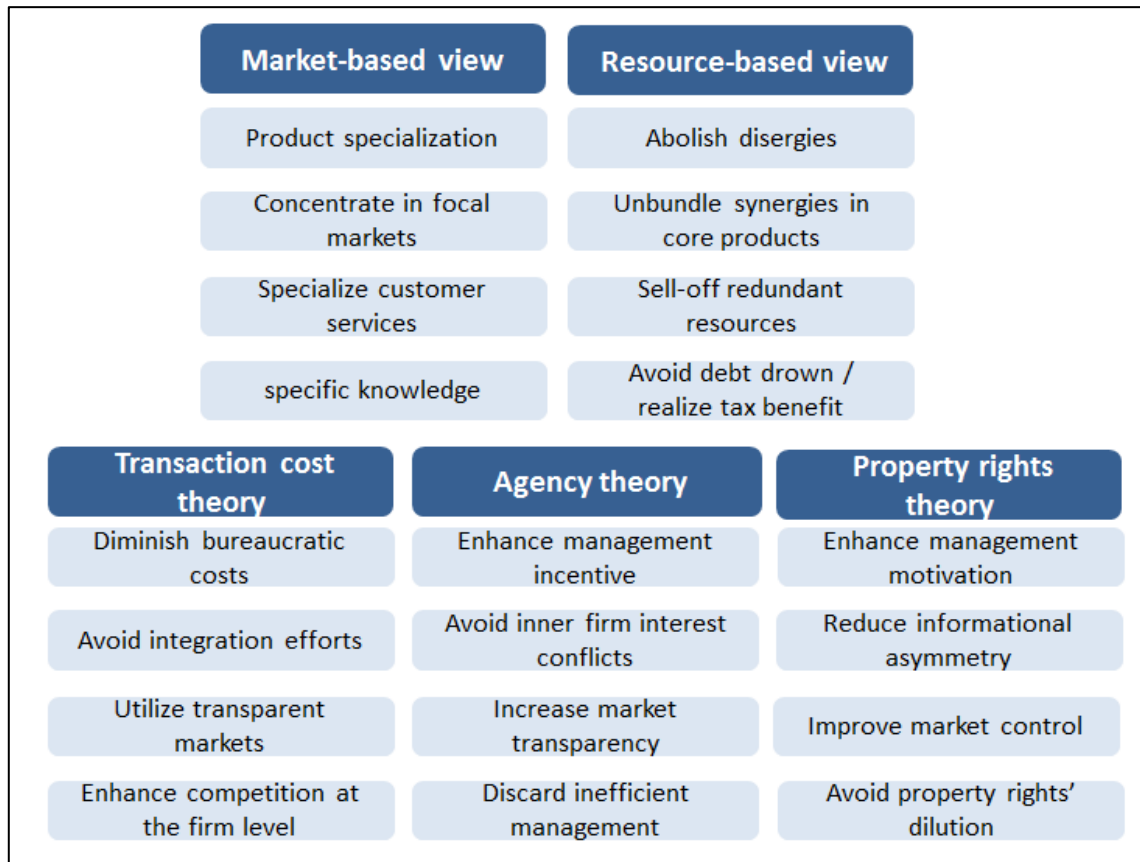
In 1999, Fluck and Lynch (1999, 342) derived a mathematical model to explain the cycle of mergers and consecutive divestments for marginally profitable stand-alone firms. Projects providing no, or only marginal, income in their start-up phase cannot be maintained independently, since they yield no profit to cover investment and operational costs. From the perspective of a conglomerate, these ventures are interesting targets for mergers and acquisitions, since they promise future profits and innovative development. Conglomerates are useful property rights allocations to enable risky start-ups, but as soon as the start-up project has proven profitable, the conglomerate hampers its further development, since information asymmetry, lack of incentives and bureaucracy, i.e. transaction costs, prevent innovative developments. In this situation, a divestment enhances the efficiency of both units. When survival as a stand-alone is possible, divestments avoid property rights dilution (Fluck & Lynch, 1999, 322-323).

Drawing on the example of a large international conglomerate selling an Irish daughter, Ray (2003, 215) explains that divestment in many cases means withdrawal from (some) foreign markets. On the other hand, engagement in foreign market causes transaction costs, for instance for the adaptation to diverging legal standards, locally adjusted marketing, and the maintenance of subsidiaries. The interaction between Mother Corporation and local daughters can be conflictual, and is characterized by information asymmetry. From a property rights perspective, property rights are largely diluted by the physical and cultural distance between mother and daughter corporations. In Ray's case study (2003), divestment is a successful strategy to allocate responsibilities locally, and avoid property rights dilution.

Hanson and Song (2003, 321) prove the effect of managerial motivation and control in divestitures, empirically. They find that firms performing poorly before a divestiture improve significantly afterwards, when CEOs become stock owners. Management ownership is a strong incentive to improve performance. From a property rights perspective, the MBO corresponds to a concentration of rights of control, resource and profit utilization.

Summarizing the insights of property rights theory, divestments remove property rights dilution that hampers the evolution of synergy effects, and enhance managerial incentives, due to the reduction of informational asymmetry and the fair allocation of responsibilities and opportunities.

### 2.2.2.6 Summary of theoretical perspectives on strategic divestments



*Figure 3: Motivations for strategic divestments (author's elaboration)*

The above overview summarizes the points made in studies that are representative of the five theoretical strands concerning motivations for strategic divestments: Neoclassical economic theory, represented by the market and the resource-based view, focusses on the points concerning products and immediate competitiveness. The two perspectives are complementary: market-based arguments in favour of divestment point out that specialization allows a concentration in focus markets, the development of specialized know-how, and the adaptation of particular, partly niche, products to customers. A strategy of focussing, from the perspective of the resource-based view, removes inner-firm disergies, and produces hidden synergetic effects in core products. Resources are freed to concentrate on core competencies, and debt capital is simultaneously reduced. Neo-institutional economics point out the relevance of divestment to indirect costs. The three theoretical strands addressed are complementary. Evaluating the arguments summarized in figure 1, line by line, essentially four points are made:

Divestments can diminish bureaucratic costs, since the management of the divested unit is motivated to act more responsibly and avoid fringe benefits when they manage the divested section independently. Integration effort resulting from inner-firm interest conflicts are avoided when the firms act independently, after the split-off. These advantages at the firm level are rewarded by the capital market: Divestments improve transparency and market control, and concentrate property rights. Divestments create managerial competition, and contribute to discarding technically inexperienced and ineffective management teams, which enhances firm competitiveness.

Both theoretical strands - neoclassical and new institutional perspectives - find arguments in favour of long-term value creation of strategic divestments, when specialization appears to be a successful market strategy, disergies are observed at the conglomerate level, and significant transaction and agency costs exist, that can be diminished by selling off inefficient parts of the firm.

The theoretical constructs underlying the observations are of course overlapping- this lies in the theories themselves. The visualization in Figure 3 is purely qualitative and does not imply any weighting of the arguments. It provides the reader with an overview on the broad range of explanations for strategic divestments.

### **2.2.3 Research question 2: Empirical perspectives and results on long-term post-divestment performance**

Section 2.2 evaluates to what extent long-term value creation of strategic divestments has been observed empirically in previous studies, and the effectiveness of established methods of divestment success measurement is analysed.

A broad range of academic studies have discussed mergers and acquisitions (buyers' perspective) and divestitures (sellers' perspective), and their effects, for different branches and contexts. Classifying previous empirical studies on long-term divestment success, by research methodology, essentially three types are available:

- Studies conducting management surveys on divestment success represent a management perspective.

- Studies taking an accounting perspective conduct balance sheet or inner-firm data analyses.
- Studies taking a capital market perspective usually conduct event studies, based on stock returns.

The results of these three study types are explained and compared below:

### **2.2.3.1 Studies from a management perspective**

Studies taking a management perspective consider the organizational implications of strategic divestments and do not directly assess the financial or stock market effects. Their focus is on the development of the companies as a consequence of the divestment activities. It is measured both qualitatively and quantitatively. The achieved sales price and post-divestment restructuring effectiveness are the prominent success measures in this study type:

In a 2002 management survey, Schiereck and Stienemann (2004) evaluate the divestment volumes and frequencies of the 100 German DAX companies. Divestments are mainly conducted by large corporations exposed to high free float levels in the capital market i.e. by firms that might experience size-related disergies, and that are exposed to significant capital market pressure. These motivations support the arguments of the resource-based view and agency theory. 46 transactions are assessed; only 7 exceed a volume of 1 billion Euros. Most (22) are below 100 million Euros. 26 divestments are classified as strategic in the initially defined sense. Corporations usually assess divestment success as a function of achieved sales price; only one firm indicates that market value creation is an important success parameter (Schiereck & Stienemann, 2004, 15-17). Though the study does not evaluate success directly, it illustrates that DAX companies have so far shown little interested in sustainable success measurement. Though strategic intentions dominate divestment decisions, it is questionable whether strategic success can be evaluated reliably on the basis of the sales price alone.

In a similar survey, Anslinger et al. (2003) ask 100 senior executives of US Fortune 1000 companies about their divestment experience. The majority of the firms are engaged in divestments (62%). 53% have sold business units during the last 18 months. The main arguments for divestments are to raise cash, discard non-core units, low unit performance,



and to shape business portfolios for the future. Only few participants indicate non-strategic reasons (good market price and negative stock price impact of divested firm). US firms seem to consider divestment success more sustainably than their German counterparts. “Realizing the target of divestment” is mentioned as a core objective most frequently (63%).

Unfortunately, these consultant-type surveys offer hardly any insight into the relationship of the actual performance to the impact of divestments. Insights are limited to the topics of the multiple choice questions. Kahlert’s study amends these shortfalls.

Kahlert (2008, 22-24) assesses performance effects of acquisition and divestment activities of 102 DAX firms, according to participants’ perception, in a management survey, and analyses the impact of general and specific managerial experience and analytical intensity, controlling for firm-specific factors, like relative deal size, deal importance, deal-relatedness. All individual factors are positively related to deal performance. Kahlert finds that high analytical intensity, combined with specific deal experience, augments perceived deal performance, but for low analytical intensity, deal performance diminishes greatly with deal experience (Kahlert, 2010, 28).

This result seems implausible, since it suggest a contradictory effect of experience. It could be criticized that the study does not differentiate between acquisitions and divestments. The success evaluation is based on management perception only, which is not an objective performance measure. There is a subjective bias, since self-confident managers, judging themselves as experienced and diligent, tend to find deals more successful than self-conscious participants. Success perception refers to overall success after deal completion, but the input factors refer to pre-deal experience only. The study neglects factors after deal completion, e.g. the management strategy of the divested firm, which might co-determine perceived success.

### **2.2.3.2 Studies from an accounting perspective**

Studies addressing the divestment issue from an accounting perspective measure divestment success on the basis of post-divestment performance of the selling entity. Balance sheet figures are used as a performance benchmark.

Madahavan's meta-analysis of 94 empirical studies of the performance effects of divestments, finds that "one stream [of studies] employs accounting measures such as return on assets (ROA), return on sales (ROS), and earnings before interest, tax, depreciation, and amortization (EBITDA)". This group of evaluations is classified as "studies from an accounting perspective" in the following.

Hanson and Song (2003, 329) analyse the long-term value effects of divestment for a sample of 300 firms that sold non-core assets, comparing their EBITDA two years before and two years after the divestiture, to a non-divesting control group. Divesting firms increasingly outperform the control group in the years after the transaction. Analysing the degree of CEO ownership of divesting firms, the study finds that CEO ownership is positively correlated to abnormal performance for divesting firms (Hanson & Song, 2003, 333). These insights support the arguments of new institutional economics.

Cristo and Falk (2006) analyse factors determining the failure rate of divestments, referring to fundamental firm data. Success is measured as a composite of accounting and market value key ratios (2006, 335) at the target of the spin-off. Parent size and revenue size of the divestiture have significant positive effects on divestment success. The divestment process seems to need strong parent support to succeed. Cristo and Falk's study is exceptional, since it focusses on the target success, but the mixed model of performance measurement though is not sufficiently detailed in the paper.

Chen and Guo evaluate the performance of a sample of divesting firms, in the period 1985 to 1998, assessing the key figures revenue growth, capital expenditure, Tobin's q book-to market value, leverage, cash flow and dividend yield, as explaining variables for the divestment decision. They compare different forms of divestment, and juxtapose each divesting firm to a set of three non-divesting firms, comparable in branch and size (Chen & Guo, 2005, 407). Employing multinomial logit analysis, the authors show that underperforming firms try to enhance operating efficiency by the divestment, and avoid credit shortage. Firms discarding small units mostly use sell-offs, while larger units are frequently divested in the form of carve-outs or spin-offs (Chen & Guo, 2005, 418). Although these results correspond with common ideas, the study makes no direct statement about the sustainable success of divestments from the divesting firm's perspective.

### 2.2.3.3 Studies from a capital market perspective

Studies taking a capital market perspective assess post-divestment performance of the selling unit quantitatively, too. However they refer to the rating of the firm in the open capital market, i.e. apply the success measure of stock price or stock return. Madhavan (2010, 1351), conducting a meta-analysis on studies of firm performance after divestments, points out that cumulated average returns, CARs, is the common standard of stock market valuation analysis.

This method dates back to 1933, when Dolley (1933) evaluated capital market reactions after stock splits. Fama et al. (1969) applied the average abnormal return approach to assess divergences from the efficient market hypotheses due to extraordinary events and novel information. They evaluate the impact of splits by analysing the divergence of a stock rate from an assumed market proportional regression line, by comparing a characteristic period before the split to a period afterwards (Fama et al., 1969, 8-9). The authors refer to a period of 12 months before and 12 months after the split, subdivide it into part periods, and find the largest reactions in a period of three to four months before the split, so the original CAR model considers long-term, rather than immediate technical reactions in the immediate proximity of the split.

More recently, the CAR approach has been applied to assess stock market reactions in the environment of divestments. A broad range of studies has so far analysed and discussed the short-term value effects of strategic divestment:

Mentz and Schiereck (2008) assess the short-term value effects of acquisitions and mergers, at the acquiring company, in cross-border transactions, in the automotive business, by comparing the price development one year in advance of completion, and 20 days afterwards, and calculate positive cumulative abnormal average returns of about 1.2 %, depending on the range (Mentz & Schiereck, 2009, 212). Rieck and Doan (2009) analyse mergers and acquisitions in the global telecommunication business over a period of 10 years, and find positive abnormal returns (as compared to the fair market model) following the announcement (+/-2 days), in an estimation window of 120 days (Rieck & Doan, 2009, 373).

Rustige and Grote (2008) apply the same method to evaluate announcement effects of mergers and acquisitions, and divestments, of German DAX companies, for the period 1996 to 2006. While M&A activities frequently cause negative abnormal returns, divestment announcements result in significantly positive average cumulated abnormal returns, for all intervals comprising 1 to 5 days around the announcement. (Rustige, Grote, 2008, 20-21).

Brauer & Schimmer (2010, 84) evaluate abnormal returns on divestiture announcements for the global insurance industry, between 1998 and 2007. They find that program divestitures generate higher abnormal returns than single-event divestitures, since programmatic divestment decisions are seen as a strategic development process, by capital markets. The timing of divestment announcements is one significant determinant, among others, of stock market reactions.

Bartsch (2005, 132) evaluates market reactions after divestments, considering a period of 200 trading days before and after the divestment, i.e. about three quarters of a year. Bartsch subdivides the observation period into subintervals of 20 days before, to 10 days after the event, i.e. in fact short-term in character. Bartsch (2005, 132) points out that longer periods are not realistic for an application of the CAR model in its established form, since it assumes the beta and alpha-factors underlying the calculation of abnormal returns are constant. Bartsch compares stock market reactions of strategic, to non-strategic, divestments, and finds that positive returns after strategic divestments are significant for all observation periods, while non-strategic divestments tend to have negative returns (Bartsch, 2005, 171).

Brauer and Wiersema (2012) analyse average abnormal returns following the announcement of divestiture decisions, in a social context i.e. depending on the positioning of the firm in the context of a larger industry-specific divestiture wave. They find a U-shaped relationship, i.e. announcements at the beginning and at the end of a wave result in positive abnormal returns, while announcements in the mid of a wave more often deliver negative returns. In low resource-intensive industries, capital market reactions are generally more positive, and equally u-shaped, since there is less threat of resource shortage after the divestment, while for dynamic industries, average divestiture returns diminish significantly with wave progression (Brauer & Wiersema, 2012, 1484-1485).

The long-term post-divestment success accordingly has not yet been analysed consistently from a capital market perspective, i.e. applying the CAR approach. None of the studies considers time frames exceeding few weeks. Madhavan's meta-analysis provides a holistic overview on the results of 94 studies of value effects, but it does not explicitly differentiate, or compare, short and long-term market effects, and does not differentiate accounting and market-based value measures. In fact, there are hardly any evaluations of long-term capital market effects of divestments.

There are some studies that evaluate long-term market reactions after CEO or top management changes. They are of interest to the present study of long-term stock return effects after divestments to the extent that CEO changes, like divestment, indicate a significant change of entrepreneurial strategy, and divestments frequently are accompanied by CEO changes.

Lambertides (2009, 652-655) analyses the effects of CEO changes on the long-term performance development of 202 US-based stock companies, between 2001 and 2006. The study explicitly selects firms that have not been exposed to further turbulence in the period of observation. Average abnormal returns, as compared to the return expected according to the CAPM (risk-adjusted fair market value), are calculated for a time span of 200 day before and after the change. The study shows that CEO changes due to retirement of the predecessor result in positive stock reactions, while abrupt terminations due to death or illness have no significant stock return effects. Outsiders' entry tend to have positive long-term effects. Lambertides calculates the CAAR for a period of 202 days after the event, but assumes constant beta and alpha values for the estimation of the capital market line (Lambertides, 2009, 655-656). This is problematic, since beta and alpha factors of stocks vary with time. The beta value observed and fixed at the beginning of the observation period of 202 days, will have changed significantly by observation day 202, and this questions the validity of the assumed abnormality of stock returns. Lambertides' (2009) results accordingly are not reliable since they refer to the long-term but neglect alpha and beta changes. Further studies on changes after CEO switches apply other methodologies to avoid the problem of CAR inadequacy for longer observation periods:

Warner et al. (1988) assess market reactions to CEO changes, outsider changes and forced departures, at three half-yearly intervals after the change, and find no significant abnormal

returns (Warner et al., 1988, 474). Later studies are more significant. Clark (2004, 220-222) evaluates Fortune 500 firms after CEO changes, over the period 1997 to 2002, and finds that volatility diminishes in the year following the change, although many firms experience significant return slumps two years later. The study does not differentiate change conditions, or further potential macroeconomic factors beyond the reference index.

Braun and Latham evaluate firm performance after leveraged buyouts connected to a change in management boards. Performance is assessed as market capitalisation the year before and after the deal, which is the target parameter in a multiple regression model. Independent experts and bankers, lawyers or politicians in the management team cause positive performance development (Braun & Latham, 2009, 719). Unfortunately, macroeconomic input factors are neglected, and no reference index is considered.

#### **2.2.3.4 Summary of achievements and research gaps of long-term success measurement after divestments**

This review has grouped studies of value creation due to divestments, into three groups: surveys representing a managerial perspective, studies based on accounting figures, and market performance-based studies. Each category provides some insights, but has idiosyncratic limitations.

Virtually all studies discussed suggest that strategic divestments usually evoke positive value effects, and cause positive capital market reactions. Although this result is not representative, Madhavan's meta-analysis of 94 empirical studies supports the conclusion that the broad majority of reported value effects after divestments is positive (Madhavan, 2010, 1363).

No reliable and coherent methodology has so far been developed to measure long-term market value creation of divestments reliably:

Few of the studies from a management perspective intend to measure long-term market value created by divestments at all. Managerial surveys usually provide a by topic management assessment of the firm and taken together can provide practical insights into branch and business trends. The fundamental problem in management studies is that they

always represent the management perspective, which, as Vaara (2002, 214) points out, tends to be “overly optimistic” of divestment success (when the participating management has taken the divestment decision), and tends to overemphasize environmental and market-related difficulties (to justify management action).

Surveys usually evaluate events in the past, on the basis of personal experience, and provide future estimates on the basis of hope and prognosis. Objective performance results are hard to compare in a survey, since answers usually are coded in nominal or ordinal categories, to standardize across firm sizes and market conditions. None of the management-survey studies identified here provides objective, quantitative performance figures after divestments.

Quantitative studies based on balance sheet evaluation and stock market performance face the inverse difficulty. Kahlert (2010, 20) explains that accounting and market valuation-based studies are problematic, since a causal relationship between the value development and the process of divestment is frequently ambiguous. Further factors like the competitive situation, or global macroeconomic trends, could influence value development. For this reason, quantitative evaluations alone do not reliably explain the reasons for divestment success. On the other hand, balance and market key figure-based performance assessments provide objectively comparable performance data that can reliably be juxtaposed to compare performance development over time.

The market model and CAR approach proven for the analysis of short-term market reactions, has not been consistently transferred to the long-term perspective. The question under which conditions an application of the CAR model to long-term market reactions is useful, has not been answered reliably. Lambertides (2009, 655-656) attempts to use the CAR model in its standard form for an analysis of 202 days after the event of a CEO change, but operates on constant beta and alpha factors. This strategy assesses CARs incorrectly, since beta and alpha factors vary over time.

Brauer & Schimmer's (2010), Brauer and Wiersema's (2012) results for the short-term suggest, that the timing of the divestment is another important determinant of venture success. The impact of timing on the long-term market value effect of divestments has not yet been analysed quantitatively at all.

There has been some discussion of whether market or accounting-based performance measures should be preferred. While studies using accounting-based key figure analysis differ strongly concerning methods, targets and results, market-valuation based studies rely on the CAR approach as an established standard. The CAR method, on the one hand makes market-value based studies immediately comparable, but on the other hand it is so far inadequate for the analysis of extended timespans, since beta and alpha factors of the CAR model are usually assumed stable, which in the long-run is unrealistic.

Another point of critique concerning market valuation, usually based on stock returns, is that it cannot eliminate speculative effects inherent in the prices. Speculation does not always mirror facts precisely, it tends to predict, and partly overestimate, future developments. On the other hand, market based evaluations are to some extent more up-to-date and are not subject to accounting bias: Balance sheet figures are prepared after conclusion of a business cycle, so they give a historical perspective. Within the scope of accounting rules, they are subject to interpretation and manipulation (Madhavan, 2010, 1350). Market-based measures are more up-to-date, and are not biased by management interest. Stocks prices are available in a standardized form on the web, and need not be extracted from balance sheets, so stock price-based evaluation are more appropriate for large samples. Stock price-based performance evaluation is a reliable and efficient method for handling long data series and performance comparisons, in different time periods.

Capital market analysis therefore would be better apt for the assessment of long-term value effects of divestments, if a method is developed to handle the time-variance of beta and alpha factors.

## **2.3 Empirical research method**

### **2.3.1 Open Questions and hypotheses**

Summarizing the critique of previous studies, they do not answer the question of the quantitative sustainable i.e. long-term market performance effect of divestments:



Previous studies agree that expected long-term results of divestments are positive, but little is known of the extent of this effect. Madhavan (2004) finds that the combined market and accounting value effect observed, is between -0.5 and + 0.5 %, but he does not differentiate between short and long-term, and different forms of calculation.

Studies from a capital market perspective use the CAAR approach and evaluate the part periods in detail. Results of studies based on the CAR model however are reliable only for brief time periods after the event since so far application of the CAR approach are not apt to consider changing alpha and beta factors. (Lambertides, 2009, Bartsch, 2005; Brauer, 2006, Brauer & Wiersema, 2012). The CAAR model in its present form only calculates market reactions reliably only in the immediate aftermath of the announcement. In result truly long term effects spanning several years form the divestment event cannot be analysed using the present CAR method.

On the other hand, studies based on other methods namely balance sheet data (Hanson and Song, 2003, Cristo and Falk, 2006, Chen and Guo, 2005) and annual regression of returns (Warner et al., 1988, Braun & Latham, 2009) are inadequate to evaluate the development the companies undergo in the period between two assessment time points. Precisely they are not differentiate enough to analyse which development the companies take in between two accounting dates, e.g temporary over or under-pricing.

The core objectives of the following empirical study derive from these research gaps: It develops and tests a dynamic market model, to analyse long-term market value effects and time-dependence of divestments, based on the CAR approach. Performance results can thus be classified by time of deal completion, so periodic patterns determining market success can be determined quantitatively.

Such a model is of practical and academic value: From an academic perspective it classifies divestments in the context of previous research in CAR models, and expands its horizons. Considering the long-term effects of divestments, it also provides insights for shorter periods, by applying comparable strategies (Rustige & Grote (2008), Brauer & Schimmer (2010), Brauer & Wiersema (2012)).

From a managerial perspective, the study shows quantitatively to what extent divestments in telecommunications create sustainable value. The study identifies ideal time points in the past for divestments in telecommunications, drawing on a representative global sample, to help time future divestitures.

To concretize this research objective, two research hypotheses are formulated, as follows:

**H1:** The CAAR in the two post-divestment years significantly exceeds the CAAR in the two pre-divestment years.

**H2:** Long-term cumulative average abnormal returns differ significantly, depending on the timing (deal year) of the divestment.

### 2.3.2 Statistical method

To resolve this research task, a statistically-founded methodology, based on the CAR model for short-term analysis, is first developed.

#### 2.3.2.1 Market model

The market model, as defined by Markowitz (1959) and Sharpe (1963), has established a common reference standard for the assessment of fair returns of a stock, compared to a reference index. It is employed by Bartsch (2005, 139) and Brauer & Wiersema (2012), for instance, and its empirical relevance has been proven in many empirical studies (Armitage, 1995, 33).

The market model estimates the expected return  $E(R_{it})$  of stock company I, at time point  $t$ , as a linear function of the return  $R_{Mt}$  of the reference index M, in  $t$ , as follows:

$$E(R_{it}) = a_i + b_i R_{Mt} + \varepsilon_i$$

$a_i$  describes a constant development of  $R_{it}$ , independently of the stock index,  $b_i$  measures the sensitivity of the stock return to the development of the return of the market index, i.e. represents the systemic risk the stock is exposed to. The residual variable  $\varepsilon_i$  describes an idiosyncratic risk component of the stock, dependent on firm-specific influences only, which are expected to be zero in the long-run (Francis & Kim, chapter 12.5).

Given the returns of an index and a stock, for a certain time period, the  $b_i$  and  $a_i$  values for the expected return of the stock can be estimated in an ordinary least-squares regression. Brauer and Wiersema (2012, 1480), for instance, determine the factors of the market model based on an estimation window of 250 trading days, from 295 to 45 days before the divestment event. Bartsch (2009, 139) assumes a formation period of 230 days before, to 10 days after the event. Rieck and Doan (2009, 374) use an event window of 120 days to 12 days before the event.

Barber and Lyon (1997, 342-343) argue that, generally, long-term models based on abnormal returns as compared to a general index, are not fit to calculate abnormal returns, since indexes have a listing, rebalancing and skewness bias, as a result of which test statistics are positively biased. Certainly this argument fits to some extent, as it does for every long-term index-based analysis. Barber and Lyon suggest comparing individual paired companies instead.

This method, however, has further, and even more serious, difficulties: Each company has its own, particular history. Particularly in the long run, one firm-specific event leads to the next, and creates an idiosyncratic storyline. Reference companies that have not been exposed to divestments are likely to undergo further incidents, like management changes, acquisitions and financial difficulties or options, which will all affect the stock price. Comparing two selected firms in the long-term would multiply the biases of making reference to an index: While an index balances specific corporate events, individual firm comparisons overrate divergences in stock price developments resulting from idiosyncratic events. The choice of reference companies is always subjective: Particularly over longer observation periods, it is hard to find firms that are parallel in their growth history and strategic development. For this reason, the choice of the CAAR approach is the lesser evil, compared to individual company comparisons.

However, some adaptations have to be made to the basic static market model to adapt it to long-term analysis requirements: The method of using a fixed formation range is not appropriate for long-term analysis. The choice of longer observation periods, according to Bartsch (2005, 131) and Rieck & Doan (2013, 373), entails the risk that further market impacts disturb the results, and that abnormal returns are falsely attributed to the divest-

ment. Beta factors change in the course of the observation, which means that the underlying market model no longer reflects fair returns more. For this reason, virtually all previous studies which apply the CAR/CAAR approach are restricted to the observation of short-term effects of divestments (e.g. Bartsch, 2005, Rustige & Grote 2008, Brauer & Schimmer 2010, Brauer & Wiersema 2012).

Applying constant beta-factors to short-term analyses (analyses spanning a time window of only a few days from the divestment), is justified, since in such short periods the risk inherent in the asset is unlikely to change fundamentally. Beta and alpha-factors are accordingly kept constant in these short-term studies. Authors operating on CAR models have, however, so far never considered the long-term, because the so far broadly accepted model using constant beta-factors is not applicable to the long term, when beta factors usually change. Brown and Warner (1985) explain that CAARs work out for the short term only, for this reason, but are inadequate to assess the long-term.

To resolve this problem, and allow reliable CAR-based analyses for the long-term, a new solution, which builds on time-varying beta factors, is suggested here. For the observation of long-term performance patterns after divestments, the methodology of CAAR evaluation applied in short term analyses has to be adapted to consider time-varying beta and alpha factors. To this end, the monthly time series of beta and alpha factors, by stock, are retrieved, and the topical beta and alpha factor is used to calculate the abnormal return for each period.

To derive current parameters,  $a$  and  $b$  of the market model are calculated on the basis of the previous 200 trading days, for each observation day, a timeframe which has been found sufficiently short in previous short-term studies to obtain reliable  $a$  and  $b$  factors (Bartsch, 2005, Rustige & Grote 2008, Brauer & Schimmer 2010, Brauer & Wiersema 2012). Time-varying parameters are calculated in Excel (as shown in the table 3) for a reference period of *4 days*.

	A	B	C	D	E	F	G
1	Days	index return	stock return				
2		x-values (Rit)	y-values (RMt)	slope (bi)	y-axis intercept (ai)	Formula slope	formula intercept
3	01.01.2012	0,03	0,015				
4	02.01.2012	0,05	0,07				
5	03.01.2012	0,02	0,06				
6	04.01.2012	0,05	0,05	0,50	0,03	=INDEX(RGP(\$C3:\$C6,\$B3:\$B6);1)	=INDEX(RGP(\$C3:\$C6,\$B3:\$B6);2)
7	05.01.2012	0,06	0,07	0,17	0,06	=INDEX(RGP(\$C4:\$C7,\$B4:\$B7);1)	=INDEX(RGP(\$C4:\$C7,\$B4:\$B7);2)
8	06.01.2012	0,06	0,08	0,33	0,05	=INDEX(RGP(\$C5:\$C8,\$B5:\$B8);1)	=INDEX(RGP(\$C5:\$C8,\$B5:\$B8);2)
9	07.01.2012	0,01	0,04	0,65	0,03	=INDEX(RGP(\$C6:\$C9,\$B6:\$B9);1)	=INDEX(RGP(\$C6:\$C9,\$B6:\$B9);2)
10	08.01.2012	0,02	0,06	0,59	0,04	=INDEX(RGP(\$C7:\$C10,\$B7:\$B10);1)	=INDEX(RGP(\$C7:\$C10,\$B7:\$B10);2)
11	09.01.2012	0,05	0,08	0,76	0,04	=INDEX(RGP(\$C8:\$C11,\$B8:\$B11);1)	=INDEX(RGP(\$C8:\$C11,\$B8:\$B11);2)
12	10.01.2012	0,02	0,05	0,94	0,03	=INDEX(RGP(\$C9:\$C12,\$B9:\$B12);1)	=INDEX(RGP(\$C9:\$C12,\$B9:\$B12);2)
13	11.01.2012	0,06	0,01	-0,55	0,07	=INDEX(RGP(\$C10:\$C13,\$B10:\$B13);1)	=INDEX(RGP(\$C10:\$C13,\$B10:\$B13);2)
14	12.01.2012	0,04	0,04	-0,51	0,07	=INDEX(RGP(\$C11:\$C14,\$B11:\$B14);1)	=INDEX(RGP(\$C11:\$C14,\$B11:\$B14);2)
15	13.01.2012	0,05	0,04	-0,86	0,07	=INDEX(RGP(\$C12:\$C15,\$B12:\$B15);1)	=INDEX(RGP(\$C12:\$C15,\$B12:\$B15);2)
16	14.01.2012	0,06	0,07	0,00	0,04	=INDEX(RGP(\$C13:\$C16,\$B13:\$B16);1)	=INDEX(RGP(\$C13:\$C16,\$B13:\$B16);2)
17							

Table 3: Method of calculating a time-varying reference market model for long-term analysis (author's elaboration)

This method results in a modified market model in which  $a_i$  and  $b_i$  are not constant, they are time-varying with a lag of  $l$ . It describes the horizon before the measurement of  $R_i$  and  $R_m$  that is considered to determine the factors. Mathematically, the time-varying market model is:

$$E(R_{it}) = a_{i;l} + b_{i;l}R_{Mt} + \varepsilon_{i,l} \quad \text{with } E(\varepsilon_{i,l}) = 0$$

To validate the long-term model, according to Brown and Warner (1985, 3), returns and abnormal returns must be stochastically normally distributed, and not auto-correlated. Tests for normal distribution and autocorrelation of the data series have to be conducted, to test the empirical validity of the model, but the same tests are also necessary for short-term, and regression models in general.

### 2.3.2.2 Evaluation of CAR (cumulated average abnormal returns)

The following formula calculates discrete daily returns from stock rates:

$$R_{it} = \frac{K_{it} - K_{it-1}}{K_{it-1}}$$

where  $K$  are the stock rates, cleared by dividend and adjustments (clean price). The abnormal return is the extent to which the observed return exceeds the expected return:

$$AR_{it} = R_{it} - E(R_{it})$$

Using the time-varying market model, the dynamic formula for abnormal returns results is now:

$$AR_{it} = R_{it} - [a_{i;t} + b_{i;t}R_{Mt}]$$

Dynamic abnormal returns by stock can be calculated daily for a certain reference index and a reference period of lag  $l$ . Dynamic abnormal returns, in contrast to conventional abnormal returns, are appropriate for the assessment of infinitely long periods of time, since  $b_i$  and  $a_i$  are not fixed, they adapt dynamically with elapsed time.

Cumulated abnormal returns for a period starting at day  $t = u$  and ending at day  $t = z$  can now be calculated by adding up the daily returns from  $u$  to  $z$  (see Bartsch, 2009, 139-140):

$$CAR_{[u;z]} = \sum_{t=u}^z AR_{it}$$

To test H1 and find out the degree of sustainable market-value creation due to divestments, two CAR series have to be compared: The CAR for the two-year period before the divestment, and the CAR for the two-year period after the divestment. The result of the CAR calculation is a dataset containing two values per stock: a CAR<sub>v</sub> (before the divestment) and a CAR<sub>n</sub> (after the divestment), as follows:

<b>Company</b>	<b>Deal year</b>	<b>2 years period before divestment</b>	<b>2 years period after divestment</b>
Firm 1	2001	CAR <sub>v</sub> 1999	CAR <sub>n</sub> 2003
Firm 2	2004	CAR <sub>v</sub> 2002	CAR <sub>n</sub> 2006
Firm 3	2010	CAR <sub>v</sub> 2008	CAR <sub>n</sub> 2012

*Table 4: Conceptual structure of resulting dataset author's illustration)*

To avoid short-term stock market reactions resulting from speculative effects in the immediate environment of the divestment, affecting the results, and to ensure that only sustainable value effects are considered, a period of 100 days before, and 14 days after the day of divestment contract conclusion, is omitted from analysis.

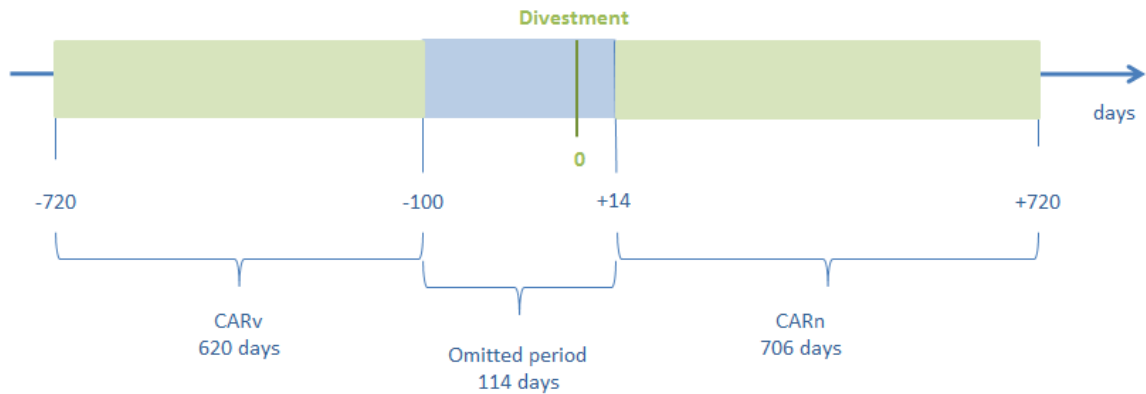
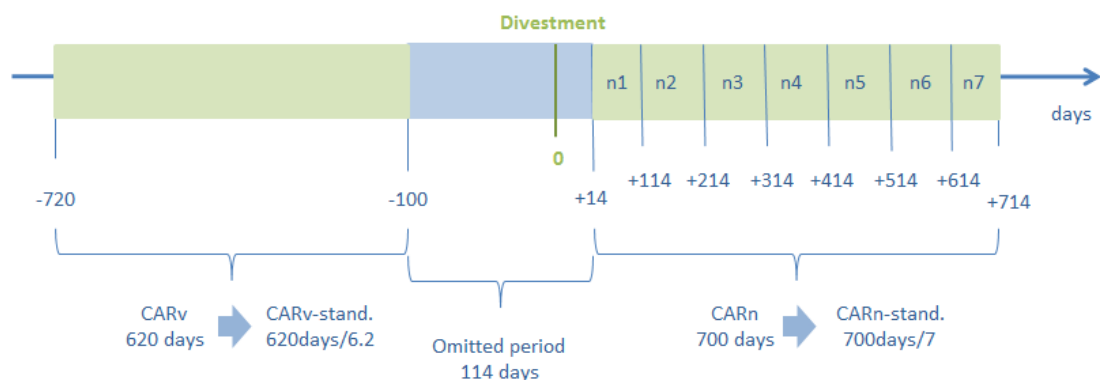


Figure 4: Timeframe of analysis (author's draft)

This range is chosen in accordance with previous studies of short-term market reactions to divestments, which omit a timeframe of two to five days in the immediate environment of the divestment, and consider timeframes of 100 to 200 days before, and 5 to 14 days after the deal (e.g. Bartsch, 2005, Rustige & Grote 2008, Brauer & Schimmer 2010, Brauer & Wiersema 2012). Omitting this short-term period of -100 to + 14 days, allows comparing the long-term data to short-term results for the omitted timeframe, later (chapter 3/study 2).

To evaluate H1 in more detail, the research period marked in green in figure 5 is subdivided into seven sub-periods, comprising 100 days each, as follows.



*Figure 5: Subdivision and standardization of timeframe (author's draft)*

CARs for each of these sub-periods CAR<sub>n1</sub> to CAR<sub>n7</sub> are now compared to the CAR-value in the pre-divestment phase. Since CAR<sub>v</sub> comprises 620 days, it has to be standardized on a 100 day basis, to be comparable to the CAR<sub>n</sub> sub-periods. CAR<sub>v</sub> is standardized by dividing by 620 and multiplying by 100. To make the whole CAR<sub>n</sub> period, comprising 700 days, comparable to the standardized CAR<sub>v</sub> period, CAR<sub>n</sub> is divided by 700 and multiplied by 100. In this way, the average abnormal return values of the total CAR-v and CAR-n period become comparable to the 100 day intervals.

H1 now can be subdivided into seven part-hypotheses: CAR<sub>n</sub>, where n takes the values 1 to 7, for the consecutive seven 100 day periods n, beginning at day 14 after the divestment, and ending on day 714 after the divestment, each significantly exceed the standardized CAR (on a 100 day basis) for the two pre-divestment years.

### **2.3.2.3 Concretization of H1 and T-Test for paired samples**

The CAR values for the standardized complete period n and v, and the part intervals n1 to n7 are now tested for the equality of their means, in a t-test for paired samples, in SPSS. The t-test examines the zero-hypothesis that the means of the CAR values in the 2-year period before the divestment are equal to the means of the CAR values in the two years period after the divestment, by calculating the t-value as follows (Brosius, 2011, 489):

$$t = \frac{\bar{D}}{\sqrt{\frac{s_D^2}{N}}}$$

$\bar{D}$  is the average difference between the two CAR value series,  $s_D$  is the standard deviation of the differences between the CAR values v, and N is the sample size. When the difference between the CAR values is low, and t is near zero, H<sub>0</sub> has to be accepted. To verify H<sub>1</sub>, the difference  $\bar{D}$  should be as high as possible. SPSS indicates the error probability of falsely accepting that H<sub>0</sub> though H<sub>1</sub> are true, in a significance value, indicating the % error probability. The test significance should be as low as possible, to accept H<sub>1</sub>. H<sub>1</sub> is accepted here for error probability below 0.1 (10 %).



### 2.3.2.4 Concretization of H2 and ANOVA to test time-dependence of CARs

To test H2, a univariate ANOVA test of the timing of the deal is conducted. It compares the CARn values, the market values in the period after the divestment. ANOVA groups the divestment acts by deal year, and compares the mean returns achieved. Formally, an F-test is conducted to examine the zero hypothesis that means are equal across all case groups (i.e. independent of the year of deal conclusion). Mathematically, SPSS analyses the variance of the cases, and divides the total variance into the variance within (QSI), and between the case groups (QSZ). The F-value is the ratio of the variance between the groups to the variance within the groups, and also considers the degrees of freedom resulting from the number of groups (k) and the number of cases (N) (Brosius, 2011, 504).

$$F = \frac{\frac{QSZ}{k-1}}{\frac{QSI}{N-k}}$$

$$QSI = \sum_{i=1}^k (N_i - 1)S_i^2 \quad QSZ = \sum_{i=1}^k N_i(\bar{X}_i - \bar{X})^2$$

To assume H2, F should be high, i.e. the variance between the case groups should be much higher than the variance within them. SPSS indicates the significance value, i.e. the error probability of falsely accepting H0 and denying H2. It should be below 10% (Sig < 0.1) to accept H2.

The test years that do not differ at that error are divided into subgroups, to identify periods of different CARn levels, to suggest the optimal timing of divestments, to achieve a high level of sustainable market value creation.

To concretize the analysis of H2, the timing of the deal is specified in more detail, applying the following time categories:

**H2a:** The CARn values for periods 1 to 7, and as a whole, differ significantly, depending on the year of divestment deal conclusion. To test this assumption, a year dummy is applied.

**H2b:** The CAR<sub>n</sub> values for periods 1 to 7, and as a whole, differ significantly, depending on the quarter of divestment deal conclusion (regardless of the year). To test H2b, a quarter dummy, coded 1 to 4, is introduced.

**H2c:** The CAR<sub>n</sub> values for periods 1 to 7, and as a whole, differ significantly, depending on whether the divestment deal was concluded before or after the financial crisis of 2008 (compare introduction to this paper). To test H2c, a dummy, coded 1, for deal conclusions before December, 31, 2008, and 2 for deal conclusions after December 31, 2008 is introduced.

### **2.3.3 Empirical data**

#### **2.3.3.1 Choice of business and companies**

To test and apply the methodology of long-term market value analysis developed, the following elaboration focusses on the telecommunications business. Global telecommunications is of particular practical and academic interest for a detailed analysis:

On the practical level, the telecommunications business has recently been subject to significant structural changes. PWC (2012) points out that the number of high-value deals in telecommunications has been rising strongly since global players expand their acquisition activity, while smaller corporations concentrate on their core competencies. Simultaneously, a dynamic technological development is under way in the smartphone, mobile, wireless web and app markets (Deloitte, 2013/II). Providers are under pressure to adapt to these trends and develop own expert knowledge, to remain competitive. The question whether divesting firms benefit from these trends is still unresolved. The telecommunications business could be a pioneer and reference to the development in other dynamically evolving high-tech branches.

On the academic level, Rieck and Doan (2008) have analysed short term M&A performance effects in global telecommunications, but the question of the effect of divestments in this business is still unresolved. Similarly to Rustige and Grote's (2008) comparative insights on divestitures and acquisitions in DAX companies, the juxtaposition of divestments and M&A effects in telecommunications promises interesting insights into the alternatives of focussing or diversification.

The data set of underlying the following evaluations refers to divestments in the global telecommunication business from 2005 to 2011. This range ensures the scope of the analysis, and guarantees that continuous stock prices are available for the whole period of analysis. For earlier transactions, no contingent data is available.

There is a broad range of about 250 divestments available in the communications business in the observation period of 2005 to 2011. The difficulty is, that not all transactions are representative, since small scale divestments frequently are dominated by large scale buyers who in fact determine the sales price per stock. To avoid this bias this study refers to transactions exceeding a certain minimum size only. Huberman and Halka (2001, 166) suggest that the stock market can be classified into four liquidity quartiles according to the market capitalization of stocks. Stocks in the lowest size quartile are little liquid and accordingly are easily influenced by bulk orders. The size of 300 million stocks corresponds to about the 25% percentile of available divestment transaction in the telecommunication business in the observation period, and for this reason has been chosen as a lower size limit.

Previous studies usually refer to a common stock market index. Bartsch (2009, 147), for instance, uses the DAFOX. Brauer and Wiersema (2012, 1480) employ the S&P 500 as a reference. For a branch-specific analysis, as intended here, general indexes are not adequate, since they do not mirror branch-specific trends. Referring to a general stock index, telecommunications-specific excess returns, as compared to the general trend of global stock, would be counted falsely in the CAR calculation. To eliminate the impact of branch-specific effects on the abnormal return, the branch-specific underlying ETF iShares Global Telecom<sup>5</sup>, is employed as a reference. It is free from dividend payments, and available from Nov, 26, 2001.

It could be argued that the margin between the branch-specific index iShares Global Telecom, and individual telecommunications stocks, do not mirror part of the general market risk, since telecommunications companies have particular properties. However, the discussion in this dissertation is not about global market risk exposure, it is about the isolated effect of divestments on stock returns. If a non-branch-specific index were used, the index

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<sup>5</sup> <http://finance.yahoo.com/q?s=IXP>, access on Jan, 5, 2014

would display general market risk, while the telecommunications titles would show a diverging exposure to this general risk, due to their branch-specificity. In practice, the difference between the two margins would mirror the divergence between general markets and the telecommunications market, which is not relevant for the analysis in this study. Accordingly, arguing with Barber and Lyon (1997), the restriction of the reference sample to communication companies eliminates some of these unmatched risks. The margin between a telecommunications title and the Ishares Global Telecom is more appropriate to calculate the isolated effect of the divestment than the margin between a telecommunications title and a general market index.

### **2.3.3.2 Available market data**

To develop a valid dataset, strategic divestments in the telecommunications business have to be detected reliably, which again poses the question of the delimitation of strategic divestments (as compared to other reactive or forced divestments). Bartsch (2005, 152) suggests only accepting a set of 5 divestment motives (strategic redefinition, portfolio adjustment, concentration on core competencies, complexity reduction, apex of product life cycle, provision against unfriendly take-over) as strategic. Bartsch assumes a strategic divestment when one of these motives is mentioned in annual reports or in the press, but he neglects the following strategic reasons: management re-alignment, capital market pressure, avoidance of disergies, integration difficulties, enhancement of competitiveness – points identified in the review in chapter 2. The following evaluation applies Bartsch's methodology of extracting divestment reasons from the media and annual reports, but extends the range of categories to those summarized in figure 3.

Divestment events are identified in a web search applying the key words “divest\*” AND telecommunications”. The company names in the resulting search protocol are then evaluated for concrete events, referring to annual reports and press releases. In this way, a total of 62 divestment events, exceeding 300 million US\$, were identified for the period 2005 to 2011. The dataset and data preparation explained in the following, are in appendix 7.1.

The stock rates for the divesting firms are then gathered on yahoo finance, considering a range of 720 days before, to 720 days after the divestment event, as detailed in section 2.3.2. Unfortunately, data is not available for all 62 events. Some companies are not listed

by yahoo, and some did not publish stock rates for the whole period. 10 divestment events had to be dropped, leaving a final sample of 52 datasets.

To obtain the final dataset for statistical evaluation, the basic data is managed as follows: The stock rates are listed by trading day, for each firm, and by applying the excel-function `svrweis()`, the rates of the reference index Ishares Global Telecom are assigned to each stock by trading day. Then daily arithmetic stock and index returns are calculated, and missing values for the index, i.e. days on which the stock was traded, but the index was not, are filled with a zero return.  $E(R_i)$  and  $AR_i$  are then calculated, as detailed in section 2.3.2.

Average daily abnormal returns are cumulated into the periods  $CAR_v$ ,  $CAR_{n1}$  to 7, and  $CAR_{n-total}$ , as detailed in figure 5.  $CAR_v$  and  $CAR_{n-total}$  are standardized, as described in section 2.3.2, and dummy parameters are added for years of deal conclusion, quarter of deal conclusion, and pre- and post-crisis deals.

### 2.3.3.1 Distribution of events and CARs

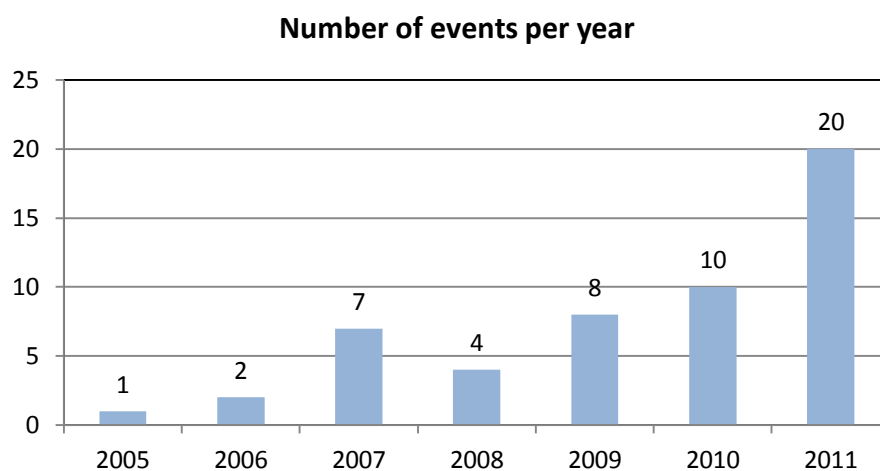
Drawing on Brown and Werner, the CAR values are first tested for normal distribution, using the Kolmogorov-Smirnov and Shapiro-Wilk test (Brosius, 2011, 405). The following overview shows that results for both tests are significant, for all CAR time series. Detailed results are in Appendix 7.2.2 and 7.3.3. A regression model, as specified in section 2.3.2.1 is thus admissible.

	Kolmogorow-Smirnow <sup>a</sup>			Shapiro-Wilk		
	Statistik	df	Sig.	Statistik	df	Sig.
day-720 to100 / 6,2	,151	52	,005	,758	52	,000
day+14 to +114	,166	52	,001	,794	52	,000
day+115 to +214	,143	52	,010	,911	52	,001
day+215 to +314	,137	52	,016	,951	52	,032
day+315 to +414	,182	52	,000	,784	52	,000
day+415 to +514	,160	52	,002	,911	52	,001
day+515 to+614	,313	52	,000	,473	52	,000
day+615 to +714	,227	52	,000	,651	52	,000
day+14 to+714/7	,216	52	,000	,812	52	,000

Table 5: Test for normal distribution (Author's table)

Tests for autocorrelations of the data series are conducted using the Box-Ljung statistic. The detailed results are in Appendix 7.1.2. There is hardly any significant autocorrelation, so the suggested model is admissible for the CAR time series.

By far highest number of events is in 2011. The number of telecommunications divestment deals seems to have increased exponentially since 2005. The comparative peak in 2007, the year in which the global financial crisis started in October, seems to be an exception to the trend. All but one of the 2007 deals were concluded before October, i.e. sellers managed to utilize high market ratings for the sale. Altogether, 27 % (14) of the events are pre-crisis, i.e. concluded before December, 31, 2007, and 73 % are post-crisis deals.



*Figure 6: Number of events per year (author's draft)*

These observations on divestment deal timing are subject to some publication bias. Web research is most detailed for recent years, and information available diminishes with time. 8 years ago, the web was not as widespread as it is today, so it contained less information on divestment deals, so the study is biased towards recent events. There is less bias concerning the quarters of deal conclusion, neglecting the year:

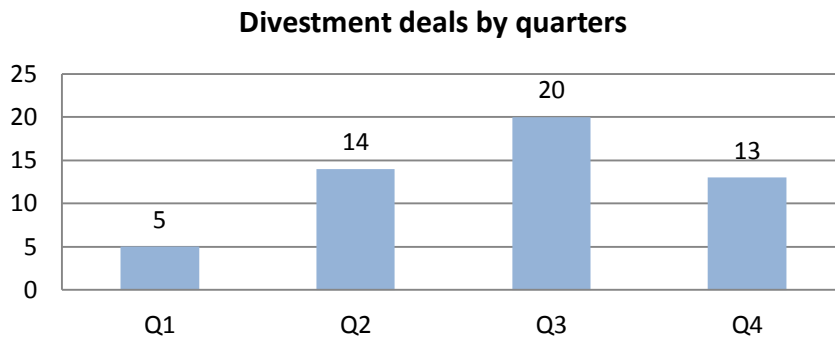


Figure 7: Number of observed events per quarter (author's draft)

Most deals are concluded in quarter 3, followed by quarter 2 and 4. Only 5 of 52 divestments were in quarter 1. An analysis of the share of positive CARs by observation period permits some initial insights into the distribution of the sample results:

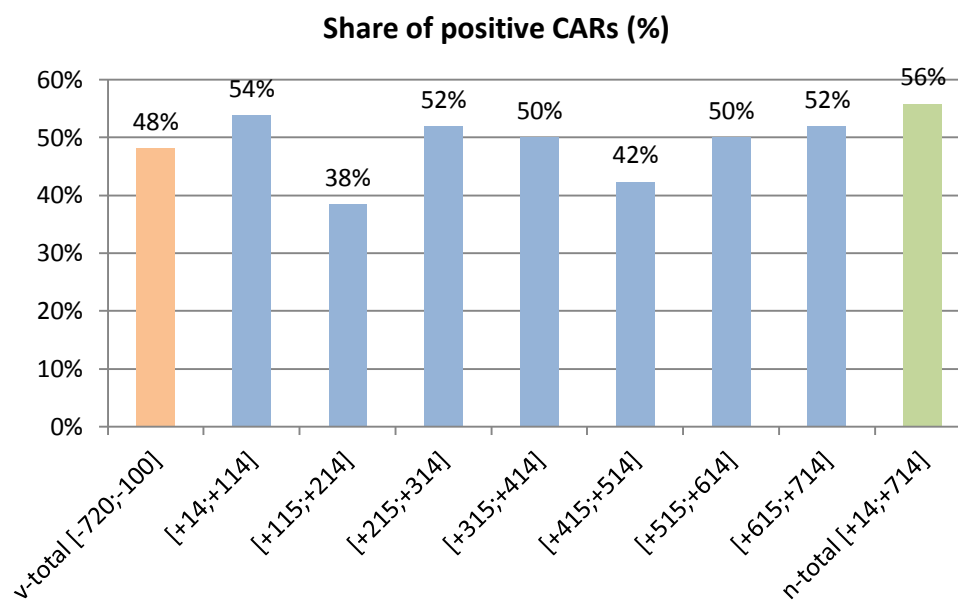


Figure 8: Share of positive CARs per period (author's draft)

It is striking that for the period v, i.e. before the divestment events, a significantly smaller proportion (48%) of the sample displays positive CARs, than in the whole period n after the divestment contract (56% positive). An analysis of the sub-periods n1 to n7 after the divestment shows that the share of positive and negative CARs is quite balanced. In periods n2 and n4, about 60 % of the CARs are positive, while in n1, n3 and n6, only about 42 to 52% of the CARs are positive. Strategic divestments apparently are not a ready-made recipe for market success, but this chart says nothing about the scope of abnormal

returns. CARs in the pre-divestment period range between  $-1.264$  and  $+0.438$ , and CARs in the post-divestment period n-total are between  $-0.389$  and  $+1.056$ . This preliminary result suggests that for the upper quintiles of the events considered, the post-divestment CARs is significantly higher than the pre-divestment values. Does the hypothesis test confirm this assumption?

## 2.4 Empirical results

The data is exported to SPSS, to conduct the tests of H1 and H2, which provides further information on the quantitative relationship of divestment and success. The SPSS results are in appendix 7.1.2 for H1, and appendix 7.1.3 for H2.

### 2.4.1 H1: Comparative CARs before and after divestment

H1 tests the assumption that the CAR in the two pre-divestment years (v-period) is significantly lower than in the two post-divestment years (n period). The following chart summarizes the comparative CAR values by sub-period, and indicates the significances of the T-tests. Higher mean values by period, and significant results, are printed in green.

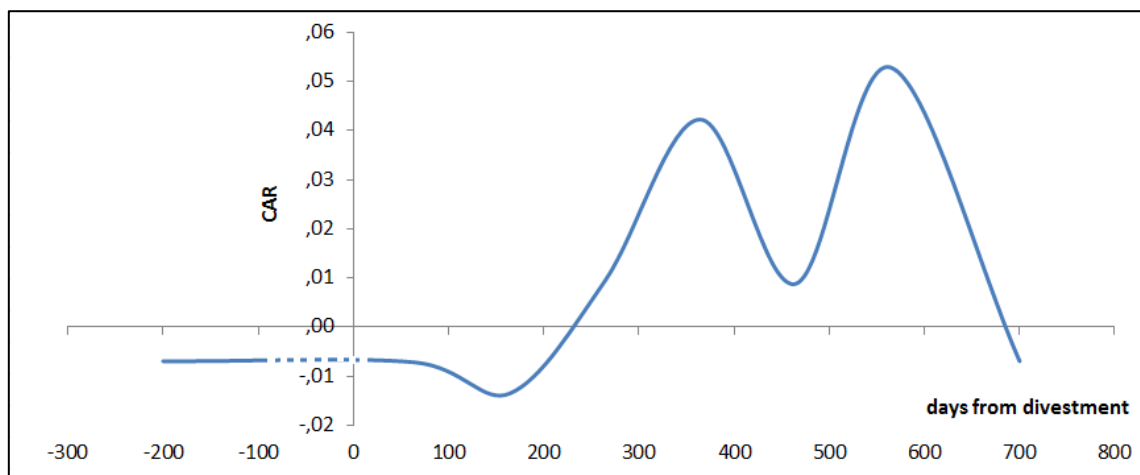
Period		Value	Mean	t- Sig.
V-period [+14;+114]	to N1	CAR_V_Stand	-,00696	
		CAR_N1	-,00718	,993
V-period [+115;+214]	to N2	CAR_V_Stand	-,00696	
		CAR_N2	-,01351	,773
V-period [+215;+314]	to N3	CAR_V_Stand	-,00696	
		CAR_N3	,00947	,495
V-period [+315;+414]	to N4	CAR_V_Stand	-,00696	
		CAR_N4	,04230	,081
V-period [+415;+514]	to N5	CAR_V_Stand	-,00696	
		CAR_N5	,00880	,598
V-period [+515;+614]	to N6	CAR_V_Stand	-,00696	
		CAR_N6	,05291	,225
V-period [+615;+714]	to N7	CAR_V_Stand	-,00696	
		CAR_N7	-,03950	,459
<b>V-period [+14;+714]</b>	<b>to N-total</b>	<b>CAR_V_Stand</b>	<b>-,00696</b>	
		<b>CAR_tot_stand</b>	<b>,00848</b>	<b>,093</b>

Table 6: Comparative CAR-values and t-significances (author's draft)



Comparing the pre-divestment period (v) to the total post-divestment period (n), CAR values have significantly improved on average, from a standardized mean abnormal return, on a 100 day basis of -0.7% to + 0.84 %.

The analysis of the sub-periods is of interest: it illustrates that for the initial two post-divestment sub-periods N1 and N2, i.e. from day 14 to day 114 after the divestment, the pre-divestment return tend to exceed the post-divestment return. From post-divestment period N3 to N6 (i.e. from day 215 to 614), this relationship inverts - the post-divestment return now exceeds the pre-divestment return. In N4, i.e. from day 315 to 414 after the divestment, this post-divestment success is significant. In N6, another CAR peak is observed, but is not significant. In period N7, again pre-divestment returns tend to be higher than post-divestment returns. H1 is accepted, but for the majority of interim periods the part hypotheses are not significant. The following chart illustrates the development of CARs over the observation period (The dotted line indicates that the range of 100 days before to 14 days after the event has not been evaluated in this study).



*Figure 9: Smoothed development of CARs in the prolonged post-divestment period (author's draft)*

This observation suggests that sustainable value creation after divestments needs time to develop. Although over the whole observation n-period of two years, strategic divestments definitely bear positive value effects, initial barriers have to be overcome first, to put efficiency gains into effect. These reach a statistical apex about one year after the divestment (period N4 and N6). For observation period N7, the efficiency effect of divestments is possibly diluted by other market influences.

The initially reviewed theories of divestment motivations from different economic perspectives explain this observation:

The market-based view points out that divestments ease focussing on core competencies, key customers and key markets, which enhance competitiveness (Dung, 2012, 107; Hill, 1985, 828, Federico & Lopez, 2012, 12). This takes time to develop. Customer services have to be reorganized after the divestment, and activity in key markets can be intensified only when capital has been made available after the sale. Focused marketing strategies in remaining key markets have to be developed and be accepted. From a resource-based view, divestments diminish disergies, and allow concentration on key resources. Specialization enhances the utilization of synergy effects in particular fields (Eckardt, 1996, 70-71; Chang, 1996), but these core competencies though do not unfold immediately, they need time to grow. Divestments entail organizational restructuring, which initially causes friction, but in the long run leaves divesting firms free of ballast. Markets reflect the difficulties of reorganization and reorientation after divestments, and reward these processes only after some reluctance.

## **2.4.2 H2: ANOVA analysis of CAR time-dependence**

### **2.4.2.1 Impact of divestment year on divestment value creation**

Do the long-term CAR values depend on the timing of contract conclusion, as suggested by H2? H2a tests to what extent post-divestment, as compared to pre-divestment, CARs, depend on the year of contract conclusion. Table 7 illustrates the mean values by year of contract closure and observation period. Values in green are highest for the observation period, values in red are lowest.

The following table 7 illustrates that highest and lowest CARs occur in the years 2005 to 2008 most frequently, independently of the observation time. For observation periods N4 and N5, the highest CARs are for deal year 2011. CAR volatility after divestments has tended to diminished since the global economic crisis.

deal year		2005	2006	2007	2008	2009	2010	2011	total	ANOVA
V-total										
stand.	[-720;-100]	,01981	-,03043	,01372	,01841	-,00202	-,01008	-,01869	-,00696	,277
N1	[+14;+114]	-,07939	,10976	-,09534	,04727	,02736	,02629	-,02584	-,00718	,475
N2	[+115;+214]	-,01558	,05691	,08705	,00598	-,05768	-,02172	-,03778	-,01351	,729
N3	[+215;+314]	,09575	-,09439	,04228	-,02440	,02957	,03047	-,00771	,00947	,932
N4	[+315;+414]	,00551	-,03014	-,05144	,07959	,02561	,01973	,09469	,04230	,614
N5	[+415;+514]	-,00405	,07318	,00278	-,08976	-,03838	-,08709	,09164	,00880	,351
N6	[+515;+614]	-,07692	,05544	,13657	,00571	-,05205	,04338	,08604	,05291	,962
N7	[+615;+714]	-,03922	-,25904	,02213	,02806	-,00099	-,02477	-,07542	-,03950	,947
N-total										
stand.	[+14;+714]	-,01577	-,01872	,02427	,00800	-,00947	-,00126	,01904	,00848	,462

Table 7: CARs by year of divestment contract conclusion (author's draft)

The ANOVA tests conducted to assess H2a are not significant for any observation period. H2a has to be denied. The year of deal conclusion does not predict sustainable market value creation due to strategic divestments, reliably.

#### 2.4.2.2 Impact of divestment quarter on divestment value creation

Does, as asserted by H2b, the quarter of deal conclusion, irrespective of the year, have an impact on sustainable market value creation after divestments?

deal quarter		Q1	Q2	Q3	Q4	total	ANOVA
V-total							
stand.	[-720;-100]	,00539	,00576	-,00309	-,03138	-,00696	,041
N1	[+14;+114]	,01640	-,02339	,03452	-,06293	-,00718	,305
N2	[+115;+214]	-,01463	,02239	-,01708	-,04627	-,01351	,786
N3	[+215;+314]	-,00557	,04067	-,02449	,03390	,00947	,660
N4	[+315;+414]	-,02452	-,02711	,03233	,15808	,04230	,028
N5	[+415;+514]	-,05100	-,01347	-,01425	,09123	,00880	,426
N6	[+515;+614]	-,02150	,01362	-,01816	,23316	,05291	,185
N7	[+615;+714]	,05137	,00323	-,00603	-,17197	-,03950	,379
N-total							
stand.	[+14;+714]	-,00175	,00424	-,00287	,03446	,00848	,057

Table 8: CARs by quarter of divestment contract conclusion (author's draft)

H2b is accepted for the pre-divestment and the total post-divestment period, and part period N4. For these periods, ANOVA supports the assumption that differences between CARs depend significantly on the quarter of deal conclusion, but

it is difficult at first sight to derive a general rule for which quarter is best for deal conclusion, from the perspective of an investor deciding to buy a firm that is divesting. Considering the whole observation period, for 14 days to 614 days after the divestment, deals concluded in quarter one to three perform significantly worse than deals concluded in quarter four. Deals in quarter 3 underperform the market.

A t-test is conducted to analyse the significance of the divergence of the quarters for the significant periods according to ANOVA (v-period, N-total and N4), in more detail:

<b>T-test for significance of variance deviations</b>						
Quarter	Q1 - Q2	Q1-Q3	Q1-Q4	Q2-Q3	Q2-Q4	Q3-Q4
v-period	0,962	0,185	0,043	0,314	0,049	0,115
N4-period	0,947	0,123	0,063	0,137	0,036	0,134
n-total period	0,477	0,875	0,065	0,459	0,133	0,063

*Table 9: T-test of variance deviations by quarter (author's draft)*

The test reconfirms the observation that Q4 CARs deviate from Q1, Q2 and to some extent Q3, significantly.

Firms divesting in quarter 4 perform significantly better afterwards than firms divesting in quarters 1 to 3. For expected CARs in N4, Q1 and Q2 are particularly negative time-points for divestments. According to table 9, the same observation tends to be valid for N5 and N6, where quarter 1 is particularly unfavourable, while deals concluded in quarter 4 outperform the market. In the immediate aftermath of the deal, i.e. in N1 and N2, deals concluded in quarter 4, on the other hand, tend to be more negative than deals concluded earlier that year (table 9).

An analysis of the pre-divestment period with regard to future deal conclusions, explains these observations. Underperforming firms, i.e. firms with negative CARs in the pre-divestment period, tend to schedule their divestment in Q4, while firms with performances above the market tend to schedule divestments in Q1 and Q2 (table 9). According to the t-test, the divergence of CARs in the v-period is significant when comparing Q1 and Q2 to Q4. This relationship is also significant according to ANOVA. The pre-deal underperformers scheduling in Q4, obviously turn out to be over-performers one to two years after

the divestment (i.e. in N4 to N6). In N7, this advantage is partly lost. The effect that pre-deal underperformers scheduling in Q4 turn into over-performers, takes some time to develop. In N1 and N2, Q4 deals still tend to underperform. In N4 their performance has improved significantly.

Why do underperforming firms schedule their divestment dates late in the year? From a transaction cost perspective, the end of a business year eases large transitions, since the spin-off then is handed over at the beginning of the new accounting period (Jones & Hill, 1988, 166). When, at the end of an accounting period, it turns out that business units have not been performing adequately, selling in quarter 4 could be attractive, to start afresh in a new accounting period. Deals concluded in quarter 4 could equally reflect some urgency. They could, for instance, be intended to reduce debt capital, or embellish balance sheets. At the end of an accounting period, those firms feeling an urgent need to change their business policy are likely to decide for strategic divestments.

This explains why under-performers (scheduling late) turn out to be over-performers later, while deals concluded in Q1 to Q3 show excess post-divestment performances much less frequently. When the divestment decision is connected to the urgent need for a change of business policy, firms are likely to take serious action in the year to come, and improve their business strategy in the following year. Simultaneously, investors perceive a reduction of debt capital, or balance sheet change resulting from a divestment at the end of the year, more directly than a divestment in Q1 to Q3, and decide in favour of Q4-divestors for the new period, which drives stock prices. From a principal agent perspective, divestment contracts concluded in quarter 4 are perceived as a signal in the capital market, and are more information-efficient than deals concluded earlier in the year.

#### **2.4.2.3 The impact of the macro-economic crisis on divestment value creation**

H2c compares CARs for divestment deal conclusion in the pre-crisis period (before December, 31, 2007), to the post-crisis-period (after December, 31, 2007). Higher values and significant ANOVA tests are marked in green. Only for period N2 is the divergence of CARs significant. H2c has to be denied for the other periods. Pre-crisis and post-crisis deals do not usually differ significantly concerning post-divestment performance.

pre-/post-crisis deals	pre-crisis	post-crisis	total	ANOVA
V-total stand. [-720;-100]	,00919	-,01292	-,00696	,057
N1 [+14;+114]	-,02416	-,00092	-,00718	,623
N2 [+115;+214]	,05225	-,03774	-,01351	,092
N3 [+215;+314]	,00752	,01019	,00947	,960
N4 [+315;+414]	-,00689	,06042	,04230	,221
N5 [+415;+514]	-,01409	,01723	,00880	,636
N6 [+515;+614]	,07234	,04574	,05291	,808
N7 [+615;+714]	-,02073	-,04642	-,03950	,799
N-total stand. [+14;+714]	,01062	,00770	,00848	,821

Table 10: CARs by pre- post crisis contract conclusion (author's draft)

Detailed analysis of table 10 provides some further insights: the observed average difference of CARs is significant for the pre-divestment period, and for N2. The CARs in the post-divestment period do not differ significantly between pre-crisis and post-crisis deals. For pre-crisis deals, pre-divestment CARs are significantly higher than for post-crisis deals. The average pre-crisis deal was characterized by positive pre-divestment abnormal returns, while the average post-crisis deal is characterized by negative pre-divestment abnormal returns.

How can this be explained? Before the financial crisis, firms were prone to divest even though their business was profitable, i.e. had positive CARs, since prices paid for divested units were high in a booming market (observation period 2005 to 2007). The financial crisis caused a credit shortage, which forced indebted firms that did not operate profitably to sell inefficient units, so the share of pre-divestment under-performers in the sample increased, from 2008.

Post-divestment returns show significant differences for N2 only. Pre-crisis returns are also significantly higher than post-crisis returns here. The same tends to be true for the total (standardized) post-divestment observation period. In pre-crisis years it was apparently easier to enhance entrepreneurial efficiency by divestments. Prices paid for sell-offs were higher before the crisis, the market situation between 2005 and 2007 was a global

boom, and the global financial crisis induced a capital shortage that also affected divesting firms.

## 2.5 Discussion

### 2.5.1 Summary and academic contextualization of empirical results

Summarizing the empirical analysis, the initially posed research questions on sustainable market value creation by strategic divestments can now be answered:

First, it was asked how models established for short term divestment research can be adapted for the analysis of long-term divestment value creation. This study has developed a statistical method of analysis for long-term cumulated average abnormal returns, by modifying the CAR-approach proven for short term analysis. The conventional CAR model, as applied by Brauer & Schimmer (2010) Brauer & Wiersema (2012), and Bartsch (2009), for instance, is appropriate for the (very) short-term only, since it operates on the assumption of *constant beta-factors*, whereas in fact, the risk exposure of stocks as compared to the diversified market portfolio, changes over time, which means that this assumption is not correct for the long-term. For this reason, all but one (Lambertides, 2009, 656) of the available previous studies use the CAR model for an observation period of no more than 10 days after the event.

Here, a *novel method of CAR calculation* has been developed, that operates on the basis of *gliding alpha and beta factors*. As detailed in section 2.3.2.1, a lag 1 of 200 trading days is chosen, for which the capital market line is calculated in advance of each observation day. This strategy makes the CAR model applicable to arbitrarily long observation time spans. This study tests the approach for an event window of 720 days before, to 720 days after a divestment event, omitting 100 days before, and 14 days after the event, to remove the influence of short-term market reactions. The observation range after the event is subdivided into tranches of 100 days (compare figures 4 and 5).

Applying this methodology, the study provides *novel objective insights* into sustainable market value creation after divestments, and answers research question 2, *whether divestments result in positive abnormal returns in the long-term*: Previous long run studies usu-

ally applied management surveys (Kahlert, 2008; Schiereck & Stienemann, 2004, Anslinger et al., 2003), or accounting figures (Hanson & Song, 2003, Cristo & Falk, 2006, Chen and Guo, 2005). Neither method represents the perspective of a prospective investor asking for the market value after divestments. Further, management surveys are biased by the perspective of the participating managers concerning the performance assessment after the divestment. Accounting-based studies suffer from the information bias inherent in any firm balance, and do not include market expectations. Both types of analysis cannot analyse detailed timeframes after the event.

This evaluation has closed these research gaps: Applying the modified CAR approach, post-divestment returns have been analysed for seven consecutive 100-day intervals, and the whole 700-day period after the event, and have been compared to the 700-day period before the event. Briefly, the test of hypothesis 1 has shown:

- a) For each part-period, the proportions of over and under-performers after divestments, as compared to the expected fair return, is around 50% (see figure 8), but over-performers show significantly higher absolute returns than under-performers.
- b) Comparing post-divestment CARs to pre-divestment CARs, considering the whole post-divestment period, divesting firms perform significantly better than before (see table 4, table 7).
- c) Sustainable positive market value needs time to develop: While in the first 200 days after the divestment – exempting technical share price reactions in the first fortnight after the deal – post-divestment CARs tend to be negative. They are significantly positive from day 315 to 414 (subperiod N3). The average positive effect disappears in period N7 (see figure 9).
- d) The economic theories of the market-based and resource-based views reviewed in chapter 2 suggest that efficiency gains after divestments need some time to develop, and markets need time to react to changes.

The evaluation of H2 in section 2.4.2 answers research question 3, *concerning the dependence of post-divestment returns on the timing of the divestment deal*. While Brauer & Schimmer (2010) and Brauer & Wiersema (2012) have found cycles for the short-run, no study has so far analysed the long run:



- a) Post-divestment returns do not significantly depend on the year of deal conclusion.
- b) The quarter of deal conclusion has a significant impact on post-divestment returns: Deals concluded in quarter 4 perform significantly better than deals concluded in quarter 1 to 3, in the period N4 (315 to 414 day after contract conclusion), and in the post-divestment period as a whole.
- c) Pre-crisis divestments do not differ significantly from post-crisis deals, concerning post-divestment returns, but pre-crisis deals performed significantly better in the pre-divestment period than post-crisis deals, which suggests that between 2005 and 2007 equally well-performing firms found divestments attractive, while after the crisis capital shortage and the need for consolidation were major reasons for strategic divestments.

To some extent, long-term and short-term market value development after divestments depends on the *timing* of the sale, but the broad span of performance results suggests that *firm-specific factors* have an important impact on the sustainability of value creation.

### **2.5.2 Managerial implications**

The study results provide some interesting insights for managers planning strategic divestments. First, stock market success after divestments is not automatic, and divestments are not a ready-made recipe to enhance entrepreneurial efficiency. The evaluation has shown that more than half of the ventures (56 %) do not create sustainable value (figure 8), but result in negative CARs two years after the deal. The absolute value increase of profitable divestments on the other hand, is higher than the market value loss resulting from unsuccessful deals. When cooperation results in significant disergies, or suffers from high information asymmetry, divestment can be a promising option. Selling a corporate unit because of attractive market prices, on the other hand, without weighing the pros and cons in detail, could endanger long term economic success.

When planning divestments, firms should consider that fundamental stock market effects resulting from the divestment, take some time – in this study about one year - to develop, since investors do not immediately adjust their opinion of a corporation, and efficiency

gains are only realized sometime after the divestment contract. Further, stock market effects resulting from divestments are of limited duration. Here, stock market returns are back at their original value about 700 days after the divestment. In the long run, numerous superimposing factors affect the stock price.

When should divestments be planned, to maximize stock market success in the long run? Here, no significant impact of the year of deal conclusion has been identified, but the quarter is of significant relevance to mid and long-term market valuation after divestments. Quarter 4 seems to be ideal for successful divestments, from a stock market perspective, although the causal chain of this relationship is not quite clear: Possibly, firms that are under pressure to divest schedule in quarter 4, and in the aftermath attain more significant return increases than firms planning the deal loosely in the course of quarters 1 to 3. Divestments in quarter 4 certainly reach higher investor interest than deals concluded earlier in a year, since they are perceived as typical in the due annual balance.

### **2.5.3 Limitations and further research**

Though this study has shown up some interesting tendencies, it is limited in validity and significance, since the size of the sample is very small (52 data sets). Since for the t-tests and the ANOVA the sample is split up further, few events remain by case. Further, the time horizon of the event study is limited to 2005 to 2011, i.e. it spans no more than a single macroeconomic cycle. For this reason, the effect of timing on divestments has only been examined tentatively, and no stable annual cycles have been identified.

The problem of inadequate representativeness originates in the difficulty of identifying adequate divestment cases (> 300 million US\$) relevant to stock market returns, and the absence of reliable data sources. Relevant events for this study have been gathered from the internet. Information available on the web is subject to significant topic bias. More recent events are easily identified, while events before 2003 are hardly published online.

Further research in long term CARs should use a broader sample and cover a longer time horizon, for instance 20 years. Academic databases should be used to identify and cluster events. The impact of the economic crises on divestments should be evaluated in more detail, by trying different time horizons. This study is limited to the analysis of long-term

CARs, but has not drawn comparisons to existing short-term research. Follow-up papers in this series will try to make that connection.

### **3 Comparison of long and short-term capital market effects of strategic divestments<sup>6</sup>**

#### **3.1 Introduction**

##### **3.1.1 Strategic divestments – opportunity or escape?**

Divestment is a process opposed to investment, and implies the selling of an asset and, more frequently, corporate shares or whole corporations (Brauer & Schimmer, 2000, 84; Madhavan, 2010, 1347). From the perspective of the buyer, the deal is a merger or acquisition, from the seller's perspective the transaction is a divestment. Following Mintzberg et al. (1976, 246) and Eisenhardt & Zbaracki's (1992, 17) definition of strategy, strategic divestment implies that the divestment decision is "important in terms of the actions taken, the resources committed or the precedents set", i.e. is unique, well-planned and has long-term effects. Controversial statistics on global strategic divestments suggest low market transparency and a dynamic market development:

From 1987 until 2001, divestiture transactions in the European Union increased continuously, and the number of deals almost quintupled over that period (Brauer, 2011, 3). Since the collapse of the World Trade Centre on Sept 11 2001, and the burst of the internet bubble in 2002, the world and capital markets have changed (Ederington & Guan, 2010; Wachter, 2008). They are characterized by increased volatility and uncertainty – a trend that equally influences the market for corporate divestments. Since 2001, deal volume has declined, and was down 14 % from 2011 to 2012. On the other hand, deal sizes have been growing steadily. In 2012 alone they increased by 16 % (from 129 to 149 million US dollars (Deloitte, 2013, 2). For 2014, another increase in divestments is expected, according to a global survey among 600 senior executives, conducted by the British Economist Intelligence Unit. Three quarters of the respondents intend to increase their divestment activity (EIU, 2013)

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<sup>6</sup> This chapter is based on the second paper, which was presented and published by ARC2014 (Academic Research Conference 2014 in Pattaya) in Sept 2014. Authors: Krasniqi, V. & Weigand J. (2013): "Comparison of long and short-term capital market effects of strategic divestments", WHU-Otto Beisheim School of Management, Vallendar..

To some extent, divestiture volumes and values depend on the macroeconomic climate, and on branch trends. In situations of economic downturn, investors' inclination to sell and re-buy seems to increase. Firm-specific factors are also significant. 60 % of the EIU survey participants argue that "short term financial measures" of the target are the most important instruments in the divestment decision (EIU, 2013). This statement, however, leaves one key question unanswered:

Are strategic divestments escapes from excess corporate loan burdens, or are they an opportunity to utilize macroeconomic trends to reorganize corporate strategy and cleanse the business of units lagging behind, or impairing sustainable corporate development, i.e. are divestments good or bad news for the shareholders of the divesting firm?

Deloitte's (2013/I, 9) survey among divesting firms finds that market changes and (resulting) financing needs are important reasons for the selling decision. 81% indicate that the sold business is a "non-core asset". Deloitte (2013/I, 7) points out that the impact of macroeconomic conditions is highly significant in only 30% of divestitures, so divestments do seem to have an economic purgatory effect that can be interpreted positively or negatively, depending on the stance and objective of argumentation: On the one hand divestitures are a remedy to compensate for past management mistakes, on the other hand they imply a process on focussing on corporate core competencies (Moschieri & Mair, 2008, 399).

These consultant analyses speculate on the motivations and expectances of the deal, but find little on the gains and consequences of divestments from a shareholder perspective. This paper intends to differentiate the true shareholder value impacts of strategic divestments, by comparing short and long-term stock price effects statistically for a representative global sample from the telecommunications business.

### **3.1.2 Study contextualization and research questions**

The present paper is the second in a series of three contingent studies analysing long and short term value creation by strategic divestments. The paper series approaches the key question, "How can companies augment their market value sustainably by strategic divestments?" and applies an integrative research concept of event study, case study and management survey. All three papers rely on a single sample of 60 divestment events in

the telecommunications business, from 2002 to 2011. The results of the studies are thus fully interconnected.

Paper 1 has focussed on long-term empirical observation, to develop an adequate methodology of long-term value analysis after divestment decisions. It has adapted the cumulative abnormal rate of return approach, established for the short-term analysis of divestments (Lambertides, 2009, Bartsch, 2005; Brauer, 2006, Brauer & Wiersema, 2012), to prolonged time periods by using time-varying beta and alpha factors. Applying this method, paper 1 has calculated the cumulative average rate of returns for a period of 706 trading days after a divestment, referring back to a time period of 720 trading days before the event. Paper 1 has calculated CARS at seven 100 days intervals after the event. Time-dependence of CAR results is analysed by year of deal conclusion, quarter of deal conclusion, and by pre and post-crisis deals. The study finds that after a CAR decline 100 to 200 days after the deal, post-deal CARs peak 300 to 400 days after the event. The positive CAR effect is lost about 700 trading days after deal conclusion. For the whole observation period, post-deal CARs significantly exceed pre-deal CARs. Short-term stock market reactions 100 days before, and during the first fortnight after the divestment, have so far been exempted from analysis.

Paper 2 now bridges the gap between these long-term results of strategic divestments in the telecommunications business, and previous results on short-term divestment effects, asking:

**What is the relationship between short and long-term market performance effects of strategic divestments?**

The following part-questions split this complex topic up into manageable parts, for statistical evaluation:

1. Do short-term CARs in the divestment period exceed CARs in the two pre-divestment years? (H3).
2. Are short-term CAR values after divestments significantly lower than long-term CAR values after divestments? (H4) Brauer & Schimmer (2010) suggest this, assuming that time elapsed since the divestiture is positively related to CARs.

3. Are short-term CAR values after divestments an indicator for long-term CAR values, i.e. to what extent is short-term market performance correlated to long-term market performance? (H5).
4. Do disappointing divestiture processes that show lower returns in the post-divestment phase than in the pre-divestment phase, and lower CARs in the post-divestment phase than in the divestment phase, result from exceptional external developments or management mistakes that cause divestment failure? (H6).

The fourth question is assessed qualitatively in the form of case studies, and prepares the discussion of [paper 3](#), which will evaluate management and industry-specific moderating parameters that affect short and long-term stock market performance after strategic divestments. Paper 3 relies on a management survey which is connected to the quantitative performance assessment conducted in paper 1 and 2.

Contextualizing study 2 in previous academic research, it expands previous methodologies and insights. Short and long-term abnormal returns after divestments are for the first time compared for the same dataset. Short-term results are comparable to previous data for other industries (Mentz & Schiereck, 2008; Rustige, & Grote, 2008), and for M&As in telecommunications (Rieck & Doan, 2008), since a comparable method is applied. The impact that the time elapsed after divestitures has on abnormal returns is examined in a novel approach which invites further research into the dynamic effects of divestments (as initiated by Brauer & Wiersema, 2012 and Brauer & Schimmer, 2010).

From a management perspective, study 2 allows conclusions on the extent to which market expectations in divestments are fulfilled or disappointed. The qualitative analysis of outliers exemplifies which management errors and external impacts cause divestment failure, and should be avoided in future divestment processes.

### 3.1.3 Course of argumentation

The remainder of this paper is structured as follows:

Chapter 3.2 comprises a *literature review*, systematizing previous research on the short-term effects of strategic divestments, and insights into the relationship between short and long-term effects. Section 3.2.1 explains the review method. Section 3.2.2 explores reasons for short-term market reactions to strategic divestments, and their long term implications. Section 3.2.3 details quantitative insights. Section 3.2.4 summarizes achievements and limitations of short-term success measurement after divestments.

Chapter 3.3 develops an *empirical research* method to answer these research questions, explains the empirical dataset (global telecommunications firms) and develops the statistical method, by adapting the CAR model and T-test for paired samples, to compare short and long-term data.

Chapter 3.4 *evaluates the empirical results*, answering research question 1 to 4. Chapter 3.5 *discusses the insights* in an academic context, and explains *managerial implications* and further research needs.

## 3.2 Literature Review

### 3.2.1 Review method

The literature search is based on Drinkmann, 1990, Pettiti 2000, and Cooper and Hedges (1994), as described in section 2.2.1, and, as detailed there, proceeds in 4 steps:

1. Definition of research questions
2. Delimitation of inclusion and exclusion criteria
3. Extraction of relevant studies from databases
4. Evaluation of studies

The research questions for the review derive from the key questions for study 2, which were formulated in section 3.1.2. In accordance with Lee and Madhavan (2010, 1348ff),



the study investigates the theoretical underpinnings of previous research, and the empirical results of post-divestment performance, and compares the short and long-term perspectives

1. Which theoretical assumptions explain the divergence or coincidence of short and long-term performance after strategic divestments?
2. Which previous empirical insights have been gained on short-term capital market effects of divestments?

To identify a relevant range of papers, the following **inclusion and exclusion criteria** have been defined:

- f. To ensure a scientific approach, only articles from academic journals and books, or book contributions employing an academic approach, are selected.
- g. Research is limited to publications in German and English.
- h. Since detailed evaluation is indispensable to answer the research questions, only articles available in full text are employed.
- i. To ensure practical value, the focus is on empirical analyses.
- j. To guarantee accuracy of the contributions, the search is limited to the period 1980 to 2015.

To comply with criteria a and b, research is restricted to the following scientific **databases**:

- Emerald Full text: containing a large range of studies and articles on business and management,
- Science direct: a comprehensive academic database containing nearly 2,500 journals and 26,000 books.
- Ebsco Electronic Journals Service: multidisciplinary access to more than 300 journals,
- Additional papers retrieved from “Scholar Google”, which presents a large selection of free article from different databases.

The choice of adequate key word combinations is essential, to detect relevant studies reliably. Drawing on the keywords in Lee’s and Madhavan’s comprehensive meta-analysis,

keyword sets combining the issues of corporate divestitures and success have been chosen to guide database analysis. The two keyword groups are combined.

<b>Corporate divestiture-related key-words</b>	<b>Success-related keywords</b>
Divestiture divestment M&A, merger & acquisition, strategic alliance, transaction	short term performance synergy effect success short-term outcome

*Table 11: Keywords for literature review (study 2)*

To retrieve the most topical articles the results per data base are sorted by relevance and full text contributions are loaded down in this sequence. Each potentially relevant article is checked manually whether it fits for one of the part questions of the review. The process is necessarily subjective, - as for any review. However the automated pre-selection reduces subjective selection biases to a large extent. The analysis is stopped as soon as 5 consecutive full-text articles do not fit with the review criteria. The results now are classified in accordance with established academic divestment theories as follows:

Section 3.2.2 answers review research question 1. The analysis of the study contexts shows that previous divestment-related research can be classified according to three key hypotheses identified by Brauer and Schimmer (2010, 86ff): undervaluation, strategic alignment, and monitoring-incentive. The detailed results are presented in section 3.2.2. The results of studies applicable to research question 1 are classified according to their relevance to one or the other hypothesis and are discussed in that context.

Section 3.2.3 discusses previous empirical results on short term effects of M&A and divestment activities. Only studies applying the CAR methodology and providing empirical insights on market value development after the activity are chosen for that section. These previous empirical studies of short-term post-divestiture performance focus partly on the short term, and partly compare short and long-term performance. To obtain a comparative overview of the results, the identified empirical studies are systematized by sample type, observation period, business, timeframe, peak price period, and maximum cumulative average return.

### 3.2.2 Review question 1: Hypothesis on short-term post-divestment over or under-performance

Paper 1 has elaborated reasons for long-term stock price effects of strategic divestments, arguing from the perspective of neoclassical theory and new institutional economics. Although the arguments of the cited theoretical strands differ, they all recognize that the reasons for long-term return effects of divestments are predominantly fundamental, i.e. founded in the observable development of the divesting firm after the event. Short-term market reactions to divestment announcements are based on a different rationale, since in the immediate aftermath, or even before, the event, fundamental effects of divestments are not yet observable.

Brauer and Schimmer (2010, 86ff) explain positive short-term market reactions to divestments by 5 hypotheses. Arguing that the majority of previous studies find positive capital market reactions after divestments, they argue the pros of these hypotheses only. Madhavan (2010, 1347), however, argues, that “there is still little consensus in the literature as to whether post-divestiture firm performance is positive or negative”. He cites essentially three hypotheses why divestments should create positive performance effects in the short run (Madhavan, 2010, 1348). To discuss short-term market effects and their possible long term implications, this evaluation follows Brauer and Schimmer’s, and Madhavan’s discussion mode referring to hypotheses, but the possible inverse, i.e. negative capital market reactions to divestments, are also argued here. With reference to further literature, 3 hypotheses are derived, for which the pros and cons can be detailed clearly:

1. The undervaluation hypothesis refers to corporate finance arguments concerning the change of market valuation due to divestments,
2. The strategic realignment hypothesis refers to the hope for fundamental corporate changes.
3. The monitoring-incentive hypothesis refers to the hope for governance changes, and improved managerial surveillance.

Hence, the hypotheses are first discussed for the short-term, based on previous observations (section 3.2.1.1. to 3.2.1.3), and then conclusions on long-term effects are derived (section 3.2.1.4).

### **3.2.2.1 Undervaluation hypothesis**

The efficient market hypothesis questions the possibility to financially benefit from divestments. According to the capital asset pricing model, given transparent and information-efficient markets, investors react immediately to new opportunities, which results in the immediate adjustment of prices to the fair value of an asset (Rieck & Doan, 2008, 371). The opportunity to realize excess returns from divestments should be limited to small price fluctuations between the first rumours of the deal and deal conclusion. Investors could try to make use of market inefficiency by buying divesting firms quickly, as soon as they are informed of planned divestments, and selling rapidly afterwards. This strategy makes short-term price movements around divestments plausible.

Further fundamental financial reasons speak for the speculation on a positive value development of divesting firms: Investing in divesting firms might be of interest, since the mother corporation profits from tax or financing advantages after the divestment. Divesting corporate units frequently enables firms to get rid of loan obligations which are sold together with the divested subsidiary. The subsidiary, on the other hand, increases debt and equity capital, which gives the start-up the opportunity to start from zero, as well as significant tax benefits (Renneboog, 2005, 7). After the divestments, remaining creditors should provide the mother corporation with loans at lower interest rates, since its debt ratio has diminished (Rustige, Grote, 2008, 3). The strategy of de-leveraging debt by divesting could make the divesting company more attractive to investors, which should drive stock prices after the divestment.

On the other hand Fluck and Lynch (1999, 324-325) argue that divesting firms lose economies of size, which entails financing and tax disadvantages. Agency theory argues that divestments will take place only when the shares to be sold are overvalued. Since the management of the divesting firm and its shareholders, are better-informed about the firm's performance than outsiders interested in an investment, they will plan a sell-off only when the corporation has reached its performance peak, and no further value increases are expected (Wu & Wang, 2005, 915).

### 3.2.2.2 Strategic realignment hypothesis

Further fundamental arguments can be found that justify the acquisition of divesting firms, and hence make stock price gains in the immediate environment of divestments plausible:

Divestments are frequently connected to a focussing strategy (Brauer & Schimmer, 2010, 86). Inefficient parts of the divesting company that do not fit with established core competencies, are sold. Corporate power after the divestment is concentrated on the remaining segments, and synergies are easier to develop for a reduced set of organizational units, functions and processes. Focussing strategies diminish complexity and augment efficiency along the whole value-added chain. Investors expect that after the divestments the variety of the supply side diminishes, i.e. more homogenous raw products and prefabricated items are bought in larger amounts. Focussed production processes operate more efficiently, and economies of scale and scope are realized (Eckardt, 1999, 70-71). Core markets can be operated more intensely after the divestment, which creates competitive advantage in the core segments (Kwoka, 1993, 49; Dung, 2012, 49). This saves transaction costs for communication and administration (Aulich and Hughes, 2013, 176-180).

On the other hand, it could be argued that divestment does not necessarily imply focussing and efficiency gains. Selling corporate units entails significant time-consuming reorganization. In the realignment phase, the divesting mother corporation might face a lack of resources that were previously provided by the divested segments, and now have to be bought from outside (Benito, 2005, 235). Bartsch (2010, 68) explains that while contestable resources, that are not key competencies, can be divested without strategic disadvantage, the sell-off of idiosyncratic resources can endanger the divesting firm's independence. Organizational readjustment is frequently accompanied by dismissals and staff re-disposition. These processes can impair employees' motivation, cause uncertainty, and the migration of knowledge carriers (Burt et al., 2009, 30-33). The expectation of such developments could cause insecurity among investors from the moment of divestiture announcement, and cause short-term stock price slumps in divestments.

### 3.2.2.3 Monitoring incentive hypothesis

The monitoring incentive hypothesis summarizes arguments in favour of, or against, stock price gains after divestment announcements, resulting from expectations about governance changes and managerial surveillance. Brauer and Schimmer (2010, 86) argue that organizational effort enhances corporate transparency from the perspective of market participants. The narrowing of business fields eases shareholder control over corporate success. Managers of divesting firms are under increased pressure to succeed in the remaining business fields, since the argument that losses result from unprofitable non-core units no longer applies (Hanson & Song, 2003, 321). Conversely, inefficient units that have so far hampered the success of the conglomerate, are sold off (Rajan, Servaes & Zingales, 2000, 36) Market participants and rating agencies can assess the true value of the core corporation more easily after the divestment, which saves monitoring and signalling costs. New buyers are attracted by this expectation, and the stock price goes up (Matusaka & Nanda, 2002, 176).

Divestments are a signal to market participants that the management of the divesting firm is not striving for power and expansion for their own sake, but is interested in the profitability of the core corporation (Shleifer & Vishny, 1989, 123-125). The management signals its quality and sustainable intentions by allowing shareholders a more differentiated perspective on the focussed mother corporation. Divestitures can thus re-establish market participants' trust in corporate policy, and attract new investors (Pagano & Panetta, 1998, 6-8).

Shareholders of the remaining mother corporation should need less effort to supervise the management of this focussed unit effectively (Weston, et al., 1998, 328). This is of particular relevance in public-to-private divestments. The transference of equity from a large number of shareholders (the state) to a few (or less) private owners, strengthens their rights and power of control, and increases the pressure on managers to act in the interest of the shareholders (Aulich & Hughes, 2013, 176-180).

On the other hand, it could be argued that by selling off equity claims to outsiders, managers reduce the level of equity claims in the mother corporation, which allows them to increase their private material and immaterial benefits. The divestiture of equity capital

would thus strengthen the position of the mother corporation's management, while the shareholders' power would decline (Renneborg, 2005, 8). Further divestment strategies could be seen as an indicator of a declining business development. Selling unprofitable businesses demonstrates management's previous misjudgement and inability to govern complex conglomerates. Krishnan and Sivakuma (2004, 24) find that top managers with leadership deficits are more likely to divest two years later than their powerful colleagues. After the divestiture, top management power usually decreases further. The divestment of units which are unprofitable in the present market situation means giving up the opportunity of in-house realignment, when the now rewarding business declines.

#### **3.2.2.4 Coincidence or divergence of short and long-term market price development after divestments**

The previous discussion has shown that market participants' estimates of the status of the divesting company determine the price development in the period immediately around the divestment. Expected undervaluation, the hope of a strategic realignment, improved management control, and improved competitiveness after the divestment, encourage investors to buy or hold the asset. In this case, stock prices should rise in the period immediately around the divestment. On the other hand, investors could fear that efficiency gains are not realized in the near future. In this case they will tend to sell on divestiture announcement.

To what extent are stock price developments in the short term relevant to the long-term stock performance of the divesting firm?

The extent to which investors' hopes and fears triggered by the announcement are realized, only becomes clear during a long period after the divestment. If the strategic realignment is successful, and the company actually realizes economies of scale and scope in the supply chain, and in production (Federico & Lopez, 2012, 12), and addresses key markets successfully after dismissing the conglomerate subsidiary, initially hopeful investors will be confirmed and hold the asset (Reinecke, 1989, 7-8). Sceptical shareholders will be convinced of the focussed policy, and re-buy the asset and stock prices rise in the long run, due to increased demand.

If, on the other hand, initial hopes are not realized, and sceptical investors are confirmed, established shareholders will sell the asset, and in spite of initial upward trends, the price of the divesting firm will fall in the long run. Ostrowski (2008, 79) explains for M&As that the potential of the strategic realignment is frequently overestimated, and expected economies of scale and scope are not realized (Benito, 2005, 235).

From a technical perspective, the development of divesting companies in the short and in the long run after the event, are not necessarily interdependent. While before the divestments, investors' hopes and fears, and thus speculative expectations, dominate the stock price development, in the long run factual observations, based on the development documented in balance figures, are decisive for investors' judgement.

Are short and long-term stock price development, i.e. aspirations and real future development, actually two fundamentally, i.e. statistically, independent events? The assumption in this question would statistically presuppose that the probability of the judgement "hope" in the situation  $t = 0$ , at the divestment announcement, is independent of the observation "firm performs well", in the situation  $t = 1$ , at the prolonged distance of the divestment event for all, or at least most, investors. Is this a realistic assumption?

In complete, information-efficient and transparent capital markets, according to the CAPM, any expected future cash flows are the result of a linear combination of existing cash flows (Mandl & Rabel, 1997, 18). Investors have rational and homogenous expectations, and a risk-averse utility function. In this situation, the future market value is the market value of a duplication portfolio of existing investments (Matschke & Brösel, 2006, 25-26; Matschke, 2004, 683), where the market price of the divesting company in  $t=0$  would be a fair price, realistically mirroring the risks and opportunities of the divestment (Steiner & Bruns, 2000, 3-5) and in fact, statistically, would be a realistic estimate of the company's future development. The events valuation in  $t = 0$  and in  $t = 1$  would not be independent. In fact, due to electronic communication systems and globalization, modern markets approximate information efficiency.

Still, critiques of the CAPM argue that, particularly in divestments, which are unique events, characterized by an informational advantage of corporate insiders, markets are not information-efficient (Laux & Schabel, 2008, 22-23). Not all market participants have the



same information, and the opinions formed about future developments depend on subjective estimates. Information acquisition causes transaction costs that cannot be, or are not, incurred by all market participants. Are estimates of post-divestment returns in  $t=0$  (short-term) and observations of factual developments after the divestment in  $t=1$  (long-term) independent in conditions of information inefficiency and incomplete markets?

While the CAPM predicts an arbitrary stochastic movement of capital markets in the long run, in fact stochastic trends are observed for markets as a whole, as well as for individual stocks. The equity premium puzzle evaluated by Mehra for US stocks over the period 1802 to 2000, finds a risk-adjusted return difference of 8 % of US stocks, compared to assumedly risk-free US treasury bonds (Mehra, 2003, 6-12). The authors assume that investors demand a higher risk premium for volatile papers, since they are risk-averse, and prefer anti-cyclic assets to stabilize their consumption. Clemens and Soretz explain that further long-term expectations of a (positive) technological and macroeconomic development, drive long-term stock returns (Clemens & Soretz, 1999, 12).

Transferring the observation of the equity premium puzzle to the long, as compared to short-term development of stock prices of divesting firms; this would mean that in the long run, positive estimates prevail. Past risky developments, for instance corporate changes in the form of divestments, confirm investors in the not always rational assumption that in the long-term future, this risk will pay off. Fundamental corporate changes convince investors that in the long run, stock returns will grow, due to radical technological and economic progress that differentiates the divesting firm from its organizationally stable competitors.

In sum, models based on the CAPM, and models based on its critique, support the assumption that investors' short-term positive expectations in  $t=0$  (announcement date) will tend to persist in the long run, even if the expected success is delayed.

On the other hand, in imperfect capital markets, the hypothesis of myopic investors is of interest: according to Bushee (1993, 207), investors, in particular institutional investors, are frequently myopic. They expect that their investment decision will deliver positive returns in the short term, and sell the asset as soon as this return has been realized. The potential long run opportunities of the investment are ignored, to secure short-term gains.

On the other hand, investors tend to buy and hold an asset when their positive expectations have not yet been realized, since they fear to make losses, and future opportunities are lost (Barberis, 2000, 227-229).

If this myopic behaviour of investors is predominant, divesting firms performing positively in the short-term would deteriorate in the long run, and, inversely, short-term slumps would be followed by positive market reactions in the long run. According to established financial market theory, the relationship between short and long-term performance after divestments can't be finally clarified. To shed light on the issue, the following section evaluates empirical studies on short-term (as compared to long-term) performance of divesting and merging corporations.

### **3.2.3 Review question 2: Previous quantitative insights on short-term capital market effects**

#### **3.2.3.1 Short-term CARs in M&As**

Most previous studies concentrate on short term market reactions after corporate transactions. Though this study focusses on divestments, results on mergers & acquisitions – the opposite of divestments - are also of interest, since M&A studies frequently apply similar methods, and come to similar conclusions on the driving factors for abnormal returns. The following discussion refers to applications of the CAR approach to the market value effect of M&As.

Kale et al. (2002) assess abnormal stock price gains after alliance announcements, and surveys managers on their commitment to the alliance function, and the working of the alliance, to identify and classify parameters determining performance. The evaluation comprises 78 companies, a mixed sample from the chemical, pharmaceutical, electronics and computers industries. It refers to the timeframe from 1993 to 1997. While firms with the alliance function reach abnormal returns of 1.35 %, non-dedicated corporations attain only 0.18 % in the period -10 to + 3 days from the announcement event (Kale et al., 2002, 759-760).

Mentz and Schiereck (2008) assess the short-term value effects of acquisitions and mergers, on the acquiring company, in cross-border transactions, in the automotive business,

by comparing the price development one year in advance of completion and 20 days after. A national and a transcontinental sample are compared, as a reference. They refer the abnormal return to a period of 252 days before the announcement, and employ a CAR approach. The study considers 697 transactions exceeding 50 million USD, in the period 1981 to 2004. Significant abnormal returns are observed from day - 1 to +5, with peaks on day 0 and +1. The results do not differ significantly according to level of internationality. The study calculates positive cumulative abnormal average returns of about 1.2 % for the whole sample (Mentz & Schiereck, 2009, 212), but the level of abnormal returns does depend on the type of the target. Acquirers attain significant short-term abnormal returns for subsidiary targets only, while buyers of private targets do not make exceptional returns between day -1 and day 5 from the announcement. Buyers of public targets make about 2.2 % (Mentz & Schiereck, 2009, 211).

Chi et al. (2011) evaluate the short and long-term performance of Chinese exchange-traded companies involved in M&A processes. They analyse the short-term performance in a time window of 2 days before to 2 days after the event, and find no significant abnormal returns. For the long observation period, comprising 6 months before to 6 months after the event, a static CAR model based on the CAPM is applied. It results in significant abnormal returns of 1.4% in the month of the investment. A significant performance effect is observed from month 5 before, to month 4 after the event (Chi et al., 2011, 34-36). The authors suppose that insignificant short-term results originate in market regulation in China. The long-term effect of M&As on stock price depends, to a large extent, on political support for the firm, and not so much on firm performance (Chi et al., 2011, 1). The paper illustrates that efficient capital markets are fundamental to the applicability of the CAR model.

Rieck and Doan (2009) analyse mergers and acquisitions in the global telecommunications business over a period of 10 years, and evaluate positive abnormal returns (as compared to the fair market model) following the announcement (+/-2 days), based on an estimation window of 120 days to 12 days before the announcements (Rieck & Doan, 2009, 373). They compare the results of conglomerate and non-conglomerate mergers, cross-border to domestic M&As, and M&A in developed, as compared to emerging, markets, in the time window of 1998 to 2006.

The complete sample realizes a CAR peak of about 1 % one day before the merger. The effect ebbs off to about 0.7 % until day 5 after the event. Conglomerate mergers generate twice as high revenues in the -1 to +1 day from the event window. Cross-border transactions are more positive than national mergers. They result in CARs of about 1.8 % in the same time range, while national transactions show no significant abnormal returns. Cross-border transactions in emerging markets are positive (CAR = + 1.06%), but not as significant as the whole sample of cross-border transactions (Rieck & Doan, 2009, 385).

Rustige and Grote (2008) apply the same method, to evaluate announcement effects of mergers and acquisitions of German DAX companies, for the period 1996 to 2005. While conglomerate M&A activities partly cause negative abnormal returns, focussing M&As on the other hand usually result in positive market reactions. Rustige and Grote's sample attains highest excess returns in the time window of -2 days to + 2 days from the announcements. The maximum abnormal returns are 1.28% for focussing M&As, while diversifying acquisitions result in negative market reaction of - 0.37 % on day -1 to 0 (Rustige & Grote, 2008, 12-14).

Accordingly CARs in the short run after M&As range between -0.37% (Rustige & Grote), and 2.02 % (Mentz & Schiereck, 2008). Short term CAR peaks are usually observed on the announcement day, or one day before or after it. The observation period usually comprises not more than 20 days before and after the event. CARs resulting from M&A activities are fairly homogenous, regardless of the business and the location of the activity. Focussing and international M&As, tend to evoke more positive market reactions than national and conglomerate M&As (Rustige & Grote, 2008; Rieck & Doan, 2009).

### **3.2.3.2 Short-term CARs in divestments**

To clarify to what extent post- M&A short term CARs resemble divestments, the following paragraphs analyse empirical studies that refer to the short term effects of divestments only:

Madhavan's (2010, 1362) meta-analysis provides an overview of the results of 94 studies of divestment value effects. Though the study does not explicitly differentiate or compare short and long-term market effects, it finds that divestments usually create positive performance effects. The usual effect range is between - 0.5 and 0.5 %.

Brauer and Schimmer (2010, 87) provide an overview of research in short-term divestment effects, in the time range 1962 to 2000, referring to studies published between 1983 and 2001. The 19 cited studies only refer to samples from the US or the UK, and consider event windows of 1 to 13 days. They observe cumulated average rates of return of 0.1 to 11.3 %.

Renneboog (2005, 45) compares the samples, deal types, event windows and CARs of 14 previous studies on management buy-outs, and other public-to-private divestments. In the period of 1973 to 2003, 13 analyses refer to US samples, and one is from the UK. The observation windows range from five days before and after the event, to 50 days. All observed CARs in these observation periods are positive, with a minimum of 12.68% (Goh et al., 2002) and a maximum of 29.98 % (Renneboog et al, 2005/II).

The following evaluation intends to confirm this overview by more recent publications, to identify an adequate and comparable observation period for our own empirical study, and to obtain reference CAR values for comparison with the international telecommunications sample underlying this study:

In 1997, Wright and Ferris (1997) evaluated a sample of 37 South African firms, in the period of 10 days before, to 10 days after divestiture announcements, in the time period of 1984 to 1990. They find significant negative excess returns, culminating in the first five days after the announcement. The authors suspect that in South Africa, divestments are mainly driven by managerial self-interest, and do not correspond with the interests of firm's stakeholders (Wright & Ferris, 1997, 82-83).

Cao et al. (2008) assess the CARs of UK-based companies' divestments, considering a timeframe of -5 to +5 days from the event. The events take place between 1992 and 2002, and they detect significant excess returns, culminating on day zero, for all partial samples. Domestic divestments attain average CARs of 1.60 %, compared to 0.65% for international divestitures. CARs decline to 0.01 % by day 10 after the event (Cao et al., 2008, 20-21).

Campbell and Owers (2010, 825) evaluate a sample of 179 firms from different branches that divested or exchanged assets in the period 1990 to 2002. The observation window is

only one day around the announcement event (-1; +1). The authors calculate the observed CARs as a linear regression function of several influence factors, for instance cash received, product swap, information and debt ratio. Firms in product swaps show significant abnormal returns, while firms conducting focus-neutral swaps usually show no exceptional returns. Maximum CARs are observed on day -1 to 0 from the announcement (0.89). Geographic swaps reach highest CARs of 1.02% in this period, product swaps peak on day 0, with 1.1 % excess returns. Due to the regression approach, the group-wise results of this model are not directly comparable to the conventional CAR models using t-tests for group comparisons.

Rustige and Grote's (2008) results on divestments confirm the assumption that focussing strategies improve market expectations in the short run: divestment announcements result in significantly positive average cumulated abnormal returns for all intervals comprising 1 to 5 days before and after the announcement. The peak of return effects is reached in the period -2 to 1 day from the announcement (1.51%). Announcement effects usually reach higher positive abnormal returns for divestments outside the core business, compared to divestments within the core business (Rustige, Grote, 2008, 20-21). Low diversification strategies in international, and particularly emerging, markets promise significantly higher announcement returns. The return difference between these two groups reaches its peak in the period -1 to +2 days from the divestment, so markets reward focussing strategies, at least in the short run.

Bartsch (2005, 132) evaluates market reactions after divestments, considering a period of 200 trading days before and after the divestment, i.e. about three-quarters of a year. Bartsch subdivides the observation period into subintervals of 20 days before, to 10 days after the event. For the total sample, CARS reach a maximum from day -10 to day zero (2.48%). The effect declines between day 10 and 20 before or after the divestment, respectively. Medians are at a maximum on day 0, i.e. the day of the announcement, with 0.851 % (Bartsch, 2010, 171).

Bartsch compares stock market reactions of strategic to non-strategic divestments, in the timeframe 1997 to 2003, and finds that positive returns after strategic divestments are significant for all observation periods, while non-strategic divestments usually do not deliver abnormal positive, but sometimes negative returns (Bartsch, 2005, 171). Strategic

divestments reach top CARs of 4.99% from 10 days before, to 10 days after the event, while the maximum CAR of strategic divestments is 0.65 %, on day zero, so the stock price effects of strategic divestments are higher and more sustainable than for non-strategic transactions (Bartsch, 2010, 173). There are also significant differences between business branches: while markets reward producers of consumer and investment goods with CARs of 2.65% and 2.58%, banks divestments result in negative CARs of -0.27%, for the whole observation period.

Brauer & Schimmer (2010, 84) evaluate abnormal returns on 160 divestiture announcements, for the global insurance industry, between 1998 and 2007. In contrast to previous studies, they refer to press releases to classify planned divestments. The study compares programs to stand-alone divestitures, in the time range -1 to + 5 days from the divestiture announcement. CARs peak on day 0, with 0.28%, but are negative for the -1 to +5 day period, i.e. -0.38%. The study finds that program divestitures generate higher abnormal returns (peak: 0.59 in observation period - 1 to +1 day) than single-event divestitures (with a maximum CAR of 0.13%, on day 0. This could be because programmatic divestment decisions are seen as a strategic development process in capital markets. The timing of divestment announcements is another significant determinant of stock market reactions.

In an evaluation of 136 equity carve-outs, in Taiwan, during the period 1995 to 2007, Sun and Shu (2011) find continuously augmenting CARs for the period from 25 days prior, to 25 days after the event. The maximum CAR is measured for the period (-25; +25), with 3.15%. In the period (-1; +1) alone, a CAR of + 0.51% is observed (Sun & Shu, 2011, 889-890).

Referring to a sample of US companies divesting between 1993 and 2007, Brauer and Wiersema (2012) analyse average abnormal returns following the announcement of divestiture decisions, in a social context, i.e. depending on the positioning of the firm in the context of a larger industry-specific divestiture wave. They find a u-shaped relationship, i.e. announcements at the beginning and at the end of a wave result in positive abnormal returns, while announcements in the middle of a wave deliver negative returns. In little resource-intensive industries, capital market reactions in general are more positive, and equally u-shaped, since the threat of resource shortage after the divestment is less serious,

while for dynamic industries, average divestiture returns diminish significantly with wave progression (Brauer & Wiersema, 2012, 1484-1485).

Borisova et al. (2011) evaluate a cross-industry sample of US exchange-traded divesting companies, in the period 1998 to 2008. They compare the CARs in the time window of one day before, to one day after the event, and find that cross-border divestments cause more positive market reactions than domestic divestments (3.18% compared to 1.72%, between day -1 and day +1) (Borisova et al., 2011, 49).

Alagbe evaluates the stock price reactions to divestments in the first ten hours after the announcement. He refers to a sample of 16 companies traded at the Helsinki exchange, and to announcements made between 2008 and 2010. The study groups' reactions classified as positive, negative or insignificant, only, without indicating the size of the price movement. It finds that the majority of the announcements (70%) induce no market reactions, about 15% show negative market reactions, and about the same number of reactions are positive. A high level of intrinsic interest in the announcement increases the share of positive reactions to about 23% (Alagbe, 2013, 46-47).

Hagen and Follesdal (2013) evaluate initial public offerings of Norwegian companies, in the period 1996 to 2010. The study differentiates equity-backed and non-equity-backed IPOs. IPO performance is usually below the reference index. In agreement with previous IPO studies, the authors find predominantly negative CARs, comparing the first month after the IPO to the following month, CARs diminish further, continuously. In the first month after the event equity-backed IPOs show better performance than non-equity-backed IPOs (-0.09% compared to -2.78%). After 60 months, however, the CARs of the equity-backed IPOs are down -99.64%, while the non-equity-backed IPOs are at -89.38% (Hagen & Follesdal, 2013, 84). In contrast to studies based on the market model, Hagen and Follesdal calculate the abnormal return simply as the return difference of the asset and the reference index, without referring to expected development based on the previous development of the share (Hagen & Follesdal, 2013, 62). In the case of IPOs, this is the only viable method, since no pre-event market prices are available. The resulting CARs however are not directly comparable to results calculated employing the market model.



As compared to M&A research, CAR methods and results in divestment research accordingly are more diverse: short-term observation timeframes vary from 11 days, to about 30 days around the event. Peak CARs around the divestment are between -30% (Mathesius, 2007) and +4.99% (Bartsch, 2010). A direct comparison of the studies is impossible, since the observed timeframes overlap, and there is no common standard to compare branches and countries.

### **3.2.3.3 Studies considering short, compared to long-term effects**

Few studies compare short-term market reactions to divestment, to long-run effects:

Pagano and Panetta (1998) evaluate balance sheet key figures of Italian firms conducting carve-outs and independent initial public offerings, in the timeframe 1983 to 1994. They compare these values in the year of deal conclusion, and annually, in years 1, 2 and 3 after the deal. While the return on assets is equal (-0.009) for both groups in the year of deal conclusion, carve-outs perform worse than IPOs in the following three years, and show a negative ROA of -4.8% in year 3, compared to -2.7% for independent IPOs (Pagano & Panetta, 2010, 50). The leverage of both independent and carve-out IPOs diminishes to a similar extent (-9.4% and -9.5% in year 3). Independent IPOs start with lower growth rates in year 1 (1.6% compared to 3.8%), and finish with higher growth rates than carve-outs in year 3 (-4.6% compared to +1.6%). Independent IPOs seem to be the more sustainable business policy, according to these results. Comparing the IPO sample to a sample of comparable companies without public offerings, IPOs result in an excess diminution of profitability.

Pagano and Panetta's paper is based on balance analysis, and does not evaluate the financial gains or losses from the perspective of shareholders, as expressed in the share price. The comparison of an IPO and a non-IPO sample is subject to selection bias, and does not explicitly consider firm-specific parameters. The comparison of annual figures suffers from reporting bias, and cannot consider very short-term announcement effects.

Krishnaswami and Subramanian evaluate 118 international NYSE-traded parent companies that divested subsidiaries in the period of 1978 to 1993. They observe short-term abnormal stock returns in the interval 30 days before, to 30 days after the event, and find maximum CAR on days -1 to +1 ( 3.28 %). The announcement effect is inverted in the

time intervals +1 to +5 days (-0.51 and +6 to + 30 days (-0.84). They put the positive price effect down to the diminution of information asymmetry due to the divestment (Krishnaswami & Subramanian, 1999, 87).

To assess the long-term performance of the divesting firms, Krishnaswami et al. (1999) compare the frequency of equity issues of the divesting sample, to a reference group of non-divesting firms, in the timeframe three years before, to three years after the divestment. They find that divesting firms issue equity significantly more frequently than the control group, in the pre-divestment year and in the 3 post-divestment years. In all years following the spin-offs, divesting firms raise significantly more equity and debt capital than the non-divesting firms. After the spin-off, debts are usually greater than before the spin-off. The authors suggest that increased equity availability after the spin-off could be a main reason for this observation (Krishnaswami & Subramanian, 1999, 97-98). While Krishnaswami and Subramanian employ the CAR method to calculate short-term profitability of divestments, they use fundamental key figures to assess the long-term performance of firms after divestments. This method provides insights into whether divestments usually enhance the companies' equity position, but it is insufficient to compare the shareholder value before and after the divestment, quantitatively, and to gauge the comparative size of short and long-term shareholder value effects of divestments.

Mathesius assesses CARs in equity carve-outs, i.e. initial public offerings of subsidiaries, in which the mother corporation keeps more than 50% of the assets. Equity carve-outs are a special form of divestments, since the mother corporation sells off part of the subsidiary. Mathesius evaluates all 12 equity carve-outs of German corporations, in the period 1998 to 2000 (Mathesius, 2002, 121), and considers an event window of 30 days before, to 30 days after the event, referring to a period of 60 days before that range, and after (Mathesius, 2002, 121). The average abnormal returns in a range of -5 to + 5 days from the public offering are negative, at about -12%, depending on the approach (Mathesius, 2002, 137-138). For the -10 to + 10 days range, the CARs are even lower (- 18%), and for the +/-30 days period are about -30%.

Mathesius explains that the unusually high negative CAR could result from the burst of the internet bubble in 2000, and investors' subsequent uncertainty (Mathesius, 2002, 148). This assumption does not fit, however, since in the period January 1998 to August

2000, the DAX in fact followed a long-term upward trend. The initial consequences of the burst of the internet bubble were only felt from September 2000 onwards (compare historical DAX prices at Yahoo Finance). The fact that Mathesius chooses the public offering day, while other studies refer to the announcement day, could be another, more significant reason for divergences from previous evaluations of short and long-term results. When the public offering takes place, the information about the divestment has already long been reflected by the market. Mathesius' results accordingly reflect rather the long-term market reaction than the short-term impact of divestment announcements. Another point of critique of Mathesius' study is that the sample, which comprises only 12 companies, is unrepresentative, and the comparatively short reference period of 60 days before and after the evaluation period.

Middelmann and Helmes (2005, 516) compare the short and long-term stock price development of an IT service provider, after a divestment, as a case study, and find that divestments initially, i.e. in the first months after the initiation of the sales process, stop and invert a negative price development. The evaluated firm reached a stock price growth of 50 % in the acquisition phase, after a downward trend of -69% in the previous 2 years. The downward trend, however, continued after deal completion. Although this result is not statistically representative, it confirms Mathesius' (2002) study, which also finds negative stock returns after equity carve-out completion.

Bringing the results of comparative long and short term studies together, there is a similar broad range of results as for studies considering the short term only: The results of the divestment depend on the macroeconomic environment in the period the deal is closed and settled, on the industry and sample as well as on the observation period. The following overview brings the results of the review of empirical studies according to review part question 2 together:

### 3.2.4 Summary of review results

### 3.2.5 Overview of studies of short-term CARs

Results of CAR-based analyses for the short term _ M&As									
Author	Publ. year	business	period	sample type	time frame	peak time	CAR peak		
Kahle	2002	mixed	1993-1997	alliance announcements	(-10;+3)	(-10;+3)	1,35%		
							0,18%		
Mentz & Schiereck	2008	automotive	1981-2004	M&A announcements	(-20;+20)	(0;+1)	1,20%		
						(0;+1)	1,88%		
						(0;+1)	0,10%		
				public			2,02%		
Chi et al.	2011	Chinese	1998-2003		(-2; +2)	(-2; +2)	0,00%		
						(0;+1m)	1,10%		
Rieck & Doan	2009	telecom	1998-2006	M&A announcements	(-2;+2)	(0;-1)	1,00%		
						(0;-1)	1,80%		
						(0;-1)	0,00%		
						(0;-1)	1,00%		
				cross border					
				national					
				emerging markets					
Rustige & Grote	2008	DAX	1996-2005	focussing M&A ann.	(-5;+2)	(-1;+2)	1,28%		
						(0;-1)	-0,37%		
				conglomerate M&A ann.					

Table 12: Overview of M&A studies based on the CAR approach (author's draft)

Results of CAR-based analyses for the short term _ Divestments until 2003									
Author	Publ. year	business	period	sample type	time frame	peak time	CAR peak		
Krishnaswami	1999	Mixed, NYSE listed	1978-1993	subsidiary divestment	(-30,+30)	(-1,+1)	3,28%		
Wright & Ferris	1997	South Africa mixed	1984-1990	divestment announcement	(-10,+10)	(-10,+10)	negative		
Mathesius	2002	Germany, mixed	1998-2000	equity carve out	(-30,+30)	(-5,+5)	-12,00%		
						(-10,+10)	-18,00%		
						(-30,+30)	-30,00%		
Cao et al.	2008	UK, mixed	1992-2002	divestment announcement	(-5,+10)	(0;0)	1,21%		
				domestic		(0;0)	1,60%		
				international		(0;0)	0,66%		
Campbell	2010	mixed	1990-2002	divestment announcement	(-1;1)	(-1;0)	0,89%		
				geographic swaps		(-1;0)	1,02%		
				product swaps		0	1,10%		
Bartsch	2010	mixed	1997-2003	divestment ann.	(-30+;10)	(-10;0)	2,45%		
				strategic		(-10,+10)	4,99%		
				non-strategic		0	0,65%		

Table 13: Overview on divestment studies based on the CAR approach – 1978-2003 (own draft)

Results of CAR-based analyses for the short term _ Divestments until 2010									
Author	Publ. year	business	period	sample type	time frame	peak time	CAR peak		
Rustige & Grote	2008	DAX	1996-2005	divestment announcement	(-5;+2)	(-1;+2)	1,51%		
Brauer & Schimmer	2010	US insurance	1993-2007	divestment announcement program single-event	(-1;+5)	0 (-1;1) 0	0,28% 0,59% 0,13%		
Sun & Shu	2011	Taiwan mixed	1995-2007	equity carve out	(-25;25)	(-25;25)	3,15%		
Brauer & Wiersema	2012	US cross-industry	1998-2007	divestment announcement	(-3;+3)	(-3;+3)	0,20%		
Borisova et al.	2011	US cross-industry	1998-2008	cross-border divestment domestic divestments	(-1;1) (-1;1)	(-1;1) (-1;1)	3,18% 1.72%		
Alagbe	2013	Finland mixed	2008-2010	divestment announcement	(0;10 h)	(0;10 h)	n.n.		
Hagen, Follesdal	213	Norwegian IPOs	1996-2010	initial public offerings	(0; 3y)	(0; 30)	-0,09%		

Table 14: Overview of divestment studies based on the CAR approach –  
2005-2010 (author's draft)

The overview above summarizes the results of the evaluation of studies assessing abnormal returns after divestments and M&As, in the short observation period. Altogether, 20 empirical studies have been evaluated, but only 18 are in the tables, since Middlemann & Helmes (2005) and Pagano & Panetta (1998) do not use CARs as a measurement instrument, and are not immediately comparable. The overview presents short-term results only, since results for the long run are not directly comparable. The tables are presented by order of observation period, beginning with the earliest evaluations. Altogether, the studies span a period from 1978 to 2010. Column 6 refers to the timeframe of analysis, by study, i.e. the period in which CARs are identified. Column 7 refers to the period in which the CARs reach their peak, and column 8 contains the maximum CAR value measured, by study and divestment or M&A type. Table 12 refers to M&As, table 13 comprises divestments until 2003, and table 14 divestments from 2004 to 2010.

### **3.2.5.1 Achievements and research gaps of short-term success measurement after divestments**

Comparing the methods and insights of previous studies focussing on cumulative average abnormal returns of M&As and divestments, the following points are of interest:

Most studies find positive CARs around the events. Mathesius' (2002) evaluation of German DAX corporations between 1998 and 2000 is the only example of significantly negative CARs.

According to table, 9 CARs around M&As are between -0.37% (Rustige & Grote), and 2.02 % (Mentz & Schiereck, 2008). Short term CAR peaks are usually observed on the announcement day, or one day before or after it. The observation period usually comprises not more than 20 days before and after the event. Only Chi et al. (2001) evaluate the prolonged period of six months before and after the event, comparatively. CARs resulting from M&A activities are fairly homogenous, regardless of the business and the location of the activity. Focussing, and international M&As, tend to evoke more positive market reactions than national and conglomerate M&As (Rustige & Grote, 2008; Rieck & Doan, 2009).

Compared to M&A research, CAR methods and results in divestment research are much less homogenous: short-term observation timeframes vary from 11 days, to about 30 days

around the event. Peak CARs around the divestment are between -30% (Mathesius, 2007) and +4.99% (Bartsch, 2010). To some extent, the broad variety of observed divestment types, timeframes and periods of analysis is responsible for this significant divergence: Mathesius (2002) observes a pure German sample in the period when the internet bubble burst. Bartsch (2010), on the other hand, registers maximum CARs for purely strategic divestments, preselected according to qualified criteria. A direct comparison of the studies is impossible, since the observed timeframes overlap a lot, and there is no common standard to compare branches and countries.

A comparison of the meta-analytic results of this study, and previous reviews, is of interest to possibly identify regularities of CAR development around divestments: Brauer and Schimmer (2010, 87) assess divestments between 1962 and 2000, and also find predominantly positive CARs, between 0.2% and 11.3%, with only one exception, of -25%. This result corresponds qualitatively to this review. There is no generalizable trend with regard to the model applied, the event window, or the period in which the sample was collected.

Renneboog's (2005, 45-47) evaluation of MBOs and other public-to-private divestments, finds much higher CARs, between 20% and 40%, in the period 1973 to 2003. Since Brauer & Schimmer (2010) and this review agree on divestments in general, the reason for the higher returns observed by Renneboog is probably the focus on buy-outs. Shareholders probably expect particularly incentive, transaction cost and speculation effects, from this form of divestment.

In short, there are significant differences between divestment returns, depending on the type of the divestment. According to this review, the stock price effects of divestments are much more differentiated than for M&As. Previous studies have not managed to derive a common rule as to when, and under what conditions, stock prices react to divestment, in which way. This implies that, in spite of the broad variety of analyses of divestment-related CARs, further business-specific and country-specific evaluations are necessary, to fully understand the stock price effects of divestments.

The interdependence of short and long run stock return effects of divestments has not yet been investigated sufficiently: CAPM-based considerations, and the critique of the CAPM, suggests that short and long-term returns after divestments should be positively



correlated, but this assumption has not been tested quantitatively in previous empirical studies of divestments: few studies compare short and long-term CARs after divestments, but the results for the short and long run are not comparable, since methods that are incompatible with the CAR approach have been chosen for the long run: Pagano and Panetta (1998) refer to balance key figures. Krishnaswami compares the frequency of equity issues for the long run. Middlemann and Helmes (2005) rely on a single case study.

None of these methods provides reliable results for the development of the shareholder value. For exchange-traded companies, the stock price and dividend yield are the main performance measures. A central reason for the failure to refer to stock prices in the long observation period is that reliable return measures, cleared of other influences, are not available. The standard CAR method is not applicable for prolonged observation periods, since it assumes constant beta and alpha factors, which is not a realistic assumption in dynamic capital markets.

To summarize: no study using the CAR approach has so far combined the short and long-term perspectives of divestment-based stock price development: the relationship between the short and long-term market performance effects of strategic divestments has not yet been quantified. No method to combine short and long-term valuation consistently from a statistical perspective has so far been developed.

### **3.3 Empirical research method**

#### **3.3.1 Open questions and hypotheses**

The critique of previous studies indicates that the initial research question, “What is the relationship between short and long-term market performance effects of strategic divestments?” Has not yet been answered.

The following empirical evaluation closes this research gap for the telecommunications business. Departing from previous insights, four research hypotheses are derived, to assess the core question above in a different way:

Both short and long-term studies find mainly positive performance effects of divestments (Brauer & Schimmer, 2010, 87, and table 9 to 11 of this paper), so it is assumed that:

**H3:** Short term CARs in the divestment period significantly exceed CARs in the two pre-divestment years.

Brauer & Schimmer (2010, 92) further assume that time elapsed since the divestiture is positively related to CARs. If this assumption is true for the telecommunications dataset, the long-term CAR values should exceed the short term CAR values. From this follows:

**H4:** Long-term CAR values after divestment are significantly higher than short-term CAR values after divestments.

The preliminary considerations in section 3.2.1.4 suggest that, under the conditions of the CAPM, and in imperfect markets, short term positive return effects should continue into the long run. So far, empirical studies seem to confirm this assumption. From this results hypothesis 5:

**H5:** Short term CAR values after divestments are an indicator for long-term CAR values after divestments, i.e. short-term market performance is significantly positively correlated to long-term market performance.

Since most previous studies find positive divestment-related CARs, it is assumed that for the present sample few companies diverge from H4 and H5, i.e. show higher CARs in the pre-divestment period than in the divestment and post-divestment periods. For such divestment processes, market expectations on divestment announcement are not met in the long run, so it seems worthwhile to examine these disappointing outliers on a case-study basis, qualitatively, which results in hypothesis 6:

**H6:** Divestiture processes of outliers displaying significantly lower returns in the divestment phase than in the pre-divestment phase, and significantly lower CARs in the post-divestment phase than in the pre-divestment phase, are characterized by exceptional external developments or management mistakes that cause divestment failure.

### 3.3.2 Statistical method

This section develops the statistical methodology to test H3 to H5.

### 3.3.2.1 Standard and dynamic CAR evaluation

Previous studies assessing shareholder values for comparatively short periods of 1 to 5 years usually refer to discrete stock returns daily:

$$R_{it} = \frac{K_{it} - K_{it-1}}{K_{it-1}}$$

The market model, as defined by Markowitz (1959) and Sharpe (1963), has established a common reference standard for the assessment of fair returns of a stock, as compared to a reference index. It is employed by Bartsch (2005, 139) and Brauer & Wiersema (2012), for instance, and its empirical relevance has been proven in many empirical studies. The market model estimates the expected return  $E(R_{it})$  of stock company I, at time point t, as a linear function of the return  $R_{mt}$  of the reference index M, in t, as follows:

$$E(R_{it}) = a_i + b_i R_{Mt} + \varepsilon_i$$

$a_i$  describes a constant development of  $R_{it}$ , independently of the stock index,  $b_i$  measures the sensitivity of the stock return to the development of the return of the market index, i.e. represents the systemic risk the stock is exposed to. The residual variable  $\varepsilon_i$  describes an idiosyncratic risk component of the stock, dependent only on firm-specific influences, which is expected to be zero in the long run (Francis & Kim, chapter 12.5). Given the returns of an index and of a stock, for a certain time period, the  $b_i$  and  $a_i$  values for the expected return of the stock can be estimated in an ordinary-least-squares regression.

The abnormal return is the extent to which the observed return exceeds the expected return:

$$AR_{it} = R_{it} - E(R_{it})$$

Cumulated abnormal returns for a period starting at day  $t = u$ , and ending at day  $t = z$ , can now be calculated by adding up daily returns from u to z (see Bartsch, 2009, 139-140):

$$CAR_{[u;z]} = \sum_{t=u}^z AR_{it}$$

The initial overview (table 12 to 14) illustrates that this standard approach is established for the analysis of short-term CAR analysis, but standard CAR models are inadequate for longer periods of analysis, since they assume stable  $a_i$  and  $b_i$  factors. Alpha and beta factors, the expected development of the stock price depending on the index, vary with time, for instance due to fundamental changes of corporate competitiveness, or changes of investor expectations of the development of this stock compared to the market, so previous studies of long-term value effects of divestments usually don't use the CAR approach, they use management surveys (Anslinger et al, 2003, Schiereck & Stienemann, 2004), accounting-based evaluation (Hanson & Song, 2003, Cristo & Falk, 2006; Chen & Guo, 2005) or other capital market performance measures (Warner et al, 1988 explores the volatility development, Braun & Latham (2009) assess the market capitalization), instead.

Paper 1 of this study series has, however, modified the CAR approach to make it applicable to long-term stock performance analysis, as follows: to add a dynamic development to the basic market model,  $a_i$  and  $b_i$  are assumed to vary with time, with a lag of  $l$ . The lag describes the horizon before the measurement of  $R_i$  and  $R_m$  that determines the factors. Mathematically, the time-varying market model is:

$$E(R_{it}) = a_{i;l} + b_{i;l}R_{Mt} + \varepsilon_{i,l} \quad \text{with } E(\varepsilon_{i,l}) = 0$$

A dynamic formula for abnormal returns is:

$$AR_{it} = R_{it} - [a_{i;l} + b_{i;l}R_{Mt}]$$

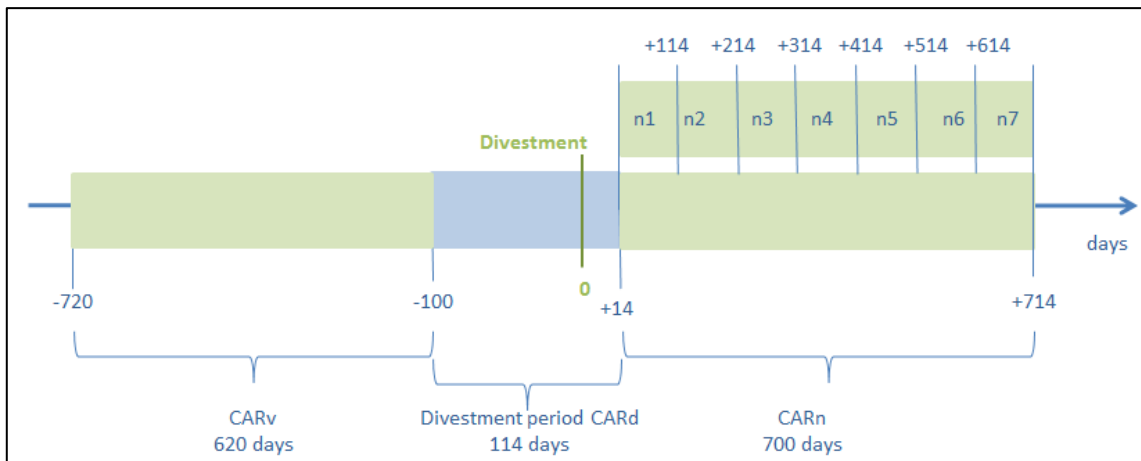
Dynamic abnormal returns can be calculated, by stock, daily, for a reference index and reference period of lag  $l$ . Dynamic abnormal returns, in contrast to conventional abnormal returns, are appropriate to assess infinitely long observation periods, since  $b_i$  and  $a_i$  are dynamic, not fixed.

### 3.3.2.2 Comparative evaluation of short and long-term CARs

The modified dynamic CAR model is also appropriate for short term analysis of CARs, and is even more precise than the static CAR model: in fact, the moving method of calculating alpha and beta factors results in small daily adjustments of the expected return,

based on the lag. This assumption is more realistic than the prognosis of the expected return based on static alphas and betas, since the expectation of market participants is subject to continuous development and change, which is reflected in the changing alphas and betas.

The following evaluation applies the dynamic CAR model to the short and long-term analysis of cumulated average returns before, at the time of, and after strategic divestments. The timeframes for the pre-divestment period  $v$ , the divestment period  $d$ , and the post-divestment period  $n$ , with sub-periods  $n1$  to  $n7$ , of 100 days each, were determined in study 1 of this series of papers, as follows:



*Figure 10: Tripartite timeframe of analysis (author's analyses)*

Paper 1 omitted the blue divestment period, which will now be examined in detail and in comparison to the pre-divestment period  $v$ , and the post-divestment period  $n$ . The divestment period is subdivided into sub periods, as follows:

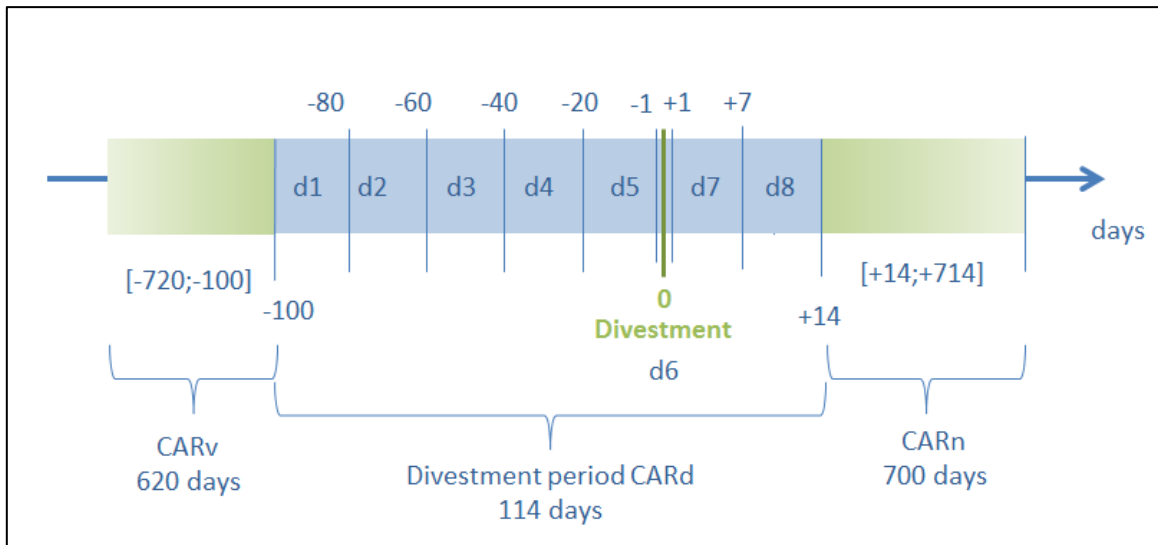


Figure 11: Subdivision of immediate divestment period (author's analyses)

The divestment period  $d$  comprises 100 days before, to 14 days after the divestment announcement. This period has been chosen in accordance with previous empirical studies for the short and long-term: Bartsch, 2005, Rustige & Grote 2008, Brauer & Schimmer 2010 and Brauer & Wiersema 2012 omit a timeframe of two to five days around the divestment, and consider timeframes of 100 to 200 days before, and 5 to 14 days after the deal. The minimum documented pre-deal time window of 100 days has been chosen to avoid further influence of other extraordinary effects. Since the telecommunications business is dynamic, long pre-deal periods increase the risk that the aftermath of previous strategic changes, divestment, or M&A events, influence the market price. This influence is minimized for the short-term analysis. Differentiating the timeframe  $-[-702;-100]$  from the close pre-deal timeframe, allows a step by step approximation to the divestment time point. Gradual price changes can be traced precisely by subdividing the close pre-divestment time frame into 20 days intervals:

This short-term period is subdivided into partial intervals, comprising  $d_{tot}$   $[-100;+14]$ ,  $d1$   $[-100; -81]$ ;  $d2$   $[-80; -61]$ ;  $d3$   $[-60; -41]$ ;  $d4$   $[-40; -21]$ ;  $d5$   $[-20; -1]$ ;  $d6$   $[-1; 1]$ ;  $d7$   $[1; 6]$ ;  $d8$   $[7;13]$ . The figures in brackets indicate the days from the divestment in each partial period. These partial intervals are compared below to the pre-divestment period  $v$ , and the post-divestment periods  $n_{tot}$ ,  $n1$  to  $n7$ .

The partial intervals of the divestment period  $d$  have been chosen in accordance with previous short-term CAR evaluations of divestments. Brauer & Schimmer (2010), Brauer

& Wiersema (2012) and Borisova et al (2011) find abnormal return peaks for the very narrow timeframe of -1 to +1 days around the announcement. Short-term abnormal returns are usually identified until 10 to 30 days after the announcement. As in study 1 of this series, 14 days after the announcement are considered. However, previous studies do not consider the extended period of -100 to -20 days from the announcement, although abnormal stock price reactions in this period seem plausible: Strategic divestments are frequently considered or planned some time ahead of the official announcement. Inefficiently working units are usually monitored for a long time, and are reported on quarterly, so investors may anticipate impending divestments up to a quarter before the deal announcement, and the extension of the influence window of strategic divestments to a timeframe of -100 to + 14 days from the deals extends the horizons of previous research accordingly.

### **3.3.3 Empirical data**

#### **3.3.3.1 Choice of business and companies**

To evaluate H3 to H6, a sample from the telecommunications business is used, for which a long-term analysis (timespan: day -720 to + 720 from the divestment, omitting day -100 to +14) of abnormal stock returns after divestments was conducted in study 1 of this paper series. Stock market reactions to global telecommunications divestments are of particular interest since, due to radical technological innovation in recent years (growth of the web 2.0 and mobile/smart phone technologies), business dynamics and competition have been growing significantly (Deloitte, 2013/II). From an investor's perspective, the timing of stock market activities is of particular relevance. Typical stock price development patterns around of divestment deals are an essential element of strategic portfolio management.

There is a broad range of about 250 divestments available in the communications business in the observation period of 2005 to 2011. The difficulty is, that not all transactions are representative, since small scale divestments frequently are dominated by large scale buyers who in fact determine the sales price per stock. To avoid this bias this study refers to transactions exceeding a certain minimum size only. Huberman and Halka (2001, 166) suggest that the stock market can be classified into four liquidity quartiles according to the market capitalization of stocks. Stocks in the lowest size quartile are little liquid and

accordingly easily influenced by bulk orders. The size of 300 million stocks corresponds to about the 25% percentile of available divestment transaction in the telecommunication business in the observation period, and for this reason has been chosen as a lower size limit. A sample of 62 strategic divestment events in global telecommunications, exceeding 300 million US\$, and 52 events for which adequate stock price series are available, have been evaluated.

To calculate short-term CAR values, the study extracts the closing rates 100 days before the event, to 14 days afterwards, and compares and calculates the abnormal returns compared to the reference ETF iShares Global Telecom. To compare with long-term CARs in the pre-divestment period  $v$  and the post-divestment period  $n$ , it uses the data gathered in study 1 of this series of papers. The dataset and the data preparation are in appendix 7.2.1.

The dynamic CAR is calculated as follows: the stock rates are listed by trading day, for each firm and, applying the Excel function `SVERWEIS()`, the rates of the reference index iShares Global Telecom are assigned to each stock by trading day. Daily arithmetic stock and index returns are calculated, and missing values for the index, i.e. days on which the stock was traded but the index was not, are closed by entering a zero return.  $E(R_i)$  and  $AR_i$  are calculated, as detailed in section 3.3.2.1. Average daily abnormal returns are cumulated for the periods  $CAR_v$ ,  $CAR_d$ ,  $CAR_{d1}$  to  $d8$  and  $CAR_n$ , and  $CAR_{n1}$  to  $n7$ . To compare the values for the individual periods, they are standardized, by dividing by the number of days in each period, so for each part period, an average (daily) abnormal return is calculated, and referred to as “standardized CAR” in the following.

### 3.3.3.2 Concretization and testing of H3 to H6

Employing the part periods delimited in section 3.4.2, the hypotheses H3 to H5 are now defined in more detail:

**H3**, assuming, that short term CARs in the divestment period significantly exceed CARs in the two pre-divestment years, is concretized as follows:



The standardized CARs for the divestment sub-periods  $d_{tot} [-100;+14]$ ;  $d1[-100;-81]$ ;  $d2[-80;-61]$ ;  $d3[-60;-41]$ ;  $d4[-40;-21]$ ;  $d5[-20;-1]$ ;  $d6[-1; 1]$ ;  $d7[1;6]$ ;  $d8[7;13]$  are each compared to the standardized CAR of the v-period  $v[-720;-100]$ , using the t-test for paired samples. It is assumed that standardized CARs in each of the divestment sub-periods exceed the standardized  $CAR_v$  measured for the pre-divestment period.

**H4**, assuming that long-term CAR values after divestment are significantly higher than short-term CAR values after divestments, is concretized as follows:

The standardized CARs for the divestment sub-periods  $d_0 [-100;+14]$ ;  $d1[-100;-81]$ ;  $d2[-80;-61]$ ;  $d3[-60;-41]$ ;  $d4[-40;-21]$ ;  $d5[-20;-1]$ ;  $d6[-1;1]$ ;  $d7[1;6]$ ;  $d8[7;13]$  are each compared to the standardized CAR of the n-period  $n[+14;-714]$ , using the t-test for paired samples. It is assumed that standardized CARs in each of the divestment sub-periods exceed the standardized CAR measured for the post-divestment period n.

The mathematical approach of the t-test is as follows: the t-test examines the zero hypothesis that the means of the CAR values in the pre-divestment period (H3), and in the post-divestment period (H4), equal the means of the CAR values in the divestment period and its sub-periods, by calculating the t-value as follows (Brosius, 2011, 489):

$$t = \frac{\bar{D}}{\sqrt{\frac{s_D^2}{N}}}$$

$\bar{D}$  is the average difference between the two CAR value series,  $s_D$  is the standard deviation of the individual differences between the CAR values v, and N is the sample size. When the difference between the CAR values is low, t is near zero, and H0 has to be accepted. To verify H3 and H4 respectively, the difference  $\bar{D}$  should be as high as possible. SPSS indicates the error probability of falsely accepting H0 although H and H4 respectively are true, in a significance value, indicating the % error probability. The test significance should be as low as possible to accept H3 and H4. Here, H3 and H4 are accepted for an error probability level below 0.1 (i.e.10 % error probability).

To test **H5**, CAR values for the short and the long run are correlated, and the significance of the correlation is tested, by a Chi<sup>2</sup> test. For correlations significant at the 95 % level,

H5 is accepted. For the part periods, H5 is concretized as follows: The correlations of the CARs for the divestment period  $d_0$  [-100;+14] and  $d_1$ [-100;-81];  $d_2$ [-80;-61];  $d_3$ [-60;-41];  $d_4$ [-40;-21];  $d_5$ [-20;-1];  $d_6$ [-1; 1];  $d_7$ [1;6];  $d_8$ [7;13], is compared to the total post-divestment period  $n$  [+14;+714], and each of the post-divestment part-periods  $n_1$  to  $n_7$ , comprising  $n_1$ [+14;+114];  $n_2$  [+115; +214];  $n_3$  [+215;+314];  $n_4$  [+315;+414];  $n_5$  [+415;+514];  $n_6$  [+515;+614];  $n_7$  [+615;+714]. H5 is accepted for each period pair if a correlation significant at the 95 % level is measured.

For the test of H5, the correlation coefficient according to Bravais- Pearson is calculated for each pair value series. It is derived from the co-variance, which is standardized by dividing it by the product of the two variances. While the covariance takes values between – and + infinity, the Pearson correlation coefficient ranges between -1 and 1. A value of 1 describes a complete positive correlation (Maurer, Albrecht 2005, 105).

The correlation significance is examined in a chi<sup>2</sup>-test. Chi<sup>2</sup> is the measure of association

$$\chi^2 = \sum_i \sum_j \frac{(h_{ij}^0 - h_{ij}^e)^2}{h_{ij}^e},$$

where  $h_{ij}^0$  = observed, absolute frequency of the combination of the characteristics  $X = i$  and  $Y = j$ ,  $h_{ij}^e$  = absolute frequency of the combination of the characteristics  $X = i$  and  $Y = j$ , expected in case of statistical independence. For  $\chi^2 = 0$  there is no correlation, for  $\chi^2 > 0$  a correlation exists. The hypotheses underlying the Chi<sup>2</sup> test are:

$H_0: \chi = 0$ : the value rows are correlated.  $H_1: \chi \geq 0$ : the value rows are not significantly

correlated. The decision rule is  $\chi_{0.95}^2 < \chi_{error}^2 = \sum_i \sum_j \frac{(h_{ij}^0 - h_{ij}^e)^2}{h_{ij}^e}$  (Duller, 2007, 135).

**H6** proposes that divestiture processes displaying significantly lower returns in the post-divestment phase than in the pre-divestment phase, and significantly lower CARs in the post-divestment phase than in the pre divestment phase, are characterized by exceptional external developments or management mistakes that cause divestment failure. Relevant underperforming companies first are selected conducting a simple t-test.

To identify outliers displaying significantly lower returns in the post-divestment phase than in the pre-divestment phase, the difference of the standardized  $CAR_{dtot}$  values and

the standardized  $CAR_v$  values is calculated as a variable “DminusS” in SPSS. To identify outliers displaying significantly lower CARs in the post-divestment phase than in the divestment phase, the difference of  $CAR_n$  values and  $CAR_d$  values “NminusV” is calculated. For outliers relevant to an analysis of H6, both values “DminusV” and “NminusV” have to be significantly negative, i.e. below zero. To test for significance for both value series, a simple t-test that determines the lower confidence intervals for the test value 0 is conducted in SPSS. These are in appendix 7.2.5. The difference DminusV and NminusV is then compared to the lower confidence intervals, for each of the companies in Excel. Companies are chosen for a case study analysis if both values are significantly negative, i.e. CARs in the divestment period are below the pre-divestment period, and CARs in the post-divestment period are below CARs in the pre-divestment period.

### **3.4 Empirical results**

#### **3.4.1 Distributions of CARs in the short run**

The share of positive CARs by part-period is shown in figure 12 (following page). It illustrates that while among the pre-divestment CARs in the period of 720 to 100 days before the event only 48% are positive, in the immediate divestment phase, 54% are positive. In the prolonged post-divestment phase n, comprising days 14 to 714, even more (56%) of the CARs are positive. This observation suggests that divestments are received positively by market participants, and for the majority of divesting companies market participants’ expectations are confirmed in the long run, which results in increasingly positive CARs. Considering the divestment period from day 100 before the announcement to 14 after, in more detail, CARs are predominantly negative from day 100 to day 40 before the announcement. From day 40 to day 1 after the announcement, market expectations switch: the majority of CARs are positive (58 to 63 %). This development consolidates from day 1 to day 14 after the announcement: the majority of returns are negative (42% and 46% positive CARs). Is this observation of univariate analysis significant statistically?

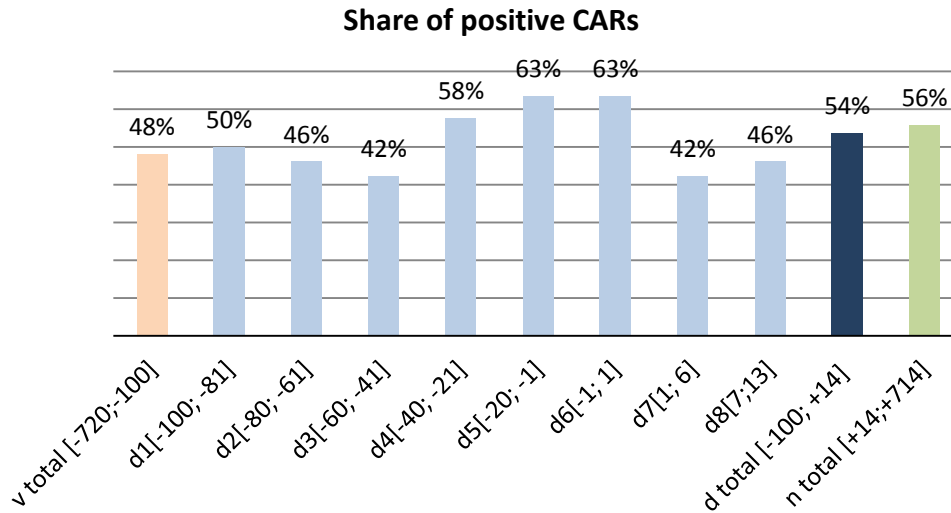


Figure 12: Share of positive CARs per period (author's draft)

### 3.4.2 H3: Comparative CARs analysis for the pre-divestment and immediate divestment phases

H3 compares CARs in the pre-divestment period  $v$  [-720; -100] to CARs in the divestment phase [-100; +14], conducting a t-test for paired samples. The results are in appendix 7.2.2, and summarized in the following table 12. Short term CARs and long term CARs are tested for normal distribution and correlation. The tests are in appendix 7.2.7. The samples for short-term and long-term CARs are partly normally distributed. The results for D1, D3, D4 and D6 do not fulfil the requirements of the Komogorow-Smirnow and Shapiro-Wilk test. Since not all parameters are normally distributed, spearman correlations have to be chosen, to test for statistical independence. Short-term and long-term CARs are not significantly correlated, according to spearman, i.e. the observations are independent.

Table 15 displays the period mean in %, that is, the unstandardized CARs for the part periods which each comprise a different number of days. These values are appropriate for a comparison with previous studies that usually refer to different period lengths. Table 15 contains the standardized (daily) CARs, which are appropriate for a comparison among the part periods, and for a test of H3.

Period	period mean %	Value	standardized daily mean %	t- Sig. (stand.)
V-period d1[-100;-81]	to -4,318	CARv_stand	-0,007	0,6
	-0,578	CARd1_stand	-0,029	
V-period d2[-80;-61]	to -4,318	CARv_stand	-0,007	0,437
	0,755	CARd2_stand	0,038	
V-period d3[-60;-41]	to -4,318	CARv_stand	-0,007	0,352
	-0,793	CARd3_stand	-0,040	
V-period d4[-40;-21]	to -4,318	CARv_stand	-0,007	0,66
	0,218	CARd4_stand	0,011	
V-period d5[-20;-1]	to -4,318	CARv_stand	-0,007	0,062
	1,527	CARd5_stand	0,080	
V-period d6[-1; 1]	to -4,318	CARv_stand	-0,007	0,112
	0,663	CARd6_stand	0,331	
V-period d7[1;6]	to -4,318	CARv_stand	-0,007	0,905
	0,013	CARd7_stand	0,002	
V-period d8[7;13]	to -4,318	CARv_stand	-0,007	0,485
	0,269	CARd8_stand	0,038	
<b>V-period d-total [-100;+14]</b>	to -4,318	CARv_stand	-0,007	<b>0,19</b>
	<b>1,896</b>	<b>CARdtot_stand</b>	<b>0,017</b>	

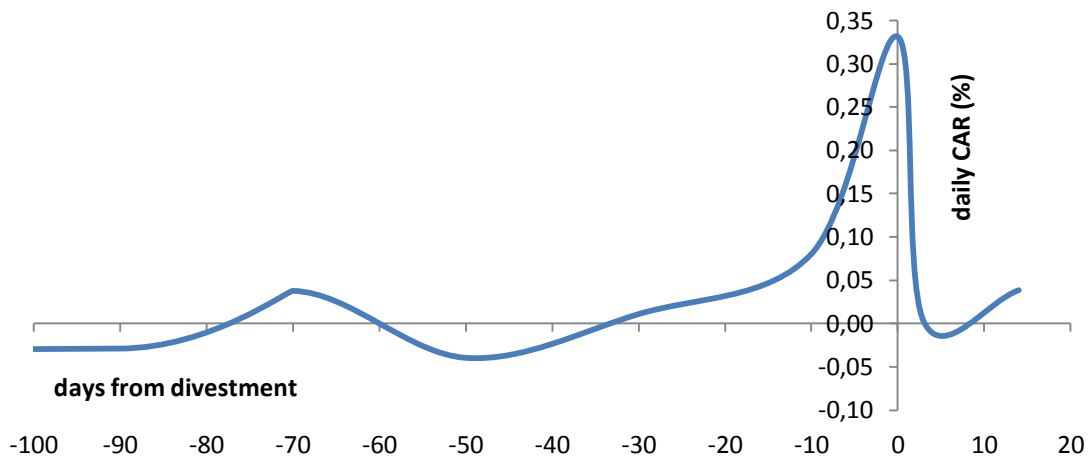
Table 15: Comparative pre-divestment and divestment phase CAR values (H3) and t-significances (author's draft)

The column “standardized daily mean (%)” shows that, with the exception of d3 [-60;-41,], for each of the part periods d1 to d8, in the immediate divestment phase, mean CARs are higher than in the pre-divestment phase [-702;-100], but the differences between the pre-divestment means and the divestment means are significant at the 0.1 level for the core part-periods d5 and d6 only. While the pre-divestment mean CAR is – 0.007%, the daily CAR in d5, comprising days [- 20; -1] is + 0.08%, and in d6, comprising days [-1; 1], the daily CAR is 0.331%. For the whole v-period [-720;-100], compared to the whole d-period [-100; +14], the difference of the means is only just not significant, with a t-value of 0.190.

H3 proposes that short-term CARs in the divestment period significantly exceed CARs in the two pre-divestment years, which implies: H3 is accepted for part period d5 and d6, but rejected for d<sub>tot</sub>, but the assumption underlying H3 tends to be accepted: all divestment

CARs are above the pre-divestment CARs. Usually, investors have positive expectations on the announcement of divestments, and average returns change from negative to positive in the divestment phase.

The following chart illustrates the course of the standardized CARs (per day) in the divestment phase, as a smoothed curve.



*Figure 13: Smoothed development of CARs in divestment period, compared to prolonged pre-divestment period (author's draft)*

Figure 13 shows that from day 40 before the divestment, an increasing upward movement of daily CARs, which culminates in a daily value of 0.33% on the days -1 to +1 from the announcement, is observable. From day 1 to day 6 after the announcement, daily CARs fall to virtually zero (+0,002 % daily), and recover to a daily value of +0.04 from day seven to 14 after the announcement.

These results provide two new insights into the development of CARs around divestments:

1. The positive effect of divestments occurs shortly before their announcement. An inversion of the CAR trend starts from day 40 before the announcement, and increases exponentially until the official announcement date.
2. As soon as the announcement is made public the positive short-term CAR effect ceases. CARs go down to virtually zero, and only recover about a week after the announcement.

These two novel observations are confirmed by the proportion of positive CARs, as illustrated in figure 13. Insider dealing and short-term profit-taking are possible explanations: some important market participants may be aware of rumours about the impending divestment deal, before its official announcement. Hoping for technical stock price reactions at the announcement date, they buy the divesting firms, which results in positive abnormal returns, compared to the pre-rumour period. With increasing proximity to the announcement, the rumours spread, and an increasing number of investors decide to buy or hold the asset. Exponentially rising returns attract additional buyers. As soon as the announcement of the divestment is made, investors realize their short-term profits by selling the stock, which makes CARs fall to their previous level, between day 1 and 6 after the announcement. After this post-announcement slump, divesting companies show a predominantly positive CAR development again.

#### **3.4.3 H4: Comparative CARs in the divestment and prolonged post-divestment-phase**

Hypothesis 4 evaluates the impact of short-term reactions after divestments on long-term effects, assuming that long-term CAR values after divestments are significantly higher than short-term CAR values. This would mean that positive investors' expectations are reconfirmed in the long run, since divestments usually result in efficiency gains. H4 is evaluated in appendix 7.2.3, conducting a t-test for paired samples. Table 13 summarizes the results, and again displays the period means in %, for comparison with other studies, and the standardized daily CARs per period, for comparison between the periods.

For the total post-divestment period  $n_{tot}$  [+14; +720], the total CAR is 5.939%. This corresponds to a daily post-divestment CAR of 0.010%. To test of H4, the standardized daily CARs for the post-divestment period  $n$  are compared to the daily CARs for the divestment part periods  $d_1$  to  $d_8$ . According to table 16 (next page), the daily CAR for the post-divestment period exceeds the divestment periods  $d_1$  and  $d_3$ . For the remaining periods,  $d_2$ ,  $d_4$ ,  $d_5$ ,  $d_6$ ,  $d_7$  and  $d_8$  and the while divestment period  $d_{tot}$ , the daily CARs are higher than for the long post-divestment period  $n$ . The results are significant for period  $d_5$  and  $d_6$ , at 0.1%. In the close proximity of 20 days before, to 1 day after the divestment announcement, abnormal daily returns are on average above the post-divestment  $n_{tot}$  period from day 14 to day 720.

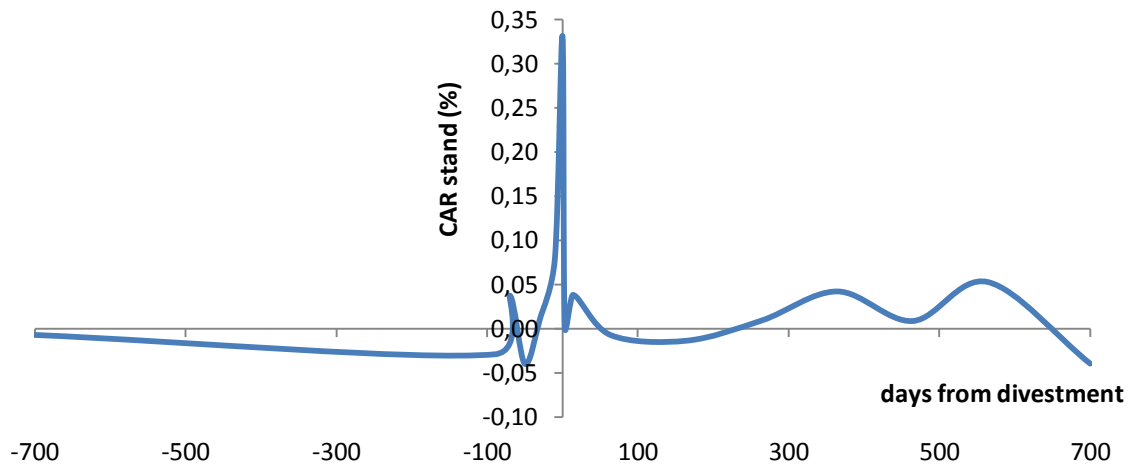
Period	period mean %	Value	standardized daily mean %	t- Sig. (stand.)
d1[-100;-81]	to -0,578	CARd1_stand	-0,029	0,385
N-total-period	5,939	CARntot_stand	0,010	
d2[-80;-61]	to 0,755	CARd2_stand	0,038	0,589
N-total-period	5,939	CARntot_stand	0,010	
d3[-60;-41]	to -0,793	CARd3_stand	-0,040	0,195
N-total-period	5,939	CARntot_stand	0,010	
d4[-40;-21]	to 0,218	CARd4_stand	0,011	0,981
N-total-period	5,939	CARntot_stand	0,010	
d5[-20;-1]	to 1,527	CARd5_stand	0,080	0,138
N-total-period	5,939	CARntot_stand	0,010	
d6[-1; 1]	to 0,663	CARd6_stand	0,331	0,131
N-total-period	5,939	CARntot_stand	0,010	
d7[1;6]	0,013	CARd7_stand	0,002	0,917
to N-total-period	5,939	CARntot_stand	0,010	
d8[7;13]	0,269	CARd8_stand	0,038	0,65
to N-total-period	5,939	CARntot_stand	0,010	
<b>d-total [-100;+14]</b>	1,896	CARdtot_stand	0,017	<b>0,697</b>
<b>to N-total-period</b>	<b>5,939</b>	<b>CARntot_stand</b>	<b>0,010</b>	

Table 16: Comparative divestment and post-divestment phase CAR values (H4) and t-significances (author's draft)

This means that H4, assuming that long-term post-divestment returns are above the returns in the divestment phase, has to be rejected. The contrary tends to be the case: The major divestment-related returns are realized shortly before, and at the announcement, in the period [-20; +1].

This implies that the excessive expectations investors develop in the phase in which the divestments are a rumour, are not fulfilled later on. CARs are more positive in the long run after the divestment than before, but the high excess returns realized in the rumour phase are speculative exaggerations. The following smoothed development line for the CARs of this sample brings the short and long-term perspectives together:





*Figure 14: Smoothed development of CARs in divestment period, compared to prolonged pre and post-divestment period (author's draft)*

While pre-divestment CARs are below 0, divestment rumours cause an inversion of this trend, and a short-term CAR peak between days -20 and +1 from the announcement. Due to short-term profit taking, the short-term CARs after divestment go down to virtually zero, but recover in the first post-divestment year. The positive post-divestment development ends in the third year after the divestment. Although post-divestment CARs exceed pre divestment CARs, the CAR peak in the immediate divestment phase strongly exaggerates the factual future development

#### **3.4.4 H5: Correlation of long and short-term CARs after divestments**

To what extent are investors' expectations fulfilled for the individual companies? Are companies for which high divestment CARs are observed, in fact more successful in the long run than companies without significant CARs in the divestment period? Hypothesis 5 explores these questions, assuming that short-term CAR values after divestments are an indicator for long-term CAR values, i.e. CARs in the d-period are positively correlated to CARs in the n-period. The corresponding Chi<sup>2</sup> test of correlation is in appendix 7.2.5. The results are summarized in table 17. Correlations significant at the 95% level are marked in blue, correlations significant at the 99% level, in green.

	CARn1_ stand	CARn2_ stand	CARn3_ stand	CARn4_ stand	CARn5_ stand	CARn6_ stand	CARn7_ stand	CARntot_ stand	
CARv_ stand	correlation Pearson 2 sided significance	-0,283 0,042	0,316 0,022	-0,060 0,672	-0,605 0,000	-0,066 0,640	-0,143 0,312	0,152 0,282	-0,394 0,004
CARd1_ stand	correlation Pearson 2 sided significance	-0,142 0,315	0,195 0,165	-0,143 0,311	-0,309 0,026	0,183 0,195	-0,109 0,443	-0,046 0,746	-0,288 0,038
CARd2_ stand	correlation Pearson 2 sided significance	-0,014 0,920	0,075 0,595	0,103 0,469	0,371 0,007	0,049 0,730	0,339 0,014	-0,285 0,041	0,488 0,000
CARd3_ stand	correlation Pearson 2 sided significance	0,228 0,104	-0,199 0,158	-0,005 0,974	-0,194 0,168	-0,238 0,089	-0,213 0,129	0,250 0,074	-0,304 0,028
CARd4_ stand	correlation Pearson 2 sided significance	0,132 0,351	0,027 0,852	-0,177 0,208	-0,122 0,389	0,011 0,936	-0,145 0,305	0,058 0,681	-0,216 0,124
CARd5_ stand	correlation Pearson 2 sided significance	-0,084 0,556	0,236 0,092	0,122 0,389	-0,055 0,697	-0,028 0,843	-0,029 0,837	-0,165 0,244	-0,036 0,799
CARd6_ stand	correlation Pearson 2 sided significance	0,145 0,303	-0,136 0,337	-0,142 0,316	0,109 0,440	-0,134 0,345	-0,032 0,821	0,017 0,906	-0,159 0,261
CARd7_ stand	correlation Pearson 2 sided significance	0,068 0,631	-0,173 0,220	-0,150 0,288	0,362 0,008	0,004 0,980	0,142 0,316	-0,044 0,755	0,187 0,185
CARd8_ stand	correlation Pearson 2 sided significance	0,417 0,002	-0,477 0,000	0,018 0,901	0,211 0,134	-0,086 0,547	-0,201 0,153	0,247 0,077	-0,004 0,978
CARd tot_ stand	correlation Pearson 2 sided significance	0,219 0,118	-0,039 0,782	-0,067 0,639	0,066 0,642	-0,047 0,741	-0,040 0,777	-0,101 0,476	-0,098 0,490

Table 17: Correlations of divestment and post-divestment CARs (author's draft)

Considering the final column of table 17 first, none of the post-divestment CARs ( $n_{tot}$  and  $n1$  to  $n7$ ) is significantly correlated to the CARs in the divestment phase as a whole ( $CAR_{d_{tot}}$ ). From 72 correlations relevant to the test of H5, only five are significantly positive. Five correlations are significantly negative. This means that H5 has to be clearly rejected. CARs in the divestment phase as a whole are not a reliable indicator for the long-term development of the stock. Frequently, post-divestment CARs are inversely correlated to CARs in the divestment phase.

There are some further interesting insights, however:

The first concerns pre-divestment compared to post-divestment CARs: Pre-divestment CARs ( $v$ ) and CARs in period  $d1$  - comprising the days  $-100$  to  $-80$  before the divestment, are significantly negatively correlated to post-divestment CARs. Comparing the pre-divestment phase until day 80 before the announcement, to the post-divestment returns, it is obvious that divestment means a turn-around, and CARs usually change from negative to positive. From an investors perspective, the return development of a divesting firm in period  $d2$   $[-80;-61]$  before deal conclusion, can be seen as a realistic indicator for post-divestment performance in the first two years after the deal.

Another relevant observation is that CARs in divestment phase 2, comprising days  $-80$  to  $-61$  before the divestment, mirror CARs in the post-divestment phase most realistically. This concerns period  $n4$   $[+315; +414]$ , and the total post-divestment period  $[+14; +720]$  in particular. The correlations between  $d_{tot}$ , and  $d2$  and  $n4$ , are significantly positive at the 99% level. Reconsidering the results of paper 1 of this study series,  $n4$  and  $n_{tot}$  are particularly successful as compared to the pre-divestment phase. Correlations of  $d2$   $[-80; -61]$  and  $n7$   $[+615; +714]$  are significantly negative. This is another indicator for the observation made in paper 1 that positive divestment effects wear off in the third year after deal conclusion.

### 3.4.5 H6: Case study analysis of outliers

**H6** assumes that outliers in divestment processes displaying significantly lower returns in the post-divestment phase than in the pre-divestment phase, and significantly lower CARs in the post-divestment phase than in the pre divestment phase, are characterized by exceptional external developments or management mistakes that cause divestment failure. Relevant companies are identified in a simple t-test. The calculation of the t-test confidence intervals is in appendix 7.2.5, and the results by divestment event are in appendix 7.2.1.

For a t-test at the 95% level, 8 companies would have to be tested, increasing the test level to 99%, 6 corporations, and for a t-test at the 99.9 % level, 5 firms remain relevant. These most significant 5 outliers are chosen for the case-study. These are

- Telstra (divestment 13.8.2007),
- China Telecom (divestment 4.6.2008),

- Portugal Telecom (divestment 2.9.2009),
- France Telecom/Orange (divestment 28.2.2011),
- Telecom New Zealand (divestment 14.4.2011).

For these extremely negatively performing outliers, company databases and news on the web are searched for corporate information concerning the divestment period.

**Telstra Corporation limited** is Australia's biggest telecommunications and media provider. The originally public enterprise was privatized in several stages, and privatization was completed in 2006 when a governmental fund took over a major part of the Telstra shares (ANAO, 2008, 1-17). From 1997 to 2006, the Telstra share price had shown an exponential growth, due to the privatization (ANAO, 2008, 26). By 2006, Telstra held a significant share in the Pay TV provider Foxtel. Foxtel had shown an immense growth in subscribers and profits between 1995 and 2007. In 2007, the Australian Competition and Consumer Commission feared monopolistic threats due to the immense growth of Foxtel-Telstra, and advised Telstra to sell its shares in Foxtel. The deal was announced on August, 13, 2007 (BuddleComm, 2007).

Telstra's cumulated average abnormal return in the 620 days v-period, was 21.25%, in the divestment period  $d_{tot}$ , however, performance was down, at a CAR of -19.94%. In the post-divestment period,  $n$  CARs were predominantly negative, in part periods  $n1$  to  $n6$ , and only recovered in  $n7$  (+15.5%). The average post-divestment CAR ( $n_{tot}$ ) is 1.6%. Obviously, the forced divestiture of Telstra's shares in Foxtel unsettled investors significantly. With the announcement, Telstra's strong growth trend inverted, and it took two years until the corporation recovered its performance. By 2009, the government fund sold another share package to private investors, which meant an impetus to renewed performance growth (Munir, 2009). Concerning Telstra, H6 is clearly accepted: the disappointing performance in the divestment and post-divestment phase originates in the extraordinary situation of a forced sale of a highly profitable unit.

**China Telecom Corporation Limited** is among China's leading providers of cable and internet broadband services, and operates in about 20 economically well-developed regions in China. The corporation was founded in 1994, as an independent, non-government-backed firm. Between 1998 and 2002, the Chinese government repeatedly forced

the corporation to divide. China's infrastructure growth, and the increasing liberalization of China's telecommunications and capital markets, is the main drivers of the corporation's growth (China Telecom, 2012).

By May, 2008 the National Development and Reform Commission, and the Ministry of Finance, issued a joint announcement stipulating further reforms of the telecommunications industry. This decree forced China Telecom to sell shares to other public telecommunications firms that are, to some extent, under governmental protection. As a whole, the governmental order meant a severe restructuring of China Telecom (China Telecom, 2012/II, 16). In the pre-divestment period  $v$ , China Telecom showed a CAR of 43.75%. The CAR in the divestment period was  $-3.75\%$ , and in the whole post-divestment period remained virtually zero.

The forced intertwining of public and private telecommunications companies, on governmental orders, seems to have undermined investors' confidence in the working of a liberal capital market in China. Clearly, H6 has to be accepted for China Telecom. The 2008 divestment was not a strategic corporate decision, it was forced by the government, and from the perspective of market participants means an impairment of China Telecom's autonomy and efficiency.

**Portugal Telecom (PT)** is Portugal's largest telecommunications provider. The firm operates in Portugal and Brazil. On September 2 2009, PT announced that it had entered into a definitive agreement, together with Telefónica, S.A. (Telefónica), for the joint sale of their equity stakes in Médi Telecom S.A. (Méditel), (each representing 32.18% of local shareholders of Méditel). Méditel operates in Morocco and, offers multiple communications services. Morocco-based corporations (Finance Com, S.A., RMA Watanya, S.A. and Fipar Holding) acquired Méditel for 400 million Euros. The sale was concluded by December, after the approval of the local regulator (Portugal Telecom, 2009, 89). The pre-divestment performance of PT was 13.5% in the  $v$ -period. In the divestment period  $d$ , the corporation realized CARs of  $-4-29\%$ , but the worst slump was still ahead. In the post-divestment period  $n$ , comprising 14 days to 720 days after the divestment, CARs were down  $-38.5\%$ . The company has still not recovered from the downfall today. The corporation serves a dense and transparent market, and is now the smallest among several competitors (Yahoo.finance, 2014). The decision to withdraw from Morocco has proven

a strategic failure, given the large growth of the Moroccan mobile phone market. From this perspective, the divestment could currently be seen as a strategic failure. However, further influence factors, for instance and increasing concentration in the Portuguese and Brazil telecommunications markets, could be the reasons for the disappointing development of Portugal Telecom after the divestment. No unequivocal statement on the relevance of strategic mistakes concerning the disappointing CARs after the divestment, i.e. on H6, is possible.

**Orange S.A.** is among France's biggest telecommunications providers. The corporation is in the mobile phone, land-line and internet businesses. In 2011, Orange acquired several telecommunications companies in North Africa and the near East, but divested its Swiss subsidiary, to "optimize its portfolio of international assets" (Orange, 2011, 3). Before the divestment, CARs were 4.37%. In the divestment phase, CARs went down to -6.8%, and remained at that level for the period  $n [+14; +720]$ . A closer look at the stock price development of Orange S.A. (Yahoo Finance, 2014), however, illustrates that the downturn is not an extraordinary event initiated by the divestment, it is part of a long-term downward price movement that, with the exception of a brief interruption in summer 2010, went on from October 2009 to July 2013. The 2011 divestment of the Swiss subsidiary meant no significant change to that trend, so H6 is not unequivocally accepted for Orange S.A.

**Telecom New Zealand** is New Zealand's largest telecommunications and IT service provider (Telecom NZ, 2014). It was privatized in 1990, and between 2008 and 2011 underwent repeated restructurings and divisions, under governmental pressure, to reduce its monopolistic power. On April 14 2011, NZ Telecom announced its impending separation from the daughter Chorus. Chorus, now is a public company, specialized in the development of the ultra-fast broadband network, a government-initiated infrastructure plan. Splitting Chorus, from the perspective of NZ Telecom means a concentration on core competencies, but equally abandoning technical leadership in broadband network development. The corporations announced their intention to keep up their close cooperation in future, and investors' representatives agreed on the divestment (Fletcher, 2011).

Stock markets initially reacted reluctantly to the announcement of the planned deal. NZ Telecom CARs fell from 8.08% in the pre-divestment period v, to -7.11% in the divestment period d. During the post-divestment period n, they remained negative on average, at -0.89%. In part period n7, i.e. 614 to 714 days after the announcement, however, CARs recovered to 5.55%. A closer look at the prolonged stock chart illustrates that the divestment did not in the long run destroy the corporation's year-long upward movement. H6 is rejected for NZ Telecom: in the long run, the carefully planned 2011 divestment of Chorus did not halt the mother corporation's shareholder value growth. The analysis of the 2011 divestment of NZ Telecom illustrates the limitations of CAR analysis. CARs indicate a relative development, comparing a reference point to a target point, but do not always grasp the development in between realistically.

The following overview summarizes the results of the evaluation of H6 by company. It contains the CAR values for the pre-divestment, divestment and post-divestment periods, the test of H6, and a summary of the argumentation:

title	Ann. Date	CAR v-period [-720;-100]	CAR d-period [-100;+14]	CAR n-period [+14;+714]	H6	Comment
Telstra	13. Aug. 07	21,26%	-19,94%	1,65%	yes	forced sale of profitable unit provokes sustained decline
China Telecom	4. Jun. 08	43,75%	-32,91%	-3,76%	yes	split on governmental decree, prolonged stagnation
Portugal Telecom	2. Sep. 09	13,58%	-3,40%	-38,90%	partly	abandoning of profitable Marroquin market, prolonged negative trend
France Télécom (orange)	28. Feb. 11	5,89%	-6,80%	-6,00%	partly	divestment of Swiss subsidiary, prolonged decline
Telecom New Zealand	14. Apr. 11	8,08%	-7,11%	-8,90%	no	demerger of network provider, unbroken growth trend

*Table 18: Summary of test of H6 (author's draft)*

Hypothesis 6 is accepted in two of 6 cases (Telestra, and China Telecom), where the divestments were forced by governmental authorities, and contradicted entrepreneurial reasoning. For Portugal Telecom and France Telecom, the divestments were decided on in the context of a more comprehensive entrepreneurial downturn. The divestments could not halt this development. For Telecom New Zealand, the de-merger was initiated by governmental shareholders, but did not sustainably alter the growth trend of Telecom NZ,

since the divestment was well-planned, harmonious, and resulted in a close cooperation with the divested subsidiary. Partly H6 is supported: when divestments fail to improve shareholder value, adverse conditions (Telstra, China Telecom), or the failure to make use of rationalization and restructuring opportunities (Portugal Telecom, Orange S.A.), are frequently the cause.

### **3.5 Discussion**

#### **3.5.1 Summary and academic contextualization of empirical results**

This study has developed and applied a novel approach of comparing short and long-term CARs around divestments. The study uses a novel dynamic method of CAR calculation, based on time-varying alphas and betas, to compare CARs for the pre-divestment, divestment and post-divestment periods, by standardizing CARs daily. This novel methodology allows quantitative analysis of short and long-term performance effects after divestments, based on stock prices, for the first time.

Applying this approach to a sample of 52 global telecommunication companies, the study answers the initial research questions:

Research question 1 (H3): (Daily) CARs in the divestment period [-100; +14] do exceed (daily) CARs in the prolonged pre-divestment period [-702;-100]. The positive effect starts from day 60 before deal announcement, cumulates between day -1 and day 1 after it, and falls to virtually 0 in the first week after the deal.

Research question 2 (H4): Short term CAR values in the divestment period are not a general indicator of long-term post-divestment performance. Market expectations are significantly exaggerated. However, usually, post-divestment CARs beyond day 14 after the divestment are more positive than pre-divestment performance until day 80 before the divestment.

Research question 3 (H5): Contrary to Brauer & Schimmer's (2010, 92) proposition, in the telecommunications sample evaluated, short term CAR values after divestments are not generally reliable predictors of long-term post-deal performance. Usually, correla-



tions between performance in the divestment period  $d [-100;+14]$ , and the post-divestment period  $[+14;720]$  are insignificant. However, CARs realized between pre-divestment day  $-60$  and  $-41$  are a reliable indicator of post-divestment performance, in the first two years after the divestment.

Research question 6 (H6): Several companies perform worse after the divestment than before, in the long run. This study has evaluated the 5 most significant outliers. When pre-divestment expectations are not fulfilled, adverse external influence factors (e.g. governmental regulations, or a global recessive corporate development) have frequently been fundamental causes of the divestment.

### **3.5.2 Managerial implications**

These insights have some interesting implications from an investor's perspective: capital markets anticipate divestment decisions before their official announcement. For the present sample of telecommunications companies, the stock price shows deviations from its long term trend from day 80 before the announcement onwards, and exponential return increases are observed from days 20 to 0 before the announcement. The reason is probably insider knowledge. Investors can make use of impending divestments by carefully observing corporate news that points to a divestment decision, and the corresponding development of stock prices. As soon as the public announcement has been made, however, returns collapse. It is not advisable to buy divesting telecommunications companies immediately after deal announcement. Pre-announcement profits should be realized on the day of the official publication. Long-term investors might get a realistic estimate on the prolonged post-divestment performance, by looking back to a period of 80 to 60 days before the announcement. Referring to this return level, they might identify an adequate point of entry after deal conclusion.

### **3.5.3 Limitations and further research needs**

Like study 1, this analysis is limited in validity and significance, since the size of the sample is very small (52 data sets). Further, the time horizon of the event study is limited to 2005 to 2011, i.e. it spans only a single macroeconomic cycle. Further research in long term CARs should take a broader sample and cover a longer time horizon, of, for instance, 20 years.

The discussion of individual companies has shown that observed course patterns in the environment of divestments depend on the individual circumstances and planning of the process. The influence of outliers on the test results for the whole sample is comparatively high since the number of companies in the sample is limited. To avoid the quantitative influence of outliers on the total result a much larger sample would be necessary.

Within the framework of this study it has not been clarified whether the results would have differed if buy and hold returns or a CAPM based measure would have been applied. Such fundamentally long-term return calculation methods however would not have been able to reflect on short term pricing anomalies in the immediate environment of the divestment and accordingly would not have met the study objective. The actual academic contribution of this paper is the development of a dynamically adjusting CAR- calculation method based on time-varying beta and alpha factors. This approach allows for the comparative analysis of short and long-term results within a single research framework and accordingly makes temporary over- and underrating of the company in the environment of the divestment process possible.

This study, and study 1, have examined stock return development in the immediate and prolonged period after divestments, based on the past development of stock prices and the reference index only. The testing of the final hypothesis, however, illustrates that company-specific factors and external influences are relevant to divestment success. Past stock returns are frequently not an adequate indicator of future CARs, when the company acts in an adverse business environment, is exposed to significant competitive pressure, or is unable to adapt successfully to the novel situation after the divestment. Further research in moderating parameters is essential to understand the cause and effect chain inducing divestment success or failure. Paper 3 will augment the insights of this study by a quantitative management survey.

## 4 Moderating parameters of divestment success<sup>7</sup>

### 4.1 Introduction

#### 4.1.1 Discussion of shareholder value effects of strategic divestments

In an increasingly globalized and dynamic economy, strategic divestments, i.e. proactive sales of corporate shares or whole corporations, intending a prolonged corporate change (Brauer & Schimmer, 2000, 84; Madhavan, 2010, 1347; Bartsch, 2005, 16-19), have become a common phenomenon. Deal sizes have been growing steadily. In 2012 alone, they increased by 16% (Deloitte, 2013, 2). As a consequence, divestment activities are becoming increasingly relevant to corporate development and shareholder value, and are attracting attention in the capital market.

Evaluations like Deloitte's Divestment Survey 2012 tend to unsettle investors: The major objective of the majority of sellers is to maximize the sales price and the speed to sale (Deloitte, 2012, 12). Profound analyses on the long-term effects of the sale are partly neglected (Deloitte, 2012, 10). In fact, 43% of the divestment processes take longer than expected to be completed (Deloitte, 2012, 18). According to Cornerstone Research, about 94% of corporate divestments result in litigation. Essential risks of the sale are neglected, to push the deal through quickly (CMS, 2013).

However, the arguments made in favour of strategic divestments are multiple: From the perspective of Porter's market-based view, divestments allow focussing on core markets and key customers, while redundant and inefficient units are sold off. The result should be enhanced competitiveness, flexibility and economies of scale in the core markets (Montgomery et al., 1984, 30; Reinecke, 1989, 7-8; Dung, 2012, 107; Federico & Lopez, 2012, 12). From the perspective of the resource-based view, divestments reduce organizational disergies and allow focussing on key competencies and resources (Ostrowski,

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<sup>7</sup> This chapter is based on the third paper, which has not yet been published, but has been accepted for presentation and publication by Emerald Group Publishing. A special issue of *Journal of Hospitality and Tourism Technology: Innovation in Service Industries* Emerald Group Publishing. authors: Krasniqi, V. & Weigand J.(2014):"Strategic determinants of divestment success", WHU-Otto Beisheim School of Management, Vallendar.

2008, 83-84; Belderbos & Zou, 2006, 1). Deleveraging reduces corporate debt burdens (Renneboog, 2005, 9-10; Krishnaswami & Subramaniam, 1999, 76).

From a new institutional perspective, divestments reduce transaction costs (Meyer, Milgrom and Roberts, 1992, 9; Rajan, Servaes & Zingales, 2000, 36) and diminish information asymmetry between management and shareholders (Amihud & Lev, 1981, 606; Aulich & Hughes, 2013, 176-180).

Indeed, the majority of academic studies find that the shareholder value increases briefly after divestments: Brauer and Schimmer's (2010, 87) review of divestment research between 1983 and 2001, observes cumulated average rates of returns of 0.1% to 11.3% after divestments. Studies spanning the time range from the mid-1990s to 2008, confirm this result for very short periods around divestments: Rustige & Grote find CARs of up to 1.51% in the immediate divestment phase, for DAX companies. Brauer and Schimmer (2010) measure excess returns for the US insurance business, where on the divestment day CARs of up to 0.59% are reached. Sun and Shu find that a Taiwanese cross-industry sample attains CARs of 3.15% about 25 days after equity carve-outs. All these results, however, concern only the very narrow time span a few days after the divestment.

Brauer (2011, 2) argues that divestments can't be seen as an isolated event. The long-term consequences for the seller should be considered, to assess their efficiency and effectiveness. However, studies of the long-term stock market performance of divesting firms have rarely been published. The reason is that there was no methodology to measure CARs for prolonged timeframes until recently. CAR models usually used static alpha and beta factors, which prevented their adaptation to prolonged timeframes.

#### **4.1.2 Study contextualization**

This study series intends to close the existing research gap on long-term divestment effects. The initial two papers suggest that divesting corporations frequently do not outperform in the long run. A novel dynamic methodology of CAR analysis is applied, and short and long-term excess stock returns in the pre-divestment, divestment and post-divestment phase are compared for an international sample of 62 companies from the telecommunications business. Altogether, the evaluation spans the timeframe of 720 days before, to 720 days after the divestment.

The essential findings are:

- In the immediate divestment phase (day 20 before until day 1 after the event) in accordance with previous research, daily average abnormal returns are indeed higher than in the pre-divestment period (day -720 to day -100 before the deal) (Paper 2, section 3.4.1).
- In the period day 14 to day 714 after the divestment, cumulated average returns of the sample mostly exceed the pre-divestment period comprising day -720 to -100 before the divestment (significance 90%). However, after day 714 the effect falls off to virtually zero (paper 1, section 2.4.2.1).
- CARs in the immediate divestment phase (peak: 0.3% on day -1) are significantly higher than in the prolonged post-divestment phase (daily average 0.01% for days +14 to +720). Short-term market expectations exaggerate divestment effects significantly (Paper 2, section 3.4.3).

These results cast doubt on the previous academic assumption that divestments usually produce mainly positive shareholder value effects. While in the short run CARs are extrapolated the sustainability of over-performance is not guaranteed.

Which factors are responsible for the failure of sustainable shareholder value effects of strategic divestments? To some extent, macroeconomic factors codetermine divestment success: deal volumes depend on macroeconomic cycles. Increased volatility and uncertainty make investment volumes go down: after the collapse of the World Trade Centre on 09/11/012001, deal volume declined (Ederington & Guan, 2010; Wachter, 2008). In prolonged economic downturns, however, investors' inclination to sell and re-buy seems to increase. Deloitte's (2013/I, 9) survey among divesting firms finds that market changes and (resulting) financing needs are important reasons for the selling decision.

Branch- specific trends are another aspect: According to PWC (2012), deal volumes in the M&A business are on a slow but continuous decline for media and telecommunications since 2008, while deal volumes in technology corporations have been rising recently, after a brief decline in 2009. Barba explains that in the aftermath of the global

banking crisis in 2008, divestitures in banking have almost doubled from 25.6% to 48% of total M&A activity (Barba, 2013). In oil and gas, an inverse trend is observed: in 2013 deal volume decreased by 26%, and deal value by 43% (PennEnergy, 2013).

Deloitte (2013/I, 7), however, finds that the impact of economic conditions is highly significant in only 30% of divestitures. In fact there are other important, firm-specific factors. Extreme macroeconomic or branch-specific trends are triggers for long-delayed or neglected corporate crises that unleash partly forced and partly strategic spin-off decisions. Divestments, accordingly, seem to have an economic purgative effect that can be interpreted positively or negatively, depending on stance and objective of argumentation: on the one hand divestitures can compensate for past management mistakes, on the other hand they imply a process of focussing on corporate core competencies (Moschieri & Mair, 2008, 399). These observations suggest that any form of divestment is based on a complex inner-firm development process that is additionally fired by exogenous factors, i.e. broader economic trends (Moschieri & Mair, 2008, 399).

A preliminary case study conducted within the framework of paper 2 (section 3.4.5) suggests that to a large extent, firm-specific aspects determine sustainable divestment success: an in-depth analysis of five corporations showing extremely bad post-divestment results compared to pre-divestment and divestment phase performance, illustrates that in two cases underperformance results from divestment decisions forced by government decree, and in two further cases originates in corporations' lack of post-divestment adaptation and restructuring, in a dense external market situation.

According to these preliminary considerations, four factors are essentially responsible for divestment success or failure, measured as the post-divestment excess return of the divesting mother corporation: the macroeconomic development, branch-specific trends and competition, extraordinary external firm-specific impacts, and strategic factors at the firm level.

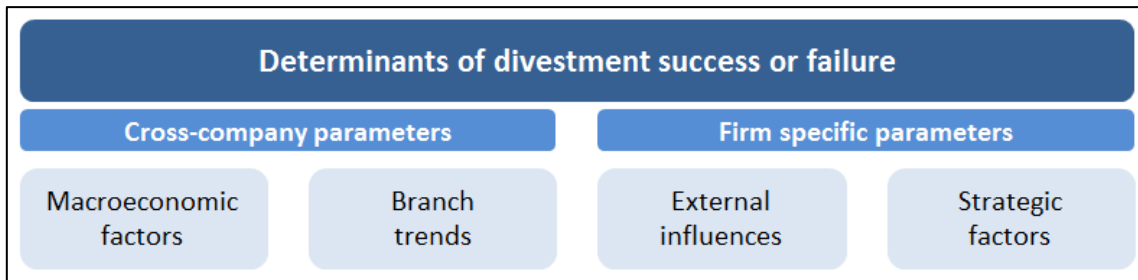


Figure 15: Classification of determinants of divestment success or failure (own draft)

Although Brauer and Wiersema (2012) point out the high relevance of cross-correlations between moderating parameters, little comprehensive information has so far been gained on firm-specific determinants of divestment success. Recent consultant analyses speculate on the motivations and expectancies of the deal, but find little on the gains and consequences of divestments, from a shareholder perspective. Neither Deloitte (2013) nor PWC (2012) look beyond the immediate process of the transaction. They focus on deal values and transaction motivations. Moderating parameters co-determining divestment success for corporations have not so far been explored systematically.

#### 4.1.3 Research questions and study design

Study 3 closes this research gap, asking, “Which firm-specific moderating parameters act on long and short-term market performance, and to what extent do they interact, or reinforce each other?”

It analyses the impact of strategic planning and corporate governance, statistically, and augments the event-based data set of telecommunications divestitures by a quantitative management survey in these companies, applying a novel combined methodology of market data analysis and survey.

The above key question splits up into four operational part questions:

1. Which firm-specific parameters connected to strategic planning in a broader sense, have been found to influence a) short-term and b) long-term performance after corporate transactions (including divestments and M&As)?
2. How can the identified firm-specific parameters be revealed in a management survey among the sample of telecommunications companies, and which statistical

methodology can integrate survey results and time series results on divestment success (from paper 1 and 2)?

3. Which are the relationships between firm-specific strategic planning and divestment success?
4. What do the results imply for the corporate governance and strategic planning of divesting corporations? What are the determinants of divestment success or failure, from a shareholder perspective?

These part questions determine the structure of paper 3:

To answer research question 1, **chapter 4.2** conducts a literature and finds strategic parameters which co-determine divestment success. Since there are not many studies of divestments, it includes M&A research. Parameters determining success in the short run, i.e. in the transaction phase, and in the long run, in the realignment phase after termination of the transaction process, are distinguished. Section 4.3 summarizes the review results, provides an overview of relevant moderating parameters of divestment success, and summarizes the achievements and limitations of previous research.

To answer research question 2, **chapter 4.4** details the empirical research approach. It explains the motivation for a management survey, starting from open questions on strategic success factors of divestments. Section 4.4.1 determines the research hypotheses and relevant target parameters. Section 4.4.2 explains the survey implementation, referring to questionnaire, sample and survey operationalization. Section 4.4.3 explains the statistical evaluation methodology of regression analysis, and drafts the regression models. The testing methodology is explained.

**Chapter 4.5** answers research question 3: It presents the empirical results of univariate analysis and regression modelling, and tests the hypotheses.

Answering research question 4, **chapter 4.6** summarizes and contextualizes the research insights, and derives managerial implications of the identified significant strategic success factors of divestments. It sketches limitations and further research needs.



## 4.2 Literature review of moderating parameters of divestment success

### 4.2.1 Review Method

The literature review uses the method based on Drinkmann, 1990, Pettiti 2000, and Cooper and Hedges (1994) developed in section 2.2.1, and, as detailed there, proceeds in 4 steps:

- Definition of research questions
- Delimitation of inclusion and exclusion criteria
- Extraction of relevant studies from databases
- Evaluation of studies

The research questions for the review derive from the key questions for study 3, which were formulated in section 4.1.3.

1. Which moderating parameters of post-divestment performance have been identified in previous literature, and how can the moderators be classified?
2. Which sample and timeframe do the studies refer to, and which methods are applied?
3. Which previous empirical insights have been gained on the effect, direction and strength of divestments?

To identify a range of papers, the following **inclusion and exclusion criteria** have been defined:

- a. To guarantee a scientific approach, only articles from academic journals and books or book contributions employing an academic approach, are selected.
- b. Research is limited to publications in German and English.
- c. Since detailed evaluation is indispensable to answer the research questions, only articles available in full text are employed.
- d. To ensure practical value, the focus is on empirical analyses.
- e. To guarantee topicality of the contributions, the search is limited to the period 1980 to 2015.

To comply with criteria a. and b. research is restricted to the following scientific **data-bases**:

- Emerald Full text: containing a large range of studies and articles on business and management,
- Science Direct a comprehensive academic database containing nearly 2,500 journals and 26,000 books.
- Ebsco Electronic Journals Service: multidisciplinary access to more than 300 journals,
- Additional papers retrieved from “Scholar Google”, which presents a large selection of free article from different databases.

The choice of appropriate key word combinations is essential to detect all relevant studies. Drawing on the keywords in Lee and Madhavan’s comprehensive meta-analysis, key-word sets combining the issue of corporate divestitures and success have been chosen to guide database analysis. These are adjusted by moderator-related keywords. The three keyword groups are combined.

<b>Corporate divestiture-related keywords</b>	<b>Success-related keywords</b>	<b>Moderator-related keywords</b>
Divestiture divestment M&A, merger & acquisition, strategic alliance, transaction	short-term performance synergy effect, success short-term outcome	Moderators Determinants Success factors Control variables

*Table 19: Keywords for literature review (study 3)*

To retrieve the most topical articles the results per data base are sorted by relevance and full text contributions are loaded down in this sequence. Each potentially relevant article is checked manually whether it fits for one of the part questions of the review. This manual selection process necessarily is subjective – as for any review. However the extent of this subjective bias has strongly been reduced by the systematic automated selection routine. The analysis is stopped as soon as 5 consecutive full-text articles do not fit with the review criteria. The results now are classified as follows:

The review finds that in agreement with the insights from study 1 and 2, moderating parameters of post-divestment performance differ, according to whether the short or the long-term after the divestment is considered. While studies referring to the short-term focus on moderating effects in the transaction phase, long-term oriented studies argue for the integration phase.

The following evaluation of moderating parameters classifies studies accordingly. The analysis includes M&A and divestment-related studies (section 4.2.2 and 4.2.3), since moderating parameters correspond, to a large extent, for the two transaction types.

#### **4.2.2 Moderating parameters of M&A success/failure**

Since the 1990s, success factors in M&A processes have been thoroughly investigated. While studies referring to the short run (few days to weeks) usually rely on the CAR approach, long-term studies (months to years after the deal) apply a much broader set of performance measures:

##### **4.2.2.1 Short-term effects – transaction phase**

Short-term shareholder value effects of mergers and acquisitions depend, to a large extent, on the environmental framework in which the deal takes place. **Moeller's (2005)** study, for instance, finds, that M&A deals between 1998 and 2001, in the period of the burst of the internet bubble – significantly underperformed, compared to deals before 1997 (Moeller, 2005, 767). The study further finds support for the relevance of the target type (private as compared to public), industry-relatedness (positive effect) the type of offer (negative effects of competing and hostile deals), and the relevance of equity in payment (positive) (Moeller, 2005, 775). Moeller, unfortunately, does not consider strategic corporate factors, and does not explicitly recognize the relevance of the macroeconomic situation.

Two later studies point out the relevance of strategic factors to short-term shareholder value creation in M&A processes: **Kale et al. (2002)** assess firm-specific factors influencing alliance success, for a sample of 78 global corporations, in a management survey,

and refer these to abnormal stock market returns following alliance announcements. They find significant relationships for the parameters “cumulative alliance experience and dedicated alliance function. Alliance experience is the number of alliances pursued, and dedicated alliance function refers to the intensity, duration and the depth of organizational intertwining” (Kale et al., 2002, 754). The study controls for branch effects and annual sales. Further, the study finds that investment in a dedicated alliance function is more significant than experience, to overall alliance success (Kale et al., 2002, 758).

**Capron and Pistre (2002)** evaluate 101 mixed global M&As’ success, in a management survey, considering post-announcement cumulative average rates of return. They find that high innovation and managerial resource transfer to the target is rated positively by market participants, marketing resources transfer however is negative. Inversely, target marketing resource transfer to acquirers is rated positively (Capron & Pistre, 2002, 788-789). Abnormal returns are calculated for 50 days before, to 50 days after the event, and exclude acquisition announcement effects (Capron & Pistre, 2002, 791).

#### **4.2.2.2 Long term effects – integration phase**

The long-term shareholder value effects of mergers and acquisitions are assessed more frequently. A broader range of performance measures is available: management estimates, stock performance and balance sheet information. Long-term post-divestment success factors refer to the type and funding of the transaction, but mainly comprise strategic factors, i.e. changes in corporate government, improved resource management:

**Loughran and Vijh (1997)** investigate the long-term benefit of M&As to shareholder value, for a sample of 947 acquisitions, between 1970 and 1989. Although the study does not primarily evaluate success factors, it provides some interesting insights into moderators of acquisition shareholder success. The study considers the control parameters: company size, and book-to-market ratio, but ignores branch trends (Loughran & Vijh, 1997, 1772). Acquisition success depends firstly on the form in which the acquirer pays (stock or cash), and secondly on the form of the acquisition (merger or tender offer). The study proves that tender offers, and acquisitions paid in cash, Are more advantageous from a shareholder perspective: comparing the excess percentage of returns for the 5 years following the deal, cash and tender offers increasingly outperform stock payment and mergers (Loughran & Vijh, 1997, 1796). The authors assume that tender offers, which, in

contrast to mergers, are usually hostile, result in a more consistent policy of governance change. While stock payment is chosen in case of stock overvaluation, cash payment is made when stocks are under-valued. Undervalued targets tend to outperform in the following years (Loughran & Vijh, 1997, 1789).

**Datta (1991)** assesses acquisition performance of 173 US-based corporations, in the years 1980 to 1984, in a management survey. He considers the input parameters: “differences in management style” and “evaluation systems”, and uses the control parameters high/low post-acquisition integration, and relative size of acquirer and target. Performance is measured by survey, referring to ROE, EPS, stock price, cash flow and sales growth (Datta, 1991, 288). While differences in management style are related negatively to post-deal success for both high and low integration, there is no significant relationship for differences in evaluation systems. Size differences are not significant.

**Canella and Hambrick (1993)** assess the influence of CEO changes on post-M&A performance. They refer to a sample of 96 companies that merged between 1980 and 1984. Performance is assessed in a management survey, asking about profitability at the time of the deal and four years after (Canella & Hambrick 1993, 144). The study controls for the level of industry-relatedness, and a change in industry-specific ROE. Executive departure and pre-acquisition performance have negative correlation coefficients in models explaining performance change. Industrial parameters are not significant. Senior management departures are more significant than departures in lower management (Cannella & Hambrick, 1993, 147). To some extent, the performance measure of executive estimates is biased, since present management will tend to judge performance development positively. Present estimates of performance results four years ago are not always reliable.

**Capron (1999)** surveys post-M&A performance for a mixed international sample of 253 corporations. The independent parameters are the level of post-acquisition asset divestiture, and post-acquisition resource redeployment, i.e. the swap of resources from acquirer to target, or from target to acquirer (Capron, 1999, 992). The evaluation assesses several dependent parameters (cost savings, market coverage, innovation capability, acquisition affect on market share, sales and profitability) in a structural equation model. It finds highly significant relationships for all input parameters. Accordingly, asset divestiture

and resource redeployment are crucial success factors in M&As. Assessing synergy effects in a survey and structural equation model provides a comprehensive picture (Capron, 1999, 1006). In a follow-up study, Capron et al. (2001) identify further cross-relationships. Strategic similarities ease post-merger redeployment, and thus, M&A success. Resource redeployment and divestiture are positively cross-correlated (Capron et al., 2001, 834).

On a critical note, performance results in Capron's studies originate from participants' estimates only. It seems plausible that managers doing radical restructuring after the merger are inclined to justify these measures by indicating highly positive performance results, while passive managers feel less pressure to justify, so the study might be biased to some extent, since there are no quantitative performance measures.

### **4.2.3 Moderating parameters of divestment success/failure**

Academic interest in divestment processes has mainly developed since the year 2000, i.e. more than 10 years after the start of M&A research. Methods applied in the analysis of success factors of divestments, however, broadly correspond to M&A analysis. Depending on the timeframe within which performance is measured, and on the performance measures applied, studies for the short-term (few days to weeks from the transaction) and the long run (several months to years), are again differentiated:

#### **4.2.3.1 Short-term effects – transaction phase**

In the analysis of short-term performance effects of divestments, the CAR approach is again dominant. In the short-term, success factors based in the transaction environment, like the divestiture type, the equity situation of the divesting firm, and the level of diversification after the deal, are significant.

**Haynes'** early paper (2000) on strategic divestments of UK firms between 1985 and 1989, assesses driving forces that encourage divestment activity. Though this paper is not about the success factors of divestments, it provides a comprehensive set of control variables to observe, when measuring determinants of divestment success. Haynes finds the following parameters significant and positively related to divestment decisions in all models: high firm leverage, extensive board composition, high share of management equity, high level

of diversification, large firm size, low level of concentration, intensive change in management (Haynes, 2000, 16).

Further studies are interested in firm-specific success factors of short-term divestment performance: **Datta et al. (2003)** analyse shareholders and bond holders excess returns, at the seller and at the buyer, in the transaction phase, for a sample 113 sellers and 96 bidders, between 1982 and 1992 (Datta et al., 2003, 356-358). The study refers to bond and stock CARs, from 10 days before, to 10 days after the event. Stockholders and bondholders of the divesting firm benefit significantly from the transaction, while results for the acquiring firms are neutral (Datta et al., 2003, 359-360). Using a regression model, the study shows that seller excess returns result from high monitoring activity only. For “low monitoring” sellers, excess returns are insignificant (Datta et al., 2003, 368). Monitoring activity is a significant determinant of divestment success, from a sellers’ perspective.

**Povaly (2007)** examines preconditions to divestment success, in a management survey among 56 European divesting firms conducting buy-out exits (Povaly, 2007, 248). He finds that the status of the capital market and the certainty of the execution environment are the most important success factors. Industry characteristics, divesting company performance and portfolio size of the divesting firm are further relevant aspects (Povaly, 2007, 274). Unfortunately, Povaly’s study does not refer to a clear target parameter, and does not draft testable hypotheses. It is based on a univariate survey evaluation only. The investigated categories provide no firm-specific information, they are mainly control variables concerning the macroeconomic and branch-specific situation.

**Madhavan (2010)** evaluates determinants of divestment performance, conducting a meta-analysis of previous empirical divestment studies. He uses the moderating parameters performance measure, divestment type, strategic intention, relatedness, price announcement (yes/no), and resource level of the divesting firm. The majority of the studies evaluate the (standard) CAR model (503), i.e. consider the short run. 147 studies use accounting measures, so they consider long-term performance. Madhavan’s study is thus predominantly short-term in focus. Studies using accounting-based measures, according to Madhavan, show significantly more positive performance effects than those using mar-

ket-based measured, so long-term performance is usually higher than short-term performance. Since the study conducts t-tests, it does not control for the short and the long run for other moderating parameters. Divestment performance depends significantly on transaction type, improves with strategic intention and the resource level, but does not depend statistically on relatedness (Madhavan, 2010, 1360). Since Madhavan's sample includes long and short-term studies and different performance measures, the results for the moderating factors are not reliable, but the moderator categories developed are of interest.

**Brauer (2009)** explores the relevance of divisional or corporate management involvement in divestment processes, in a case study. He finds no definite performance effects, but indicates that the course of the change process depends, to some extent, on the form of management involvement. Results differ by company, since a broad range of contingencies has to be observed. Brauer (2009, 345-346) takes account of relative unit performance, exit mode, unit size, unit-relatedness and interconnectedness, and internal control events. The study proposes that in investor-driven divestments, preceded by significant profit declines, corporate managers are frequently the main addressees. Though Brauer's study provides no direct information on divestment success, the categories employed are of interest to this analysis.

**Brauer and Schimmer (2010)** compare the short-term post-divestment performance of stand-alone divestments and program divestments, and evaluate the impact of specific and general divestiture experience on cumulative average returns (standard short-term model). Program divestitures are assumed when pre-divestment press releases explicitly announce a series of strategically contingent divestment steps (Brauer & Schimmer, 2010, 94). The study refers to a sample of US-based corporations, divesting between 1998 and 2007, and considers day -5 to +5 from the divestment. The evaluation controls for firm size, degree of diversification, and debt-to equity ratio, none of which is significant in the basic model. Firm performance depends positively on the parameter program divestiture, and positively on the time elapsed between the divestitures. Divestiture experience is not significant (Brauer & Schimmer, 2010, 100). Though the study avoids an ex-post declaration of divestments as programmatic, by referring to initial press releases, in my opinion, the measurement of the level of "program divestiture" from press releases alone is doubtful. It can't be accepted that the information retrieved is unequivocal. Press reports partially differ about whether it is a serial or stand-alone divestment.



#### 4.2.3.2 Long-term effects – post-divestment realignment phase

Compared to short-term analyses, divestment studies of long-term performance identify firm-specific success factors more frequently, and have more differentiated macro-economic and branch-related control variables, and strategic factors at the corporate level:

**Dawley et al. (2002)** evaluate post-restructuring performance for US firms on the verge of bankruptcy. They differentiate the control variables of external constraints and strategic choice, assuming that after refocussing, post-restructuring performance will improve when at least one of the parameters is high. The study considers a sample of 218 US-based manufacturing firms in distress, between 1980 and 1992 (Dawley et al. 2002, 702-704). It refers to a compound performance measure of 3 to 5 years averages of industry-adjusted ROA, ROS and Altman's Z-Score. The hypothesis that, given sufficient strategic options for action, refocussing significantly improves performance is accepted (Dawley et al., 2002, 709).

**Cristo and Falk (2006)** evaluate reasons for spin-off success, for a sample of 156 US-based spinoffs and carve-outs, in the period of 1996 to 1998, in a survival-based exponential regression model. The success of the spin-off is measured as a combination of key figures (e.g. annual revenue growth, ROA, book value per share, market price per share, price-earnings ratio). It is measured one year before, and three years after the divestment. The study tests the independent variables: size of parent, size of spin-off, reason for spin-off (as available from the SEC, e.g. strategic, risk reduction, sale, etc.) industry concentration, management team ownership, management team continuity (before/after spin-off), transition type, funding of spin-off, and innovativeness (incremental/new technology). The study finds that parent size alone, combinations of high parent size and spin-off size, and parent size and revenue size, are highly significant indicators of spin-off success (Cristo & Falk, 2006, 339-340). Divestiture reasons alone are insignificant, but combined with parent size are significant: Under-valuation, good access to capital markets, consistent strategy, and expansion, enhance divestment success (Cristo & Falk, 2006, 340-341).

Though the study provides several new categories, it leaves some methodological questions open: most factors assessed in Cristo's model are not strategic in themselves, they

are actually control variables (parent, spin-off and revenue size), reasons for divestment are a potential strategic factor, but relationships between success and “reasons” are not sufficiently detailed. For the strategic parameters “reasons for divestiture”, the relationships to the control parameters are not detailed in the study. It does not explain how the success parameters cited are combined to measure divestment success. It remains unclear how stock prices and balance sheet key figures are integrated into a compound success measure.

**Berg and Lim (2008)** refer to a sample of 205 international spin-offs, to assess the effect of general spin-off experience and recent spin-off experience, on post-spin-off success. Success is measured as ROA and average earnings per share, five years after the spin-off. Experience is the number of prior restructuring events in the recent 10 years. Recent experience refers to the previous year (Berg & Lim., 2008, 603). The study controls for debt, asset-relatedness, transaction price, total assets and block holdings. Both input parameters are significant. Recent spin-off experience is related to post-divestment success more closely than remote experience (Berg & Lim 2008, 605-607).

**Kahlert (2010)** suggests that the parameters “management experience” as an antecedent condition, and “analytical intensity”, as an organizational behaviour, are moderating parameters of divestment and M&A success (Kahlert, 2010, 6). Kahlert differentiates combinations of high and low analytical intensity, and high versus low past deal experience. These assumptions are tested in a management survey, among a sample of 110 German and Swiss stock companies which underwent some form of restructuring. Both dependent (performance) and independent (general and specific deal experience and analytical intensity) variables are assessed in the survey only. Kahlert controls for deal size, deal importance, relatedness, general firm performance and firm size, none of which is significant in the basic model (Kahlert, 2010, 24).

The study tests four regression models, and finds a moderating function of analytical intensity: Kahlert’s finds that both analytical intensity and high general and specific deal experience have a positive effects on deal success. However, the study finds that a combination of both parameters is not always useful: given low past deal experience, analytical intensity should be high, but given high past specific deal experience, analytical intensity should be limited, to avoid “over-investigated decision-making” (Kahlert, 2010,

13). High analytical intensity diminishes deal success in the situation of high specific deal experience, but augments deal success given low specific deal experience. The insights of the study are biased, to some extent, since performance is measured according to participants' perceptions: managers, who judge their specific deal experience positively, might be tempted to overrate venture success. Neutral stock market performance measures might deliver different results. Since the conventional CAR approach is limited to the short time span, Kahlert did not have reliable long-term stock market performance measures to assess long-term performance reliably.

**Braun and Latham (2009)** evaluate the relationship between post-leverage buy-out performance (dependent variable) and management board structure, for 65, mainly US-based firms in different branches. To measure performance, the study compares the change in firms' total assets in the fiscal year in which the LBO takes place, to the previous year, and compares positive to negative value developments. The board structure is described by the regression variables duality of leadership, board size, expert support and board independence. The control variables are debt and equity capital, S&P 500 development, and the level of management and directors ownership of the firm. The only significant parameters for post-LBO performance are specialist support, board independence and S&P 500 development (Braun & Latham, 2009, 721).

Braun and Latham's performance measure is, however not reliable. It does not consider at which date the LBO was concluded in the relevant year. For LBOs early in the assessment years, the performance effect should be considerably higher than for LBOs later in the year of observation. Further, Braun and Latham's evaluation illustrates that the macroeconomic development has an important impact on post-LBO performance. The performance measure total asset development is unfortunately inadequate to reflect this effect. The moderating parameter S&P 5000 development does not reflect branch-specific developments. A stock price-based performance measure, referring to a branch index, would be more accurate in timing, and would include macroeconomic and branch-specific moderators in the target variable, i.e. would avoid both difficulties.

**Domney (2009, 555)** finds further support for the relevance of concentrated ownership to the success of telecommunications privatizations. Comparing a New Zealand share

issue privatization to an Australian direct sale privatization, the study explains that concentrated ownership of the seller effectuates higher post-divestment dividend pay-outs, but does not enhance post-privatization efficiency. This result is not representative, since it refers to two companies only, but suggests that ownership might be significant to divestment success.

**Moschieri (2011)** conducts a tentative case study comprising 6 companies, and interviews managers on preconditions and enablers of divestment success. The participants explain that intense management participation at the unit level, and sensitivity to transaction success, enhance post-divestment efficiency (Moschieri, 2011, 382). Moschieri refers to several long-term success indicators, including book value and ROA, and sustainable share price gains (Moschieri, 2011, 376). In line with the basic assumptions of this study, Moschieri points out that divestments are an individual process, and success depends on the efficient interplay of firm-specific parameters (Moschieri, 2011, 368). It is essential to finally release the divested unit into independence, making a clear cut (Moschieri, 2011, 386). Though these results are not representative, they might serve as guidelines for a larger survey.

## 4.3 Summary of review results

### 4.3.1 Overview of determinants of deal success

1st Author	year	business	output	method	significant firm-specific input variables significant (+/-);(insignificant)	control variables	additional relationships
<b>Mergers &amp; Acquisitions</b>							
<b>Short-term performance focus</b>							
Moeller et al.	2005	M&A global	CAR [-1,+1]	regression	target type (private/public), relatedness (+), hostile offer (-), equity payment (+)	period (before 1997; 1998 to 2001)	
Kale et al.	2002	Pharma/electronics 78 firms	CAR	survey, event study, regression	alliance experience (+), alliance dedication (+)	annual sales	high dedication compensates for lacking experience
Capron et al.	2002	101 mixed global M&As	CAR	survey, regression	innovation and management resource transfer from acquirer to target (+), marketing resource transfer from target to acquirer (+), marketing resource transfer from acquirer to target (-)	annual sales, internationality, industry demand/production, economies of sale, overcapacity reduction, financial risk reduction, rival blocking	
<b>Mergers &amp; Acquisitions</b>							
<b>Long-term performance focus</b>							
Loughran & Vijh	1997	947 global acquisitions	stock over performance (Fama-French model) 1 to 5 years after	event study, case groups	merger versus tender offer, stock vs cash payment	company size, book-to-market-ratio	tender offers result in fundamental change; cash payment in case of stock undervaluation
Datta	1991	173 US M&As	management survey of performance indicators	survey, regression	management differences (-), (evaluation system difference)	relative size, high/low integration	
Cannella & Hambrick	1993	96 global corporations	management estimate of performance change	survey, regression	management change (-), senior management change (-)	relatedness, pre-acquisition performance (-), change in industry ROE	senior departure more relevant than lower management departure
Capron	1999	253 international M&As	acquisition performance, cost savings, market coverage, innovation capability	survey, structural equation model	divestiture of assets (+), redeployment of resources (+)	strategic similarities (+)	cost savings and improved market coverage enhance acquisition performance. cross correlations between inputs.

Table 20: Success factors in previous M&A research (author's analyses)

1st Author	year	business	output	method	significant firm-specific input variables	control variables	additional relationships
<b>Divestments</b>							
<b>Short-term performance focus</b>							
Haynes	2000	UK divestments	(divestment decision)	regression	leverage (+), extensive board composition (+), management equity (+), diversification (+), firm size (+), concentration (-), management change (+)		only sellers achieve significant results acquirers are insignificant
Datta et al.	2003	113 divestments	CAR [-10:+10] of bands and stocks	event study, CAR, regression	monitoring activity		
Povaly	2007	56 European equity buyouts		survey, univariate evaluation	portfolio size	state of capital markets, certainty of execution, industry characteristics	
Madhavan	2010	metaanalysis	performance (different measures)	metaanalysis, t-test	divestment type, strategic intention (+), resource level (+)		
Brauer	2009	case study among 5 international electronics companies	divisional or corporate manager involvement in divestments	qualitative case study	unit performance, exit mode, unit relatedness, internal control		severe difficulties from a stakeholder perspective causes high corporate management involvement
Brauer & Schimmer	2010	266 US corporations	CAR [-5:+5]	regression	general divestiture (specific/ general divestiture ce); Program (+)/stand-restiture, time elapsed between divestitures (+)	size, degree of diversification, debt-to equity ratio	

Table 21: Short-term success factors in previous divestment research author's analyses)



1st Author	year	business	output	method	significant firm-specific input variables	control variables	additional relationships
<b>Divestments</b>							
<b>Long-term performance focus</b>							
Dawley et al.	2002	218 US companies in	ROA, ROS, Z-score over 3 to 5 years	ANOVA	refocussing strategy (+)	high/low constraints, high/low strategic choice	
Cristo & Falk	2006	156 US spin-offs & carve-outs	compound: annual revenue growth, ROA, book value per share, market price per share, price-earnings-ratio		size of parent (+), size of spin-off (+), reason for spinoff, industry concentration, management team ownership, management team continuity, transition type, funding of spin off and innovativeness		reasons only significant with parent and spin-off size
Berg & Lim	2008	205 international spin-offs	ROA	regression	spin-off experience (+), recent spin off experience (+)	debt, asset relatedness, transaction price, total assets, block holdings	recent experience more significant than total experience
Kahlert	2010	110 German and Swiss publicly traded companies	management success perception	survey, regression	general and specific deal experience (+), analytical intensity (+)	deal size, deal importance, relatedness, general firm performance and firm size	inverse relationship of specific deal experience and analytical intensity
Braun & Latham	2009	US companies mixed branches	total asset growth	regression	(board duality, board size), board independence (+), expert advice (+)	debt, management ownership, S&P 500 (+)	
Domney	2009	New Zealand/Australia n telecommunicati	dividend payment, investment quota	case study	collective vs single ownership		
Moschieri	2011	case study 6 companies	share price gains, ROA, book value	Case study	management sensitivity (+) involvement (+), clear cut (+)		firm-specific interplay of success factors

Table 20: Long-term success factors in previous divestment research (author's analyses)

The above overviews summarize output, input and control parameters, and significant results, in table form, differentiating by M&As and divestments, the short and the long-term perspective.

#### 4.3.1.1 Conclusions and research gaps of research in strategic moderators

Summarizing these results, key question 1, "Which firm-specific parameters related broadly to strategic planning, have been found to influence a) short-term and b) long-term performance after corporate transactions?" can be answered.

Contrasting study results for the short-term following M&A, and divestment-specific, firm-specific success factors have been found significant. The parameters are extracted from tables 19 to 21, expressed as positive (i.e. shareholder success-enhancing) factors, and grouped by topics:

Firm specific determinants of		
SHORT TERM	short term M&A success	short term divestment success
target related parameters	target type (private/public)	firm size
	target relatedness	diversification, low concentration, portfolio size, low unit relatedness
		monitoring activity, internal control
transaction process related parameters	friendly offer	divestment type, exit mode, program divestiture
Capital related parameters	equity payment	leverage
		management equity
		unit performance
Mother corporation-related parameters	alliance experience	strategic intention
	alliance dedication	
resource related parameters	innovation transfer to target	resource level subsidiarity
	resource transfer to target	
	marketing transfer to acquirer	
management related parameters		
		management change
		extensive board composition

Table 23: Firm-specific determinants of short-term transaction success (author's analyses)

Table 23 suggests grouping the identified success factors into five categories. Target-related parameters describe proprieties of the target or the divested unit, for instance the



type of the target, the portfolio size of the divesting corporation, and the level of relatedness of the corporate units. Transaction process-related parameters refer to the way in which the transaction process is approached, i.e. refer to the divestment/acquisition mode and the number of repeated transactions. Capital-related parameters refer to the way in which the M&A or divestment is financed, for instance the leverage, equity or debt financing and the resulting ownership structure. Parameters at the mother corporation refer to the strategic intention of the mother corporation with the deal, and the modalities of transaction implementation, i.e. experience, dedication and strategic intention. Resource-related parameters refer to the change of resource utilization after the deal, i.e. the synergies resulting from M&As, or disergy avoidance after the divestment. Management-related parameters refer to control of the deal process, and management changes resulting from the deal.

Previously identified long-term firm-specific determinants of divestment success can now be similarly structured:

Firm specific determinants of		
LONG TERM	long term M&A success	long term divestment success
Target related parameters	target size level of integration	size of parent to size of target level of concentration
Transaction process related parameters	tender offer/merger	analytical intensity, expert advice clear cut
Capital related parameters	stock/cash payment	management ownership funding of divestment collective/single ownership
Parent related parameters		reasons for divestment (recent) experience general/specific experience
Resource related parameters	asset divestment resource redeployment	refocussing strategy innovativeness
Management related parameters	management homogeneity senior management change	management team continuity board size, board duality board independence management sensitivity/ involvement

Table 24: Firm-specific determinants of long-term transaction success (author's analyses)

Table 24 illustrates that for the long run, the same categories for previously identified success factors are applicable as for the short run. The focus of long run studies is to a

larger extent on management-related parameters, but no fundamental difference concerning the success parameters tested significant, is observable from previous studies.

This analysis of so-far-proven short and long-term success factors of strategic divestments and M&As, summarizes the limitations of previous research:

Although a broad range of factors was tested, no study integrates the available sets of categories into a single evaluation. This is problematic for the validity of the results: studies focusing on single categories ignore the influence of other categories. For instance, Brauer & Schimmer (2010) assess divestiture experience and divestiture type, but do not consider monitoring activity and board change. Braun and Latham (299), on the other hand, focus on board structure and financing issues, but ignore the relevance of strategic intention and resource utilization, to divestment success. Possibly erroneous cause and effect relationships may be identified in the results. Since the parameter board or strategy is ignored, performance effects are falsely assigned to the evaluated parameters.

*A comprehensive approach, considering all known relevant influence factors on divestment success, is necessary, to avoid this weakness.*

Another point of critique concerning the sample of previous studies evaluated, as a whole, is that hardly any evaluation integrates the short and long-term perspectives of transaction success into a contingent model. The reason is that previous authors lacked a methodology to directly compare short and long-term shareholder value effects, using a single and reliable success measure. For the short-term, CAR models are proven (Datta et al., 2003, Brauer & Schimmer, 2010). Until recently, however, CAR models were limited to the very short run, since they relied on fixed alpha and beta factors. For the long run, management success estimates (Datta, 1991; Capron et al., 1999 & 2001, Kahlert, 2010) and balance sheet analyses (e.g. Berg & Lim, Braun & Latham, 2009, Domney, 2009), are proven concepts. Using monthly or annual stock return difference (Loughran & Vijh, 1997; Moschieri, 2001, Cristo & Falk, 2006) is an inaccurate and unreliable performance assessment strategy, since the return is based on the difference of starting and closing price, so interim gains or losses are not considered.

To compare the relevance of success factors in the short and long run, reliably, *a model is needed that refers to a single valid performance measure that can be “scaled” for the short and the long-term perspectives.*

#### 4.4 Model-building

##### 4.4.1 Hypothesis development

This chapter develops a research approach apt to close the research gaps identified in the course of the literature review. The result is a comprehensive model that considers all previously identified categories of influence factors, on divestment success, verifies relevant variables by category, and refers them to a success parameter adaptable to the short and long run. The hypotheses each refer to one of the input parameter categories, and are defined for the short run (coding a) and the long run (coding b). This approach is acceptable, since no significant differences concerning significant variables between short and the long term studies have been found in the review (see table 22 and 23). Each hypothesis tests several variables that were found to be significant in previous studies. A hypothesis is accepted if at least one of the suggested parameters is tested significant. To bring the results together, finally, a comprehensive model that contains all significant parameters from all categories, is built.

**H6a)** Short-term and **H6b)** long-term divestment success depend on **target-related variables**. The following target-related variables are tested for significance:

1. pre-divestment performance of divested unit, compared to parent company
2. size of parent/size of divested unit,
3. level of concentration of parent before divestment/level of concentration of parent after divestment,
4. level of relatedness to divested unit.

**H7a)** Short-term and **H7b)** long-term divestment success depend on **transaction-process-related variables**. The following transaction-process-related variables are tested for significance:

5. abruptness of exit (timeframe of divestment),

6. level of divested unit separation,
7. Analytical intensity before divestment
8. Monitoring intensity of the divestment process

**H8a)** Short-term and **H8b)** long-term divestment success depend on **capital-related variables**. The following capital-related variables are tested for significance:

9. Percentage of management ownership at the deal
10. Development of share of debt financing due to divestment
11. Development of level of diversified ownership after divestment
12. Development of level of equity capital due to divestment

**H9a)** Short-term and **H9b)** long-term divestment success depend on **mother-corporation-related variables**. The following mother-corporation-related variables are tested for significance:

13. Level of divestment experience of mother corporation
14. Last divestment activity of mother corporation (before current transaction)
15. Number of repeated divestitures in a row
16. Mother corporation's bond to divested unit (before divestment)

**H10a)** Short-term and **H10b)** long-term divestment success depend on **resource-related variables**. The following resource-related variables are tested for significance:

17. Level of resource dependence from divested unit
18. Level of refocussing necessary to reorganize
19. Level of innovativeness of restructuring process

**H11a)** Short-term and **H11b)** long-term divestment success depend on **management-related variables**. The following management-related variables are tested for significance:

20. Extent of management change in divestment process
21. Level of diminution of board size in divestment process
22. Relevance of external expert advice in divestment process

23. Management involvement in divestment process

24. Sensitivity of actions taken in divestment process

To test H6 to H11, study 3 regression models based on OLS analysis are applied, and the significance of the input variables is tested in t-tests. For details, see section 3.3

The dynamic CAR model, as derived in paper 1 and 2 of this study series, is chosen as a time-variable success measure. The approach is detailed in section 4.4.3.1.

#### **4.4.2 Survey implementation**

This section answers research question 3 (How can the identified firm-specific parameters be revealed in a management survey among the given sample of telecommunications companies, and which statistical methodology is appropriate to integrate survey results and time series results on divestment success?) by developing the research methodology to test the hypotheses in detail:

##### **4.4.2.1 Sample**

To test the above hypotheses, this study refers to a global sample from the telecommunications business. Reconsidering the review (table 19 to 21), previous studies have usually referred to mixed samples, not to a single industry. As a result, branch effects cannot be distinguished clearly. Studies applying the CAR, or the Fama-French model, refer to a diversified stock price index in which the corporations are rated, as a reference (Moeller et al., 2005, Kale et al., 2002, Capron et al., 2002, Voughran & Vjih, 1997), Datta et al., 2003; Brauer & Schimmer, 2010). This index does not reflect branch-specific effects. Indirectly, it is assumed that by referring to a mixed sample, branch effects are excluded, which is in fact not the case, since usually not all possible branches are represented in the samples, and the sample is not large enough to ensure this statistically (lack of statistical representativeness).

To avoid branch biases, it is helpful to refer to a single branch, and to use a branch-specific index. The telecommunications business is of particular interest, since this sector has recently been subject to highly dynamic developments, due to the exponential growth of mobile communications and the internet (Deloitte, 2013/II). As a result, the number of

large transactions has been growing strongly in the recent decade PWC (2012). However, research in telecommunications divestments is so far rare. Success factors of divestments in the telecommunications business have only been tentatively analysed by Domney (2009), in a case study on two Australian/New Zealand-based providers. Rieck & Doan (2009) assess CARs in telecommunications M&As, but, apart from the parameter "internationality", do not consider firm-specific success factors.

This study closes this research gap in the telecommunications market, and refers to a sample for which study 1 and 2 of this paper series evaluated short and long-term CARs. It comprises 62 strategic divestment events in global telecommunications, exceeding 300 million US\$, in the period 2005 to 2011. 52 events, for which adequate stock price series are available, have been evaluated. To calculate CAR values, the study extracts the closing rates 720 days before the event, to 714 days after it, and compares and calculates the abnormal returns, compared to the ETF iShares Global Telecom<sup>8</sup>, as a reference. This is a highly fluid branch-specific exchange traded fund, free from dividend payments, and available from Nov, 26, 2001.

#### **4.4.2.2 Relevance and possible biases of a management survey**

A management survey is the most efficient way to derive statistically valid measures of the success determinants (input factors) derived from the review. Theoretically, some of the derived parameters could be gathered from corporate balances, but they would have to be standardized in an additional work step to make the corporations comparable. Since the divestment events considered extend over a time-span from 2005 to 2012, balance figures would only be partly comparable, and would have to be adjusted for macro-economic influences. Applying a management survey, these steps are condensed. For instance, to assess the level of diversified ownership, a Likert scale can be used, instead of counting the number of major shareholders (which would hardly be possible in many cases). Resource-related, management-related and some process-related parameters are available from surveys only, since this data is not publicly available.

Several previous studies analysing these points particularly, have applied management surveys and achieved reliable results (Datta, 1991; Capron, 1999, Capron et al., 2001,

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<sup>8</sup> <http://finance.yahoo.com/q?s=IXP>, access on Jan, 5, 2014

Capron et al., 2002, Kahlert, 2010; Povaly, 2007). A core critique concerning this previous research is that mostly even performance parameters are measured by management estimate (Cannella & Hambrick, 1993; Capron, 1999, Capron et al., 2001, Capron et al., 2002, Kahlert, 2010). The measurement of both – determinants of success and success effects – in a survey is usually biased, since participants are tempted to assume that high activity results in high, positive performance effects. There is also a risk that the participants do not remember past events correctly, and in particular, forget about negative experiences and performance results. This study avoids this bias as far as possible, by assessing potential success factors in a survey, while the relevant success effects are neutrally measured as cumulative average stock returns.

#### **4.4.2.3 Survey based determination of success factors (input parameters)**

To assess the input parameters, each of the 52 corporations for which CAR have been calculated, is submitted a *management survey* that assesses the items 1 to 24, derived in section 4.3.1, in 24 part questions, about the divestment event to which the CAR parameters refer. To achieve this, management executives of the firm are called beforehand, asked for participation, and the matter and reference event are explained. It is ensured that the executives themselves participated in the divestment. The link to the electronic survey is then sent by e-mail. The electronic letter of intent again refers to the divestment event, and asks for answers to the questions with reference to the event.

The questions are multiple-choice, to standardize the answers for statistical evaluation. The answering options are coded for statistical analysis in a regression model. To code the items, an appropriate scale has to be chosen. Weiber & Mühlhaus (2010, 97) state that Likert scales, which classify statements according to participants' agreement intensity, are most widespread in empirical surveys. Coding Likert scales into 5 possible ranks allows participants adequate choice, without overburdening the survey. 5-step Likert scales have a clear median value, and are easy to understand (Weiber & Mühlhaus, 2010, 97). In accordance with these practical experiences, the answers are coded on a Likert Scale that, if possible, ranges from 1 (no confirmation) to 5 (high confirmation). It could be argued that the items measured by question are not comparable between the questions, but this is no problem here, since each item remains independent, i.e. every part question represents an individual parameter in the regression model.

The participants choose one option per question. Each question refers to one of the items derived from the literature review (see Table 23 and Table 24.). This means that the items are operationalized in a formative way, i.e. the constructs derived from the review are each reflected in a single item or part question. This approach corresponds to the thought model of regression analysis (Weiber & Mühlhaus, 2010, 202).

The questions are well-thought-out and formulated in the way so that they lead directly into the relevant construct e.g. “management change, management involvement etc., which is expressed in verbs. This is the clearest form of conceptualizing the constructs. If the constructs were circumscribed in several part questions, it would be impossible to verify whether these questions are perceived as contingent concerning the construct as a whole. Referring to the name of the construct directly in the form of a single question each, avoids this difficulty.

It could be argued that the interviewees possibly understand different things under the constructs “management change”, “management involvement” etc. However this bias is common for any type of formulation, particularly for circumscriptions of the construct, which again can be understood in a broad variety of ways. By addressing the construct directly the range of understandings is recorded and reflected in the variety of answers. Since a representative sample has chosen the results reflect the construct understanding of the majority of managerial participants.

The questions are formulated as follows:

1. Comparing the pre-divestment performance (EBIT) of the divested unit, to your (parent) corporation, was it (1) much worse, (2) worse, (3) equal, (4) better, (5) much better than the parent corporation.
2. Could you please indicate the size of the divested unit as compared to the parent corporation, as expressed in share of the balance sum: (1) < 10 %, (2) 10-20%, (3)20-30%, (4) 30-40 %, (5) > 50%.
3. Comparing the level of market concentration of the parent before and after the divestment, has concentration (1) diminished, (2) remained constant, (3) slightly increased, (4) increased or (5) strongly increased?



4. To what extent was the divested unit related to the parent company concerning the business conducted? (1) not related at all, (2) slightly related, (3)intermediately related, (4) strongly related, (5) it was in the same business
5. What was the timespan between the actual internal divestment decision and the conclusion of the divestment contract? (1) less than 1 month, (2) 1 to 3 months, (3) 3 to 6 months, (4) 7-12 months, (5) more than one year.
6. To what extent is the parent company now really separate from the divested unit? (5) no contact at all, (4) casual interchange, (3) repeated sporadic business activity, (2) regular business activity, (1) close cooperation.
7. What was the level of analytical intensity before the divestment contract was concluded, was it (1) very low, (2) little in-depth, (3) as economically useful, (4) intense, (5) extraordinarily thorough.
8. What was the level of monitoring intensity in the process of divestment deal implementation, was it (1) very low, (2) little in-depth, (3) as economically useful, (4) intense, (5) extraordinarily thorough.
9. What was the level of management ownership of your corporation when the deal was decided on? (1) none, (2) less than 10 %, (3) 11 to 30%, (4) 31 to 50%, (5) more than 50%.
10. Did the level of debt financing of the parent corporation diminish due to the divestment? (1) no, it increased, (2) no, it remained about constant, (3) it diminished slightly, (4) it diminished strongly, (5) it was reduced to virtually zero.
11. Did the level of ownership diversification diminish due to the divestment? (1) no, it increased, (2) no, it remained about constant, (3) it diminished slightly, (4) it diminished strongly, (5) there are only very few owners left now.
12. Did the parent corporation's share of equity increase due to the divestment? (1) No (2) it increased slightly, (3) it increased to some extent, (4) it increased strongly, (5) there is now mainly equity financing.
13. To what extent was your corporation experienced with divestments at the time of the relevant deal? (1) Not at all, (2) to some extent, in theory, (3) profound previous

consultation (4) own experience in one previous divestment deal, (5) experience in several previous divestment deals.

14. How long in the past was previous divestment experience when the relevant divestment was accomplished? (1) There was no prior deal, (2) more than 5 years before, (3) 2 to 5 years, (4) 1 to 2 years, (5) few months.
15. Considering the relevant divestment, was it (1) a unique event, (2) was it connected to another divestment event (3) was it embedded in a chain of several divestments of your corporation?
16. To what extent did your corporation have a close bond to the divested unit before the divestment? Was the relationship to the divested unit (1) rather superficial, (2) relevant to part functions (3) relevant to core functions (4) strategically important (5) dense and intimate.
17. To what extent did you depend on the divested unit concerning business resources (manpower, knowledge, material resources)? (1) Virtually no dependence (2) low dependence (3) intermediate dependence, (4) high dependence, (5) very high dependence.
18. To what extent did your company have to reorganize after the divestment? (1) not at all, (2) very partial reorganization, (3) moderate reorganization, (4) important reorganization, (5) strategically indispensable reorganization
19. To what extent would you call the restructuring process undergone after the divestment innovative? (1) not at all, (2) little innovative, (3) intermediately innovative, (4) above average innovative, (5) very innovative
20. To what extent did the management of the parent corporation change in the course of the relevant divestment process? (1) it did not change at all, (2) single team members changed, (3) several team members changed, (4) most team members changed, (5) radical change of the whole management team.
21. To what extent did the board size diminish in the divestment process? (1) it grew, (2) it remained constant, (3) single positions were cut, (4) several broad positions were cut (5) many board positions were cut.

22. To what extent did you rely on external advice in the divestment process? (1) External consultants were not asked at all, (2) consultancy was unimportant (3) external consultancy was moderately important (4) external consultancy was above average important, (5) external consultancy was most important.
23. To what extent was the management involved in the divestment process? The management was... (1) not involved at all, (2) only marginally involved, (3) partly involved, (4) well integrated (5) dominating the decision process
24. To what extent was the management sensitive to the actions taken in the divestment process? It was (a) not sensitive at all, (2) only marginally sensitive (3) moderately sensitive, (4) highly sensitive, (5) extremely sensitive.

The participating firms submit the dataset electronically.

To assign the data to CARs, they cannot be processed anonymously. A comparative univariate analysis explores the dataset. The characteristics of the sample are estimated for each value series, i.e. the number of values observed for each measurement parameter, calculating the distribution of frequencies. To characterize the results statistically, means, standard deviation, and maximum and minimum are calculated by part question (Blunch, 2008, 237).

To make sure that the part questions in fact refer to the assumed category, and are essential to measure a construct, a principal component analysis is conducted. It confirms that, for instance, questions 1 to 4 in fact refer to the category “target-related variables, and that all four part questions are necessary to determine the category. The factor analysis results are in the appendix 7.3.1 (Brosius, 2011, 796).

### **4.4.3 Statistical evaluation**

#### **4.4.3.1 Dynamic CARs as output parameters**

To determine success effects of the divestments, the study refers to the results of CAR calculation, according to a novel dynamic model, which was developed in papers 1 and 2 of this study series. The essence of the method is: the market model (Markowitz, 1959;

Sharpe, 1961) estimates the expected return  $E(R_{it})$  of stock company I, at time point  $t$ , as a linear function of the return  $R_{mt}$  of the reference index M, in  $t$ , as follows:

$$E(R_{it}) = a_i + b_i R_{Mt} + \varepsilon_i$$

$a_i$  is a constant development of  $R_{it}$ , independent of the stock index,  $b_i$  measures the sensitivity of the stock return to the development of the return of the market index, i.e. represents the systemic risk the stock is exposed to. The residual variable  $\varepsilon_i$  describes an idiosyncratic risk component of the stock, dependent on firm-specific influences and mirrors possible control parameters.  $\varepsilon_i$  is expected to be zero in the long run (Francis & Kim, chapter 12.5). Given the returns of an index and of a stock for a certain time period, the  $b_i$  and  $a_i$  values for the expected return of the stock can be estimated in an ordinary-least-squares regression.

The abnormal return is the extent to which the observed return exceeds the expected return:

$$AR_{it} = R_{it} - E(R_{it})$$

Cumulated abnormal returns for a period starting at day  $t = u$ , and ending at day  $t = z$ , can be calculated by adding up daily returns from  $u$  to  $z$  (see Bartsch, 2009, 139-140):

$$CAR_{[u;z]} = \sum_{t=u}^z AR_{it}$$

The CAR approach has been modified here, and made applicable to long-term stock performance analysis, as follows: to add a dynamic development to the basic market model,  $a_i$  and  $b_i$  are assumed time-varying, with a lag  $l$ . The lag describes the horizon before the measurement of  $R_i$  and  $R_m$  that determines the factors. Mathematically, the time-varying market model results in:

$$E(R_{it}) = a_{i,l} + b_{i,l} R_{Mt} + \varepsilon_{i,l} \quad \text{with } E(\varepsilon_{i,l}) = 0$$

A dynamic formula for abnormal returns results in:

$$AR_{it} = R_{it} - [a_{i,t} + b_{i,t}R_{Mt}]$$

Dynamic abnormal returns by stock can be calculated daily, for a certain reference index and a reference period of lag 1. Dynamic abnormal returns, in contrast to conventional abnormal returns, are adequate to assess infinitely long observation periods, since  $b_i$  and  $a_i$  are not fixed, they adapt dynamically with time.

Study 1 and 2 have calculated CAR<sub>v</sub> for the pre-divestment period, comprising day [-720;-100] before the divestment, CAR<sub>d</sub> in the divestment period [-100; +14], and in the prolonged post-divestment period [+15; +714]. CAR<sub>d</sub> evaluates CARs in the short post-divestment period, when the timeframe is limited to ds [-1;+14], i.e. to test hypotheses part a. CAR<sub>n</sub> analyzes success factors in the long post-divestment period, according to the hypotheses part b. Since short and long-term success effects can only be measured with regard to the previous development of the company, it makes sense to calculate the difference of CAR<sub>n</sub> and CAR<sub>v</sub>, and CAR<sub>d</sub>s and CAR<sub>v</sub>. To calculate the differences, the CAR values have to be standardized to a daily basis, by dividing the CARs by the number of days they refer to. The standardized target parameters Y for the regression analysis are:

$$CAR_{stand.}^{short} = \frac{CAR_{ds}}{16} - \frac{CAR_v}{620}$$

$$CAR_{stand.}^{long} = \frac{CAR_n}{700} - \frac{CAR_v}{620}$$

#### 4.4.3.2 Regression analysis and hypotheses testing

To test the hypotheses, multiple regression models are drafted and examined. Mathematically, a simple regression model takes the form of a linear equation  $Y = a \cdot x + b$ . The regression model estimates the parameters  $a$  and  $b$  by minimizing the average distance of each value pair  $I$  from a regression line. The estimate for  $b$  is the ratio of the covariance of  $x$  and  $y$ , and the variance of  $x$  with  $b = \frac{s_{xy}}{s_x^2}$ .  $a$  results from  $a = \bar{y} - b \cdot \bar{x}$  (Duller, 2007, 148). The residuals  $\varepsilon$  are the deviations of the observed  $y$  values from the estimated  $y$

values  $\varepsilon_i = y_i - \bar{y}_i$  (Duller, 2007, 152). To achieve an optimal approximation, the sum of residuals is minimized.

Multiple regression extends simple regression models by further independent (explanatory) parameters  $x_1 \dots x_n$  (Brosius, 2011, 586), as follows:

$$Y = a + b_1 * X_1 + b_2 * X_2 + \dots + b_k * X_k$$

The quality of the complete regression model results from the measure of identification  $R^2$ , the ratio of the squared sum of the explained variance, and the squared sum of the total variance.  $R^2$  is between 0 and 1, and indicates which share of the true y-values is explained by the regression model. 1 stands for maximum model quality (complete coincidence of observed values with the regression line). The measure corrected  $R^2$  also considers the sample size and the number of explaining variables, and is helpful to estimate whether further explaining variables  $x_i$  improve the model fit (Brosius, 2011, 564-567).

To test the hypotheses, an ANOVA test is conducted. ANOVA examines the share of variance explained by the model, of the total variance. ANOVA employs an F-test, examining the zero-hypothesis that the variables jointly do not explain the observed values at all. If ANOVA significance is below 0.05 (less than 5 % error probability), this assumption is rejected (Backhaus et al., 2011, 159-161) and the hypothesis H6 to H11 is assumed.

The individual model parameters are tested for significance, in a T-test. Parameters are reliable when significance values below 0.05 (significance level of 95%) are reached. SPSS indicates standardized and non-standardized coefficients ( $b_{1\dots n}$ ). The standardized coefficients compare the relevance of the explaining variables, while the un-standardized coefficients perform content-wise interpretation.

To make sure that the model parameters reliably explain the target values, further tests of a) multi-collinearity of the explaining variables, b) autocorrelation, and c) normal distribution of the residuals, are conducted.

Multicollinearity implies a content-wise relationship between two explaining parameters, which can impair the reliability of the regression coefficients. To examine possible collinearities, an initial correlation analysis of the input variables is conducted. To ensure a good model fit for the regression, there should be no significant correlations between the input parameters. SPSS also provides collinearity-statistics with the regression model. Tolerance values should be below 0.1. The VIF values, and the condition index derived from the tolerance, should be below 10, to assume non-collinearity.

To test for auto-correlation, SPSS conducts a Durbin-Watson test with the regression model. It should be around 2. Significantly lower or higher values suggest positive or negative auto-correlations. Normal distribution of the residuals is tested by saving these as separate variables, and applying the Kolmogorov-Smirnoff and Shapiro-Wilk tests. Both tests should be below 0.054 for normally distributed values (Brosius, 2011, 404-405).

SPSS offers several ways to create fitting regression models. Inclusion method means that all suggested input factors are employed for the model. The backward elimination method eliminates redundant and insignificant parameters. It is an algorithm that, departing from the inclusion solution, discards insignificant input parameters, step by step, by order of insignificance. For the evaluation in this study, both methods are used for each hypothesis, to come to fully significant models with regard to each input parameter, and to test the hypotheses.

Finally, all parameters that have been proven significant in the regression models according to H6 to H11, are condensed into a comprehensive regression model, which explains the relative influence of target-related, transaction process-related, capital-related, mother corporation-related, resource-related and management-related parameters, for the telecommunications business.

#### **4.5 Empirical results**

Appendix 7.3.1 contains the dataset. The univariate evaluation, and the correlation analysis, is in appendix 7.3.2, the regression models are in appendix 7.3.3 and 7.3.4.

#### 4.5.1 Univariate results of success factors

All 52 corporations for which CARs are available, participated in the survey, due to the authors' relationships to a broad range of executives in these companies. The participants are all involved in corporate strategy, or in mergers and acquisitions and divestment activity, and were personally engaged in the relevant deals.

The standardized CAR values (daily) according to the dynamic approach (see section 4.3.3.1), are calculated on the basis of the data gathered in paper 1 and 2 of this study series. Based on the daily returns per share, the timeframe is adapted to the short post-divestment period ds [-1; +14], and the long post-divestment period n [+15; +714] is available directly from previous calculations (compare appendix 7.3, table 25 "CARs").

Quest.	Hypothesis	Item	Mean	STD	1	2	3	4	5
Q1		Preinvestment EBIT target/parent	2,29	1,143	32,69%	25,00%	25,00%	15,38%	1,92%
Q2	H6 target-related inputs	target size/parent size	2,71	1,348	21,15%	30,77%	17,31%	17,31%	13,46%
Q3		market concentration parent	3,00	1,482	21,15%	21,15%	17,31%	17,31%	23,08%
Q4		relatedness of target	3,19	1,284	11,54%	25,00%	9,62%	40,38%	13,46%
Q5		time span decision to conclusion	2,58	1,377	26,92%	30,77%	11,54%	19,23%	11,54%
Q6	H7 transaction process related inputs	separation from target after divestment	2,87	1,495	25,00%	23,08%	11,54%	21,15%	19,23%
Q7		analytical intensity	2,71	1,405	26,92%	21,15%	19,23%	19,23%	13,46%
Q8		monitoring intensity	3,00	1,268	13,46%	28,85%	11,54%	36,54%	9,62%
Q9		management ownership at deal conclusion	2,69	1,489	30,77%	21,15%	11,54%	21,15%	15,38%
Q10	H8 capital related inputs	debt financing diminished?	2,83	1,264	17,31%	30,77%	9,62%	36,54%	5,77%
Q11		ownership diversification diminished	3,27	1,330	11,54%	17,31%	28,85%	17,31%	25,00%
Q12		share of parent equity increased?	3,21	1,226	7,69%	26,92%	17,31%	32,69%	15,38%
Q13		divestment experience before	2,54	1,228	21,20%	36,50%	17,30%	17,30%	7,70%
Q14	H9 parent related	divestment experience how long ago?	2,98	1,488	23,08%	19,23%	15,38%	21,15%	21,15%
Q15		program divestiture?	1,90	,721	30,77%	48,08%	21,15%	-	-
Q16		bond to divested unit before?	3,19	1,373	13,46%	23,08%	15,38%	26,92%	21,15%
Q17		H10 resource related inputs	resource dependence on target	3,17	,944	3,85%	17,31%	44,23%	26,92%
Q18	necessity to reorganize after divestment		2,52	1,393	30,77%	26,92%	13,46%	17,31%	11,54%
Q19	restructuring innovative?		2,48	1,146	19,20%	40,40%	19,20%	15,40%	5,80%
Q20		management change?	2,65	1,186	13,46%	42,31%	19,23%	15,38%	9,62%
Q21	H11 management related inputs	board size diminished?	2,56	1,290	25,00%	26,92%	26,92%	9,62%	11,54%
Q22		external advice?	2,60	1,376	23,08%	34,62%	19,23%	5,77%	17,31%
Q23		management board involved?	2,98	1,057	1,92%	38,46%	30,77%	17,31%	11,54%
Q24		management sensitive?	2,54	1,146	15,38%	44,23%	19,23%	13,46%	7,69%



*Table 25: Univariate analysis of input data author's analysis)*

Table 25 contains the univariate results per part question, i.e. the first two sample moments, and the frequencies per option. Maximum frequencies per part question are marked in dark grey.

All parameters are normally distributed, according to the Komogorow-Smirnow and the Shapiro-Wilk tests. Auto-correlations are insignificant for the CAR-short to CAR long-margins (see appendix 7.3.2).

The factor analysis, also in appendix 7.3.2, mainly confirms the categories and hypotheses derived from the review. The Bartlett test of sphericity indicates to what extent many significant correlations are assumed, although they are all equal to zero. Bartlett significance should be close to zero, to assume construct validity (Brosius, 2011, 794-795). The Bartlett significances for H6, H7, H9, H10 and H11 fulfil this condition. The KMO Test evaluates the partial correlations between the items. These should be low, since high partial correlations indicate low contingency among several factors. The KMO criteria should be at least 0.40, and ideally close to 1 (maximum value) (Brosius, 2011, 796). All constructs fulfil these conditions. All test constructs, except factor H8, are thus plausible according to the PCA. Varimax rotation improves construct H8. The initial solution suggests omitting Q 10 (debt financing). This parameter is omitted from the regression model.

Concerning target related items, the following is found: most participants indicate that the pre-divestment EBIT was much worse than the parent's, only about 17% indicate better, or much better, EBITs for the target, so the reason for the divestment in most cases was at least partly financial. Usually, divested targets are much smaller than the parent. Market concentration of the parent, in most cases, has increased, or strongly increased, due to the divestment (40.4%). However, in 21.15% of the cases, market concentration has diminished. Possibly, parent companies use the capital freed by the divestment to expand their activity. Surprisingly, strongly related units are divested more frequently than unrelated subsidiaries. In the telecommunications business, divestment might be considered a strategy to free resources for new business development.

The results for transaction process related inputs indicate: most companies spend 7 to 12 months to finally conclude the deal, i.e. on finding an adequate buyer. The majority (25%) keeps no further contact to the target after the divestment, about 20% remain in close cooperation, however. Surprisingly, most participants judge analytical intensity to find an adequate partner “very low”. This corresponds with Deloitte’s previous insights (Deloitte, 2012, 10, section 2.1.1). However, most participants find monitoring intensity in the transaction phase comparatively high (level 4) (36.5%).

Considering capital inputs, most firms indicate no, or very low, levels of management ownership at the time of deal conclusion (51%). Usually, debt financing diminishes due to the divestment (51%), but 17.3% of the corporations increased their debt level in spite of the sale. Ownership diversification frequently diminishes significantly due to the divestment (42%). The share of parent equity usually increases strongly (47%). This corresponds to the observation about debt quotas. These capital-related results indicate that divestment is frequently a strategy of consolidation and de-leveraging.

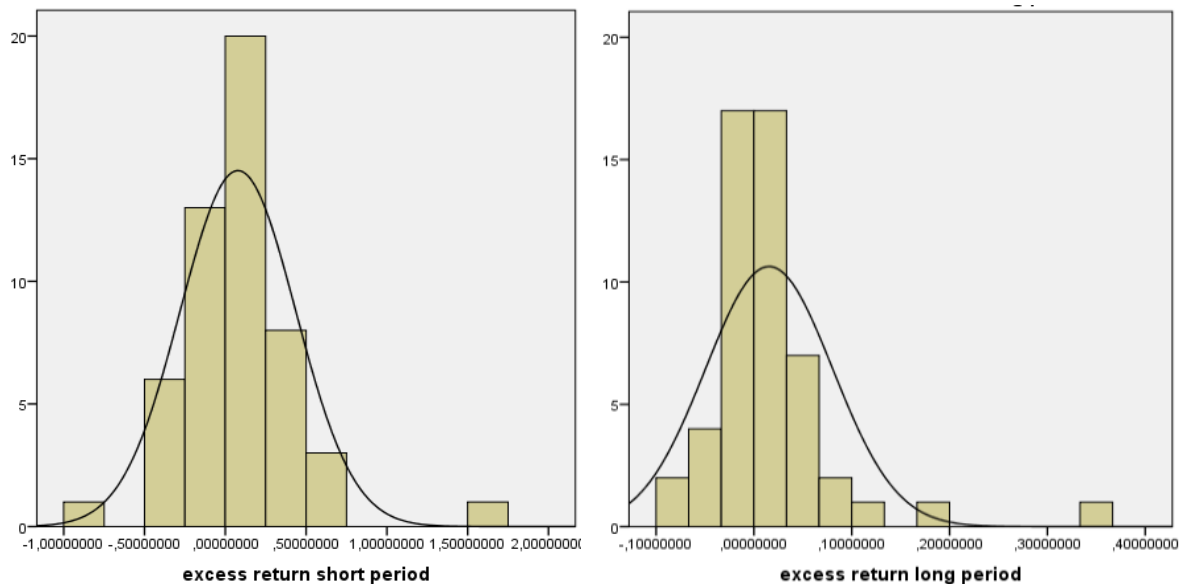
Considering parent-related input factors, most parent companies have no previous divestment experience (51%). 23% have never done a divestment before, for 19.3% of the companies, recent divestments are more than 5 years ago. However, for about half of the corporations, the relevant divestment takes place in the immediate proximity of another divestment deal. About 47% of the divested corporations had a strong, or very strong, bond to the divesting firm, before the deal. The parent-related observations suggest that increasing market dynamics in the telecommunications business has encouraged divestments recently, although divestment experience is frequently low.

Considering resource-related input factors, most participants have been moderately dependent on the sold unit (44%), and felt little or no need to restructure after the deal (56%). The majority of the participants find their companies’ restructuring processes little, or not at all, innovative (60%). It remains to be examined to what extent the neglect to restructure after the divestment affects shareholder value.

The results for management-related inputs suggest that the majority of the firms do not undergo management changes after the divestment (55%). About 51% do not diminish their board size after the transaction. The opportunity to save organizational efforts after

the transaction is obviously frequently neglected. Most corporations do not seek external advice at all, or only superficially, when deciding on a divestment (57%). The management board frequently is only partly involved in the deal (58%). The majority of the participants indicate low management sensitivity to the developments in the transaction process (44.23%). This suggests that the majority of the participating telecommunications firms do not invest significant managerial effort in the divestment process.

Comparing the results for the daily CARs for the short and long observation periods, it is striking that excess returns in the short observation period are higher than in the long observation period. These results correspond to paper 1 and 2. Markets overestimate positive shareholder value effects of divestments. The daily mean excess return in ds  $[-1; +14]$  is 0.07%. In the long observation period  $n [+15; 714]$ , it is 0.01%. CARs in the long run are more strongly right-skewed, i.e. more frequently below zero, than short term CARs. In the long run, almost half (44.2%) of the divesting firms perform worse than the market, while in the short run it is only 38.5%. The maximum average daily CAR for the short run is 1.55%, for the long run it is only 0.35%. For details of the distribution of CARs, see appendix 7.3.



*Figure 16: Distribution of daily CARs in short and long observation periods*

## 4.5.2 Regression models and hypotheses tests

The analysis of the regression models allows testing the hypothesis and identification of significant determinants of divestment success:

### 4.5.2.1 H6: Relevance of target-related success factors

H6 assumes that CARs depend on target-related success factors. **H6a** tests this assumption for the short time frame  $ds$ , for the timespan  $[-1; +14]$  days from the divestment announcement. Durbin-Watson is 2.11, i.e. acceptable, and the collinearity statistics shows no inadmissible values. The ANOVA analysis suggests one significant model including factor Q3 (relatedness of target) only. The significance of the corresponding regression equation  $CARds = 0.273 * Q3 + 0.066$ , is 95 %. Market concentration of the mother corporation results in increases CARds values. These results correspond to Moeller et al. (2005), who also find a positive relationship between short-term CARs (one day before and after the divestment), and concentration, for global M&As. In accordance with the strategic realignment hypothesis, market participants obviously expect lower adaptation efforts and resource savings for related divestments (Kwoka, 1993, 49; Dung, 2012, 49). Transaction costs are saved when the parent's concentration increases organizational efficiency (Aulich and Hughes, 2013, 176-180). **H6a is accepted.**

To test **H6b**, target-related parameters are regressed on long-term CARs, for the timespan  $[+15; +714]$ . No significant model is found with the iterative elimination method. Corrected  $R^2$  is always below 0.1. None of the suggested models explains the output reliably. **H6b is rejected:** none of the suggested target-related parameters (pre-divestment EBIT, relative size of target, parent's market concentration, and relatedness) explains long term post-divestment CARs reliably.

### 4.5.2.2 H7: Relevance of transaction process-related success factors

H7 tests the relevance of transaction process design to short and long-term divestment success. The Durbin-Watson test is around 2 (1.894), and the collinearity statistic is admissible. Backward elimination finds four admissible models, i.e. all models, whether they include all four, or only one suggested factor, are reliable. However, not all parameters are significant. **H7a is accepted:** transaction process-related parameters have a sig-

nificant impact on short-term post-divestment success. However, considering the significances of the individual parameters, only the final model, containing Q8 (monitoring intensity), contains only significant factors. Its ANOVA significance is 0.000, i.e. the model fit is optimal. Short-term divestment success increases with monitoring intensity. The standardized regression equation is  $CARs = 0.524 * Q8$ . This is plausible, according to the monitoring incentive hypothesis: Divestments enhance corporate transparency and shareholder control on corporate success. From the perspective of market participants, divesting managers are under increased pressure to perform, and find it harder to draw fringe benefits after the transaction (Brauer & Schimmer, 2010, 86; Hanson & Song, 2003, 321).

Regressing transaction process-related input parameters on long-term CARs, the Durbin-Watson test is 1.234 (i.e. little auto-correlation). The collinearity statistic is acceptable. However, according to the correlation analysis, Q 8 is correlated to Q5, and Q6 to Q7, at the 95% level, i.e. models should contain either Q5, Q6 or Q7 or Q8 and Q6 or Q7. SPSS suggests four significant and admissible models, reducing Q5, then Q8 and finally Q7, so an ideal model should contain Q7 and Q8. For this reduced model, Q7 is not significant, Q8 has a significance of 0.065, so the one-factor model using Q7 from the backward elimination approach, is better: It is significant with an ANOVA of 0.002, and has the equation:

$$CAR_n = 0.424 * Q7.$$

Long-term divestment success increases with analytical intensity. This observation again corresponds to previous observations: From the resource-based view (Ostrowski, 2008, 83-84), and the agency perspective (Aulich & Hughes, 2013, 176-180), divestments reduce transaction costs, and result in production cost savings, when disergies are reduced. High analytical intensity avoids unconsidered divestments, and ensures that expected efficiency gains are, in fact, realized. On the other hand, hasty divestment decisions might result in the separation of indispensable units, which might increase transaction costs in the long run. H7b is accepted.

#### 4.5.2.3 H8: Relevance of capital-related success factors

H8 examines the relevance of capital-related success factors in divestments. **H8a** refers to short term CAR changes. Durbin-Watson is 1.984, i.e. acceptable, so is the collinearity statistics. Backward elimination finds two significant models, but only the second model including Q9, Q11 and Q12 is significant for all factors. These factors are management ownership at deal conclusion, diminution of ownership diversification, and increase of parent equity. None of these factors is correlated to another. The R<sup>2</sup> value of the model is 30%. **H8a is accepted.** The standardized regression model is:

$$\text{CAR}_d = 0.434 * Q_9 + 0.217 * Q_{11} + 0.346 * Q_{12}.$$

The model is significant at the 99.99% level. This result is plausible according to Moschieri's telecommunications case study findings (2011). Domney (2009, 555) finds further support for the success factor concentrated ownership, in telecommunications privatizations. Divestments usually reduce corporate debt and increase equity capital. This reduces the risk of loan givers and shareholders, and is reflected positively in capital markets (Renneboog, 2005, 9-10).

Do capital-related success factors also enhance long-term shareholder value after divestments? The reduced significant model for CAR<sub>n</sub> contains Q 9 and Q 10, i.e. management ownership at deal conclusion, and diminution of debt financing. It is significant at the 97% level. The explanatory value of the model is, however, only 10 %, i.e. there are many other important influence factors on long-term post-divestment CAR development. The standardized regression equation is:

$$\text{CAR}_n = 0.260 * Q_9 + 0.286 * Q_{10}.$$

**H8b is accepted:** Capital-related success factors have a significant impact on long-term post-divestment CARs. These results confirm previous findings. Management ownership reduces inner-firm interest conflicts, and the information asymmetry between external shareholders and the management. Management motivation is enhanced, when managers are shareholders (Fluck & Lynch, 1999, 322-323, Ray, 2003, 215). Reduced debt financing enhances the position of the remaining shareholders and creditors, which enhances

capital market ratings, and encourages investors to buy, and hold, the asset in the long run (Amihud & Lev, 1981, 606).

#### 4.5.2.4 H9: Relevance of mother corporation-related success factors

According to H9, mother-corporation-related success factors are significant to short and long term CARs after divestments. H9a tests the short run influence of the factors: divestment experience, how recent divestment experience has been, program divestiture, and bond to the divested unit. The Durbin Watson test and the collinearity statistics are reliable (2.234). There are no significant correlations between the input parameters. However SPSS finds no significant model at the 95% level. Step by step, the parameters Q14 (divestment experience), Q15 (program divestiture), and Q13 (divestment experience) are eliminated. The model including Q 13 and Q16 and Q16 (bond to divested unit) only reach significances of about 92%. The explanation value of these models is only between 4 and 5%. None of the model factors is significant above the 92% level. **H9a is rejected.** Mother corporation-related success factors do not reliably explain short-term post divestment CARs.

These results confirm Brauer and Schimmer's (2010) study, to some extent. They found no significant impact for specific or general divestiture experience. However, program divestitures (compared to stand-alone divestitures) enhance short-term CARs, in the time window of 5 days around the divestment announcement. The divergence of results could result from differences in research methodology (Brauer & Schimmer compared US companies, and the CAR period was shorter. It controlled for size and debt.).

H9b tests the impact of the same parameters on long-term post-divestment CARs. Again none of the parameters is significant. Backward elimination finds no admissible model. Neither divestiture experience, nor repeated divestment experience, nor program divestiture, nor "bond to divested unit", explain the observed long-term CAR development for the relevant sample. **H9b is rejected.** This result does not correspond to previous observations. Bergh & Lim found positive effects of spin-off and recent spin-off experience on ROA. According to Kahlert (2010), general and specific deal experience enhances success according to management perception. Both studies, however, did not measure shareholder value in the form of stock returns. Possibly capital markets reflect experience differently than managers. Capital markets do not always react to enhanced balance figures,

since market trends reflect investors' future expectations rather than past performance results.

#### 4.5.2.5 H10: Relevance of resource-related success factors

H10 assesses the impact of resource-related parameters on post-divestment success. For the output "short-run CAR", Durbin-Watson and the collinearity statistics are reliable. Backward elimination identifies three significant models including the factors Q19 (innovative restructuring), Q18 (reorganization necessity after divestment) and Q17 (resource dependence). **H10a is accepted** at the 99% level (ANOVA = 0,006). Only the factor Q 18, however, is significant. As expected, its Beta is negative:

$CARs = - 379 * Q18$  for the standardized model. The corrected  $R^2$  value is 12.6%. Short-term post-divestment CARs are significantly reduced when divestments entail strong reorganization at the mother corporation. The need to reorganize hampers post-divestment efficiency. The inverse relationship has so far only been analysed for M&As: Capron et al. (2002), for instance, found that mutual resource utilization enhances post M&A CARs. The inverse relationship, according to this survey, is valid for divestments.

H10b assesses the impact of resource-related success factors on long-term post-divestment CARs. The Durbin-Watson statistics is 1.558, i.e. it suggests some auto-correlations among the inputs. The collinearity statistic is reliable. There are no significant correlations between the input parameters. Backward elimination finds two significant models, one including Q 17, Q18 and Q19, and one including Q18 and Q19 only. However, Q17 is not significant according to the t-test, so the two-factor model with Q 18 (re-organization necessity) and Q19 (restructuring innovation), is chosen. It is significant with an ANVOA value of 0.001. **H10 b is accepted**. The regression model is:

$$CAR_n = -0,310 * Q18 + 0,308 * Q 19$$

Long-term post divestment success depends on resource-related factors. As expected, the necessity to reorganize is negatively correlated with  $CAR_n$ , and "restructuring innovation" has a positive effect, so innovativeness in reorganization processes can compensate for the hampering effect of high reorganization needs, in the long run. While in the short



run, capital markets reflect on re-organisation needs only, in the long run investors recognize innovative activity, which results in increasing investment in the asset, and rising returns. Although this differentiation for the short and the long run has never been proven before, the results agree with Dawley et al. (2002), who find for the long run that post-divestment refocussing strategies, given high strategic choice, result in a positive fundamental return development.

#### 4.5.2.6 H11: Relevance of management-related success factors

H11 tests the relevance of management-related parameters to post-divestment CARs. H11a analyses short term CARs. Durbin-Watson is 2.157, i.e. acceptable, and the collinearity diagnosis shows no significant cross-correlations. Correlation analysis confirms this. Backward elimination suggests four significant models, including the parameters Q 20, Q 21, Q 23 and Q 24. The model fit according to ANOVA is between 0.032 (four factors) and 0.015 (one factor). **H11a is accordingly accepted.** Short-term post-divestment CARs depend on management parameters. However, only the one-factor solution with parameter 23 is significant for all parameters. The corrected R<sup>2</sup> is 9.4% for this solution, and could be enhanced by 2% by adding another (insignificant) factor. Accordingly, the one-factor regression model is chosen. It is significant at the 99,5% level:

$$\text{CARs} = 0.334 * \text{Q23}.$$

Q 23 represents management board involvement in the divestment process. Highly involved management boards augment short-term post-divestment success. This result corresponds with Moschieri's (2011) case study, which finds positive effects of management involvement for the long run. This study reaches these conclusions: capital markets honour management participation in divestment decisions, also for the very short time window after the divestment.

Hypotheses H11b tests management-related factors for their impact on long-term post-divestment performance. Backward elimination finds 4 highly significant models, with significant values between 0.021 (four-factor solution) and 0.004 (two-factor solution). H11b is accordingly accepted: long-term post-divestment shareholder value depends on management-related factors. Considering the parameter significances according to the t-

tests, only the two-factor solution contains only significant factors. It comprises Q 22 (external advice) and Q 24 (management sensitivity). The regression model is:

$$\text{CAR}_n = 0.295 * \text{Q 22} + 0.271 * \text{Q24}$$

As expected, external advice and management sensitivity both increase long-term post-divestment success. This result agrees with previous research: Braun & Latham (2009) find that expert advice significantly increases total asset growth for mixed US divestments. Moschieri's case study finds that management sensitivity is essential to fundamental success in divestments.

#### 4.5.3 Comprehensive model of success factors to divestment success in telecommunications

Input parameters	Hypothesis		b1	b2	b3	ANOVA
target related	H6 a	short term CAR	<b>0,273</b>			0,050
			Q3: parent concentration			
	H6 b	long term CAR				n.a.
transaction process related	H7 a	short term CAR	<b>0,524</b>			0,000
			Q8: monitoring intensity			
	H7 b	long term CAR	<b>0,424</b>			0,002
			Q7: analytical intensity			
capital related	H8 a	short term CAR	<b>0,434</b>	<b>0,217</b>	<b>0,346</b>	0,000
			Q9: management ownership	Q11: reduced ownership diversification	Q12: increase of parent equity	
	H8 b	long term CAR	<b>0,260</b>	<b>0,286</b>		0,028
			Q9: management ownership	Q10: reduced debt		
mother-corporation-related	H9 a	short term CAR				0,080
	H 9b	long term CAR				n.a.
resource related	H10 a	short term CAR	<b>-0,379</b>			0,006
			Q18: reorganization necessity			
	H10 b	long term CAR	<b>-0,310</b>	<b>0,308</b>		0,001
			Q18: reorganization necessity	Q19: innovativeness of restructuring		
management related	H11 a	short term CAR	<b>0,334</b>			0,015
			Q19: management involvement			
	H11 b	long term CAR	<b>0,295</b>	<b>0,271</b>		0,004
			Q22: external advice	Q24: management sensitivity		

*Table 26: Summary of hypothesis test (author's illustration)*

Table 26 summarizes the results of the hypothesis tests for short and long-term CARs. This result answers **research question 3** (What are the relationships between firm-specific strategic planning and divestment success?). The following parameters (see table 27) have been found to be significant for the short and long-term development of post-divestment CARs:

<b>Short term</b>	<b>Long term</b>
Q3: parent concentration	Q7: analytical intensity
Q8: monitoring intensity	Q9: management ownership
Q9: management ownership	Q10: reduced debt
Q11 reduced ownership diversification	Q18 reorganization necessity (-)
Q12: increase of parent equity	Q19: innovativeness of restructuring
Q18: reorganization necessity (-)	Q22: external advice
Q23 management involvement	Q24: management sensitivity

*Table 27: Eligible parameters for comprehensive model (author's illustration)*

#### **4.5.3.1 Comprehensive short-term CAR model**

Based on the significant parameters, comprehensive models explaining short and long-term post-divestment CARs, and including all significant factors, can now be drafted. Since models with more than 5 factors are usually complex to handle, and are frequently characterized by cross-correlations, a more efficient model, considering the dominant parameters, is looked for, using backward elimination. A correlation test for the parameter is conducted, to eliminate input parameter interdependencies. The results are in appendix 7.3.4. Considering the potential inputs for the short-term, the following correlations result (see table 28):

	H6_3	H7_8	H8_9	H8_11	H8_12	H10_18	H11_23
H6_3	1	,449**	,151	-,080	,227	-,237	,250
H7_8	,449**	1	,312*	-,256	,504**	-,400**	,424**
H8_9			1	,003	,015	-,224	,021
H8_11				1	-,084	,061	-,122
H8_12					1	-,433**	,457**
H10_18						1	-,206
H11_23							1

Table 28: Inter-item correlations for significant parameters in short-term CAR models

Accordingly, there are three possible models avoiding inter-item cross-correlations:

Model s1	Q8		Q11	
Model s2	Q3	Q9	Q11	Q12
Model s3	Q3	Q9	Q11	Q18 Q23

Table 29: Possible integrative regression models for short-term CARs (author's analysis)

All three models are tested for significance, using backward elimination, and the most reliable model is chosen.

Model s3 is significant at the 99.9% level, and explains 36.1% of the target parameter variance. Both factors are significant. Model s2 has a corrected  $R^2$  of 30.7%, and an ANOVA significance of 99.9%. Factor Q3 is reduced, since it is not significant according to the t-test. Model s3 has a corrected  $R^2$  of 35.6%. Its significance is 99.9%. Backward elimination suggests a four-factor solution comprising Q9, Q11, Q18 and Q23 (see an overview on table 30).

	corr. R <sup>2</sup>	ANOVA	b1	b2	b3	b4
Model s1	0,361	0,000	0,612 Q8: monitoring intensity	0,346 Q11: reduced ownership diversification		
Model s2	0,307	0,000	0,434 Q9: management ownership	0,217 Q11: reduced ownership diversification	0,346 Q12: increase of parent equity	
Model s3	0,356	0,000	0,373 Q9: management ownership	0,24 Q11: reduced ownership diversification	-0,246 Q18: reorganization necessity	0,305 Q23: management involvement

*Table 30: Optimal comprehensive regression models for short-term CAR (author's analysis)*

Table 30 summarizes the standardized solutions and significances, for the three eligible models which are significant for all parameters. Model s1 has the highest explanatory value ( $R^2$ ), and is easy to build, since it contains only the factors monitoring intensity and reduced ownership diversification. To predict short-term post-divestment performance for the time window day [-1; +15] from the announcement, the parameters monitoring intensity and the level of ownership diversification due to the divestment are most reliable. From a capital market perspective, high monitoring intensity reduces information asymmetry between seller and buyer, and increases the probability that the target unit is sold at a fair price. Reduced ownership diversification enhances transparency, from the perspective of market participants, and ensures that contingent decisions in the divesting mother corporation are taken rapidly. These results correspond with previous studies, from an internal and external capital market perspective. Capital markets favour divestment decisions that enhance information efficiency and save transaction costs (Picot, Reichwald & Wigand, 1998, 42- 48). In the short run, when information on fundamental efficiency gains from the divestment is not yet available, expected agency and transaction costs are an indicator for the development of excess returns.

#### 4.5.3.2 Comprehensive long-term CAR model

In the same way, correlations for the significant parameters concerning long-term CARs are determined according to table 31 and 32, to find admissible comprehensive models free from cross-correlations between the input parameters. The following correlations are relevant:

	H7_7	H8_9	H8_10	H10_18	H10_19	H11_22	H11_24
H7_7	1	,154	,126	-,283*	,173	,354**	,123
H8_9		1	-,091	-,224	,100	-,158	-,177
H8_10			1	-,182	,316*	,399**	,350*
H10_18				1	-,258	-,165	,055
H10_19					1	,412**	,202
H11_22						1	,265
H11_24							1

*Table 31: Inter-item correlations for significant parameters in long-term CAR models (author's analysis)*

This results in the following four possible models without significant inter-item correlations:

Model I1	Q7	Q9	Q10			
Model I2	Q7	Q9		Q18	Q19	Q24
Model I3			Q10	Q18		
Model I4		Q9		Q18	Q22	Q24

*Table 32: Possible integrative regression models for long-term CARs (author's analysis)*

The four models are again tested for significance, using backward elimination. Model I1 is significant at the 99.98% level, and all but one parameter are eliminated for lack of significance. Q7, analytical intensity, remains. The explanation value is 16.4%. Model I2 reaches an optimal corrected R<sup>2</sup> value (0.286) and a significance of 99.9% after the elimination of Q9. Q7 (analytical intensity), Q18 (reorganization necessity) and Q19 (innovativeness of restructuring) are included. In model I3, Q10 is eliminated for lack of significance. Only Q 18 (reorganization necessity) remains, reaching a corrected R<sup>2</sup> of 13.5%, and an ANOVA significance of 99.96%. Model I4 is significant for all parameters without reduction, and accordingly contains Q9 (management ownership), Q18 (reorganization necessity), Q22 (external advice) and Q 24 (management sensitivity). Its explanation value is 0.348, i.e. highest. ANOVA is 0.000. Accordingly, model I4 should be chosen to predict long-term CARs after divestments most reliably.

	corr. R <sup>2</sup> ANOVA		b1	b2	b3	b4
Model I1	0,164	0,002	0,424 Q7: analytical intensity			
Model I2	0,286	0,000	0,311 Q7: analytical intensity	-0,231 Q18: reorganization necessity	0,274 Q19: innvativeness of restructuring	
Model I3	0,135	0,004		-0,39 Q18: reorganization necessity		
Model I4	0,348	0,000	0,269 Q9: management ownership	-0,304 Q18: reorganization necessity	0,269 Q22: external advice	0,342 Q24: management sensitivity

*Table 33: Optimal comprehensive regression models for long-term CAR (author's analysis)*

This result corresponds to previous insights: Managerial ownership reduces information asymmetry, and the divergence of interests between management and external shareholders. This results in enhanced investors' trust and fundamental corporate governance, in accordance with sustainable shareholder value development. Reorganization necessity after the divestment impairs corporate efficiency, and accordingly prevents the development of positive shareholder value effects. Managers asking external advice in divestment decisions support the divestment process by additional know-how, and avoid in considered divestment decisions, which enhances shareholder value. Management sensitivity to divestment processes is essential, to promote the understanding of employees, and realize an effective reorganization. The results illustrate that sustainable divestment success depends on a broad range of hard and soft factors, and is worth managing actively.

#### **4.6 Conditions of sustainable value creation by strategic divestments**

##### **4.6.1 Academic contextualization of empirical results**

The results of study 3 improve established methods of measuring strategic impacts on divestment success, and identify the set of identified success factors of strategic divestments.

In a systematic literature review, the study has condensed success factors in strategic divestments and M&As, referring to a broad range of previous studies. The empirical part

has tested them systematically for relevance to shareholder value development. Independent variables are gained from a survey, while success is measured by stock market returns. This strategy eliminates positive biases inherent in management success evaluations, and provides an investor's perspective on shareholder value opportunities of divestment activity. By referring to proven input categories, the results are comparable to previous studies, and are appropriate for qualitative cross-sample comparisons.

The results confirm previous studies, and develop previously observed relationships further. Previous studies usually either consider the short run (applying the CAR approach) or the long run (referring to management surveys or balance key figures). This study has combined the analysis of short and long-term perspectives, applying a dynamic CAR model. The relevance of different input factors, short versus long-term, on post divestment success accordingly becomes directly comparable.

Divestment success as a whole significantly depends on the characteristics of the target, the design of the transaction process, capital development, resource utilization after the divestment, and managerial influence on the divestment process. The individual factors' relevance, however, differs according to the time horizon of analysis: The comparative analysis of the relevance of the individual parameters has shown that for the short run, shareholder value development heavily depends on the transaction cost development and the degree of information efficiency expected from the deal. Stock returns react positively when monitoring intensity of the transaction is high, ownership diversification is reduced, management ownership increases, the management is involved in the deal to a large extent, and little reorganization is necessary after the divestment.

Sustainable value creation after the deal, however, demands further factors: Positive long-term CARs in the first two years after the deal are significantly more often achieved by firms seeking profound external advice, showing high analytical intensity in the decision process. Companies with a highly-sensitive and involved management, succeed more frequently. When reorganization is necessary, investors trust in companies showing an innovative restructuring process.

While previous studies usually focussed either on a fundamental resource and market-based perspective (Moeller et al., 2005, Capron et al., 2002, Capron, 1999, Capron et al.,



2001 Madhavan, 2010, Brauer, 2009), or on models drawing on institutional economics (Domney, 2009, Moschieri, 2011, Datta, 1991, Cannella & Hambrick, 1993, Datta et al., 2003), this study combines the two perspectives. It illustrates that in the first fortnight after divestment announcements, investors consider mainly the expected development of transaction costs, but in the long run, the creation of fundamental efficiency gains seems to be at least as important.

#### **4.6.2 Practical conclusions**

Referring back to the empirical results part **question 4** (“What do the results imply for corporate governance and strategic planning of divesting corporations? What can be concluded about determinants of divestment success or failure, from a shareholder perspective? “) is now answered:

##### **4.6.2.1 Management implications**

The study informs managers of divesting companies on salient aspects to ensure sustainable divestment success:

- In the decision phase, the management should proceed carefully and with high analytical intensity, to assess the potential consequences of the divestment decision, and to find an adequate buyer at a fair market price. This strategy helps to avoid misunderstandings in the transaction process, and ensures sustainable excess returns in the post-divestment phase.
- Divesting to enhance the corporate equity-debt level, i.e. in a process of deleveraging, according to this survey, is a promising strategy to enhance shareholder value in the short and the long run.
- Deals reducing ownership diversification and increasing management ownership should be favoured to maximize shareholder value in the short and in the long run.
- Selling subsidiary units is useful when transaction costs can be reduced sustainably. Reorganizations at the parent company after the deal should be as little as possible, so ideal divestment targets are little related to the mother corporation, and do not have specific key competencies. If restructuring after the divestment is necessary, openness to novel solutions can compensate for resulting transaction costs.

- According to the survey evaluation, more than 40% of the managers are not really involved and interested in divestment processes. According to the regression analysis, however, these aspects are essential to short and long-term shareholder value gains. Managers should show high involvement in the decision and transaction process. Capital markets honour managerial engagement and sensitive behaviour.
- The univariate analysis has shown that about 40% of the divesting companies do not rely on practical advice from external experts. External advice, however, has proven highly significant to sustainable shareholder value. Managers with little experience in divestment processes should trust in external advice, to ensure long-term post-divestment profitability.

#### **4.6.2.2 Implications for shareholders of divesting companies**

The results of this study are, finally, of interest to shareholders of divesting companies. It reduces investors' uncertainty concerning divestment situations (see section 4.1.1), and provides guidelines for investment decisions and divestment situations: when deciding for an investment in divesting companies, investors should focus on the parameters identified significant to divestment success, and choose companies accordingly. For speculative investments in the very short run, to be realized in the first fortnight after the transaction, investors should decide for businesses diminishing transaction and agency costs: they should prefer companies achieving a higher level of concentration due to the divestment, that proceed carefully in the divestment process.

The increase of management ownership is an indicator of divestment profitability, while transactions causing significant reorganization needs are less recommendable. Investors aiming to hold the asset for a longer time should additionally observe the development of the parent corporation's equity/debt ratio, and the innovativeness and management sensitivity in the restructuring process. Divesting companies should be sold when equity quotas diminish in spite of the divestment, and when the divestment is not sustainable.

Divestment processes conducted in a responsible and diligent way, and with a high level of analytical and monitoring intensity, can preserve shareholder value sustainably and

reduce information asymmetry between shareholders and the management. Strategic divestment can be a successful strategy of shareholder value creation, if the above derived managerial guidelines are considered.

#### **4.6.3 Limitations and further research needs**

This paper has compared a broad range of success factors to divestments, and has contrasted success parameters for the short and long-term perspective, using a novel dynamic CAR approach. However, further research should be done, to concretize and verify the indicators. The study is based on a very small sample of only 52 companies from the telecommunications business. The insights gained are accordingly not statistically representative, and cannot be transferred to other branches.

Further studies should refer to a broader sample, and cover a longer time period to consider macro-economic influences explicitly. The dynamic CAR approach could be extended to much longer observation periods than 714 days after the divestment. An analysis of the very long term performance, of two to five years after the divestment, would be of interest. The comparison of the performance of parent and divested companies would also be interesting.

Since data on strategic divestments are so far difficult to obtain, and frequently not published officially, further divestment research would require close cooperation between academic research and professional practice. More extensive databases, containing information on the long-term development of fundamental key figures after divestments, would help to enhance the reliability of academic research, reduce investors' uncertainty, and improve market transparency in the divestment business. These parameters could be applied to the regression as control factors which possibly would further enhance the model fit.

## **5 Summary and Conclusions**

Divestment generally is a process opposed to investment, and implies the selling of an asset and, more frequently, corporate shares or whole corporations (Brauer & Schimmer, 2010, 84; Madhavan, 2010, 1347). Although a broad range of studies has discussed and

empirically investigated the shareholder value effects of strategic divestments, essentially three research gaps remain:

- So far, no reliable and coherent methodology has been developed to measure long-term market value creation of divestments. Virtually all previous studies exploring stock market reactions based on market data are limited to performance effects in the short, or very short, timespan from the divestment announcement (e.g. Lambertides, 2009, Bartsch, 2005; Brauer, 2006, Brauer & Wiersema, 2012).
- Virtually no study is available that compares short-term to long-term divestment effects (e.g. Krishnaswami, 1999; Matthesius 2002, Cao et al, 2008, Brauer & Schimmer, 2010, Borisova et al, 2011). The reason is the incompatibility of short and long-term research. While short-term studies rely on the CAR (cumulative average rate of return) model, long-term studies mostly apply management surveys.
- The success factors of strategic divestments so far have not been explored comprehensively (Haynes, 2000; Datta et al., 2003, Brauer, 2009; Brauer & Schimmer, 2010, Bergh & Lim, 2008, Kahlert, 2010). Previous studies usually explore only a few factors each. However, comparing the evaluations, a broad range of potential influence factors exist, and their mutual cross-relationships have not yet been systematically explored.

These shortcomings have been the motivation for a series of three papers exploring the short and long performance effects, and determinants of, divestment success, systematically, for a sample of 52 divestments in the global telecommunications business, exceeding 300 million USD, between 2005 and 2011. The empirical results are summarized briefly in the following:

**Study 1** explores the long-term stock price effects of strategic divestments in the time window 14 days to 720 days after the announcement. It develops a novel dynamic CAR methodology, using time-varying alpha and beta factors and standardized average daily CAR values, to compare seven time windows after the divestments, comprising about 100 days each. Some interesting points have been made: for each sub-period, the share of over and under-performers after divestments, compared to the expected fair return, is

around 50%. Over-performers show significantly higher absolute returns than under-performers. Comparing post-divestment CARs to pre-divestment CARs, considering the whole post-divestment period, divesting firms perform significantly better than before. While in the first 200 days after the divestment – exempting technical course reactions in the first fortnight after the deal – post-divestment CARs tend to be negative, they are significantly positive from day 315 to 414. The average positive effect disappears after about 700 days. This suggests that efficiency gains after divestments need some time to develop, and markets need time to react to changes. While the year of deal conclusion has hardly any impact on long-term post divestment performance, the period of the announcement is of some relevance: Deals concluded in quarter 4 perform significantly better than deals concluded in quarter 1 to 3, about 1 year after the deal.

Applying the time-varying CAR model, **study 2** compares short-term performance 100 days before, to 14 days after the divestment, to long-term effects in the timeframe discussed in study 1. Study 2 finds: (Daily) CARs in the divestment period [-100;+14] exceed (daily) CARs in the prolonged pre-divestment period [-702;-100]. The positive effect starts from day 60 before deal announcement, cumulates between day -1 and day 1 after, and falls off to virtually 0 in the first week after the deal. Short term CAR values in the divestment period are not a general indicator of long-term post-divestment performance. Market expectations exaggerate significantly. However, usually post-divestment CARs beyond day 14 after the divestment is more positive than pre-divestment performance until day 80 before the divestment. Short-term CAR values after divestments are not generally reliable predictors of long-term post-deal performance. Usually correlations between performance in the divestment period  $d$  [-100; +14] and the post-divestment period [+14; 720] are insignificant. However, CARs realized between pre-divestment day – 60 and –41 can be a reliable indicator of post-divestment performance in the first two years after the divestment.

**Study 3** systematically explores a broad range of influence factors to strategic divestments and derives significant multiple regression models explaining short-term and long-term post-divestment performance. While previous studies usually focussed on the resource/market-based view, or institutional economics, paper 3 integrates the two perspectives: it finds significant models integrating factors from both disciplines: divestment success as a whole significantly depends on the characteristics of the target, the design of the

transaction process, capital development, resource utilization after the divestment, and managerial influence on the divestment process. However, success factors for the short and the long run differ: For the short run, shareholder value growth heavily depends on the transaction cost development, and the degree of information efficiency expected from the deal. Sustainable value creation in the long run, however, comprises a more comprehensive set of success factors. Positive long-term CARs in the first two years after the deal are significantly more often achieved by firms seeking profound external advice, showing high analytical intensity, with a highly sensitive and involved management, and an innovative restructuring process.

Bringing the results of the three studies together, both long and short-term post-divestment performance is determined by the factor of time on the one hand, and by content factors, e.g. strategic planning, market and resource situation, on the other. This implies that divestment success is firm and brand-specific, and can be devised strategically within the boundaries of macroeconomic cycles and time.

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## **7 Appendix**

### **7.1 Study 1**

#### **7.1.1 Data set and preparation in Excel**

[7.1.1.1 Attach xls Basis Data set](#)

#### **7.1.2 Results for H1**

[7.1.2.1 Attach H1 updated 22\\_09\\_15.spv](#)

[7.1.2.2 Attach H1 updated 22\\_09\\_15.pdf](#)

#### **7.1.3 Results for H2**

[7.1.3.1 Attach H2.spv](#)

[7.1.3.2 Attach H2.pdf](#)

#### **7.1.4 SPSS Dataset Study 1**

[7.1.4.1 Attach SPSS Data set Paper 1.sav](#)

### **7.2 Study 2**

#### **7.2.1 Data set and preparation in Excel**

[7.2.1.1 Attach ExcelData 03\\_05\\_14.xlsx](#)

#### **7.2.2 Results for H3**

[7.2.2.1 Attach H3 tTest v d.spv](#)

[7.2.2.2 Attach H3 tTest v d.pdf](#)

#### **7.2.3 Results for H4**

[7.2.3.1 Attach H4 tTest d n.spv](#)

[7.2.3 Attach H4 tTest d n.pdf](#)

#### **7.2.4 Results for H5**

[7.2.4 Attach H5 chitest.spv](#)

[7.2.4 Attach H5 chitest.pdf](#)

#### **7.2.5 T-test for H6**

[7.2.5 Attach H6 ttest.spv](#)

[7.2.5 Attach H6 ttest.pdf](#)

#### **7.2.6 SPSS Dataset Study 2**

[7.2.6 Attach Data set Paper2.sav](#)

#### **7.2.7 Tests for correlations and independence**

[7.2.7 Attach Independence test.spv](#)

[7.2.7 Attach Independence test.pdf](#)

### **7.3 Study 3**

#### **7.3.1 Dataset (excel)**

[7.3.1 Attach dataset Paper3.xlsx](#)

#### **7.3.2 Univariate analysis and correlations**

[7.3.2 Attach univariate correlations updated.spv](#)

[7.3.2 Attach univariate correlations updated.pdf](#)

#### **7.3.3 Regression models – hypotheses tests (extracts from SPSS)**

[7.3.3 Attach regression hypotheses.spv](#)

[7.3.3 Attach regression hypotheses.pdf](#)

#### **7.3.4 Comprehensive regression models**

[7.3.4 Attach comprehensive regression models.spv](#)

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#### **7.3.5 SPSS Dataset Study 3**

[7.3.5 Attach SPSS Data set Paper 3.sav](#)

## List of abbreviations

$\bar{D}$	average difference between the two (CAR-value) series
(E(Rit)	expected stock return
ai	y-axis intercept
AR	average return
bi	slope
CAAR	cumulated average abnormal return
CAPM	Capital Asset Pricing model
CAR	cumulated average return
CARd	cumulated average returns in the divestment phase
CARn	cumulated average returns after divestment
CARv	cumulated average returns before the divestment
F	F-value in F-test
H	hypothesis
k	number of case groups
M&A	Mergers and Acquisitions
N	sample size
QSI	variance within case groups
QSZ	variance across case groups
Rit	stock return
RMt	Index return
$s_D$	standard deviation
t	t-value in t-test

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